ECO POOLS

A Report on Energy Efficiency Options for Swimming Pools

Contents

Introduction

As the national governing body for swimming in Ireland, Swim Ireland is dedicated to promoting excellence, inclusivity, and environmental responsibility within the aquatic community. Swim Ireland recognize the critical importance of reducing energy costs and carbon emissions in public swimming pools across the nation. With this objective in mind, Swim Ireland presents this comprehensive report, which explores the potential of innovative technologies to address these pressing challenges.

Ireland, like many nations, faces the imperative of embracing sustainable practices to protect our environment. Public swimming pools, as significant community assets, provide an opportunity to showcase technological advancements that optimize operational costs and contribute to carbon reduction targets.

This report examines a range of operational and technology solutions available to public swimming pools in Ireland, with a specific focus on reducing energy costs and carbon emissions. By exploring advancements such as efficient heating and ventilation systems, alternative filtration solutions, renewable energy generation, and advanced control systems, we aim to provide pool operators and stakeholders with the knowledge and tools necessary to drive positive change.

The adoption of these technologies can create sustainable swimming pool environments that align with our commitment to a greener future. By reducing energy consumption and integrating renewable energy sources, we can make substantial progress in reducing carbon emissions and enhancing the overall efficiency of our facilities.

The report not only delves into the technical aspects of technology implementation but also examines the economic benefits of these solutions. By advocating for the utilization of technology to achieve energy reduction and carbon mitigation in public swimming pools, we aspire to contribute to a more sustainable future.

We invite you to explore the insights and recommendations presented in this report, which we hope will inspire collaboration, innovation, and action within our aquatic community. Together, we can leverage technology to transform our public swimming pools into models of sustainable excellence, making a meaningful impact on energy costs, carbon emissions, and the well-being of our environment.

Swim Ireland is a 32 county body and cost estimates are presented in Euro and Sterling. The currency rate at the time of publishing this report was £1 = €1.17.

The summary table below is a hand quick reference guide, with more detail set out in each of the chapters.

Summary

	Capital Cost	Lifecycle Savings	Carbon Savings	Scalability
Pool Covers	€	€€€	2 trees	● ● ●
Thermal Jackets	€	€	1 tree	● ● ●
Heat Pumps	€€	€	3 trees	● ●
Solar PV	€€€	€€	3 trees	● ●
Waste Water Heat Recovery	€€	€€	2 trees	●
Ceramic Microfiltration	€€€	€€€	2 trees	● ●
Variable Speed Drives	€	€€	2 trees	● ● ●
Server Heating (Deep Green)	€	€€	3 trees	●

Capital Cost € = Low Cost <50k €€ = Mid Cost >50k/<150k €€€ = High Cost > 150k

Lifecycle Savings € = Low Savings €€ = Mid Savings €€€ = High Savings

Carbon Savings 1 tree = Low 2 trees = Mid 3 trees = High

Scalability ● = Low ●● = Mid ●●● = High

(Low is most difficult to install or prohibited by cost and availability


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Operation First

The starting point towards efficiency is to first of all understand the energy usage of the facility. Unfortunately, in this current climate we can't do much about the unit cost per kilowatt but you may be able to limit the amount of energy (kilowatts) used by taking action.

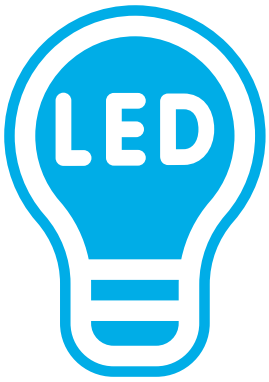
In the first instance, it is advised to start to take meter readings for electric, gas and water as a minimum on a weekly basis if not daily to understand the usage. Track this so you are able to work out the weekly usage, then averaged per day or actual daily usage.

