



De.mem Limited (ASX:DEM)

Investor Presentation

23 September 2019



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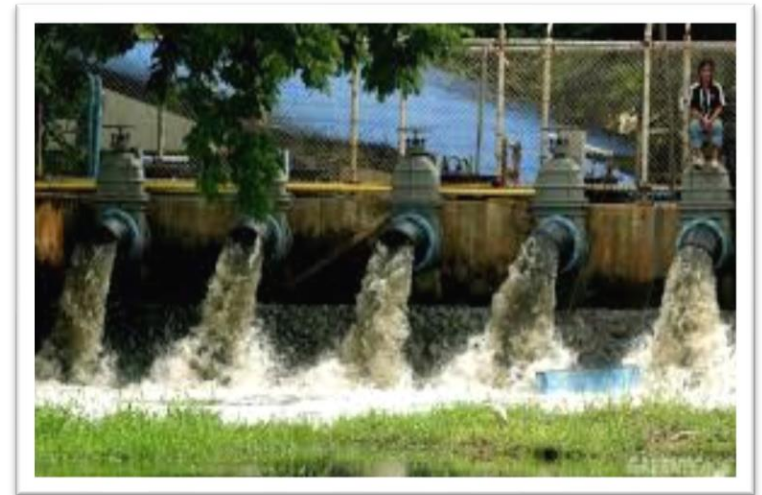
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LARGE ADDRESSABLE MARKET OPPORTUNITY: DECENTRALISED WATER TREATMENT

- The global market for packaged / decentralised water treatment systems was valued at USD 12 billion in 2015 and is projected to reach USD 21.8 billion by 2021 - a compounded growth of 10.4% per annum*
- Decentralised (ie. smaller, modular or “packaged” plants) are a cost-efficient and easy to deploy solution
- Large centralised plants are often inefficient, require heavy budgets or take too long to deploy
- Water pollution and scarcity among key issues for many developed and developing countries worldwide
- Outdated and ageing infrastructure in many countries are compounding the matter



KEY INVESTMENT PROPOSITION

De.mem is on a clear track to become the leading player in de-centralized water treatment in Australia and the Asia-Pacific region, based on a suite of proven, disruptive, easy-to-scale membrane technologies targeting a huge addressable market



Introduction – What we do

De.mem designs, builds, operates and services water treatment systems for de-centralized applications. The company is a solution provider, deploying proprietary technology where applicable



Key Product Lines

A wide range of water treatment systems – including membrane-based systems, aerobic systems, anaerobic systems, chemical dosing systems



Key Target Markets

All major water treatment applications: Potable, sewage treatment, industrial waste and process water.
Key target growth segment: Food & Beverage, Agriculture.



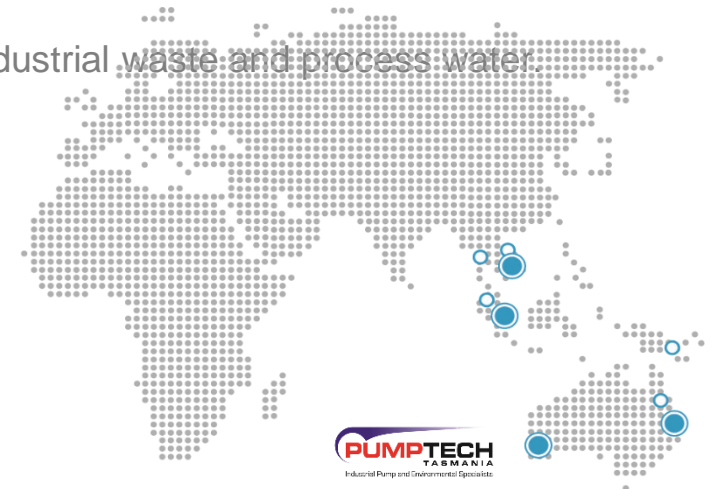
Locations

Brisbane, Adelaide, Melbourne, Perth, Singapore, Ho Chi Minh City, Vietnam



Employees

60 in total comprising - 45 Australia, 12 Singapore, 3 Vietnam



Uniquely positioned to become the leading player in decentralized water treatment across APAC, providing a range of proven, world-class, highly scalable and potentially disruptive technologies to a large addressable market



Proprietary technology – De.mem has access to a range of proven, disruptive, easy-to-scale membrane technologies targeting a huge addressable market. Part of the IP is owned by De.mem, other has been licensed exclusively from Nanyang Technological University (NTU), Singapore – ranked no. 2 in membrane research worldwide by Lux Research (2013).



High growth market – The global water industry is estimated to reach US\$915bn by 2023 (*source: Global Water Intelligence*). The global market for packaged / decentralised water treatment systems was valued at USD 12 bn in 2015 and is projected to reach USD 21.8 billion by 2021 - a compounded growth of 10.4% per annum (*source: Markets & Markets*).



Blue chip customer base – **Including:** Rio Tinto, Monadelphous, Bechtel (mining/resources); St Hilliers, Mulpha, JRK Group, Civeo, Ausco (infrastructure/municipal); Givaudan, FMC Technip (industrial)



High revenue growth – from \$0.3m in 2016 to \$2.9m in 2017 and \$10.5m 2018. FY19 YTD exceeding FY18 run-rate, with \$10.5m secured revenues as of September 2019.



Stable revenue component - Approx. \$3.5m or 35% of revenues from long term or revolving Operations & Maintenance or Build, Own, Operate contracts



Multiple growth drivers – high growth addressable market; growing product range; emerging new technologies; cross-sell opportunities; recent expansion into new geographies (Western Australia and Pacific Islands).



Visible path to cash positive – Operating cash outflow of \$1.6m on \$10.5m revenue in FY18, with growing FY19 revenue outlook. Flexible revenue model, low cost base, existing projects providing stable cash flow and recurring service revenues.



Valuation discount – DEM trades at an 87% discount to ASX-listed peers on a market cap/revenue (x) basis.

DEM is growing its recurring revenue base and has a visible path to sustainable operating cash positive

A\$M (DEC YR END)	2016	2017	2018
Revenues	0.3	2.9	10.5
COGS	0.4	2.4	7.9
Gross Margin	(-0.1)	0.5	2.6
Gross Margin (% of revenues)	Neg.	18%	25%
Net Operating Cash Flows	(-1.2)	(-2.4)	(-1.6)

PROFITABILITY

- **High gross margin** approx. 25% in CY18 (18% in CY17) with improving outlook

REVENUE GROWTH

- **High revenue growth** from \$0.3m in 2016 to \$2.9m in 2017 and \$10.5m 2018
- **2019 on track to exceed 2018** with approx. \$10.5m secured revenues in CYFY19 year to date
- **Strong recurring revenue** in FY18, approx. \$3.5m from BOO & O&M contracts

CASH BALANCE

- **Strong cash (including term deposits) balance** \$1.9m as of 31 March 2019, \$3.5m as at 30 June 2019
- **Positive 2019 outlook** run-rate YTD exceeding FY18, with strong sales pipeline in Australia and Asia
- **Visible path to cash positive** March quarter 2019 cash outflow of \$600k; June quarter 2019 outflow of \$212k

MARKET DATA

ASX code	DEM
Ordinary shares	140.0m
Market capitalisation	\$23.7m
Cash on hand (30.06.19)	\$3.5m
Listed on ASX	7 April 2017
Issue price	\$0.20
Last price (30.8.19)	\$0.17
52 week high	\$0.24
52 week low	\$0.09
Average daily volume	108,519
GICS classification	Utilities

