



**OVIVO**<sup>TM</sup>  
Bringing water to life<sup>SM</sup>

**Water Specialists for the Power Sector**  
creating value in water through innovation, creativity and expertise

[ovivowater.com](http://ovivowater.com)

# A New Global Force in Water

As society and the global economy demand more and more from water, there is a growing requirement for ever more specialist applications to manage clean water, to create specialist process waters, to treat wastewater, to extract energy from wastewater and to champion the reuse of water.

The 2010 merger of Eimco Water Technologies, Enviroquip, Aqua Engineering and Christ Water Technology plus many smaller specialist firms allows Ovivo to offer a unique combination of advanced solutions, probably the most significant application knowledge base in the world and some of the best brains in the business.

Ovivo aims to become the water partner of choice for clients in the public and private sectors and the leading source of water expertise for engineers and consultants across the globe.

For further information, visit [ovivowater.com](http://ovivowater.com)



*Ovivo - creating value in water through innovation, creativity and expertise in clean water, process water, wastewater treatment, waste-to-energy and water reuse markets across 5 continents.*



# Ovivo - bringing water to life



# Our Role in your Industry

Ovivo is the world's leading supplier of high quality water treatment equipment, and we are therefore in a unique position to meet the demands of clients within the power sector.

Whether you need a proven water technology or a more innovative solution, we have the technical expertise and product range to meet all applicable environmental and regulatory requirements and provide you with safe, progressive and economical technologies and services.

### The power sector requires a large amount of water as:

- cooling water to condensers;
- feedwater to boilers to produce the steam that drives the turbines to generate electricity;
- a scrubbing medium to remove air pollutants.

### Current trends include:

- The ever more demanding environmental regulations for water discharge have resulted in increased interest in zero-liquid discharge systems.
- There is also a trend towards higher pressure boilers that use less - but higher purity - water.

### The Benefits of choosing Ovivo:

#### Complete solutions

Many of our competitors tend to specialize in either pure water or cooling water technologies within the power industry. We are unique in that we operate across both areas and can therefore provide you with complete cost-effective solutions.

#### Simply water

Most of our competitors have interests across a wide variety of sectors, of which water is only one. We, on the other hand, are the first purely global water company - that means our focus is much greater on optimizing water and associated technologies and solutions.

#### Low running/lifecycle costs

We focus on water processes and technologies that offer the best value for our clients; sometimes these may have higher capital costs, but are more economical to run over the long-term and represent better value over their lifetime.

### An environmental focus

We take our environmental responsibilities - and those of our clients - very seriously. Water is one of our most precious resources and, as a result, everything we do is focused on conserving it. But, as much as we care about water, we also care about the people and animals that depend upon it. Within the power industry, for example, protecting fish is an integral part of what we do (see over page).

### Brilliant people

Ovivo are dedicated to operational excellence and will ensure a dedicated key account team of experienced project managers and installation and commissioning engineers. Clients will also enjoy dedicated aftermarket support and the collaboration of our specialist centers of excellence.



## Creating Value



*The ever more demanding standards of quality and reliability demanded by today's power industry can be exceeded by Ovivo's specialists in cooling water, condenser optimisation, feed water and wastewater treatment.*



# Expertise in the Power Industry

## Pure Water Technologies and Processes

### Pre-treatment

Raw water source quality can fluctuate greatly with the seasons, and so to cope with these fluctuations, you need a carefully designed and built pre-treatment system. We have decades' of experience in doing just this. But perhaps more importantly, we work closely with leading membrane suppliers to develop and optimize ultrafiltration systems that are fast becoming the world standard in modern, industrial plants. Types of pre-treatment we are experienced in include:

- Rapid flocculation with aluminum or iron salts.
- Lamella baffle plate clarifiers.
- Contact sludge lime soda softening.
- Preparation of lime milk.
- Pressurized or open multimedia filters.
- Sludge level control, automatic blow-down, thickening.
- Sludge dewatering with plate, frame or belt presses.
- Ultrafiltration in dead-end or hybrid-flow modules.

