

Presentation of
REMONDIS Aqua GmbH & Co. KG



Presentation of REMONDIS Aqua

The RETHMANN Group's three divisional companies.

The RETHMANN Group

> Environment

- Water Management
- Environmental Services
 - Raw Materials
 - Energy
 - Services

REMONDIS®

> Logistics

- Contract Logistics
- Freight Logistics
- Port Logistics
- Public Transport

The logo for Rhenus Logistics, featuring a stylized blue and white graphic to the left of the text "RHENUS LOGISTICS" in blue.

> Bio-Industries

- High quality products made from animal by-products
- New forms of energy
- Services for the agriculture and food industry

SARIA®

Presentation of REMONDIS Aqua

Main facts REMONDIS-Group



- Turnover: 5,4 Mrd. Euro
- Employees: 20,000
- Sites: 500
- Countries: 28
- Facilities: 500
- Logistics network: 7,000 commercial vehicles
- Processing volumes: Over 25 million tonnes of valuable materials and raw materials

Executive Board:

- Ludger Rethmann (Chairman)
- Egbert Tölle
- Thomas Conzendorf
- Max-Arnold Köttgen
- Thomas Breitkopf
- Bernhard Heiker

Presentation of REMONDIS Aqua

REMONDIS - Two strategic business fields

Services for municipalities, the industry, trade and commerce

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graph TD; A[Services for municipalities, the industry, trade and commerce] --> B[Water management]; A --> C[Environmental Services];
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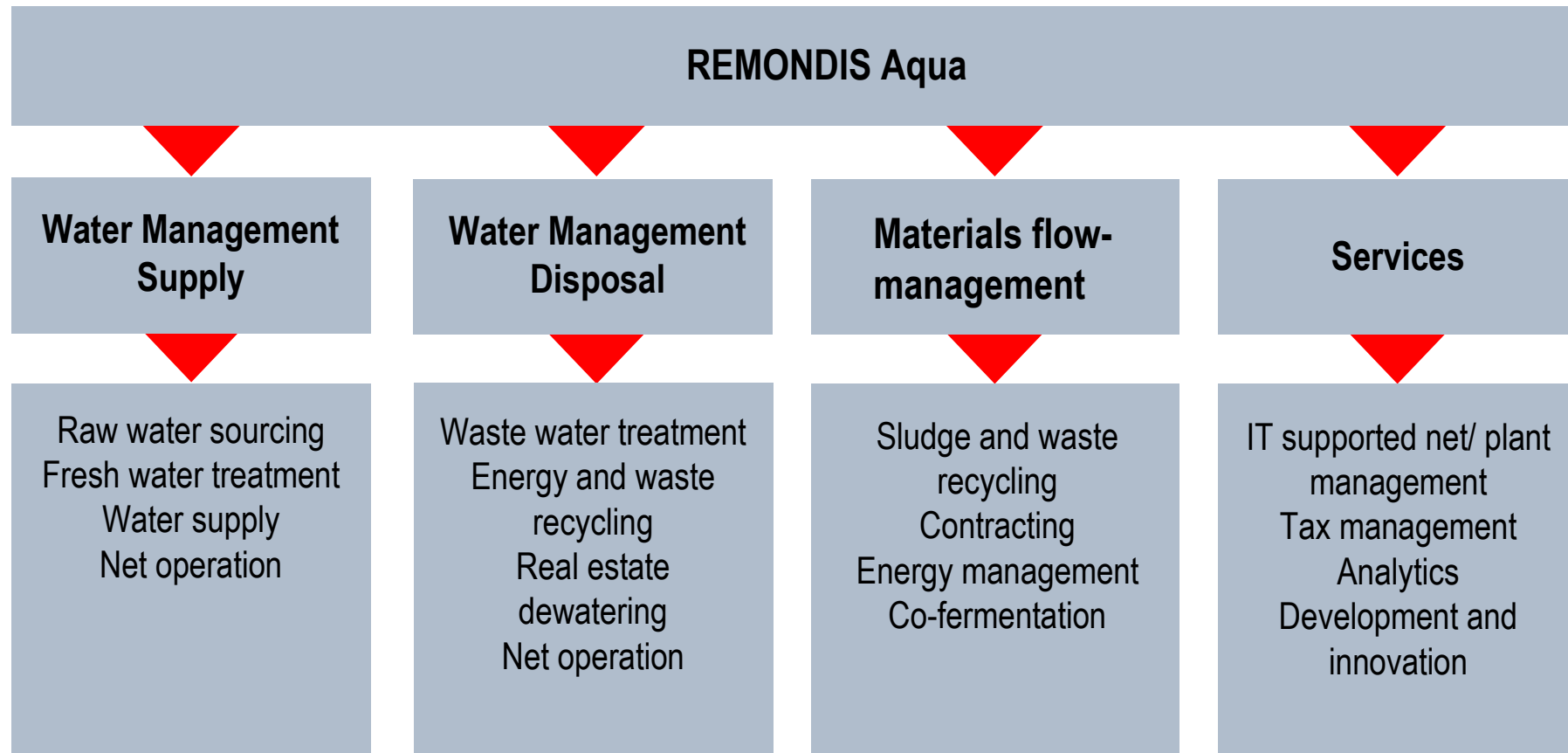
Water management:

- Services covering all aspects of water supply, running networks, treating water, water recovery as well as operating dams
- Integrated concepts within water management
- Implementing custom-made solutions targeted towards safety, water quality and cost efficiency
- Development of innovative, forward-looking processes
- Planning, building and operating water supply plants and sewage treatment plants

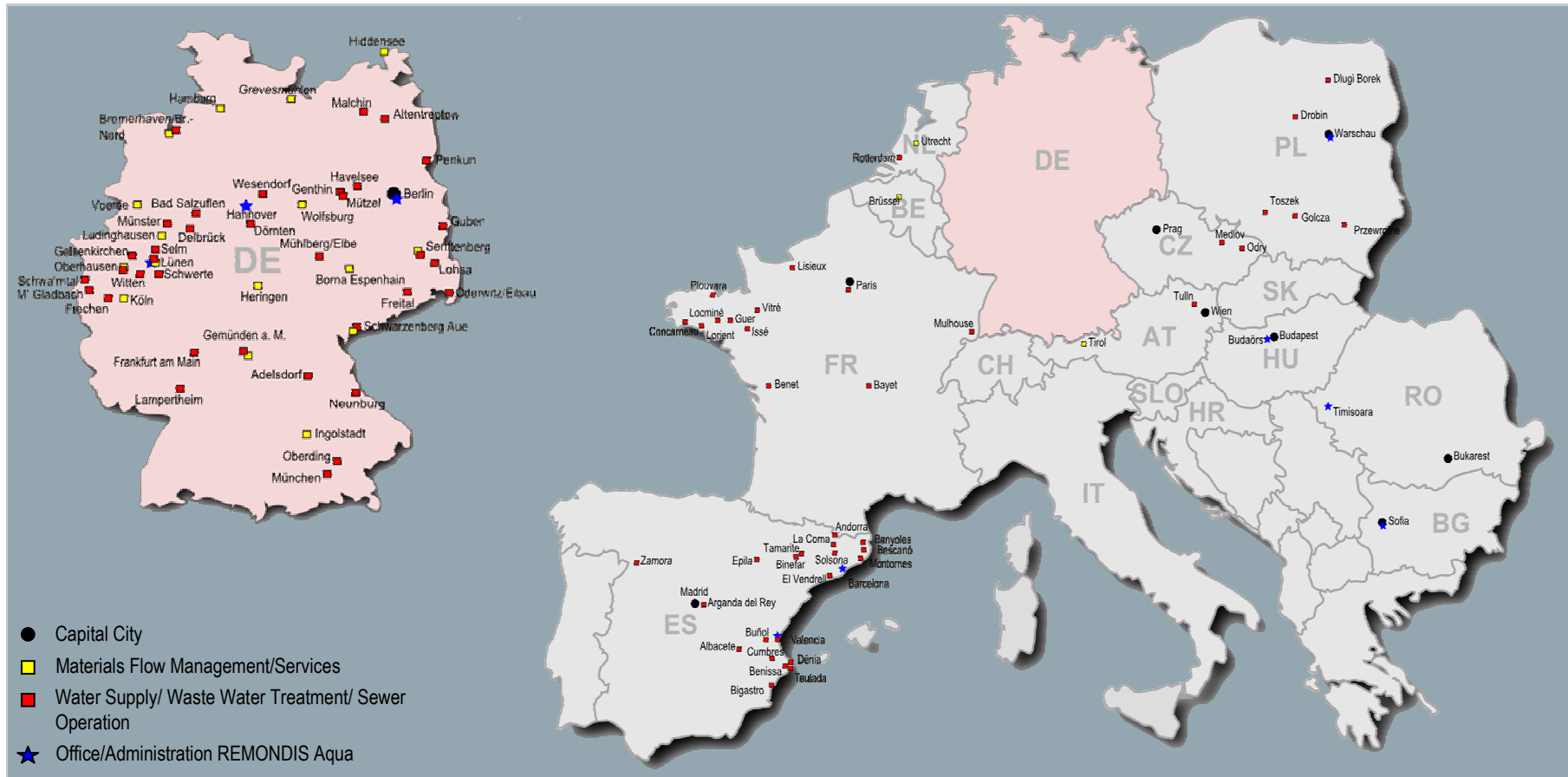
Environmental Services:

- Environmentally friendly material-flow management – from the collection, logistics, sorting, processing, treatment and recycling to marketing company products
- Development of disposal and service concepts which fulfil the customers' requirements
- Comprehensive integrated services, such as WEEE take-back systems
- Planning, building and running treatment, processing, recycling and production plants

Presentation of REMONDIS Aqua Business Fields



Presentation of REMONDIS Aqua Locations Middle and Southern Europe



Presentation of REMONDIS Aqua Locations Eastern Europe / Asia



Presentation of REMONDIS Aqua

Development of the Business Segment Aqua (1/3)