MAJOR SHAREHOLDERS

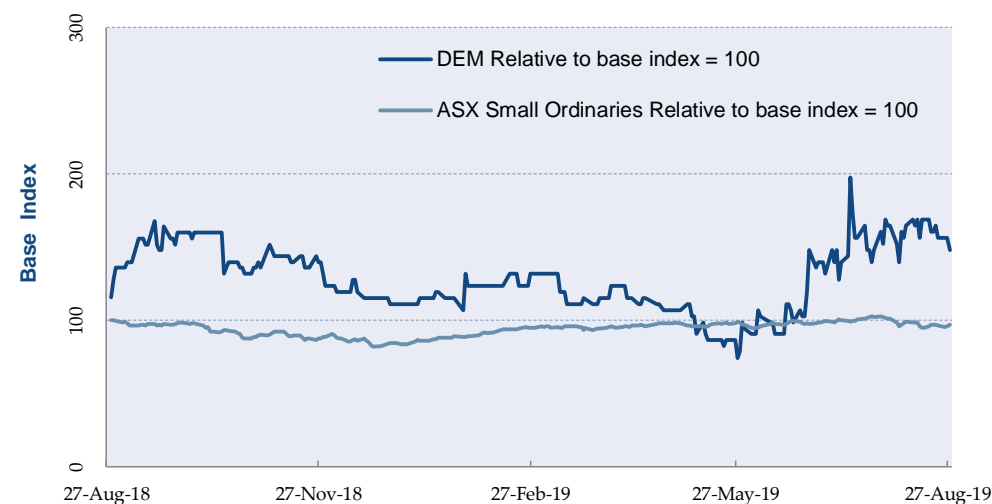
NA Singapore Early-Stage Venture Fund	30.1%
New Asia Investments Pte Ltd	9.4%
Perennial Value Microcap Opportunities Fund	7.7%
National Nominees Limited	8.2%
Mr Andreas Hendrik De Wit	5.7%
Andreas Kroell	1.9%
HSBC Custody Nominees (Australia) Limited - A/C 2	1.6%
Citicorp Nominees	1.4%

SHARE PRICE PERFORMANCE

DEM Stock Price



DEM Relative to ASX Small Ordinaries Index



DEM trades at an 87% discount to the average Market Capitalisation/Revenue multiple of its listed comparables

Company	Last Twelve Months Revenue	Market Capitalisation (30 August 2019)	Market Capitalisation / Revenue	Technology	Market Focus
Phoslock Water Solutions ASX: PET	A\$18.8m 12 months to 30/06/19	A\$713m	37.9x	Chemicals to bind phosphorus	Prevention of algae growth
Fluence ASX: FLC	A\$136.5m* 12 months to 30/06/19	A\$225m	1.6x	Aerobic waste water treatment (MABR)	Municipal waste water
Purifloh ASX: PO3	A\$0.0m 12 months to 30/06/19	A\$167m	NA	Free Radical Generation (FRG)	Water treatment, air, surface sterilisation
Scidev ASX: SDV	A\$2.9m 12 months to 30/06/19	A\$33m	11.4x	Chemicals	Coagulants and flocculants for wastewater treatment and sludge dewatering
Average			12.4x		
De.mem ASX: DEM	A\$10.5m 12 months - FY18 (Dec year end)	A\$24m	2.3x	Membranes	Industrial water treatment solutions

De.mem as a Total Water Management Solutions Provider: A “One-stop-shop” for the customer

- Deep technical know-how based on long term experience and strong team
- Access to proprietary products/components, deployed as part of the systems to provide a “competitive edge”
- Partnership in R&D with Nanyang Technological University, Singapore
- Strong know-how in automation and de.live remote monitoring platform
- Highest quality standards ensured through industry qualifications
- “Made in Australia” products for Australian customers
- Build, Own, Operate and Operations & Maintenance offer
- After-sales support and service offering



Annuity revenues are approx. 35% of total revenues and growing



Equipment sales

- Sale of water and waste water treatment systems
- Providing a turn key solution to the customer
- Typically projects-based, with strong and stable repeat customer base



Build-Own-Operate or Build-Own-Transfer

- De.mem owns the equipment and rents out the equipment
- Long term contract with the customer
- Stable recurring revenue stream
- High margin



Operations and Maintenance

- De.mem operates & maintains water treatment equipment owned by the client
- Long-term or revolving contract
- Stable recurring revenue stream



Consumables Sales

- Includes the sale of
 - Chemicals
 - Filters
 - Membrane modules
 - Pumps
 - Other spare parts
- Recurring revenue stream

~60% of revenues (2018)

BOO & O&M:
~35% of revenues and growing

~5% of revenues

In CY 2018, approx. 40% of group revenues or A\$4 million was derived from long-term contracts or recurring revenue streams

BOO/BOT, O&M SERVICES

- Intensified promotion of Build-Own-Operate (BOO)/ Build-Own-Transfer (BOT) offer, targeting signing of additional BOO / BOT projects in Australia and Singapore for Q4 2019 – CY 2020
- Operations & Maintenance (O&M) and service offer generate revenues without upfront capex required

CHEMICALS & CONSUMABLES

- Largely increased recurring revenue base through sale of consumables, small-scale water treatment equipment and replacement components after recent acquisition of Pumptech Tasmania Pty Ltd
- Planned expansion of product offering by adding water treatment chemicals such as membrane cleaners, coagulants & flocculants and antiscalants to the De.mem product range – strong customer need and synergies to De.mem membrane products

DOMESTIC WATER FILTERS

- De.mem domestic point-of-use water filters as a new product line launched in 2018
- Available in Singapore through distribution partnership
- Planned launch in other countries from 2019-2020
- Consumer product which provides stable and recurring replacement revenues to De.mem for its hollow fibre membranes

Customers include global mining companies, large EPC contractors, municipalities, water utilities and multinational corporations

Mining	Municipal / Infrastructure	Food & Beverage	Other Industrial
<ul style="list-style-type: none"> Potable/sewage treatment for mining camps Waste water Approx. 50% of 2018 revenues 	<ul style="list-style-type: none"> Potable Municipal sewage Approx. 50% of 2018 revenues 	<ul style="list-style-type: none"> Key 2019 growth sector Waste water Process water Recycling 	<ul style="list-style-type: none"> Industrial waste water Process water Recycling
    	     	 	   

DEM intends to expand into new geographies and new market segments, supported by the further expansion of the IP and product portfolio

IMMEDIATE GROWTH PLAN (12 MONTHS)

- **Expansion into Food & Beverage segment**
 - F&B as a key sector in Australia
 - Existing leads
- **Australia-wide expansion**
 - Current focus on Queensland
 - Recent openings of Adelaide and Melbourne

MEDIUM TERM GROWTH PLAN (1-3 YEARS)

- **Expansion into other Industrial sectors**
 - Asia as a manufacturing hub with strong presence of industrial manufacturing, i.e. electronics, oil & gas sectors
- **International Expansion**
 - Based on existing presence in South East Asia
 - China, Europe as opportunities
 - Potentially through partnerships and with focus on technologies to minimize capital expenditures