Operational Energy Saving Suggestions

- Emptying the strainer basket more often will result in a reduction in head loss on the main circulation pumps and reduce the energy consumption.
- Ensure that the fan at the back of the pump/motor is clear from dust as the fan draw in air to reduce the heat of the pump. Pumps and motor draw more energy when in warmer environments. Do this on the main circulation pumps, heat exchanger boosters and any spa massage jet pumps.
- The sample line water could be plumbed back into the swimming pool system if the total dissolved solids can be controlled in line with mains water plus 1000ppm or less. A sample line going to waste running at 1 litre a minute will use 1440 litres per day. This will cost you €1870.55/£1608.34 per year (€3.56/£3.06 per cubic metre) and that cost doesn't include heating.
- Ensure that the air temperature of the pool is plus or minus 1 degree of the pool water with a maximum limit of no more than 30 degrees Celsius. As per the PWTAG Code of Practice.
- Running air temperatures on poolside at one degree less than the swimming pool water temperatures increases the evaporation of the swimming pool.
- Although you maybe think it will save you energy with poolside being cooler, the increased amount of water you require to replace the evaporated water ends up costing you more. This is because the mains incoming water needs to be heated, which requires a massive amount of energy from cold to the swimming pool target temperature.
- Humidity should be maintained between 50-70 percent but an increase in humidity can reduce energy consumption. As an example, increase humidity from 60 to 62 percent.
- Ensure that the primary flow and return pipework on boilers are insulated and any valves that are exposed are covered. Valve covers can be purchased at a very low cost.
- Ensure that timeclocks are adjusted around the building and that any light sensor are clean.
- Could the shower heads be changed for more energy efficient ones? A standard shower uses between 8-12 litres of water per minute but new energy saving showers head can be as low as 5 litres per minute.

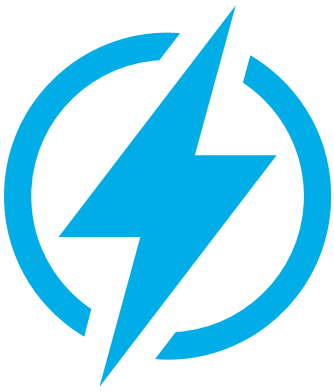
LED Lighting

LED lighting has revolutionized the way we illuminate indoor spaces, offering significant energy efficiency advantages over traditional lighting systems. When it comes to pool halls, where lighting is essential for creating a safe and inviting environment, LED technology presents a compelling solution. By replacing halogen lighting systems with LEDs, pool halls can experience remarkable energy and cost savings, resulting in a compelling return on investment.



LEDs, or Light Emitting Diodes, are highly efficient light sources that convert a greater percentage of electrical energy into visible light compared to halogen bulbs. This increased efficiency translates into substantial energy savings, which directly impact the operating costs of a pool hall. In a pool hall setting, where lighting is typically required for long periods, the energy consumption can be significant. By transitioning to LED lighting, pool halls can significantly reduce their energy consumption and, subsequently, their electricity bills.

In addition to energy savings, LED lighting systems offer extended lifespans, ensuring lower maintenance costs and reduced frequency of bulb replacements. Traditional halogen bulbs have a relatively short lifespan compared to LEDs, which can last up to 25 times longer. This longevity translates to fewer disruptions and expenses associated with changing bulbs, further contributing to the return on investment of LED lighting.



When considering the return on investment, it's important to analyse the initial investment cost and the projected savings over time. While the exact figures may vary depending on factors such as the size of the pool hall, the number of lighting fixtures, and the operating hours, numerous studies and real-world applications have consistently demonstrated that LED lighting can deliver energy savings of up to 50-70% compared to halogen lighting systems. These substantial energy savings, combined with the extended lifespan and reduced maintenance costs of LED lighting, result in a relatively short payback period, typically ranging from 1 to 3 years.

In summary, replacing halogen lighting systems with LED technology in a pool hall offers not only significant energy and maintenance cost savings but also a compelling return on investment. The long lifespan, energy efficiency, and superior lighting quality of LEDs ensure reduced operating expenses and enhanced customer experience. By embracing LED lighting, pool hall operators can improve their bottom line, achieve long-term savings, and create a visually appealing environment for their patrons.

Pool Covers

There is a significant opportunity to enhance energy efficiency and reduce carbon emissions through the use of pool covers. This chapter explores the potential benefits and cost-effectiveness of their utilization in swimming pools.

