

A dynamic graphic of water splashing, with a blue stream of water falling from the top right and splashing into a pool of orange and yellow water at the bottom. The background is a light, neutral color.

Moving Elements

ANNIVERSARY CONFERENCE 2009
CONFERENCE PORTFOLIO

Conference, exhibition, ceremony
Leipzig, 22 and 23 September 2009

gat 2009
leipzig

wat 2010
leipzig

150 years of  **DVGW**

WELCOME TO LEIPZIG!

Dear Delegates,

gat 2009 and wat 2010, which has been brought forward, are being held together on the occasion of the 150th anniversary of DVGW. The anniversary conference will offer an opportunity for an exchange of experience between gas and water industry delegates in the platform discussions and forums. Recognized experts in their fields will be presenting first-hand reports on innovations in the gas and water industries.

This conference portfolio includes the abstracts of all presentations which were submitted in time for publication. They are intended to give you an overview of the content and allow you to select presentations more effectively in accordance with your own personal priorities

The full versions or the presentation documents of the various speakers can be downloaded from www.150-Jahre-DVGW.de by registered delegates following the event. You have received the password you require together with your conference documents.

To ensure that it was up-to-date, the list of delegates was only printed shortly before the anniversary conference. You can place the list in the flap at the back of the portfolio..

The conference team would like to wish you a pleasant and successful stay.

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PROGRAMME

TUESDAY, 22 SEPTEMBER 2009

09:00 a.m.-12:00 p.m. | Hall Bonn

OPENING CEREMONY

DVGW opening speech

Prof. Dr.-Ing. Hans Mehlhorn, President of DVGW

Welcome and greetings

Anniversary keynote speech

Prof. Dr. Klaus Töpfer, former federal minister and executive director of UN Environment programme

“Enough water and energy for 9 bn people?

To what extent can and must we build a sustainable future?”

Panel discussion

Chair: Ulrich Wickert, Telecaster and author

“Changes in the gas and water industry – what are the contributions of technology and setting of technical rules?”

12:00 p.m.-4:00 p.m. | Hall 3

EXHIBITION

2:00 p.m.-3:30 p.m. | Hall Bonn

DVGW MEMBERS' ASSEMBLY

Participation only on specific invitation

4:00 p.m.-5:30 p.m. | Hall Bonn

GAS/WATER FORUM

Chair: Dr. Jürgen Lenz, E.ON Ruhrgas AG, Essen

Safe and secure supply – a cornerstone for the future

Prof. Dr. Klaus Homann, Thyssengas GmbH

Dr. Bernhard Hörsgen, Gelsenwasser AG, Gelsenkirchen

Renewable energies and proactive water resources protection – mutually exclusive?

Dr. Richard Beisecker, Ingenieurbüro für Ökologie und Landwirtschaft, Malsfeld

Renewable energies and proactive water resources protection – mutually exclusive?

Uwe Bauer, E.ON Hanse, Hamburg

Integrated it systems – what is their benefit for and efficiency in asset management?

Markus Lermen, energis GmbH

Admission from 6:30 p.m. | Hall 1

GALA

MOVING ELEMENTS

Don't miss this out-of-the-ordinary gala where you will learn more about both the DVGW's past and future in an entertaining and subtle manner. Expect an intriguing show, with the "elements" of our anniversary motto remaining the central theme of the night. Each agenda item will itself turn into an element that will keep you, our guests at this gala, moving. The gala will be perfectly rounded off by a creative and highly ambitious gourmet dinner that will take your palate from one culinary highlight to the next. You'll be in for surprises and enchantment!

We look forward to seeing you!

PROGRAMME

WEDNESDAY, 23 SEPTEMBER 2009

PARALLEL DISCUSSION FORUMS

09:00 a.m. – 10:30 a.m.

Hall Bonn

WATER FORUM – REGULATORY FRAMEWORK

Chair: Wulf Abke,
Hessenwasser GmbH & Co. KG, Groß-Gerau

Challenges for the German water industry
Jörg Simon, Berliner Wasserbetriebe AöR (BWB), Berlin

Water prices under scrutiny
Gunda Röstel, Stadtentwässerung Dresden GmbH, Dresden

(Climate) change and the water industry
Dr. Michael Beckereit, Hamburg Wasser, Hamburg

Summary of the legal opinion concerning requirements for the supervision of water companies by anti-trust authorities to prevent abuse of market position in accordance with Section 103 (5), Act Against Restraints of Competition, Old Version
Dr. Andreas Lotze, Attorney-at-law, Essen

Hall Brüssel

INDUSTRY FORUM

Chair: Dr. Detlef Bohmann, Begatec, Berlin

Innovative maintenance solutions for buried valves
Axel Sacharowitz, 3S Antriebe GmbH, Berlin

PE multi-layer and high-pressure pipes – solutions for gas and water distribution systems
Dr. Thorsten Späth, egeplast Werner Strumann GmbH & Co. KG, Greven

Trenchless technology with ductile cast-iron pipeline systems
Raimund Moisa, Fachgemeinschaft Guss-Rohrsysteme, Griesheim

Hall Berlin

GAS FORUM – METERING

Chair: Dr. Ulrich Wernekinck,
RWE Westfalen-Weser-Ems AG, Dortmund

Process and data exchange requirements for metering point operators/metering service providers
Jürgen Pilz, ESWE Versorgungs AG, Wiesbaden

Smart Metering – Starting on 01-10-2010!?
Ernst Kaiser, RWE Westfalen-Weser-Ems AG, Dortmund

Requirements on calorific value calculation (determination)
Gerhard Kleppek, Wingas Transport GmbH, Kassel

10:30-11:00 BREAK

PROGRAMME

WEDNESDAY, 23 SEPTEMBER 2009

PARALLELE DISKUSSIONSFOREN

11:00 a.m. – 12:30 p.m.

Hall Bonn

WATER FORUM – QUALITY AND SUSTAINABILITY

Chair: Prof. Dr.-Ing. Hans Mehlhorn, Zweckverband Bodensee-Wasserversorgung, Stuttgart

Quality of the resources – preventive water protection versus end-of-pipe philosophy

Dr. Helge Wendenburg, Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, Bonn

Drinking water quality – how pure is pure?

Dr. Doris Reick, LGA Stuttgart, Stuttgart
Prof. Dr. Wolfgang Kühn, DVGW-Technologiezentrum Wasser (TZW), Karlsruhe

Environmental and energy balance in a water supply context – how can suppliers contribute?

Dr. Berthold Hambach, Gelsenwasser AG, Gelsenkirchen
Reinhold Hüls, Veolia Wasser GmbH, Leipzig

Hall Berlin

GAS FORUM – ASSET MANAGEMENT

Chair: Andreas Hennig, THÜGA Aktiengesellschaft, München

Control and forecast of replacement investments – asset management of gas facilities

Dr. Klaus Steiner, E.ON Ruhrgas AG, Essen
Jeff Douglas, E.ON Central Networks, England

Maintenance caught between regulation and safe, secure and sustainable energy distribution

Heinrich Busch, Mainova AG, Frankfurt

Asset management in the context of incentive regulation

Jan Fuhrberg-Baumann, Stadtwerke Leipzig Netz GmbH, Leipzig

Hall Brüssel

INNOVATION FORUM – DVGW/ASUE

Chair: Dr. Jochen Arthkamp, ASUE Arbeitsgemeinschaft für sparsamen und umweltfreundlichen Energieverbrauch e. V., Essen

Fuel cells and stirling engine as electricity producing heating systems

Michael Braun, Baxi Innotec, Hamburg

Gas heat pumps: efficient technology for today and tomorrow

Michael Plothe, Bosch Thermotechnik GmbH

Heat supply in new buildings – full-cost comparison

Prof. Dr. Bert Oschatz,
Institut für Technische Gebäudeausrüstung Dresden, Dresden

12:30 p.m.-1:30 p.m.

EXHIBITION

PROGRAMME

WEDNESDAY, 23 SEPTEMBER 2009

PARALLEL DISCUSSION FORUMS

1:30 p.m. – 3:15 p.m.

Hall Bonn

GAS FORUM – NEW APPLICATION TECHNOLOGIES

Chair: Dr. Bernhard Klocke,
Gasversorgung Westfalica GmbH, Bad Oeynhausen

Award of DVGW gas prizes for students

Dr. Jürgen Lenz, DVGW-Vizepräsident Gas

Results and consequences from the DVGW/ ASUE innovation study

Dr. Almut Kirchner und Vincent Rits, Prognos AG, Basel

The heat market in the next decade

Karel Schweng, VNG

The new technologies from the industry point of view

Dr. Ekkehard Laqua, Bosch Thermotechnik GmbH, Wetzlar

Hall Berlin

WATER FORUM – TECHNOLOGY AND MANAGEMENT

Chair: Dietmar Bückemeyer, Stadtwerke Essen AG, Essen

Award of dvgW water prizes for students

Dr. Bernhard Hörsgen, DVGW-Vizepräsident Wasser

The water-safety-plan concept for buildings: “Quo vadis?”

Oliver Schmoll, Benedikt Schäfer, Umweltbundesamt, Bad Elster

Technical safety management – What are the benefits for suppliers and the industry?

Henning Schaare, Wasserverband Peine, Peine
Roland Grothe, Hessenwasser GmbH & Co. KG, Groß-Gerau

The new DVGW damage and net statistics on water – what are the advantages of an industry-based solution?

Bernd Heimhuber, enercity Netzgesellschaft mbH, Hannover

Hall Brüssel

INDUSTRY FORUM

Chair: Dr.-Ing. Lutz Wittmann, figawa,
Bundesvereinigung der Firmen im Gas- und Wasserfach e.V., Köln

Innovations for buried hydrants

Udo Arrenberg, Hawle Armaturen GmbH, Freilassing

Flexible system solutions for water circuits

N.N.

Flexible materials for drinking water in europe

N.N.