- **Strengthening of recurring revenues**
 - BOO/BOT, O&M and services as an attractive offering to client base
 - Recurring sales of chemicals, consumables and domestic filters



ONGOING



- **Expansion of product portfolio**
 - “One-stop-shop” offer
 - Cross-selling to existing customer base



ONGOING



- **Further build up of IP**
 - See slide on Intellectual Property Portfolio (Slide 15)



ONGOING



REGIONAL AND INTERNATIONAL EXPANSION

Currently, ~90% revenues are from Australia with further opportunity to grow Australian revenues and offshore at the same time

CURRENT GEOGRAPHIES

Australia & Pacific

- Australia as a strong home market
- Profitable in CY 2018
- De.mem as a market leader in Queensland
- Australian-wide coverage through offices in Brisbane, Adelaide, Melbourne and Perth
- Expansion into F&B / agricultural

Singapore / SE Asia

- Huge need for decentralised water treatment in SE Asian countries due to lack of modern water treatment infrastructure
- Singapore as the water technology hub in South East Asia and worldwide. De.mem as leading supplier for industrial waste water treatment in Singapore
- De.mem has an existing presence in Vietnam
- Expansion into further SE Asian countries based on partnerships

TARGET GEOGRAPHIES

Germany / Europe

- Strong demand for decentralised / packaged solutions – in particular in industrial waste water treatment
- Market size for sales of water treatment systems and components in Germany alone estimated at 1.45 bn EUR in 2010*
- Growth opportunity through potential acquisition

New Zealand

- Strong agricultural and food & beverage segments with adjacency to Australia.



Strategic bolt-on acquisitions can expand customer base, customer geographies and product range; expand DEM into new customer industries and provide cross-sell synergies

The most recent strategic acquisition is Pumptech, in July 2019



CONSIDERATION

- Consideration of A\$1.05 m - A\$900k in cash with A\$450k immediately payable followed by three deferred cash payments over 36 months plus A\$150,000 in DEM shares (subject to 12-months escrow).

FOOD & BEVERAGE SEGMENT

- The acquisition further expands De.mem into the strategic food & beverage segment and further geographically diversifies its revenue base across Australia.

STRATEGIC RATIONALE

- Strong strategic rationale for the acquisition including geographic expansion, further penetration of target customer verticals, product portfolio expansion, cross-sell opportunities, economies of scale, cost synergies and earnings accretion.

MANAGEMENT

- The Pumptech founders will join the De.mem senior management team.

De.mem proprietary product portfolio includes breakthrough membrane innovations

COMPLETED (2018 and 2019)

- **Nanofiltration membrane**
 - Superior filtration performance due to minimum pore size at low pressure / energy consumption
 - Developed at and licensed from NTU
- **Ultrafiltration membrane**
 - Large applicable market, i.e. pre-filtration for Reverse Osmosis and potable water treatment
 - In-house developed and fully owned by De.mem
- **Forward Osmosis membrane**
 - De-watering of industrial waste water and liquid concentration in F&B (via Aromatec Pte Ltd)
 - Developed at and licensed from NTU
- **Microfiltration membrane**
 - Large applicable market, including process water applications in F&B; in-house development
- **Domestic “point of use” filter system**

PLANNED (2019 FF)

- **Membrane Bioreactor (MBR)**
 - Treatment of high organic load waste water
- **New membrane technologies**
 - Using new materials



Competitive advantage of collaboration with Nanyang Technological University (NTU), Singapore – one of the world's leading institutions for water technology research & development

- NTU ranked no. 2 in membrane research worldwide by Lux Research (2013)
- De.mem owns the exclusive rights to a range of membrane technologies developed by NTU, against a payment of a royalty % on revenues
- Plus in-house developed technologies
- Technology portfolio includes breakthrough innovations such as:
 - Low pressure hollow fibre Nanofiltration (NF) membrane and
 - Hollow fiber Forward Osmosis (FO) membrane



Inventors Prof. Wang Rong and Prof. Anthony Fane awarded with the Alternative Water Resources Prize by UN Secretary-General Ban Ki Moon

NEW PRODUCT LAUNCH: DOMESTIC “POINT OF USE” WATER FILTER SYSTEM

Recently entered domestic water solutions market through low-cost distribution partnership model

- De.mem launched a new product line targeting domestic “point of use” water filtration, as announced on 18 July 2018
- The product uses De.mem membranes as a key treatment process and is deployed prior to domestic consumption (i.e. under the kitchen sink)
- Using De.mem membranes, the filter system delivers high quality treated water – it is tested i.e. for “6-log” reduction of bacteria (a number of 1,000,000 microbes is reduced to 1 after filtration)
- Sold in Singapore through partnership with established distributor. Further partnerships planned.
- The market for domestic point of use filtration is estimated at 24.5 billion USD per annum worldwide, with the Asia-Pacific region accounting for the largest share*



Board has a strong industrial background



Cosimo Trimigliozzi
Chairman

- COO of Wild Flavors International
- Managing Director Givaudan Asia
- MBA, University of Basel, Switzerland



Bernd Dautel
Non-Executive Director

- Director New Asia Investments
- Managing Director Wieland Metals Asia Pacific
- Master of Chemical Engineering, Karlsruhe University of Technology, Germany



Stuart Carmichael
Non-Executive Director

- Partner & Director Ventnor Capital
- Executive Vice President UGL Limited (ASX:UGL) KPMG Corporate Finance
- Bcom, CA



Michael Edwards
Non-Executive Director

- Non-Executive Director Norwood Systems Limited (ASX:NOR) & Dawine Limited (ASX:DW8)
- BBus (Economics / Finance), BSc (Geology), Grad Dip (Oen)

Highly experienced and committed management team



Andreas Kroell
CEO and Director

- Director New Asia Investments
- Deutsche Bank Corporate Finance
- Deloitte Audit & Advisory
- MBA, University of Frankfurt, Germany



Matt Howland
Group Sales Manager

- 20 years water industry experience
- Previous roles with i.e. Ovivo, MAK Water
- Bachelor of Business, Flinders Uni



David Chua
Director, Membrane Manufacturing

- 10+ years experience in membrane production and R&D
- Previously with Mann+Hummel, Hyflux
- Bachelor / Master, Nanyang Technological University, Singapore



Allan Afonso
Senior Operations Manager

- 20 years experience water and hydraulic industry
- Formerly Construction Manager with JRK Group, supervising 70+ staff
- Diploma in Project Management



Ongoing revenue growth

- On track to exceed 2018 revenues, with year-to-date revenues in CY 2019 in line with FY2018
- Clear strategy and focus on growing recurring revenues - driven by BOO, O&M, increased consumables and products sales
- Visible path to sustainable operating cash positive, with negative cash flow \$212k in June quarter 2019



Contracts

Strong customer pipeline with ongoing new contract wins expected



Expansion into new geographies

Regional growth from strong client base in Queensland into South East and Western Australia, as well as internationally with a focus on the Asia Pacific region



