

The Toilet Reinvented

Impact Report April 2016



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1 CEO overview

A growing world population, urbanisation and water-intensive lifestyles mean that many parts of the world are now water stressed with others facing water supply and wastewater disposal problems.

Phoenix Product Development, which trades as Propelair, is passionate about water conservation and has developed the Propelair 1.5 litre flush toilet to make a significant impact.

1(a) Organisational summary

Propelair is a UK registered company which has developed and patented in all the major global markets a new type of water saving toilet system called Propelair®. It uses an innovative air-based operating principle and only 1.5 litres of water per flush. The product has been approved for the UK, US and Australian markets with the sales effort currently focused on the UK market.

We have over 80 customers across both private and public organisations, including:

- Brighton & Hove City Council
- Ecotricity
- London Borough of Redbridge
- London School of Economics
- Lyceum Theatre
- McDonald's
- PricewaterhouseCoopers
- The Princess Alexandra Hospital NHS Trust
- Royal Bank of Scotland
- Southern Water
- Thames Water
- Winchester City Council

At present we employ directly 12 staff but forecast this increasing significantly as the business expands initially in the UK and then overseas

Propelair is keen to become a member of the Social Stock Exchange in order to increase its profile through the unique capital markets platform and provide access to a growing community of investors which will enable us to achieve our social objectives.

1(b) Commitment to social value

Propelair's social and environmental contribution derives directly from the environmental performance of its innovative product offering. Water is saved as it is only used to clean the bowl and not transport the waste water as this is done by the innovative use of displaced air. As well as delivering massive water savings, the Propelair 1.5 litre flush toilet provides the following benefits:

- **Excellent performance** - powerful and consistent single air flush with significantly less water use which allows it to be installed in water stressed areas where conventional toilets would not function
- **Produces less sewage** - less treatment required, which reduces carbon emissions, less emptying of holding tanks, which saves money
- **Hygienic** - proven to remove 99.939 per cent of waterborne contaminants and reduce the creation of aerosolised contaminants by 95 per cent
- **Quick refill** - small capacity cistern fills quickly between flushes to reduce public queuing

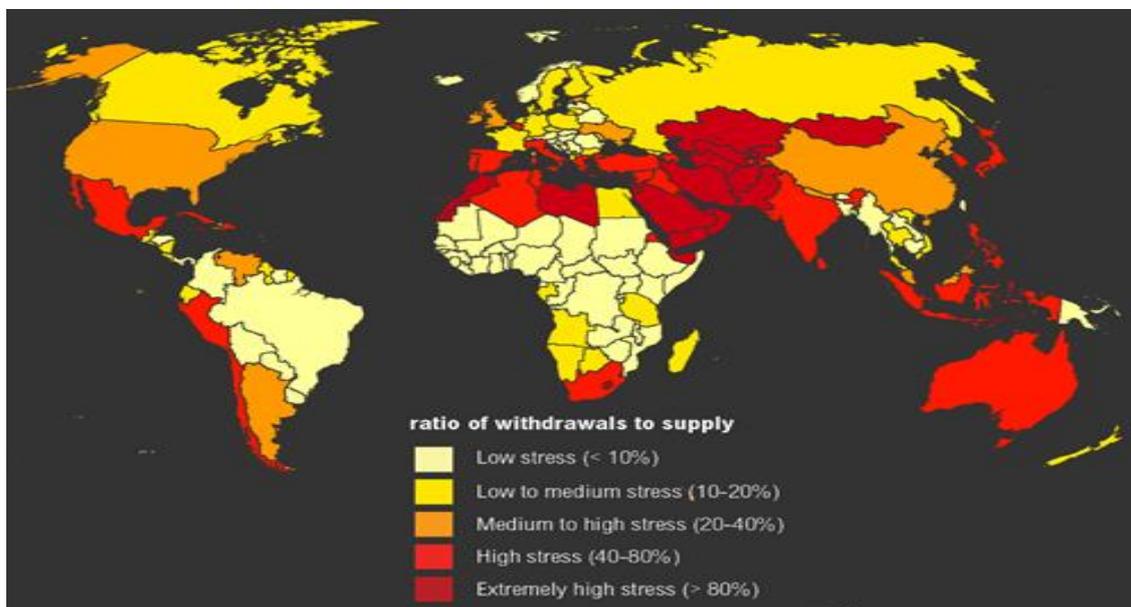
Propelair is committed to measuring and regularly disclosing information on its social and environmental performance through the company's annual Impact Report and direct engagement with its partners, stakeholders and customers.

