



Global potential in many sectors

Expect first sales in about 6 months

Recommendation

Speculative, Strong BUY

Price

55c

Valuation

\$5.10

Industry

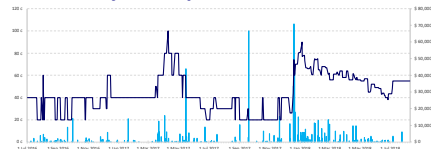
New technology for water treatment, air purification, surface sterilisation and other applications

- **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

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

Purifloh

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.

Inorganic matter agglomerates so that it can be easily filtered.

Applications

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.

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

Air Purification

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.

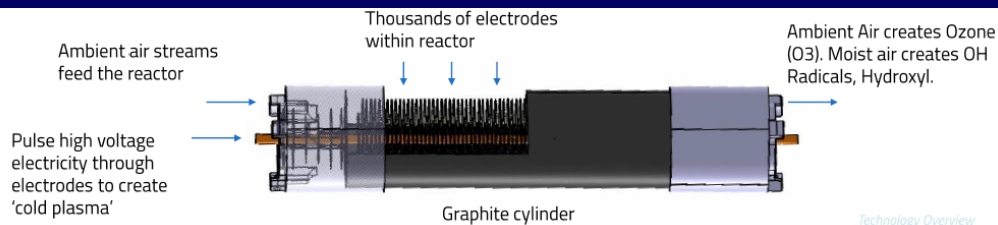
PO3 has developed “Bluemist”, which is a fine ozone – hydroxyl mist that is capable of achieving over 99.999% kill of spores, mould, bacteria and viruses.

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

Recreational water market is a more modest size.

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

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
C O G S	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	C O G S	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

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);

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

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 FLC 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

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

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.

Purifloh

Introduction

PO3 has the global, exclusive right to commercialise technologies developed by Somnio Global specific to the Free Radical Generator (“FRG”) as its use relates to Air Purification, Water Treatment and Surface Sterilisation.

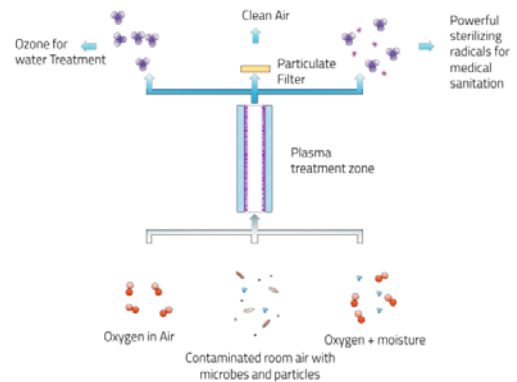
Somnio Global is a privately owned, Detroit based company formed in 2012 to translate scientific innovations into successful commercial solutions. It is jointly owned by its Directors, Professor Pravansu Mohanty and Carl Le Souef, who is also the major shareholder in PO3, through his company, Dilato Holdings.

Professor Mohanty is a Professor in mechanical engineering at University of Michigan who currently has 17 patents accredited to him.

Development of applications for the FRG has focussed on production of oxygen and hydrogen radicals, ozone (O₃) and the hydroxyl ion (OH), which are amongst the most powerful oxidising agents known. The process is shown in Figure 16 :

- Physically destroys bacteria, viruses, spores and mould, at the level of the individual cell;
- Is very effective against antibiotic resistant pathogens;
- Is safe chemical free solution with a benign waste output; and
- Eliminates Volatile Organic Compounds (VOCs)

Figure 16 : Operation of the FRG



Source : Purifloh

FRG Applications

As shown in Figure 17, there are 3 product areas into which PO3 plan to sell the FRG technology :

- (i) Air purification
- (ii) Water sanitation; and
- (iii) Surface sterilisation.

Air Purification

The FGR induces a cold plasma in the air flow and breaks down harmful airborne substances, such as bacteria, spores, mould, VOCs and toxins, including tobacco.

Figure 17 : Applications of the FRG technology



Source : PO3 ASX announcement, 17 April 2018

As particles pass through the cold plasma they acquire electrical charges causing agglomeration so they are easily trapped by a filter. The FRG is much more effective than the current “start of the art” High Efficiency Particulate Arrestance (HEPA) filter, capturing finer particulates, including viruses that are not captured by the HEPA.

The superior performance of the FRG technology over the “state of the art” HEPA technology is shown in Figure 18.

Purified air is then released to the occupied space.

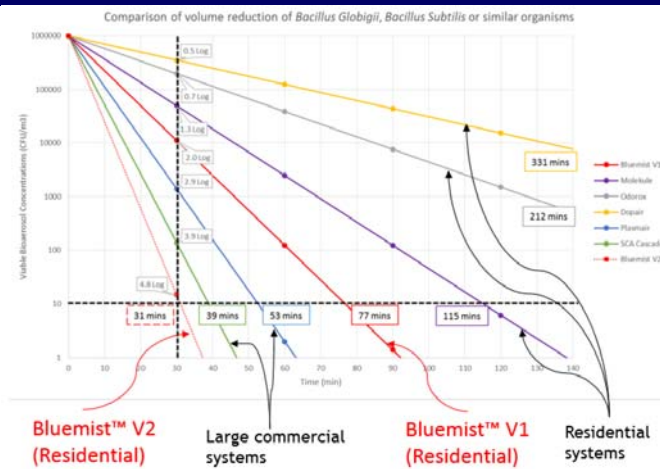
Figure 18 shows the superiority of the FRG technology in terms of particulate capture, while Figure 19 shows that the FRG achieves a very high kill rate, of 99.999%, in 31 minutes; and the amount killed continues to increase with time, though asymptotically.

Figure 18 : Particulate capture



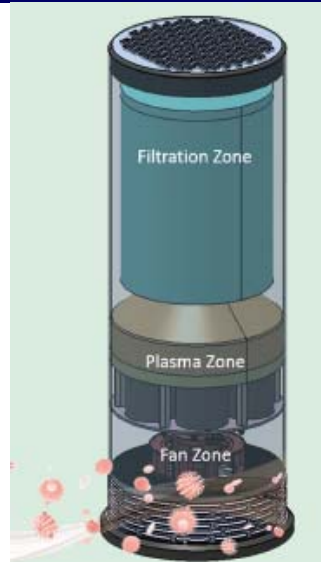
Source : PO3 brochure, May 2018

Figure 19 : FRG – High kill rate, in quick time



Source : PO3 ASX announcement, 17 April 2018

Figure 20 : FRG stand-alone

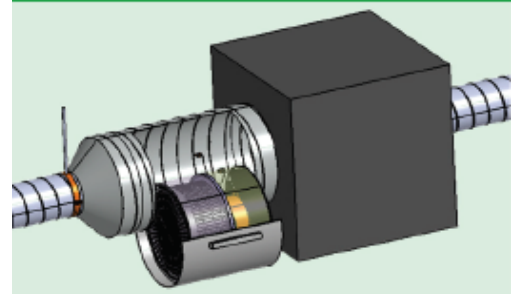


Source : PO3 brochure, May 2018

PO3 has reduced the time to achieve 99.999% kill rate from 31 minutes, as shown in Figure 19, to 22 minutes in testing since the 17 April announcement.

Figure 20 shows the operation of the FRG as a stand-alone unit, while Figure 21 shows the FRG unit installed in modified duct-work.

Figure 21 : FRG unit in duct-work



Source : PO3 brochure, May 2018

Target markets for both stand-alone portable units and ducted systems include :

- Residential homes;
- Medical facilities;
- Hotels and office buildings; and
- Planes, trains and ships.

This application will be first rolled out in the USA, as many of the global manufacturers are based there and PO3 has already established a base in Detroit.

In Beer & Co.'s view, however, the largest market in the medium terms, but especially in the longer term, will be Asia due to the heightened awareness of, and concern about, air quality and health, as shown in Figure 22, and also the size of the urban population.

Figure 22 : Air Quality Index



Source : <https://waqi.info/>, July 2018

Water Sanitation

The FRG technology has been previously tested for the treatment of swimming pools, replacing the use of chlorine and other chemical consumables. Ozone is a superior swimming experience to chlorinated swimming pools with less health impact to the swimmer and less corrosion to the pool infrastructure.

In preliminary trials, the FRG was highly effective, though it required mechanical development to continue to perform well in stress testing.

The technology has been further developed as a turnkey solution, able to perform across all typical operating conditions.

There are many areas to which this the FRG technology can be applied. The initial focus is recreational water sector (ie. swimming pools, spas, etc) due to size and ease of entry. Other water treatment areas to which this technology can be applied may 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.

Surface Sterilisation

The FRG technology produces the Hydroxyl radical from water / moisture in its feed. Hydroxyl radicals are highly reactive and undergo chemical reactions that make them short-lived.

When biological systems are exposed to hydroxyl radicals, they can cause damage to cells, including those in humans, where they can react with DNA, lipids, and proteins.

Ozone (or trioxygen (O_3)) is a pale blue gas with a pungent smell, which is why PO3 refers to it as their “Blue Mist” technology application.

On 13 February, 17 April and 26 June 2018, PO3 announced significant test results from its BlueMist technology, eliminating 99.999% of bacteria and 99.9999% of viruses, as well as ultra-fine particulates.

The dominant application for this technology will be in hospitals as a better alternative to current methods of room sterilisation, which is chlorine bleach with hydrogen peroxide, and requires that the room be not used for a 24 hour period. In comparison, PO3 has a target of less than 1 hour.

Beer & Co expects that it will take probably 2 years for this application to be accepted by hospitals, standard setters and insurers.