- **1977** Building of the first waste water treatment plant in Marl
- **1983** PPP model waste water purification, Wesendorf
- **1992** Operator model Henkel, Genthin
- **1998** PPP model water supply and waste water treatment, Gotha
- **1999** PPP model WBO waste water, Oberhausen
- **2000** Operator model Ruhr-Zink, Datteln
- **2001** Operator model Ruhr-Oel, Gelsenkirchen
- **2002** Operator model EuroCoin, Schwerte
- **2003** PPP model waste water, Bremerhaven
- **2004** Process water supply BASF Coatings, Muenster and Pilkington, Witten
- **2004** Operator model Saxonia, Halsbruecke
- **2004** PPP model waste water, Frechen
- **2005** Operator model waste water, Gemuenden
- **2005** PPP model VERA, Hamburg

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Development of the Business Segment Aqua (2/3)

- **2005** Contracting model Lorenz Snack-World, Neunburg v.W.
- **2005** Contracting model MAN Truck&Bus, Munich
- **2005** Operator model Wasserverband Lausitz
- **2006** PPP model Drobin, Poland
- **2006** Contracting model HUMANA Milchindustrie (today's DMK), Altentreptow
- **2006** Contracting model WILD Valencia, Spain
- **2007** Contracting model Blanke Textech, Bad Salzuflen
- **2007** Joint Venture REMONDIS Sistem Yapi A.S., Istanbul, Turkey
- **2007** PPP model Toszek, Poland
- **2008** SAL (Stadtentwaesserung Lünen) Service GmbH
- **2008** Phosphor recycling within water services REPHOS®
- **2008** Operator model drinking water supply, municipality of Adelsdorf

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Development of the Business Segment Aqua (3/3)

- **2009** Contracting model AkzoNobel at Botlek
Chemical Park Rotterdam, Netherlands
- **2009** Formation of REMONDIS Aqua (India)
Private Ltd. and takeover of 12
contracting projects
- **2009** Contracting model Borgmeier
Frischgeflügel, Delbrueck
- **2009** Formation of the 1st PPP company in
Russia for the city of Arzamas
- **2010** Contracting model Valensina,
Moenchengladbach
- **2010** Acquisition OMS-Saccede S.A., Barcelona
and takeover of 22 municipal operator
models
- **2011** Takeover of 100% Shares of Eurawasser
with municipal operator models
- **2011** Takeover of 50% Shares of KED Wedemark
with municipal operator models
- **2011** Contracting Oettinger Brewery,
Moenchengladbach

Presentation of REMONDIS Aqua Development & Innovation

■ **Biological waste water treatment:**

- Anaerobic degradation of waste water with high content of solids from the food industry
- Examination of hydrolysis and absorption of substrate among anaerobic conditions
- Influence of different precipitants and the process technology on filamentous organisms

■ **Process water treatment:**

- Development of innovative processes with the purpose of getting highly purified water to produce colouring (BASF Coatings AG)

■ **Ground water decontamination:**

- Development and patenting of the BIORETH® process to decontaminate organically contaminated ground water

■ **Recycling of Resources:**

- Phosphate recycling by the REPHOS® process
- Developing processes to eliminate sulphate out of waste water and extract resources as CASUL® (pigment coating)

RE2ENERGY®

REPURE

BIORETH®

REPHOS®

CASUL®

RECOMPLEX

REBALANCE

AquaDialog®

KoSIS®

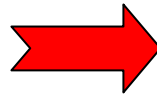
MainControl®

Research & Development

Example REPHOS® - process

- REPHOS® = Phosphorus-elimination and recycling by magnesium-ammonium-phosphate (MAP or Struvit) directly from the waste water stream
- Avoiding to mix with sewage sludge allows production of a comparably clear product