Pool covers offer a simple and practical solution to reduce energy consumption and water evaporation. By installing lightweight sheets that can be easily stored on large spindle or 'goal post' structures at the end of the pools, operators can roll out the covers over the water surface during periods of pool inactivity. These idle periods often exceed 3500 hours per annum, presenting ample opportunities for energy and cost savings.

The estimated savings resulting from the use of pool covers are substantial. It is projected that implementing pool covers can lead to energy savings of over 200,000 kWh per year and water savings of 75m3 per year. Additionally, the carbon emissions associated with pool operations can be reduced by approximately 35,000kg CO_2 annually

These energy efficiency measures align with Ireland's commitment to environmental sustainability and the reduction of carbon footprints. By implementing pool covers, swimming pool facilities can contribute to the country's goals of achieving energy efficiency and promoting a greener economy.

The economic feasibility of pool covers is another compelling factor. Payback calculations indicate that incorporating pool covers should be considered for both refurbishment projects and new pool constructions. The savings generated by reducing energy consumption and water usage can offset the initial investment in a relatively short period (2-4 years).

In addition to the installation of pool covers, optimizing the pool hall environment is essential to achieve further enhanced energy efficiency. Energy modeling suggests that adjusting the pool hall temperature through the building management system (BMS) to a lower setting, such as 24°C overnight, strikes a balance between energy savings and the need to reheat the pool hall air in the morning.

The advantages of pool covers extend beyond energy conservation. They act as a vapor barrier, reducing evaporation heat losses, minimizing the need for makeup water, and decreasing the required pool hall air handling flow rate. Furthermore, the covers provide insulation, reducing heat losses through conduction and radiation from the water surface to the surrounding air.

Implementing pool covers in swimming pools is a relatively straightforward process. In most cases, it requires minimal additional capital investment and can be easily integrated into existing facilities. For older pool buildings, more complex modifications or control system upgrades may be necessary to achieve optimal energy efficiency. However, in newly constructed or recently renovated pools equipped with building management systems (BMS), the implementation process is expected to be smooth and efficient.

To maximize the effectiveness of pool covers, choosing the appropriate material and thickness is crucial. For enhanced thermal insulation and vapor separation, covers with an assumed thickness of 8-10mm are recommended.

Estimated Cost - €20-30k/£17,200-£25,800

Return on Investment <5 years

Thermal Insulation & Heat Exchanger Jackets

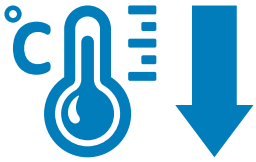
Heat exchangers are a primary method for exchanging heat into swimming pool water. However, these systems can experience significant heat loss to the atmosphere within the plant room, leading to increased energy costs and added strain on pumps and motors. To address this challenge, the implementation of heat exchange covers has proven to be an effective solution.

By installing covers/jackets, swimming pool operators can retain heat and reduce energy consumption. These covers come in various insulation values and qualities, providing a range of options to suit different pool requirements. Most covers are designed with insulation materials such as 50mm x 45kg/m2 Rockwool or mineral fiber. They are also waterproof and feature velcro attachments for secure fastening.

Based on collected data, we have observed notable temperature differentials between heat exchangers with and without covers. External temperatures of plate heat exchangers with covers averaged around 25.4 degrees, while those without covers reached 54 degrees. This remarkable difference indicates a heat retention of 29 degrees within the plate when covers are utilized. Furthermore, the reduced heat loss also translates into energy savings by reducing the energy required from circulation pumps.

Cost Analysis

By considering a target temperature of 29 degrees and a heat loss of 0.5 degrees, our analysis estimates an annual cost of €30,000 (£25,800) for heating and maintaining a swimming pool temperature, excluding backwashing.



However, when incorporating a plate heat exchanger cover and achieving a reduced heat loss of 0.4 degrees, the annual cost for heating and maintenance is projected to decrease to €22,000/£19,000, also excluding backwashing. This represents a significant annual saving of **€8,000/£6,900.**

The average cost of a cover is approximately €300-€600/£260-£500, which results in a rapid payback period of approximately 40 days. It is worth noting that for optimal efficiency, insulation of the flow and return pipework from the boiler systems to the plate heat exchanger is recommended. This additional insulation ensures maximum heat retention within the system, leading to further energy conservation.