Strategic Opportunities

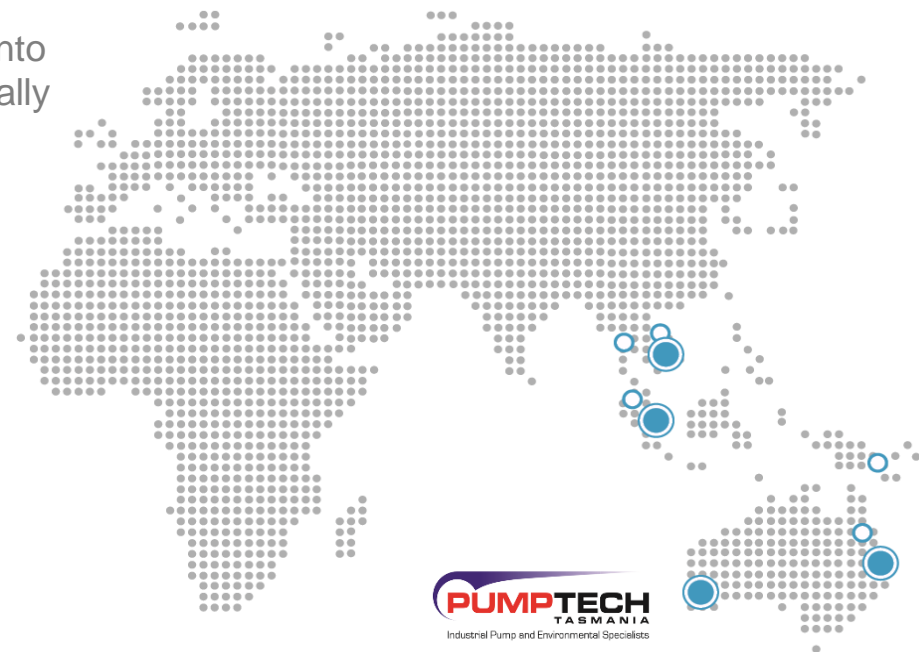
M&A, JVs, partnerships



Product enhancement

Access to new technology / expansion of intellectual property portfolio

demem  | demem 
akwa



PUMPTECH
TASMANIA
Industrial Pump and Environmental Specialists

22 APPENDIX A ANNOUNCED CUSTOMER CONTRACTS



2019 total initial value of new contract wins = >A\$4.37m

Company	Date Announced	Description	Initial Value (A\$m)
Acciona	10-Sep-19	Delivery of a containerized, membrane-based water treatment plant.	NA
1. Western Australian Government Organization 2. Pacific-Islands based Food & Beverage Corporation	28-Aug-19	1. Water treatment system for a vehicle wash facility 2. Delivery of containerized waste water treatment plant	\$0.35
Customers in Australia and Singapore	6 May 2019	Supply of a chlorination system for the generation of potable water Delivery of bioreactors (aeration reactor vessels)	\$0.44
Mulpha: A Malaysian Infrastructure Investor	10-Apr-19	Delivery of a desalination plant in Queensland.	\$2.80
Singapore-based distributor of water filtration products	26-Feb-19	First commercial Order for the first 50 "points of use" water filters.	NA
Rio Tinto, Global Leader in Mining	05-Feb-19	12 month order to undertake operations of water treatment plants at Amrun Mine, Queensland	\$0.78

2018 total initial value of new contract wins = A\$2.96m

Company	Date Announced	Description	Initial Value
Municipal and Resource Sector in Queensland	10-Dec-18	Delivery of a chlorination system and sale of membrane based water system	\$0.35
JRK Group	11-Sep-18	Delivery of a water treatment plant to be deployed turn-key at a site in NSW	\$0.57
St Hilliers Property Group	30-Apr-18	Delivery of a turn-key water treatment system, including associated equipment and pumping systems.	\$1.70
Singapore-based and Vietnamese customers	03-Apr-18	Two projects for deployment of proprietary membrane technology.	NA
<ul style="list-style-type: none"> - EL Questor Wilderness Park - Bechtel Australia - Aromatec Ltd 	06-Mar-18	<ul style="list-style-type: none"> - Delivery of a containerized water treatment plant to El Questro Wilderness Park, Queensland - Delivery of additional equipment and spare parts to Bechtel Australia, related to December 2017 order - Delivery of a membrane based water treatment system 	\$0.34

2017 total initial value of new contract wins = A\$2.6m

Company	Date Announced	Description	Initial Value (A\$M)
<ul style="list-style-type: none"> - JRK Group - Ausco Modular Ltd. 	22-Dec-17	<ul style="list-style-type: none"> - Delivery of an integrated portable water treatment system to JRK Group - Delivery of equipment, particularly storage tanks to Ausco Modular Pty Ltd. 	\$0.80
Bechtel Australia	04-Dec-17	Delivery of a containerized sludge dewatering system and membranes for a reverse osmosis water treatment plant	\$0.20
St Hilliers Property Group	23-Nov-17	Delivery of two water treatment systems and 12 month operations and maintenance service in Queensland	\$0.55
Maranoa Council, Qld	31-Oct-17	Delivery of re-chlorination systems	\$0.25
<ul style="list-style-type: none"> - Glencore Group - Metro Mining - M&K Pipelines - Luxury Resort in Queensland 	27-Sep-17	<ul style="list-style-type: none"> - Delivery of a containerized sludge dewatering system to a company which is part of Glencore Group - Delivery of a pump station to Metro Mining - Delivery of a chemical dosing system to M&K Pipelines - 3-Month operations and maintenance agreement with resort in Queensland 	\$0.30
Hung Thanh Environment Investment, Vietnam	08-Aug-17	Sales of water treatment plant	\$0.50
Novaland Group, Vietnam	12-Apr-17	Conduct a feasible study regarding treatment of water from a lake with Novaland's new residential development	NA

26 APPENDIX B

SAMPLE PROJECT REFERENCES





Industrial Waste Water

Food Industry Waste Water

Municipal / Potable Water

Nghe An Water Treatment Plant

Mining / Potable Water

Coppabella Water Treatment Plant

Mining / Potable Water & Sewage

Sewage and Water Treatment Plants

- **Location:** Singapore
- **Value:** Approx. 0.3 million A\$
- Using different types of membranes plus pre and post-treatment
- Recycling option

- **Location:** Nghe An Province, Vietnam
- **Value:** Approx. 0.5 million A\$
- Using ultrafiltration membrane technology

- **Location:** Coppabella mine, Queensland, Australia
- **Value:** Approx. 2 million A\$
- Using chemical dosing and membrane bioreactor technology

- **Location:** Wafi Golpu Mine, Papua New Guinea
- **Value:** Approx. 2 million A\$
- Using membrane technology

SELECTED PROJECT REFERENCES (CONT.)