Garry Moore, CEO

2 Social purpose and context

Conventional toilets' vital health and sanitation role is universally accepted, but efficient pan clearance and transport of waste is coupled to flush water volume. Flush toilets account for up to 90 per cent of clean usually potable water use in non-residential buildings and up to 40 per cent in domestic ones. It is extraordinary that a product dating from the 1800s, which mixes human waste with up to 90 per cent of the clean water supply to a building, is still the accepted norm. Europe flushes around 35.3 million m³ clean water per day - conventional toilets waste water on an unprecedented scale.

The figure below shows worldwide water stress defined as a ratio of withdrawals to supply. Lifestyle changes and new appliances have resulted in 55 per cent per person increase in water consumption over the last 25 years and 100 per cent over 86 years. Whilst worse in Southern Europe, even temperate areas are suffering water shortages.



Global water demand is projected to increase by 55 per cent between 2000 and 2050. As a result more than 40 per cent of the global population is projected to be living in areas of severe water stress through 2050. There is clear evidence that groundwater supplies are diminishing with an estimated 20 per cent of the world's aquifers being over exploited.

Propelair's aim is to reduce the demands on the earth's most valuable scarce resource, water, which is the key to all life and is coming under increasing pressure from population growth, increasing affluence which is putting greater demands on water resources and climate change. By reducing water use in toilets Propelair aims to generate further benefits:

- Less waste created and therefore there will be less waste treatment required. This will reduce the energy used in the latter and therefore reduce carbon emissions
- Germs can be spread by aerosols created when conventional toilets are flushed in washrooms. By eliminating these aerosols Propelair promotes health and well-being in commercial environments

- Financial savings through the reduction in water charges, which results in a fast payback

An additional benefit is the reduced flush cycle, just 30 seconds compared to a conventional toilet which can take two minutes, which results in an absence of or shorter queues.

The Bathroom Manufacturers Association 2013 Trends Survey estimates that an average UK household could save as much as 50,000 litres of good fresh drinking water every year if it changed its old WC for a new eco-suite. Its 2006 survey indicated there was an installed base in the UK of 50 million toilets of which around 10 million are in the commercial sector which is the Propelair’s initial target market. Many of these toilets are older using high flush volumes:

- 15 million with 6 litre flush
- 13 million with 7.5 litre flush
- 18 million with 9 litre flush
- 4 million with > 11 litre flush

It is worth noting that the data on existing toilet flush volumes generally refers to cistern capacity and not the actual average flushing volume, which can be up to 20 per cent higher due to double-flushing to clear the pan, leakages caused by faulty flush valves, refilling while still flushing and mis-adjustment by installers and maintenance personal. All these problems are obviated by Propelair®.

Replacing existing higher flush volume toilets with the Propelair® 1.5 litre flush toilet offers substantial water savings and for metered customers (which covers around 35 per cent of the domestic market and the whole of the commercial market) and significant financial savings, as shown in the table below:

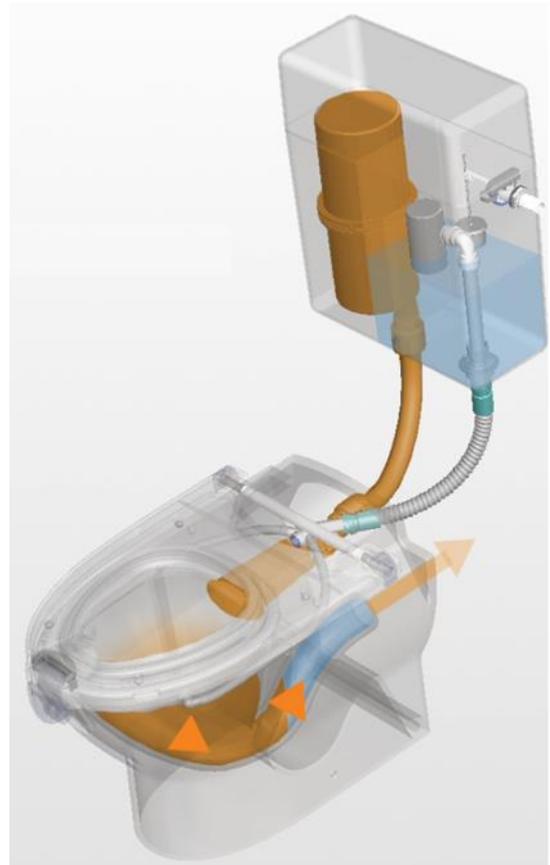
<i>Water and carbon saving (50 flushes/day)</i>				
<i>Flush volume</i>	<i>Per flush</i>	<i>Per day</i>	<i>Each year</i>	<i>Carbon saving</i>
<i>Litres</i>	<i>Litres</i>	<i>Litres</i>	<i>Litres</i>	<i>Kg CO₂</i>
6.00	4.50	225	81,000	29.7
7.50	6.00	300	108,000	39.6
9.00	7.50	375	135,000	49.5
11.00	9.50	475	171,000	62.7
13.00	11.50	575	207,000	75.9