Crystal
form of appearance
„usual Struvit
(MAP)“

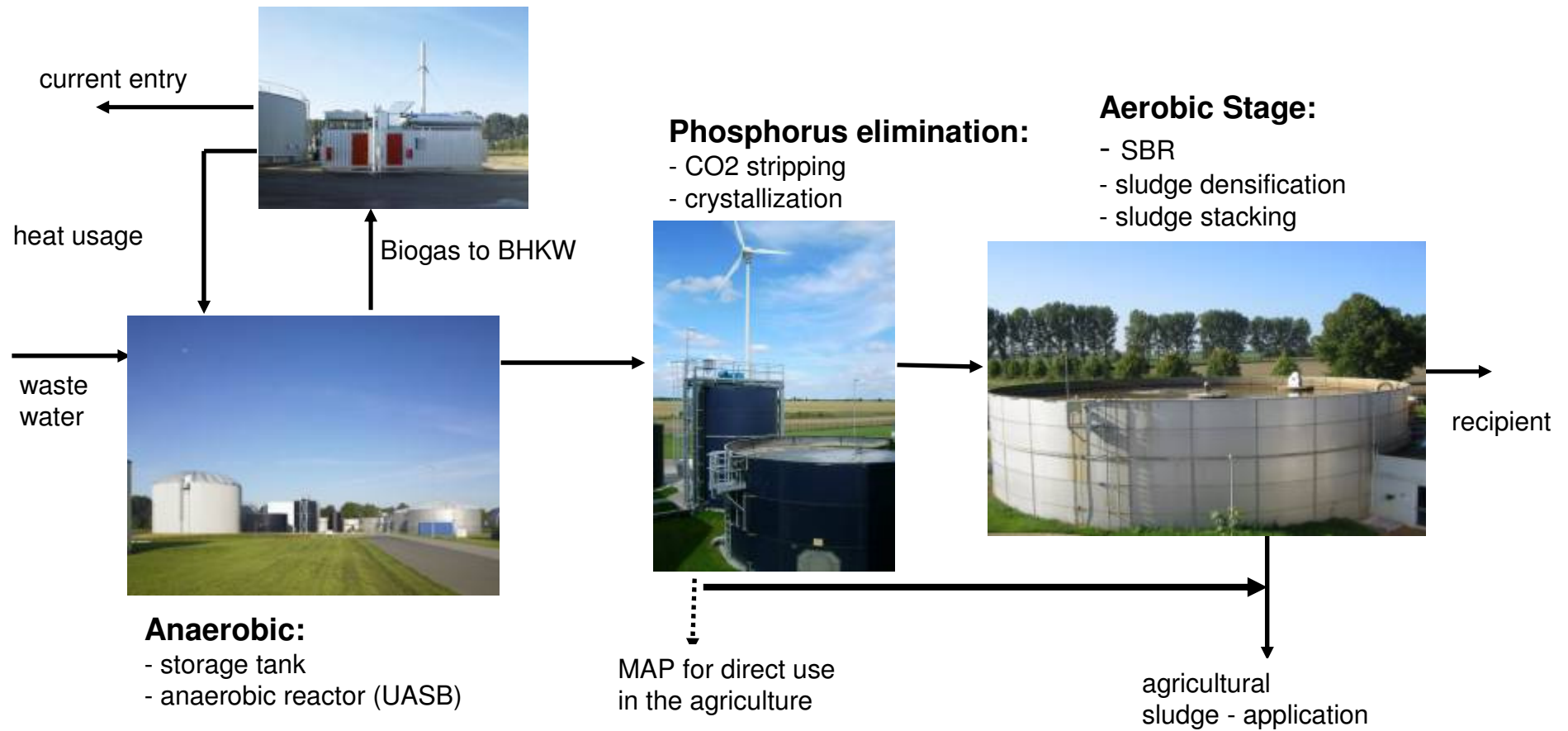


Product of the
REPHOS®-process
with retard-effect
(time-shifted detachment)

- REMONDIS-Process allows the realization of a targeted materials flow management by means of
 - specific phosphorus-recycling to keep the limit discharge value
 - creation of a concentrated product and the following usability for the agriculture

Research & Development

Example REPHOS® - process



Company Partnership

Why a Contracting Model?

- **The need for action in the production enterprise for modernisation/ conversion/ extension and new construction of plants for process water treatment**
 - to optimise costs
 - to optimise process (quality improvement/ reaching of limit values)
 - to adjust capacity to planned changes / extensions in production
 - for the realisation of authorities demands
 - as replacement after expiration of life-time

Company Partnership

Why a Contracting Model?

■ Obstacles in realisation of projects

- Limited process know-how, lack of knowledge in water market
- Risks of process selection fully beared by the client
- Lack of personal resources for planning, construction and following operation of the plants
- Possibly purchasement of external know-how necessary for technology evaluation
- Capital binding for non-core-business activity gives no added value, means Compliance of payback- / ROI- requirements of production is often difficult -> no approval for investments

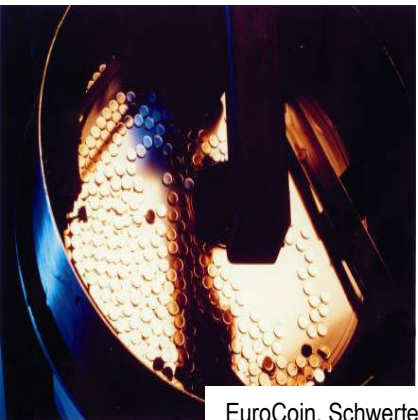


Project realisation postponed or partially executed, no total usage of given potentials

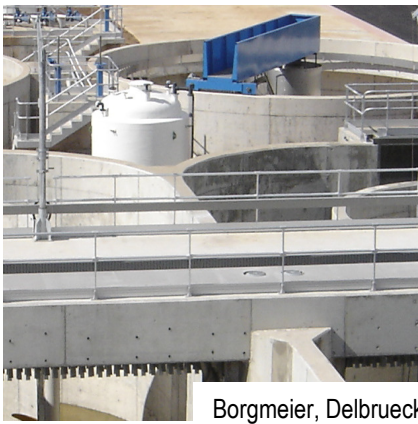
Company Partnership - The Successful Model Solution “Contracting”

