

Financing Industrial Water Treatment and Resource Recovery



Resonance Asset Management Limited



- Resonance Asset Management Limited (“Resonance”/“Manager”) is an alternative asset management firm focused on originating, distributing and managing real asset investment vehicles for institutional investors.
- Since 2012, Resonance has expanded in two key areas of real asset investments and currently manages c. US\$450m in two investment funds, including Resonance Industrial Water Infrastructure:- US\$320m.
- The fund is global with focus on investments in greenfield and retro-fit industrial water treatment and resource recovery infrastructure assets primarily focused in Europe, Australia, China and S.E. Asia, expanding into Americas.
- The firm’s mission is to deploy capital in a manner that makes a positive contribution to the economy and environment as well as generating attractive risk-adjusted returns for investors.
- The fund is a financial partner to the industrial water users and also water and sludge treatment solutions providers.
- We offer non-recourse equity investments alongside Industrial Water Partners that take on the design, EPC and operation of the whole plant. The Industrial Water Partner is invited to make a minority investment in the project, as well as providing DBO or O&M services.
- Resonance is a signatory of the UN’s Principles of Responsible Investment.

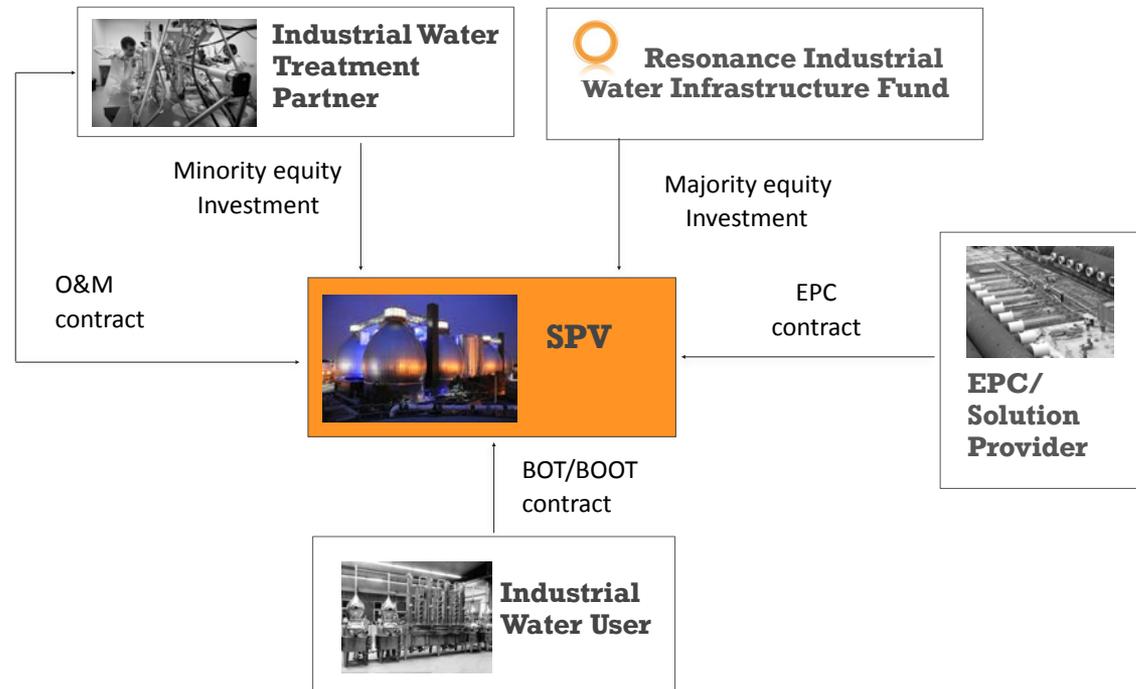


A New Financing Model - sharing technology risk with partners

- ❖ Historically, water treatment assets were financed by a combination of Industrial Water Partner's balance sheets, and operating leases.
- ❖ New model: as Fund and Industrial Water Partner jointly invest in equity of the SPV, their interests are aligned to deliver the best performance.

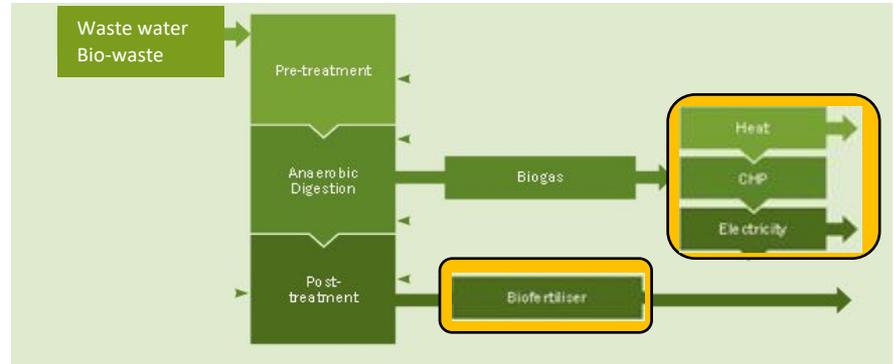
❖ Growth in Industrial BOT opportunities is driven by industrial clients increasingly seeking to outsource water cycle management:

- To secure essential supply (via dedicated water reuse and desalination capacity) instead of competing with other users for traditional sources of water.
- To manage business critical water treatment systems.
- To comply with ever tightening regulatory environment with tighter discharge consents that necessitate investment in sophisticated new water treatment facilities that require continuous high value-added services.
- To capture additional value from resource recovery e.g. energy, nutrients and valuable commodities, requiring investments in new technology that are outside of the industrial clients' areas of expertise.

