



Global potential in many sectors

Expect first sales in about 6 months

Recommendation

Speculative, Strong BUY

Price

55c

Valuation

\$5.10

Industry

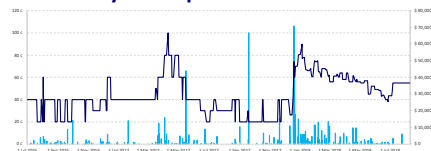
New technology for water treatment, air purification, surface sterilisation and other applications

- **PO3 has the globally exclusive licence to commercialise Somnio's Free Radical Generator (FRG) technology.**
- **There are 3 areas in which the FRG technology is pending deployment :**
 - (i) **Air purification : Destroying bacteria, mould and fine particles (eg. tobacco smoke) in the air;**
 - (ii) **Water sanitation : destroying biological and organic contaminants; and**
 - (iii) **Surface sterilisation : combatting the rise of antibiotic resistant superbugs within the medical sector with easier application and reduced hospital bed down-time.**
- **PO3 expect first sales in 2019 H1, with the potential for steep growth for a long period.**
- **The technology is proven; the risk is in its roll-out.**

Snapshot

Market Cap	\$15.0m
Cash held	\$0.3m
	Able to draw on a further \$1.3n
Shares on Issue	27.29m
52 Week High	90c
52 Week Low	20c
1 month / 6 month VWAP	54.8c / 58.8c

PO3 : daily share price v. value traded



The predecessor to PO3, Water Resources Group (WRG) listed on the ASX in December 2010 to exploit a further development in water de-salination.

After spending \$16.5m, the management and Board was changed in 2013, and a review showed that while a demonstration plant worked, the technology was not able to be scaled up to a commercial size.

The FRG technology is different to the original WRG technology. It has been tested and developed and is now ready to be exploited commercially.

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Free Radical Generator (FRG) technology

The FRG is a graphite tube in which an electrical current is pulsed. If the tube is in air, ozone, a radical of oxygen is generated; in the presence of moisture / water, hydroxyl is generated. Together, these can destroy organic matter (bacteria, mould, viruses) and neutralise many forms of inorganic matter.

Air Purification

The air purifier is a stand-alone unit or it can be incorporated into existing ductwork. Air passes through and is cleaned of all microbial and particulate contaminants. This is a high growth market, particularly in Asia where smog is a serious issue.

PO3 is negotiating with Original Equipment Manufacturers to include FRG units into their product.

Water Sanitation

Using ozone to treat water in swimming pools gives a much cleaner and superior swimming experience than any other method, especially chlorine. PO3 is able to supply FRG units to the installers of pools, spas and hot tubs.

Surface Sterilisation

The most powerful application is for medical facilities. While the technology is proven, there is further development required for its effective deployment. The value potential is very large.

Beer & Co has a Speculative, Strong BUY recommendation on PO3

Beer & Co.'s valuation is many times the current share price as PO3 has spent many years developing this technology, without being able to produce newsflow showing strong commercial outcomes.

The technology is now developed and the risk is in its roll-out over time.

PO3 expects to announce agreements with Air Purifier OEMs late this year, with first sales being for water sanitation in about 6 months.

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Executive Summary

Purifloh

PO3 has global exclusive rights to commercialise the Free Radical Generator (FRG)

PO3 has the global, exclusive right to commercialise applications of the Free Radical Generator (“FRG”) technology relating to Air Purification, Water Sanitation and Surface Sterilisation.

The FRG has been developed by Somnio Global, which is headed by Professor Pravansu Mohanty who is a Professor in mechanical engineering and materials science at University of Michigan, and currently has 17 patents accredited to him.

Somnio Global has one patent pending covering the technology but will be wrapping other patents around certain aspects of the technology. However it will be about 2 years before the patent is granted, and even then there will be parts of the technology that will remain a “black art”, and not be disclosed.

The FRG technology generates high voltage pulses of electricity, creating a plasma that generates radicals, including ozone and hydroxyl.

The IP will be further protected by manufacturing in Detroit, with final assembly of sourced components being done by PO3.

Free Radical Generator (“FRG”)

The FRG uses conventional power supply, to generate high voltage pulses of electricity using a proprietary power board, creating a plasma which generates a range of radicals, including Ozone (O₃) and the Hydroxyl (OH⁻) radical. Ozone destroys bacteria, viruses and biological matter, while the hydroxyl radical is able to destroy not just biological matter, but also pharmaceuticals and other substances.

These radicals destroy biological matter including bacteria, viruses as well as pharmaceuticals.

The process charges inorganic material, causing it to agglomerate, enabling it to be filtered out efficiently.

In its ASX announcements of 13 February, 17 April and 26 June 2018, WRG / PO3 announced outstanding results from testing the air purifier, with kill rates of bacteria and viruses over 99.999% within 21 minutes.

Applications

Inorganic matter agglomerates so that it can be easily filtered.

PO3 has identified many areas of application, but is targetting air purification and water sanitation as the first 2 areas due to relative ease of entry, with the potential for surface sterilisation as a third, very valuable, application.

Air Purification

The first target application is fir air purification, removing dust, pollen, mould and other triggers of asthma

Air purifiers are used in households where one or more people suffer from allergens, such as dust, pollen, pet dander, mould spores, and dust mite faeces, as well as second-hand tobacco smoke particles and volatile organic compounds, all of which can trigger asthma. The need is significant in areas with poor air quality, such as much of Asia.

