

Marine Water Technology

RWO

Veolia Environnement: The leader in environmental services



The only company in the world
able to cover the entire range
of environmental services



The global benchmark
in water services

World leader
€12.55bn



The leading European provider
of energy services

European leader
€7bn



The global benchmark for waste
management and resource recovery

Worldwide reference
€9bn



The standard for managing safe
and sustainable mobility solutions

European leader
€5.8bn

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Veolia Environnement: The leader in environmental services



- **€ 34.5 billion** revenue in 2009
 - **336,013** employees
- **76%** revenue generated in Europe
 - **72%** serving municipalities
- **28%** serving industrial and tertiary companies

Vessel Fleet within Veolia

- **Over 60 ships** within the Veolia Group



Veolia Water: The global benchmark in water services



- Managing water and wastewater services for public authorities and industry
- Designing technological solutions and building the facilities required to deliver these services
- Construction, rehabilitation and maintenance of networks and associated infrastructure



Veolia Water: The global benchmark in water services



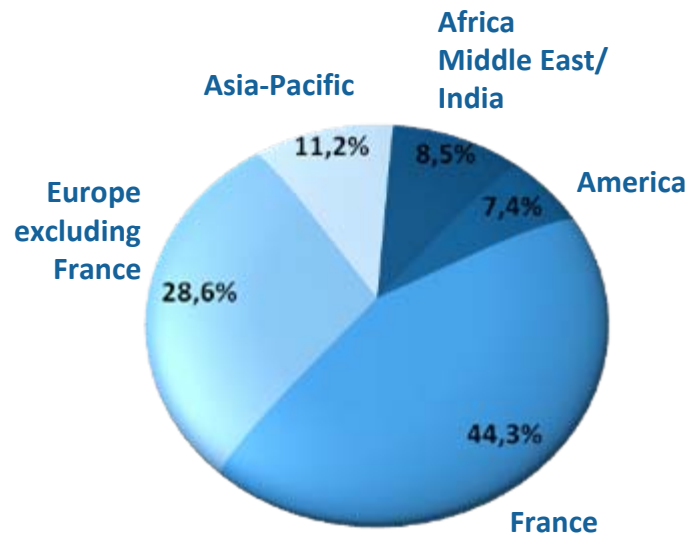
- **95,789** employees in **66 countries**
- Almost **95 million** people provided with drinking water and more than **68 million** with wastewater services
 - **5,263 water production plants** managed
 - **3,229 wastewater treatment plants** managed
 - **8.31 billion cubic meters** of water distributed
 - **6.73 billion cubic meters** of waste water collected

Veolia Water: The global benchmark in water services



Revenue 2009
12.55 billion euros

Revenue breakdown by region



Veolia Water Solutions & Technologies: Global leader in water treatment



Solutions & Technologies

- A cutting edge technology company
- Specialized in water and wastewater treatment for industries and municipalities
 - Technological solutions
 - Design-Build
 - Associated services
- An unrivalled network of business units
- 100% subsidiary of Veolia Water