- **Delegation of the complex task to a competent service provider with transfer of responsibility for concept, planning, construction and operation, by that**
 - Optimal solutions due to our experience, expertise and innovation in the business field of water management
 - Development of customer-specific processes by use of the best available technology, independent of appointed manufacturers -> point of view “operator”
 - Transparency and cost efficiency of all activities
 - Transfer of risks in planning, operation and costs to the contractor
 - Warranty for treatment results over full contract duration time (mostly 10-15 years)
 - Extensively release of the production company, already in concept/planning phase
 - Flexible financing by the Contractor gives possibility for realisation of projects beyond budget plannings

Water Management Activities References Industry – National (Germany)



Water Management Activities References Industry – National (Germany)



Water Management Activities References Industry – International



Wild Valencia/Spain



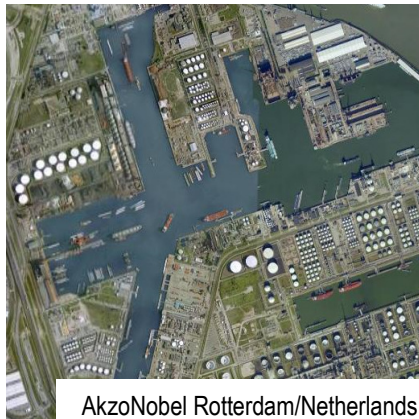
Deponie Hamitler/Turkey



TATA Ficosa, Pune/India



ACC Cement, Wadi,/India



AkzoNobel Rotterdam/Netherlands



Industrial Zone, Antalya/Turkey



Asian PPG / Volkswagen, Pune/India



Lanxess, Pune/Indien

References Industry – Complete Water Management

Example: **MAN**



- Operation and expansion of the central waste water treatment plant of the MAN Nutzfahrzeuge AG in Munich
- Treatment of oil, heavy metal and paint particle-loaded waste water
- Multiple discharges from the production
- Supervision and supply of two process-water treatments
- Optimisation of the process engineering
- Installation of an intelligent buffer management



References Industry – Waste Water Treatment

Example: **HUMANA Milchindustrie**

- Waste water treatment after whey processing
- Planning, construction and operation of an anaerobic waste water pre-treatment and extension of the present aerobic biology
- Generation of electric energy out of fermentation gas through a new built combined heat and power plant
- Reduction of costs via process engineering in the sense of a circular-flow-economy
- Development of an innovative process to eliminate phosphate
- 2008 order for planning, construction and operation of the 2nd extension of the waste water treatment plant



References Industry – Waste Water Treatment

Example: **AkzoNobel**

- Contracting-model for building and operation of an extension of the waste water treatment plant for the chemical park Botlek at Rotterdam
- Development of a conception for the modification and extension to clean the waste water of the production from several companies of the chemical park to quality for direct discharge
- Two-stage treatment as a combination with physicochemical and biological treatment
- Guaranteed abundance of the strictly discharge limits of the Netherlands



References Industry – Waste Water Treatment

Example: **Lanxess**

- Recommissioning and operation of existing effluent treatment plant for chemical production at the Jaghadia site, Gujarat (India)
- Complex waste water composition
- Treatment based on activated sludge process
- Concept to anticipate future production extension in waste water treatment with zero discharge



References Industry – Water Supply Example: **BASF Coatings**

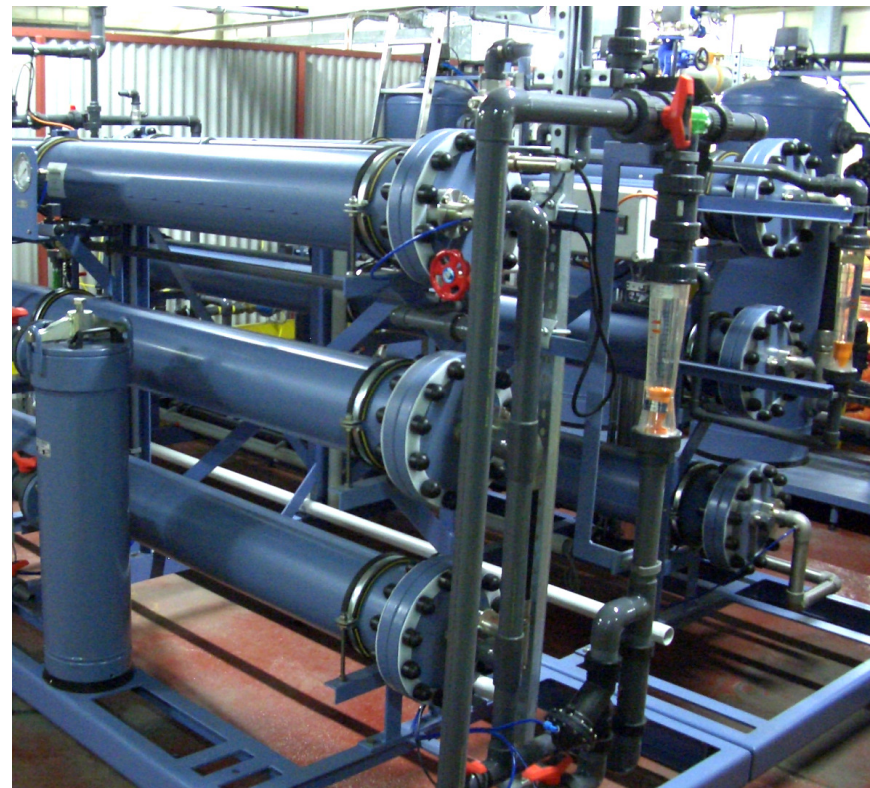
- Contracting to supply highly purified de-ionised water at the factory site in Muenster-Hiltrup
- Multilevel-2-line plant to refine the urban drinking water with the help of innovative diaphragm technologies
- Maximum requirements on residual components and availability
- Application in production and steam generation
- Final-treatment with Electro-De-Ionisation (EDI) unit to ensure purified water quality