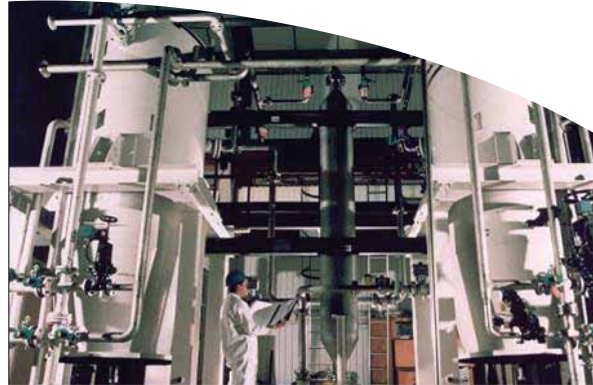


### Demineralized Make-up

To optimize steam turbine efficiency, the steam purity and boilerfeed make-up water quality needs to be as high as possible; sodium and silica contamination, even for a short period, can lead to corrosion and turbine damage. We can provide an environmentally friendly, chemical-free solution for ion exchange from small to large scale applications.

Over 60 years' experience of boiler feed water systems, combined with special knowledge of ultrapure water systems make us an ideal partner for any kind of high-pressure boiler feed application:

- Ion exchange with, Fluidized-bed, Amberpack and UPCORE.
- Electrodeionisation (EDI)
- Reverse osmosis, with permeate and staged concentrate.
- Mixed-bed deionizers with internal and external regeneration.
- Thermal, vacuum and membrane degasifying of boiler feedwater.



### Condensate Polishing

Condensate polishing entails purifying the return steam condensate. This is essential for meeting the quality requirements of high pressure thermal cycles, and also minimizes the consumption of make-up water. Condensate polishing is applied in places where the condensate is the major portion of the boiler feedwater, or if the risk of contamination of return condensate is persistent.

Turbine condensate may be contaminated by corrosion products from the piping system or by leaching water from condensate and heat exchangers, which must be removed before being recycled to ensure the efficiency and long life of the turbine.

Especially for frequent stop-and-go and high flow rate fluctuations, our well-designed CPPs ensure short start-up times and high operational security. It frequently happens that not only turbine condensate but also external condensate must be treated simultaneously, and such special tasks require solid experience in design and manufacture of condensate polishing.

### Our experience includes:

- Mixed-bed deionisation with internal or external regeneration.
- Automatic resin separation for highest resin purity employing the CONESE<sup>®</sup> technology.





### Fish Protection

Our clients in the power industry abstract large volumes of water from rivers, lakes, reservoirs, seas and oceans. As these are home to many fish and other marine life, we offer a variety of technologies and processes to prevent entry into water intakes. We work closely with several environmental agencies to ensure that we safeguard the natural habitat and future of aquatic species and, far from adding cost, fish protection systems help save money by eliminating the costs involved in handling and disposal of fish kills - and in plant equipment maintenance and repair.



### Passive Screens

These fish-friendly, reliable physical barriers keep marine life and debris separate from the volumes of water entering the intakes. The screens incorporate tiny slots through which water can pass, but larger aquatic life and debris cannot.

They can be placed away from shore for better water quality, and away from high concentrations of debris and marine life; bursts of air remove debris from the screen surface. Advantages of passive screening include:

- Reliable water delivery.
- Low screen system costs.
- Simpler intake and pump station design.
- Low total projects costs.
- Low maintenance costs.



### Fish Guidance

Behavioral barriers - or deterrent methods - exploit a fish's natural response to stimulus. Ours offer a range of stimuli that either deter fish from the area of a water intake or guide them into a bypass channel to a point downstream, and which include:

- Acoustic sound projector array for fish deterrent.
- Bio-acoustic fish fences for exclusion.
- Strobe lights.
- Bubble curtains.



### Fish Recovery & Return (S.I.M.P.L.E.®)

Where fish do get into raw water intakes, survivability can be significantly increased with our fish handling band screens. Traveling fish buckets incorporated into the screen design provide a natural shelter for fish, then elevate them to the deck level where a series of gentle sprays sluice them into a return through-system and back to their natural habitat away from the intake flow.