Municipal / Sewage Treatment
Municipal Sewage
Treatment Plant

- **Location:** Queensland
- **Value:** Approx. 1 million A\$
- Submerged Membrane Bioreactor, containerized
- Delivery to and deployment on an island off the coast



Municipal / Potable Water
Reservoir
Re-Chlorination

- **Location:** Queensland, Australia
- **Value:** Approx. 0.2 million A\$
- Containerized chlorination system plus pH correction



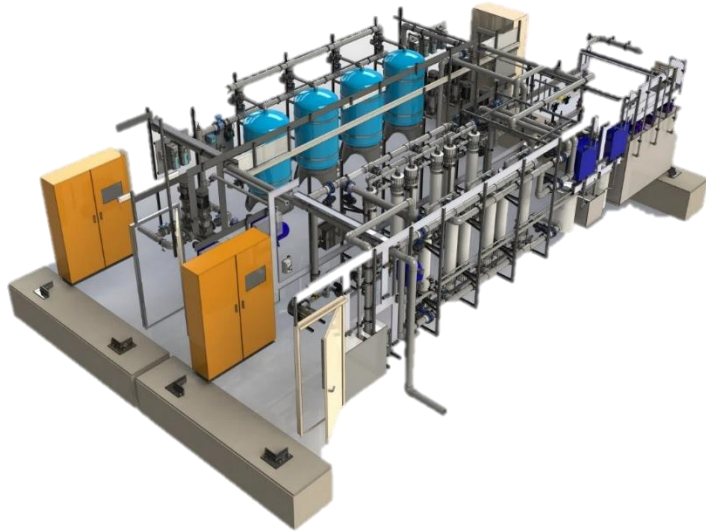
Industrial Waste Water
Oil & Gas Industry
Waste Water

- **Location:** Singapore
- **Value:** Approx. 0.1 million A\$
- Deployed several Ultrafiltration systems at different facilities of a multinational corporation from the oil & gas industry in Singapore



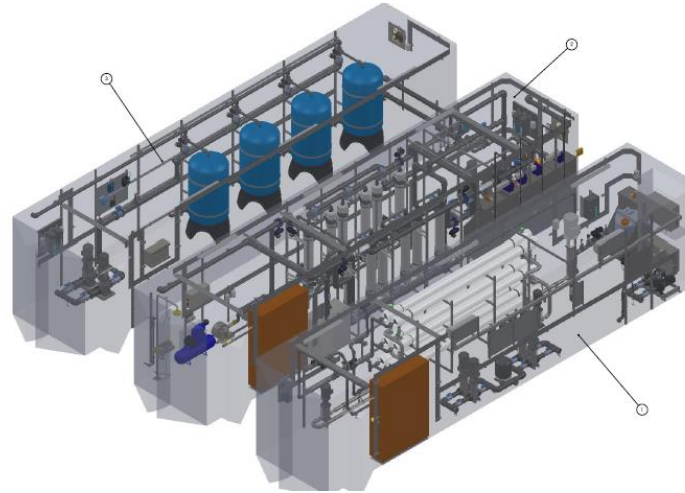
Infrastructure / Waste Water
Vehicle Wash Bay
Waste Water

- **Location:** Cultana, South Australia
- **Value:** 1.7 million A\$
- Using Dissolved Air Filtration and other water treatment processes



Hidden Valley Mine

- Supply of 350 m³ per day potable water to 1,400 person mining camp
- Raw water source is river water
- Process includes carbon media plus UF membrane
- Disinfection using on-site sodium hypochlorite generation
- Remote monitoring capability
- Easily managed and operated by local staff with remote assistance and operator training



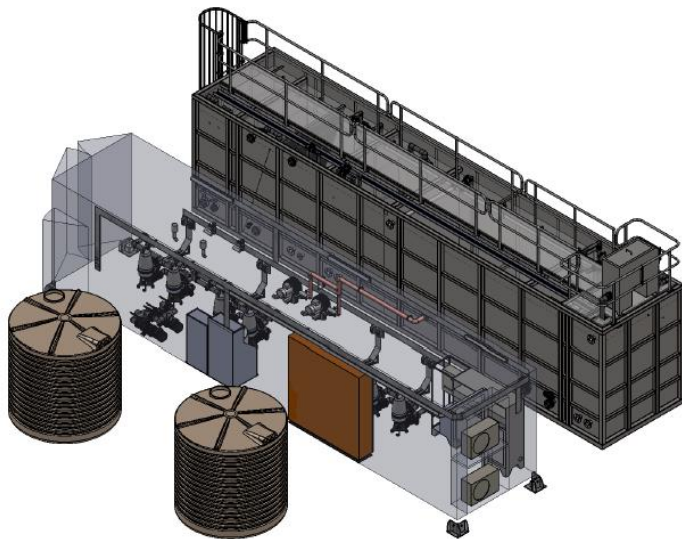
Calliope Village

- Supply of 250 m³ per day potable water to 1,100 person accommodation village
- Raw water source is brackish bore water
- Includes carbon media, UF and and RO membranes
- Remote monitoring capability
- Easily managed and operated by local staff with remote assistance and operator training



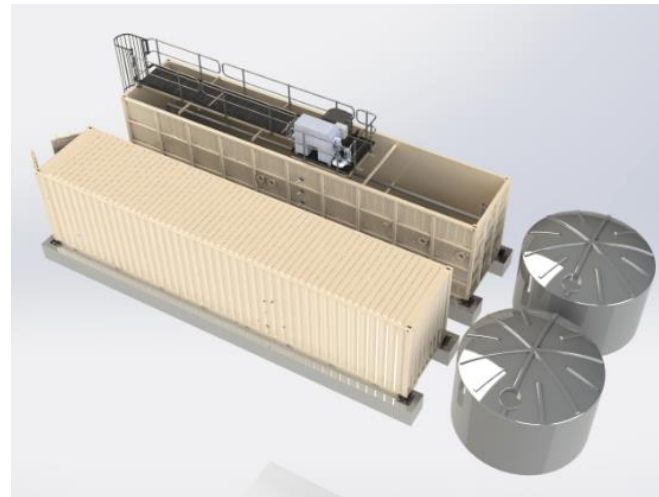
Coominya Municipality

- Supply of 500 m³ per day potable water to the 1,500 people municipality
- Blended surface and dam water supply
- Coagulation and media filtration process design
- Project completed in 8 weeks



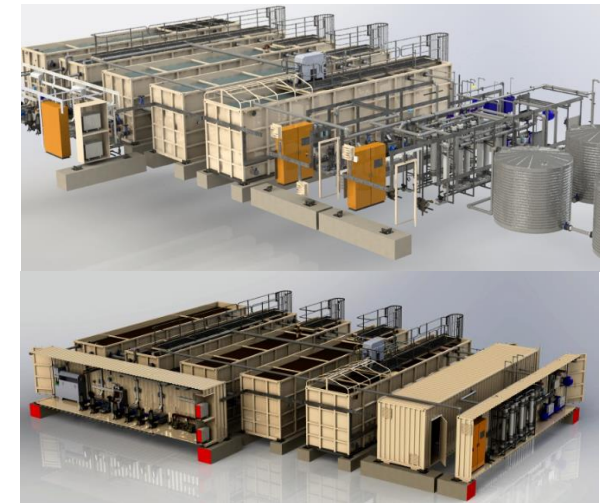
Wafi Mine Construction Camp

- Sewage Treatment Plant for the Wafi Mine accommodation village with 250 people and treatment capacity of 62.5 m³ per day
- Based on Biological Nutrient Reactor (BNR) process
- 20 year design life
- Effluent treated to Class C
- Project completed in 13 weeks



BP Bulwer Island - Australia

- Sewage Treatment Plant for the Jet Terminal project admin camp
- 20 m³ per day treatment capacity (100 person)
- Based on Sludge Bioreactor (SBR) process
- 25 Year design life
- Effluent treated to Class B
- Project completed in 14 weeks



Wafi Golpu Mine JV

- Sewage Treatment Plant for the Wafi Golpu Mine accommodation village
- Treatment capacity of 250 m³ per day, serving 1000 person facilities
- 25 Year design life
- Based on Biological Nutrient Reactor (BNR) process with external UF membrane filtration
- Effluent treated to Class A
- Project completed in 24 weeks



