

# KEEP SWIMMING

The present and future of swimming pools  
and sustainability



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and sustainability

# 4 FOREWORDS

**5**  
Fernando Pozas  
Director, Water Business Unit  
Aquor  
Mexico

**6**  
Jerome Pedretti  
Executive VP and CEO, Pool  
Pentair  
USA

# 8 EXECUTIVE SUMMARY

# 10 OPENING PERSPECTIVES

**12**  
Pool Horizons

**15**  
The swimming pool industry's  
commitment to sustainability  
and the environment

# 16 THE IMPACT OF SWIMMING POOLS ON THE ENVIRONMENT

**18**  
Context  
and approach

**20**  
Water and  
swimming pools

**26**  
Energy and  
swimming pools

**30**  
Chemicals and  
swimming pools

**32**  
CASE STUDY 1  
A sustainable symbiosis  
Exmouth, UK

# 34 BEST PRACTICES FOR IMPROVING THE SUSTAINABILITY OF SWIMMING POOLS

**36**  
Environmental stewardship  
and swimming pool  
best practices

**38**  
Water  
management

**40**  
Energy  
efficiency

**42**  
Chemical  
management

**44**  
Innovation  
and technology

**45**  
Workforce and skilled  
management

**46**  
CASE STUDY 2  
A circular water solution  
Barcelona, Spain

# 48 A VISION FOR THE FUTURE OF SWIMMING POOLS AND SUSTAINABILITY

**51**  
HORIZON 1  
Sustainability of  
the swimming pool itself

**52**  
HORIZON 2  
Integrating sustainability  
into the facility

**53**  
HORIZON 3  
The swimming pool as part  
of a sustainable community

**54**  
A call to action  
to all stakeholders

**56**  
CASE STUDY 3  
More sun, less carbon  
Coyoacán, Mexico City

# 58 CONCLUSIONS AND BEYOND

# 60 CONTRIBUTORS

# 68 REFERENCES

# CONTENTS

# FOREWORDS

As leaders of the working groups behind this report, Fernando Pozas and Jerome Pedretti highlight the potential of integrating sustainability into every aspect of the swimming pool industry. Their reflections emphasize the importance of balancing enjoyment with environmental stewardship, setting the stage for actionable strategies that benefit both people and the planet.

## A vision of a sustainable swimming pool industry

As I reflect on the journey that led us to this report, I am struck by the urgency and promise of our mission. Leading the Pool Horizons Sustainability and the Environment working group has been both an honour and a responsibility, one that I approach with a deep commitment to sustainable progress in the swimming pool industry. This document represents a desire to transform swimming pools from simple recreational facilities into sustainable spaces that reflect our respect for the environment.

Having dedicated much of my life to the water industry, I understand the profound role that water plays in our communities and ecosystems. For me, this is not just a professional endeavour; it is a calling to help ensure that our use of resources aligns with the principles of stewardship and responsibility. In developing this report, we have leveraged the expertise, insights and passion of the working group to present a framework that not only addresses current environmental challenges but also anticipates the needs of future generations.

This report outlines strategies for managing resources wisely: from conserving water and reducing energy use to exploring responsible chemical practices and minimizing waste. These are not just recommendations; they are pathways towards a future where swimming pools are integrated into the environment in ways that enhance, rather than diminish, our natural world.

I am proud to present this work on behalf of a team committed to advancing sustainable practices within our industry. Together, we can all build a legacy that I believe will help shape a more resilient and sustainable world. Let this report be a starting point for meaningful change, inspiring each of us to embrace sustainability as a core value in our work and in our communities.



**Fernando Pozas**

Director, Water Business Unit, Aquor  
Mexico

# Swimming pools that are good for enjoyment and the environment

As a leader in the swimming pool industry, I have seen first-hand how the need for sustainable solutions has evolved from a distant goal to an immediate imperative. We should all focus on shaping a more sustainable future where pools contribute positively to both people and the planet. This report embodies the mission to work towards a more sustainable, responsible industry where our actions today set the standard for tomorrow.

From construction and operation to energy management, water conservation and the responsible use of chemicals, Pool Horizons envisions what's possible for the entire lifecycle of swimming pools.

A greener future starts with practical steps and innovations that reduce our environmental impact, without compromising the enjoyment and value that swimming pools bring to individuals and communities. Pool Horizons is about more than incremental improvements; it's about fostering a cultural shift within the swimming pool industry.

This report includes the work of dedicated industry experts, leaders and stakeholders who recognize that the time for action is now. It provides a comprehensive framework for integrating sustainable practices into every aspect of the swimming pool experience.

I feel privileged to stand alongside my colleagues and peers who have served in the Pool Horizons initiative. Let this report serve as a platform for each of us - manufacturers, operators, builders, services, industry advisors and users alike - to create a legacy of sustainability that will define our industry's future. Together, we can transform our industry and ensure that swimming pools are as beneficial to the environment as they are to those who enjoy them.

## Jerome Pedretti

Executive Vice-President and CEO, Pool, Pentair  
USA



# EXECUTIVE SUMMARY

This report envisions a future where swimming pools play a crucial role in advancing environmental sustainability, driving resource efficiency and supporting ecological balance. Through the adoption of innovative technologies and sustainable practices, an industry goal should be that pools will become more energy efficient and focused on further preserving and conserving critical environmental resources.

The Pool Horizons Keep Swimming report envisions a future in which swimming pools play a pivotal role in advancing societal progress while promoting environmental stewardship. It outlines the industry's potential to integrate sustainable practices into swimming pool operations, offering a roadmap for reducing the environmental impact of pools through innovative technologies and strategic resource management.

The report explores three critical areas: the sustainability of individual pools, the integration of sustainable practices into pool facilities, and the role of swimming pools within broader community ecosystems. It emphasizes the importance of reducing water consumption, improving energy efficiency and adopting eco-friendly chemical management strategies. The report also discusses how aligning with the United Nations Sustainable Development Goals (SDGs) can guide the industry toward more responsible and impactful actions.

Case studies from around the world, including Exmouth in the United Kingdom, Coyoacán in Mexico and Barcelona in Spain, highlight how such initiatives can deliver environmental benefits while maintaining community engagement and accessibility.

The report concludes with a vision for a more sustainable future, emphasizing the need for innovative solutions. It calls on the swimming pool industry to continue evolving, ensuring that pools are not only recreational spaces but also key players in promoting environmental sustainability and resilience in communities. Through these efforts, the industry can help shape a more balanced and sustainable world, turning pools into symbols of ecological and social progress.

# OPENING PERSPECTIVES

The Pool Horizons initiative provides a guiding compass for the swimming pool industry's response to modern social and environmental challenges, promoting sustainable practices, enhancing wellbeing and fostering communities. The initiative emphasizes reducing the industry's environmental footprint while encouraging innovative sustainable approaches.

# Pool Horizons

The Pool Horizons initiative serves as a guiding star for the swimming pool industry and its entire ecosystem, helping to navigate the complexities of the 21st century's second quarter. It offers a strategic vision to address the social and environmental challenges of our time. This effort is the result of a unique collaboration between global industry experts and key stakeholders, who together have crafted a forward-looking roadmap, one that charts a course across four horizons, showing how the swimming pool industry can shape a future that is both hopeful and sustainable.

## Health and Wellbeing

Pool Horizons envisions a world where swimming pools are not only leisure spaces, but powerful tools for enhancing physical and mental health, aquatic sanctuaries that can uplift individuals, weaving them into a broader tapestry of wellbeing.

## Community Development

Swimming pools can be hubs of social vitality and engines of community cohesion. Pool Horizons aims to ensure that access to water is not a privilege but a universal right.

## Water and Safety

Swimming pools are the best place for individuals of all ages to develop water competency, an essential skill that reduces risks and unlocks a lifetime of enjoyment in and around water.

## Sustainability and the Environment

The swimming pool industry has worked to evaluate the sustainability of swimming pools over the years, with significant progress in innovation and the implementation of best practices. Pool Horizons calls for a new relationship between swimming pools and the environment, promoting a vision of harmony between human-made spaces and the natural world.

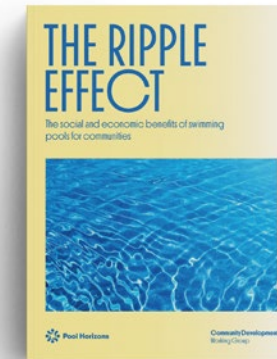
These four horizons weave together into an interconnected network, stretching from individual actions to community impact and further, shaping our global environment.

The Pool Horizons working groups, organized around these themes, have presented their conclusions in four reports, of which this is one.



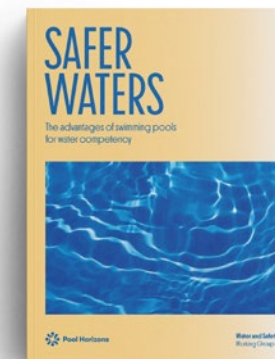
### Making a Splash

The positive impact of swimming pools on health and wellbeing



### The Ripple Effect

The social and economic benefits of swimming pools as community spaces



### Safer Waters

The advantages of swimming pools for water competency



### Keep Swimming

The present and future of swimming pools and sustainability



This report explores the swimming pool industry's shift towards greater sustainability, examines swimming pools' use of resources and advocates for efficient practices that reduce environmental impact while also lowering costs. Offering a cohesive vision for the future of swimming pools, the report provides a roadmap for environmental transformation, calling on industry stakeholders to embrace a future where efficiency is integral to every pool and community, promoting environmental and economic sustainability.



