INTERCLEAN

Smart solutions for reducing water consumption in the cleaning industry

There can be no denying that water has become a buzzword when it comes to sustainability goals across all sectors – and for very good reason. Viewed in the context of a global water scarcity crisis, businesses are having to prioritise the implementation of strategies and solutions to reduce water consumption, manage their water usage and minimise environmental impact. The cleaning industry is inextricably linked to water – after all, it's the most basic component of hygiene and sanitation. But what is the environmental cost of being clean? And how can the cleaning industry be part of the solution and not the problem? In this white paper, we will explore how smart technology, innovative new products, and advanced water-saving strategies within the cleaning industry can be implemented to conserve this precious and irreplaceable resource.

Table of Contents

Water – An Essential Resource for Cleaning

Safe drinking water, sanitation and hygiene are crucial to human health and well-being.[1] As custodians of cleanliness, hygiene and well-being the cleaning industry has a tremendous responsibility to ensure that water, our most precious resource, is used judiciously to ensure sustainable water conservation strategies.

Professional cleaning often includes a great deal of water use, an increasingly valuable global resource. With chemical cleaning products alone relying on large amounts of water, businesses are having to constantly rethink their priorities and processes.

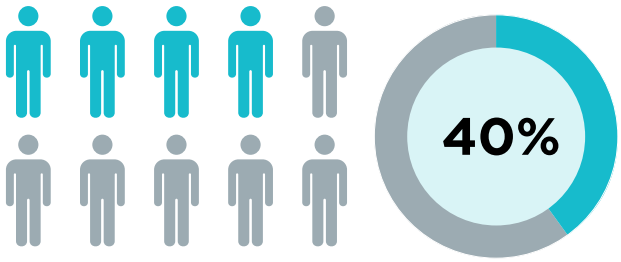
It's estimated that commercial laundry washing machines use an average of 157,931 litres of water and up to 910 kWh of electricity per year.[2] More than 90% of a typical bottle of cleaning product is simply comprised of water.[3]

The commercial window cleaning industry is also undergoing some exciting new technological developments, offering refined processes to save on costs and meet sustainability goals. Smart sensors can predict when a building's windows need to be cleaned – reducing unnecessary washing and saving water (see Case Study on page 9).

But the impending fate of our planet's precious "blue gold" is sobering. The impact of climate change is making an effective response to water scarcity essential.

According to the United Nations, water scarcity affects more than 40% of the world's population. And if the current trend continues at this alarming rate water demand will exceed supply by 40% in 2030. Clean water together with sanitation is the 6th of the UN's sustainable development goals.[4]

Across all sectors – including the commercial cleaning sector – companies are responding to this water scarcity crisis by embracing innovative



Water scarcity affects more than 40% of the world's population

[1] Water, sanitation and hygiene (WASH) (who.int).

[2] Laundry Practices and Water Conservation (U.S. National Park Service) (nps.gov)

[3] (ellenmacarthurfoundation.org)

[4] Water shortage: can technology cut water consumption? | Orange Business (orange-business.com).

strategies to conserve water. These include programmes to reduce water intake, use efficient water-saving equipment, reuse and recycle water, and manage wastewater treatment systems.

What Can We Do To Reduce Water Use in the Cleaning Industry

If the world wants to improve the availability of clean water for all, better water management will be absolutely critical –both on a macro and a micro level.

In light of various different international protocols which provide guidance on what can be done to reduce our environmental footprint, the correct use of water is of specific significance in the cleaning sector. The process of commercial cleaning requires sufficient water to obtain satisfactory results, but this doesn't imply the unconditional, irresponsible, or wasteful use of clean water.

There are a number of innovative new products, devices, and processes that can be used by both individuals and businesses to guarantee high standards of cleanliness and hygiene, as well as maintain the controlled and efficient consumption of water.

Commercial cleaning is experiencing an exciting new wave in sustainability practices – motivated by a more ethically and ecologically aware generation.