References Industry – Water Supply

Example: **Pilkington Automotive**

- Supply of de-ionised water for the production and steam generation at the factory site in Witten
- 2-line plant to refine the urban drinking water with the help of modern diaphragm technology
- Efficiency: 2 x 10 m³/h
- Increasing the supply guarantee by integrating the plant into the 24 hours control and supervision network of REMONDIS Aqua





References Industry – Waste Water Treatment

Example: **Oettinger Brauerei**

- Treatment of production waste water of the brewery site at Moenchengladbach
- Construction of an pre-treatment plant due to planned capacity extension of production and to reduce sewage costs
- Planning, construction and operation of an anaerobic waste water pre-treatment plant (RE2Energy-process) for indirect discharge to municipal sewer
- Utilitisation of produced biogas by a new comined heat and power plant, feed into power grit according to german „EEG“-law



References Industry – Waste Water Treatment

Example: **Valensina**

- Treatment of the waste water from the produktion of cooled fruit juice and smoothies at the location of Moenchengladbach
- Necessity for construction of a waste water pretreatment due to planned extension of the production plant
- Planning, construction and operation of an anaerobic waste water pretreatment (RE2ENERGY-process) for indirect discharge
- Treatment of the generated biogas for the use as a substitute for natural gas in the steam generation of the production



References Industry – Waste Water Treatment

Example: **WILD Valencia, S.A.**

- Treatment of waste water from production of fruit juice, juice concentrates and flavours for the beverage and food industry at the location of Carcaixent, region Valencia (Spain)
- Necessity for the erection of a waste water pre-treatment facility due to increasing production
- Planning, construction and operation of an anaerobic waste water pretreatment (RE2ENERGY-process) for indirect discharge
- Treatment of the generated biogas for the use as a substitute for natural gas in the steam generation of the production



References Industry – Waste Water Treatment

Example: **Borgmeier Frischgeflügel**

- Treatment of the waste water from the poultry slaughter of approx. 90,000 animals a day in the location of Delbrueck
- High exigencies in particular on effluent quality due to a weak recipient
- Design, build and operation of a membrane bioreactor, submerged ultra-filtration diaphragms in a separate filtration basin, prepurification using DAF-Flotation
- Recycling of a partial current of the purified wastewater



References Industry – Waste Water Treatment

Example: **Food Industry Bremerhaven**

- Waste water treatment for the food industry in the industrial area of the fishing harbour in Bremerhaven
- Collective treatment of industrial and municipal waste water
- Mechanical and biological waste water treatment plant (approx. 50 % of the toxic freight coming from industrial discharges)



References Industry – Waste Water Treatment

Example: **The Lorenz Bahlsen Snack-World**

- Treatment of the waste water and organic residues from the snack-production in Neunburg v.W.
- Extension of the existing aerobic biology by an anaerobic waste water pre-treatment and a digester
- Generation of electricity out of fermentation gas through a newly built combined heat and power plant, feed-in according German EEG
- Reduction of costs via process engineering in the sense of the material flow economy



References Industry – Waste Water Treatment

Example: **GEA Group**



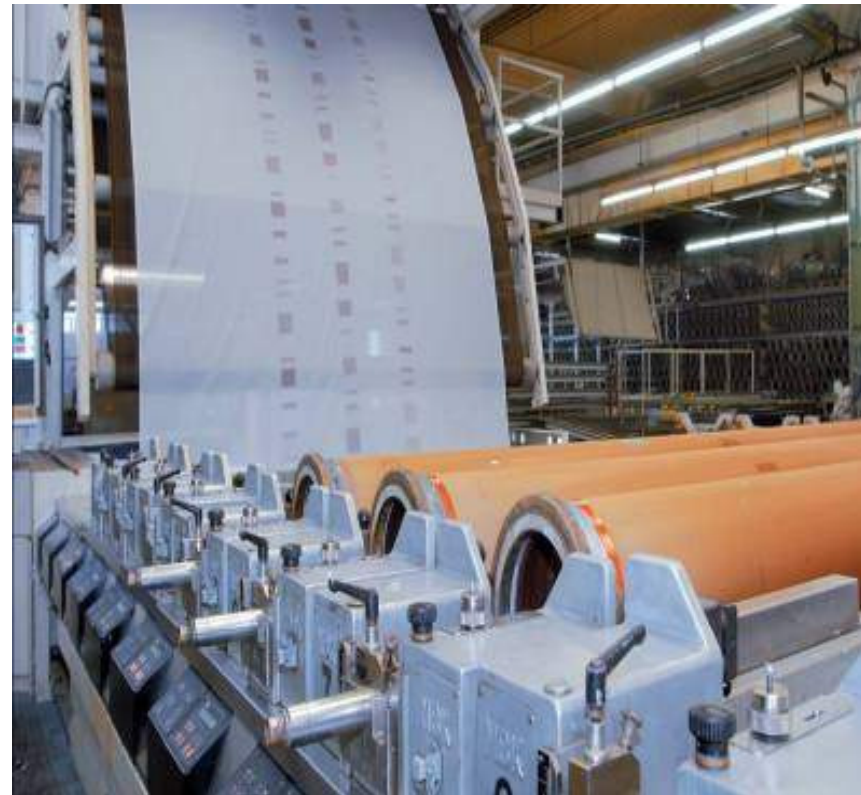
- Construction and operation of a waste water treatment plant for Ruhr-Zink GmbH in Datteln
- Contamination with waste water containing heavy metals
- Treatment of multiple discharges from the production as well as cleaning the surface water
- New technical concept to considerably reducing the sludge
- Contractual cooperation since 1999