## The swimming pool industry's commitment to sustainability and the environment

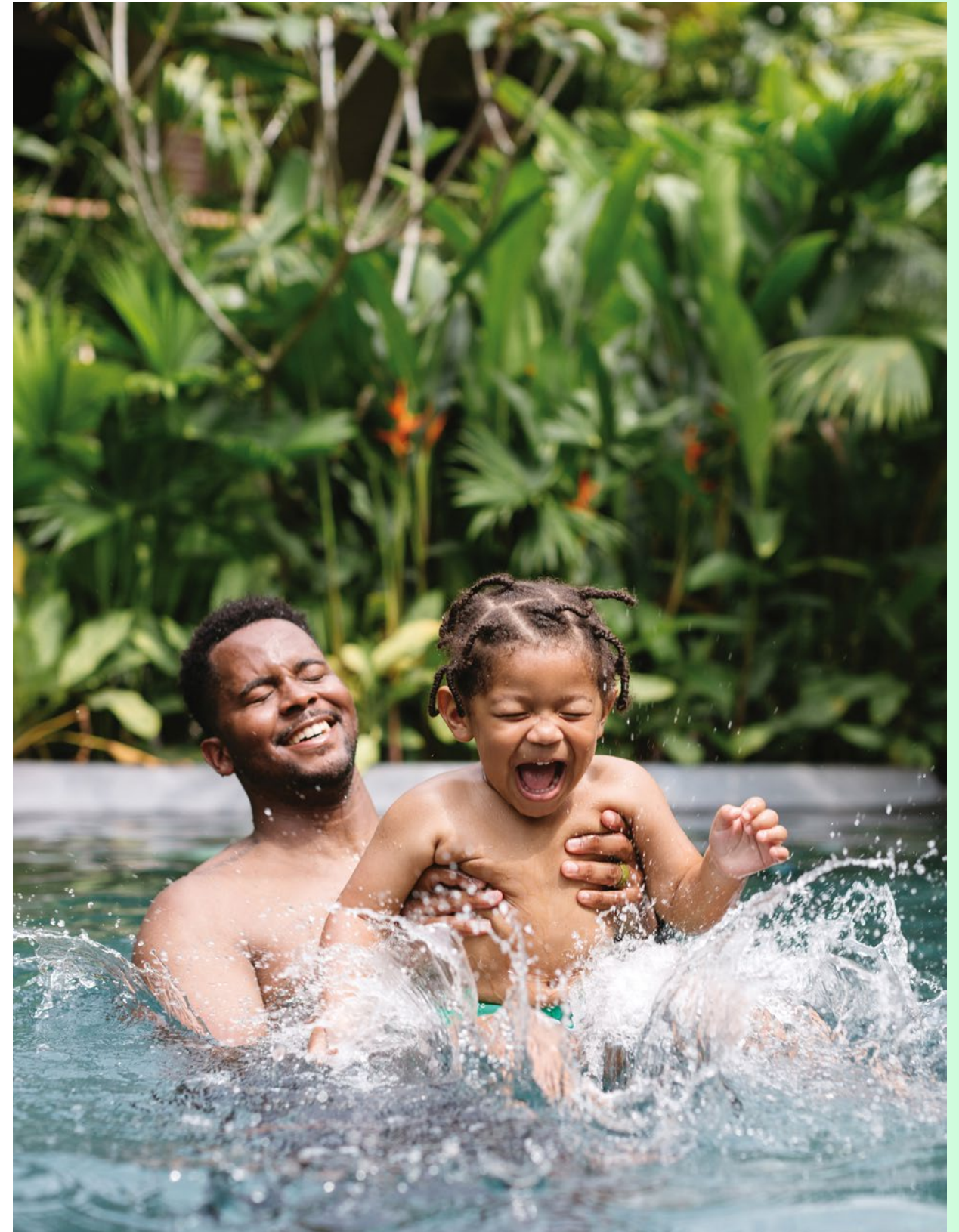
**Swimming pools serve as more than just places for recreation; they are dynamic spaces that help shape the wellbeing and vitality of communities.** They offer havens for exercise and relaxation, while also acting as gathering spots that strengthen social ties and elevate quality of life. In these waters, people find both respite and connection, fostering a sense of belonging that transcends age and background.

As the global focus sharpens on the realities of climate change and resource scarcity, the call for environmentally responsible practices has become louder than ever. The swimming pool industry stands at a pivotal crossroads, undergoing a profound transformation driven by a commitment to sustainability. This shift isn't just about meeting regulations; it's a voluntary embrace of responsibility, recognizing the impact that pools, both large and small, have on the planet.

From family, backyard pools to community aquatic centres, the industry is working to develop innovative technologies that conserve water, cut energy consumption and promote long-term environmental stewardship. **This evolution is more than a response to external pressures; it is a deliberate movement towards exploring how the swimming pool industry can work to make the pools of today leave a lighter, more positive imprint on the world of tomorrow.**

# THE IMPACT OF SWIMMING POOLS ON THE ENVIRONMENT

Swimming pools provide valuable benefits to individuals and communities, enhancing health, recreation and social interaction. However, like all human activities, they have a potential environmental impact. To mitigate this impact and ensure long-term viability, pool owners and operators can look towards implementing increasingly sustainable practices and technology, allowing these cherished spaces to be enjoyed responsibly, fostering harmony between human enjoyment and environmental stewardship.



# Context and approach

Swimming pools are a prominent feature in residential and public spaces around the world, offering numerous opportunities for recreation, exercise and relaxation. They provide spaces where families and friends can gather, host lively summer events and offer venues for fitness activities. **Despite the many ways swimming pools enrich our lives, they come with environmental challenges that are worth evaluating to determine their ultimate impacts and potential avenues for mitigation.**

A thorough evaluation of the environmental impact of swimming pools requires a Life Cycle Assessment (LCA). This assessment examines every phase of a pool's existence, starting from the extraction of materials, manufacturing and construction, through its operational lifespan and ending with decommissioning. Each stage contributes differently to the pool's overall potential environmental impact.

The construction phase involves the use of substantial resources, such as concrete, steel and PVC. Manufacturing these materials, as well as their transportation to construction sites, contributes to environmental impacts, which can be reduced by following alternative approaches. This phase is resource-intensive, highlighting the importance of choosing sustainable building methods and materials wherever possible.

Once a pool is operational, it enters a phase that often lasts several decades, during which it continues to consume water, energy and chemicals. Water is needed to fill and top up the pool, while energy is required to power heating systems, filters and circulation mechanisms. Maintaining clean and safe water necessitates the regular use of chemicals such as chlorine.

At the end of its useful life, a swimming pool must be decommissioned, a process that involves demolishing structures and disposing of materials. Opportunities may exist to adopt more sustainable practices in repurposing these materials.

The swimming pool industry collaborates closely with other sectors, including construction, materials manufacturing and recycling. These partnerships aim to drive sustainable innovations, enhance efficiency and improve the management of pools throughout their lifecycle.

In this report, we will concentrate on three critical resources that are central to the operation of swimming pools: water, energy and chemicals. Each of these resources plays an essential role in maintaining optimal pool conditions. Understanding their usage and impact is key to helping pool operators adopt more sustainable practices. By focusing on improvements in water conservation, energy efficiency and responsible chemical use, the industry can create safer and more enjoyable swimming experiences while prioritizing environmental responsibility. Through these efforts, **the swimming pool sector can contribute to a more sustainable future, balancing the benefits of recreational water facilities with the need to protect our planet.**

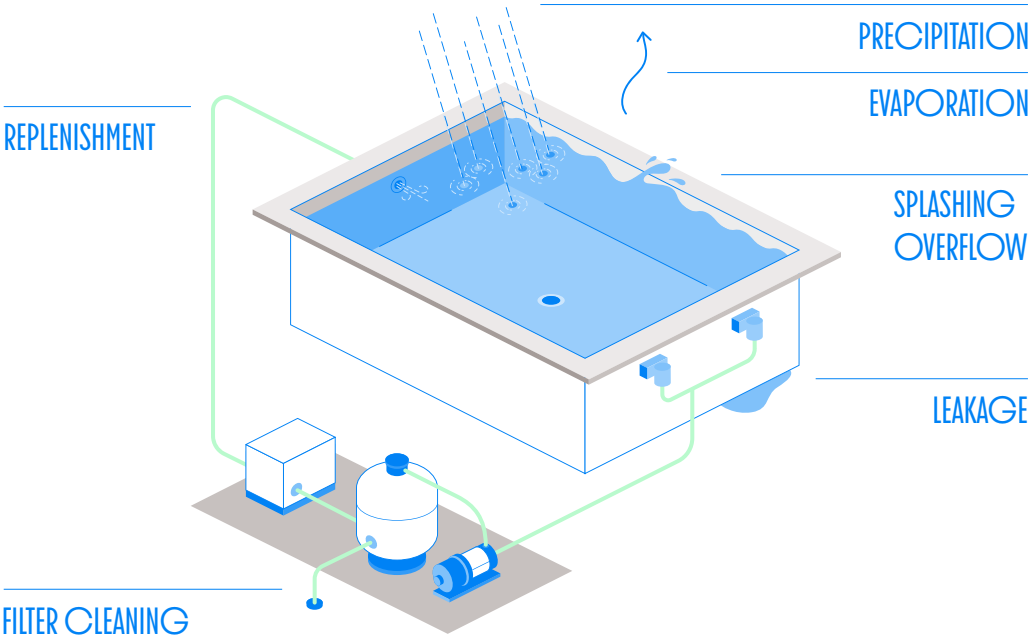


# Water and swimming pools

Swimming pools provide recreational, therapeutic and community benefits and, inevitably, consume water. The water requirements for both family and community pools involve initial filling and subsequent replenishment due to water loss from splashing, leakage and evaporation. Water can also be required for maintenance, including backwashing of filters. Current practices by pool owners and advancements in pool equipment technologies help mitigate potential water loss. Additionally, there are opportunities to explore new strategies and technologies to further reduce water consumption.

Evaporation can be an important factor in water loss, requiring frequent replenishment. Pools may suffer from leakage, leading to further water loss if leaks are not detected and repaired promptly. Maintenance practices such as backwashing pool filters, which involve flushing water through the filter to maintain quality, also contribute to overall water use.

