Cleantech ALPS | Western Switzerland Cleantech Cluster

Water treatment in western Switzerland

An overview of the technologies and issues involved

CleantechAlps est une initiative des Cantons de Berne, Fribourg, Vaud, Neuchâtel, Genève, Valais et Jura, soutenue par le Secrétariat d'Etat à l'économie (SECO)

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Département fédéral de l'économie DFE
Secrétariat d'Etat à l'économie SECO


Cleantech
ALPS
Western
Switzerland
Cleantech
Cluster

Summary

« Western Switzerland should become a centre of excellence for water treatment. »

Editorial

Water treatment – a vital issue for western Switzerland

Water is the source of all life. Yet according to United Nations statistics, between 800 million and one billion people do not have a source of drinking water. And the rest of humanity is faced with a severe inequality of service, depending on the region of the world in which they live.

“Blue gold” is thus an increasingly rare commodity, which should be conserved using all possible means, starting with the development of technological solutions. Cleantech, or clean technologies, have a significant role here. And as a “developed” country, western Switzerland can contribute not only by exporting its expertise to “emerging” countries, but also by promoting sensible usage and further improving water quality at our latitudes. The effective treatment of waste water is also a challenge Switzerland must address using modern technologies.

Water treatment, one of the major strands of the CleantechAlps platform, is not among the best-known fields of clean-tech. With the aim of demonstrating the existing expertise in western Switzerland and outlining the main issues involved in this sector, we are presenting you with this updated survey, which reiterates some elements of the document “For a better understanding of cleantech”, published by CleantechAlps at the end of 2011.

It will introduce you to some of the companies and technological institutes who lead their specialised fields, offering a range of innovative solutions. They deserve to be more widely known, earning western Switzerland the status of a real centre of excellence in the field of water treatment.

I hope this document will bring you some interesting insights, and I would be delighted to discuss them with you at any time.

Eric Plan
Chief Operating Officer of CleantechAlps

What is cleantech ?

Cleantech covers those technologies, products and services which have the aim of sustainable utilisation of natural resources and which provide for the production of renewable energy. They aim in particular to reduce the consumption of these resources and to conserve the natural systems in question. The new technologies have a fundamental role here.

More than just technology

However, clean technologies are not only about the simple utilisation of innovative technologies that safeguard natural resources. Cleantech reflects a set of ideas, an attitude, reactions and a way of life which inspire individuals and companies in all sectors and over all the continents to act in a way that conserves resources. Human activities and economic processes should therefore be rethought in order to incorporate the principle of the efficient, respectful use of raw materials, energy and water. These conditions pave the way for an era of true sustainable development, which rests on three fundamental pillars: the environment, the economy and society.

And yet a field that does not formally exist...

There is no specific industrial sector as such – we are talking of technologies, products or services that are connected with a number of areas of application, such as :

Renewable energies (photovoltaic and thermal solar energy, wind power, small hydro, geothermal energy, etc.) – Energy efficiency – Energy storage – Renewable materials – Waste management and recycling – Sustainable management and treatment of water – Sustainable mobility – Sustainable management of agriculture and forestry – White biotechnology – Biomass energy – Smart grids – Industrial ecology – Environmental technology in the strict sense of the term (including measuring technology, cleaning up contaminated sites, filtering technology, etc.).

The water treatment's segment is a major part of the cleantech world. Due to his innovation potential and positive outlook, this part of the economy is a real asset for Western Switzerland.