GAS/WATER FORUM

SAFE AND SECURE SUPPLY – A CORNERSTONE FOR THE FUTURE

PROF. DR.-ING. KLAUS HOMANN, THYSSENGAS GMBH

Modern industrial societies are highly dependent on a safe and secure supply of raw materials, especially primary energy and products derived from energy sources. In this context, "safe and secure" means technically safe, reliably available and available at competitive conditions. This not only concerns the import of energy sources but also the contribution of German energy suppliers. Despite large reserves of hard coal and lignite, security of supply is also an essential consideration for Germany. Local options for sustainable primary energy production, including wind energy, solar power, biomass, etc. must also be included.

Initially, it may be assumed that safe and secure supply is a public good. Government is responsible for providing the framework and the energy industry is responsible for meeting these requirements. However, the introduction of more intensive competition in the energy sector clearly indicates the dilemma we face if security of supply is classed as a public good in this way. Rational consumers are simply not prepared to pay any premium whatsoever for safe and secure supplies.

The objective of the DVGW is to ensure that German gas networks are technically safe and ensure reliable supplies of gas. The situation on the basis of European and national legislation is relatively clear. The Federal Network Agency is responsible for ensuring that network operators (including storage facility operators) have sufficient resources to maintain their systems in a condition which is safe and allows them to deliver gas reliably. However, technical specialists are well aware that technical safety and reliability are by no means absolute. For both safety and reliability, it is necessary to define the minimum level that is acceptable and can be

achieved efficiently. This is the task of the regulatory authorities, which base their assessments on DVGW codes of practice, an approach that has been further reinforced by Section 49 of the Energy Industry Act.

However, in the context of cost regulation and especially of incentive regulation, the requirements of Section 49 take on a new dimension. The "Q-Element" is intended to provide an incentive for maintaining the quality of supplies. However, we all know that safety from the technical point of view is a key element in or indeed a prerequisite for secure supplies and calls for action based on long-term considerations. There is therefore only a very limited possibility that the Q-Element, with its short-term effect via the cost formula, will provide adequate incentives for minimum safety levels. Nevertheless, the DVGW is active in this area. In order to meet this challenge, it will be necessary to update the relevant codes of practice. Our codes of practice call for responsible specialists with the best possible qualifications. As a result, it has been possible to limit the codes of practice to the statement of general objectives in many cases. However, incentive regulation based on cost comparison indicates that it may be necessary to consider the inclusion of specific measures in codes of practice. Compliance with construction and maintenance procedures already considered to be reasonable but not explicitly laid down in regulations or codes of practice must not be called into question as a result of comparative efficiency measurements. Despite the perceptible effects of excessive pressure on costs, the clear statement by the Federal Network Agency that it intends to pursue the same objective as the DVGW and the energy regulators in this context gives us reason to be cautiously optimistic.

GAS/WATER FORUM

SAFE AND SECURE SUPPLY – A CORNERSTONE FOR THE FUTURE

DR.-ING. BERNHARD HÖRSGEN, GELSENWASSER AG

Drinking water must meet high health and aesthetic requirements at all times and be available in sufficient quantities and at adequate pressures at all delivery points (DIN 2000). German water companies meet these high requirements on a nationwide basis, at least to the extent that they operate their plants in accordance with the "generally accepted rules of technology". Among gas and water industry specialists, the DVGW codes of practice represent the shared understanding of these generally accepted rules.

In connection with the public discussions of appropriate pricing for water, which have become increasingly frequent recently, the objection that companies take action that is not immediately necessary is occasionally raised. In this context too, the DVGW codes of practice are a key yardstick. In future, it will probably be necessary to

formulate standards even more stringently in order to have a clear basis for the "generally accepted rules of technology" which can stand up to scrutiny by the courts. The review and certification of water companies will also have a key role to play in the future as certification will confirm that a company applies the DVGW codes of practice properly.

The core competence of the German water industry is its ability to meet requirements for the supply of first-class drinking water at all times. Despite all the understandable efforts being made to reduce costs, it is essential to ensure that the high quality of water supplies is not impaired at the waterworks or in the pipeline. The high levels of security of supply which we have achieved are a cornerstone for the confidence of our customers and also a guarantee for a secure future.

GAS/WATER FORUM

RENEWABLE ENERGIES AND PROACTIVE WATER RESOURCES PROTECTION – MUTUALLY EXCLUSIVE?

DR. RICHARD BEISECKER, INGENIEURBÜRO FÜR ÖKOLOGIE UND LANDWIRTSCHAFT (IFÖL), MALSFELD

Energy supplies based on renewable raw materials are becoming increasingly important as a result of rising energy prices and the issue of climate change. In Germany, there has been significant growth in renewable energies, especially the production of biogas and biofuels from biomass. Apart from biogenic solid fuels, biogas plants are the key factor in power generation using biofuels, accounting for approx. 46.5 % of capacity installed (based on the figure for 2007: 2,649 MWel.). As a result, there has also been a dramatic increase in the cultivation of energy crops over the past few years.

The risks to groundwater and surface water connected with the cultivation of energy crops for biogas production and the use of fermentation residue are mainly the result of the changes in land use which have already been observed, with increased ploughing up of grassland, the extension of maize-growing and more intensive production to ensure higher yields and the more intensive discharge of nutrients to water which must be expected in this context. In some regions of Germany, concentration on a few especially high-yield energy crops such as silo maize has already led to cultivation structures which are no longer balanced. In addition, the need to use fermentation residue in agriculture has exacerbated the problems of manure utilization, especially in areas with large numbers of cattle.

As the results of current DVGW research projects show, the hazards to drinking water resources as a result of energy crop cultivation are connected with factors such as land use and crop rotation, fertilizer use and nutrient balances, erosion and the effects on subsurface water. In particular, the agricultural use of fermentation waste may result in severe pollution or excess nutrient application, depending on the material which is fermented (energy crops, manure, agricultural production waste or organic waste). For the sustainable cultivation of energy crops, it is therefore important to apply on a national basis the current DVGW guidelines for the cultivation of energy crops with reference to water protection and the agricultural use of fermentation waste in water production areas.

From the point of view of water resource protection, the following requirements of the DVGW position paper "Energy Crop Production and the Use of Fermentation Waste from Biogas Plants with Reference to Water Resource Protection" must therefore be implemented:

- The ploughing-up of grassland also suitable for arable use, areas set aside for several years and fallow land for the cultivation of energy crops must be avoided.
- Where energy crops are cultivated, crop rotations adapted to local conditions must be implemented to ensure year-round crop cover where possible.
- From the point of view of drinking water production, the application of fermentation residue in the protection zone II of existing or planned water resource areas or within the 50-day line of groundwater production plants is generally unacceptable and must therefore be forbidden. In protection zone III, the application of fermentation residue is possible, if the quality of both the residue and the application process are ensured by a quality management system.
- The application of fermentation residue from biogas production with co-substrates (groups 3 and 4) in water protection areas, the catchment area of waterworks and sensitive water resource areas is generally unacceptable and must therefore be forbidden.
- Organic fertilization using fermentation residue must be limited to a maximum nitrogen application rate of 170 kg/ha N, referred to the entire fermentation residue and not only to nitrogen from animal sources. In sensitive water resource areas, the nitrogen application rate from organic fertilizers should be limited to a maximum of 120 kg/ha N.
- The area to which fermentation residue is applied must therefore be larger than the area used for cultivating the fermented material. The fermentation residue application rate should be based primarily on the nutrient requirements of the crops concerned.

GAS/WATER FORUM

RENEWABLE ENERGIES AND PROACTIVE WATER RESOURCES PROTECTION – MUTUALLY EXCLUSIVE?

DIPL.-ING. UWE BAUER, E.ON HANSE AG

As a result of energy and climate policy developments over the past few decades, the German government developed an Integrated Energy and Climate Protection Programme (IECP) in 2007. Among other things, the programme aims to help in achieving the following objectives by means of regulatory measures: reduction of greenhouse gas emissions, promotion of cogeneration and fuel admixtures and an increase in biogas use to about 100 billion kWh by 2030, corresponding to about 10 percent of current natural gas demand or about 2,500 biogas plants. The programme is being implemented by legislation including the Renewable Energy Act, the Renewable Energy for Heating Act, the Cogeneration Act, the Energy Use Ordinance and regulations concerning building rehabilitation, etc. Binding statutory provisions now in force (Gas Network Access Ordinance, Gas Network Charges Ordinance, Incentive Regulation Ordinance, Cooperation Agreement III) entail obligations to connect biogas plants, to give biogas priority and to effect extended balancing; as a result, the cost of biogas injection to gas systems will be distributed between gas users in the final resort. Indirectly, this model gives a boost to energy sources competing with biomethane.

In 2006, a study concerning the injection of gas generated from biomass appeared with the support of DVGW; the study considered the period up to 2030. Apart from identifying potential, the study covered crude gas production, treatment processes and injection possibilities as well as commercial aspects. The state of knowledge concerning biogas is currently being improved by a number of research projects based on initial experience with the 15 injection plants currently in operation. These projects will contribute to the development of DVGW codes of practice (e.g. G 260, G 262, VP 265-1, G 2000, TSM, experts).

In order to assess the proactive protection of water

resources, it will be necessary to carry out comprehensive, in-depth scientific research taking into account experience with the pilot plants. Material flows within the entire biogas process chain from biomass production via gas production and treatment processes through to the point of use need to be analysed. Key aspects include drinking water requirements, the type of biomass and crop growing locations, where applicable, soil conditions, growing methods with fertilizers, storage, fermentation residue, sludge, condensates, raw materials and consumables, process waste gas and gas property requirements. Gas property requirements for biogas injection plants are updated on the basis of the results of the DVGW biogas measurement programme and developments in treatment technology. Apart from combustion properties, gas constituents and trace substances such as sulphur compounds, carbon dioxide, oxygen and ammonia are specified and microbiological requirements are stated. The main constituents and trace substances which can result from upstream process stages are indicated, depending on the technology used. Some of these substances leave the system in the form of waste gas. Other materials are returned to the process as condensate, in some cases treated (e.g. detergents) or collected (e.g. lubricating oil). Efforts to ensure sustainable proactive water resource protection must therefore focus on substrates, agricultural production and fermentation for gas production. The materials resulting from each production chain are divided into four groups on the basis of current DVGW research. These groups define the zones in which these substances can be applied and the acceptable application rates.