The additional good news is that being sustainable and saving water not only reduces our impact on the environment, it often lowers costs and can increase profits.

Commercial cleaning is experiencing an exciting new wave in sustainability practices – motivated by a more ethically and ecologically aware generation of customers and their increasing demand for greater social responsibility, a versatile range of eco-friendly products, and a commitment to sustainability.

The bottom line is that if cleaning businesses are to be successful and remain profitable, they're not only going to have to deliver consistency and quality – they are going to have to meet these new "green" expectations from the market, by

embracing this new wave of sustainable cleaning solutions.

"Green Cleaning": the new way forward in Commercial Cleaning

From small businesses to professional outfits in the cleaning industry, the move towards sustainability or "green cleaning" is arguably the No. 1 trend in the European cleaning industry and is showing no signs of slowing down. This marketplace phenomenon is being driven by customer demand and the overall trending of the broad marketplace for environmentally preferable products and services.

Commercial cleaning is a water-intensive industry, and as such, water waste constitutes a large proportion of this specialised sector's environmental impact. The methods used to approach these problems vary from new investments in technologies, to more subtle adjustments in business culture and habits.[5]

To reduce their water footprint — which measures both the volume of clean water consumed and wastewater produced — businesses need to improve their approach to water management overall.

It may appear overwhelming to think of just how to approach sustainability, but there are some general practical and attainable steps cleaning businesses can employ immediately to make a tangible difference.

Eliminate harmful chemicals

One of the many ways in which aspiring green commercial cleaning companies can change their potentially harmful habits is to reduce or eliminate dangerous chemicals. Many commercial cleaning solvents are largely derived from petroleum. The disposal of these volatile organic compounds, or VOCs, can be very damaging to both our environment and our health. They also pollute the groundwater, deplete the ozone, and can cause lasting health problems. By switching to products that use eco-

To reduce their water footprint businesses need to improve their approach to water management overall.

[5] Sustainability Guide for Commercial Cleaning: Getting Started - Green Business Bureau

friendly ingredients[6], cleaning businesses can make significant improvements to the well-being of the environment by eliminating the transfer of harmful chemicals into the wastewater system, as well as safeguarding the health of their workforce, and their end-user clients.

Many of these innovations are affordable substitutes and can be gradually introduced to replace their less sustainable counterparts – allowing cleaning companies to make the transition towards more sustainable practices at their own pace, and within their own budgetary constraints.

Water Recycling

One of the most obvious and simplest ways to reduce water consumption, is to practice water recycling strategies. Water recycling involves converting wastewater into water to be used for alternative applications. Connected technology is also being deployed on wastewater treatment. Optimizing plant operations can help reduce costs (including the use of energy and chemicals in cleaning water), which can help expand capacity without requiring a corresponding increase in investment – all while maintaining discharged water quality to meet compliance requirements.[7]

An example of where this type of water recycling innovation is utilised is in some floor scrubbing machines which feature onboard recycling systems. These "new age" floor cleaners consume less water and detergent for every clean.

Rethink Cleaning Practices

With the increasing pressure to reduce the water footprint in the cleaning industry, it is now becoming imperative that commercial cleaning entities rethink their cleaning strategies, with the goal of reducing water usage.

Whereas in the past, cleaning schedules were based on entrenched habits (or a fixed rota system) rather than a more flexible, intuitive, and accurate evaluation of what degree of cleaning (deep/ medium/ light) is necessary and how often – the recent advances in smart technology allow for far more efficient monitoring of cleanliness. This responsive data-led approach means businesses no longer have to rely on time-

One of the most obvious and simplest ways to reduce water consumption, is to practice water recycling strategies.

[6] GBB blog on safe cleaning alternatives
[7] Australia Water Association

consuming and inefficient manual floor cleaning processes for example. This new approach to harnessing the potential of machines with advanced technological capabilities not only improves productivity but also reduces environmental impact.