Statistics MRC estimated the size of the Air Purifier market was 8.9m units in 2017, growing to 21m units by 2021. ResearchAndMarkets.com estimated that the Asia-Pacific market was of \$3.95 billion in 2016, growing to US\$ 34.5 billion by 2026.

Air conditioning covers at least one, but not necessarily all, of :

- Heating. Ventilation and cooling; and
- Humidity modification (ie. either drier or more humid).

The major penetration is expected to be in areas of poor air quality, like east Asia.

As well as being part of stand alone unit, the FRG can be fitted into air conditioning duct-work to add sterilisation. Figure 1 shows the size of the global air conditioning market, which the IEA projected would grow from 1.7 billion units installed, to 8 billion by 2050.

The potential market is very large, and growing

Figure 1 : Global air-conditioning market

	Annual Sales		Installed Units	
	Domestic	Commercial	Domestic	Commercial
U S A	16m	8m	241m	132m
Europe	9m	3m	43m	53m
Japan / Korea	11m	4m	146m	62m
Middle East / Other	14m	11m	217m	131m
China	41m	12m	432m	138m
India	3m	2m	14m	13m
TOTAL	94m	40m	1,093m	529m

Source : IEA 2018 : "The Future of Cooling"

Water Sanitation

The second target area is water sanitation, initially directed at spas and swimming pools, though it can be extended to other areas such as treating waste water

While PO3's predecessor was focussed on water de-salination, PO3's focus has been on swimming pools. Other areas in which the FRG technology has potential applications include :

- Treating waste water from industrial, mining and oil & gas operations;
- Treating brackish water, waste water, ballast water;
- Producing drinking Water;
- Desalination pre-treatment; and
- Aquaculture and, related to this, microbial and oxygen control in lakes and aquariums.

There are many methods of sanitising water, including :

- Chlorine;
- Salt;
- Ultra-Violet light;
- Filtration; and
- Ozone.

The FRG system gives a much cleaner and superior swimming experience than any other method, especially chlorine

The FRG system generates ozone but has been developed to:

- Generate a higher volume of ozone reliably on a smaller footprint, to enable complete water treatment, which is not achieved by other ozone systems;
- At a cost that is comparable with, or lower than, other technologies; and
- Facilitates total consumption so that none is released.

Figure 2 shows data on the potential size of the recreational water market.

Figure 2 : Global recreational water market

	presently installed			annual installations	
	USA	Australia	Europe	USA	Australia
In-Ground	5,060k	1,020k	2,500k	70k	20k
Above Ground	3,530k			150k	
Hot tubs	5,820k			170k	
Commercial	309k	1,885	350k	3k	

Source : IEA 2018 : "The Future of Cooling"

Surface Sterilisation

The third target area is surface sterilisation for medical centres.

This application is directed at medical facilities, to counter the increasing prevalence of Hospital Acquired Infections and superbugs resistant to chemical treatment and antibiotics. The standard technology is to manually scrub a room with chlorine and hydrogen peroxide, which is :

Which is a high value area

- Expensive to execute;
- Expensive as the room is not able to be used for more than 24 hours;
- Not 100% effective; and
- Uses harsh chemicals which are not preferred within a hospital.

While the technology is very effective, PO3 still has further work on the application of this technology.

The leading technology is robots, costing US\$ 80,000 to US\$ 125,000, that bathe the room in Ultra Violet light, but their effectiveness is limited by :

- Shadows, such that the UV light does not bathe every surface; and
- UV light does not kill bacteria and viruses, but prevents their reproduction.

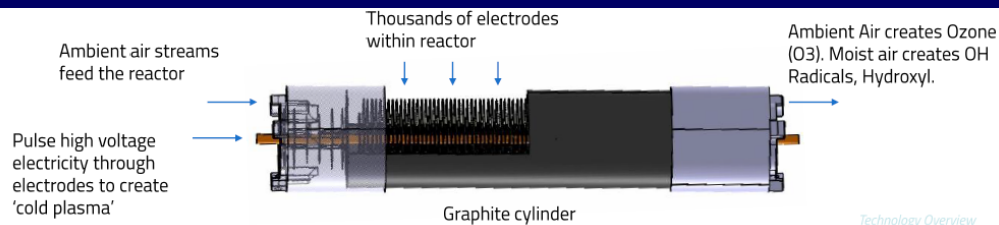
PO3 has developed “Bluemist”, which is a fine ozone – hydroxyl mist that is capable of achieving over 99.999% kill of spores, mould, bacteria and viruses.

PO3 is working with Monash University to develop an effective test of this technology.

Commercialisation

Figure 3 shows the FRG unit, developed by Somnio Global. PO3 will be responsible for the manufacture in Detroit which has significant precision manufacturing capacity, which will assist in protecting the IP.

Figure 3 : Free Radical Generator



Source : PO3 Presentation

PO3 will manufacture the FRG unit and supply it to Original Equipment Manufacturers.

PO3 will supply the FRG unit to manufacturers of air purifying units, who are also manufacturers of air-conditioning systems, and for water sanitation.

PO3 will manufacture the units for surface sterilisation, as the number of units is moderate.

PO3 currently plans to do all aspects of sales of the surface sterilisation potential; given it is a smaller market of higher value, higher margin units, different of units. Also, entry will be delayed giving PO3 options in terms of capital as well as experience.

Projected Cashflows – Air Purification segment

Figure 4 summarises the key assumptions, in terms of date of first sale and also the rate of growth of sales, on a quarter on quarter basis, made by Beer & Co.