Compliance with such requirements can be monitored by uniform, integrated approval procedures (cf. Federal Pollution Control Act) and by the technical safety management system (TSM) currently being developed by the DVGW.

GAS/WATER FORUM

INTEGRATED IT SYSTEMS – BENEFITS AND EFFECTIVENESS FOR ASSET MANAGEMENT

DIPL.-ING. (FH) MARKUS LERMEN, ENERGIS GMBH

The liberalization of power and gas markets has initiated a dynamic process of change in the energy industry. The regulation of network access charges and incentive regulation associated with this process have significantly increased the cost pressures on utilities. One of the main challenges in this situation is to reduce network costs at the same time as ensuring secure supplies. Energy companies can only succeed in this apparent tightrope act in the long term if an effective asset management system is implemented in addition to systematically optimizing corporate processes. An asset management system of this type must lay firm foundations for entrepreneurial decisions on the basis of facts which are as well-founded as possible in a situation defined by the conflicting requirements of economics, security of supplies and maintaining the value of assets. The objective is not only to define an investment plan that is as robust as possible but also to monitor and if necessary reassign the assets deployed.

One possible approach is to adopt efficient maintenance strategies no longer based only on technical considerations but also on asset management with reference to value and risks. Simulation software for assessing alternative plant and maintenance strategies has been tried and tested in practice. Factors such as plant condition, risks, the cost of failure, operating and overall expenses are taken into consideration, providing effective support for long-term decisions.

As an internal service provider, the network service organization is expected to ensure significant cost savings

in network operation. Positive results are achieved by improving personnel deployment and making internal processes leaner. Nevertheless, further optimization potential remains untapped if the island solutions and gaps in media use which are still often found on the technical side are not eliminated. The introduction of mobile IT and workforce management systems allows direct data acquisition on site and is a key factor in enhancing data quality. Data are then transferred to GIS and ERP systems as well as equipment databases and are available to other applications.

Accurate up-to-date data of existing networks play a key role in assessing the condition of assets and developing maintenance strategies. The data concerned include network structure, nominal diameter, material, condition, age, damage, etc. If the data required are not available or are implausible, a data take-off exercise is recommended. Often, information has been stored and updated in different information systems and databases, which have often been redundant. As a result, there may be considerable differences between the currency and quality of the data. Before different IT systems can be successfully integrated, these deficiencies must be eliminated and the data must be harmonized. In addition, data consistency must be ensured in order to avoid quality losses in the future. The benefits to the company are enormous, including the availability of well-founded data for asset management, the possibility of a high degree of automation, allowing efficient business processes, and finally a marked and sustained reduction in costs.

WATER FORUM – REGULATORY FRAMEWORK

CHALLENGES FOR THE WATER INDUSTRY

DIPL.-ING. DIPL.-WIRT.-ING. JÖRG SIMON, BERLINER WASSERBETRIEBE

The objective of this presentation is to highlight the main challenges faced by the water industry and to outline some possible solutions.

The business environment and the framework for action by water suppliers are changing. As a result of the European Water Framework Directive which came into force in 2000, environmental requirements will become even more stringent. In order to meet higher quality requirements, it will be necessary to improve the effectiveness of treatment (for example by adding a fourth stage to wastewater treatment plants). Water suppliers and wastewater treatment companies face the prospect of considerable investments which will need to be financed by water prices or wastewater disposal charges. It is also not clear how the potential conflict between the objectives of improved treatment performance and climate protection is to be solved. A significant increase in treatment efficiency will call for considerable additional energy, thus resulting in higher CO₂ emissions. Climate change is therefore also a challenge for the water industry. Will it be necessary to modify infrastructure in this situation? The water industry is committed to maintaining high levels of security of supplies in the future. However, the forecasts concerning climate change are still very vague.

The President of the Federal Network Agency, Mr. Kurth, raised the question of a more appropriate model of competition for the water industry again at the be-

ginning of 2009. Following the debate concerning possible liberalization, the federal government had adopted in March 2006 a modernization strategy which to a certain extent is based on elements of competition, but which still generally protects existing structures such as area monopolies. Options of the type mentioned by Mr. Kurth in his speech would represent a fundamentally different situation for the water industry. Demands for changes such as compulsory calls for tenders for franchises and an end to the obligation to be connected to and use systems will need to be critically scrutinized. In addition, the different prices charged by the industry are under discussion. In some cases, the monopoly authorities are investigating the appropriateness of pricing compared with other utilities in the sector.

One of the main challenges faced is the steady fall in direct water consumption. The effects on water and wastewater companies are severe, especially in view of the large share of fixed costs in companies' overall cost structure. As long as tariff models do not adequately reflect the actual cost structure in the industry, the leeway for action by water companies will become even more restricted. In future, legislators will need to offer greater flexibility. In addition, falling consumption has a direct impact on regional water supply and waste water disposal. For example, water levels are rising and longer dwell times within the water supply system will take existing networks to their limits.

WATER FORUM – REGULATORY FRAMEWORK

WATER PRICES UNDER SCRUTINY

GUNDA RÖSTEL, MANAGING DIRECTOR, COMMERCIAL, STADTENTWÄSSERUNG DRESDEN GMBH

The water industry faces new, and in some cases, conflicting, challenges with falling water consumption on the one hand and climate change on the other hand. At the same time, consumers are demanding stable prices and politicians have initiated calls for increasingly stringent standards.

The good news for consumers in Germany is that the quality and safety of water, a commodity that is essential for life, have reached the highest standards in the world. The bad news is that there is a price to be paid for safety and quality. Outstanding standards call for investments by water companies and these must be reflected in pricing. Furthermore, it will be necessary for these costs to be borne by fewer consumers in the future.

"Do you know how much you pay for water?" Only a few consumers can give a specific figure in response to this question. They still feel that the price is too high. However, each consumer in Germany only pays an average of 23 cents per day for drinking water and 35 cents per day for wastewater disposal. This figure is less than the cost of the handful of fruit per day recommended by doctors.

The current controversy regarding water prices is fuelled by media reports on various proceedings of the monopoly authorities. Critical and methodical reviews of prices have led to accusations against several water and wastewater utilities; it is alleged that they can charge virtually whatever price they want because they have a natural monopoly. The companies concerned have rightly rejected these allegations which not only fail to consi-

der their individual situations but also the service they provide.

It must be admitted that the German water industry is open to criticism on one point. In many cases, there has been too little effort to communicate and discuss service levels and pricing over the past few years even though public bodies have frequently raised the issue of water and wastewater pricing. To date, customers have not realized why they pay a particular price and why there are price differences between the various regions of the country. The problem has long been identified and, in addition to the image of the sector and a variety of benchmark processes, consumer organizations, politicians and the water industry are jointly working on a customer balance sheet which will allow consumers to compare and assess the services provided by their water and wastewater utilities.

The current application of monopoly law is not necessarily open to criticism. However, it must be possible to question whether these statutory provisions should be applied to the water industry in the same way as to the energy or telecommunications sector, for example. The water industry has no reason to be ashamed as it can look back on very good performance over the past few years. However, it will be necessary to discuss performance and pricing more clearly and transparently in future. Simple price comparisons are of no use in this context. The water industry must face up to this challenge in a fair and open dialogue with its customers and politicians.

WATER FORUM – REGULATORY FRAMEWORK (CLIMATE) CHANGE AND THE WATER INDUSTRY

DR. MICHAEL BECKEREIT, HAMBURG WASSER

The water industry faces a number of new challenges but the greatest is the process of climate change that is clearly apparent throughout the world. Together with the increase in sealed area, demographic change, the idea of saving water so firmly anchored in the minds of consumers and scarce energy resources, this challenge inevitably calls for the reorientation of the water industry.

In addition to droughts and hurricanes, the increase in the incidence of catastrophic flooding, caused by rising water levels, is also the result of climate change. Heavy rain produced by shifts in precipitation distribution leads to flooding in combination with the increasing proportion of sealed surfaces and inadequately sized drainage systems. Large pipe cross sections, adequate storage volumes and high pumping capacities are required in such situations. For everyday water supply and wastewater disposal, these systems are oversized because demographic change coupled with the need to save water propagated by the media has led to a fall in water

consumption. This clearly shows that the requirements for heavy rainfall situations are in conflict with those for everyday water consumption.

Currently, a number of measures are being taken to manage the effects of climate change. However, it is more important to actively combat the causes of the process. We can only succeed in halting or at least mitigating climate change if all those who are responsible throughout the world participate in climate protection. The first steps have already been initiated by politicians. The German water industry can play its part to ensure that these attempts are successful. In order to do so, it must face up to the new challenges and develop measures for avoiding energy waste and reducing greenhouse gas emissions. With a view to actively combating climate change, the objective should be to create energy-autonomous overall systems through energy saving and the use of energy-efficient plants based on renewable energy sources.

WATER FORUM – REGULATORY FRAMEWORK

SUMMARY OF THE LEGAL OPINION CONCERNING REQUIREMENTS FOR THE SUPERVISION OF WATER COMPANIES BY ANTI-TRUST AUTHORITIES TO PREVENT ABUSE OF MARKET POSITION IN ACCORDANCE WITH SECTION 103 (5), ACT AGAINST RESTRAINTS OF COMPETITION, OLD VERSION

DR: ANDREAS LOTZE, ATTORNEY-AT-LAW, ESSEN

In the previous proceedings, mainly conducted by the anti-trust authorities of the State of Hesse, and the judgement of Frankfurt Higher Regional Court of 18 November 2008 in the matter of enwag Energie- und Wassergesellschaft mbH, Wetzlar, special features of local authority constitution and water law which are inseparably connected with drinking water supply have, in the opinion of the BDEW, largely been neglected. Previous judgements in abuse of market position proceedings in the energy sector cannot simply be transferred to water suppliers, to the extent that the similarity of the utilities is concerned. The distribution of the burden of proof and evidence in the proceedings which are pending is not appropriate.