References Industry – Waste Water Treatment

Example: **Blanke Textech**

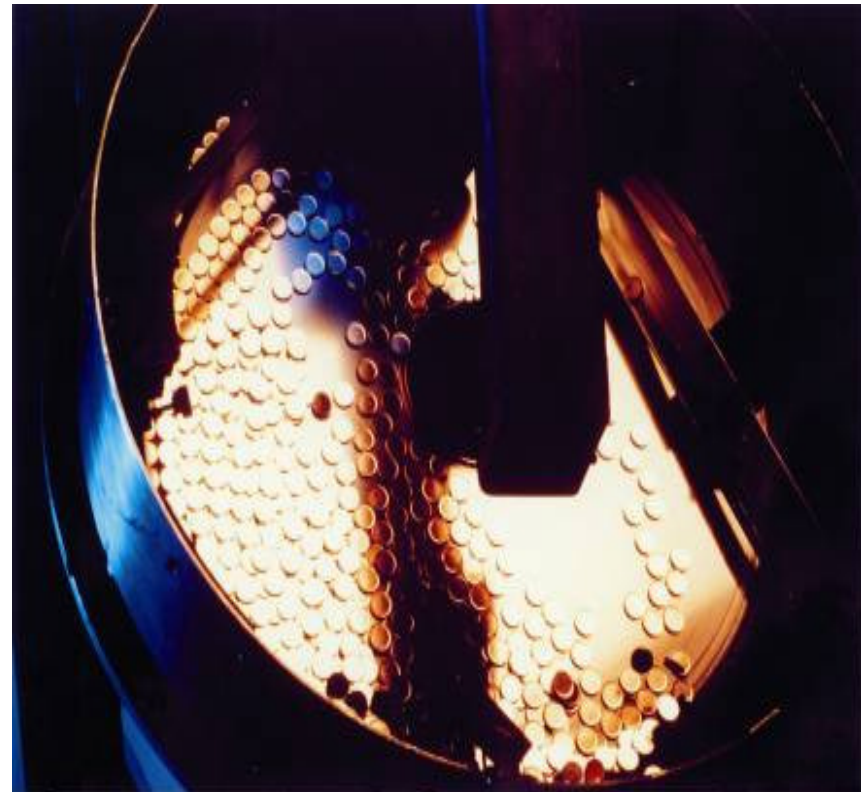
- Planning, construction/reconstruction and operation of an aerobic waste water treatment for direct discharge
- Treatment of waste water from the processing and refining of textiles for the automotive-, clothing- and home textile industries in Bad Salzuflen
- Necessity of the reconstruction and the expansion of the waste water pre-treatment due to very variable and complex waste water characteristics
- Innovative conception for boosting efficiency of the purification capacity
- Operation of waste water treatment, consisting of:
 - aerobic activated sludge biology
 - downstream turbulence flocculation



References Industry – Waste Water Treatment

Example: **EuroCoin**

- Contracting for treatment of waste water out of coin- and half-finished production at Schwerte
- Highly variety and complex waste water quality
- Development of the RECOMPLEX-process
- Treatment of low contaminated partial flows and recycling to the production
- Step by step increasing Partnership:
 - Start with Management-Contracting
 - Extension to a operation model and later on take over of ownership



References Industry – Waste Water Treatment

Example: **Deutsche Nickel**

- Production of euro-coin blanks at the location of EuroCoin AG in Schwerte
- Pollution of waste water with heavy metals and complexing agent
- Development of multi-step treatment process “RECOMPLEX”
- Take over of employees and function of water protection officer
- Additional treatment of waste water from external locations



References Industry – Waste Water Treatment

Example: **Antalya OSB**

- Central treatment of wastewaters of an industrial zone in Antalya (Turkey) with companies of the food industry, wood processing, metal and chemicals industry
- Multi-phase procedure of prepurification, chemical/physical precipitation level and terminal biological treatment
- Several dischargers of different branches, i.e. steadily changing contamination of influent water