Figure 4 : Beer & Co.’s projected sales for PO3’s air purifier

		Domestic				Commercial			
		First sale	growth	2033 sales	market share	First sale	growth	2033 sales	market share
USA	New	Sept. 2019	0.02 %	180,800	1.1 %	March 2020	0.02 %	87,200	1.1 %
	Installed	March 2021	0.02 %	162,273	0.7 %	Sept. 2021	0.02 %	106,700	0.8 %
Japan / Korea	New	Sept. 2020	0.05 %	288,750	2.6 %	Dec. 2020	0.05 %	103,000	2.6 %
	Installed	June 2021	0.05 %	240,900	1.7 %	Sept. 2021	0.05 %	127,875	2.1 %
Europe	New	March 2021	0.02 %	90,900	1.0 %	June 2021	0.02 %	29,700	1.0 %
	Installed	June 2022	0.02 %	26,087	0.6 %	Sept. 2021	0.02 %	40,192	0.8 %
Middle East / Other	New	March 2028	0.02 %	46,200	0.3 %	June 2028	0.02 %	34,650	0.3 %
	Installed	June 2028	0.02 %	45,570	0.2 %	Sept. 2028	0.02 %	34,388	0.3 %

Source : Beer & Co estimates

Beer & Co projects that PO3 captures only a very modest share of the total air market, around 1%.

Figure 4 shows that, in 15 years from now, Beer & Co projects total sales of 1.65m FRG units into a total market for air-conditioning and air purifiers that is projected to total over 3,100m air-conditioning units (noting that the FRG will be fitted only to high end air-conditioning systems) and 50m air purifying units.

Figure 4 also shows that Beer & Co has projected no sales into China or India.

Retrofitting / refurbishment will be a major potential market

In Figure 4 the market share for sales into retrofitted or already installed segment assumes an average life of 10 years for a unit, and hence a replacement cycle, so the market share is the number sold compared with the estimated number of units replaced in that year.

Figure 4 also shows that Beer & Co expects the Asian region to be the largest market due to existing air quality issues.

Figure 5 shows the unit revenues and costs, including overhead costs. Note that the overheads are low for sales to Original Equipment Manufacturers for incorporation into production units, but much higher for sales into retrofitting applications.

In addition to the costs shown in Figure 5, there is a royalty of 3% of the sales value to be paid to Somnio Global.

Figure 5a : Costs for OEM supply

	Sales Revenue	COGS	Sales, General & Admin Costs		
			fixed	Sales admin	
Domestic	US\$ 450	US\$ 400	US\$ 0.1m	US\$ 80k	100k
Commercial	US\$ 2,500	US\$ 2,200	US\$ 0.1m	US\$ 80k	100k

Source : Beer & Co estimates

Figure 5b : Costs for sales into existing installations

	Sales Revenue	COGS	Sales, General & Admin Costs			
			fixed	Sales admin	Sales reps	
Domestic	US\$ 675	US\$ 400	US\$ 0.2m	US\$ 80k	20k	US\$ 125k 2.5k
Commercial	US\$ 3,125	US\$ 2,200	US\$ 0.2m	US\$ 80k	20k	US\$ 125k 1.0k

Source : Beer & Co estimates

Commercial units are assumed to be a number of FRG devices, driving higher values.

Figure 6 summarises the detail of Beer & Co.'s projections for sales of FRG units and the resulting financial outcomes, in AUD terms.

Figure 6 : Beer & Co.'s projected sales, revenue and EBITDA for FRG into air purifiers

AUD m	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34
USA																
Unit Sales	0	9,200	30,410	67,160	108,013	148,867	189,720	230,573	271,427	312,280	353,133	393,987	434,840	475,693	516,547	549,740
Revenue	0	9	39	101	179	256	333	410	488	565	642	719	797	874	951	1,014
EBITDA	(0)	(1)	1	12	28	44	59	75	91	107	123	139	155	171	187	201
Japan / Korea																
Unit Sales	0	0	18,613	72,825	132,625	192,425	252,225	312,025	371,825	431,625	491,425	551,225	611,025	670,825	730,625	779,213
Revenue	0	0	22	111	212	312	412	513	613	714	814	915	1,015	1,116	1,216	1,298
EBITDA	0	(0)	3	21	43	65	87	108	130	152	173	195	216	238	260	277
Europe																
Unit Sales	0	0	1,500	10,564	24,898	40,325	55,752	71,178	86,605	102,032	117,458	132,885	148,312	163,738	179,165	191,699
Revenue	0	0	1	14	42	73	104	136	167	198	229	261	292	323	355	380
EBITDA	0	0	(2)	(2)	1	7	13	18	24	30	36	42	47	53	59	64
Middle East / Other																
Unit Sales	0	0	0	0	0	0	0	0	0	3,919	38,068	78,375	118,682	158,988	199,295	232,044
Revenue	0	0	0	0	0	0	0	0	0	6	74	157	240	323	406	473
EBITDA	0	0	0	0	0	0	0	0	(3)	18	48	78	108	139	163	
TOTAL																
Unit Sales	0	9,200	50,523	150,549	265,537	381,617	497,697	613,777	729,857	849,856	1,000,085	1,156,472	1,312,858	1,469,245	1,625,632	1,752,696
Revenue	0	9	62	226	432	641	850	1,059	1,268	1,483	1,760	2,052	2,344	2,635	2,927	3,164
EBITDA	(0)	(2)	2	31	72	115	159	202	245	286	350	424	497	571	644	705

Source : Beer & Co estimates

Projected Cashflows – Water Sanitation segment

Initially, water sanitation will focus on treatment of recreational water, though it has the potential to be extended into many other areas.