If we take automatic floor scrubbers as an example: they have wider scrub paths than most other methods of floor cleaning. They can clean much larger spaces far quicker and more efficiently due to their increased size and capacity. This will not only save time and energy, but automatic floor scrubbers also require less water and chemicals.

Select the Right Equipment

Another way for a cleaning business provider to fully evaluate their water usage is to take the time to perform a thorough evaluation of their needs and water-consumption goals, before researching the full gamut of solutions available to them.

One green cleaning solution is to utilise high-efficiency equipment. This doesn't just conserve energy, but also conserves water which reduces environmental strain and utility costs. Green cleaners also opt to try a "dry" solution first, thereby saving even more water.

Choosing equipment to improve water conservation is one way to manage water use, and it can provide further benefits as well. An efficient auto scrubber that utilises less water to perform routine cleaning can also run longer without stopping to dump and refill its tanks – providing a boost to productivity while conserving water.

Some key features to consider when selecting cleaning equipment:

- Pre-programmed functions for more even dosing of water and detergent solution to optimize consumption and reduce unnecessary waste.
- Automated decrease of water stream pressure during turns, to cut down the amount of water being spilled to the sides.
- "Solution Saver" technology that allows independent dosing of water and cleaning detergents, to reduce overall consumption.
- Oscillating scrubbing technology requires up to 30% less water than that required for traditional disc floor scrubbers.
- Integrated or onboard water recycling mechanisms that decrease water usage while enabling the machine to work up to 50% longer.

Correct Operation and Maintenance

Correct operation by trained operations staff along with adequate scheduled preventative maintenance, will ensure equipment continues to perform at peak condition while avoiding leaks, spills, streaking and other unnecessary forms of water seepage or discharge, in addition to minimising the potential for emergency breakdowns.

Smart Solutions to Reduce Water Stresses

Exciting developments in technology, including the Internet of Things (IoT), AI and robotics, can help organizations and individuals use water more efficiently and reduce consumption overall. After all, when it comes to cleanliness and hygiene, only the highest standards of quality will suffice. The new technology in the field of cleaning can help cleaning businesses offer their clients and customers these meticulous results – with the added benefit of helping them become part of the global water-saving movement.

AI: saving time and ensuring the highest cleaning standards

For cleaning companies looking to lower costs and increase efficiency, the application of AI could be a great option. With the advent of AI tools, cleaning businesses software[8] can provide various cleaning processes with minimal human input, meaning less chance of error and maximum efficiency. Many of these applications can also result in significant water saving – due to their increased efficiency.

While Roomba[9] is probably the most well-known domestic autonomous vacuum brand, industrial-grade autonomous vacuum cleaners are also available. They operate in much the same way – but with enhanced power. These machines can pinpoint the size of the area to be cleaned, detect obstacles and recall the optimum routes to use in navigating their working environment. As the machine takes on more cleaning, it learns from the data that it gathers and improves its future efficiency.

The Internet of Things

The Internet of Things (IoT) can also allow for autonomous monitoring of spaces that need periodic cleaning. By tracking chemicals, such as dust in HVAC systems and clarity levels in water, cleaning businesses can keep one step ahead and cleaning schedules can be created in accordance with data gathered by smart sensors. Automatic pool cleaners can be installed, which are triggered by sensor data; another time-saving and human intervention-free process.

The new technology in the field of cleaning can help cleaning businesses offer their clients and customers these meticulous results.

For instance, the use of Internet of Things (IoT) sensors can help track water quality, from treatment works right through to pipes. They can also monitor plant operational performance, checking the ratio of incoming water versus finished product liquid (for instance, at a drinks manufacturer or bottling plant). Augmented reality and remote assistance can shorten the response times to critical problems, even in difficult-to-access utility sites. Other sensors can

[8] How New Technology Can Transform Your Cleaning Service Business | Workever

[9] Roomba

enable predictive maintenance so that water-related machinery problems are captured before they occur.

Many cleaning companies are reaping multiple benefits from integrating new technology and digital processes into their solutions. With new tools coming to market, it's the perfect time to take stock of what's available to your cleaning business.