**FIGURE 1** THE WATER CYCLE IN SWIMMING POOLS



**Source**  
Every drop counts; water and swimming pools. Fluidra 2024

Globally, most pools rely on municipal water supplies, yet accurate data on pool-specific water use remains scarce. From select studies in France and Spain, estimates suggest that swimming pools account for approximately 0.75% to 1% of total municipal water use, a relatively modest figure compared to other sectors (see Tables 1 and 2 below). However, this consumption can still have localized impacts, especially in areas where water resources are limited or where seasonal demand surges.

In France, for example, research by the French Federation of Pool and Spa Professionals (FPP) indicates that swimming pools use about 40 million cubic meters of water annually, representing 0.75% of total municipal water consumption. The total water extracted in France, including industrial and agricultural uses, reaches around 26,270 million cubic meters. Based on this data, municipal water consumption for pools in France is a small percentage as compared to other uses in France, yet it remains a focal point for water efficiency initiatives.

**TABLE 1** WATER USAGE IN SWIMMING POOLS IN FRANCE

WATER USE IN FRANCE	MILLION M <sup>3</sup>	% OF TOTAL	% OF MUNICIPAL USE
Total water extracted	26,270	100	---
Industrial use	17,780	67.68	---
Agricultural use	3,180	12.11	---
Municipal use	5,310	20.21	100
Swimming pools	40	0.12	<b>0.75</b>

**Source**  
French Federation of Pool and Spa Professionals (FPP) and AQUASTAT 2020 (see full reference on page 71)

Similarly, in **Spain**, a study by the Spanish Association of Pool Professionals (ASOFAP) found that pools account for about 28.6 million cubic meters of water use, roughly 0.67% of municipal consumption. The report highlights that, if factoring in water losses from the municipal supply system, the relative impact of pools on water consumption could reach 0.90%. These figures provide a nuanced view of the role pools play in Spain's water consumption landscape.

**TABLE 2** WATER USAGE IN SWIMMING POOLS IN SPAIN

WATER USE IN SPAIN	MILLION M <sup>3</sup>	% OF TOTAL	% OF MUNICIPAL USE
Total water extracted	29,023	100	---
Industrial use	19,268	66.39	---
Agricultural use	5,514	19.00	---
Municipal use	4,243	14.61	100
Swimming pools	29	0.10	<b>0.67*</b>

\* This 0.67% represents the impact of water use of swimming pools relative to the total amount of municipal water. If the total amount of water distributed publicly is considered (including a 25% loss of municipal water), the impact of swimming pools would be 0.90%.



**Source**  
Spanish Association of Pool Professionals (ASOFAP) and AQUASTAT 2020 (see full reference on page 71)

In the **United States**, the available research shows that the impact on municipal water supplies can vary significantly. Studies from the University of Florida and various state water management agencies have examined the contribution of pools to household water use. Findings suggest that pools can represent up to 2-3% of a household's annual water consumption in regions where pools are common (Lee and Heaney, University of Florida, 2008).

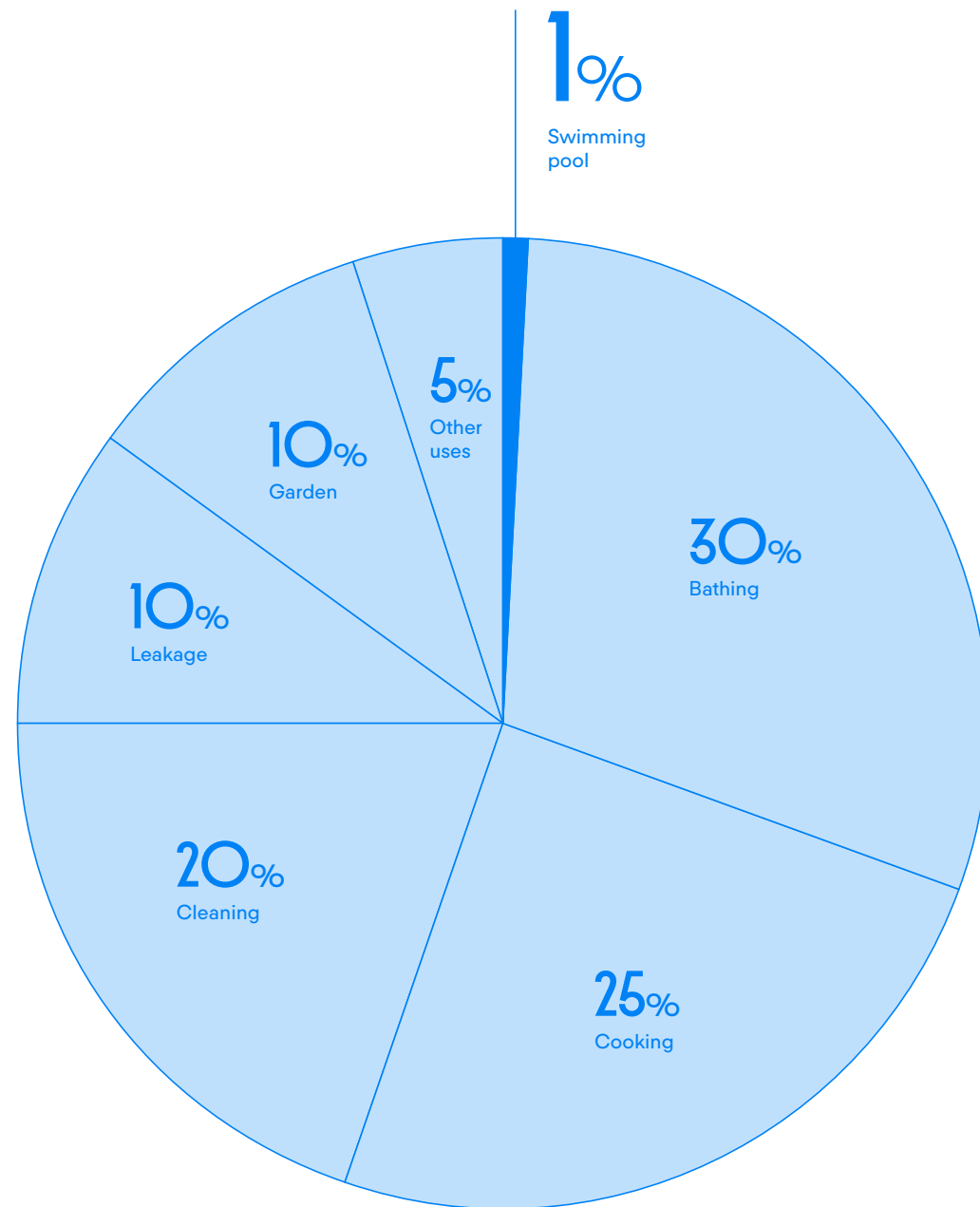
**Australia**, a country known for its extensive pool culture, faces unique challenges regarding pool water use. The dry climate and frequent droughts across much of the country have made water conservation a critical issue. According to the Australian Bureau of Statistics, residential pools can use between 30,000 to 70,000 litres of water annually, mainly due to evaporation and cleaning (Water Corporation, 2025). Given the high rate of pool ownership in states like Queensland and New South Wales, where over 10% of households have a pool, the cumulative water use becomes significant (Australian Bureau of Statistics, 2010).

Countries and regions worldwide implement various strategies to manage water consumption in swimming pools, yet these efforts often yield similar results. A comprehensive review of the most reliable data on domestic water use, sourced from organizations like AQUA, the EPA and the Water Research Foundation, indicates that **leisure activities, including swimming pools, account for about 1% of global residential water consumption (see Figure 2 on page 24).**

**This finding underscores the necessity for more accurate, region-specific data on swimming pool water usage across various applications. It also illustrates that the current data is sufficient to effectively size the relationship between swimming pools and water consumption.**

FIGURE 2

GLOBAL DOMESTIC WATER CONSUMPTION BY USE



**Source**  
Own work, based on AQUAE 2024, EPA US 2024 and Water Research Foundation 2016 (see full reference on page 71)



Internationally, organizations such as the World Health Organization (WHO) have highlighted the importance of managing water use in recreational settings, including swimming pools, within broader water conservation efforts. Studies by the WHO emphasize that while pools contribute to community wellbeing and health, their maintenance should align with sustainable water use practices (World Health Organization, 2006). This global perspective encourages countries to adopt more efficient technologies and practices that help balance recreational benefits with environmental responsibility.

In conclusion, although swimming pools constitute a small fraction of overall municipal water usage according to data from certain jurisdictions, they present distinct challenges and opportunities for water conservation. By focusing on sustainable practices and leveraging new technologies in the future, the pool industry can work to minimize its environmental impact while continuing to offer valuable social and recreational benefits. Understanding the nuances of water use across different regions allows for more targeted strategies and helps provide useful data points about the role of pools in overall water consumption.

# Energy and swimming pools

**Swimming pools consume energy for heating, filtration and lighting systems**, with energy demands especially high in colder climates where heating is frequently necessary. Adopting energy-efficient solutions helps pool owners balance facility enjoyment with reduced environmental impact, while also achieving significant cost savings and promoting economic sustainability.

## Energy consumption and carbon emissions

**Heating** is one of the most energy-intensive aspects of pool operation (Gómez-Guillen et al., 2024). In colder regions, maintaining a comfortable water temperature can be especially costly, particularly when using conventional natural gas or electric heaters. (According to the US Department of Energy (2025a), each degree of temperature increase can raise energy costs by 10% to 30%). As the relative cost of energy rises in some jurisdictions, pool owners and operators may become more conscious about the overall cost of operating their pool equipment. Pool equipment manufacturers are offering alternative solutions to the market such as solar powered heaters which may reduce the overall energy costs to an owner as compared to traditional electric or gas powered heaters. These technologies have gained traction in countries like Australia and Spain, where solar energy is abundant and offers a viable solution for pool heating.

**Filtration systems** and pumps are critical for maintaining water clarity and hygiene and to remove debris and contaminants. Typically, these systems run for several hours daily. However, older models are often inefficient, consuming more energy than necessary to clean the pool as compared to current filtration solutions offered in the market. Upgrading to energy-efficient pumps and implementing optimized circulation patterns can reduce energy consumption. In the United States, the Department of Energy has set efficiency standards for pool pumps, encouraging manufacturers to produce more energy-efficient models. Studies in California show that newer variable-speed pumps can reduce energy consumption by up to 80% compared to traditional single-speed pumps (Hunt and Easley, 2012).