Figure 7 summarises the key assumptions, in terms of data of first sale and also the rate of growth of sales, on a quarter on quarter basis, made by Beer & Co in this analysis, showing the number of unit sales made in 2033.

Figure 7 : Beer & Co.'s projected sales for PO3's water sanitation

			New Installations				Existing Installations			
			first sales	growth	2033 sales	market share	first sales	growth	2033 sales	market share
USA	In-Ground	March 2019	0.30 %	12,285	17.6 %	June 2019	0.30 %	58,190	11.5 %	
	Above Ground	June 2019	0.30 %	25,875	17.3 %	Sept. 2019	0.30 %	39,889	11.3 %	
	Hot tubs	Sept. 2020	0.30 %	26,775	15.8 %	Sept. 2020	0.30 %	114,581	19.7 %	
	Commercial	Sept. 2019	0.30 %	509	17.0 %	Dec. 2019	0.30 %	5,145	16.7 %	
Australia	Domestic	Dec. 2018	0.50 %	5,950	29.8 %	June 2019	0.50 %	19,550	19.2 %	
	Commercial					June 2019	0.50 %	54	28.8 %	
Europe	Domestic					March 2020	0.30 %	27,250	10.9 %	
	Commercial					Sept. 2020	0.30 %	5,513	15.8 %	

Source : Beer & Co estimates

Recreational water market is a more modest size.

Beer & Co projects that PO3 is able to capture a market share of 15% - 20%, despite the FRG technology giving a better result at a comparable cost.

Figure 7 shows that Beer & Co projects that PO3's first revenue will come from this segment.

Figure 5 showed the costs for general sales administration, while Figure 8 shows the revenue and costs for each unit of sales. This compares with a cost of about \$1,500 to \$2,000 for a standard domestic pool using current technology.

Figure 8 : Revenue and Costs

	Domestic	Hot Tubs	Commercial
Revenue	US\$ 1,250	US\$ 1,000	US\$ 15,000
COGS	US\$ 750	US\$ 600	US\$ 8,000

Source : Beer & Co estimates

Figure 9 summarises the detail of Beer & Co.'s projections for sales of FRG units and the resulting financial outcomes, in AUD terms.

Figure 9 : Beer & Co.'s projected sales, revenue and EBITDA for FRG into water sanitation

AUD m	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34
USA																
Newly Installed																
Unit sales	270	2,543	6,494	11,210	15,926	20,642	25,358	30,074	34,790	39,506	44,222	48,938	53,654	58,370	63,086	66,917
Revenue	0	5	11	19	27	35	43	51	59	66	74	82	90	98	106	112
EBITDA	(0)	1	2	3	4	5	6	8	9	10	11	12	14	15	16	17
Existing Installations																
Unit sales	253	5,446	18,145	34,118	50,091	66,064	82,036	98,009	113,982	129,955	145,928	161,900	177,873	193,846	209,819	222,797
Revenue	0	12	38	68	99	129	160	190	221	251	282	312	343	373	404	429
EBITDA	(0)	2	6	11	17	22	27	32	38	43	48	53	59	64	69	74
Australia																
Newly Installed																
Unit sales	150	550	950	1,350	1,750	2,150	2,550	2,950	3,350	3,750	4,150	4,550	4,950	5,350	5,750	6,075
Revenue	0	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9
EBITDA	(0)	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2
Existing Installations																
Unit sales	85	1,193	2,557	3,921	5,285	6,648	8,012	9,376	10,740	12,103	13,467	14,831	16,195	17,559	18,922	20,030
Revenue	0	2	4	6	8	10	13	15	17	19	21	23	25	27	30	31
EBITDA	(0)	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7
Europe																
Domestic pools & spas																
Unit sales	0	375	2,250	4,250	6,250	8,250	10,250	12,250	14,250	16,250	18,250	20,250	22,250	24,250	26,250	27,875
Revenue	0	1	5	9	13	17	21	25	29	33	37	41	45	49	53	56
EBITDA	0	(0)	1	2	2	3	4	5	6	7	8	9	10	11	11	12
Commercial pools & spas																
Unit sales	0	0	263	683	1,103	1,523	1,943	2,363	2,783	3,203	3,623	4,043	4,463	4,883	5,303	5,644
Revenue	0	0	6	16	26	37	47	57	67	77	87	97	107	117	127	135
EBITDA	0	0	2	6	9	13	17	21	24	28	32	36	39	43	47	50
TOTAL																
Unit sales	758	10,107	30,658	55,531	80,403	105,276	130,148	155,021	179,894	204,766	229,639	254,511	279,384	304,256	329,129	340,338
Revenue	1	20	65	121	176	231	286	341	396	452	507	562	617	672	727	772
EBITDA	(0)	2	12	23	35	47	58	70	82	94	105	117	129	141	152	163

Source : Beer & Co estimates

Projected Cashflows – Surface Sterilisation segment

Beer & Co projects that it will take some time to gain first sales in surface sterilisation

PO3 stated that there are about 390,000 medical facilities in USA and Australia. Many of these facilities will be large with multiple floors, so that the potential market is about 1,000,000.

While the technology is proven, its application needs further development.