Heat Exchanger Jacket avg cost

€300-€600

Harnessing the Power of Heat Pumps

Heat pumps are devices that utilize the principles of thermodynamics to extract heat from one source and transfer it to another. They work by transferring thermal energy from a lower temperature area to a higher temperature area, using a refrigerant as the medium.
Unlike traditional heating systems that generate heat through combustion or electrical resistance, heat pumps leverage the natural properties of heat transfer to provide heating, cooling, and hot water solutions efficiently.

How Heat Pumps Operate:

Heat exchangers are a primary method for exchanging heat into swimming pool water. However, these systems can experience significant heat loss to the atmosphere within the plant room, leading to increased energy costs and added strain on pumps and motors. To address this challenge, the implementation of heat exchange covers has proven to be an effective solution.

Next, the refrigerant enters the condenser, where it releases the absorbed heat to the desired location, such as the swimming pool, changing its state back to a liquid. To complete the cycle, the refrigerant passes through an expansion valve, reducing its pressure, and returns to the evaporator to begin the process anew.

Applications in Public Leisure Facilities:

Heat pumps offer numerous advantages for public leisure facilities, including swimming pools, spas, and other water-based amenities. Here are some key applications:

1. Heating Indoor Pools: Heat pumps provide an efficient and sustainable solution for heating indoor swimming pools. By extracting heat from the surrounding air or ground, they transfer it to the pool water, maintaining a comfortable and consistent temperature throughout the year. This significantly reduces energy consumption compared to conventional heating systems.

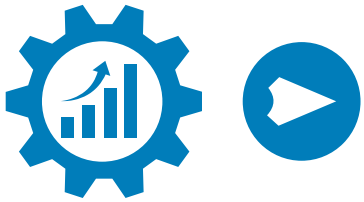
2. Cooling and Dehumidification: Heat pumps equipped with reversible functions can cool indoor pool areas during hot summer months. By reversing the refrigerant flow, heat pumps absorb heat from the pool area and release it outside, effectively cooling the space. Moreover, heat pumps aid in dehumidification, maintaining optimal humidity levels and enhancing air quality within the facility.

3. Hot Water Supply: Heat pumps can produce hot water for showers, changing rooms, and other facility requirements however it must be noted that heat pumps are less efficient when heating water is required at above 50 degrees.

Advantages of Heat Pumps

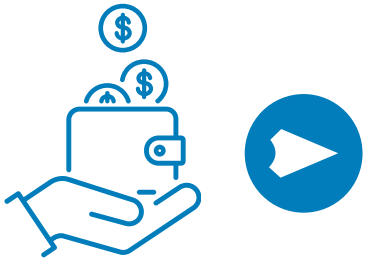
The adoption of heat pumps in public leisure facilities offers several notable advantages:

Energy Efficiency



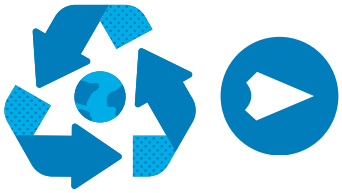
Heat pumps are highly efficient, utilizing renewable or waste heat sources to generate heating and cooling. They can achieve energy efficiencies of over 300%, meaning that for every unit of electrical energy consumed, they can generate three or more units of heat.

Cost Savings



Heat pumps can lead to cost savings in the long run however the current cost of electricity per unit in comparison to gas is high therefore on site generation of electricity can be key to maximising savings. Although the initial investment may be higher compared to conventional systems, the reduced energy consumption and lower carbon emission make heat pumps an environmental choice but may not always be the best option financially.

Environmental Sustainability



By utilizing renewable or waste heat sources, heat pumps contribute to reducing greenhouse gas emissions. They minimize reliance on fossil fuels and promote a greener and more sustainable approach to heating and cooling in public leisure facilities.

Heat pumps represent a game-changing technology for public leisure facilities in Ireland. Their ability to provide efficient heating, cooling, and hot water solutions while minimizing energy consumption and reducing carbon emissions is a significant step towards net zero.