Cleantech in Switzerland

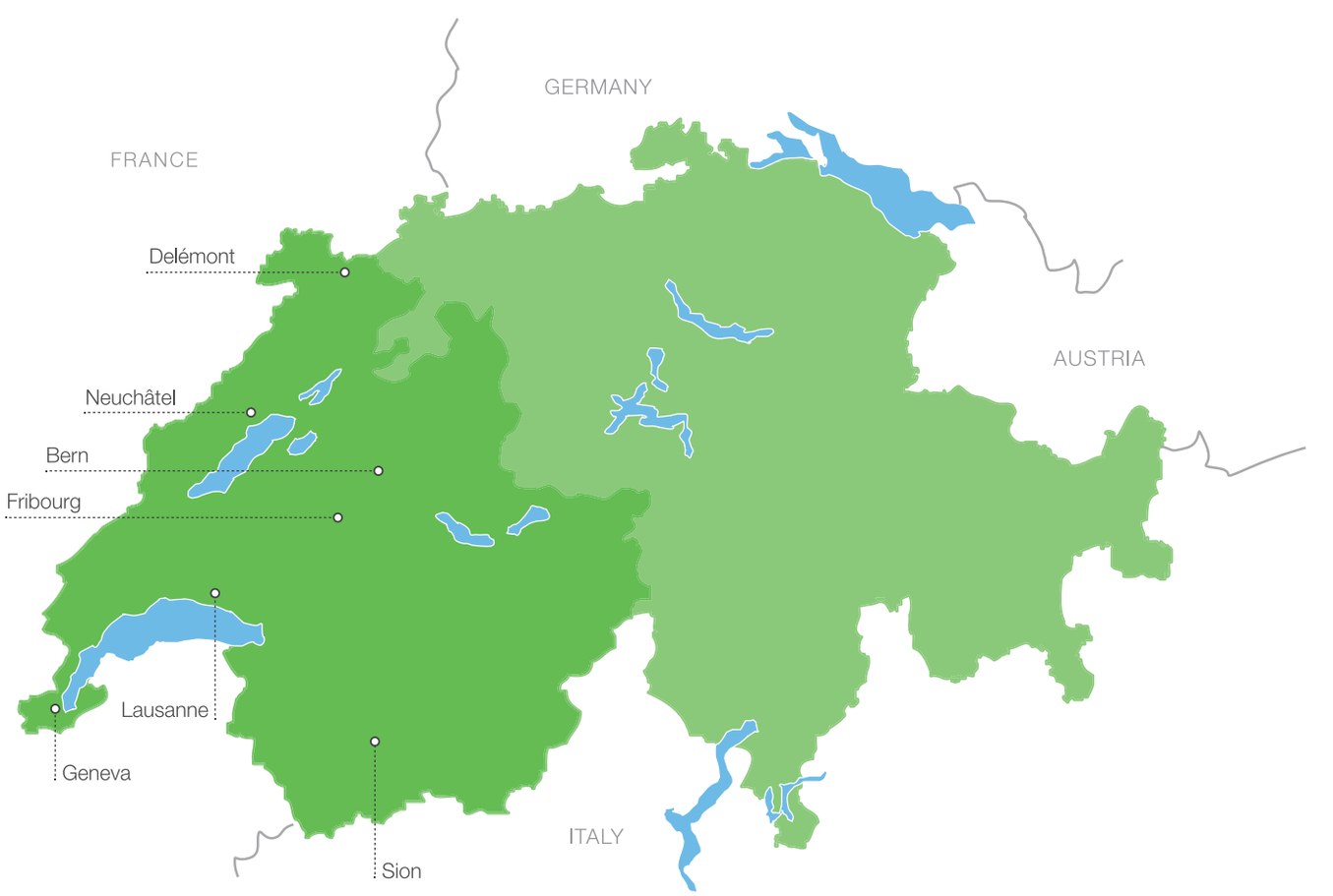
160,000 employees,
4,5 % of the total workforce

CHF 18 to 20
billion per annum
gross added value

3,5%
of the
G D P

« We have discovered the incredible potential of the region in the form of a new, dynamic infrastructure for start-ups. »

David Crettenand, RedElec Technologie SA



Western Switzerland, a fertile ground for cleantech

The Greater Geneva Berne area has excellent business conditions such as:

- Political, legal and social **stability**;
- Multilingual, multicultural and diligent **workforce**;
- **Liberal labour** laws (long working hours, virtually no strike/absenteeism, no national minimum wage, liberal employment contract);
- Concentrated expertise in **science and technology**, **intellectual property and manufacturing**;
- Location at the center of **Europe** and privileged access to the **European Union**;
- Leading **academic institutions** collaborating actively with the private sector;
- Competitive **taxation**;
- **Excellent quality of life** (easy to attract and retain qualified foreign employees often without expatriate packages);
- **Good overall infrastructure** (transport, energy, telecommunication);
- Proactive **authorities** ready to help.