The BDEW therefore instructed Dr. Andreas Lotze, attorney-at-law with the law firm of Aulinger Rechtsanwälte, and Prof. Dr. Michael Reinhardt, LL.M., Head of the Institute of German and European Water Industry Law at the University of Trier, to draw up a legal opinion, from the point of view of water and anti-trust law, on "Requirements for the supervision of water companies by anti-trust authorities to prevent abuse of market position in accordance with Section 103 (5), Act Against Restraints of Competition, Old Version". The results are now available and will be presented at the anniversary conference.

GAS FORUM – METERING

PROCESS AND DATA EXCHANGE REQUIREMENTS FOR METERING POINT OPERATORS/METERING SERVICE PROVIDERS

DIPL.-ING. JÜRGEN PILZ, ESWE VERSORGUNGS AG, WIESBADEN

The amendment of 9 September 2008 to Section 21 b of the Energy Industry Act has the effect of entirely liberalizing metering services. On this basis, a third party may assume responsibility for metering point operation and metering services if the connection user so wishes. The Metering Access Ordinance issued pursuant to the requirements of this section came into force on 23 October 2008. The Ordinance sets out key conditions for network operators as regards business processes for metering point operation and metering. The Federal Network Agency is to define uniform business processes and standard contracts for metering point operation and metering services which will apply throughout Germany in the power and gas sectors.

On 12 March 2009, Ruling Chambers 6 and 7 of the Federal Network Agency opened procedures in accordance with Section 19, Energy Industry Act and Section 13,

Metering Access Ordinance, concerning the standardization of contracts and business processes for metering in the electricity and gas sectors.

The proceedings cover standard contracts for the operation of metering points and the performance of metering services as well as the definition of uniform business processes. The objective is to ensure effective cooperation between market participants for the operation of metering points and for the acquisition, processing and distribution of the relevant metering data. Except in the case of special features of these sectors, it is proposed that the standard documents and procedures adopted for the two sectors should be as near to identical as possible. By adopting this approach, it is intended to exploit potential synergy effects between the operation of metering points and the performance of metering services in the two sectors to the greatest extent possible.

GAS FORUM – METERING

SMART METERING – STARTING ON 1 JANUARY 2010?

DIPL.-ING. ERNST KAISER, RWE WESTFALEN-WESER-EMS NETZSERVICE GMBH

The topic of smart energy metering for domestic customers is currently being widely discussed. Metering infrastructure faces a fundamental upheaval. The pace of change is rapid and the issue is technically complex. Against this backdrop, the paper gives a snapshot of the current situation, including an overview of the reasons for change, the opportunities available and the technical and economic aspects of the digitization of energy networks from the point of view of an energy supplier.

A variety of measures have been proposed for climate protection, including an increase in the efficiency of final energy use. In the field of weights and measures, new legislation not only includes the Metering Access Ordinance, creating innovative structures in the industry, but also the amended Sections 21 and 40 of the Energy Industry Act, which establish a framework for directly fostering new technologies. Under Section 40 of the Energy Industry Act, energy suppliers are under an obligation to offer "incentive tariffs" for electricity from the end of 2010. Calls for incentive tariffs reflect the generally accepted significance of smart meters as a key component in the digital networking and optimization of energy supply systems, allowing energy efficiency potential to be tapped, right through to smart grid concepts. Smart metering plans are not limited to smart electricity meters but also include smart gas meters. Consumers can take advantage of further potential for energy savings by changing their behaviour. This is the objective of Section 21, Energy Industry Act. From 1 January 2010, it will be mandatory for new buildings to be equipped with electricity and gas meters that reflect actual energy consumption and actual utilization times, giving consumers more information than was previously the case and allowing them to act in a more energy-efficient way. Compliance with Section 21 by 1 January 2010 is a challenge that faces both the electricity and the gas industry. Will it be technically feasible and economically viable for gas meters to meet this requirement? What solutions are

available? Will it be necessary to start the digital networking of meters on 1 January 2010? In order to answer these questions, the gas metering technology and smart functions currently available are described and the latest developments are outlined.

The standards which have already been developed are also considered. Standardization work in Germany has reached an advanced stage. For the power sector, the MUC concept of VDE committee FNN describes the communication of meters with an in-house communications platform and a central control room. The manufacturers in ZVEI/FIGAWA/KNX have developed an open metering specification which pays special attention to the M-BUS. Specifications for EDL 21 meters for power and gas (meters that meet the requirements of Section 21, Energy Industry Act) have been drawn up by VDE committees FNN and DVGW PK "The future of household gas metering". Standardization work at the European level has only just started, from an initial situation that was very heterogeneous. It remains to be seen whether and to what extent the work already completed in Germany can make a contribution to European standardization and what form the specific European standards will finally take.

The work will certainly need to go beyond compliance with minimum statutory requirements. A smart meter itself can also be developed as a selling point. The infrastructure offered by digital energy networks could serve as a basis for additional services, right through to home automation. The revenue available from these services could have a significant impact on the economics of smart metering. The customer must be at the centre of these considerations: it will not be possible to achieve the objectives of Section 21 if we do not succeed in convincing the customer. The paper is intended to place the various aspects of this issue in context and to provide assistance for developing a strategy for 1 January 2010 and beyond.

GAS FORUM – METERING

REQUIREMENTS FOR GROSS CALORIFIC VALUE CALCULATION (DETERMINATION)

DIPL. ING. (FH) GERHARD KLEPPEK, WINGAS TRANSPORT GMBH & CO. KG

As regards the determination and use of gross calorific values, there have been a number of changes over the past few years.

For example, GABi Gas lays down requirements for quantity nominations and balancing with respect to recorded demand measurement and standard load profile customers. Quantity nominations are made at d-1, d or d+1. At these times, information on the final gross calorific value of the gas is not yet available, which is why nominations are made on the basis of a provisional gross calorific value. Under GABi gas, balancing group invoicing must be carried out using this provisional value. Any quantity differences arising from differences between provisional and final gross calorific values are not taken into consideration in balancing group accounting. These differences are then balanced between the exit network operator and the shipper in connection with invoicing for gas surpluses and shortfalls.

In addition, DVGW code of practice G 685 was completely revised at the end of 2008. This code of practice deals with matters including the determination of entry and invoicing gross calorific values in connection with gas invoicing in thermal units, i.e. classical commercial invoicing. The new features concern the definition of a variety of invoicing periods including hours, days, months and years. In addition, the definition of fixed gross calorific values for customers covered by standard tariffs no longer applies. Finally, the time offset procedure has been introduced for the determination of the annual invoicing gross calorific value. This procedure co-

vers the determination of the gross calorific value for invoicing in the event that the value for the last invoicing month is not available. In this context, special attention must be paid to the requirement for subsequent invoice corrections.

The rule concerning the "two percent limit" in the case of gas supply from several points has also been revised. This procedure has now been extended to networks arranged in series, also referred to as "cascading" networks. The rationale for this change was to ensure higher invoicing accuracy for customers in networks where the invoicing gross calorific value is not measured but calculated by approved substitute procedures. The application of this procedure has not been tried and tested in practice and discussions are still in progress.

There have also been developments in the technology for the physical determination of gross calorific values; to some extent, these were initiated by the regulations concerning the injection of biogas into natural gas systems. For example, modern process gas chromatographs (PGC) are capable of measuring oxygen concentrations by officially calibrated procedures.

It is already clear that other innovative approaches for gross calorific value determination will be developed. Apart from the further development of the calibrated gross calorific value reconstruction procedures already in use, there are also signs that reconstruction systems may also be applied to meshed distribution networks to consumers in the future.

INDUSTRY FORUM

INNOVATIVE MAINTENANCE SOLUTIONS FOR BURIED VALVES

AXEL SACHAROWITZ, 3S ANTRIEBE GMBH

In the event of damage or planned rehabilitation work, block valves must be closed. If a valve cannot be operated because it has seized in the open position or does not close tightly, a larger section of the system needs to be blocked off, cutting off more customers. In the case of a ruptured pipe, the cost of the damage is increased. Poorly maintained valves also need to be replaced earlier.

Appropriate maintenance strategies can reduce these costs. In this context, inspection of the valves is required to allow maintenance to be based on actual condition, where this is possible (cf. DVGW codes of practice W 392 and W 400-3 for the gas sector).

To date, it has been difficult to assess the actual condition of a valve. The 3S SDG 1000 is a valve turning, inspection and maintenance tool. The battery-powered unit can even operate valves requiring a very high operating force at the same time as recording the torque actu-

ally applied. The travel vs. torque diagram produced (the "fingerprint" of the valve) clearly indicates the condition of the valve, allowing an objective assessment. If the valve requires excessive operating force, the unit can even "train" the valve and document compliance with the specified operating torque. Condition data may be transferred via a computer interface to supplement digital documentation. By analysing the condition data over the course of time, it is possible to define optimum maintenance cycles for valves, thus making maintenance more efficient.

In addition, the 3S SDG is compatible with the "Berliner Kappe" system, which allows a valve to be operated without applying any bodily force. The reactive torque produced during operation is transferred to the ground via a support plate which is secured against rotation. If this approach is taken, personnel requirements for valve maintenance with the 3S SDG are reduced.

INDUSTRY FORUM

MULTILAYER AND HIGH-PRESSURE POLYETHYLENE PIPES – SOLUTIONS FOR GAS AND WATER DISTRIBUTION SYSTEMS

DR.-ING. THORSTEN SPÄTH, EGEPLAST WERNER STRUMANN GMBH & CO. KG

Polyethylene is a plastic with highly balanced properties which has become established as a standard pipe material for water systems and both low-pressure and medium-pressure gas pipelines. In pipeline construction, polyethylene pipes with diameters between about 10 and 2,000 mm, wall thicknesses from 0.5 to 100 mm and delivery lengths up to several kilometres are now used. Plastic pipes can be produced as continuous strings by extrusion plants. Advanced multilayer technology allows layers with special functions to be integrated in a targeted way, tailoring the pipe to the needs of specific applications. State-of-the-art solutions include different-coloured layers for fluid identification, indicator layers, scratchproofing layers, reinforcement layers and barrier layers, to name but a few of the options now available.