This table illustrates not only the water savings possible from replacing existing toilets with Propelair 1.5 litre flush toilets but also the carbon savings. The figures above are for just a single toilet, the savings from a single office building would be many times these figures.

Propelair® overcomes the problems of existing products by using a patented “displaced air” flushing method. This is neither vacuum nor compressed-air technology, but a totally

new approach that is inexpensive, normal to use and able to connect to conventional drains.

- As shown to the left, the cistern unit is conventional size but divided into two sections
- One for an air pump and the other for water, which connect to the pan with two push-fit hoses
- Before flushing the lid is closed to form a seal
- When the flush button is pressed 0.5 litre of water enters the pan to wash it, followed by air from the unique patented pump. The air cannot escape due to the sealed lid. This pushes out the entire contents of the pan to give a powerful, reliable flush
- The remaining 1 litre of water refills the water trap
- The flush is completed in three seconds with the toilet ready to be re-flushed in around 20 seconds (subject to water pressure)



The air pump requires a power supply which can be provided by a 24v battery and charger or 230v AC mains. The energy used per flush is negligible with 1,000 flushes costing around 3p. Even with this small energy use, the overall carbon footprint of an average WC is reduced by around 80 per cent.

Propelair is based in Laindon, Essex where it has its administrative offices and research and development operations. Manufacture of the toilet is contracted out to ENL Ltd which is based in Portsmouth, Hampshire. Following development of the toilet it was independently certified by The Water Regulations Advisory Scheme ("WRAS") and achieved BSI kitemark and CE certification. In addition, it was endurance tested by WRAS to 200,000 cycles which is equivalent to 27 flushes per day for 20 years.

Propelair's key executives are:

Gordon Power - Chairman is a private equity specialist and one of the founding fathers of the VCT business in the UK. In 26 years' experience of private equity he has made 196 investments realising an IRR of 29 per cent. He is currently Chairman of Sustainable Technology Investors Limited and Edge Investment Management. Gordon joined the Board as an Investor Representative following the fund raising in December 2009.

Garry Moore - Chief Executive & Chief Technology Officer is a BTEC trained engineer and accomplished industrial model maker, with full machine workshop and rapid prototyping capability. He has filed patents for 18 inventions and presented a technical

paper on wastewater management to the World Health Organisation, Amman in 2000. He founded the company in 1998 with the sole purpose of developing and marketing the present “displaced air” technology, which he achieved through a series of proof of concept models and working prototypes for evaluation by the authorities and collaborators, which was funded by a series of private equity investments.

Anthony Blaiklock - Finance Director is a chartered accountant and experienced corporate financier. Previous roles have included Director of Samuel Montagu and HSBC Investment Bank, Partner of Deloitte & Touche and more recently Finance Director of two companies in the renewable energy and energy efficiency sector. Anthony joined the Board in December 2012.

Nigel Conder - Sales & Marketing Director is a sales and business improvement and marketing professional. Previous roles have included Sales & Operational Director at the Bank of New York, Sales Director BAE Systems, Sales and Operational Director at EY, Sales Director for a Leeds based NFP organisation and more recently working across various industry sectors as an independent business consultant.