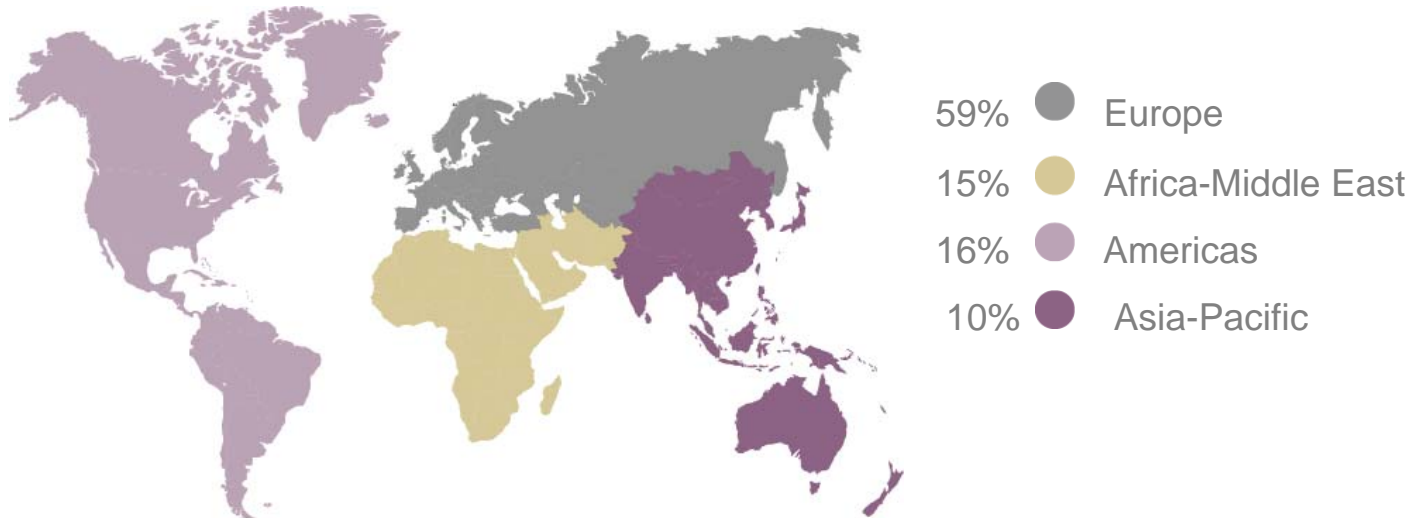


VWS: Global leader in water treatment



- ▶ **2.5€ billion** revenue in 2009
- ▶ **130** business units in **57 countries**
- ▶ **9,500** employees, **60%** are researchers, engineers, project managers
- ▶ Over **250** proprietary technologies

2009 workforce breakdown by geographical area



The World of

RWO



RWO: Headquarter Bremen

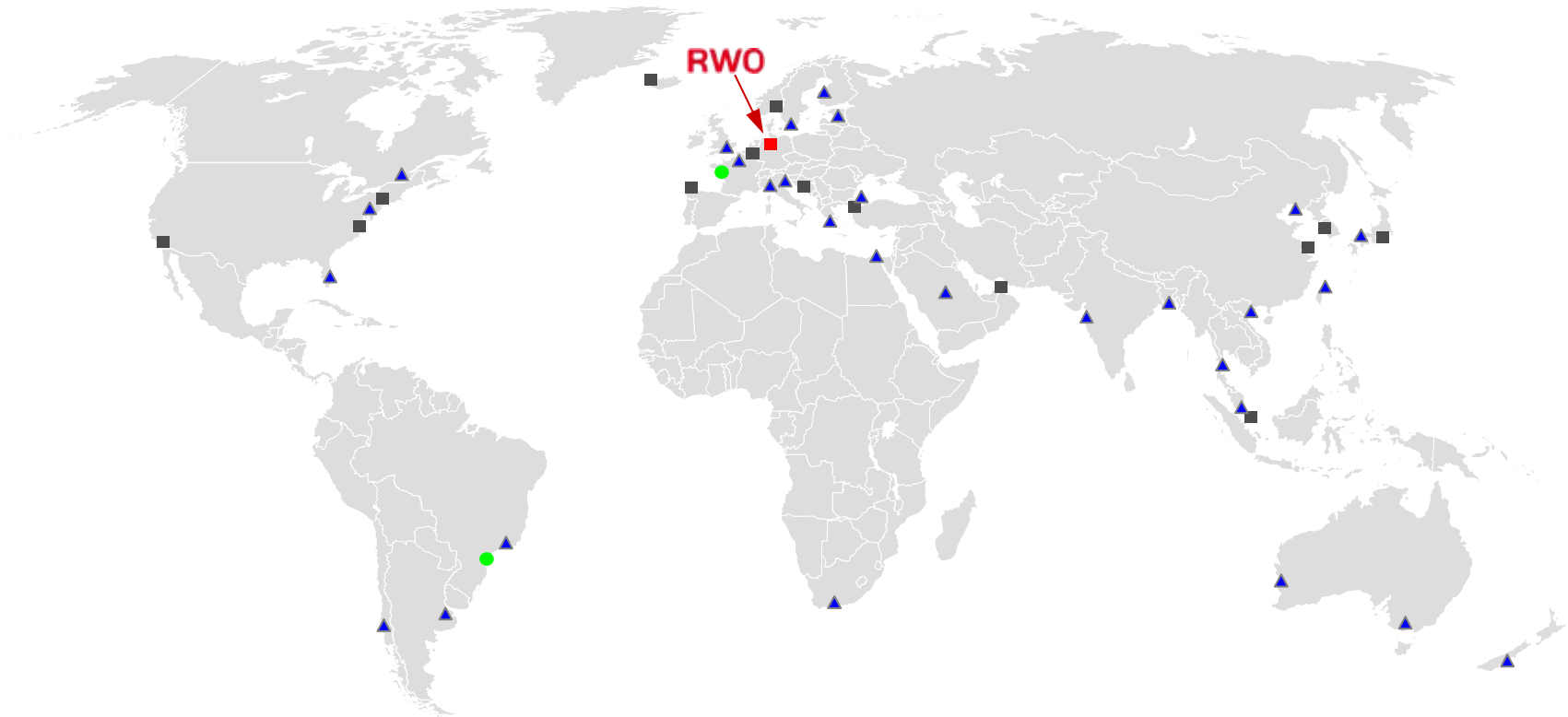
- More than **35** years of experience
- Office space - 1,200 m²
- Workshop area - 3,750 m²
- DIN EN ISO 9001:2008 environment