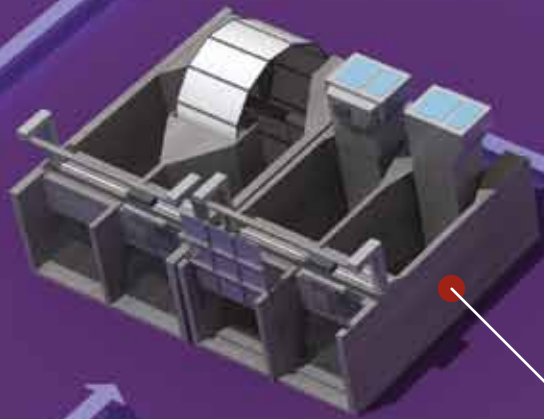
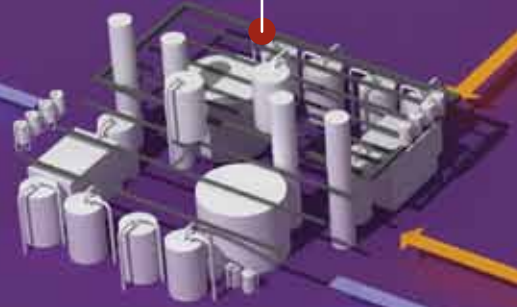




# Our Power industry processes

Discover the ways we can help you with your wastewater challenges and help save you money

Wastewater Treatment Plant



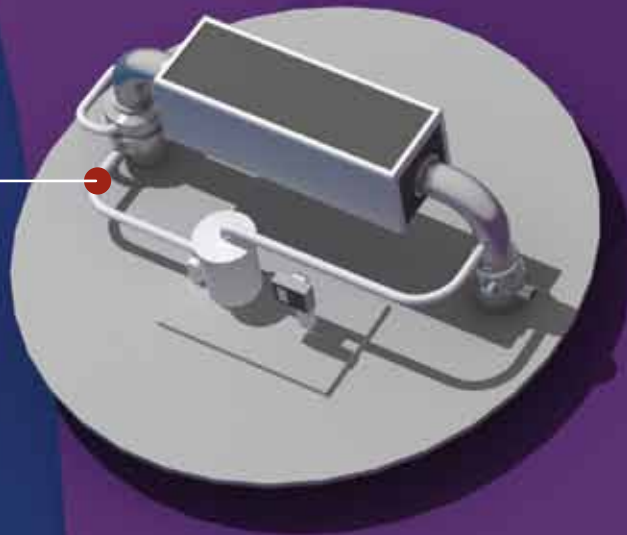
Water Intake Systems



Mexel 432<sup>®</sup> Dosing

## Condenser Optimization Systems:

- Debris filtration
- Condenser on line tube cleaning system







# Case Study Treatment of flue-gas-washing-water in power plants Mellach, Austria

## Brief

Austrian Thermal Power (ATP), a subsidiary of Verbund, is one of the largest producers of thermal energy in Austria. Its coal-fired power plant at Mellach, near Graz in Austria, began operation in 1986.

Against a backdrop of rising oil and gas prices, the economic argument for keeping its plant in service was strong as coal is

a comparatively cheaper fuel. Following changes to Austrian regulations for the discharge of waste water from thermal power plants, ATP wished to adapt its ageing flue gas washing water plant at Mellach to meet these new industry standards. Ovivo's flue gas washing water solution gave ATP's Mellach plant an extended lease of productive life.

## Solution

Flue gas washing water is continually recycled within a washing tower. This circulation results in wastewater blown down for treatment that bears a high concentration of soot, the organic residues of combustion, sulphurous acid, sulphuric acid and many heavy metals such as lead, cadmium, arsenic and mercury. All such environmental poisons must be reduced

## How we create value

- Efficiency: treating and recycling 156m<sup>3</sup> wastewater per day
- Effectiveness: achieved all guaranteed values from inception
- Reliability: operation has been uninterrupted since start-up





below relevant maximum values before any wastewater can be discharged to a sewer or into receiving water.

The plant includes several steps during which heavy metals are precipitated from flue gas washing water partly as metal hydroxides and metal sulphides. The precipitated sludge is separated and dewatered by a plate-and-frame press. A new circular sedimentation tank improves reduction of heavy metals.

DeNOx catalysts are used at fossil fuel-burning facilities to reduce nitrogen oxide (NOx) emissions. As these catalysts age an increasing amount of ammonium is detected in the flue gas washing water, which is dealt with by an ammonia desorption and absorption plant. New chemical dosing stations, a precoat cartridge filtration unit, and a final neutralisation stage complete the wastewater treatment process. An automatic sampling unit takes measurements for audit by the regulatory authorities.

**Outcome**

The plant has a net wastewater production of 156m<sup>3</sup> per day. Ovivo's treatment processes clean and recycle this volume as rinsing and dilution water for chemicals in order to improve the overall water balance. The new plant was started up in December.