F&B Industry Waste Water

- Waste water treatment plant for F&B industry factory in Singapore
- Treats factory waste water to regulatory discharge standards
- Integration different process steps including Ultrafiltration, Nanofiltration and carbon filter
- Recycling option for customer



Vehicle Wash Bay Waste Water

- Vehicle washing bay waste water treatment plant for military facility in South Australia
- Process deploying media filter, Dissolved Air Filtration (DAF) and chlorination



Oil & Gas Industry Waste Water

- Waste water treatment for Oil & Gas industry facility in Singapore
- Includes a series of Ultrafiltration systems deployed in different locations of the customer's facility
- Treatment of waste water for recycling/re-use in the production facility

32 APPENDIX C

PRODUCT AND TECHNOLOGY OVERVIEW



De.mem offers a range of proprietary hollow fibre (HF) membrane technologies

- The membranes/membrane modules serve as the key component (the actual filter) in De.mem's water treatment systems
- Membranes are a microporous structure. They act as a physical barrier to contaminants. The size of the pores determines which particles are "rejected"
- De.mem manufactures a range of membranes with different pore size

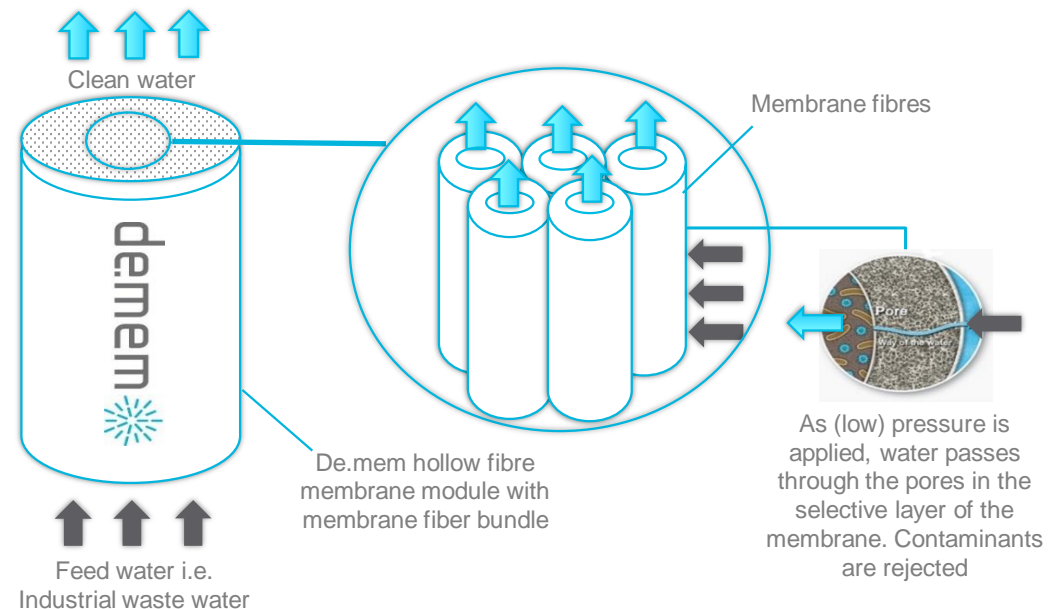
HF Membrane Bundles

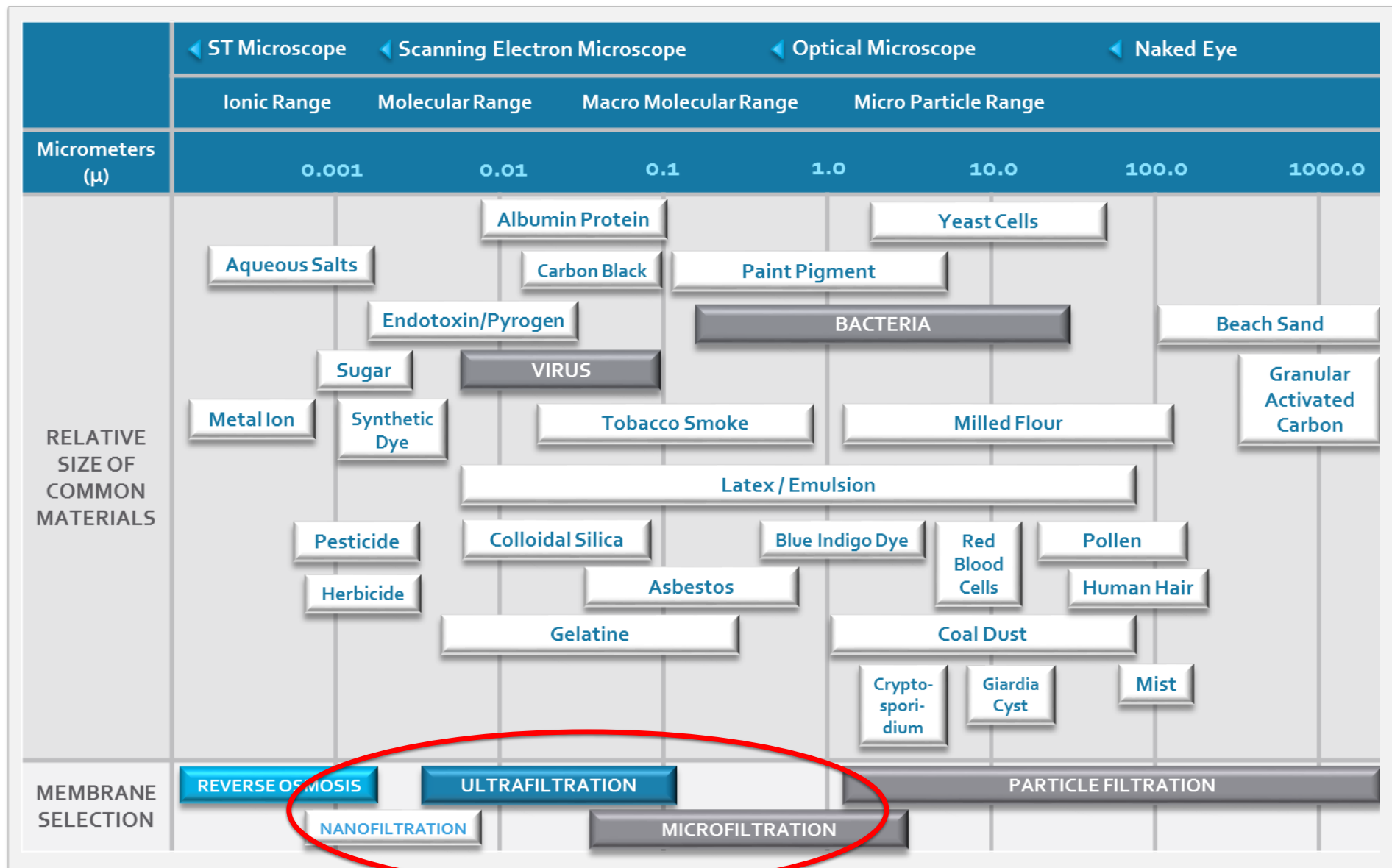


Membrane Modules



Working Principle of HF Membrane Filtration





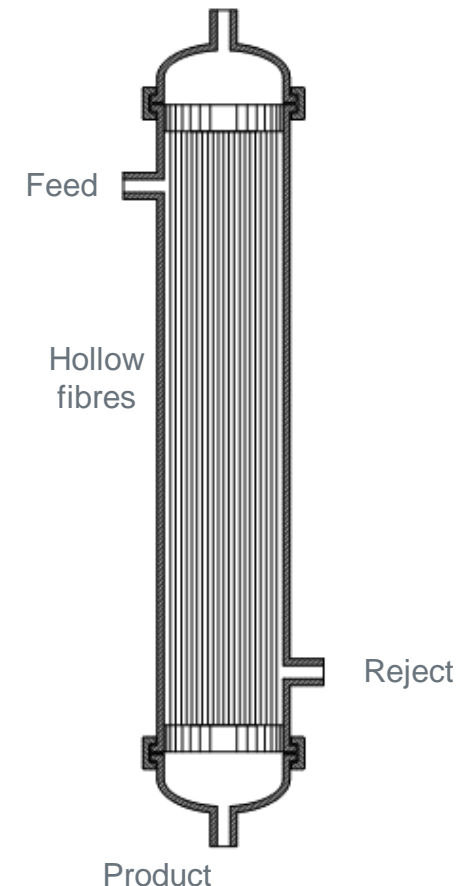
De.mem is fully capable of producing a range of hollow fibre membrane technologies at its manufacturing facility in Singapore

- With the proceeds from the IPO in April 2017, De.mem started its own membrane manufacturing facility in Singapore
- At the De.mem factory, different types of hollow fibre membranes and modules can be produced
- The factory has been fully operational since mid-2017 and manufactures industry standard membrane modules (4-inch and 8-inch diameter)
- The factory covers the required volumes for 2019-20. The further scale-up of the production is technically simple and investment requirements are low





- De.mem offers a newly developed hollow fibre **Microfiltration** membrane for cross-flow filtration
- The membrane comes with a pore size of approx. 500k
- De.mem can potentially vary membrane pore size depending on winemakers' requirements and feedback
- Well suited for beverage filtration