Robots

The use of the right robotic cleaning machines can not only reduce water and chemical waste, but also increase productivity through the strategic planning of cleaning routes in advance. While a typical cleaner would be able to clean 300 square metres of floor area per hour, a robotic cleaning machine is able to clean three times the area in the same amount of time, without the need for breaks. This results in far less water usage overall.

These cleaning robots can also be programmed to travel along the planned route, sensing and reacting to obstacles along the way. Cleaners can be redeployed to perform other cleaning tasks and re-trained to perform higher-skilled tasks, while the robots tackle the large-scale routine cleaning tasks that typically require many hours of manual labour.

Waste reduction technology to improve sustainability

Cleaning businesses can monitor and reduce their water usage by leveraging the many technologies that help reduce the amount of needless waste generated by this industry.

The use of ecological products or recycled materials are easy methods that all businesses can implement. With cleaning businesses specifically, it's advisable to look into smart cleaning equipment that burns less energy than legacy machines. Eco-saving solutions such as jet washers and water-saving taps are great ways to save on waste.

If your business utilises washing machines, try installing filtration solutions that make water reusable in a short space of time. New filtration technology can allow the reuse of approximately 95% of washing machine water.

Use of apps for field reporting to improve communication

Smart device applications such as Workever[10] can help staff at cleaning service companies improve their on-site reporting.

Besides reducing errors in reporting, these applications also ensure that your cleaning operations are more efficient and economical. Employees can report their work commencement and completion times. Progress on tasks can also be tracked by supervisors. These checks will help improve the performance of your cleaning service business. This has a direct correlation with the amount of water and other resources used: a more streamlined cleaning routine equates to less water wastage.

New technology is currently transforming the cleaning sector and making it more efficient, sustainable and agile.

[10] Workever

Case Study: A Smart Approach to Window Cleaning

Specific Case study: Heimdall Sensor Intelligence[11]

The future of the cleaning industry is moving ever rapidly towards data driven cleaning. Sensors transmit real time data when soap dispensers in washrooms require refills and how often office spaces need to be cleaned. With water being such a critical component of window cleaning, the next logical step is to develop smart ways of monitoring how often windows need to be cleaned.

Heimdall Sensor Intelligence, co-founded by Jeroen Sassen, Joris Dalderup and Gijs Derks, is a trailblazing Dutch startup with an innovative product for the window cleaning industry. They're using smart technology to clean windows – saving time, costs and, very importantly - WATER.

Heimdall Sensor Intelligence (HSI) is developing a solution for the predictive maintenance of building envelopes. Currently in the industrial pilot phase are window pollution sensors and associated backends, with extremely promising results. HSI aims to disrupt the building maintenance market with highly advanced data and prediction solutions.

[11] https://heimdallsensors.com

By applying this sensor, you only wash the windows when required, i.e., when they become dirty. Their vision with this project is to not only reduce the number of manpower hours required (with the associated reduction in cost for the building owner) but also to work towards a more sustainable future in cleaning, with a quantifiable reduction in water usage and the associated use of chemicals.

The future of the cleaning industry is moving ever rapidly towards data driven cleaning.

What began as a university project, Heimdall Sensor Intelligence initially measured many maintenance components of the building. However, the project was halted and the team then decided to focus on windows and cleanliness. This led to them developing a ground-breaking device which is placed on the inside of the windows to measure the cleanliness on the outside of the window.

The principle is the same for all of its applications. A holder the size of a bank card contains a sensor. That holder is mounted on the inside of the window, where it can remain for up to 20 years.

The sensor measures dirt on a window a few times a day. The sensor extrapolates that data for the area surrounding it. This allows the building maintenance team to accurately predict when it is time to enlist the services of a cleaning crew, with a significant saving of resources as a result.

The sensor has its own power source. It contains a light source and the solar panel that the sensor uses to produce electricity during the day, is used at night to perform measurements of cleanliness of the outside of the windows.