# Case Study Cooling Water Intakes

## Ling Ao Nuclear Power Station, China

### Brief

After the successful execution and operation of Ling Ao Phase 1 which included our high capacity drum screen technology, we have also been awarded Ling Ao Phase 2. This project is considerably larger than Phase 1.

### Solution

Ovivo supplies equipment for the world's largest cooling water intakes for thermal and nuclear power generation, including Ling Ao Nuclear Power Station in China.

Scope of equipment supply includes: barscreens, stopgates, cable hauled raking mechanisms,

double entry drum screens, washwater system and controls. All equipment has been seismically qualified and components for which nuclear safety was relevant complied with the demanding standards of the French RCC-M and RCC-E Design and Construction Rules of PWR Nuclear Islands.



Our experience, commitment and technology have resulted in our becoming one of the major global suppliers of screening plant for power applications.

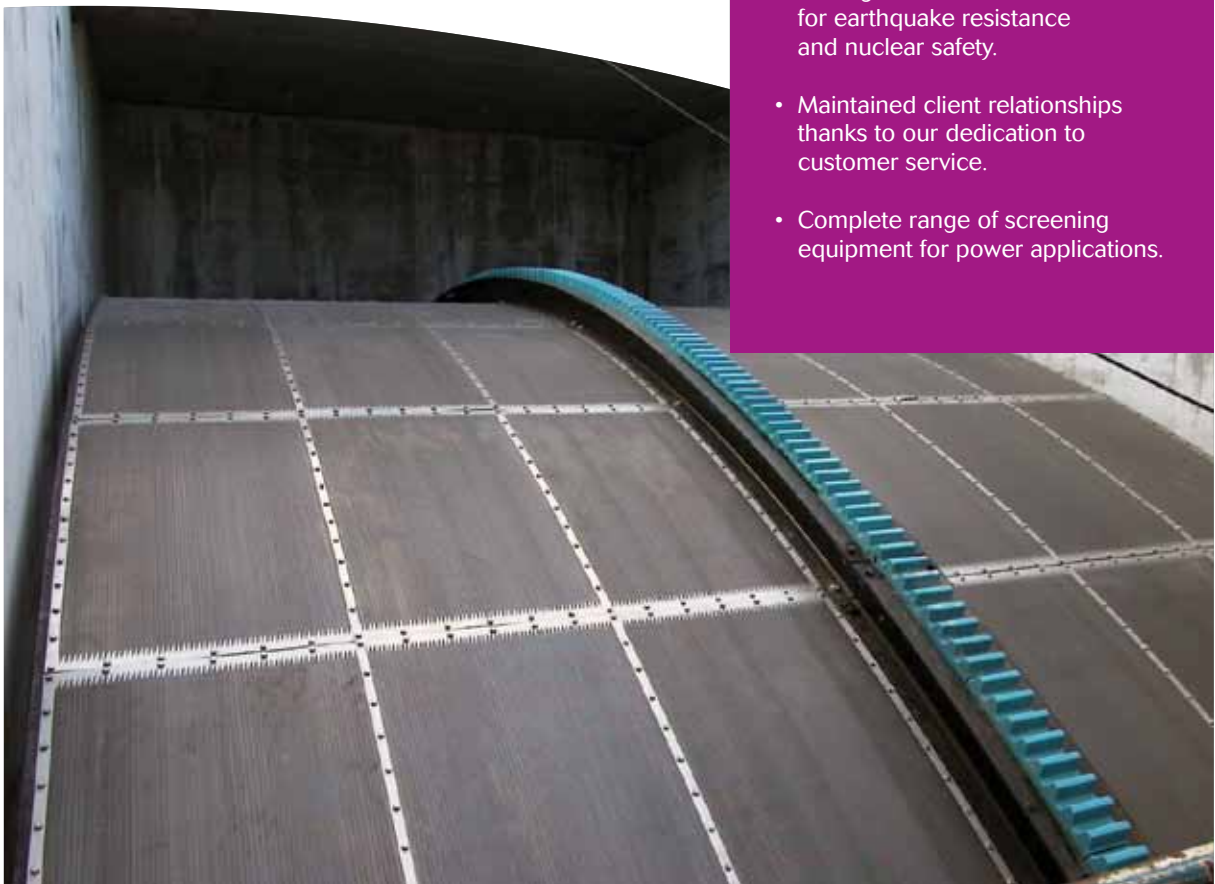
**Outcome**

Our effective screening systems for cooling water intakes at nuclear power stations met with complete client satisfaction, as can be seen from our engagement for Ling Ao Phase 2.