Commercial Model

Somnio Global has patents pending over its FRG technology. The commercial plan is for PO3 to utilise existing expertise in Detroit for the precision engineering required to manufacture the FRG units, as shown in Figure 23.

While the units will vary in size, their cost to PO3 will vary in the range from about US\$ 150, for the 150mm unit, up to US\$ 300 for the 450mm unit.

For both water sanitation and air purification, initial sales will be to Original Equipment Manufacturers (OEMs) to incorporate in their products, in a manner similar to “Intel Inside”.

Surface Sterilisation will be a more niche sector and will take time to clear the regulatory and customary barriers and is likely to be exploited by PO3 directly.

Figure 23 : FRG unit



FRG Reactor

Source : ASX announcement, 12 December 2017

The technology

Free Radical Generator

In their April 2016 ASX announcement, WRG stated that Somnio Global had developed a Free Radical Generator (FRG) and were in the process of filing a patent to cover the IP developed

The FRG is able to generate a range of radicals, including Ozone (O_3) and the Hydroxyl ($OH\cdot$) radical. The Hydroxyl radical is one of the most powerful oxidising agents known, as shown in Figure 24.

While ozone is able to destroy harmful biological matter in water, the hydroxyl radical increases the range of harmful substances able to be destroyed to include not just biological matter, but also pharmaceuticals and many other substances.

On 20 March 2017, PO3 announced that the tests of the FRG technology had demonstrated its potential to :

- De-colourise methylene blue dye, which is representative of common water pollutants harmful to aquatic animals and plants;
- Oxidise MTBE, a common and carcinogenic fuel additive (up to 1% in Australian gasolines), which has found its way into ground water in many areas;
- De-compose Ibuprofen and Metformin, which are common pharmaceutical contaminants harmful to aquatic animals; and
- Reduce pathogens.

Figure 24 : Oxidising power

Compound	Oxidation Potential (volts)
Fluorine	3.06 v
Hydroxyl radical (OH)	2.80 v
atomic Oxygen (O)	2.42 v
Ozone (O ₃)	2.07 v
Hydrogen Peroxide (H ₂ O ₂)	1.77 v
Permananate (KMnO ₄)	1.67 v
Chlorine oxide	1.50 v
Chlorine (Cl)	1.36 v
Bromine (Br)	1.09 v
Iodine (I)	0.54 v
Oxygen (O ₂)	0.40 v

Source :

FRG Technology : In Brief

There are 2 key parts to the FRG technology :

- (i) The power supply; and
- (ii) The reactor.

Power Supply

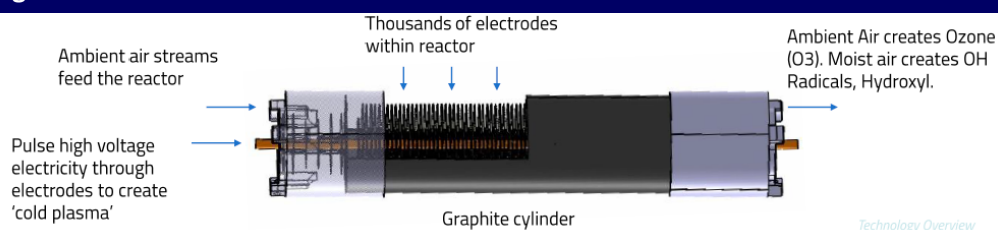
Each product comes with its own proprietary power supply which feeds off conventional power supply to generate high voltage pulses of electricity.

While these units are complex, their manufacture is not an issue for a competent manufacturer. The complexity adds to the IP associated with the FRG.

Reactor

Figure 25 shows a diagram of an FRG reactor. It shows that it is a tube, about 60 mm in diameter, and in lengths from 150mm to 450mm, depending on volume of output required and application (a greater output is obtained by having more reactors in parallel configuration.)

Figure 25 : Free Radical Generator



Source : PO3 Presentation

Operations

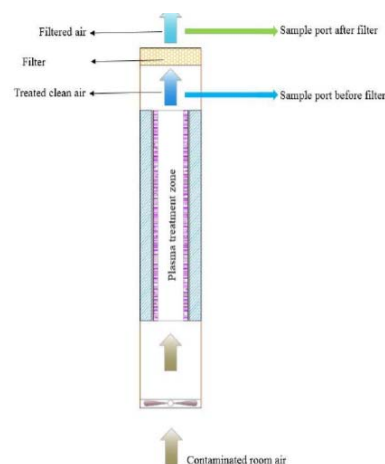
Figure 26 shows the operation of the Free Radical Generator. The reactor works by generating a plasma discharge which ionises its feed.

The core technology is a unique single-stage cold plasma channel that destroys microbes, Volatile Organic Carbons (VOCs) and other airborne contaminants.

Operating in closed loop mode, which means that radicals are not released from the unit, the contaminated air from a room is pulled into the device, passes through the cold plasma wherein the chemicals and microbes are destroyed.

The FRG charges particles that pass through it which attract each other to form larger agglomerated particles that can be captured by a filter.

Figure 26 : FRG unit operations



Source : ASX announcement, 17 April 2018

Ozone

Ozone, or trioxygen (O_3), is formed by splitting diatomic oxygen by the either ultraviolet (UV) light or electrical discharges; the atomic oxygen (O-) combines with diatomic oxygen molecule (O_2) forming trioxygen (O_3).

Ozone is very unstable under normal atmospheric conditions and breaks down to diatomic oxygen (O_2) and atomic oxygen (O-). It is believed that ozone's half-life is as short as a half an hour in atmospheric conditions. Lower temperature increases the half-life whereas lower pressure reduces the half-life.

Ozone's high oxidation capabilities enable it to break down organic materials, while oxidation of inorganic material helps treat soluble compounds, rendering them insoluble so that they can then be precipitated or filtered from solution.

Through the process of cell lysing (breaking open cells), ozone molecularly ruptures the cell membranes of microorganisms, destroying them and preventing reactivation or development of a resistant strain of the microorganism. This is more effective than any biocides for microorganisms such as bacteria, viruses, mould, fungi, and algae; *Cryptosporidium Parvum*, a drinking water pollutant, resists most chemical disinfectants, but is destroyed by ozone.

Ozone Generators

The FRG is a very different technology from, and superior to, currently available ozone generators :

- Other ozone generators require a feed of oxygen, while the FRG generates oxygen from unfiltered air;
- The power supply converts line voltage to high voltage, high frequency short pulses so that plasma is sustained but never transitions to arc discharge, reducing energy consumption, electrode erosion and nitrous oxide formation;
 - the power supply has safety features to prevent spark or arc discharge in case of flooding or excessive dirt build up;
- The cathode is the long tube that houses radial vanes with sharp, tooth like protrusions that ensures uniform discharge and even heat distribution minimising cooling requirements and erosion;

- The anode is made of graphite, separated from the cathode only by a few millimetres of air rather than an insulating material in other ozone generators
 - Using graphite means it can operate with air without needing it to be extremely dry, and means it can operate effectively at atmospheric temperatures, compared with temperatures like 60° below zero

The FRG needs about 1.05 kWh to generate 50g O₃, compared with 1.74kWh for the next most energy efficient system using air (1.55kWh is the best for a system using oxygen, which has its own, extra cost).

Air Purification

Description

The market for Air purification units is both distinct from, and overlaps with, the market for air conditioning units, as the latter covers at least one, but not necessarily all, of :

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

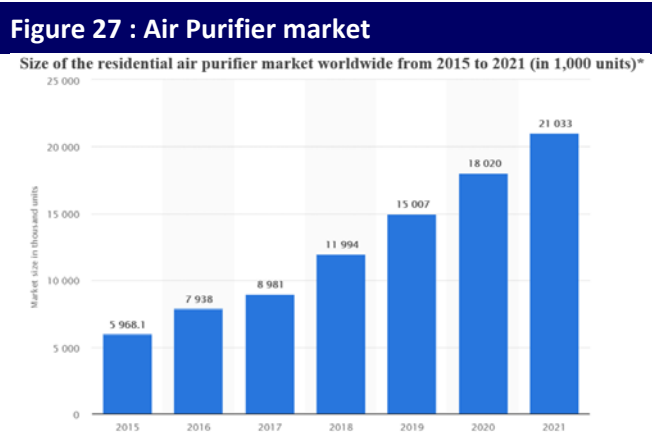
Separate air purifiers are used in households where one or more people suffer from allergens, such as dust, pollen, pet dander, mould spores, and dust mite faeces, as well as second-hand tobacco smoke particles and volatile organic compounds, all of which can trigger asthma.

Each air-conditioning unit has a filtration system to clean the air that it pushes out. However, these filtration systems :

- Fail to capture fine particulates; and
- Fail to treat many biological contaminants.

The FRG technology, as shown by PO3's ASX announcement of 13 February 2018, supported by related announcements on 17 April 2018 and 26 June 2018, is very effective in killing airborne contaminants and removing odours and fine particles.

Potential Market



Source : Statistics MRC

Figure 27 shows an estimated market size was estimated to be 8.9m units in 2017 and is projected to grow to 21m units by 2021. Separately, Statistics MRC estimated that the value of the Global Air Purification Systems market was US\$ 14.52 billion in 2016, expected to reach US\$ 26.45 billion by 2022 growing at a CAGR of 10.5% during the forecast period 2016 to 2022.

ResearchAndMarkets.com estimated that, in terms of value, the Asia-Pacific air purifiers' market size is estimated to be US\$ 34.5 billion in 2026, growing at a CAGR of 24.5% between 2016 and 2026, which yields a market of \$3.95 billion in 2016.