Additional information:

GREATER GENEVA BERNE area
economic development agency

www.ggba-switzerland.ch

info@ggba-switzerland.ch

An expert talks about...

« North-South Partnerships » to improve drinking water quality and sanitation

by Christian Zurbrügg
Eawag: Swiss Federal Institute of Aquatic Science and Technology. Department of Water and Sanitation in Developing Countries (Sandec).

Diarrhoea kills more young children worldwide each year than aids, malaria and tuberculosis combined. However, with safe disposal and treatment of sewage, improved hygiene practice and a focus on drinking water quality, around 2.4 million deaths could be prevented annually. For a large proportion of the global population therefore, water and sanitation technologies, services and hygiene behaviour are priority concerns.

Many of the Millennium Development Goals (MDG) agreed by the UN member states are closely related to water supply and sanitation. One goal specifically focuses on halving, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation. While this goal is easy to formulate, achieving it is a complex matter, particularly in an urban setting.

With the world's urban population growing at almost twice the rate of the overall population, and the proportion of slum dwellers in the cities of developing and transition countries averaging 30–50 per cent, there is a clear need for effective, innovative approaches – not only in terms of technology, but also in planning, financing, sustainable operation, user acceptance and willingness-to-pay.

According to UN predictions, over the next two decades most urban growth will take place in small and medium-sized cities in the developing world (UN-Habitat, 2006[1]); in other words, in cities that are least able to manage the challenges. One approach for scaling-up improvements, or at least to keep abreast of rapid growth, is to design more flexible small-scale approaches which build on an involvement of key local stakeholders, the local community and small businesses.

In many settings, people may have access to sufficient quantities of water, but the water is unsafe to drink. This may include piped network systems, where variable water pressure, leakage, and unreliable centralised treatment are the main causes of serious contamination.

Where existing water sources are contaminated or not treated properly, household water treatment (HWT) solutions may play an important role in protecting public health. These include a range of technologies, devices and methods used to treat water at the household level. Household water treatment, if performed correctly and consistently by the household members, can significantly improve water quality at the point of consumption. Nevertheless, most HWT systems still face difficulties with large-scale coverage (Clasen 2009[2]), as they involve behaviour change, hygiene awareness and social acceptance.

Thus, besides using appropriate technology, such an approach must also offer equal access to service and supply chains, be affordable, and win institutional, legal and political support. Increasingly, new developments in the sector are also looking at business models where, for instance, water kiosks and small enterprises treat the water and then supply households with safe drinking water at a slightly higher cost than for other water not used for consumption.

In sanitation, progress is unfortunately not keeping up with expectations. Planners and engineers often continue to default to the conventional approach of sewer network and wastewater treatment plant, even though this approach has often proved to be a failure. In most cases, the public is not involved in the planning process and cannot voice its needs, remaining a passive recipient.

Alternatives to large-scale sewer networks are decentralised sewage management approaches. In fact, in many large cities in Asia and Africa, less than 20 per cent of households are connected to a sewer and instead use on-site sanitation facilities such as pit latrines or septic tanks that separate liquids from solids.

These require improvement, particularly as regards treatment efficiency, reliable monitoring, and regular removal and treatment of separated solids. Again, technological development is only one small part of the puzzle when it comes to improving infrastructure functionality. An enabling legal, political and institutional framework, innovative business and service models, affordability, reliability and sustainable use of resources (nutrients, organic matter, water, energy, etc.) are key to the success of all these innovations.