**Lighting** is another key factor in a pool's energy profile, especially when pools are used during evening hours. Traditional incandescent lighting systems consume significantly more energy than modern alternatives (US Department of Energy, 2025). By switching to LED lighting, pool owners can cut energy use while enhancing the visual appeal of pool areas (Swim Ireland, 2024). In the European Union, the transition to LED lighting has become a standard recommendation for reducing energy consumption in both private and public swimming facilities. Similar trends are observed in the USA, where energy rebate programmes incentivize homeowners to adopt LED pool lights, resulting in lower energy bills and reduced environmental impact (US Department of Energy, 2025).

## Implications of rising energy costs

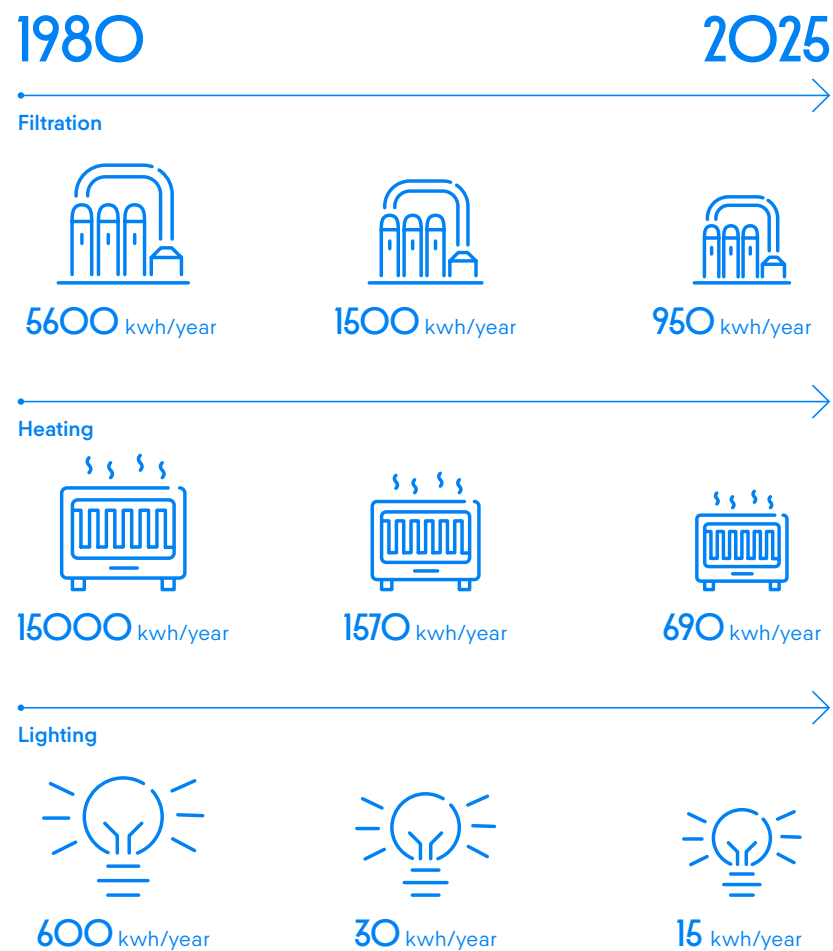
**The global rise in energy prices has significantly affected public leisure facilities, including swimming pools.** This challenge is particularly acute in Europe and North America, where many public pools are struggling with rising operational costs. Higher energy expenses have led to reduced operating hours, making it harder for communities to access these facilities. This situation has also prompted some operators to raise admission fees, potentially limiting access for lower-income families and impacting community wellbeing (Swim England, 2023).

A study titled *The Future of Swimming Facilities in Scotland* (Scottish Swimming, November 2023, page 11) highlights energy as the primary factor affecting the operational costs of swimming pools. The research analysed ten public facilities, providing detailed insights into the mechanical and electrical systems that drive their energy use. Similar challenges are seen in the United States, where public pools are crucial for community health programmes, especially in low-income neighbourhoods (National Drowning Prevention Alliance, 2025). **Rising energy costs and overall operational costs could potentially affect the availability of programmes such as swimming lessons and water-based fitness classes, which are essential for public health and safety.**

## Technological innovations and energy efficiency

Over the past few decades, the swimming pool industry has made notable progress in energy efficiency. Technological advancements have transformed the management of pool facilities, making it possible to operate pools more sustainably. The study Économies d'énergie 1980-2025 by the French Federation of Swimming Pool Professionals illustrates the impact of such innovations. The study notes a reduction in heating energy use from 15,000 kWh in 1980 to 1,570 kWh in 2015 due to improvements in heat pump efficiency. Similar gains have been made in filtration, with energy consumption dropping from 5,600 kWh in 1980 to 1,500 kWh in 2015, thanks to the adoption of better-designed pumps (Source: see Figure 3).

**FIGURE 3** EVOLUTION OF ENERGY USE BY SWIMMING POOLS, 1980 TO 2025



**Source**  
Piscine Global  
from Fédération  
des Professionnels  
de la Piscine  
et du Spa 2020

The United States Department of Energy has issued regulations addressing the energy efficiency of dedicated pool pumps (US Department of Energy, 2023). The U.S. Department of Energy Energy Star programme promotes the adoption of energy-efficient pool pumps by consumers, helping to reduce the **environmental impact of residential pools**. Moreover, these advances have helped private pool owners make more informed decisions about their energy use, contributing to lower overall carbon emissions.

## Global perspective on energy use in swimming pools

Studies indicate that the **contribution of swimming pools to household carbon emissions can be relatively small when managed efficiently**. For example, research in France found that a private pool accounts for only 1.2% of the annual CO<sub>2</sub> emissions of a typical household (FPP, September 2020b). This perspective is valuable in global discussions, as it highlights the **potential for improving energy efficiency without sacrificing the benefits of swimming pools**.

In Australia, for instance, the widespread use of covers and heat retention systems has become a common practice, with the publication in 2022 of the new Australian Standards (AS5348) Pool Covers and Swimming Pool Heat Pump Systems (AS5352) (Chris Maher, December 14th, 2022) helping to minimize heat loss and reduce the energy required for heating.

In the USA, the state of California (Riverside Public Utilities. Pool & Spa Pump Rebate Program, 2024) has been a leader in promoting energy efficiency for pools, partly due to its commitment to reducing greenhouse gas emissions and its year-round pool usage climate. Various rebate programmes encourage the installation of solar heating systems, efficient pumps and LED lighting (US Department of Energy, 2025b). Similar initiatives can be found in Canada and Germany, where governments have introduced incentives for upgrading to energy-efficient pool systems (Natural Resources Canada, 2024; Bundesministerium für Wirtschaft und Klimaschutz, 2024).

The energy demands of swimming pools present a challenge, but **innovations in technology and efficiency standards offer pathways to more sustainable management**. By adopting advanced heating, pumping and lighting systems, pool owners have a pathway to reduce their energy consumption. This shift not only lowers operational costs but also supports more sustainable living. As countries continue to grapple with rising energy costs, the example set by research and practices in places such as the United States, France and Australia demonstrates that it is possible to balance enjoyment of pools with a commitment to environmental responsibility.



# Chemicals and swimming pools

**Maintaining high water quality in swimming pools is essential;** achieving this normally requires the regular use of chemicals such as chlorine, algaecides and pH balancers. These substances play a critical role in controlling the growth of harmful microorganisms, ensuring safer swimming conditions. However, improper management of these chemicals can lead to environmental and health challenges, emphasizing the need for **careful handling and innovative alternatives to traditional methods.**

Chlorine remains the most widely used disinfectant in pools due to its efficacy in eliminating bacteria, viruses and other pathogens. However, its interaction with organic matter like sweat, hair and skin cells can produce harmful by-products, specifically trihalomethanes (THMs) (Hua et al., 2022). THMs are of particular concern due to their potential health risks, which include respiratory conditions such as asthma and bronchitis (Villanueva et al., 2015). These risks are more pronounced in poorly ventilated pool environments, where airborne exposure to these compounds can be higher. Beyond the health implications for pool users, improperly discharging pool water containing chlorine and its by-products into natural water bodies can pose serious threats to ecosystems. Such discharges can disrupt aquatic life, impacting fish populations and other organisms that depend on a balanced aquatic environment (Pennsylvania Department of Environmental Protection, 2019).

In response to these challenges, various alternative sanitation methods have been developed, offering potentially safer and more sustainable solutions. Ozonation, for instance, uses ozone gas to purify water. Studies have shown that this disinfection method is highly promising, as it significantly reduces the concentration of by-products compared to chlorination (Ilyas, 2018). Bromination, another alternative, offers a more stable solution compared to chlorine, performing effectively in both hot and cold water. Its stability makes it particularly useful for pools in varying climates, as it maintains its disinfecting properties over time (Coleman et al., 2023). Saltwater electrolysis has also gained popularity as a means of generating chlorine directly from salt.



**Each of these alternatives has its own unique benefits and can contribute to the creation of safer, healthier and more environmentally friendly swimming facilities.** The adoption of these methods requires consideration of various factors, such as cost, pool size and regional regulations to ensure that the most suitable solution is implemented for each situation.

Overall, the use of chemicals in swimming pools is a balancing act between maintaining high sanitation standards and mitigating potential environmental and health risks. By exploring alternative disinfection methods, adhering to proper storage and disposal practices and staying informed about evolving regulations and technologies, pool owners and operators can create spaces that are not only safe for swimmers but also considerate of broader ecological impacts.

# A SUSTAINABLE SYMBIOSIS

## EXMOUTH, UK



### Overview

Exmouth Leisure Centre, located in the southern English town of Exmouth, is benefiting from an innovative solution that repurposes waste heat from data centres. Data centres, which power AI, robotics and other technologies, generate significant amounts of heat, which is usually released into the atmosphere. Deep Green, a company specializing in repurposing energy for social good, captures heat from a data centre installed at the leisure centre and uses it to heat the pool, reducing the need for gas boilers. This approach lowers energy costs and carbon emissions, making swimming more affordable and environmentally friendly for the local community.