Estimated Cost - Large variation between air source heat pumps and ground source heat pumps. Capital cost is greater than conventional fuels.

Return on Investment - Heat pumps utilise electricity as a fuel to produce heat rather than conventional boilers that utilise gas. The cost of electricity is currently higher per unit rate than gas and therefore often results in a larger operational cost than conventional gas boilers.

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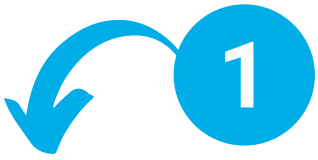
Solar PV: Power Generation

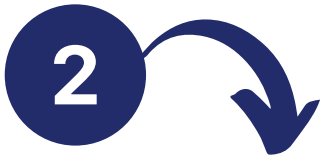
As the urgency to combat climate change intensifies, the transition to renewable energy sources becomes paramount. In Ireland, leisure facilities are embracing solar photovoltaic (PV) technology as a powerful tool to decarbonize their operations.

Solar PV systems harness the abundant energy from the sun and convert it into electricity. The technology utilizes photovoltaic cells that absorb sunlight and generate direct current (DC) electricity. This electricity is then converted into alternating current (AC) power through inverters, making it suitable for use in various applications.



Clean Energy Generation

By installing solar PV panels on rooftops, carports, or open spaces, leisure facilities can generate their electricity from a clean and renewable source. The abundant sunlight in Ireland, although variable, can provide a substantial portion of the facility's energy needs. This reduces reliance on fossil fuels and significantly decreases carbon emissions associated with traditional grid electricity consumption.



Cost Savings

Solar PV systems offer a compelling financial case for leisure facilities. While the upfront installation costs may require investment, the long-term benefits far outweigh the initial expenses. Solar PV systems have a lifespan of 25 years or more, and during this time, they can generate significant cost savings on electricity bills. Leisure facilities can redirect these savings towards facility maintenance, improvements, or other sustainability initiatives.

Solar PV: Power Generation contd.

3

Carbon Footprint Reduction

Leisure facilities contribute to carbon emissions through their energy consumption and operational activities. By adopting solar PV systems, these facilities actively contribute to reducing their carbon footprint. Each kilowatt-hour of solar electricity generated offsets the need for electricity produced from fossil fuel sources, leading to direct emissions reductions.

4

Environmental Stewardship

Embracing solar PV technology demonstrates a commitment to environmental stewardship and sustainability. Leisure facilities can showcase their dedication to renewable energy and inspire visitors, staff, and the broader community to adopt similar practices. The visible presence of solar panels can serve as a powerful educational tool, raising awareness about the benefits of renewable energy.

5

Solar PV systems provide a degree of energy independence and resilience to leisure facilities. By generating their electricity on-site, facilities are less susceptible to power outages or disruptions in the grid. This ensures uninterrupted operations, particularly during critical times when public access to leisure facilities is crucial.

Solar PV systems present a tremendous opportunity for leisure facilities in Ireland to decarbonize their operations and contribute to a sustainable future. By harnessing the power of the sun, these facilities can generate clean energy, reduce their carbon footprint, and inspire others to embrace renewable energy solutions. With government support and incentives in place, now is the time for leisure facilities in Ireland to embrace solar PV technology and play a crucial role in building a greener future.

Estimated Cost - €200,000/£172,000

Return on Investment - <10 years

Waste Water Heat Recovery

Energy consumption within swimming pools comes from a variety of sources most notably domestic hot water production for showers and pool heating. With approximately 26% and 27% of the total energy consumption attributed to these aspects respectively, finding solutions to reduce energy waste is crucial. Waste water heat recovery systems have emerged as a promising technology that captures and repurposes wasted heat, leading to improved energy efficiency in Irish swimming.

To maintain water quality, the Pool Water Treatment Advisory Group (PWTAG) recommends a dilution rate of 30 liters of fresh water per bather. As a result, pools discharge a significant amount of water per bather, which is lost to the sewage system during backwashing of filters or other water treatment processes. This loss represents a missed opportunity for heat recovery.