RWO: Worldwide sales and service network



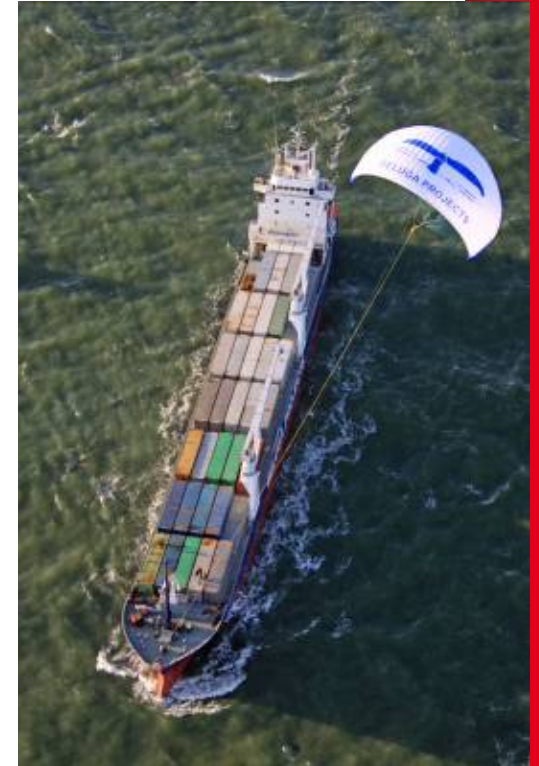
- Over 45 Sales and Service Stations



- ▲ Sales agent
- Sales and service agent
- Service agent
- RWO headquarter

RWO: performance

- **25%** of world fleet equipped with RWO water treatment systems
- Nowadays over **800** ships a year fitted with RWO systems
- Export to over **80** countries
- **Quality** and **performance** meeting shipyard and owner requirements



RWO: Product Portfolio



Ballast Water Treatment



Oil / Water Separation



Biological Sewage Treatment



Membrane Sewage Treatment



Reverse Osmosis Desalination



Softeners and Demineralisers



Bilge Water Splitting and Filtration



Water / Seawater Filtration



Grease Traps



Chemical Dosing Systems



Mineralisation & Deacidification



UV Disinfection



onboard **Ships...**

- **Ballast water** treatment
- **Oil / water** separation
- **Sewage** treatment
- Seawater **desalination**
- **Fresh water** treatment
- **Process water** treatment





... and Offshore

- **Ballast water** treatment
- **Oil / water** separation
- **Sewage** treatment
- Seawater **desalination**
- **Fresh water** treatment
- **Process water** treatment



RWO: our values

- Cohesion in diversity
- Customers' satisfaction
- Performance
- Technical expertise and innovation
- Responsibility
- Recognition of all employees
- Transparency



RWO: Certifications & approvals

- Quality management system
- Certified in acc. with DIN ISO 9001
- CE conformity (MED Marine Equipment Directive, company and products acc. to module B and D)
- Class certificates (GL, DNV, LR, RINA, ABS, BV, CCS, MRS, KR,)



RWO: IMO ship recycling convention

- Available for:
 - Oil / Water Separator
 - Sewage treatment
 - Ballast water treatment
 - Steriliser (UV)
 - Mineraliser
 - Grease trap
 - Softener
 - Seawater desalination
 - Split Filtration Unit



RWO: Some of our esteemed Customers – Merchant



RWO: Some of our esteemed Customers – Offshore



RWO: Some of our esteemed Customers – Cruise & Yacht



Technologies of

RWO

Oil / Water Separator

- **World leading** supplier
- Over **12,000** systems supplied
- **Suction** or **pressure** type
- Complying with **5 ppm** standard
- **Type approved** acc. to IMO-Resol. MEPC 107(49) by USCG, SBG, MED, MRS, CCS
- **Easy** to handle by crew
- **Safe** operation



Process Unit for OWS Upgrade

- **Emulsion splitting** system with **15 ppm** alarm device
- Exceptionally **high purity** levels
- **Safe** during Port State Control
- **Easy** to install and handle
- Class notations **“Clean Design”** and **Alaska-Rules** conformity



Ballast Water Treatment

- **Fast** ballast water production at even commonly high sediment loads
- Works in **sea-** and **river-water**
- **Low pressure** drop and **low power** consumption
- **Continuous** performance
- **Modular** design for easy integration