**“The potential is enormous. Making swimming and other active pastimes more accessible and more sustainable, we can maintain activity in our community so that people stay more healthy.”**

Olly Swayne, CEO, LED Community Leisure

### Points of interest

- Water in a swimming pool is normally heated to above 28°C.
- Rising energy costs have contributed to the closure of over 380 public swimming pools across the UK since 2010.
- According to some calculations, 97% of the energy that goes into a computer comes out as waste heat.
- Data centres do not have to be in industrial warehouses but can be at the heart of local communities.

**“The future is heating every swimming pool for free with data centres. That’s incredibly exciting!”**

Mark Bjornsgaard, CEO, Deep Green



### Conclusions

This partnership demonstrates a groundbreaking win-win approach to sustainability. By repurposing waste heat from servers to warm swimming pools, data companies reduce environmental impact, while the community benefits from lower energy costs, reduced carbon emissions and affordable access to facilities. This innovative model transforms a challenge into a community asset, highlighting the potential for scalable, sustainable solutions that integrate technology with local needs, fostering environmental and social benefits on a global scale.

# BEST PRACTICES FOR IMPROVING THE SUSTAINABILITY OF SWIMMING POOLS

There are many many existing technologies and best practices that exist today that, with increased adoption, could help reduce adverse environmental impacts. This section of the report outlines some of the best practices that can further contribute to optimizing the use of resources and increasing sustainability efforts.



# Environmental stewardship and swimming pool best practices

In alignment with the shift to embracing responsibility, the UN has defined 17 Sustainable Development Goals with specific targets and indicators to improve the overall health of people and the environment. Adopting swimming pool management best practices can contribute to a number of these goals, notably Clean Water and Sanitation (SDG 6) and Affordable and Clean Energy (SDG 7). Specifically, pools can contribute to SDG target 6.4 by improving water efficiency of pools to conserve fresh water and SDG target 7.3 by continuing to improve energy efficiency and moving towards clean energy solutions. Good pool management can also support other Sustainable Development Goals, even if not directly tied to specific SDG targets. These include Good Health and Wellbeing (SDG 3), Sustainable Cities and Communities (SDG 11), Responsible Consumption and Production (SDG 12) and Climate Action (SDG 13).



# Water management

## Best practices

- **Water recycling and reuse.** Implementing systems to capture and treat backwash water for reuse is a highly effective strategy to reduce overall water consumption in both private residential and public pools. (Backwashing is the process of flushing water in reverse through the filter to remove accumulated particles.) This approach not only conserves valuable water resources but also enhances operational efficiency. It is essential for pool owners and operators to ensure compliance with local regulations, which can vary widely, and maintain strict water quality standards to guarantee swimmer safety and satisfaction. For public pools, adopting innovative water recycling systems can enhance their reputation as environmentally responsible facilities. In both settings, these systems contribute to lower operational costs and align with broader sustainability objectives.
- **Cartridge filters.** Swimming pool cartridge filters provide an efficient alternative to traditional sand filters, capturing dirt and impurities without requiring backwashing. Instead, they are cleaned by removing and rinsing them with a hose, saving significant amounts of water, a key advantage in areas with strict water restrictions. Their compact size and straightforward maintenance make them ideal for residential pools, spas and hot tubs, particularly in settings with smaller water volumes and limited space. However, cartridge filters have limitations. They require manual cleaning, which can be time-consuming, and they may need more frequent replacement. They are less effective at handling large debris loads, making them less suitable for pools in debris-prone environments. Despite these drawbacks, cartridge filters excel in smaller or medium-sized pools, offering water-efficient and user-friendly solutions for maintaining clean and clear water.

- **Rainwater harvesting.** Installing rainwater collection systems can enhance the water supply for both swimming pools and the surrounding landscaping, providing a sustainable solution to water usage. These systems capture and store rainwater, which can then be used for filling pools, watering gardens and maintaining green spaces. However, while this approach offers substantial benefits in terms of conservation and efficiency, it also requires careful development and regulatory support. It is important to note that some countries have restrictions on rainwater harvesting practices, which can hinder implementation. Advocating for changes in these regulations and promoting awareness of the benefits of rainwater collection is essential to encourage wider adoption and maximize its potential impact on both residential and community swimming pools.
- **Pool covers.** Using covers to minimize evaporation significantly reduces the need for pool refilling. By creating a barrier that limits exposure to sunlight and wind, these covers help maintain the water's temperature and reduce the overall evaporation rate. This approach has proven to be an effective and economical strategy for preventing water loss, supporting sustainable water management practices and saving time, effort and the cost of refilling (US Department of Energy, 2025c).
- **Leak detection and repair.** Regular inspection and maintenance of pool infrastructure, including plumbing, tiles and surface, are crucial to preventing water loss from leaks. Establishing a routine check-up schedule allows for early detection of potential issues, enabling timely repairs that conserve water, reduce chemical costs and maintain the pool's overall integrity. Investing in leak detection services and technology can help ensure that hidden leaks are promptly identified and addressed, contributing to more sustainable swimming.

## Best practices

- **Solar pool heating.** By harnessing the power of solar energy to warm pool water, homeowners can potentially lower their dependence on fossil fuels, promoting environmental sustainability. There are two primary methods for achieving this. The first method involves the use of photovoltaic panels, which convert sunlight into electricity. This electricity can then be used to power electric heaters for the pool, offering the flexibility to use the generated power for other electrical needs as well. The second method utilizes solar collectors, which directly heat the pool water. In this process, water is pumped through a series of tubes within the solar collectors, where it is heated by the sun before being circulated back into the pool. This approach ensures a more direct and efficient transfer of solar heat. Both methods make use of renewable energy, providing a cost-effective and sustainable way to maintain a comfortable pool temperature throughout the swimming season. By investing in solar heating systems, pool owners contribute to a cleaner environment (by reducing their dependence on other fossil-based energy sources) while potentially lowering their energy costs.
- **Energy-efficient pumps and filters.** Installing energy-efficient equipment, such as variable-speed pumps and high-efficiency filters, can potentially decrease the electricity consumption of pool systems, thereby reducing energy bills in both public facilities and households.

- **Pool covers.** Covers play a crucial role in maintaining pool temperature by minimizing heat loss. By keeping the warmth in, they reduce the need for additional heating, which in turn lowers energy consumption. This makes pool covers an effective tool for enhancing energy efficiency, as they help maintain a comfortable water temperature with less reliance on external heating systems. Using a cover can extend the swimming season while cutting down on energy costs, contributing to both financial savings and environmental sustainability.
- **LED lighting.** LED lights consume up to 80% less energy than incandescent bulbs and have a much longer lifespan, often lasting for over 25,000 hours (US Department of Energy, 2025d). This means less frequent replacements and potential savings on electricity costs, all while providing vibrant and customizable lighting options.
- **Smart energy management systems.** Implementing automated energy management systems can optimize energy use based on pool usage patterns and real-time weather conditions. These smart systems can adjust heating, lighting and filtration schedules to ensure that energy is used efficiently, minimizing waste and maximizing comfort for users.



# Chemical management

## Best practices

- **Monitoring and maintenance.** Consistent monitoring and maintenance of pool systems are critical for ensuring safety water quality and optimal chemical use. Regular testing of pH levels and sanitizer concentrations prevents imbalances that can compromise water quality and pose health risks. Scheduling routine inspections of equipment ensures all systems function properly, reducing the likelihood of costly breakdowns. Advances in digital monitoring systems have transformed pool management by providing real-time data on key parameters such as pH, chlorine levels and water temperature. These systems enable precise adjustments, reducing the risk of chemical overuse or underuse. Paired with automated dosing systems, which efficiently administer amounts of chemicals as needed, they streamline maintenance processes, enhance water quality and potentially reduce both costs and environmental impact.
- **Alternative disinfection methods.** Alternative disinfection methods, such as saltwater chlorination, UV and ozone systems may be considered. These methods offer an alternative approach to disinfecting pool water, reducing reliance on traditional chlorine and other harsh chemicals. Their effectiveness depends on factors such as the pool's water volume, temperature, turbidity and the types of organic matter present. For example, saltwater systems use a salt cell to generate chlorine on-site, while physical filtration systems, such as membranes, capture and neutralize bacteria and microorganisms before they can multiply, minimizing the need for higher chemical concentrations.

- **Softening water.** Softening the water used to fill and replenish swimming pools can potentially reduce the need for chemicals by minimizing the levels of minerals such as calcium and magnesium, which contribute to water hardness. Hard water can create an environment that requires more chemicals to balance pH levels and maintain optimal water conditions. By using softened water, the pool's pH and alkalinity are easier to stabilize, reducing the amount of chlorine, pH adjusters and other treatments required. Additionally, softer water prevents the buildup of mineral deposits in filtration systems and plumbing, improving overall efficiency and prolonging the lifespan of pool equipment (Godseken et al., 2012). This approach not only lowers chemical consumption but also supports cost savings and environmental sustainability in pool maintenance.
- **Proper chemical storage and handling.** Ensuring the safe storage and handling of pool chemicals is crucial to preventing leaks, spills and contamination. This involves using proper containers, clearly labelling them and storing them in a cool, dry location away from direct sunlight and incompatible substances. Training pool maintenance staff on safe handling practices can significantly reduce the risk of accidents, ensuring a safer environment for everyone.