Figure 10 shows the estimated size of various markets and Beer & Co.'s projections for first sales, which allow for significant time for development and testing, and sales in 15 years, showing that our valuation is based on modest market penetration for superior value and effectiveness.

Figure 10 : Surface Sterilisation market

	No. facilities	first sales	growth	2033 Sales	market share
USA	1,000k	March 2020	0.01 %	21,400	21 %
Europe	900k	March 2021	0.01 %	18,180	20 %
Japan / Korea	500k	Sept. 2021	0.01 %	9,500	19 %

Source : Beer & Co estimates

The market is conservative and it will take time to prove performance

Beer & Co.'s revenue estimate is based on a small discount to the existing UV units, despite the inferior performance of the UV units, as shown in Figure 11, which also shows unit costs as well as overhead and associated costs.

Figure 11 : Sales and costs, Surface Sterilisation

Sales, General & Admin Costs					General Overhead	
Sales Revenue	COGS	fixed	Sales reps	productivity	Annual	Sales related
US\$ 75,000	US\$ 33,750	US\$ 0.1m	US\$ 150k	25	US\$ 0.5m	0.20 %

Source : Beer & Co estimates

Figure 12 summarises the detail of Beer & Co.'s projections for sales by PO3 of surface sterilisation machines and the resulting financial outcomes, in AUD terms.

Figure 12 : Beer & Co.'s projected sales, revenue and EBITDA for surface sterilisation

AUD m	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34
USA															
Unit sales	120	1,400	3,000	4,600	6,200	7,800	9,400	11,000	12,600	14,200	15,800	17,400	19,000	20,600	21,900
Sales Revenue	12	140	300	460	620	780	940	1,100	1,260	1,420	1,580	1,740	1,900	2,060	2,190
E B I T D A	4	66	146	225	305	384	464	543	623	702	781	861	940	1,020	1,086
Europe															
Unit sales	0	288	1,620	3,060	4,500	5,940	7,380	8,820	10,260	11,700	13,140	14,580	16,020	17,460	18,630
Sales Revenue	0	31	175	330	486	642	797	953	1,108	1,264	1,419	1,575	1,730	1,886	2,012
E B I T D A	(0)	14	92	177	262	347	432	516	601	686	771	856	941	1,026	1,096
Japan / Korea															
Unit sales	0	0	310	1,100	1,900	2,700	3,500	4,300	5,100	5,900	6,700	7,500	8,300	9,100	9,750
Sales Revenue	0	0	31	110	190	270	350	430	510	590	670	750	830	910	975
E B I T D A	0	(1)	14	57	101	144	188	231	275	318	361	405	448	492	528
TOTAL															
Unit Sales	120	1,688	4,930	8,760	12,600	16,440	20,280	24,120	27,960	31,800	35,640	39,480	43,320	47,160	50,280
Revenue	12	171	506	900	1,296	1,692	2,087	2,483	2,878	3,274	3,669	4,065	4,460	4,856	5,177
E B I T D A	4	80	252	460	667	875	1,083	1,291	1,499	1,706	1,914	2,122	2,330	2,537	2,710

Source : Beer & Co estimates

Valuation of PO3

The valuation of PO3 is the cashflows generated by each segment

Figures 6, 9 and 12 show the detail of Beer & Co.'s projected cashflows for each segment. The valuation of PO3 is the Net Present Value (NPV) of the cashflows shown, less taxes and corporate costs.

The per share valuation then adjusts for the equity that is required to fund the start-up of operations, and then adjusted for risk, as shown in Figure 13.

Figure 13 : Beer & Co.'s base case value of PO3

Beer & Co then risks the NPVs, due to uncertainties.

Beer & Co has allowed for further equity raisings

While the technology for surface sterilisation is proven, machines to apply it need further development.

AUD m	risk :	30 June 2018			6-Aug-18
		100%	Product	per share	
Air Purification					
USA	50 %	297	148	\$A 1.7	\$A 1.7
Japan / Korea	35 %	363	127	\$A 1.4	\$A 1.4
Europe	35 %	71	25	\$A 0.3	\$A 0.3
Middle East / Other	25 %	83	21	\$A 0.2	\$A 0.2
Water Sanitation (Pools)					
USA	50 %	153	76	\$A 0.8	\$A 0.9
Australia	50 %	18	9	\$A 0.1	\$A 0.1
Europe	30 %	91	27	\$A 0.3	\$A 0.3
Surface Sterilisation					
USA	0 %	1,846	0	\$A 0.0	\$A 0.0
Europe	0 %	1,611	0	\$A 0.0	\$A 0.0
Japan / Korea	0 %	694	0	\$A 0.0	\$A 0.0
Corporate					
franking credits	40 %	1	0	\$A 0.0	\$A 0.0
Corporate	100 %	(8)	(8)	(\$A 0.1)	(\$A 0.1)
Equity raisings	100 %	29	29	\$A 0.3	\$A 0.3
Cash / Debt	100 %	(1)	(1)	(\$A 0.0)	(\$A 0.0)
TOTAL		5,247	454	\$A 5.1	\$A 5.1
Shares on issue		27.3m	F P O shares	0.0m	Options
		62.5m	to be issued	0.0m	exercised

Source : Beer & Co projections

Due to this risk, we have zero weighted our value for the surface sterilisation segment.

Figure 13 shows that Beer & Co has significantly risked the derived NPVs for the Air Purification and Water Sanitation segments.