3 Who benefits

The key beneficiaries of Propelair's products and social purpose are:

- **The environment** which benefits from the reduced demands on limited water resources and reduced carbon emissions
- **Our customers**, who are private and public organisations, that use Propelair's 1.5 litre flush toilet in their washrooms. The key benefits derived are significantly reduced water use, and therefore charges, and a healthier workplace as the spread of germs through the washrooms are virtually eliminated

The steps from first engagement with our customers to installation of toilets and preparing a case study are broadly as follows:

- First we survey their existing washrooms and often, but not always, install flush counters and water meters. These will collect data for a number of weeks on the number of times each toilet is flushed and the amount of water each toilet has used. From this information the flush volume can be calculated which is frequently significantly greater than the advertised flush volume for the particular toilet due to leakages and double flushing
- Next we build the business case for the installation of the toilets which is a function of the water saved, cost of water and existing flush volume. Based on the water saved we can also calculate the carbon emissions savings. A litre of water uses 3,200 joules of energy to treat and pump and our toilet uses less than 1,000 joules per flush so the energy saving in replacing a 9 litre flush toilet would be 23,000 joules per flush
- Then the toilets are installed followed by a further period of monitoring to collect data and confirm the water savings
- And finally the case study is prepared

The Propelair toilet is one of the most hygienic systems available, creating a cleaner toilet environment for customers, clients, patients and staff. This can make a positive impact on their health, well-being and productivity. Flushing a conventional toilet creates a "sneeze effect", spraying bacteria, viruses and moisture into the air. These airborne aerosols can travel up to eight feet away from the toilet itself, contaminating the surrounding washroom surfaces and getting drawn into ventilation systems to travel throughout the building. Harmful bacteria can survive up to 24 hours on washroom surfaces making it a perfect breeding ground for viruses and germs to spread. With Propelair, this unhygienic "sneeze effect" is avoided. Propelair reduces aerosolised germs by 95 per cent.

The germs are trapped inside Propelair's unique closable lid, and then efficiently removed with its powerful air-flush, creating a more hygienic and healthier washroom environment for users. Conventional toilets can leave up to 6 per cent of previous users' contaminants behind after flushing, which can become airborne during subsequent flushes. Propelair removes 99.9 per cent of contaminants in the water trap

(compared to the EU standard of 94 per cent), ensuring less risk of cross-contamination.

- **Users of the toilets** in certain types of building, such as theatres and conference centres where there is focused demand on the washroom at particular times of the day. They will experience much shorter queuing times due to the Propelair toilets short flush cycle which is a quarter of that of a conventional toilet.

In summary the specific outcomes for each beneficiary are as follows:

<i>Beneficiary</i>	<i>Outcome</i>	<i>Measure</i>
Environment	Water savings	m ³ of water saved
	Carbon savings	kgs of CO ₂
Customers	Financial savings	£ savings from lower water charges
	Improved hygiene	Reduced staff illness and absence *
	Less waiting time	No/shorter queues
Users	Improved hygiene	Reduced illness *
	Less waiting time	No/shorter queues

* We will consider further how this can be measured and report on it next year

4 Activities and operations

The Propelair® toilet system completed its testing and certification by The British Standards Institute in 2013 and carries the BSI kitemark. It has also been tested and approved under the Water Regulations Advisory Scheme (“WRAS”) which is a requirement for any product connected to the public mains water supply in the UK. WRAS testing took six months and involved 200,000 complete cycles which is equivalent 27 flushes per day for 20 years. In addition to these two approvals, Propelair® is CE compliant and can be marked as such, which is mandatory for products placed on the market in the European Economic Area. It has also been approved for the US and Australian markets. The manufacture of the toilet is contracted out to ENL Limited which is based in Portsmouth and is AS9100 and ISO9001 accredited.



In addition to all research and development work, Propelair is responsible for the following activities:

- **Sales and marketing:** using our website, social media, sponsorship
- **Training:** on the product and its installation for our business partners which are facilities managers, providers of energy efficiency products and services and water companies
- **Partner support:** through access to case studies and other marketing support
- **Installation:** is carried out by our staff, contracted out or the existing contractors used by customers
- **After sales service:** whilst the product has been endurance tested and is designed to be maintenance free, there is a two year warranty offered

Our success will lead to commercial buildings, initially in the UK, adopting the Propelair 1.5 litre flush toilet which will result in massive water savings and therefore carbon savings as well.