As with all research and development activities, local stakeholders – entrepreneurs, experts, planners, and decision-makers in municipal authorities – must be able to access this knowledge so that it can be adapted and applied to their specific local context.

This knowledge transfer is no easy matter. It means involving local stakeholders in the early stages of a project, and outreach work among practitioners and policymakers with easy-to-use decision support tools. It is often useful to create partnerships within the country concerned or with international NGOs or development agencies[3].

Here, Switzerland has a lot to offer - well-developed long-standing partnerships between Swiss Universities and local research centres in low and middle-income countries, technical expertise in innovative Swiss enterprises, and also the Swiss Agency for Development and Cooperation (SDC), which supports research and can incorporate the results of research into its own projects or disseminate knowledge through its local partnership offices. All this enables Swiss researchers to interface well with policy makers and practitioners and through this play a relevant part in improving water and sanitation and combating poverty.

Defluoridation community filter using aluminium hydroxide as filter media, in Tuchi Gragona, Oromia Region, Ethiopia.

[1] *UN-Habitat (2006) State of the World's Cities 2006/7. UNHabitat, Nairobi.*
[2] *Clasen, Thomas F. (2009). Scaling Up Household Water Treatment Among Low-Income Populations. World Health Organization, Geneva.*
[3] *Zurbrügg, C. (2011). Combined efforts to improve sanitation. In: Healthy water resources - balancing the needs of humans and the environment. Eawag News 70e, June 2011. Dübendorf.*

An expert talks about...

The issues surrounding drinking water treatment in western Switzerland

By Paul-Etienne Montandon, manager of the water laboratory, Viteos SA.

Our society is using ever more chemical substances of industrial origin which, after use, are dispersed in the environment and into the water systems, where these substances and their by-products accumulate. Do these micropollutants, which originate from various sources such as medicines, pesticides, biocides, cosmetics and substances from various human activities, represent a problem for the consumers and distributors of water in western Switzerland? A brief overview of the question is proposed here.

By international comparison, Switzerland has a plentiful supply of drinking water of excellent quality. This is the result in particular of the environmental policy which has been in place for decades and includes a legal requirement for strict self-monitoring by Swiss water distributors. However, demographic pressure, increasingly intensive land use and industrialisation are all affecting the soil – and therefore water – quality, which can cause serious problems for water distributors.

Legal measures have therefore been implemented to protect the catchment areas for spring-fed and underground water sources. Drinking water is prepared using a multi-barrier approach with, first of all, protection of the catchments followed by treatment that includes procedures both chemical – involving the transformation of substances by oxidation – and physical, in which pollutants are caught and eliminated. This approach has been duly tested over the course of many years. It is also subject to constant improvement with the integration of new treatment and monitoring technologies.

The disinfection of water using chemical (chlorination, ozonation) or physical (UV radiation) processes is appropriate where the chemical quality of the water is within the tolerances for drinking water but it may be contaminated by bacteria indicating faecal contamination.

Where the physico-chemical quality of water does not conform to the standards, more complex treatment is necessary; this is generally the case for surface waters (lakes and rivers) and polluted underground water. Ozone, the most powerful chemical disinfectant used in water treatment, is generally used in conjunction with treatment by filtration.

The table below details the possible treatments and techniques for the preparation of drinking water.

Treatments	Type	Role
A. Disinfection	a) Chlorination (chlorine gas, electrolytic and bleach)	Elimination of bacteria, partial inactivation of viruses and parasites
	b) Chlorination with chlorine dioxide	Elimination of bacteria, partial inactivation of viruses and parasites
	c) Ultraviolet (UV) radiation	Good inactivation of bacteria, viruses and parasites
	d) Ozonation	Elimination of bacteria and inactivation of viruses and parasites
		Solution for odour and colour problems
B. Conventional	a) Coagulation/flocculation followed by decantation and/or filtration	Reduction of the concentration:
		1) of suspended solids (sand, silt, plankton bacteria, algae, parasites, etc.)
		2) of colloidal matter (<1 pm), of the same origin as the suspended solids
	b) Sand bed filtration	Reduction of the concentration of suspended solids
	c) Activated carbon bed filtration	Reduction of the content of dissolved organic matter
C. Microfiltration	Polypropylene membrane (pore: 0,2 µm)	Significant reduction of the concentration of suspended solids and colloidal matter
D. Ultrafiltration	Membrane, cellulose derivative (pore: 0.01 µm)	Significant reduction of the concentration of suspended solids and colloidal matter