However, there are many technologies serving this market.

Figure 28, which comes from the June 2018 report by the International Energy Agency, "The Future of Cooling), shows that, in 2016, there were about 1,685m air-conditioning units installed globally, with 134m units being installed in that year.

Figure 28 : Global Air-Conditioning

	Annual Sales		Installed Units	
	Domestic	Commercial	Domestic	Commercial
U S A	16m	8m	241m	132m
Europe	9m	3m	43m	53m
Japan	9m	2m	116m	33m
Korea	2m	2m	30m	29m
China	41m	12m	432m	138m
India	3m	2m	14m	13m
Middle East	4m	2m	30m	18m
Other emerging	3m	2m	29m	42m
Rest of World	7m	7m	158m	71m
TOTAL	94m	40m	1,093m	529m

Source : IEA "The Future of Energy, 2018", Beer & Co

Further the IEA projects that the number of units installed will grow very strongly, from 1.7 billion currently to about 8 billion by 2050 due to increasing GDP growth, especially in currently poorer countries, coupled with urbanisation.

Commercialisation of FRG technology

Somnio Global has prepared and tested FRG units and FRG applications. PO3 stated in its 28 June 2018 ASX announcement that it is in discussions with various original equipment manufacturers (OEMs). The discussions are expected to result in the OEMs undertaking their own trials.

Beer & Co expects that PO3 will reach agreement for commercial supply of FRG units to be incorporated into some of the OEM's product lines.

Somnio Global is based in Detroit, which through its history of car manufacturing, has a significant engineering, design and manufacturing capability and is home to many OEMs. Initial commercialisation activities will be focussed on the North American market as:

- Figure 28 shows that it is a very large market; and
- Somnio/PO3 can have confidence that the IP will be protected.

Pricing

The FRG units will be sold in premium products; the cheapest air purification units, which are just filtration units, about US\$ 200, while premium units cost over US\$ 1,000 for domestic units.

PO3 will sell only the FRG units; a single FRG will cost about \$400 and sell for about \$450 to the OEM.

North American Sales

In terms of timing, Beer & Co projects that :

- Required NDAs will be concluded by September;
- The OEMs will spend 6 months testing the FRG units;
- Product design and incorporation into production will then take a further 6 months.

New Units

Figure 29 shows Beer & Co.'s projected market penetration for FRG units into the new air-conditioning units sector. It shows that by 15 years, the projected rate of penetration generates a very modest market share of under 2% by 2033.

Figure 29 : PO3 sales to new Air Purification units

			<u>by 2033</u>	
	first sales	growth	unit sales	share
Domestic	Sept. 2019	0.02 %	180,800	1.2 %
Commercial	March 2020	0.02 %	87,200	1.1 %

Source : Beer & Co projections

A domestic unit has a single FRG unit installed, while a commercial unit will have a number of FRG units installed, with the number being determined by the size of the system.

Beer & Co expects that penetration into the commercial sector has greater potential than shown as the FRG technology appears to be effective against outbreaks of legionnaire's disease.

Already Installed

Figure 28 shows that the installed base in North America is 373m units. Of these, Beer & Co assumes that

- Domestic units have a life of about 15 years, which means that about 16m units are replaced each year; and
- Commercial units have a live of about 12 years, which means that about 11m units each year are replaced.

Figure 30 shows the projections used by Beer & Co in this analysis, showing that first sales into this sector are 18 months later than the sales into new units, which is to allow for a period of time for the technology to be validated by users due to its adoption by OEMs.

Figure 30 : PO3 sales to refurbished Air-Conditioning units

			<u>by 2033</u>	
	first sales	growth	unit sales	share
Domestic	March 2021	0.02 %	162,273	1.0 %
Commercial	Sept. 2021	0.02 %	106,700	1.0 %

Source : Beer & Co projections

Figure 30 shows that Beer & Co projects that, after 15 years, The FRG technology has achieved a market share of about 1.0% of refurbishments, so that less than 1% of all installed units are using FRG, despite its clear advantages.

Japan and Korea Sales

Figure 31 summaries the size of the Japan / Korea market, which also includes other richer areas of Asia including Taiwan, Hong Kong and Singapore.

Figure 31 : The Japan / Korea market

	<u>Annual Sales</u>		<u>Installed Units</u>	
	Domestic	Commercial	Domestic	Commercial
Japan / Korea	11m	4m	146m	62m

Source : IEA "The Future of Energy, 2018", Beer & Co

In Beer & Co.'s view, this geographical area will be the "sweet spot" for the application of the FRG technology to air purification due to :

- The generally poor quality of the air;
- High incidence of cigarette smoking;
- The concern that "Chinese mothers" have with cleanliness; and
- The relative wealth to be able to pay for the product.

However, Beer & Co expects it will take some time for the product to get into to the market as PO3 needs to strike an agreement with an established brand in the region.

New Units

Figure 32 shows that Beer & Co projects that first sales into the Asian region will be about 2 years from now; our view is that Asian OEMs will wait until after an agreement is reached with an OEM in USA as particle validation of the technology and its commerciality, and partly because of the generally slow decision making processes of Asian companies.

Figure 32 : Penetration into new sales segment

	first sales	growth	<u>by 2033</u>	
			unit sales	share
Domestic	Sept. 2020	0.05 %	288,750	2.7 %
Commercial	Dec. 2020	0.05 %	103,000	2.7 %

Source : Beer & Co projections

Figure 33 : Penetration into existing segment

	first sales	growth	<u>by 2033</u>	
			unit sales	share
Domestic	June 2021	0.05 %	240,900	2.6 %
Commercial	Sept. 2021	0.05 %	127,875	2.6 %

Source : Beer & Co projections

Already Installed

Figure 28 showed that the already installed base is over 200m units. With an average life assumed of 12 to 15 years, this means that each year 15m new units are installed as replacement units.

Beer & Co projects that first sales into existing applications will be about 9 months after the first sales into new appliances.

European Sales

Figure 28 shows the European market to be a smaller market, with 12m new units annually and just under 100m units installed. Figures 34 and 35 show that Beer & Co projects first sales into Europe in 2020, and penetration of about 1% after 15 years.

Figure 34 : Penetration into new sales segment

	first sales	growth	<u>by 2033</u>	
			unit sales	share
Domestic	March 2021	0.02 %	90,900	1.0 %
Commercial	June 2021	0.02 %	40,192	1.0 %

Source : Beer & Co projections

Figure 35 : Penetration into existing segment

	start	growth	<u>by 2033</u>	
			unit sales	share
Domestic	0.02 %	0.02 %	26,087	0.9 %
Commercial	0.02 %	0.02 %	40,192	0.9 %

Source : Beer & Co projections

Middle East / Other Sales

Figure 36 shows the size of the combined remaining markets from Figure 28, excluding both India and China, which are excluded from this analysis as, in Beer & Co.'s view, penetration into these markets while maintaining protection of Intellectual Property will be difficult.

Figure 36 : Total market – Middle East / Other

	Annual Sales		Installed Units	
	Domestic	Commercial	Domestic	Commercial
Middle East / Other	14m	11m	217m	131m

Source : Beer & Co projections

Figures 37 and 38 show that Beer & Co projects first sales into these markets to be delayed, due to the growth in other markets.

Figure 37 : Penetration into new sales segment

	first sales	growth	by 2033	
			unit sales	share
Domestic	March 2028	0.02 %	63,000	0.5 %
Commercial	June 2028	0.02 %	47,300	0.5 %

Source : Beer & Co projections

Figure 38 : Penetration into existing segment

	first sales	growth	by 2033	
			unit sales	share
Domestic	June 2028	0.02 %	62,207	0.5 %
Commercial	Sept. 2028	0.02 %	46,942	0.5 %

Source : Beer & Co projections

Valuation of PO3 Air Purification segment

Revenues

Figure 39 shows the unit revenues assumed by Beer & Co.

Figure 39 : Projected Unit revenues

	OEMs / New Product		Installed / Refurbished	
	Domestic	Commercial	Domestic	Commercial
USA	US\$ 450	US\$ 2,500	US\$ 675	US\$ 3,125
Europe	€ 400	€ 2,250	€ 600	€ 2,800
Japan / Korea	US\$ 450	US\$ 2,500	US\$ 675	US\$ 3,125
Middle East / Other	US\$ 500	US\$ 2,750	US\$ 750	US\$ 3,500

Source : Beer & Co projections

Domestic units have a single FRG unit while commercial air-conditioning systems have a number of FRG units.

FRG units supplied to OEMs for incorporation into manufactured product sells for a lower price than those for installed units as those supplied to OEMs come with effectively no marketing cost, other than organising shipment, while there is a sales cost for currently installed units, including technical advice.

Costs

Costs include :

- Costs for each FRG unit manufactured;
- Installation of each unit, whether by contractor or employed installer;
- Sales generation and administration;
- A royalty of 3% of sales paid to Somnio Global for the exclusive rights to the FRG technology; and
- General office overhead for each country.

COGS

Figure 40 shows Beer & Co.'s estimate of the cost of manufacture of each FRG unit.

Figure 40 : Projected COGS

	Domestic	Commercial
USA	US\$ 400	US\$ 2,200
Europe	€ 350	€ 2,000
Japan / Korea	US\$ 400	US\$ 2,200
Middle East / Other	US\$ 440	US\$ 2,420

Source : Beer & Co projections

Sales Generation and Administration

There are 2 parts to the S, G & A costs :

- The amount paid to sales and administration people; and
- The productivity of the sales and administration people.