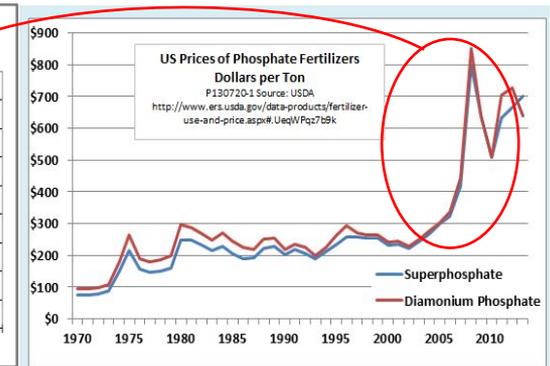
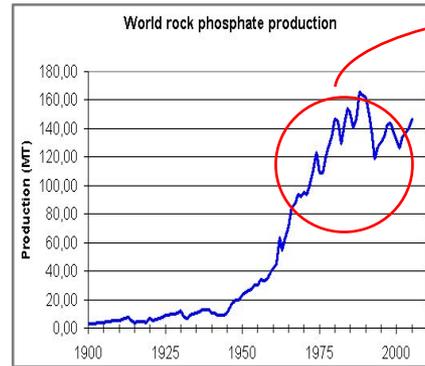


Recourse Recovery from Waste Water - Key Driver of Investment

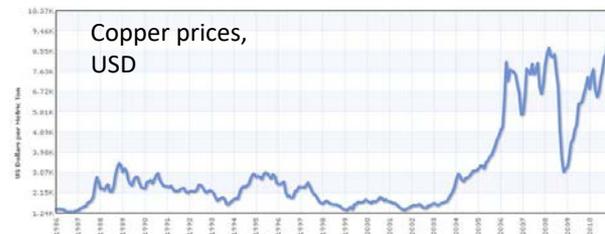
- **ENERGY:** The global market for anaerobic digesters equipment was estimated at to be \$7 billion by 2018, and registered a five-year compound annual growth rate of **9.4%** from 2013 to 2018.
- Key Drivers:
 - increasing world energy demand, in particular in China and India
 - growing energy costs and import dependency within many countries
 - decreasing capacity for landfill
 - 45% of European soils suffering from low organic matter content and reduced fertility.



- **NUTRIENTS:** Phosphorus and other nutrients recovery are the most attractive opportunities after the energy recovery. The manufacturing of the synthetic fertiliser from the raw materials is a very energy intensive process (and polluting). In addition, deposits of Phosphate rock are being depleted and the recovery of Phosphorus from waste water is a becoming a very financially attractive. The product of the Anaerobic digestion is a rich source of nutrient material which will become increasingly popular.



- **MATERIALS:** Waste water generated in mining processes contains a lot of raw material (e.g. copper) that is recoverable through a proven water treatment processes. Similarly, in other processes that use expensive catalytic or lubricant materials, it is possible to recover them from waste fluids and reuse them.



Benefits for Industrial Water Clients

- ❖ **The key drivers of return for the Fund and the Industrial Water User are the recovery of resources (energy, nutrients, metals, or specialist chemical substances used in manufacturing processes), and technology upgrades that improve plant efficiency and reduce operating costs.**
- ❖ This form of financing offers access to a unique proposition: non-recourse equity financing. This significantly reduces the technology risk for the industrial Water Users. The risk of the plant not delivering lies with the Fund and the Industrial Water Partner and not the Industrial Water User in the case of the outsourced solution under BOOT/DBFO.
- ❖ Allows Industrial Water Users to focus capital and management's attention on their core business.



- * Industrial groups that use water in their manufacturing processes and produce waste water that needs treatment



Invested and pending projects by the fund 2016-2018, \$212m

Recovery of salt from wastewater from a Coal-to-Chemical factory	China	Invested
Production of biogas from cattle abattoir wastewater (2 facilities)	Australia	Invested
Production of biogas from chicken egg farm wastewater	United Kingdom	Pending
Production of biogas from chicken egg farm wastewater	Singapore	Pending
Production of biogas from lamb abattoir wastewater	Australia	Pending
Production of biogas from cattle abattoir wastewater	Australia	Pending
Production of biogas from chicken egg farm and protein factory's wastewater	Netherlands	Pending
Production of biogas from poultry manure and sludges from industrial clients	Belgium	Pending
Production of biogas from distillery wastewater	Philippines	Pending

Summary

- ❖ The Fund is providing a unique source of financing for greenfield and retro-fit water treatment plants on an industry standard Build-Own-Operate-Transfer (BOT or BOOT) structure.
- ❖ This approach benefits Industrial Water Users by allowing them to focus their capital on their core business, to **reduce technology risk exposure while deploying new resource recovery processes to achieve plant optimisation.**
- ❖ This approach benefits Industrial Water Partners by allowing them to use their balance sheet more efficiently, be more competitive in their proposals to clients and generally grow their business.
- ❖ Resonance has an experienced team and can help the Industrial Water Users and Partners with the investment structuring, tax optimisation and legal support.



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