The various water treatment techniques. (source: Viteos SA / CleantechAlps)

Conventional water treatment

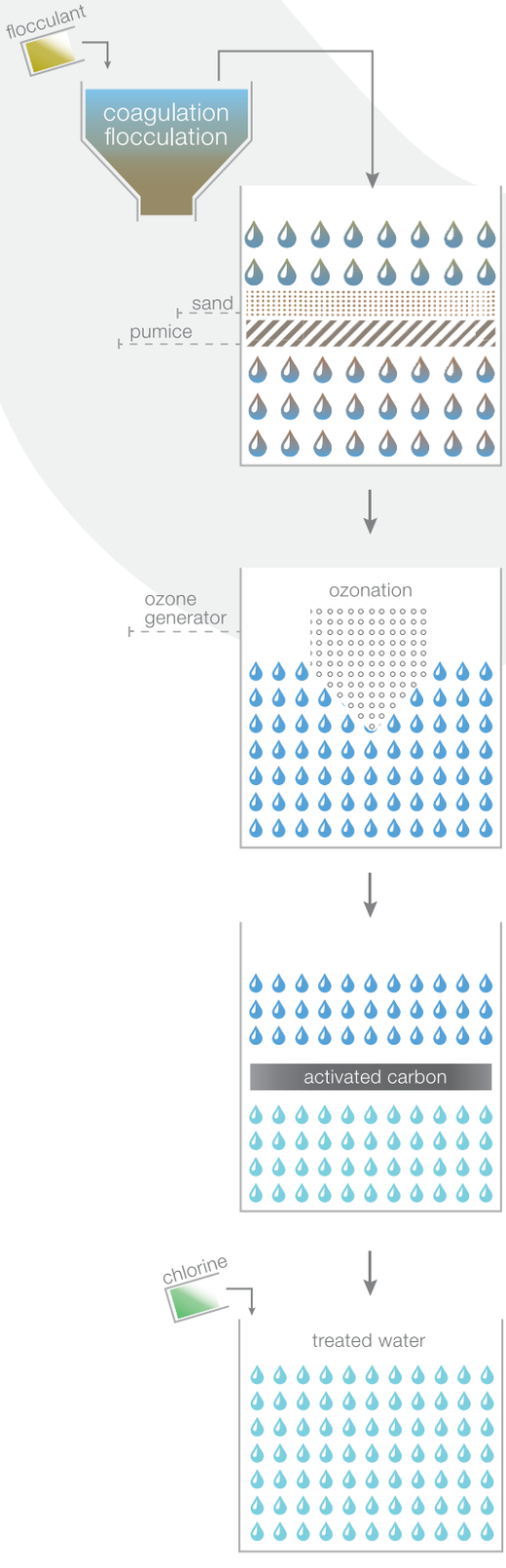
In 1973 a process – which is known today as the "conventional process" – emerged in western Switzerland following pilot tests undertaken by Sulzer in collaboration with various authorities at Federal and cantonal level. This process comprises five treatment stages (see diagram below):

The quality of the water largely depends on the environment from which it comes. On the basis of the conventional treatment presented above, a unique expertise has developed in Switzerland, and various solutions have been developed and then implemented in the field. Apart from desalination, the full range of water treatments is available in western Switzerland. This region is therefore characterised as a veritable full-scale laboratory in this field. What follows is a brief overview of the main implementations in this area.