- Membrane can clear out for example suspended solids, colloidal particles, enzymes or yeast to give the beverage a clearer appearance, improve the microbiological profile, extend the shelf life etc
- De.mem delivers a turn-key system plus related servicing and support



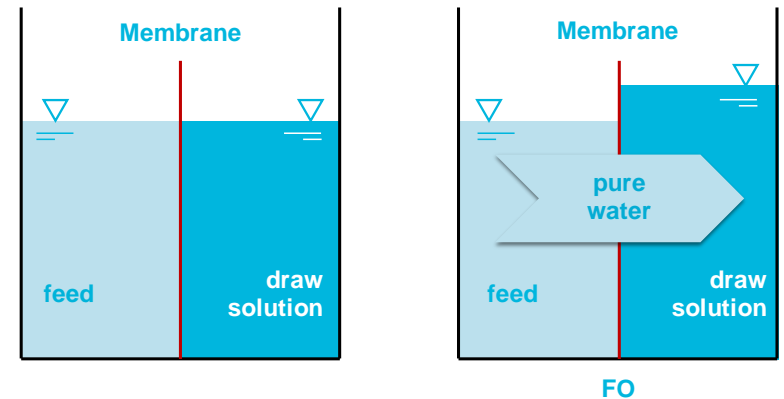
- De.mem's **Ultrafiltration** membrane technology is an established separation process using a pore size around 100 nm (approx. 100k Da MWCO)
- The membrane can be deployed in a wide range of applications – from waste water treatment to process/production related applications
- De.mem's **hollow fibre Nanofiltration** membrane is a technology unique in the industry
- The membrane comes with a pore size in between 1 and 10 nm (approx. 500 Da MWCO)
- While flat sheet (high pressure) Nanofiltration is available, hollow fibre (low pressure) Nanofiltration is a new technology. De.mem's membrane runs under 1-2 bar operating pressure only, enabling significant savings on energy consumption
- It can filter out small molecules such as dyes, pesticides, herbicides, and small organics, with applications in potable and waste water treatment, or may be deployed for concentration processes



DE.MEM's FORWARD OSMOSIS-DEWATERING MEMBRANE

- **Forward Osmosis (FO)** is a membrane separation technology based on osmotic pressure differences; without any external mechanical pressure being applied
- Salt concentration in a “draw solution” pulls water molecules through the membrane out of a feed liquid, and effectively concentrates the feed
- The **De.mem technology is based on a hollow fibre membrane**. It was originally developed by NTU and won prestigious industry awards
- It enables “gentle” concentration of liquids, preserving Volatile Organic Compounds (=taste), nutrients such as proteins, enzymes, vitamins
- The De.mem FO has been deployed on coffee and tea concentration so far with superior results compared to existing state-of-the-art (=evaporation)
- Potentially applicable to fruit juice, dairy products, beer, wine, etc.
- Further applications in industrial waste water treatment

Working Principle of Forward Osmosis Membrane



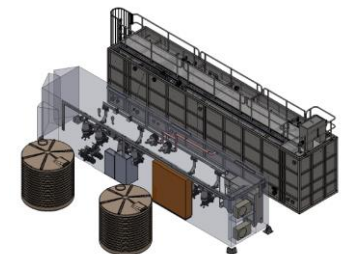
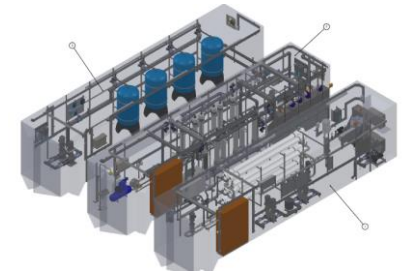
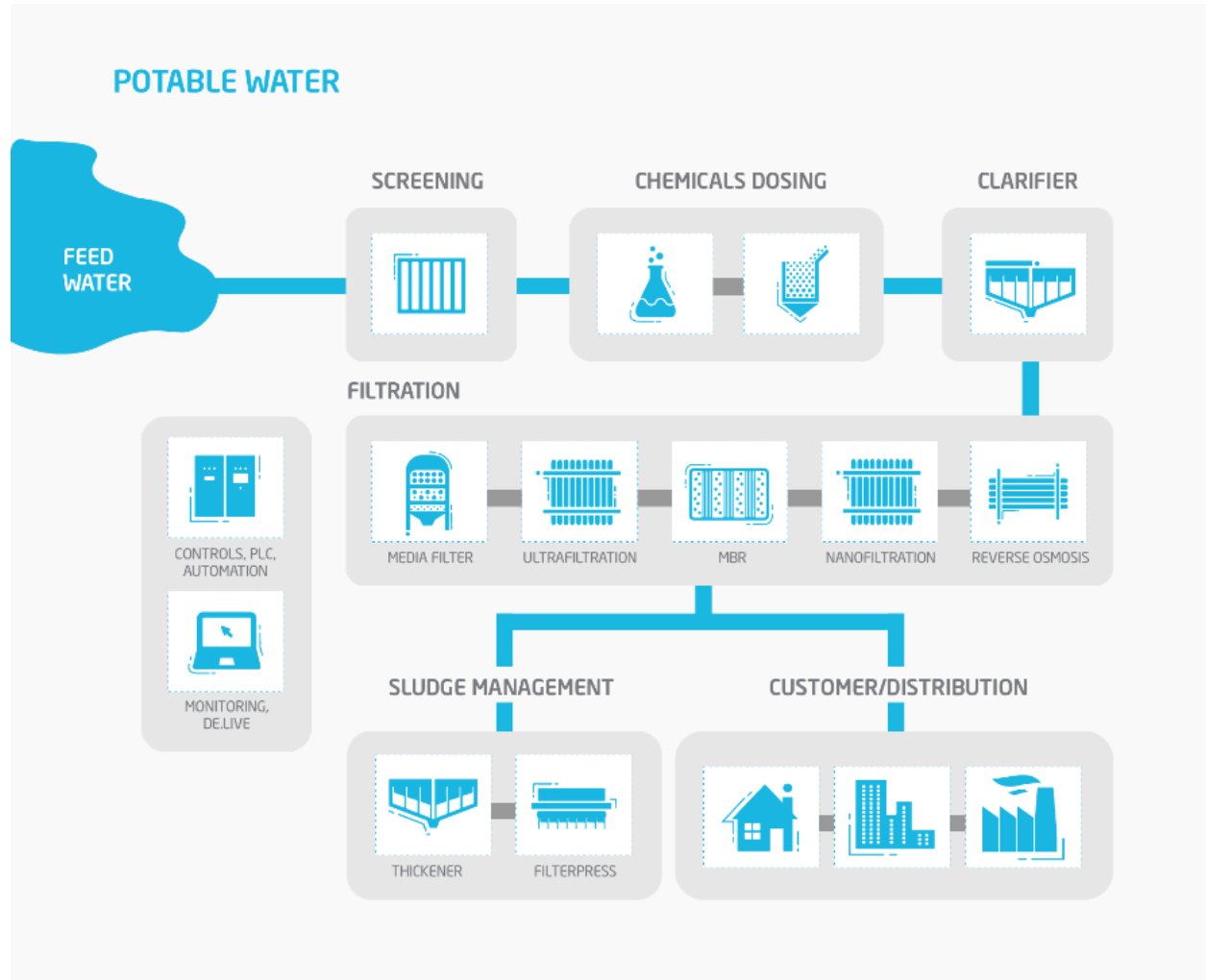
Promoting FO membrane into lucrative food & beverage segment through Aromatec