5 Stakeholders

Stakeholders are those individuals, groups of individuals or organisations that affect and/or could be affected by our activities, products or services and associated performance.

Propelair has identified that the following groups of people are key stakeholders, other than the beneficiaries covered in section 3:

- **Board:** meets regularly and is responsible for strategy, performance, approval of major capital projects and the framework of internal controls. To enable the Board to discharge its duties, all Directors receive appropriate and timely information. Briefing papers are distributed to all Directors in advance of Board meetings. In addition, procedures are in place to enable the Directors to obtain independent professional advice in the furtherance of their duties, if necessary, at the Company's expense.

The Board is accountable to the shareholders who receive quarterly updates on progress. In addition, the company holds an Annual General Meeting and further meetings as required with shareholders. The person on the Board who has overall responsibility for delivering our social purpose is Anthony Blaiklock.

- **Business partners:** our UK business partners act as resellers being responsible for the on-ward sale, installation and after sales service for Propelair 1.5 litre flush toilets. At present we have five such partners who are facilities managers and providers of energy efficiency measures, for example OCD-FM and SaveMoneyCutCarbon. We are looking to extend this network further across the UK and then into selected global markets. Propelair provides product and installation training as well as on-going support to these partners.
- **Employees:** Propelair has regular communication with its 12 employees, some of whom are also shareholders. There are monthly staff meetings attended by the CEO and CFO to update the team on company progress against strategy, where an open question and answer session also takes place. The exercise of the meeting is to share ideas and opportunities amongst the group, take away new information and discuss best practice in conducting business. Feedback and employee engagement is encouraged.
- **Government (DECC/Ofwat):** Propelair actively monitors the developing government policy and legislative landscape in relation to climate change mitigation and water conservation in all of the jurisdictions in which the company operates. It also seeks to engage in the policy development process by participating in government inquiries on relevant subjects. By delivering our products we assist, in a small way, the UK Government in achieving its water saving and carbon reduction targets.
- **Shareholders:** the company has over 130 shareholders. Whilst most are individual investors, we have one key institutional investor, CF Woodford Equity Income Fund. Regular communication with shareholders is given high priority. Following the end of each quarter the Board writes to shareholders with an update on the performance of the company and also communicates with them in relation to any major corporate developments. There is also a monthly newsletter and at the Annual General Meeting the Board presents the results of the year together with the budget for the following

year and answers any questions from shareholders. As further progress against our objectives is made, we are committed to increasing the level of disclosure surrounding our environmental and social impact.

- **Water companies:** we are in regular contact with the water companies, and indeed a number are customers, as the Propelair 1.5 litre flush toilet can benefit them in two principal ways. Firstly in easing any water stress arising in periods of low rainfall and, second, by reducing the peak flow requirement for the drainage system without which new larger drains might need to be installed particularly in areas where there has been significant new commercial and residential development where little existed before, for example the Battersea Power Station and Nine Elms Development.
- **Others:** Propelair has and continues to develop relationships with a number of individuals, companies and other organisations which have an interest in our products, technologies, processes or environmental credentials, for example universities, engineering consultancies, architects and research and testing bodies. These relationships assist Propelair with further developing the market place as well as product and process development.

In addition to regular meetings, we use the following channels to communicate with our stakeholders:

- A monthly newsletter
- Up to date corporate and product websites including all news; corporate issues, brand and product information
- Product awareness is also available by social media sites including, Facebook and twitter
- Propelair also has contact forms on our website where anyone can contact us; they can also opt-in to receive marketing material from us
- External PR consultants are used to report relevant activities, progress in local newspapers, magazines and online

6 Evidencing social value

Propelair is committed to disclosing information about its environmental and social impact through an annual impact report and ongoing communication with its stakeholders. As outlined previously, Propelair's vision and business model is inextricably linked with its social, environmental and economic outcomes for a range of beneficiaries. The company's social and environmental goals are embedded within its business and strategic planning processes at all levels of the organisation.

6(a) Evidence

Propelair's current environmental and social impact reporting framework is outlined in the evidence table below. As it is at an early stage of development, forward projections for the number of installations are uncertain. As such, for the company's year one impact report, Propelair has primarily set targets based on estimates of the quantified benefits expected per toilet installed. Propelair is committed to measurement and monitoring of the environmental benefits realised as its products are used in the market and will set and measure progress against additional aggregate environmental benefit targets in future impact reports.