# Innovation and technology

## Best practices

- **Smart pool management systems.** By implementing artificial intelligence (AI) and IoT (Internet of Things) solutions, pool operators can achieve real-time monitoring of essential aspects of pool management including water quality, energy consumption and other operations. These systems can send alerts for necessary maintenance, automate chemical dosing and optimize heating schedules, ensuring a consistently safe and enjoyable swimming experience while minimizing waste.
- **Advanced filtration technologies.** Utilizing cutting-edge filtration systems can greatly reduce water and energy usage while maintaining superior water quality. These technologies often combine with methods such as UV purification or ozone treatment, which not only require fewer chemicals but also contribute to a healthier swimming environment by reducing the reliance on traditional chlorine-based treatments.
- **Sustainable materials.** In the construction and renovation of pools, the choice of materials plays a crucial role in sustainability. By using recycled, sustainable material, such as natural stone or composite decking, pool owners and operators can lower the environmental impact of their facilities (Oliveira et al., 2018). The use of locally sourced materials helps support community economies and reduces transportation emissions.

# Workforce and skilled management

## Best practices

- **Training and development programmes.** Regular training sessions on sustainability practices, safety protocols and the use of innovative technologies should be organized, ensuring that staff members are knowledgeable and capable of operating pools in an environmentally responsible manner.
- **Fair labour practices.** Fair labour policies that ensure decent working conditions, fair wages and opportunities for career advancement should be implemented, promoting job satisfaction and staff retention, leading to a more stable and experienced workforce.
- **Collaboration and stakeholder engagement.** Collaboration between management, staff and external stakeholders should be encouraged, to foster a culture of sustainability. Engaging employees in decision-making processes can lead to innovative ideas and a shared commitment to sustainability goals.



## CASE STUDY 2

# A CIRCULAR WATER SOLUTION

## BARCELONA, SPAIN



### Overview

The Club Natació Atlètic-Barceloneta (CNAB) is a municipal swimming and sports centre between the beach and the port in Barcelona. The club's showers use approximately 80 m<sup>3</sup> of mains water a day, about 30,000 m<sup>3</sup> annually. This grey water is then discarded. Across the road, MB92, one of the Mediterranean's leading shipyards for repairing and refitting yachts, uses approximately 21,900 m<sup>3</sup> of fresh mains water annually for cleaning and maintenance. In a pioneering, innovation, a project has been developed to treat and reuse the grey water from the showers at the CNAB for cleaning the yachts at MB92. A simple, circular, sustainable solution.

**“What to do about the shower water in our facilities is a key issue we needed to address as a club. This partnership demonstrates that by looking beyond our own operations, we can turn what was traditionally a waste product of our activities into a valuable resource for other industries.”**

Hector Cruz, Project Director, CNAB

### Points of interest

- The grey water undergoes advanced treatment using state-of-the-art submerged flat ultrafiltration (UF) membranes.
- The project also enhances the monitoring and control of water consumption across the facilities using a Supervisory Control and Data Acquisition (SCADA) system and a mobile application.
- Additional potential uses for the grey water are being explored.

**“The water footprint is a crucial factor in our organization’s environmental sustainability. This innovative project will drastically enhance our water management by transitioning from mains water to reclaimed water for our industrial processes, paving the way for self-sufficiency.”**

Marc Hervás, Sustainability Manager, MB92

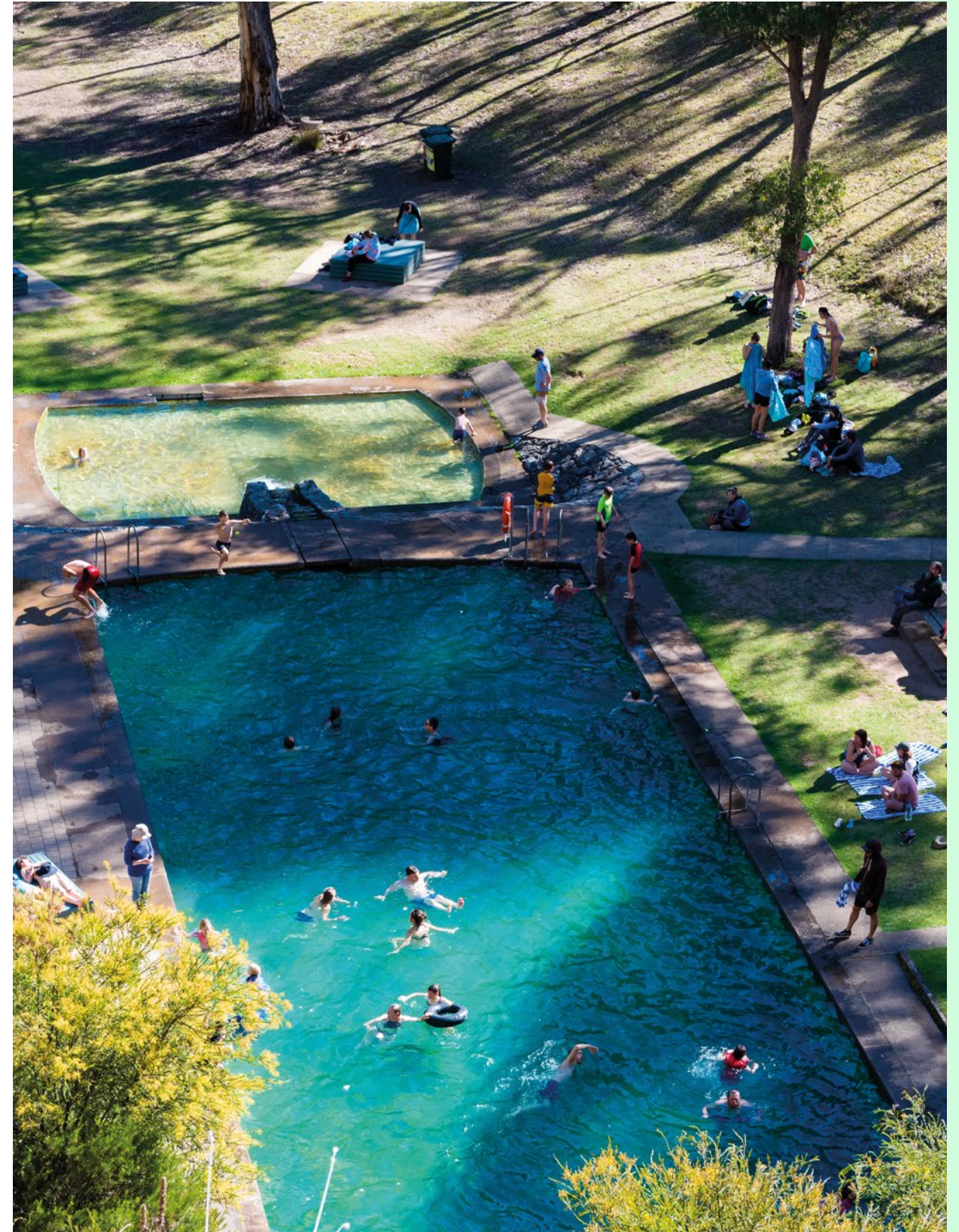


### Conclusions

This project exemplifies the transformative power of innovation and collaboration, demonstrating how circular solutions can address resource challenges while fostering environmental stewardship. By treating and reusing grey water, CNAB and MB92 pioneer a sustainable blueprint that benefits industry and community alike. The swimming pool industry can draw inspiration from this initiative, recognizing the potential to look beyond a pool's immediate surroundings for similar partnerships. Such forward-thinking practices can redefine resource use, inspire change and contribute to a more sustainable, resilient and interconnected society.

# A VISION FOR THE FUTURE OF SWIMMING POOLS AND SUSTAINABILITY

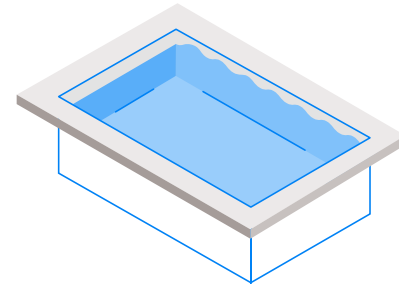
Sustainability in the swimming pool industry can advance by aligning pool design and operation with broader infrastructure and urban sustainability goals. This chapter delves into three critical aspects: enhancing the sustainability of pool systems, optimizing facility efficiency and addressing the social and environmental impact of pools on local communities.



## HORIZON 1

### Swimming pool

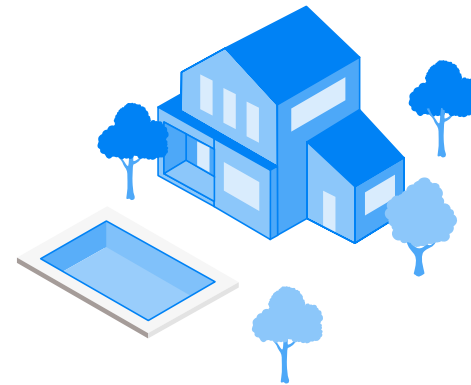
Resource efficiency during the pool's life cycle.



## HORIZON 2

### Premises

Contribution and synergies of the swimming pool in the context of the garden, house, leisure centre or wherever it is installed.



## HORIZON 3

### Community

Contribution and synergies of the swimming pool beyond its immediate premises. Optimization and sharing of resources in a broader urban, industrial and environmental context.



## HORIZON 1

# Sustainability of the swimming pool itself

The swimming pool industry has made significant progress in improving materials, equipment and overall pool efficiency. Important areas of development include better water management, increased energy efficiency and optimized chemical usage, all aimed at creating more sustainable and cost-effective pools.

- **Water management** in the pool industry has drawn increased interest, especially in connection with recycling and reuse. Advanced filtration systems enable water to be recycled within the pool, reducing the need for fresh water. Technologies now exist that can capture and treat backwash water or eliminate backwashing entirely. Effective leak detection and repair are essential; regular inspections and maintenance help prevent leaks, while smart monitoring systems can detect them early, potentially saving water and minimizing environmental impact. In climates where the use of covers makes sense, they can contribute to reducing water evaporation.
- **Energy efficiency** is another priority in the pool industry. Solar heating systems, for example, can harness sunlight to warm pool water, reducing dependence on non-renewable energy sources. Pool covers also play an important role by preventing heat loss, thereby cutting down on energy needs. Upgrading to energy-efficient equipment, such as variable-speed pumps and high-efficiency filtration systems, helps maintain water quality while using less power. Switching to LED lighting reduces energy consumption and lowers maintenance costs, thanks to the longer lifespan of LED bulbs.
- **Chemical management** in pools is increasingly focused on alternative disinfection methods, such as ozone, UV or saltwater chlorination, to reduce reliance on chemicals and minimize their by-products. Softening pool water by lowering calcium levels can also lessen the need for chemicals. Automated chemical dosing systems ensure efficient usage, minimizing waste and preventing overuse. Advanced filtration technologies, such as membrane systems, can effectively remove bacteria and pathogens, further decreasing the need for chemical treatments.