**How we created value**

- Met rigorous standards for earthquake resistance and nuclear safety.
- Maintained client relationships thanks to our dedication to customer service.
- Complete range of screening equipment for power applications.



# Prolonging the efficient life of your assets

## Customer Services

Recognising the importance of customer's needs for an efficient and fully reliable equipment, whether it is a small packaged plant or a major turn-key installation, we support all customers with a comprehensive portfolio of After Sales service packages ranging from the supply of spare parts through to full operation and maintenance contracts. Our dedicated Customer Service team has a proven service track record in the Power sector serving several hundred power industry customers throughout the world.

## Erection, Commissioning and Training

For all equipment and systems supplied, Ovivo can provide fully qualified technicians to undertake plant erection, commissioning, supervision and operator training. Both classroom and on-site training packages are tailored to individual customers needs to ensure that all aspects of Health and Safety legislation are adhered to as a minimum.

## Maintenance

Provision of on site supervision and/or site operatives to cover the complete range of maintenance disciplines are available to suit required needs. Multi-skilled staff are equipped for both planned maintenance and intervention work.

## Service & Inspection Visits

Both Standard and Validated service / inspection visits, complete with inspection reporting, are available from our trained service engineers to ensure planned maintenance and to reduce the chance of un-expected / premature failure.

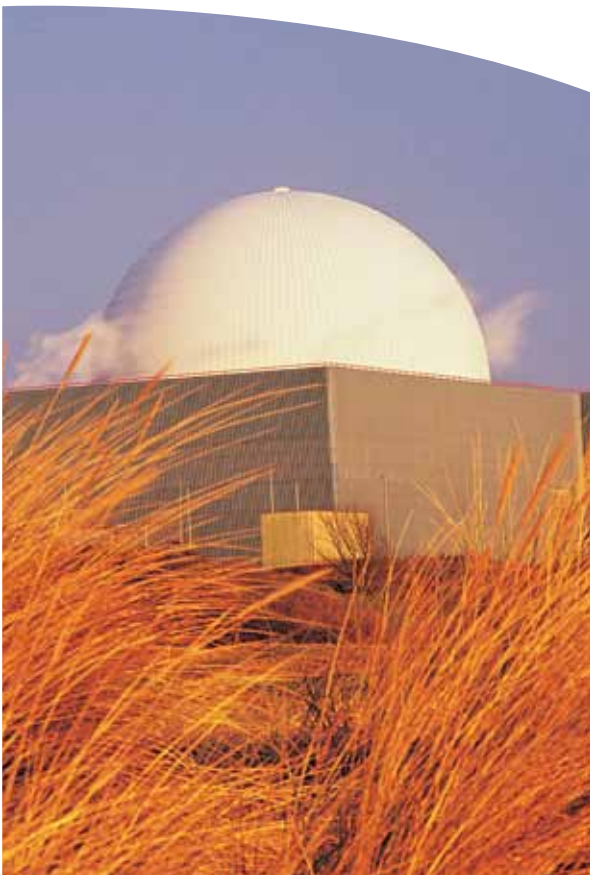
## Upgrades, Overhaul & Performance Upgrades

Whether driven by legislation, environmental conditions or new technologies, upgrades, improvements and overhauls are offered to maintain your equipment to the level performance expected and that is compliant and include:

- Mechanical plant overhaul and refurbishment
- Plant optimisation and trouble shooting
- Control and instrumentation enhancements including system automation
- New Technologies

## Spare parts

- OEM Parts will ensure reduced downtime and reliable plant operation.



## Creating Value



*Prolonging the life of a power stations assets by ensuring water treatment for cooling, boiler feed, condensate polishing and condenser optimization that delivers effective and efficient performance is key to Ovivos' success.*





# Applications and Solutions

Industry	Solution	Application
Energy	Process Water Treatment	Condensate Polishing
		Condenser Optimization
		De-ionization (Demineralization)
	Wastewater Treatment	Chemical Physical Wastewater Treatment
	Water Intake Solutions	Condenser Optimization
Cooling Water & Pumping Stations		



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