Beer & Co assumes very high productivity for sales administration for OEM units sold, while for units sold for installed units, there is an extra cost for sales representatives.

There is also a quarterly fixed cost for each segment, covering general office and some advertising for the installed / refurbished segment.

General Office Overhead

Beer & Co.'s analysis also allows for a general office overhead cost, which increases with the value of sales each quarter.

Projected Net Cashflows

USA – New units / OEM supply

Figure 41 shows the outcome from the projections given for unit sales and resulting cashflows from sales of FRG units to OEMs / new product segment.

Figure 41 : Beer & Co.'s projected unit sales and cashflows, sales to OEMs in USA

	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 - New, Domestic																
Unit Sales	0	8,000	20,800	33,600	46,400	59,200	72,000	84,800	97,600	110,400	123,200	136,000	148,800	161,600	174,400	184,800
Revenue	US\$ 0m	US\$ 4m	US\$ 9m	US\$ 15m	US\$ 21m	US\$ 27m	US\$ 32m	US\$ 38m	US\$ 44m	US\$ 50m	US\$ 55m	US\$ 61m	US\$ 67m	US\$ 73m	US\$ 78m	US\$ 83m
COGS	US\$ 0m	(US\$3m)	(US\$8m)	(US\$13m)	(US\$19m)	(US\$24m)	(US\$29m)	(US\$34m)	(US\$39m)	(US\$44m)	(US\$49m)	(US\$54m)	(US\$60m)	(US\$65m)	(US\$70m)	(US\$74m)
Royalties	US\$ 0m	(US\$0m)	(US\$0m)	(US\$0m)	(US\$1m)	(US\$1m)	(US\$1m)	(US\$1m)	(US\$1m)	(US\$1m)	(US\$2m)	(US\$2m)	(US\$2m)	(US\$2m)	(US\$2m)	(US\$2m)
Sales, G & A	(US\$0.1m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)
Net	(US\$0m)	(US\$0m)	US\$ 0m	US\$ 1m	US\$ 1m	US\$ 2m	US\$ 2m	US\$ 3m	US\$ 3m	US\$ 4m	US\$ 4m	US\$ 4m	US\$ 5m	US\$ 5m	US\$ 6m	US\$ 6m
USA - New, Commercial																
Unit Sales	0	1,200	7,200	13,600	20,000	26,400	32,800	39,200	45,600	52,000	58,400	64,800	71,200	77,600	84,000	89,200
Revenue	US\$ 0m	US\$ 3m	US\$ 18m	US\$ 34m	US\$ 50m	US\$ 66m	US\$ 82m	US\$ 98m	US\$ 114m	US\$ 130m	US\$ 146m	US\$ 162m	US\$ 178m	US\$ 194m	US\$ 210m	US\$ 223m
COGS	US\$ 0.0m	(US\$3m)	(US\$16m)	(US\$30m)	(US\$44m)	(US\$58m)	(US\$72m)	(US\$86m)	(US\$100m)	(US\$114m)	(US\$128m)	(US\$143m)	(US\$157m)	(US\$171m)	(US\$185m)	(US\$196m)
Royalties	US\$ 0m	(US\$0m)	(US\$1m)	(US\$1m)	(US\$2m)	(US\$2m)	(US\$2m)	(US\$3m)	(US\$3m)	(US\$4m)	(US\$4m)	(US\$5m)	(US\$5m)	(US\$6m)	(US\$6m)	(US\$7m)
Sales, G & A	US\$ 0.0m	(US\$0.4m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)	(US\$0.5m)
Net	US\$ 0m	(US\$0m)	US\$ 1m	US\$ 3m	US\$ 4m	US\$ 5m	US\$ 7m	US\$ 8m	US\$ 10m	US\$ 11m	US\$ 13m	US\$ 14m	US\$ 16m	US\$ 17m	US\$ 18m	US\$ 20m

Source : Beer & Co projections

USA – supply for existing installations / refurbishments

Figure 42 shows the outcome from the projections given for unit sales and resulting cashflows from sales of FRG units to existing installations, at the time refurbishment is required.

Figure 42 : Beer & Co.'s projected unit sales and cashflows, USA refurbishments

	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 - Installed, Domestic																
Unit Sales	0	0	2,410	14,460	27,313	40,167	53,020	65,873	78,727	91,580	104,433	117,287	130,140	142,993	155,847	166,290
Revenue	US\$ 0m	US\$ 0m	US\$ 2m	US\$ 10m	US\$ 18m	US\$ 27m	US\$ 36m	US\$ 44m	US\$ 53m	US\$ 62m	US\$ 70m	US\$ 79m	US\$ 88m	US\$ 97m	US\$ 105m	US\$ 112m
COGS	US\$ 0.0m	US\$ 0m	(US\$1m)	(US\$6m)	(US\$11m)	(US\$16m)	(US\$21m)	(US\$26m)	(US\$31m)	(US\$37m)	(US\$42m)	(US\$47m)	(US\$52m)	(US\$57m)	(US\$62m)	(US\$67m)
Royalties	US\$ 0m	US\$ 0m	(US\$0m)	(US\$0m)	(US\$1m)	(US\$1m)	(US\$1m)	(US\$1m)	(US\$2m)	(US\$2m)	(US\$2m)	(US\$2m)	(US\$3m)	(US\$3m)	(US\$3m)	(US\$3m)
Sales, G & A	US\$ 0.0m	US\$ 0.0m	(US\$0.8m)	(US\$1.2m)	(US\$1.3m)	(US\$1.5m)	(US\$1.7m)	(US\$1.8m)	(US\$2.0m)	(US\$2.2m)	(US\$2.4m)	(US\$2.5m)	(US\$2.7m)	(US\$2.9m)	(US\$3.1m)	(US\$3.2m)
Net	US\$ 0m	US\$ 0m	(US\$0m)	US\$ 3m	US\$ 6m	US\$ 9m	US\$ 12m	US\$ 15m	US\$ 18m	US\$ 21m	US\$ 24m	US\$ 27m	US\$ 30m	US\$ 34m	US\$ 37m	US\$ 39m
USA - Installed, Commercial																
Unit Sales	0	0	5,500	14,300	23,100	31,900	40,700	49,500	58,300	67,100	75,900	84,700	93,500	102,300	109,450	
Revenue	US\$ 0m	US\$ 0m	US\$ 0m	US\$ 17m	US\$ 45m	US\$ 72m	US\$ 100m	US\$ 127m	US\$ 155m	US\$ 182m	US\$ 210m	US\$ 237m	US\$ 265m	US\$ 292m	US\$ 320m	US\$ 342m
COGS	US\$ 0m	US\$ 0m	US\$ 0m	(US\$12m)	(US\$31m)	(US\$51m)	(US\$70m)	(US\$90m)	(US\$109m)	(US\$128m)	(US\$148m)	(US\$167m)	(US\$186m)	(US\$206m)	(US\$225m)	(US\$241m)
Royalties	US\$ 0m	US\$ 0m	US\$ 0m	(US\$1m)	(US\$1m)	(US\$2m)	(US\$3m)	(US\$4m)	(US\$5m)	(US\$5m)	(US\$6m)	(US\$7m)	(US\$8m)	(US\$9m)	(US\$10m)	(US\$10m)
Sales, G & A	US\$ 0.0m	US\$ 0.0m	(US\$0.3m)	(US\$1.2m)	(US\$1.4m)	(US\$1.8m)	(US\$2.0m)	(US\$2.3m)	(US\$2.6m)	(US\$2.8m)	(US\$3.1m)	(US\$3.4m)	(US\$3.7m)	(US\$4.0m)	(US\$4.3m)	(US\$4.5m)
Net	US\$ 0m	US\$ 0m	(US\$0m)	US\$ 3m	US\$ 10m	US\$ 17m	US\$ 25m	US\$ 32m	US\$ 39m	US\$ 46m	US\$ 53m	US\$ 60m	US\$ 67m	US\$ 74m	US\$ 81m	US\$ 87m

Source : Beer & Co projections

Europe – supply for existing installations / refurbishments

Figure 46 shows the outcome from the projections given for unit sales and resulting cashflows from sales of FRG units to existing installations, at the time refurbishment is required.