## Integrating sustainability into the facility

The second horizon involves adopting a more **holistic approach to sustainability by considering the entire premises where the swimming pool is located**. This approach highlights the potential of the swimming pool to contribute to the broader building systems.

Energy and heat recovery is a key aspect of this integration. Heat exchange systems enable the recovery of heat from pool water, which can be used to warm other areas of the facility, such as showers or heating systems. Combined Heat and Power (CHP) systems can also be implemented, allowing facilities to generate electricity and useful heat simultaneously from the same energy source, thus improving overall energy efficiency.

Water reuse within the facility is another important area. Greywater systems can treat water from pool backwashing, allowing it to be reused for non-potable purposes like toilet flushing or irrigation. Rainwater harvesting systems can be installed to capture and store rainwater, which can then supplement the pool's water needs, reducing reliance on municipal water supplies.

The use of sustainable materials and construction practices is another avenue for reducing environmental impact. Facilities should opt for sustainably sourced options in the construction or renovation of pools and surrounding areas. Pursuing certifications such as Leadership in Energy and Environmental Design (LEED) can help facilities meet stringent sustainability standards, ensuring they contribute positively to environmental goals.

## The swimming pool as part of a sustainable community

The third, widest horizon considers the **role of swimming pools within the broader community, exploring how they can contribute to urban sustainability and the development of their immediate surroundings**.

**Swimming pools play a unique role in the local environment, offering opportunities to contribute to energy efficiency, water conservation and community resilience.** Community heat networks, for instance, enable swimming pools to connect to district heating systems, supplying surplus heat generated during pool operations to nearby buildings, which reduces the community's overall energy demand. In water management, pools can integrate into broader systems by repurposing treated water for local landscaping or agricultural uses, supporting water conservation efforts. Incorporating stormwater management systems into pool facilities helps to reduce urban runoff, mitigate flood risks and improve local water quality, enhancing the sustainability of the surrounding environment.

**The social and economic integration of swimming pools, both public and private, into communities is a vital aspect of sustainability.** Sustainable operations and maintenance not only create job opportunities, driving local economic growth, but also encourage environmentally friendly practices. Public pools can enhance social sustainability by participating in community wellbeing programmes, offering inclusive spaces for recreation, fitness and education. Similarly, private pool owners can contribute by adopting sustainable practices, supporting local businesses for maintenance and supplies and occasionally making their pools available for small-scale community activities, fostering connection and shared purpose within neighbourhoods.

The future of swimming pools lies in advancing sustainability to include surrounding facilities and local communities. **By minimizing environmental impact and overcoming technical, regulatory and economic challenges, pools can become integral to resilient, interconnected and sustainable community landscapes, fostering positive change.**

# A call to action to all stakeholders

**Making sure that swimming pools are as sustainable and environmentally friendly as possible requires a collaborative approach that engages all stakeholders from across the ecosystem, from governments to individuals.**

Each has a unique role in shaping a future where swimming pools prioritize efficiency and environmental stewardship, fostering spaces that embody sustainable enjoyment for current and future generations.

- **Policymakers and authorities**  should prioritize legislation and dedicate resources to support the construction and maintenance of environmentally sustainable community and family swimming pools. By implementing and enforcing regulations that promote advanced filtration systems, energy-efficient technologies and water conservation practices, they can significantly improve pool sustainability. Allocating resources to these initiatives ensures that sustainable swimming pool solutions are accessible and widely adopted, reducing the overall environmental impact of pools. This proactive approach not only enhances the sustainability of swimming pools but also drives efficiency and reduces the financial impact of swimming pools, thereby helping to ensure their future.
- **Researchers**  play a crucial role in driving innovation for sustainability within the swimming pool industry. By exploring cutting-edge solutions and understanding the broader environmental impact of pools, they provide valuable insights that inform more sustainable practices. Their findings help set industry standards and encourage the adoption of proven, sustainable methods, fostering a shift towards greener pool management and design. Through collaboration with industry stakeholders, researchers are essential to the development of sustainable advancements that benefit both the environment and pool users.
- **Real estate developers and urban planners**  should make sustainable swimming pools a standard feature in their projects, considering the pool's integration within its surroundings and its potential contribution to local sustainability. Collaborating with environmental groups allows these developments to align with community ecological goals, enhancing both their value and their appeal to residents.

- **The swimming pool industry** , including pool builders, manufacturers and suppliers, plays a crucial role in advancing sustainable practices. Through innovation in design, materials and operations, the industry can lead the transition towards pools with reduced environmental impact. By investing in research and development for sustainable solutions, the industry can set new standards that make pools more efficient and sustainable.

- **Public swimming pool managers and private pool owners**  can enhance sustainability, improve efficiency and achieve cost savings by adopting sustainable practices and technologies. Reducing water waste and minimizing energy consumption can be achieved through optimized filtration systems, regular leak inspections, solar-powered heating and lighting, and the use of insulated pool covers to maintain temperature and reduce evaporation. The careful choice of cleaning products lowers the chemical footprint, benefiting both users and the environment. Educating pool users on sustainable practices fosters a community-wide commitment to environmental responsibility, making swimming pools more enjoyable, efficient and environmentally friendly.

- **Individuals**  can actively contribute to the push for more sustainable swimming pools, both public and private, by advocating for sustainable practices and making responsible choices as pool users. Supporting community pools that prioritize sustainable methods encourages local authorities to invest in more sustainable options. For private pools, individuals can make choices that improve the efficiency and sustainability of their pools, contributing to protecting their environment and saving money. By voicing support for sustainable policies and practices, individuals help pool owners and managers recognize the importance of pool management. In doing so, they contribute to a community where pools serve as positive environmental assets, enhancing local ecosystems and offering spaces for people to connect with nature in a responsible way.

**By coming together, all the stakeholders in the swimming pool ecosystem can help swimming pools be vibrant symbols of sustainability, nurturing local ecosystems and inspiring a legacy of environmental care and enjoyment for generations to come.**

## CASE STUDY 3

# MORE SUN, LESS CARBON

## COYOACÁN, MEXICO CITY



### Overview

Centro Deportivo Coyoacán, A.C., established in 1977, stands as a pioneering model for integrating renewable energy within recreational facilities. The centre was originally created to provide a space for physical, mental and social wellbeing, for the employees and families of its founding institutions. Over the years, it has evolved to become a beacon of sustainability in urban Mexico City, leveraging solar energy across its installations to significantly reduce its environmental impact, enhance its energy independence and reduce its operating costs.

**“One of the best investments we’ve made at the Coyoacán Sports Centre: we reduce costs while being environmentally friendly - a perfect combination!”**

Adán Santillanes Sosa, Managing Director, Centro Deportivo Coyoacán, A.C

### Points of interest

- An 820 kWth solar thermal system helps heat the swimming pool to 29°C, cutting gas consumption by 80%.
- A 499 kWp photovoltaic solar power system reduces the carbon footprint of pool operations, including pumping and filtering systems, as well as the broader club’s energy use, by 50%.

**“I am even prouder to work at the Coyoacán Sports Centre, knowing that we are contributing to a better future for generations to come.”**

Gilberto Aguirre Delgado, Head of Maintenance, Centro Deportivo Coyoacán, A.C



### Conclusions

This project highlights how sports and recreation centres can embrace renewable energy solutions to reduce carbon emissions and operational costs. Coyoacán Sports Centre sets a precedent for integrating advanced solar technologies in pool facilities, showcasing the environmental and economic benefits of reducing reliance on fossil fuels. By combining solar thermal and photovoltaic systems, the centre not only promotes sustainability but also fosters community wellbeing in an eco-friendly environment. This initiative exemplifies the potential for recreational facilities worldwide to adopt renewable energy, contributing to a greener future while enhancing their operational resilience.

Photos courtesy of Módulo Solar y la Asociación de Profesionales de la Piscina AC

# CONCLUSIONS AND BEYOND

Pool Horizons envisions a future where sustainability and environmental stewardship are the driving principles of the swimming pool industry, ensuring that pools not only provide enjoyment and relaxation but also contribute to a healthier planet.

From the earliest days when humans first gathered by rivers and lakes, water has been a source of life, a symbol of renewal and a place of connection. Across centuries, we have sought to shape water to our needs, building pools as spaces of recreation and refuge. But in our modern era, with its pressing environmental challenges, the question is no longer just about enjoyment but about how we care for this precious resource.

Sustainability in swimming pools is not merely a technological shift; it is a reflection of our deeper values, our commitment to leaving a smaller footprint and ensuring that our use of resources aligns with the planet's needs. As the climate crisis intensifies, the industry stands at a critical juncture, one where every innovation, every energy-efficient technology, every water-saving practice contributes to a broader vision of ecological balance.

This report is more than an analysis; it is a call to action. It urges us to recognize that our actions today shape the world of tomorrow. The swimming pool industry, with its capacity to blend tradition with innovation, can lead the way toward a more sustainable future, where using aquatic facilities does not come at the expense of our planet.

Our resolve is firm. We are not merely building swimming pools; we are shaping ecosystems of sustainability. We are ensuring that every pool, whether in a family garden or a city centre, becomes a testament to responsible stewardship. As we move forward, our mission is clear: to support sustainable design practices, to collaborate with communities and policymakers, and to champion practices that protect the environment for generations to come.

Let us remember that the future of sustainability is not just in advanced technologies or policy changes. It lies in the timeless commitment to live in harmony with our environment, to honour water as both a source of life and a shared responsibility. The swimming pool industry is ready to take on this challenge, not just as a business but also as a custodian of our planet's wellbeing.