At least in Germany, utility systems now offer virtually nationwide coverage. In this situation, renovation and rehabilitation, especially using trenchless pipelaying procedures, are more important than the construction of new lines. As polyethylene pipes are highly flexible and can be welded with force-fit joints, they are widely used in trenchless pipelaying. However, alternative construction systems make more severe demands on pipe materials than conventional pipelaying in a protective sand bed. Grooves and notches created when a polyethylene pipe is inserted may weaken the pipe and stones on the pipe surface may cause local stress concentrations. In both cases, premature failure of the pipe may be the result. To overcome these problems, modern multilayer pipes feature erosion-proof protective layers and PE 100-RC materials which are resistant to stress cracking.

Special composite pipes with an electrically conductive aluminium layer sandwiched between the pressure containing pipe and the protective casing allow continuous leakage monitoring. An electric current is applied to the

aluminium layer and the resistance of the layer is monitored by an earthed measurement system. If the plastic pipe is damaged, a change in the pipe resistance indicates the leak and allows the location to be identified with an accuracy of about 50 centimetres.

To date, it has not been possible to use PE pipes in high-pressure pipelines because of the low strength of polyethylene in comparison with metal pipe materials, Fibre-reinforced polyethylene pipes or RTP (Reinforced Thermoplastic Pipes) are an exception. High-strength fibres embedded in the pipe wall allow very high operating pressures. The strength of polyethylene can also be increased by stretching, i.e. by targeted optimization of the material structure during processing. Pipes of this type reinforced by high-strength structures within the same material are referred to as "monocomposite". One advantage of monocomposite materials is that the strength of a component can be increased without any deterioration in its other properties. The balanced properties of polyethylene are maintained, allowing the design and construction of polyethylene high-pressure pipelines without any change in the well-known properties of PE 100 pipes. Waste and pipe scrap can also be recycled in an environmentally compatible way. Compliance with standardized diameters laid down in European standards and the use of weldable PE 100 or PE 100-RC materials mean that joints can be made using conventional electrofusion fittings. Mechanical compression fittings designed for fast installation may also be used.

More and more, multilayer pipes adapted to the specific application are coming to dominate the market. In the future, we will certainly see even more applications for smart multilayer systems tailored to individual applications. Single-layer polyethylene pipes will soon be a thing of the past.

INDUSTRY FORUM

TRENCHLESS TECHNOLOGY WITH DUCTILE CAST IRON PIPELINE SYSTEMS

DIPL.-ING. RAIMUND MOISA, FACHGEMEINSCHAFT GUSS-ROHRSYSTEME (FGR) E. V.

Although conditions on each individual construction site are different, it is possible to classify trenchless pipelaying using modern procedures, to mechanize the work and to largely isolate it from weather conditions. Ductile pipe systems for pressure pipelines in accordance with DIN EN 545, which have been tried and tested in practice for many years, are also outstandingly well-suited for trenchless pipelaying. In trenchless construction, bell and spigot joints must, as a general principle, be of the longitudinal force fit type. The main task of these joints is to absorb axial forces resulting from internal pressure. The main types of bell and spigot joints used in trenchless construction are BLS® and TIS-K®. A safe seal is ensured by the TYTON® gasket, already used successfully in millions of applications. The guaranteed deflection on which is acceptable in the joint depends on the nominal diameter of the pipes. The bell-and-spigot joints allow pipelines to be drawn into place in trenchless pipelaying; with the guaranteed deflections which are admissible, very tight radii are also possible on complicated pipeline routes.

Cast iron pipes have been tried and tested in water supply systems for centuries, which is why utilities also call for ductile cast iron to be used as a material for trenchless pipelaying. The main reasons for the use of ductile cast iron pipes in trenchless pipelaying are as follows:

- sturdy pipes,
- deflection possible in bell and spigot joints,
- high safety reserves, also for load cases which were not considered,
- simple installation,
- acceptable hygiene for drinking water systems,
- long service life of overall system,
- the lowest damage incidence rate of all materials,

- very low leakage rates,
- very low operation and maintenance expenses, and
- wide range of applications in conditions ranging from easy to extremely difficult.

Trenchless pipeline construction and rehabilitation procedures are covered by DVGW codes of practice GW 320, GW 321, GW 322, GW 324 and GW 325. The main procedures used for the trenchless installation of cast iron pipes are:

- horizontal directional drilling,
- pipe jacking, pulling and auxiliary pipe methods, and
- long pipe relining and burst lining.

The use of ductile cast iron pipes is now normal practice in trenchless construction. As a result of the record-breaking DN 900 directional drilling project completed in Valencia in 2007, it has been possible to extend the range of applications for horizontal direct drilling. The individual pipe pulling procedure for ductile cast iron pipes which has been developed to maturity over the past few years offers the following benefits, which have a considerable impact on the economics of the procedure:

- lowest possible space requirements for pipe insertion pit,
- shortest duration of joint assembly,
- highest admissible pulling forces at all temperatures,
- no need for cooling phases, and
- the best possible hygiene and ergonomic conditions during joint assembly.

The German cast iron pipe industry is continuing its innovation efforts to improve trenchless pipeline construction technology.

WATER FORUM – QUALITY AND SUSTAINABILITY

QUALITY OF RESOURCES – PREVENTIVE WATER PROTECTION UNDER THE NEW WATER RESOURCES ACT AND THE GROUND-WATER ORDINANCE

MINISTERIALDIREKTOR DR. HELGE WENDENBURG, FEDERAL MINISTRY FOR THE ENVIRONMENT

The quality of our drinking water depends on the quality of the untreated water resources which are available. Clean drinking water is only possible with clean untreated water. The objective of modern water resources policy is to keep both surface water and ground water clean. Although we know that we are in a position to eliminate many pollutants and trace impurities during water treatment or at least to limit the concentration of these substances to the point where they no longer present a hazard to human health, the new Water Resources Act, which states uniform requirements for the whole of Germany for the first time, aims to limit the discharge of pollutants to our water resources.

In this context, the objective of sustainable water resource management is to bring the various uses to which water is put into balance with a view to ensuring the ecological protection of these resources. The use of water as an essential substance for human life is one of the top priorities. Sustainable water resource management aims to ensure that existing resources remain available and to make new resources available for use, especially for public water supply. Water supply to the general public is an essential public service and the protection of public water supply continues to be one of the main objectives of the ecological management of our surface water and groundwater resources.

The new Water Resources Act, which comes into force on 1 March 2010, provides a uniform nationwide basis for preventive water protection in the first time in the history of the Federal Republic of Germany; the constitutional foundations for this approach were already laid in 2006. The important point in this context is that individual states will not have the authority to deviate from federal statutory provisions concerning substances and facilities. In future, the federal government will therefore not only set the framework but adopt detailed regulations which will ensure that the water industry is uniformly regulated throughout the country, of course taking European legislation into account. In future, it will only be necessary to adopt one new law or regulation to re-

flect changes in regulations; previously, the regulations were implemented individually, and in different ways, by the 16 German states.

Preventive water protection under the new Water Resources Act includes not only the management of surface water based on environmental principles but also groundwater protection. In this connection, even when other uses are permitted, our surface water resources must be protected against additional pollution and existing pollution must be reduced. Our rivers, or at least some of them, such as the Rhine and Danube, are used as waterways. Almost all our rivers and streams are used for the discharge of treated wastewater from homes, businesses and industry. Rivers also provide cooling water for power stations and water for many other industrial purposes. In many cases, rivers supply drinking water, either via reservoirs or from wells drilled in river banks. In all cases, we must ensure that other uses do not make it impossible to produce drinking water.

The Wastewater Ordinance and the various supplements lay down requirements for a wide variety of industrial processes with a view to ensuring that the discharge of pollutants to our water resources via wastewater is minimized and, at least in most cases, limited to the point where no health damage occurs. Pollutant contamination from diffuse sources is a growing cause of concern. Examples include the illegal cleaning of ships' holds, which has led to MTBE pollution of the Rhine, or nutrient discharge from agriculture. The situation with regard to agricultural pollution may be alleviated by the introduction for the first time of an uncultivated strip along the banks of all major rivers throughout Germany. Even if 5 metres is certainly less than the width which was demanded and actually required from the environmental point of view, we must admit that the establishment of a uniform requirement throughout the country is an important achievement. Even though there may be deviations both above and below this value at the state level, I do not believe that the discussion as to whether an uncultivated strip is actually required is likely to be

reopened. As regards the legal use of pesticides, it is important to note that the minimum distance from rivers and streams at which they can be used is already a consideration in the approval process. This distance is the decisive factor. If it is 50 m, the uncultivated strip is irrelevant. If it is 1 m, additional approval for use in the riverside strip would represent unnecessary bureaucracy. Micropollutants are another issue causing growing concern with respect to wastewater treatment. The occurrence of these substances shows the extent to which people handle chemicals and pharmaceuticals in their everyday lives and the risks which arise in this connection. Nevertheless, further research will be required in many cases to investigate relationships of cause and effect in greater detail. In some cases, education will be needed. Drugs which have passed their expiry date are waste and not wastewater. They should be placed in the dustbin or returned to the pharmacy rather than simply tipping them into the toilet or the drains. If more people were aware of this, we would be able to avoid many problems or at least to concentrate on eliminating them at hospitals and doctors' surgeries. In implementing the directive concerning priority substances, in the Environmental Quality Standards Ordinance, we will be dealing with this issue in addition to well-known pollutants.