After extensive testing the team realised they needed a bespoke solution for every building, which is now part of the smart window cleaning solution package they offer.

They are able to use 3-D models of buildings and utilize this information to define different zones where cleanliness is expected to differ over time. For each zone they determine the amount of sensors required.

Previous tests have indicated that there is a significant difference between pollution on lower floors and on higher floors. One of the USPs of the HSI system is it can result in a substantial reduction in water consumption, simply by washing less frequently on higher floors. The higher floors are subject to less degradation, as the windows are not exposed to pollution, dust, and other dirt from, for example, passing traffic.

There are 3 main advantages to using this device:

1. A reduction in cost.
2. Quality assurance: with this system there are five levels of cleanliness to select from, e.g. an upmarket hotel would require the highest level, while less conspicuous buildings only require a medium level of cleaning.
3. More sustainable: water consumption is significantly lowered and the amount of chemicals used to clean the windows is also reduced.

The feedback thus far has been extremely positive.

The cleaning companies the HSI team has approached are very open to innovation instead of against it. They know the technology is coming, they just have to adapt and go with the flow – they see the need to embrace it in order to remain adaptable to changing demands from the market. With sustainability being a key priority for every sector in the cleaning industry – this water-wise approach to window cleaning is the next logical step in the “green cleaning” movement.

The Need for Expertise and the Right Partnerships

Towards a collective approach to saving water in the cleaning sector

“Nearly every water-related intervention involves some kind of cooperation. Safeguarding water, food and energy security through sustainable water management, providing water supply

and sanitation services to all, supporting human health and livelihoods, mitigating the impacts of climate change and extreme events, and sustaining and restoring ecosystems and the valuable services they provide, are all pieces of a great and complex puzzle. Only through partnerships and cooperation can the pieces come together. And everyone has a role to play. Cooperation is critical to achieving all water-related goals and targets." [12]

The key takeaway of the above-mentioned report and many others like it, is that the way forward is through collaboration and cooperation between governments, the private sector as well as community entities and organisations to explore smarter, more efficient and less wasteful ways of working with water. Tech-driven solutions are the way forward for the cleaning service industry, and businesses would be wise to future-proof themselves by staying abreast of these exciting developments.

"The tools and systems to improve water management are here today. Companies can deploy these technologies to understand their water footprint across the value chain, from better measurement, to better management and outcomes." [13]

Interclean: United in Sustainability, Passionate About Progress

Cleaning businesses that are making these eco-friendly changes are demonstrating their commitment to social responsibility and environmental sustainability. The transition to sustainability in cleaning should engender pride in all the various stakeholders that they are all doing their bit to take care of our precious and irreplaceable natural heritage.

Tackling water security is unequivocally a team effort – and it is a win-win proposition for business

Tech-driven solutions are the way forward for the cleaning service industry, and businesses would be wise to future-proof themselves by staying abreast of these exciting developments.

owners, employees, consumers/ clients, AND the environment.

Especially considering the many responsive and smart technology options available to the professional cleaning industry these days, there really is no excuse anymore for complacency.

Interclean is proud to be one of the foremost facilitators in showcasing these pioneering sustainability innovations. As the world's leading platform for professionals in the world of cleaning and hygiene, Interclean has been on the forefront of advances within the cleaning industry since Interclean Amsterdam was first founded in 1967. During inspiring events in Amsterdam, China and Online, Interclean offers a complete overview of products, services and innovations from the world's leading companies. Interclean is also a highly regarded knowledge-sharing platform – providing access to the very latest news, views and analysis on cleaning and hygiene.

Interclean excels in uniting cleaning expertise under one roof, to share cutting-edge innovations and forge strategic partnerships – together we can learn, grow, and lead.

For more information, please visit:
intercleanshow.com

[12] The United Nations World Water Development Report 2023: partnerships and cooperation for water - UNESCO Digital Library.

[13] How Businesses Can Address The Water Scarcity Crisis (forbes.com)

INTERCLEAN