**The water is ready. Let's make it sustainable!**

# CONTRIBUTORS

The knowledge and dedication of a diverse group of experts and collaborators have been instrumental in shaping this report, reflecting the strength of collective effort in advancing sustainability, environmental stewardship and the future of the swimming pool industry.



## Fernando Pozas

Director, Water Business Unit  
Aquor, Mexico

Fernando Pozas is part of the third generation of his family involved in the swimming pool industry, starting with his grandfather in 1954. Aquor, the family business, has expanded across Mexico, the USA, the Caribbean and Brazil. Fernando heads the company's Water Division. He actively contributes to the industry, serving as President of the Supervisory Board of the Asociación de Profesionales de la Piscina (Association of Swimming Pool Professionals) and representing Mexico in the World Alliance of Pool and Spa Associations (WAPSA). He is also Vice President of Environment at the Monterrey Chamber of Commerce.



## Heather Morris

Director of Corporate  
Communications, Pool  
Pentair, USA

Heather Morris is an accomplished corporate communications and public relations professional with a notable track record of overseeing and executing innovative corporate communications campaigns. Throughout her career, Heather has consistently advised executive leadership and driven global communications programs that advance brands, promote business growth and drive employee engagement. Her strategic approach to corporate communications demonstrates thought leadership, increases share of voice, and effectively engage audiences. Heather holds a Bachelor of Arts degree in communication from Luther College, located in Decorah, Iowa.





## Charlie Claffey

President  
Claffey Pools. USA

Charlie Claffey leads Claffey Pools in Southlake, Texas, a leading swimming pool builder which has been in business for over 35 years. Under his leadership, Claffey Pools has significantly expanded its output, becoming one of the nation's leading pool builders. Charlie has served as Chairman of the Board for The Pool & Hot Tub Alliance (PHTA) and continues to play an active role in shaping the future of the pool industry.



## Mike Church

CEO and President  
Cody Pools Inc. USA

Mike Church is the CEO and President of Cody Pools, a company with over 510 employees in 16 offices across Texas, Florida, and Arizona, with a projected 2024 revenue of \$360 million. When Mike Cody bought the company in 2003, it had 19 employees and \$5 million in revenue. Under Mike's leadership, the company has made strategic acquisitions, including Challenger Pools, Platinum Pools, and American Pools & Spas. Cody Pools has been ranked first in Pool and Spa News' Top 50 Pool Builders for 11 consecutive years and is recognized as a top employer in Texas. Mike's dedication to excellence has made him a key leader in the USA pool.



## Ben Davis

Sector Coordinator  
Alliance for Water Stewardship. UK

Ben Davis has nearly a decade of experience in corporate sustainability, much of it focusing on water stewardship. Since 2021, he has worked as the Sector Coordinator at AWS, helping organisations worldwide address water challenges. Ben's work supports the implementation of sustainable water management practices on both global and local scales.



## Azur Dzindo

Segment Innovation Officer, Pool  
Pentair. USA

Azur Dzindo holds a BS and MS in Mechanical Engineering from Rochester Institute of Technology. After starting his career in the automotive industry, he joined Pentair, where he has spent 20 years innovating in water heating and quality management. He holds multiple patents and has held various leadership roles in engineering and product management.



## Pierre-Yves Flattot

Director, Water Business Unit  
CCEI S.A.S. France

Pierre-Yves Flattot has a decade of experience in business development for the pool industry. He has successfully built and managed subsidiaries in Canada and the USA, with turnovers of \$5 million and \$20 million respectively. Currently, he serves as Director of CCEI in France, managing global sales, production and project management.



## Bridget Forbes

Senior Water Engineer  
Arup. USA

Bridget Forbes is a Senior Water Engineer at Arup's New York office, with 10 years of expertise in water resources, green infrastructure, stormwater management, and sustainable development. As a lead engineer and project manager, she delivers detail-oriented solutions to complex challenges, working on projects across the U.S. and globally, including her role in Hydraulic Modeling for the Peru Reconstruction Project. Bridget is dedicated to innovative design, focusing on sustainability, rainwater harvesting, greywater reuse, and nature-based solutions.



## Carlos Heise

Director  
Panozon Ambiental. Brazil

Carlos Heise, a Brazilian entrepreneur, has over 35 years of business experience. In 2001, he founded Panozon Ambiental, which focuses on ozone technology for water treatment. He also acquired Girassol Solar, a solar pool heating company. Carlos actively promotes environmental and social causes, serving as President of various industry associations in Brazil.



## Joshua Hoots

Director of Product Management  
Core Products  
Hayward Holdings Inc. USA

Joshua Hoots has been with Hayward for 20 years, starting as a Product Engineer in Hayward Flow Control before moving into product management in Hayward Pool. He currently oversees core products such as pumps, filters, and heating systems. Joshua holds a BS in Mechanical Engineering from North Carolina State University and an MBA from the University of North Carolina.



## Nicolas Jarraud

Senior Specialist for Engagement  
and Partnerships Development  
Global Water Partnership. Cyprus

Dr Nicolas Jarraud is a Senior Specialist for Engagement and Partnerships Development at the Global Water Partnership (GWP), coordinating over 2,800 water-related organizations worldwide to promote sustainable water management. He is a founding member of the Leadership Council of Sustainable Development Solutions Network (SDSN), Cyprus, focusing on the UN's Sustainable Development Goals. Before GWP, he worked in international relations at the Cyprus Institute and spent over a decade with the UNDP-ACT in Cyprus. Nic holds a PhD in Environmental Science, an MSc in Science Communicatio, and a BSc in Biology from Imperial College London.



## Richard Lamburn

Head of Facilities  
Swim England. UK

Richard Lamburn, Head of Facilities at Swim England for seven years, has deep expertise in swimming pool design and operation. He previously managed facilities and served as a pool plant technical manager, training over 3,000 operators annually. Richard consults on sustainable facility design and refurbishment. He has been on the PWTAG technical committee for over a decade, including four years as a Council Member, and is a representative on the British Standards working group for European pool standards. He has also presented globally, including at Splash International and the World Aquatic Health Conference.



## Cedrik Mayer-Klenk

CEO  
CF Group. Germany

Cedrik Mayer-Klenk followed his father's legacy in the swimming pool industry, reclaiming Chemoform in 1997 at age 25. He transformed the small company into a major player, culminating in the 2019 merger with France's FIJA Group to form the CF Group, one of Europe's largest pool equipment manufacturers. Today, CF Group employs 1,200 people and operates in over 40 countries, emphasizing eco-friendly practices. Cedrik contributed to the European DIN standard EN 17645 in 2022 for resource-efficient pools and is a member of the Club d'Affaires Franco-Allemand.



## Bruce Mungiguerra

CEO  
Riverbend Sandler Pools. USA

Bruce Mungiguerra, CEO of Riverbend Sandler Pools since 2021, has over 25 years of leadership experience. He has led the company's rapid expansion through acquisitions, including Pulliam Pools, Claffey Pools, Hauk Custom Pools, and Richard's Total Backyard Solutions. Riverbend Sandler focuses on growth in Texas, building a premium platform for pool construction, renovation, service, and maintenance. Before the pool industry, Bruce spent 20 years in security/technology and 14 years in the airline sector, holding leadership roles at Delta Airlines, Brinks Home Security, Monitronics International (where he served as COO), and Nortek Control as SVP Global Sales and Marketing.



## Jerome Pedretti

Executive Vice-President & CEO, Pool  
Pentair. USA

Jerome Pedretti is the Executive Vice President and CEO of Pentair's Pool segment. Since joining Pentair in 2005, he has held various leadership roles across Business Development, EMEA, Valves and Controls, and Aquatic Systems. Prior to overseeing the Pool segment, Jerome served as Executive Vice-President and President of Pentair's Industrial and Flow Technologies division. Before his time at Pentair, Jerome worked as a growth consultant for Bain and Company. He holds a Bachelor of Mechanical Engineering from the University of Nancy, France, and an MBA from the Rotterdam School of Management, Erasmus University, The Netherlands.



## Franck Sogaard

Chief Revenue Officer,  
President Americas, EMEA & APAC  
Maytronics. USA

Franck Sogaard is an experienced executive with a background in leadership roles at Berkshire Hathaway, Newell Brands, Jarden Corporation and Maytronics. Currently, he serves as President of Maytronics Americas, EMEA and APAC, and as Chief Revenue Officer for Maytronics Ltd., a global leader in robotic pool cleaning solutions with over 2,000 employees. He also chairs ECCXI, an e-commerce company acquired by Maytronics in 2022. Previously, he led sales and marketing at Larson-Juhl, a Berkshire Hathaway company, and spent over a decade at Jarden Corporation. Franck holds a Business Administration degree from the College of Charleston and an International MBA from the University of South Carolina.



## David Tapias

Director of Product Compliance  
Sustainable Pool & Innovation  
Fluidra. Spain

David Tapias has been with Fluidra since 1997, starting as Technical Manager of the export area before advancing to Technical Director in 2005. From 2010 to 2020, he served as Director of Research and Development, and since 2020, he has held the position of Director of Product Compliance. In addition, David leads Fluidra's Open Innovation and Corporate Venturing division (Fluidra LAB) and the Product and Sustainable Pool division. David began his career at Sandoz in 1993, working in water treatment technology. He holds a degree in Biology from the Universitat de Barcelona and post-graduate degrees in Business Management and R&D Project Management. David also represents Fluidra on the boards of Indecat, the Catalan Water Partnership and Indpuls.



## Frank Tomaselli

President &  
Chief Regional Officer  
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Keep Swimming, a report developed by the Pool Horizons Sustainability and the Environment working group, envisions a transformative role for swimming pools in advancing sustainability and societal progress. It outlines strategies for integrating resource efficiency, innovative technologies and sustainable practices across swimming pools, facilities and community ecosystems. The report highlights the potential for swimming pools to evolve into symbols of environmental responsibility and resilience, shaping a more sustainable and connected future.