For the first time, we have uniform provisions throughout Germany for the handling of potentially water-polluting substances. This alone is a considerable simplification which reduces bureaucracy. Even though the individual states had previously agreed on similar provisions, a relatively minor difference can already cause considerable additional work. For us, the top priority is the protection of water resources. We aim to ensure that substances which could represent a hazard to water resources are handled, stored and transported in such a way that we can largely exclude detrimental impact. The Act includes a number of separate provisions intended specifically for this purpose, such as Section 32, concerning the maintenance of water purity, Section 36, concerning plants in, on, above and below bodies of surface water and especially Section 62, which concerns requirements for the handling of potentially water-polluting substances. The national ordinance which is required in this context is currently being drafted by the Federal Ministry for the Environment and will be submitted for consultation to the bodies concerned within the next few weeks.

Especially with respect to drinking water production, groundwater protection is particularly important. Despite the changes which have been made, one key principle of water law in Germany which has applied to groundwater protection for 50 years and more remains unchanged. Section 48 of the Water Resources Act states: "A permit for discharging or introducing substances to groundwater shall not be issued unless there is no cause for concern that such discharge or introduction may cause a detrimental change in the properties of the water." Sentence 2 of this section allows the issue of ordinances. The main purpose of this provision is to allow the definition of uniform national requirements for substances, materials or building products for which the possibility of detrimental impact on water resources can be excluded with certainty. Such requirements will be based on the approach of maximum concentration thresholds developed by the federal and state governments within the state water and wastewater authorities. This is crucial in connection with the use of building materials produced from waste. On one hand, European law calls for growing efforts to increase recycling rates. Germany has played a pioneering role in this area; more than 80 percent of construction waste is now recycled. On the other hand, we must ensure that the use of building materials produced from recycled waste does not lead to pollution problems in the future. Considerable sensitivity is required when balancing these requirements. Apart from these requirements related to specific substances, the most effective means of protecting water resources is of course to designate water protection areas which provide special protection against detrimental impact for particularly important water resources. However, the nitrate pollution of our groundwater which has been identified by data take-off and monitoring indicates that the designation of protection areas alone is not sufficient. We will need to pay considerable attention to agriculture with a view to devising strategies for achieving good chemical quality in our groundwater and for reaching a turning-point. This also applies to pesticide use. If the chemical transformation of legally used pesticides in the ground results in a failure to comply with drinking water standards or the need for complex additional treatment, it will be necessary to adopt harmonized regulations.

WATER FORUM – QUALITY AND SUSTAINABILITY

DRINKING WATER QUALITY – HOW PURE IS PURE?

DR. DORIS REICK, LGA STUTTGART

PROF. DR.-ING. WOLFGANG KÜHN, DVGW TECHNOLOGIEZENTRUM WASSER (TZW)

ENVIRONMENTAL AND ENERGY BALANCE IN A WATER SUPPLY CONTEXT – HOW CAN SUPPLIERS CONTRIBUTE? (PART 1)

DR.-ING. BERTHOLD HAMBACH, GELSENWASSER AG

As regards positive contributions to the environmental balance, water companies are in a special position. As the high quality of drinking water can only be maintained by considerable commitment to environmental protection, it is important for water companies to perform an exemplary function on a voluntary basis. This is the case if companies' contributions to environmental protection are clear and transparent, communications concerning these activities are issued and third parties are also encouraged to pay attention to environmental issues, for example in co-operation arrangements.

By establishing environmental principles, a water company can not only define its environmental policy but also the framework for its contributions to environmental protection. These concern all aspects of sustainable water supply. An environmental declaration in accordance with EMAS, which is updated at regular intervals, can be used to formulate new environmental objectives and to monitor the degree of achievement. This is an appropriate method for documenting and assessing activities and progress.

In Germany, public water supply systems offer nationwide coverage. In terms of numbers, the people involved in water supply are equivalent to a major industrial group. The possible contributions of water suppliers to the improvement of environmental and energy balances are of medium significance with reference to the contributions of comparable energy supply or raw materials companies. However, in addition to water production, i.e. extraction, treatment and distribution, water companies can also be active in all fields of environmental protection which can affect drinking water resources. These include, for example, ecologically sound land use and the avoidance of emissions and waste. The large number of people involved in water supply also means that the areas of administration and transport can make significant, measurable contributions to a positive impact on environmental balances.

The environmental activities of a water company can be especially beneficial if all the company's employees assume responsibility for environmental protection and it becomes a normal part of their everyday work.

WATER FORUM – QUALITY AND SUSTAINABILITY

ENVIRONMENTAL AND ENERGY BALANCE IN A WATER SUPPLY CONTEXT – HOW CAN SUPPLIERS CONTRIBUTE? (PART 2)

DIPL.-ING. REINHOLD HÜLS, VEOLIA WASSER GMBH

The activities of Veolia Environnement are not limited to Europe. Certification is therefore processed throughout the company on the basis of ISO standards. Veolia Wasser has developed a comprehensive, integrated management system covering quality, environmental protection and health and safety. Together with technical and commercial reporting systems, this management system allows the company to orient itself towards sustainable corporate policies and to avoid management based solely on the concerns of individual sectors.

Since 2006, Veolia Wasser has published each year a sustainability report which, among other things, covers the objectives and measures taken with respect to the improvement of the energy and environmental balance. Following the publication of each report, representatives of environmental and consumer associations, trade uni-

ons and politicians are invited to take part in discussion groups.

Veolia Wasser is committed to reducing the energy required for operation through optimization programs with a view to saving costs and limiting the environmental impact associated with energy use. In this context, the company has considered the increased use of renewable energy sources. One of the results of this work was the development of a drinking water heat pump; a patent application is now pending. The system uses the natural geothermal energy of the drinking water which is extracted. The heat pumps can be adapted to local conditions and are not dependent on a specific manufacturer. This energy recovery system represents a sustainable contribution to the conservation of resources and reduces the use of conventional energy sources.

GAS FORUM – ASSET MANAGEMENT CONTROL AND FORECAST OF REPLACEMENT INVESTMENTS – ASSET MANAGEMENT OF GAS FACILITIES

DR. KLAUS STEINER, E.ON RUHRGAS AG

JEFF DOUGLAS, E.ON CENTRAL NETWORKS

In view of the deterioration in industrial equipment as a result of ageing and wear, condition assessment has a key role to play in asset management. Condition assessments consider data from operational monitoring, supplement them and provide significant additional benefits for the optimization of equipment life cycles. These benefits include the prioritization of replacement investments, limiting expenditure to the level actually required, forecasts of replacement investments, clear and comprehensible bases for decisions, average service life figures and support for condition-

based maintenance. The main focus of these additional benefits is normally on support for measures with a short to medium-term planning horizon. This paper shows that long-term forecasts can also be derived from the information available. These significantly extend the time period considered and provide a firmer foundation for the planning horizon. As this procedure breaks new ground in the gas sector, the paper presents and explains some basic considerations with reference to short-term and long-term forecasts of replacement investments.

GAS FORUM – ASSET MANAGEMENT

MAINTENANCE CAUGHT BETWEEN REGULATION AND SAFE, SECURE AND SUSTAINABLE ENERGY DISTRIBUTION

DIPL.-ING. HEINRICH BUSCH, MAINOVA AG

Since the beginning of regulatory work in the gas industry, there have been significant changes in the basic conditions for economical network expansion, maintenance and control. Each year, network expansion and maintenance are the main item in a network operator's budget. The optimization of network expansion and maintenance therefore offers considerable potential for cost savings.

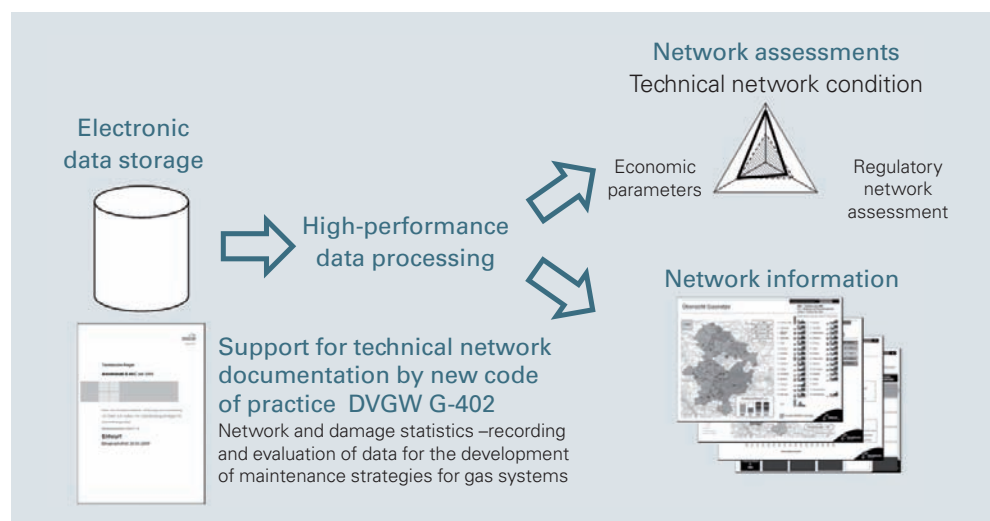
Optimization measures must be based on technical and commercial criteria as well as on regulatory requirements. In some cases, the optimization effects of these criteria and requirements are contradictory, resulting in a potential conflict between regulatory requirements on the one hand and safe, secure and sustainable energy supplies on the other hand. In order to resolve these conflicts and to develop a sustainable maintenance and expansion strategy, detailed information on the condition of the network, commercial parameters and the regulatory assessment of the network is essential.

Using high-performance computer systems, it is possible to record and calculate the complex interaction bet-

ween technical, commercial and regulatory criteria. In combination with each company's individual knowledge of its network, the information obtained by processing this data forms an essential prerequisite for the development and optimization of network strategies. However, this approach is only possible if consistent network documentation recording not only the technical data of the existing network but also operating data (incidents, system condition and expenses) is available.