<i>Beneficiary & outcomes</i>	<i>Indicator</i>	<i>Current annual value</i>	<i>Target value</i>
The Environment			
- water saved	m ³ of water	55,789m ³ of water *	50 fold increase by 2018
- emissions reduced	CO ₂ reduction	20,803 kgs of CO ₂ *	50 fold increase by 2018
		* See note below	
Propelair's customers			
- financial savings	£	> £170,000 saved *	50 fold increase by 2018
- improved hygiene	Reduced absence	Not yet measured	To be reported on 2017
- less waiting time	No/shorter queues	Data not available	To be reported on 2017
Users of the toilets			
- improved hygiene	Less illness	Not yet measured	To be reported on 2017
- less waiting time	No/shorter queues	Data not available	To be reported on 2017

*** Note:** the water savings and carbon savings are based on the number of toilets in use as at 31 March 2016; the average flush volume of the toilets that have been replaced; the number of days the premises are in use during the year; and the frequency with which the toilets are flushed. The latter can vary significantly in commercial premises, amongst our customers the busiest locations can experience more than 200 flushes a day and whereas the quietest locations can be as low as 30. The

current annual values calculated above have assumed averages of 9 litre flush, 261 days and 50 flushes per day which we believe is conservative.
 The financial savings use a simple average of the cost of water in the UK. The cost range is £2.10 to £5.42 with an average of £3.07/m³.

An example of a customer case study is included as the Appendix to this report.

6(b) Current management

As described in section 3 above, in building the business case for the replacement of conventional toilets with Propelair 1.5 litre flush toilets, in many cases we conduct a period of data capture on the existing toilets. This determines:

- The number of times each toilet is used
- The water used by each toilet
- As a result of which the amount of water used for each flush can be calculated

These figures are then used to measure the impact of replacing the existing toilets with Propelair toilets in terms of water savings, carbon savings and financial savings. The latter is a function of the water charges for the particular region. These vary from £2.10/m³ for the Thames Water area to £5.42/m³ for the South West Water area. The table below shows our cost saving calculator which is used in preparing the business case:

Propelair 1.5 litre flush cost saving calculator			
Metered water charge/m ³	£3.49	0.00349	pence per litre
Current flush volume in Litres	7.5	6	Litres saved each flush
Number of WC flushes each day	85	20,825	flushes per year
Savings		£436.08	per year
Propelair cost £675 less discount	£675.00		
		1.9	years payback period on balance on balance
Cost of installation	£175.00		
Cost of new conventional WC			
Balance	£850.00		
Discount		124,950	litres water saved
		18,200	Joules energy saved per flush
		2.20	grammes C02 saved per flush
		379,015,000	Joules energy saved per year
		45.80	Kg C02 saved per year
		Annual savings	
Number of toilets	25	£10,902	
		3,123,750	litres of water
		1,145	kg of CO ₂

This shows the business case for the retrofit of 25 toilets and therefore uses the cost of supply and installation of Propelair toilets without any offset which is applicable to new

build and refurbishment projects where the customer will be installing a toilet. In such cases the payback calculation only applies to the incremental cost of the Propelair toilets.

6(c) Future plans

Propelair is committed to reporting regularly on the environmental impact of its products and activities. As deployment of our products increases, we expect that much more data will become available, enabling a greater understanding and more thorough reporting of Propelair's impacts at both a company level and a product level. In the future we will look at ways in which we can report on:

- The indicators showing the impact of the significantly improved hygiene of our toilet compared to conventional ones and the shorter queuing time due to the fast flush cycle
- Impacts on our staff
- The direct environmental impacts of our operations
- Lifecycle analysis of our products. We aim to maximise the recyclability of the components of our products

7 Other issues

The other issues affecting Propelair are:

- The price of the toilet is higher than the conventional toilets used in commercial washrooms and customers are not accustomed to associated payback with a toilet
- Whilst the toilet is manufactured in the UK there are a number of components which are sourced from the Far East. Propelair will look at cost effective local alternative suppliers as its volumes increase



Appendix

Customer case study





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