Figure 46 : Beer & Co.'s projected unit sales and cashflows, European refurbishments

	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
Europe - Installed, Domestic																
Unit Sales	0	0	0	143	2,007	4,300	6,593	8,887	11,180	13,473	15,767	18,060	20,253	22,647	24,940	26,803
Revenue	€ 0m	€ 0m	€ 0m	€ 0m	€ 1m	€ 3m	€ 4m	€ 5m	€ 7m	€ 8m	€ 9m	€ 11m	€ 12m	€ 14m	€ 15m	€ 16m
COGS	€ 0m	€ 0m	€ 0m	(€0m)	(€1m)	(€2m)	(€2m)	(€3m)	(€4m)	(€5m)	(€6m)	(€6m)	(€7m)	(€8m)	(€9m)	(€9m)
Royalties	€ 0m	€ 0m	€ 0m	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)	(€0m)
Sales, G & A	€ 0.0m	€ 0.0m	€ 0.0m	€ 0.0m	(€1.0m)	(€1.0m)	(€1.0m)	(€1.0m)	(€1.1m)	(€1.1m)	(€1.1m)	(€1.1m)	(€1.2m)	(€1.2m)	(€1.2m)	(€1.2m)
Net	€ 0m	€ 0m	€ 0m	€ 0.0m	(€0.5m)	€ 0.0m	€ 0.6m	€ 1.1m	€ 1.5m	€ 2.1m	€ 2.6m	€ 3.1m	€ 3.6m	€ 4.1m	€ 4.6m	€ 5.1m
Europe - Installed, Commercial																
Unit Sales	0	0	0	221	3,092	6,625	10,158	13,692	17,225	20,758	24,292	27,825	31,358	34,892	38,425	41,296
Revenue	€ 0m	€ 0m	€ 0m	€ 1m	€ 9m	€ 19m	€ 28m	€ 38m	€ 48m	€ 58m	€ 68m	€ 78m	€ 88m	€ 98m	€ 108m	€ 116m
COGS	€ 0m	€ 0m	€ 0m	(€0m)	(€6m)	(€13m)	(€20m)	(€27m)	(€34m)	(€42m)	(€49m)	(€56m)	(€63m)	(€70m)	(€77m)	(€83m)
Royalties	€ 0m	€ 0m	€ 0m	(€0m)	(€0m)	(€1m)	(€1m)	(€1m)	(€1m)	(€2m)	(€2m)	(€2m)	(€3m)	(€3m)	(€3m)	(€3m)
Sales, G & A	€ 0.0m	€ 0.0m	€ 0.0m	(€0.5m)	(€1.0m)	(€1.1m)	(€1.2m)	(€1.3m)	(€1.4m)	(€1.5m)	(€1.5m)	(€1.6m)	(€1.7m)	(€1.8m)	(€1.9m)	(€2.0m)
Net	€ 0m	€ 0m	€ 0m	(€0.3m)	€ 1.2m	€ 3.7m	€ 6.1m	€ 8.5m	€ 11m	€ 13m	€ 16m	€ 18m	€ 21m	€ 23m	€ 26m	€ 28m

Source : Beer & Co projections

Middle East / Other –

Figures 29 and 30 showed that Beer & Co projects a delayed start into these markets. As a result, the value generated is not significant.

Comment on Projected Market shares

Figure 47 summarises the addressable global market for air-conditioning used in this analysis, excluding India and China.

Figure 47 : Global air-conditioning market

	<u>Annual Sales</u>		<u>Installed Units</u>	
	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
TOTAL	50m	26m	647m	378m

Source : Beer & Co projections

Figure 48 shows the projections developed by Beer & Co in this analysis for the penetration achieved by PO3 for the FRG technology in the air-conditioning segment by 2033-34, which is in 15 years from now.

Figure 48 : Beer & Co.'s projections for PO3, by 2033

	<u>Annual Sales</u>		<u>Installed Units</u>	
	Domestic	Commercial	Domestic	Commercial
U S A	0.20m	0.10m	1.3m	0.8m
Europe	0.10m	0.03m	0.2m	0.3m
Japan / Korea	0.30m	0.11m	1.7m	1.7m
Middle East / Other	0.07m	0.05m	0.26m	0.20m
TOTAL	0.67m	0.29m	3.4m	3.0m

Source : Beer & Co projections

Figure 48 shows that Beer & Co projects that in 15 years from now, PO3 will have achieved :

- Annual sales of 1.38m units into the residential / domestic sector in the USA; and
- Total cumulative sales over the period of 11.3m units into the installed units / refurbishment sector.

Water Sanitation

Water Sanitation Technology

There is a range of technologies employed for water sanitation, with chlorine being the most common.

Chemical treatment

As shown in Figure 49, there are many other methods which are more effective than chlorine, with ozone and atomic oxygen rated much more highly.

Also, there are many negatives to chemical treatment, including :

- Corrosion, especially with salt systems; and
- Chemical irritation, especially with chlorine.

Ultra-Violet light

UV light does not destroy bacteria or other organics, but prevents their reproduction by disrupting the structure of the RNA / DNA of bacteria.

Also, the light does not reach all parts of the water, due to shadows, and the remaining bacteria continue to breed.

Ozone Systems

At present, there are up to 10 different ozone systems available.

However, all of them, according to Somnio Global's consultant, have over-promised and under-delivered due to a combination of cost, complexity, poor reliability and also not being able to deliver sufficient ozone.

The other issue with ozone is that, while it has a life of about 30 minutes, it is a recognised lung irritant and concentrations are limited by health authorities, which require excess ozone to be destroyed.

Figure 50 shows the configuration developed by Somnio Global for use in swimming pools. In particular note the mixing chambers which ensures that all the ozone is mixed into water.

Figure 49 : Oxidising power

Compound	Oxidation Potential (volts)
Fluorine	3.06 v
Hydroxyl radical (OH)	2.80 v
atomic Oxygen (O)	2.42 v
Ozone (O ₃)	2.07 v
Hydrogen Peroxide (H ₂ O ₂)	1.77 v
Permananate (KMnO ₄)	1.67 v
Chlorine oxide	1.50 v
Chlorine (Cl)	1.36 v
Bromine (Br)	1.09 v
Iodine (I)	0.54 v
Oxygen (O ₂)	0.40 v

Source :

Figure 50 : Ozone modules for swimming pools



Source : Somnio Global

Value Proposition

Capital Cost

The size of a typical domestic in-ground pool is about 55,000 litres (8m x 4.5m x 1.5m). The cost of water treatment at the time of installation is about \$1,500 to \$2,000 per pool.

The cost of the unit show in Figure 28 will be about \$750.

The cost to the installer will be about \$1,250, or a sales margin of 66%, from which sales and admin costs need to be deducted.

Operating Cost

The operation of a pool requires about \$250 a year in chemicals (usually chlorine, flocculants and balancing chemicals), as well as the energy to run the systems.

Using the FRG unit as part of the normal filtration system requires, on its own, about 200W per hour, or about 365kWh a year of off-peak electricity, or about \$35 a year.

Outcomes / Effectiveness

PO3's Executive Director has been running this system at his own home for one season as a field trial and attests that the water is fresh and extremely clean without the usual chlorine smell and taste.

Users of the trial system have also reported a cleaner "taste and feel" to the water, especially in enclosed environments, with no need for goggles when swimming as the water is clear and does not contain irritants.

USA Market

PO3 has already trialled FRG technology for swimming pools. Beer & Co expects that PO3 will be able to secure first sales at the end of 2018.

Market Size

Figure 51 shows 2013 data compiled by the Association of Pool & Spa Professionals from USA, showing

- a total installed base of about 14.7m units; and
- about 440k new units installed in 2013
 - the number of new in-ground pools has varied from a high of 180k in 2005 to a low of about 45k in 2008. In the wake of the GFC, with a recovering trend since about 2011.

Figure 51 : Pools in USA

	In-Ground	Above Ground	Hot tubs	Commercial	TOTAL
Installed	5,060k	3,530k	5,820k	309k	14,719k
New installations	70k	150k	170k	3k	393k

Source : Association of Pool and Spa Professionals, 2013 (USA)

Projected Penetration by PO3

Figure 52 : New Installations

	first sales	growth	by 2033	
			unit sales	share
In-Ground	March 2019	0.30 %	12,285	18.0 %
Above Ground	June 2019	0.30 %	25,875	17.7 %
Hot tubs	Sept. 2020	0.30 %	26,775	16.2 %
Commercial	Sept. 2019	0.30 %	509	17.4 %

Source : Beer & Co projections

Figure 53 : Existing Installations

	first sales	growth	by 2033	
			unit sales	share
In-Ground	June 2019	0.30 %	58,190	17.7 %
Above Ground	Sept. 2019	0.30 %	39,889	17.4 %
Hot tubs	Sept. 2020	0.30 %	114,581	16.2 %
Commercial	Dec. 2019	0.30 %	5,145	17.1 %

Source : Beer & Co projections

Figure 52 shows that Beer & Co projects first sales in North America in early 2019, with the various segments trailing with various time lags due to both a demonstration effect and also marketing time.

The hot tub (spa) segment is shown as lagging as UV systems appear to be favoured, despite The Association of Pool & Spa Professionals reporting that 56.8% of hot tubs and spas are in violation of local environmental health ordinances, and about 11% require immediate closure, according to the US Centres for Disease Control (CDC), due to Cryptosporidium which is a chlorine-tolerant parasite that can survive in a properly chlorinated pool for 3.5–10.6 days.

The FRG system is able to eliminate cryptosporidium.

As shown in Figure 54, Beer & Co has made certain assumptions about the life of current installations, which mean that about 570,000 domestic systems are renewed / refurbished each year and Beer & Co projects that only about 17% of these refurbishments install the FRG system

Figure 54 : Assumed system life

Pools	Hot Tubs	Commercial
15 yrs	8 yrs	10 yrs

Source : Beer & Co projections

Australia

Figure 55 shows the data that Beer & Co has been able to locate on the size of the pool market in Australia, based on data from :

- December 2007 survey by the Australian Bureau of Statistics; and
- December 2007 data from the Royal Life Saving Society.

Figure 55 : Australian pools

	Domestic pools	Commercial
Installed	1,020k	1,885
New installations	20k	

Source : ABS, RLSS, Beer & Co

Figure 56 shows Beer & Co.'s projections for the FRG system to penetrate the population of Australian pools, with first sales by the end of this calendar year.

Figure 56 : FRG penetration in Australian pools

Australia	first sales	growth	by 2033	
			unit sales	share
Domestic - New	Dec. 2018	0.50 %	5,950	31 %
Domestic - Installed	June 2019	0.50 %	19,550	30 %
Commercial	June 2019	0.50 %	54	30 %

Source : Beer & Co projections

And a relatively high growth rate, which is due partly to the relatively small size of the market and also its concentration.

Europe

Data from the European Union of Swimming Pool and Spa Associations (EUSA) in February 2016 is summarised in Figure 57.