The new DVGW code of practice G-402 (formerly the revised code of practice G.401), "Network and Damage Statistics – Acquisition and Evaluation of Data for the Development of Maintenance Strategies for Gas Systems", offers considerable assistance for the development of technically consistent network documentation.

This paper presents the possibilities open to network operators for developing network strategies for safe, secure and sustainable energy supplies despite changing regulatory requirements and for laying a firm foundation for decisions in the context of the requirements posed by local and national government and regulatory authorities



GAS FORUM – ASSET MANAGEMENT

ASSET MANAGEMENT IN THE CONTEXT OF INCENTIVE REGULATION

JAN FUHRBERG-BAUMANN, STADTWERKE LEIPZIG NETZ GMBH

This paper briefly outlines the practical application of strategic asset management by a major distribution system operator and the options which it offers.

The possibilities offered by strategic asset management for influencing capital and operating expenses together with the maximum revenue limit and the target rate of return are presented.

The three pillars of strategic asset management (target network planning, replacement strategy and maintenance strategy) are discussed in greater detail and illustrated by practical examples. The approach adopted for implementing a defined replacement strategy in further planning is indicated.

Despite the relatively moderate approval decisions in the first regulatory period, incentive regulation calls for the exploitation of all synergy potentials with a view to maintaining safe and efficient network operation in the final distribution stage. The cost reductions defined on the basis of revenue limits will mainly have an impact on all operating expenses, as the opportunities for influencing capital expenditure are either non-existent or very limited. The significant reduction in maximum revenue is accompanied by cost increases on upstream networks,

for example for offshore equipment. There is likely to be a severe increase in political pressure on the Federal Network Agency, leading to significant reductions in approved costs in regulatory practice in the second regulation period.

It will no longer be possible to compensate for these cost reductions by exploiting conventional savings potential. The development of new and independent value addition stages such as strategic asset management will be essential in the long term. Decisions taken now have long-term impact on the cost structures of a network operator. The strategic orientation of networks towards the revenue path will increasingly conflict with the budget-driven interests of the network service organization, which are based on short-term considerations. The pressure on profit is likely to lead to unpopular measures.

The greatest challenge for network operators is to overcome these conflicts at the same time as maintaining security of supplies at the highest possible level.

At the end of the paper, the interaction between asset management and regulatory management is discussed. This interaction forms the strategic basis for ensuring the proper functioning of networks in the future.

DVGW/ASUE INNOVATION FORUM

FUEL CELLS AND STIRLING ENGINES FOR HEATING SYSTEMS WITH POWER GENERATION

DIPL.-WIRTSCHAFTS-ING. MICHAEL BRAUN, BAXI INNOTECH GMBH; HAMBURG

The Baxi Group is a leading supplier of micro-CHP plants. Currently, the company offers the following system solutions for heat and power supplies to single-family homes.

The Ecogen, the next technology available.
Performance data: 1.0 kW_{el}, 24 kW_{th}
Ancillary burner: 18 kW_{th}.

The GAMMA 1.0 fuel cell heating system – an optimized solution for the future with which the Baxi Group will be able to satisfy the steadily growing demand for energy in the home.

Performance data: 1.0 kW_{el}, 1.7 kW_{th}, auxiliary condensing boiler: 15 or 20 kW_{th}

GAS HEAT PUMPS: EFFICIENT TECHNOLOGY – TODAY AND TOMORROW

MICHAEL PLOTHE, BOSCH THERMOTECHNIK GMBH

In view of the integration of renewable energy sources, carbon dioxide savings potential and higher annual load factors compared with condensing boilers, gas-fuelled heat pumps are one of the most promising heating technologies for the future.

Apart from technical aspects of gas absorption and diffusion absorption technology, typical fields of application, technical prospects and existing positive factors and barriers are discussed. The presentation also deals with the current status of gas-fuelled heat pump development activities within BOSCH Thermo-technik.

HEAT SUPPLY IN NEW BUILDINGS – A FULL-COST COMPARISON

PROF. DR.-ING. BERT OSCHATZ, ITG INSTITUT FÜR TECHNISCHE GEBÄUDEAUSRÜSTUNG DRESDEN FORSCHUNG UND ANWENDUNG GMBH

The conditions for space heating and warm water supply in Germany are changing dramatically. The main reasons are the long-term rise in energy prices and the need for more sparing use of fossil fuels as a result of climate change. Politicians have reacted by making the energy requirements for new buildings considerably more stringent. These requirements are laid down in the Energy

Saving Regulation of 2009 and the Renewable Heating Energy Act. In this changed environment, the question of the economics of natural-gas-fired space heating and hot water systems must be reconsidered in comparison with competing energy sources. The paper presents the result of detailed viability analyses with reference to the conditions which currently apply to residential buildings.

GAS FORUM– NEW APPLICATION TECHNOLOGIES

INNOVATIVE TECHNOLOGIES FOR THE USE OF NATURAL GAS ON THE SPACE HEATING MARKET

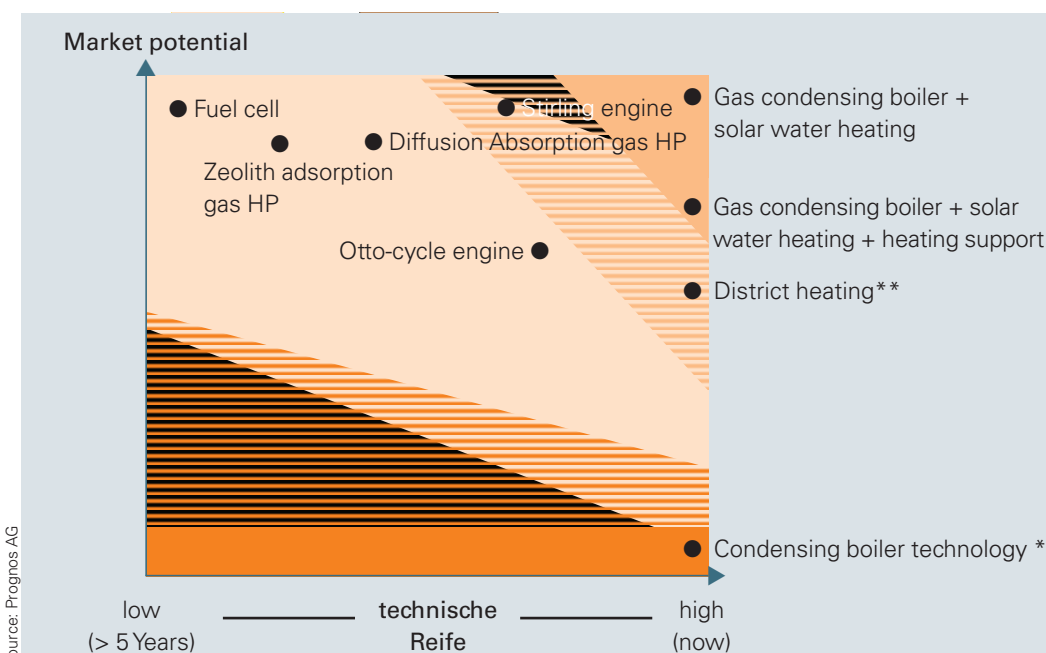
DR. ALMUT KIRCHNER, DIPL.-ING. VINCENT RITS, PROGNOSES AG

The heating market is changing. On the one hand, the statutory requirements with regard to spacing heating energy demand and heating systems set out in the Integrated Energy and Climate Programme (IECP) of the German government are considerably more stringent. On the other hand, a wide range of new, efficient space heating technologies based on a number of different fuels is now becoming available.

On behalf of DVGW and ASUE, Prognos AG investigated the fitness of the various innovative technologies for use in a number of typical applications under the new conditions that apply. Special attention was paid to a comparison of gas-based technologies with other heating technologies with reference to the framework of energy policy objectives including efficiency, application criteria, potential and technical maturity. It was found that gas-based heating technology is suitable for a wide variety of applications, even under the new conditions. This applies especially to new highly efficient heating technolo-

gies and the combined generation of heat and power, also in combination with renewable energy sources (solar heating systems and biogas) or to the generation of cold for air conditioning. In the case of a number of systems, it will be necessary to make a concerted development and finalization effort before they have realistic prospects of holding their own against competing technologies already available on the marketplace. As a general principle, gas as a source of energy is being developed into gas as a system.

The results for the technical maturity and market potential of the various gas technologies are presented with reference to a new single-family home. In the diagram, green indicates that the technology is already available and has considerable potential. Red means that there are exclusion criteria that currently prevent the use of this technology. Yellow means that more development work will be needed before the technology can be used or the potential is limited.



Assessment of gas technologies for new single-family homes

Source: Prognos AG

* Generally excluded by Renewable Heating Energy Act; exception if building demand is -15% with reference to 2009 Energy Saving Regulation
 ** Waste heat or CHP (gas-fired)

GAS FORUM – NEW APPLICATION TECHNOLOGIES

THE HEAT MARKET IN THE NEXT DECADE

KAREL SCHWENG, VNG

New business areas and utilization technologies will change our industry. This is the conclusion to be drawn from current developments on the heat energy market. The energy demand of private households is set to fall. The Prognos study produced for DVGW assumes that the energy demand of private households for space heating and hot water heating will fall by 13 percent by 2020 and 22 percent by 2030.

The current statutory and environmental requirements can be met using natural gas. Natural gas is ideally suited for use in combination with renewable energies and, in the form of biomethane, can even be a renewa-

ble energy itself. Both tried and tested and innovative technologies based on natural gas are available. In future, these technologies will have a major role to play in achieving climate policy objectives.

The economics of the various technologies will depend on the conditions in which they are used and on optimum system integration. It will be necessary to develop specific solutions for different target groups. With the wide variety of possibilities available, energy suppliers have an opportunity to extend the value stream and establish a position as environmentally progressive service providers.

THE NEW TECHNOLOGIES FROM THE INDUSTRY POINT OF VIEW

DR.-ING. EKKEHARD LAQUA, BOSCH THERMOTECHNIK GMBH

Taking main trends in heating and air conditioning technology as a starting point, the paper highlights key focuses in the research and development activities of Bosch Thermotechnik.