Figure 13 also shows that Beer & Co has treated the projected cashflows from the Surface Sterilisation segment as being too speculative on the bases that the :

- Technology has not been properly tested in an appropriate setting; and
- Application has not yet been developed as a device.

Analysis

Beer & Co.'s risked, base case valuation of PO3 is about 10x the current share price.

The current PO3 share price does not reflect its future, but its past as a stock that has had little newsflow and results

PO3 has just developed its technology, but is yet to bring it into revenue generation

PO3's markets are global and potentially very large.

Others have had share price increases of 30x when revenue can be clearly seen, after a long period of development

While there are no direct peers for PO3, other companies in water sanitation, with less upside, have market caps \$100m to \$200m

Figure 13 shows that Beer & Co.'s valuation is nearly 10x the current share price, with total market capitalisation rising from \$15m to \$480m. While these seems large :

- (i) PO3 listed nearly 9 years ago and has since then consumed almost \$25m in cash, with almost no newsflow to prompt investors to buy the stock;
- (ii) PO3 has now developed a very valuable technology that can be applied to 3 (and more) global markets, giving it huge potential;
- (iii) PO3 now has significant execution risk; and
- (iv) Significant re-ratings happen when a technology dream comes into reality. Figure 14 shows that the share price of Clean TeQ increased 30 fold, from 5c to \$1.50, over a period of about 3 ½ years from mid 2014
 - CLQ's market capitalisation rose from \$15m to over \$800m;
 - CLQ is far from a unique example (eg. Fortescue Mining rose from 13c in April 2003 to over \$7.00 in December 2007);

Figure 14 : CLQ share price increased 30x over 42 months



Source : IRESS, Beer & Co

Peers ?

Figure 15 shows potential ASX listed peers / comparisons for PO3, though :

- Most companies are relatively new to the ASX and, as such, immature;
- Only CLQ and FCL have their own technology; and
- Most operate only in a single sector.

Figure 15 : Potential peers for PO3

			Market Cap	Latest NPAT
Water Sanitation				
CLQ	Clean TeQ	Syerston Co-Ni-Sc project; water treatment projects using ion exchange technology and advanced filtering	\$ 529m	(\$12.1m)
CLX	Calix	Sewer odour and fat control	\$ 114m	(\$2.1m)
D2O	Duxton Water	Income from owning and trading water allocations	\$ 112m	\$ 2.1m
DEM	De.mem	Membrane based water filtration	\$ 15m	(\$6.3m)
FLC	Fluence Corp.	Waste water treatment	\$ 172m	(\$24.3m)
PHK	Phoslock	Locks up phosphates in water, starving blue green algae cleaning the water	\$ 211m	(\$1.8m)
Air Purification				
AEI	Aeris Environmental	Corrosion protection, hygiene consumables, mould control	\$ 25m	(\$3.7m)
CG1	Carbonxt	Sale of Powdered Activated Carbon to remove mercury from US coal fired power station emissions	\$ 31m	(\$4.0m)
EGL	The Environmental Group	Industrial air filtration	\$ 11m	\$ 1.7m
Surface Sterilisation				
NAN	Nanosonics	Infection control solutions, focussed on medical facilities	\$ 961m	\$ 26.1m
PO3	Purifloh	Commercialisation the Free Radical Generator technology	\$ 15m	(\$0.3m)

Source : IRESS, Beer & Co

Figure 15 shows that even though many companies operate in much smaller potential markets than PO3, and most do not have proprietary technology, their market capitalisations show the veracity of Beer & Co.'s valuation.

Concluding Comments

PO3's current share price reflects its past, not its future.

PO3's past has been a long period of development, with the early days, from 2009 to 2014, being poorly directed and expensive.

Current management has worked patiently to develop the FRG technology.

PO3's risk is no longer the technology, but how well it can be rolled out

Beer & Co has a Speculative, Strong BUY recommendation on PO3

Speculative due to the risk in execution

Strong BUY due to the size of the potential gain.

Summary

PO3 first listed in December 2010, to develop a technology for water desalination. After spending about \$16.5m in about 2½ years that development was paused, and then cancelled as a failed technology.

PO3 engaged Somnio Global to develop a related technology. After more than 4 years of development, and consequently a lack of newsflow to stimulate investor interest, PO3 is now on the verge of commercialisation of the Free Radical Generator (FRG) technology.

The FRG can be applied to water sanitation and air purification immediately and PO3 is developing agreements to sell the FGR units to manufacturers of air purifiers, air conditioners and swimming pool filtration equipment.

The FRG is expected to have its greatest value for surface sterilisation in the medical sector. However, while the concept has been tested, it has not yet been developed into a product, which will require testing and development.

PO3 has a superior technology that can be applied to significant global markets, which generates a very large potential value.

However, PO3 has significant execution risk.

Conclusions

Beer & Co.'s risked, base case, valuation is \$5.10, nearly 10x the current share price, though that is a very poor indicator of the company's potential as it has had little positive news for investors during the nearly 8 years it has been an ASX listed company.

Beer & Co believes that there is significant further potential to our valuation :

- From successful execution, leading to de-risking of our valuation;
- Success in developing commercial product for surface sterilisation;
- Greater penetration into some sectors, especially for air purification; and
- Exploiting the FRG technology into other potential sectors, especially for water sanitation.

Beer & Co initiates research on PO3 with a Speculative, Strong BUY recommendation

- Speculative as PO3 has still to prove it has the capability to exploit at least some of the potential; and
- Strong BUY due to significant potential gains.