Figure 57: European pools

	Domestic pools	Commercial
Installed	2,500k	350k

Source : EUSA, February 2016, Beer & Co

Figure 58 shows Beer & Co.'s projections for the FRG system to penetrate the population of European pools.

Figure 58 : FRG penetration in European pools

	first sales	growth	by 2033	
			unit sales	share
Domestic	March 2020	0.30 %	27,250	16.8 %
Commercial	Sept. 2020	0.30 %	5,513	16.2 %

Source : Beer & Co projections

Water Treatment - Other

While there are further geographies to which FRG can be applied to swimming pool applications, Beer & Co has not attributed any further value to any of these opportunities.

Neither has Beer & Co given any value for other segments to which FRG technology can be applied, including :

- Desalination pre-treatment;
- Treatment of brackish water, drinking water, waste water, ballast water
- Microbial and oxygen control in lakes and rivers;
- Treatment of waste water from industrial, mining and oil & gas operations.

Valuation of PO3 Water Treatment Segment

Revenues

Figure 59 shows the revenues for each unit sale, by segment, assumed by Beer & Co in this analysis.

Figure 59 : Projected Unit Revenues

	Domestic	Hot Tubs	Commercial
USA	US\$ 1,250	US\$ 1,000	US\$ 15,000
Australia	\$A 1,500	n/a	\$A 25,000
Europe	€ 1,250	n/a	€ 15,000

Source : Beer & Co estimates

Costs

Costs include :

- Manufacturing costs for FRG unit;
- Installation of each unit, whether by contractor or employed installer;
- Sales generation and administration;
- A royalty of 3% of sales paid to Somnio Global for the exclusive rights to the FRG technology; and
- General office overhead for each country.

COGS

Figure 60 shows the costs, projected by Beer & Co, for unit sales in each segment. This cost includes the payment for the manufacture of each unit supplied plus also the cost of each installation.

Figure 60 : Projected COGS

	Domestic	Hot Tubs	Commercial
USA	US\$ 750	US\$ 600	US\$ 8,000
Australia	\$A 800		\$A 15,000
Europe	€ 700		€ 8,000

Source : Beer & Co estimates

Projected Net Cashflows

USA

Figure 61 shows Beer & Co.'s projected unit sales and cashflows for the newly installed segment for USA, based on the data shown in Figures 52, 59 and 60.

Figure 62 shows Beer & Co.'s projected unit sales and cashflows for the refurbished segment for USA, based on the data shown in Figures 53, 54, 59 and 60.

Figure 63 shows the resulting net cashflow projected by Beer & Co for PO3's USA operations.

Figure 65 shows the resulting net cashflow projected by Beer & Co for PO3's Australian operations.

Figure 65 : Beer & Co.'s projected cashflows for PO3's operations in Australia

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
Revenue	0.4	2.6	5.3	7.9	11	13	16	18	21	24	26	29	32	34	37	39
COGS	(0.2)	(1.4)	(2.8)	(4.2)	(5.6)	(7.0)	(8.4)	(9.8)	(11)	(13)	(14)	(15)	(17)	(18)	(20)	(21)
Sales, G & A	(0.2)	(0.6)	(1.1)	(1.6)	(2.2)	(2.7)	(3.2)	(3.8)	(4.3)	(4.8)	(5.3)	(5.9)	(6.4)	(6.9)	(7.5)	(7.8)
Royalties	(0.0)	(0.1)	(0.2)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.7)	(0.7)	(0.8)	(0.9)	(1.0)	(1.1)	(1.1)	(1.2)
General Overhead	(0.5)	(0.5)	(0.5)	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)
EBITDA	(0.5)	0.0	0.6	1.3	1.9	2.5	3.1	3.7	4.3	4.9	5.5	6.1	6.7	7.3	7.9	8.5

Source : Beer & Co estimates

Europe

Figure 66 shows Beer & Co.'s projected unit sales and cashflows for Australia, based on the data shown in Figures 58, 59 and 60.

Figure 66 : Beer & Co.'s projected unit sales and cashflows FRG sales in Europe

	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
Domestic Pools																
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	€ 0.0m	€ 0.5m	€ 2.8m	€ 5.3m	€ 7.8m	€ 10.3m	€ 12.8m	€ 15.3m	€ 17.8m	€ 20.3m	€ 22.8m	€ 25.3m	€ 27.8m	€ 30.3m	€ 32.8m	€ 34.8m
COGS	€ 0.0m	(€0.3m)	(€1.6m)	(€3.0m)	(€4.4m)	(€5.8m)	(€7.2m)	(€8.6m)	(€10.0m)	(€11.4m)	(€12.8m)	(€14.2m)	(€15.6m)	(€17.0m)	(€18.4m)	(€19.5m)
Sales, G & A	€ 0.0m	(€0.3m)	(€0.7m)	(€1.2m)	(€1.6m)	(€2.1m)	(€2.6m)	(€3.0m)	(€3.5m)	(€4.0m)	(€4.4m)	(€4.9m)	(€5.4m)	(€5.8m)	(€6.3m)	(€6.6m)
Commercial Pools																
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	€ 0.0m	€ 0.0m	€ 3.9m	€ 10.2m	€ 16.5m	€ 22.8m	€ 29.1m	€ 35.4m	€ 41.7m	€ 48.0m	€ 54.3m	€ 60.6m	€ 66.9m	€ 73.2m	€ 79.5m	€ 84.7m
COGS	€ 0.0m	€ 0.0m	(€2.1m)	(€5.5m)	(€8.8m)	(€12.2m)	(€15.5m)	(€18.9m)	(€22.3m)	(€25.6m)	(€29.0m)	(€32.3m)	(€35.7m)	(€39.1m)	(€42.4m)	(€45.2m)
Sales, G & A	€ 0.0m	(€0.0m)	(€0.5m)	(€0.9m)	(€1.3m)	(€1.7m)	(€2.1m)	(€2.6m)	(€3.0m)	(€3.4m)	(€3.8m)	(€4.2m)	(€4.7m)	(€5.1m)	(€5.5m)	(€5.7m)

Source : Beer & Co estimates

Figure 67 shows the resulting net cashflow projected by Beer & Co for PO3's European operations.

Figure 67 : Beer & Co.'s projected cashflows for PO3's operations in Europe

EUR 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
Revenue	0.0	0.5	6.8	16	24	33	42	51	60	68	77	86	95	104	112	120
COGS	0.0	(0.3)	(3.7)	(8.4)	(13)	(18)	(23)	(27)	(32)	(37)	(42)	(47)	(51)	(56)	(61)	(65)
Sales, Overhead	0.0	(0.4)	(0.8)	(1.1)	(1.4)	(1.8)	(2.1)	(2.5)	(2.8)	(3.2)	(3.5)	(3.8)	(4.2)	(4.5)	(4.9)	(5.1)
Royalties	0.0	(0.4)	(1.2)	(2.1)	(2.9)	(3.9)	(4.7)	(5.6)	(6.5)	(7.4)	(8.3)	(9.2)	(10.0)	(10.9)	(11.8)	(12.3)
EBITDA	0.0	(0.5)	1.1	3.9	6.8	10	12	15	18	21	24	26	29	32	35	37

Source : Beer & Co estimates

Surface Sterilisation

Introduction

Data from the US Centre for Disease Control shows that 1 in every 25 hospital patients will contract a Hospital Acquired Infection. Of those, 1 in 9 will die. HAIs cost the US healthcare industry upwards of \$42 billion dollars annually.

In their ASX announcement of 17 April 2018, WRG (now PO3) announced that the independent test laboratory, Aerosol Research and Engineering Laboratories in Kansas had provided a final report on its testing of the Air Purification technology :

- Kill rate of 99.999% of bacteria in the test room within 90 minutes;
- Kill rate of 99.9999% of viruses in the test room within 90 minutes; and
- Removal of particulates down to 0.5µ (or 5/10,000 of a millimetre).

Whilst testing the air purifier, the results are relevant for PO3's "BlueMist" technology for surface sterilisation; both use the FRG to destroy microbial agents, with "BlueMist" using water-based mist feed streams to produce the hydroxyl radical ($\bullet\text{OH}$) which, as shown in Figure 49, is one of the most powerful oxidizing agents. It is able to react instantaneously with surrounding impurities, including organic and inorganic pollutants.

Because hydroxyl radicals have a very short lifetime, they need to be produced at the point of utilisation.

The potential commercial opportunities include :

- Medical Facilities and laboratories
- Pharmaceutical Operations
- Bio Storage Facilities; and
- Food Processing Operations.

Unlike Fluorine and Chlorine, the impact of hydroxyl on the infrastructure and environment is negligible.

Competitor Technologies

Current technology for hospitals is to wash a room in chlorine. However :

- Chlorine is NOT effective against some of the more dangerous infectants; while the test results, announced on 13 February, 17 April and 26 June indicate that PO3's Bluemist surface sterilisation technology should be effective;
- Using chlorine is expensive as it is manually applied, while the Blue Mist applicator is a small robot; and
- Using chlorine is expensive as the room is out of action for service for at least 24 hours, while the Blue Mist aims leaves a room available to be re-used within 60 minutes.

Figures 68 and 69 show alternative methods, bathing a room in UV light, which can be very effective, subject to :

- There being no shadows, so that the UV Light contacts all infectants; and
- As UV light does not actually destroy the infecting organisms, but instead disrupts their reproduction, the room needs to be kept vacant for the life of the infectors for the technology to be effective.