MBR Membrane Sewage Treatment

- Highly **effective BOD₅** degradation
- **Solids-free** effluent
- Extremely **low excess** sludge production
- **No** need for secondary settling tank
- Very **low energy** consumption
- **No chlorine** requirement for disinfection



Biological Sewage Treatment

- Excellent **effluent** results and process **stability**
- Suitable to treat **black** and **grey** water or black water only
- Delivered as **plug** and **play** unit
- Applicable for **gravity** and **vacuum** sewage drainage
- **Compact**, small footprint design



Reverse Osmosis Desalination

- Perfect water **quality**
- Complete **packaged** systems
- Fully **automatic**
- **Low** maintenance and operation costs
- **Safe** operation



Softeners & Demineralization

- Chemical **saving** processes
- **Reliable** and operation-**safe** equipment
- Electronical controls for **automatic** »hands-off« operation
- **Skid-mounted** units
- **Various applications:** bunker-, boiler feed-, gas turbine spray-, cooling-water, ...



Water / Seawater Filtration

- Enabling and **securing** a good net water production with **deep** filtration
- Designed for **high** sediment loads
- **Continuous** filtrate flow without flow interruption
- Very **low** flushwater demand
- **Low** pressure loss
- **Modular** design



Mineralisation & De-acidification

- Drinking water becomes potable and more **healthy**
- Considerable **improvement** of taste and odour
- **Avoiding** corrosion in pipes and storage tanks (pH adjustment)
- Ship equipment is **protected** against corrosion and subsequent damages



Legionella Prevention

- **Prevention** of Legionella related health issues
- **Compact** and **reliable** design
- **Easy** to operate and maintain



Chemical Dosing Systems

- **Alkalinity** reduction and scale prevention
- **Coagulation** of suspended solids
- Avoidance of **scale deposits** on reverse osmosis membranes
- **Shock treatment** to avoid bacterial growth in pipes and storage tanks
- **pH adjustment** to neutralise dissolved free carbon dioxide



UV - Disinfection

- Additional **safety disinfection** of drinking water, e.g. after the hydrophor
- **No** chemicals required
- **No** effect on taste and odour
- **No** corrosion problems
- **Easy** to operate and maintain



Bilge Water Splitting & Filtration

- For **difficult** bilge water compositions
- **Avoids** operational problems in downstream oily water separator
- **Emulsion splitting** and **particle removal** in three consecutive steps
- **Saves** consumables
- **Easy** to install and handle



Grease Traps

- Two chambers for **separation** and **storage** of sludge and grease
- **Guarantee** for high process stability and excellent effluent results
- Most **compact** design
- Delivered as **plug** and **play** unit, ready for operation
- **Easy** to clean and maintain



Top services

RWO

After Sales Services

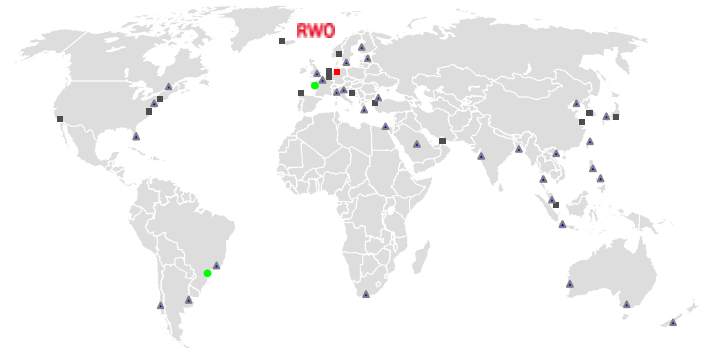
• A complete range of “Healthcare” services to ensure productive and reliable systems:

- **Commissioning**
- **Retrofits**
- **Spares**
- **Training**
- **Consumables**



“Healthcare” Services

- **Fast** and **reliable** response
- Spare parts available **from stock**
- Dedicated team of **specialist** field engineers
- **Worldwide** sales, service and technical support
- Service agreements



Research & Development



- Veolia Water has a network of R&D centres supporting our technology development



Environmental
Analysis Center
Saint-Maurice,
France



Anjou Recherche
Maison-Laffite,
France



Kompetenz Zentrum
Berlin, Germany



CREED
Limay, France



Adelaide,
Australia

- **RWO is your ideal partner for all aspects of water and wastewater treatment on board of ships and offshore**
 - part of a major international group
 - worldwide capability
 - unrivalled R&D and technical resources
 - excellent references
 - process experience second to none
 - specialist in standardized and custom made solutions
 - after sales 'Healthcare' support



Thank you for your attention



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