Beer & Co Research

Purifloh (PO3.ASX)

August 2018

Year ended June		2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Section 1 - P&L									
Sales revenue	\$A m	0	1	41	299	853	1,508	2,168	2,828
Interest revenue	\$A m	0	0	0	0	0	0	0	0
Other Revenue	\$A m	0	0	0	0	0	0	0	0
Total Revenue	\$A m	0	1	41	299	853	1,508	2,168	2,828
Cash costs	\$A m	0	(1)	(25)	(166)	(467)	(821)	(1,177)	(1,533)
Royalties	\$A m	0	(0)	(1)	(9)	(26)	(45)	(65)	(85)
Corporate	\$A m	(0)	(3)	(13)	(37)	(63)	(87)	(109)	(130)
R & D Expensed	\$A m	0	0	0	0	0	0	0	0
Other Operating Expenses	\$A m	0	0	0	0	0	0	0	0
Total Operating Expenses	\$A m	(0)	(4)	(39)	(212)	(555)	(953)	(1,350)	(1,748)
EBITDA	\$A m	(0)	(3)	2	86	298	556	817	1,079
Dep'n & Amort'sn	\$A m	0	0	0	0	0	0	0	0
EBIT	\$A m	(0)	(3)	2	86	298	556	817	1,079
Interest Expense	\$A m	0	0	0	0	0	0	0	0
Other	\$A m	0	0	0	0	0	0	0	0
Pre-Tax Profit	\$A m	(0)	(3)	2	86	298	556	817	1,079
Tax Expense	\$A m	0	1	(0)	(24)	(82)	(153)	(225)	(297)
NPAT	\$A m	(0)	(2)	1	63	216	403	593	782

Section 2 - Key Data

Ordinary shares - year end	m	27.3	64.8	89.8	89.8	89.8	89.8	89.8	89.8
Fully diluted shares on issue	m	27.3	64.8	89.8	89.8	89.8	89.8	89.8	89.8
Weighted # shares	m	22.5	52.3	83.5	89.8	89.8	89.8	89.8	89.8
Earnings per Share		(1.6c)	(4.0c)	1 c	70 c	240 c	449 c	660 c	871 c
Dividends Per Share		0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c

Section 3 - Balance Sheet

Cash & Eqv	\$A m	1	15	25	49	208	531	1,023	1,684
Receivables	\$A m	0	0	6	45	128	226	325	424
Inventories	\$A m	0	0	0	3	9	16	24	31
CURRENT ASSETS	\$A m	1	15	31	97	345	774	1,372	2,139
Receivables	\$A m	0	0	0	0	0	0	0	0
P, P & E	\$A m	0	0	0	0	0	0	0	0
Capitalised R & D / IP	\$A m	0	0	0	0	0	0	0	0
Other	\$A m	0	0	0	0	0	0	0	0
NON-CURRENT ASSETS	\$A m	0	0	0	0	0	0	0	0
TOTAL ASSETS	\$A m	1	15	31	97	345	774	1,372	2,139
Payables	\$A m	0	0	3	18	49	87	124	162
Debt	\$A m	0	0	0	0	0	0	0	0
Other	\$A m	0	0	0	0	0	0	0	0
CURRENT LIABILITIES	\$A m	0	0	3	18	49	87	124	162
Long Term Debt	\$A m	0	0	0	0	0	0	0	0
Other	\$A m	0	0	0	0	0	0	0	0
Provisions	\$A m	0	0	0	0	0	0	0	0
NON-CURRENT LIABILITIES	\$A m	0	0	0	0	0	0	0	0
TOTAL LIABILITIES	\$A m	0	0	3	18	49	87	124	162
NET ASSETS	\$A m	1	15	29	80	296	687	1,248	1,977
Accumulated Profit (Loss)	\$A m	(75)	(77)	(76)	(13)	203	606	1,198	1,981
Reserves	\$A m	1	1	(5)	(17)	(17)	(28)	(60)	(113)
Contributed Equity	\$A m	74	91	109	109	109	109	109	109
Total Equity	\$A m	1	15	29	80	296	687	1,248	1,977

Section 4 - Cashflow

Net Cashflow from operations	\$A m	(1)	(3)	(3)	(4)	5	96	114	100
Net Interest Paid	\$A m	0	0	0	0	(4)	(5)	(3)	(0)
Taxes Paid	\$A m	0	0	0	0	0	0	(15)	(23)
Change in Working Capital	\$A m	0	(0)	0	0	(2)	(3)	(0)	1
OPERATING CASHFLOW	\$A m	(1)	(3)	(3)	(3)	(1)	88	97	77
Exploration + Feasibility	\$A m	0	(1)	(8)	0	0	0	0	0
Maintenance Capex	\$A m	0	0	0	0	0	0	(2)	(2)
Expansion Capex	\$A m	0	0	0	(55)	(40)	0	0	0
PPE Acquisitions (Total Capex)	\$A m	0	(1)	(8)	(55)	(40)	0	(2)	(2)
PPE Divestments	\$A m	0	0	0	0	0	0	0	0
INVESTING CASHFLOW	\$A m	0	(1)	(8)	(55)	(40)	0	(2)	(2)
Change in Equity	\$A m	0	4	47	2	0	0	0	0
Dividends Paid	\$A m	0	0	0	0	0	0	0	0
Change in Debt	\$A m	0	0	0	22	44	(10)	(17)	(18)
FINANCING CASHFLOW	\$A m	0	4	47	24	44	(10)	(17)	(18)
Free Cashflow	\$A m	(1)	(4)	(10)	(58)	(41)	88	95	75
Net Cashflow	\$A m	(1)	(1)	37	(35)	4	78	78	57