References Industry – Waste Water Treatment

Example: **Hamitler**

- Operation of an biological landfill leachate treatment plant in Hamitler (Turkey)
- Fluctuating organical load from the landfill body
- Modern biological treatment state of the art



References Industry – Water Supply, Waste Water Treatment

Example: **Asian PPG, Volkswagen**



- Providing of highly purified de-ionised water to refine the urban drinking water at the factory site of Volkswagen through reverse osmosis and pre-treatment of waste water (effluent) from paint shop and separation tanks at the production location Volkswagen India, Pune
- Operation and management of the treatment plant
- Effluent is chemically treated
- Optimization of chemicals by monitoring and doing jar test
- Cost optimization for the client



References Industry – Waste Water Treatment

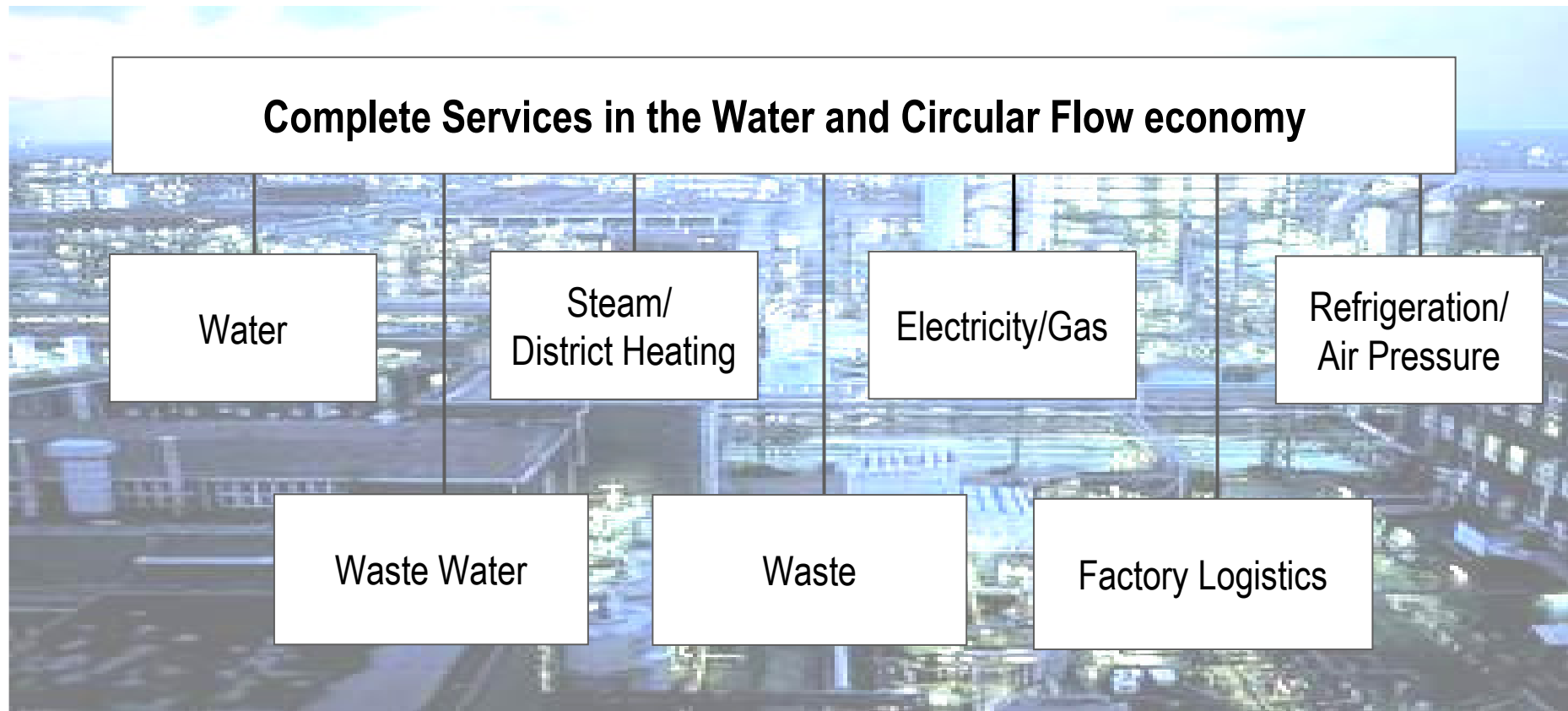
Example: **TATA Ficos**

- Treatment of graphite waste water and domestic waste water from the production of automotive components (eg: Windscreens for Ford Cars) at the location Hinjewadi in Pune (India)
- Design, erection and operation of the treatment plant
- Two step treatment:
 - chemico/physical step batchwise
 - followed by biological treatment
- Treated water is used for gardening purpose in the factory premises



Summary

REMONDIS the Multi-Utility Service Provider



Selected References Industrial Water Management



Presentation of REMONDIS Aqua



**Pure water comes from deep
in the ground**

– or from REMONDIS.