Figure 68 : Tru-D SmartUVC, Ultra-Violet system



Source : <https://tru-d.com/>

Fig 69 : Xenex UV



<https://www.xenex.com/>

Commercialisation

In their 26 June 2018 ASX announcement, PO3 stated that planning had started to trial a system in a clinical laboratory environment at Monash University Department of Infectious Diseases.

Beer & Co expects that these results will be available soon and then will need to be repeated in various test sites.

Beer & Co expects that PO3 will sell robotic units, similar to those in Figures 68 and 69, directly rather than through third parties.

This is in contrast to the Air Purification, where PO3 will sell an FRG unit that an OEM will incorporate into their unit, and Water Sanitation, where Beer & Co expects PO3 to sell an FRG unit that will be incorporated into a site installation.

The reasons Beer & Co expects PO3 to sell surface sterilisation units directly include :

- PO3 will be generating cash from the other 2 segments; and
- The market is potentially much smaller in terms of the number of units;
- The approvals and verification process will take significant time and this will be shared with the technology developer; and
- Each unit will have a much higher value than in the other segments.

Market Size and Penetration

In their ASX announcement of 17 April 2018, 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 Beer & Co is using an estimated potential market size of 1,000,000.

From this, Beer & Co has estimated the potential market size and the rate of penetration shown in Figure 70.

Figure 70 : Surface Sterilisation – potential 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 : PO3 ASX announcement 17 April 2018, Beer & Co estimates

Figure 70 shows that Beer & Co projects that first sales are nearly 2 years from now and that roll-out is slow as subsequent markets wait to see the results of the early adopters.

PO3's Bluemist unit is yet to be fully developed, but will incorporate features to produce "dry fog", which is water droplets less than 10 μ in size (ie. less than 10% of a human hair) to ensure that equipment in the room does not become damp, but settles on all surfaces, including full coverage of vertical surfaces, the ceiling and areas under beds, etc.

Revenue

The units shown in Figures 68 and 69 sell for US\$ 80,000 to US\$ 120,000.

Beer & Co expects that PO3 will be able to sell its FRG units, which will out-perform the UV based units, for at least US\$ 75,000.

Costs

Costs include :

- Manufacturing costs for each unit sold
- Sales representatives;
- Sales administration;
- A royalty of 3% of sales paid to Somnio Global for the exclusive rights to the FRG technology; and
- General office overhead for each country.

These details are shown in Figures 71 and 72 below.

Figure 71 : Cost details, Surface Sterilisation

	Sales Revenue	C O G S	fixed	Sales reps	productivity
USA	US\$ 75,000	US\$ 33,750	US\$ 0.1m	US\$ 150k	25
Europe	€ 67,500	€ 27,000	€ 0.1m	€ 120k	20
Japan / Korea	US\$ 75,000	US\$ 30,000	US\$ 0.1m	US\$ 150k	20

Source : Beer & Co estimates

Figure 72 : General Overhead

	Annual, fixed cost	Sales related
USA	US\$ 0.5m	0.20 %
Europe	€ 0.5m	0.20 %
Japan / Korea	US\$ 0.5m	0.20 %

Source : Beer & Co estimates

Projected net Cashflows

USA

Figure 73 shows the cashflows projected by Beer & Co for the surface sterilisation application of the FRG technology in North America.

Figure 73 : Beer & Co.'s projected net cashflow, North America, Surface Sterilisation

	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
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	US\$ 9.0m	US\$ 105m	US\$ 225m	US\$ 345m	US\$ 465m	US\$ 585m	US\$ 705m	US\$ 825m	US\$ 945m	US\$ 1,065m	US\$ 1,185m	US\$ 1,305m	US\$ 1,425m	US\$ 1,545m	US\$ 1,643m
C O G S	(US\$4.1m)	(US\$47m)	(US\$101m)	(US\$155m)	(US\$209m)	(US\$263m)	(US\$317m)	(US\$371m)	(US\$425m)	(US\$479m)	(US\$533m)	(US\$587m)	(US\$641m)	(US\$695m)	(US\$739m)
Royalties	(US\$0.3m)	(US\$3.2m)	(US\$6.8m)	(US\$10m)	(US\$14m)	(US\$18m)	(US\$21m)	(US\$25m)	(US\$28m)	(US\$32m)	(US\$36m)	(US\$39m)	(US\$43m)	(US\$46m)	(US\$49m)
S, G & A	(US\$1.5m)	(US\$3.9m)	(US\$6.3m)	(US\$9m)	(US\$11m)	(US\$13m)	(US\$16m)	(US\$18m)	(US\$21m)	(US\$23m)	(US\$25m)	(US\$28m)	(US\$30m)	(US\$33m)	(US\$34m)
General Overhead	(US\$0.4m)	(US\$0.9m)	(US\$1.3m)	(US\$1.7m)	(US\$2.2m)	(US\$2.6m)	(US\$3.0m)	(US\$3.4m)	(US\$3.8m)	(US\$4.3m)	(US\$4.7m)	(US\$5.1m)	(US\$5.5m)	(US\$5.9m)	(US\$6.3m)
E B I T D A	US\$ 2.8m	US\$ 50m	US\$ 109m	US\$ 169m	US\$ 229m	US\$ 288m	US\$ 348m	US\$ 407m	US\$ 467m	US\$ 527m	US\$ 586m	US\$ 646m	US\$ 705m	US\$ 765m	US\$ 814m

Source : Beer & Co projections

If we assume that each unit has a life of 10 years, so that the market in any single year is potentially 100,000 units, then Figure 73 shows that Beer & Co projects that after 15 years the technology achieves a penetration of nearly 22%, with about 15% of the total market having a bluemist machine.

Europe

Figure 74 shows the cashflows projected by Beer & Co for the surface sterilisation application of the bluemist machine in Europe. It shows that, after 15 years, assuming a life of 10 years for a unit, sales are under 21% of the annual market, and total penetration achieved is 14%.

Figure 74 : Beer & Co.'s projected net cashflow, Europe, Surface Sterilisation

	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
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	€ 0.0m	€ 19.4m	€ 109.4m	€ 206.6m	€ 303.8m	€ 401.0m	€ 498.2m	€ 595.4m	€ 692.6m	€ 789.8m	€ 887.0m	€ 984.2m	€ 1,081.4m	€ 1,178.6m	€ 1,257.5m
C O G S	€ 0.0m	(€7.8m)	(€43.7m)	(€82.6m)	(€121.5m)	(€160.4m)	(€199.3m)	(€238.1m)	(€277.0m)	(€315.9m)	(€354.8m)	(€393.7m)	(€432.5m)	(€471.4m)	(€503.0m)
Royalties	€ 0.0m	(€0.6m)	(€3.3m)	(€6.2m)	(€9.1m)	(€12.0m)	(€14.9m)	(€17.9m)	(€20.8m)	(€23.7m)	(€26.6m)	(€29.5m)	(€32.4m)	(€35.4m)	(€37.7m)
S, G & A	(€0.1m)	(€1.8m)	(€4.0m)	(€6.2m)	(€8.3m)	(€10.5m)	(€12.6m)	(€14.8m)	(€17.0m)	(€19.1m)	(€21.3m)	(€23.4m)	(€25.6m)	(€27.8m)	(€28.6m)
General Overhead	€ 0.0m	(€0.6m)	(€0.8m)	(€1.0m)	(€1.2m)	(€1.4m)	(€1.5m)	(€1.7m)	(€1.9m)	(€2.1m)	(€2.3m)	(€2.5m)	(€2.7m)	(€2.9m)	(€3.0m)
E B I T D A	(€0.1m)	€ 8.7m	€ 57.6m	€ 110.6m	€ 163.7m	€ 217m	€ 270m	€ 323m	€ 376m	€ 429m	€ 482m	€ 535m	€ 588m	€ 641m	€ 685m

Source : Beer & Co projections

Japan / Korea

Figure 75 shows the cashflows projected by Beer & Co for the surface sterilisation application of the bluemist machine in Europe. It shows that, after 15 years, assuming a life of 10 years for a unit, sales less than 20% of the annual market, and total penetration achieved is under 13%.

Figure 75 : Beer & Co.'s projected net cashflow, Japan / Korea, Surface Sterilisation

	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
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	US\$ 0.0m	US\$ 0.0m	US\$ 23.3m	US\$ 82.5m	US\$ 142.5m	US\$ 202.5m	US\$ 262.5m	US\$ 322.5m	US\$ 382.5m	US\$ 442.5m	US\$ 502.5m	US\$ 562.5m	US\$ 622.5m	US\$ 682.5m	US\$ 731.3m
C O G S	US\$ 0.0m	US\$ 0.0m	(US\$9.3m)	(US\$33.0m)	(US\$57.0m)	(US\$81.0m)	(US\$105.0m)	(US\$129.0m)	(US\$153.0m)	(US\$177.0m)	(US\$201.0m)	(US\$225.0m)	(US\$249.0m)	(US\$273.0m)	(US\$292.5m)
Royalties	US\$ 0.0m	US\$ 0.0m	(US\$0.7m)	(US\$2.5m)	(US\$4.3m)	(US\$6.1m)	(US\$7.9m)	(US\$9.7m)	(US\$11.5m)	(US\$13.3m)	(US\$15.1m)	(US\$16.9m)	(US\$18.7m)	(US\$20.5m)	(US\$21.9m)
S, G & A	US\$ 0.0m	(US\$0.4m)	(US\$1.8m)	(US\$3.3m)	(US\$4.8m)	(US\$6.3m)	(US\$7.8m)	(US\$9.3m)	(US\$10.8m)	(US\$12.3m)	(US\$13.8m)	(US\$15.3m)	(US\$16.8m)	(US\$18.3m)	(US\$18.9m)
General Overhead	US\$ 0.0m	(US\$0.1m)	(US\$0.6m)	(US\$0.7m)	(US\$0.8m)	(US\$0.9m)	(US\$1.1m)	(US\$1.2m)	(US\$1.3m)	(US\$1.4m)	(US\$1.5m)	(US\$1.7m)	(US\$1.8m)	(US\$1.9m)	(US\$1.6m)
EBITDA	US\$ 0.0m	(US\$0.5m)	US\$ 10.9m	US\$ 43.0m	US\$ 75.6m	US\$ 108.2m	US\$ 140.7m	US\$ 173.4m	US\$ 206m	US\$ 238m	US\$ 271m	US\$ 304m	US\$ 336m	US\$ 369m	US\$ 396m

Source : Beer & Co projections

PO3 Valuation

Net Projected Cashflows

Figures 41, 42, 43, 44, 45, 46, 63, 65, 67, 73, 74 and 75 showed Beer & Co.'s projected EBITDA for each identified segment.