Domestic hot water production for showers is another area where energy waste occurs. Gas-fired systems are commonly used to heat water, which is then stored in cylinders to meet the demand for showers. However, once the shower water is used, it enters the sewer system, resulting in heat loss and wasted energy.

Waste Water Heat Recovery Systems

Waste water heat recovery plants offer a practical solution to capture and repurpose wasted heat. By utilizing warm waste water and a heat pump system, waste water heat recovery plants transfer heat from the waste water to the cold fresh water supply. This recovered heat can then be used to heat the pool water or provide warm water for showers, significantly reducing the energy required for hot water production

Cost Analysis and Benefits

While the installation cost of waste water heat recovery systems depends on the size of the unit provided, the investment is justified by the long-term energy savings. With an estimated payback period of 6-7 years, the annual cost savings can be substantial, especially in larger swimming pools. Not only do waste water heat recovery systems reduce energy consumption and operational costs, but they also contribute to a more sustainable and environmentally friendly approach to pool management.

Design Integration and Implementation

Integrating waste water heat recovery systems into swimming pool facilities requires careful consideration of design and installation. Components such as coarse filters, pumps, and the waste water heat recovery plant itself should be strategically placed in the plant room, close to the point where waste water is discharged into the sewer system. Retrofitting existing showers may require additional considerations, such as incorporating waste water tanks and adjusting drainage systems to optimize heat recovery.

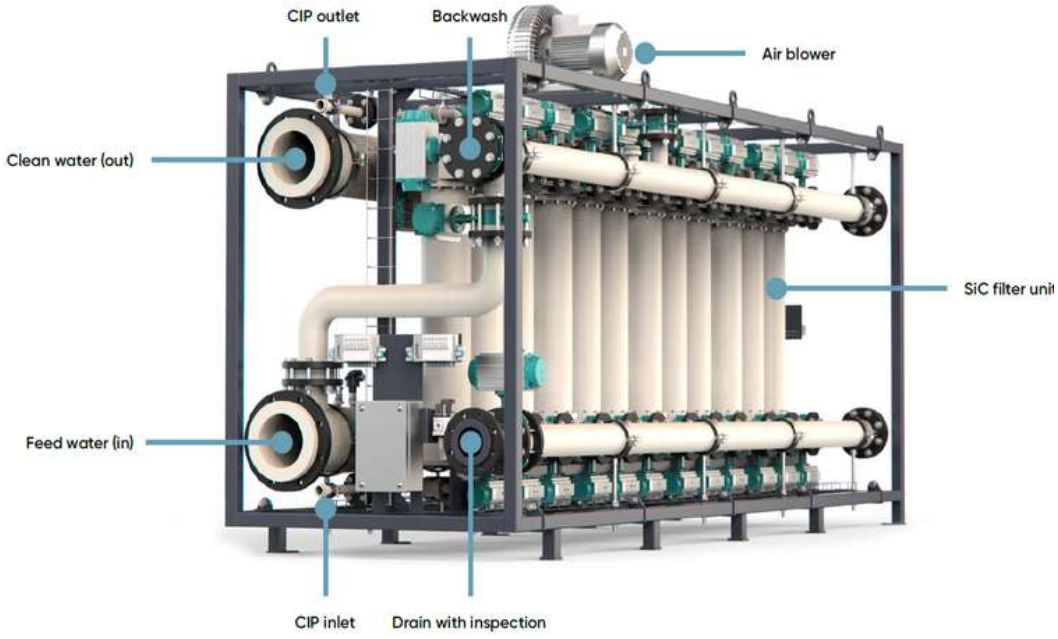
Estimated Cost - €70k/£60

Return on Investment - >5 years

Ceramic Microfiltration

Microfiltration, an advanced physical filtration process, has recently emerged in the Irish swimming pool industry. This groundbreaking technology incorporates ceramic membranes, specifically Recrystallised Silicone Carbide (R-SiC), to effectively eliminate microorganisms and suspended particles from contaminated fluids. Ceramic microfiltration, renowned for its resilience and ability to withstand demanding conditions, presents an ideal solution for elevating water quality standards in Irish swimming pools.