- As announced on 8 May 2018, De.mem took strategic stake (32%) in Aromatec Pte Ltd, a Singaporean company targeting the food & beverage industry as a joint venture between NTU, its scientists and De.mem
- Aromatec promotes the NTU-hollow fibre FO membrane into the food & beverage sector, i.e. deployed for the production of beverages
- Significant market opportunity – the use of membrane technologies in the food and beverage industry is estimated to be a market worth ~US\$5.8 billion per year by 2020*
- Technology deployed in commercial stage projects with leading corporations from F&B industry – strong pipeline of opportunities building
- The recent opening of the Adelaide office and acquisition of Pumptech Tasmania Pty Ltd, with a well-established, long-term customer base among the food & beverage and agricultural sectors, provide a strong platform for the immediate roll out of this technology into the South East Australian market

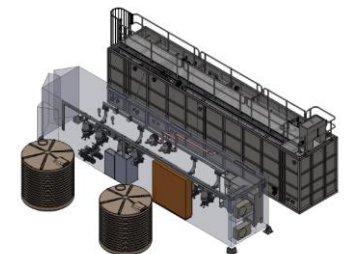
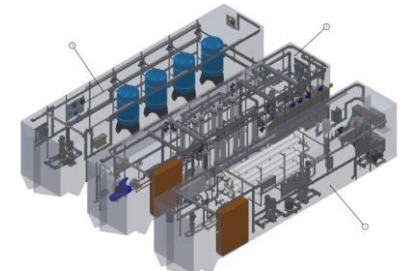
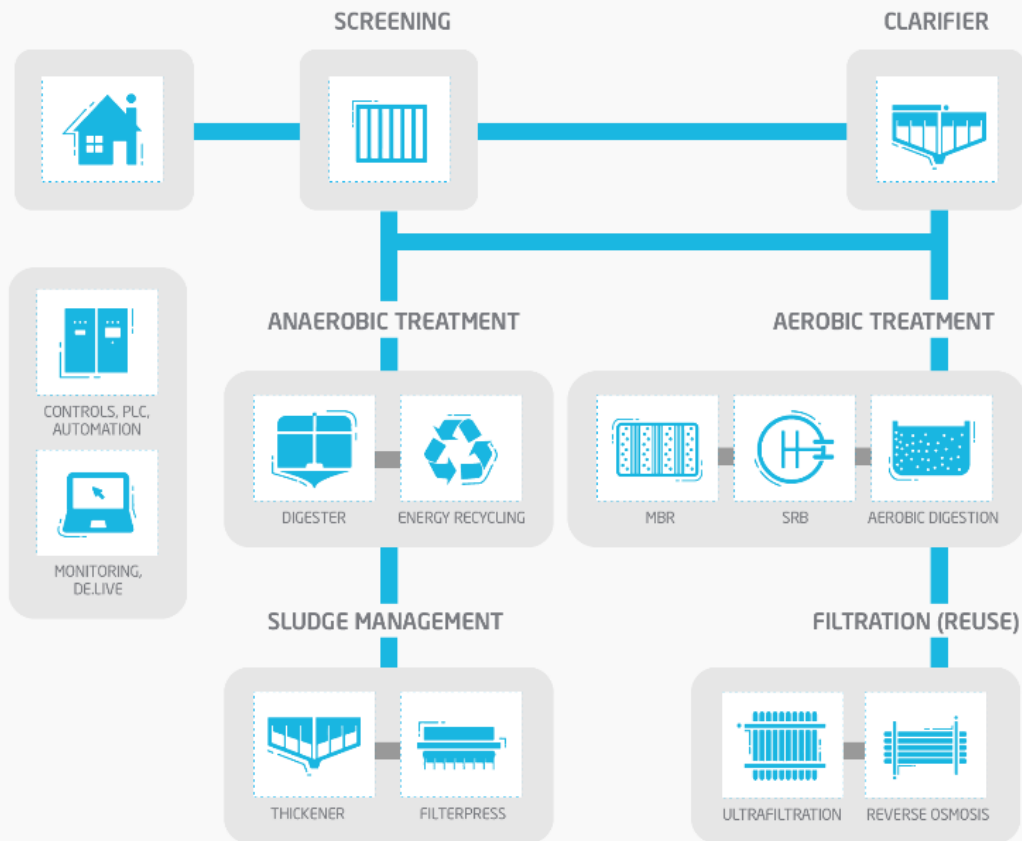


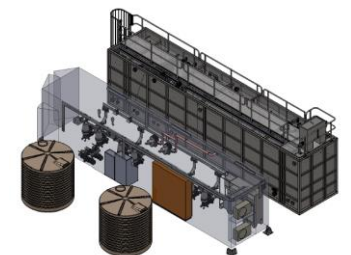
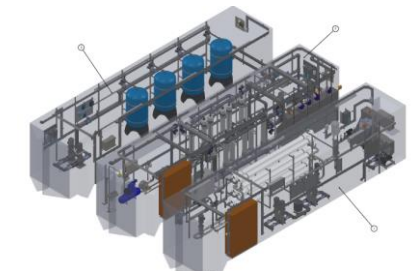
40 APPENDIX D
PROCESS &
SYSTEM DESIGN





SEWAGE TREATMENT





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All figures included in this presentation are in AUD\$ unless otherwise stated. Assumed exchange rate of AUD\$1:USD\$0.75



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