Projected Unit Sales

Year ended June		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Air Purification								
USA		0	8,000	23,210	48,060	73,713	99,367	125,020
Japan / Korea		0	0	14,967	52,783	94,250	135,717	177,183
Europe		0	0	1,350	8,243	17,307	26,800	36,293
Middle East / Other		0	0	0	0	0	0	0
Water Treatment								
USA		523	7,989	24,639	45,327	66,016	86,705	107,394
Australia		235	1,743	3,507	5,271	7,035	8,798	10,562
Europe		0	375	2,513	4,933	7,353	9,773	12,193
Surface Sterilisation								
USA		0	120	1,400	3,000	4,600	6,200	7,800
Europe		0	0	288	1,620	3,060	4,500	5,940
Japan / Korea		0	0	0	310	1,100	1,900	2,700

Market Penetration - New Units

Year ended June		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Air Purification								
USA		0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.3%
Japan / Korea		0.0%	0.0%	0.1%	0.2%	0.4%	0.5%	0.7%
Europe		0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%
Middle East / Other		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Water Treatment								
USA		0.1%	0.6%	1.7%	2.9%	4.1%	5.3%	6.5%
Australia		0.8%	2.8%	4.8%	6.8%	8.8%	10.8%	12.8%

Cumulative Market Penetration - Existing Installations

Year ended June		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Air Purification								
USA		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Japan / Korea		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Europe		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Middle East / Other		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Water Treatment								
USA		0.0%	0.0%	0.2%	0.4%	0.7%	1.2%	1.7%
Australia		0.0%	0.1%	0.4%	0.8%	1.3%	1.9%	2.7%
Europe		0.0%	0.0%	0.1%	0.3%	0.5%	0.9%	1.3%
Surface Sterilisation								
USA		0.0%	0.0%	0.2%	0.5%	0.9%	1.5%	2.3%
Europe		0.0%	0.0%	0.0%	0.2%	0.6%	1.1%	1.7%
Japan / Korea		0.0%	0.0%	0.0%	0.1%	0.3%	0.7%	1.2%

Asset based Valuation

discount rate = 12.0%	30 June 2018		6-Aug-18		
	risk :	100%	Product	per share	
Air Purification					
USA	50%	\$ 297m	\$ 148m	\$ 1.7	\$ 1.7
Japan / Korea	35%	\$ 363m	\$ 127m	\$ 1.4	\$ 1.4
Europe	35%	\$ 71m	\$ 25m	\$ 0.3	\$ 0.3
Middle East / Other	25%	\$ 83m	\$ 21m	\$ 0.2	\$ 0.2
Water Sanitation (Pools)					
USA	50%	\$ 153m	\$ 76m	\$ 0.8	\$ 0.9
Australia	50%	\$ 18m	\$ 9m	\$ 0.1	\$ 0.1
Europe	30%	\$ 91m	\$ 27m	\$ 0.3	\$ 0.3
Surface Sterilisation					
USA	0%	\$ 1,846m	\$ 0m	\$ 0.0	\$ 0.0
Europe	0%	\$ 1,611m	\$ 0m	\$ 0.0	\$ 0.0
Japan / Korea	0%	\$ 694m	\$ 0m	\$ 0.0	\$ 0.0
Corporate					
franking credits	40%	\$ 1m	\$ 1m	\$ 0.0	\$ 0.0
Corporate	100%	(\$ 8m)	(\$ 8m)	(\$ 0.1)	(\$ 0.1)
Equity raisings	100%	\$ 29m	\$ 29m	\$ 0.3	\$ 0.3
Cash / Debt	100%	(\$ 1m)	(\$ 1m)	(\$ 0.0)	(\$ 0.0)
TOTAL		\$ 5,247m	\$ 455m	\$ 5.1	\$ 5.1
Shares on issue		27.3m	F P O shares	0.0m	Options
		62.5m	to be issued	0.0m	exercised

Financial Ratios

Year ended June		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Revenue	\$A m	1	41	299	853	1,508	2,168
EBITDA	\$A m	(3)	2	86	298	556	817
EBIT	\$A m	(3)	2	86	298	556	817
NPAT (reported)	\$A m	(2)	1	63	216	403	593
Adjusted EPS (cps)		(4.0c)	1.0 c	69.7 c	240.3 c	448.7 c	660.0 c
EPS Growth (%)			126%	6,747%	245%	87%	47%
DPS (c)		0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c
Dividend Yield (%)		0%	0%	0%	0%	0%	0%
PE adj. (x)	x	(10.9)	54.0	0.8	0.2	0.1	0.1
EV / EBITDA (x)	x	(4.0)	13.0	0.3	0.0	(0.3)	(0.6)
EV / EBIT (x)	x						

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The analyst responsible for this research report certifies that all of the views expressed reflect his personal views about the securities and the issuer.

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Recommendation : Beer & Co.'s investment recommendation is driven by the difference between our base case, risked valuation and the share price at the time. A Strong BUY recommendation means a very large difference (eg. over 100%), while BUY means a significant difference and Accumulate means a small, but positive difference. The recommendation is not independent of the uncertainty in Beer & Co.'s valuation; the greater the degree of uncertainty, the greater the difference between price and value required for a positive recommendation.

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