Ceramic microfiltration surpasses traditional media bed filtration systems in terms of filtration efficacy. The unique honeycomb structure of ceramic membranes provides a significantly larger filtration area, up to 20 times greater than media bed filtration vessels. While the filtration rate is intentionally slower (approximately 1.5m3/m2/hr), this deliberate design contributes to an optimized filtration process. Notably, ceramic microfiltration systems demonstrate exceptional effectiveness in removing Cryptosporidium, with an impressive 99.996% removal rate on the first pass.



System Design and Operation:

Microfiltration systems are meticulously designed as modular units, with each membrane capable of filtering a maximum flowrate of 15m3/hr. These membranes are housed within chambers and mounted on frames, which include pipework and control valves. This design allows for seamless integration into existing pool systems or convenient delivery as pre-tested complete units. Water is pumped through the membranes, effectively capturing particles larger than 4 microns within the material's pores.

An advanced pressure monitoring system triggers an automatic washing process when the membranes reach pre-set pressure parameters. During the washing cycle, isolated membranes undergo powerful bursts of high-pressure air to dislodge particles, followed by a flushing process to remove the particles from the membrane chambers. This automated process ensures uninterrupted pool operation, even during membrane cleaning cycles.

Ceramic Microfiltration contd.

Maintenance and Sustainability:

Ceramic microfiltration systems offer numerous advantages in terms of construction, sustainability, and operational costs.

These include:

1. Compact footprint and reduced access requirements compared to media bed filtration systems, resulting in potential space savings.
2. Lower plantroom height requirements, making it suitable for various pool settings, including those with limited overhead space.
3. Reduced size of balance tanks due to the elimination of large-volume backwashing requirements.
4. Lower friction losses and reduced power consumption compared to media bed filtration systems, resulting in long-term energy savings.

Sustainability is a crucial aspect, and ceramic microfiltration systems support water conservation efforts. The improved filtration efficiency allows for potential reductions in dilution rates while maintaining optimal water quality. This reduction in water consumption, coupled with lower energy and chemical usage, contributes to a more environmentally friendly approach to pool management. By embracing ceramic microfiltration in Irish swimming pools, we can optimize filtration efficiency and champion sustainable practices, providing swimmers with an exceptional and eco-conscious swimming experience.

Ceramic microfiltration systems have emerged as a reliable and efficient solution for advancing filtration performance in Irish swimming pools. With their cutting-edge technology, modular design, and automated operation, these systems deliver superior water quality while reducing operational costs and environmental impact. By embracing ceramic microfiltration, Irish swimming pool facilities can optimize filtration excellence and promote sustainable practices, ultimately enhancing the swimming experience for all members of Swim Ireland.

Estimated Cost - €140,000-€220,00/£120,000-£172,000

Return on Investment - 5-10 years

Variable Speed Drives

Variable speed drives (VSDs) for pumps and motors offer an effective solution. By optimizing energy usage and reducing carbon emissions, VSDs present a sustainable and economically viable option for public swimming pools. This chapter explores the benefits and applications of VSDs, with a focus on their potential to save energy costs and decrease carbon emissions in public swimming pools throughout Ireland.

Variable speed drives, also known as variable frequency drives or adjustable speed drives, are electronic devices designed to control the speed and torque of an electric motor. VSDs allow for precise adjustment of motor speed according to the actual requirements of the system. By modulating the speed, VSDs enable motors to operate more efficiently, adapting to changing load conditions. In the context of public swimming pools, VSDs can be applied to pool pumps and ventilation systems, which are significant energy consumers.

Public swimming pools in Ireland face the challenge of maintaining water quality, temperature control, and proper air circulation, all of which require substantial amounts of energy. Traditional fixed-speed pumps and motors used in these facilities often result in inefficient energy usage due to constant operation at full speed. However, by replacing these conventional systems with VSDs, energy efficiency can be significantly improved.