PO3 will out-source the manufacture of nearly all the components, but will still require some capital for assembly facilities. Also, due to the terms offered for sales and marketing before sales are able to be concluded, there will be a need for significant working capital. In addition, taxes need to be paid in each of the jurisdictions.

Figures 76, 77 and 78 show Beer & Co.'s net projected cashflow for each segment, translated into AUD at rates of :

- AUD / USD = 0.750;
- USD / EUR = 1.200; and
- AUD / EUR = 1.600.

Air Purification

Figure 76 shows the EBITDAs projected by Beer & Co for each region in the Air Purification segment, translated into AUD, less taxes.

Figure 76 : Beer & Co.'s projected net cashflows, Air Purification, in AUDm

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																
EBITDA	(0.5)	(1.0)	1	12	28	44	59	75	91	107	123	139	155	171	187	201
taxes paid	0.0	0.0	(0.1)	(2.0)	(5)	(9)	(12)	(16)	(20)	(23)	(27)	(30)	(34)	(38)	(41)	(45)
Net	(0.5)	(1.0)	1	10	22	35	47	59	72	84	97	109	121	134	146	156
Japan / Korea																
EBITDA	0.0	(0.5)	(0.7)	16	36	57	78	99	120	141	161	182	203	224	245	262
taxes paid	0.0	0.0	0.0	(1.0)	(8)	(14)	(20)	(26)	(32)	(38)	(44)	(50)	(56)	(62)	(68)	(74)
Net	0.0	(0.5)	(0.7)	15	28	43	58	73	87	102	117	132	147	161	176	188
Europe																
EBITDA	0.0	0.0	(1.6)	(2)	1	7	13	18	24	30	36	42	47	53	59	64
taxes paid	0.0	0.0	0.0	0.0	(0.2)	(2)	(3)	(5)	(6)	(8)	(9)	(11)	(13)	(14)	(16)	(18)
Net	0.0	0.0	(1.6)	(2)	1	5	10	14	18	22	26	31	35	39	43	46
Middle East / Other																
EBITDA	0	0	0	0	0	0	0	0	0	(1)	21	51	80	110	139	163
taxes paid	0	0	0	0	0	0	0	0	0	0	(2)	(12)	(20)	(29)	(38)	(46)
Net	0	0	0	0	0	0	0	0	0	(1)	19	39	60	81	101	117
TOTAL	(0)	(2)	(2)	22	51	83	114	146	177	208	259	310	362	415	467	507

Source : Beer & Co projections

Taxes are subduced in early years due to tax losses carried forward and also the lag between taxable income and actual tax payment.

Figure 76 shows growth in cashflows over time which follows from the assumption of increasing market penetration due to the superiority of the technology.

Water Sanitation

Figure 77 shows the EBITDAs projected by Beer & Co for each region in the Air Purification segment, translated into AUD, less taxes.

Figure 77 : Beer & Co.'s projected net cashflows, 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																
EBITDA	(0.8)	1.5	7	13	19	26	32	38	44	51	57	63	69	76	82	88
taxes paid	0.0	0.0	(0.7)	(2.3)	(3.8)	(5.2)	(6.7)	(8)	(10)	(11)	(12)	(14)	(15)	(17)	(18)	(20)
Net	(0.8)	1.5	6	11	16	20	25	30	35	40	45	49	54	59	64	68
Australia																
EBITDA	(0.5)	(0.0)	0.5	1.2	1.8	2	3	4	4	5	6	6	7	8	8	9
taxes paid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(0.1)	(1.7)	(1.8)
Net	(0.5)	(0.0)	0.5	1.2	1.8	2	3	4	4	5	6	6	7	8	7	7
Europe																
EBITDA	0.0	(0.9)	1.8	6.3	10.8	15	20	24	29	33	38	42	47	51	56	60
taxes paid	0.0	0.0	0.0	(0.9)	(2.3)	(3.6)	(4.9)	(6.2)	(7.4)	(8.7)	(10)	(11)	(13)	(14)	(15)	(17)
Net	0.0	(0.9)	1.8	5.4	8.6	12	15	18	21	25	28	31	34	37	41	43
TOTAL	(1)	1	9	17	26	35	43	52	61	69	78	87	95	104	111	118

Source : Beer & Co projections

Surface Sterilisation

Figure 78 shows the EBITDAs projected by Beer & Co for each region in the Air Purification segment, translated into AUD, less taxes.

Figure 78 : Beer & Co.'s projected net cashflows, Surface Sterilisation

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																
EBITDA	0.0	3.8	66.5	145.9	225	305	384	464	543	623	702	781	861	940	1,020	1,086
taxes paid	0.0	0.0	(6.8)	(25.7)	(44.0)	(62.1)	(80.2)	(98)	(116)	(134)	(152)	(170)	(188)	(206)	(224)	(242)
Net	0.0	3.8	60	120	181	243	304	365	427	488	550	611	672	734	795	844
Japan / Korea																
EBITDA	0.0	0.0	(0.6)	14.5	57.3	100.8	144	188	231	275	318	361	405	448	492	528
taxes paid	0.0	0.0	0.0	(1.0)	(12.7)	(25.0)	(37.5)	(50.0)	(62.5)	(75.0)	(87.5)	(100.0)	(112.6)	(125.1)	(137.6)	(149.7)
Net	0.0	0.0	(0.6)	14	45	76	107	138	169	200	230	261	292	323	354	379
Europe																
EBITDA	0.0	(0.2)	13.9	92.1	177	262	347	432	516	601	686	771	856	941	1,026	1,096
taxes paid	0.0	0.0	0.0	(12.9)	(37.0)	(60.9)	(85.2)	(109)	(133)	(158)	(182)	(206)	(230)	(254)	(278)	(303)
Net	0.0	(0.2)	13.9	79	140	201	262	322	383	444	505	565	626	687	748	794
TOTAL	0	4	73	213	366	519	672	825	979	1,132	1,285	1,438	1,591	1,744	1,897	2,016

Source : Beer & Co projections

Cash Balances

Figure 79 shows Beer & Co.'s projected cash generation and balances for PO3, showing that the first few years are projected to consume cash as marketing and then sales are increased.

Figure 79 : Beer & Co.'s projected cash generation

AUD m	2017-18	2018-19	2019-20	2020-21
Cash generated	(0.5)	(2.2)	(14)	23
Equity raised, net	1.2	16	19	0
Cash Balance	0.6	15	19	43

Source : Beer & Co projections

Figure 80 shows the reason for cash needs is for working capital due to terms required to be offered to secure sales.

Figure 80 : Beer & Co.'s assumed sales terms

	Water Sanitation		Air Purification		Surface
	New Pools	Installed	OEMs	Installed	Sterilisation
USA	30 days	30 days	90 days	30 days	45 days
Australia	60 days	60 days			
Europe	60 days	60 days	90 days	45 days	60 days
Japan / Korea			90 days	45 days	60 days
Middle East / Other			90 days	45 days	

Source : Beer & Co projections

Per Share Valuation of PO3

Figures 76, 77 and 78 showed Beer & Co.'s projection of the net cash generated by each segment of PO3's expected operations.

To derive a per share valuation of PO3, we need to take into consideration :

- The number of shares currently on issue, and the equity capital required for the company to realise its growth;
- Corporate and other overhead costs; and
- Risks associated with the projected cashflows.

Figure 81 shows the detail of Beer & Co.'s valuation of PO3.

Figure 81 : Beer & Co.'s base case value of PO3

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

Figure 81 shows that Beer & Co has significantly risked the derived NPVs for the Air Purification and Water Sanitation segments.

Figure 81 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.

Conclusions

Analysis

Figure 81 shows that Beer & Co.'s valuation is 10x the current share price, with total market capitalisation rising from \$15m to \$480m. While these seems large :

- 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;
- PO3 has now developed a very valuable technology that can be applied to 3 (and more) global markets, giving it huge potential;
- PO3 now has significant execution risk; and
- Significant re-ratings happen when a technology dream comes into reality. Figure 82 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 82 : CLQ share price increased 30x over 42 months



Source : IRESS, Beer & Co

Peers ?

Figure 83 shows potential ASX listed peers / comparisons for PO3, though :

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

Figure 83 : 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 84 shows there are many companies with market capitalisations consistent with Beer & Co.'s valuation of PO3, even though

- Many do not have their own technology;
- Most operate in only a single segment, while PO3 will operate in 3 and potentially more; and
- Each of the segments in which PO3 will operate are globally significant.

Concluding Comments

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.

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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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