The trend towards the efficient integration of renewable energy sources is buoyed by more stringent requirements for climate protection throughout the world. The paper deals with the main developments in the fields of

solar heating and heat pumps as well as activities in the field of controlled home ventilation and future-oriented CHP developments in the small to medium size range.

Systems optimized for the conditions of individual buildings can tap the greatest energy saving potential. Thanks to holistic considerations of this type, zero energy or even energy plus homes have already become conceivable.

WATER FORUM – TECHNOLOGY AND MANAGEMENT

THE WATER SAFETY PLAN CONCEPT FOR BUILDINGS – QUO VADIS?

DIPL.-ING. OLIVER SCHMOLL AND DIPL.-BIOL. BENEDIKT SCHÄFER, FEDERAL ENVIRONMENT AGENCY

In the revision of the EU Drinking Water Directive which is currently in progress, the European Commission intends to take up the Water Safety Plan (WSP) concept recommended by the World Health Organization (WHO) in its Guidelines for Drinking Water Quality and to incorporate it into the Directive. The WSP concept is a process-oriented management system intended to systematically identify, assess and control the hazards and risks arising in connection with drinking water supply.

For the Federal Environment Agency and the Federal Ministry for Health, it is necessary to adopt a position on the WSP concept in current discussions and opinion-making processes at the European level. In this context, it is especially necessary to clarify whether the application of the WSP can be expected to bring additional benefits for water supply in Germany and, if so, how the WSP concept can be embodied most effectively in the European Directive and in national legislation in Germany.

The Federal Environment Agency drew up a first regulatory assessment of the WSP concept for Germany in 2007 in a project supported by the Federal Health Ministry and implemented in cooperation with water companies, health authorities and the DVGW. The DVGW took up key elements of the WSP concept and integrated them into its system of standards in 2008 in code of practice W 1001, "Safety in Drinking Water Supply – Risk Management in Normal Operation".

Previous work on the WSP in Germany has tended to focus on the area of responsibility of water companies and less on the important area of water installations in buildings which have been repeatedly found to have a detrimental impact on drinking water quality (e.g. as a result of design errors, inadequate maintenance, the materials used or the failure to operate the system properly). As the European Commission proposes that the WSP concept should also be applied to drinking water installations in buildings, the Federal Environment Agency is to conduct a study to investigate whether the WSP concept could constitute a suitable and beneficial tool for building owners and occupiers to ensure safe drinking water supplies in buildings in addition to compliance with the applicable standards. The project will also investigate whether the concept would assist health authorities to structure and prioritize more effectively their monitoring duties in buildings where water is provided for the public (e.g. schools, kindergartens, hospitals, restaurants and other communal facilities).

The WHO published in 2009 a manual for the practical application of the WSP concept in water companies. Work is currently in progress on a monograph concerning the application of the concept in buildings.

WATER FORUM – TECHNOLOGY AND MANAGEMENT

"TSM" – WHAT ARE THE BENEFITS FOR SUPPLIERS AND INDUSTRY

DIPL.-ING. HENNING SCHAARE, TECHNICAL MANAGER, WASSERVERBAND PEINE

DIPL. CHEM. ING. ROLAND H. GROTHE, TSM CONSULTANT, HESSENWASSER GMBH & CO KG

The initial impetus for the development of technical safety management was provided by a number of gas incidents which occurred at the end of the 1990s. These led to calls by the regulatory authorities for a tool which would allow companies to review their organization and qualifications with respect to technical safety under their own responsibility, thus allowing any deficiencies to be eliminated. DVGW rapidly shouldered this challenge, developed the tools required and introduced them in the gas and water sectors.

TSM is a sector-specific management system which applies the same criteria to all companies. This approach is ensured by the codes of practice and guidelines (questionnaires) concerned. As a self-assessment procedure for technical matters with a view to identifying deficiencies in the organization of technical equipment and personnel qualifications, TSM helps utilities to minimize organizational liability, one of their main objectives. Another benefit of TSM is that it can be used as a precursor to a fully integrated management system.

The clear structuring of the questionnaires means that most companies, even smaller ones, are in a position to develop their TSM system themselves to a very large extent. In the course of the process, they analyse their own situation, identify deficiencies and eliminate them. Another benefit is a significant cost reduction effect.

Especially in the context of reorganization and restructuring exercises, mergers, outsourcing, management and benchmarking, the consistent introduction, implementation and observance of TSM requirements offers pro-

spects of developing added value in the change process. As an example, the definition of minimum standards for organizational structure and procedures as well as records (quality documents), and the harmonization, simplification and disposal of documents and regulations using the TSM questionnaires may offer companies an opportunity to consolidate and streamline their organization.

In the meantime, the first two TSM sectors of DVGW, gas and water, have led to a whole family of TSM questionnaires, including TSM systems from VDE FNN for electricity, AGFW for district heat systems DWA for waste water and DVGW for industrial gas systems. All these sectors have joined forces in a coordination group which is responsible for developing the general part of the questionnaire and the coordination of special issues. This naturally results in synergy effects both for utilities and for the associations concerned. Joint audits of several sectors are now state of the art, leading to reduced costs.

DVGW has issued supporting documents for the water sector with reference to W 1000, namely W 1001 "safety in drinking water supply – risk management in normal operation" and W 1002 "Organization and management of drinking water systems in the case of a crisis". If possible, these documents are to be included in European standards. Work on similar material for the gas sector is currently in progress.

Finally, it should be noted that TSM can be seen as a seal of approval for the performance of a company in the context of modernization strategies.

WATER FORUM – TECHNOLOGY AND MANAGEMENT

NEW DVGW NETWORK AND DAMAGE STATISTICS FOR WATER SYSTEMS – ADVANTAGES OF AN INDUSTRY-LED SYSTEM

DIPL.-ING. BERND HEIMHUBER, ENERCITY NETZGESELLSCHAFT MBH

The first DVGW damage statistics appeared with W 395 in 1994, followed by a second edition in 1998. At the time, there was apparently considerable demand for industry-wide comparison figures and almost 400 companies reported their figures, at least for some time. As a result of the different conditions following German reunification, it proved difficult to assess the data which had been collected. The first comprehensive assessment of the information received appeared in 2002 in a DVGW water information bulletin (no. 67); the assessment distinguished between results from Germany's original states and the new states in the east. In the meantime, the number of companies reporting data had fallen to "only" about 200, but the figure rose again following the publication of the analysis. At the same time, the results demonstrated the deficiencies of data collection. The information available was not sufficiently well differentiated with respect to pipe materials. Despite these problems, the first evaluation which appeared in 2002 and the results published by DVGW in EWP in 2006 laid a firm foundation for an assessment of the condition of water systems in the Federal Republic of Germany and also provided member companies with a certain orientation for maintenance considerations. However, the results were not sufficiently well-founded for use as reference data for rehabilitation strategies or decisions.

About a year ago, the DVGW Technical Committee "Plant and Operation Management in Water Distribution" set up a working party to revise W 395 and to incorporate it in a new code of practice W 402 "Network and Damage Statistics – Acquisition and Evaluation of Data for the Maintenance of Water Systems". The work had been completed by April 2009. By August 2009, the structures and definitions used had been harmonized with those used in the corresponding draft code of practice G 401 (in future G 402) for gas systems. The objective of the 11-member working party with representatives from a number of major companies chaired by Mr. Wehr of RZV was to establish a well-founded body of data to support target-oriented

ed maintenance by water companies. In comparison to W 395, the existing code of practice, key definitions were added, as were an optional requirement for data concerning different material generations and missing network elements. The data requested were also broken down into inventory, condition and environmental data. In addition, the new document now covers key aspects of data acquisition and allocation, as well as the linking of data to maintenance plans and the basic assessment of damage data in companies. Basic considerations of quality assurance have also been introduced as a new feature. Inventory data are broken down by network components and the attributes required, which must be collected in a meaningful way by the companies concerned. A distinction is made between essential, optional and superfluous data. The code of practice includes structured lists for recording condition data which can be used directly by the companies concerned. As regards damage statistics themselves, it was necessary to develop a compromise between including as many companies as possible and a survey which would distinguish between different material generations. The working party solved this problem by dividing the questionnaire into a "compulsory" section calling for very restricted data and an optional section allowing information on damage with reference to different material generations to be provided. This section is only intended for completion by companies which have the required information available. The new W 402 therefore offers prospects of developing a broad, practically oriented body of consistent industry data for the target-oriented maintenance of water networks. Statistics can only be as good as the information on which they are based. It is therefore hoped that as many water companies as possible will supply well-founded data for the new DVGW water network and damage statistics in the future. Companies will of course only respond to calls for information if they see specific benefits for themselves – this means that DVGW will need to provide companies with continuous, high-quality evaluations of the data received to make these benefits clear.

INDUSTRY FORUM

INNOVATIONS FOR BURIED HYDRANTS

UDO ARREBERG, HAWLE ARMATUREN GMBH

The Tele-Hydrant® developed by Hawle is a buried hydrant that not only meets the stringent hygiene requirements for drinking water systems but also allows fast and reliable access to water for fire-fighting when required. In 2009, the company received the red dot design award for this innovative complete solution.

The height of the buried hydrant is adjustable, allowing easy adaptation to changes in geodetic conditions even after it has been installed.

Hawle Armaturen GmbH with headquarters in Freilassing was established on 10 April 1967 and experienced above-average growth from the start of its operations. Nowadays, Hawle is one of the leading manufacturers of valves, flanges and fittings. Hawle is committed to operations in Germany where the know-how and prerequisites needed for outstanding products are available. Conditions are ideal for targeted, flexible reactions to the needs of individual customers. The company is therefore able to ensure high quality levels and maintain employment in Germany.

FLEXIBLE SYSTEM SOLUTIONS FOR WATER CIRCUITS

N.N.

FLEXIBLE MATERIALS FOR DRINKING WATER IN EUROPE

N.N.