Variable Speed Drives

One of the primary advantages of VSDs is their ability to match the energy output of pumps and motors precisely to the pool's actual demand. VSDs can adjust motor speed to operate at lower levels during periods of low usage, such as during night time closure or off-peak times. This adjustment reduces energy consumption compared to fixed-speed systems that operate at maximum capacity regardless of actual requirements. The use of VSDs in pool pumps can result in substantial energy savings, consumption reductions of up to 30% achievable through the implementation of VSDs. For public swimming pools in Ireland, these savings can translate into significant financial benefits, allowing for the reallocation of funds towards maintenance or facility improvements.

Beyond lowering energy costs, VSDs also contribute to the reduction of carbon emissions. By optimizing energy consumption, public swimming pools using VSDs can effectively lower their environmental footprint. Ireland's commitment to environmental sustainability makes the implementation of VSDs particularly relevant, as they align with national carbon reduction targets.

The installation of VSDs enables pool operators to minimize their pool's environmental impact by reducing energy usage during non-peak hours and periods of lower demand. This reduction in carbon emissions aligns with Ireland's ambitious goals of transitioning to a greener economy and combating climate change.

Computer Power – Deep Green

Deep Green's core concept revolves around the establishment of a "metro-edge" data center network, where thousands of small data centers are strategically placed in metropolitan areas. These data centers not only serve their primary computing purposes but also capture the excess heat generated during their operations. In conventional data centers, this waste heat is typically released into the atmosphere, contributing to global carbon emissions. However, Deep Green has developed an innovative approach to capture and repurpose this heat effectively. By implementing immersion cooling and interconnectivity techniques, they have pioneered a solution that allows them to deploy smaller-scale edge instances, as low as 50 kW, directly into swimming pools, among other heating systems.

For swimming pools in Ireland, Deep Green's technology holds immense potential. The company's smart and modular systems can be seamlessly integrated into existing pool infrastructure, providing a sustainable and cost-effective solution for heating pool water.

Deep Green's approach brings a host of environmental benefits to the table. By repurposing waste heat from data centers, the system significantly reduces reliance on traditional heating methods, which often rely on fossil fuels. As a result, the carbon footprint associated with heating swimming pools is substantially reduced. Additionally, Deep Green's installations are designed to be waterless, further contributing to water conservation efforts.

Apart from the environmental advantages, adopting this technology can yield substantial cost savings for swimming pool operators. By harnessing the captured heat from data centers, pool owners can drastically reduce their reliance on conventional heating systems, translating into considerable energy cost reductions. An example of this success is the recent installation at Exmouth leisure center, which currently heats 65% of the pool for free, resulting in annual savings of £20,000 in gas bills for the operator.

Exmouth Leisure Center currently heats 65% of pool for FREE

Annual Savings of ***€23k/£20***

In conclusion, Deep Green's innovative approach to heat recapture technology presents a transformative opportunity for swimming pools in Ireland. By repurposing waste heat from data centers, swimming pool operators can benefit from sustainable heating solutions, substantial cost savings, and reduced environmental impact. Embracing this technology not only contributes to a greener future but also enhances the well-being of local communities.

Funding

Government Support and Incentives:

The Irish government has recognized the importance of renewable energy adoption and offers various support mechanisms and incentives to facilitate the installation of technologies and improvements to buildings that can aide in reducing carbon.

Support Scheme for Renewable Heat

The Support Scheme for Renewable Heat (SSRH): This scheme provides financial support to non-domestic users, including leisure facilities, for renewable heat generation systems, including solar thermal systems for water heating.

Accelerated Capital Allowances

Accelerated Capital Allowances (ACA): Through ACA, businesses can claim tax relief on capital expenditure incurred on energy-efficient equipment.

Grants and Funding

Various grant programs are available at national and local levels to support the installation of renewable energy systems in leisure facilities.

The Sustainable Energy Authority Ireland website www.seai.ie and www.gov.ie will provide the most up to date information on open schemes.

Some quick links to relevant schemes are:

The Sports Capital and Equipment Grant (SCEP)
Rural Regeneration and Development Fund
Sports Energy Support Scheme
Solar PV Grants

European Funds

At European Union Level, the LIFE Programme is the EU's main funding instrument for the environment and climate action. Additionally Horizon Programme, and Innovation Programme may be suitable vehicles for larger scale projects.

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