Several factories have been built on the basis of the model in the diagram above, most notably the Bienne plant established in Ipsach in 1974, Champ-Bougin in Neuchâtel in 1983, the Morat plant of 1990 and the Estavayer-le-lac plant commissioned in 1995. At Neuchâtel, the ozonation stage was finally relinquished in favour of drawing lake water from below the zone known as the epilimnion (at -60 m), in order to use water that is stable throughout the year with a lower organic carbon content than that of the epilimnion.

The plants of Prieuré (1996) and the Tuileries (2004) in Geneva were constructed on this model, with the addition of an acidification stage after the prechlorination in order to improve the coagulation/flocculation. The pH of the water is readjusted prior to the final chlorination. In both these cases, the treatment chain was adapted to raw water drawn from the western, shallowest part of Lake Geneva.

Various modifications have been made to the treatment process when the quality of the raw water is relatively mediocre. The plant at Bret, which treats the waters of the lake of that name, was constructed in 1986 with the addition of an ozonation stage. The plant at Le Locle, developed to treat underground water polluted with industrial solvents, has the special feature of a periodic addition of activated carbon to ensure the elimination of these solvents. The implementation of a pre-ozonation, and possibly post-ozonation stage, in conjunction with an activated carbon filter, therefore guarantees the production of good-quality drinking water where the quality of the raw water is compromised by natural organic material and/or industrial solvents.



Treatment of water by the conventional process.
(source: Viteos SA / CleantechAlps)

An expert talks about...

The issues surrounding drinking water treatment in western Switzerland

Water treatment by filtration

Membrane filtration (microfiltration, ultrafiltration), which emerged during the 1990s, was established first of all in regions where the source water is disturbed after heavy precipitation. Membrane filtration is a physical barrier that very effectively catches particles, parasites – including cryptosporidium – and viruses.

Ultrafiltration is a technique used more and more in the field of drinking water treatment. The problem of organic micropollutants (see below) does, however, require the addition of an activated carbon treatment.

The improvement of water quality following the development of municipal waste water treatment plants (WWTP) has enabled the treatment process for water from certain lakes to be simplified.

For example, the drinking water preparation plant for the city of Lausanne, located at Lutry, only involves ultrafiltration, although it does have the possibility of injecting activated carbon in powdered form as required.

Protection of the supply network

Mains water should be consumed soon after treatment to prevent the risk of bacterial development, which depends on the assimilable organic carbon content, a fraction of the dissolved organic carbon. Water filtration using activated carbon generally results in water that is biologically stable. Chlorine or chlorine dioxide, two oxidants with a persistent effect, may also be added at the end of the treatment process to maintain the bacteriological quality of the water.

Micropollutants

Micropollutants are substances of human origin found in the environment in weak concentrations, in the order of nanograms per litre or nanograms per kilogram. There are three categories of micropollutants: organic, inorganic and organometallic. Organic micropollutants are synthetic industrial products, which include cosmetics, medicines, detergents, biocides and pesticides, and consist of carbon and hydrogen. Inorganic micropollutants are compounds containing metals or metalloids. They come from road traffic, overhead cables (rail transport) and construction. Organometallic micropollutants contain a metallic and an organic component, such as the organotins used in paint for ships. The increasing use of nanopowders and nanomaterials is also problematic.

Micropollutants are found in rivers, lakes and underground waters. In Lake Geneva and the rivers that feed it, analyses of metals and organic micropollutants have been carried out for several years. The metal content remains stable and is well below the tolerances for drinking water. On the other hand, the total pesticide content (about fifty substances analysed) has dropped by a factor of 2 between 2004 and 2008, stabilising at between 100 and 200 ng/L.

How can micropollutants be eliminated?

Legal measures should be implemented at source and aimed at both the municipal treatment of waste water and consumers of drinking water.

From a practical point of view the elimination of organic micropollutants depends on the processes used and the physico-chemical properties of the pollutants. Coagulation/flocculation is less effective for eliminating medicines, for example. Ultrafiltration alone does not enable organic micropollutants to be caught, but the injection of activated carbon powder gives good results with a retention efficiency of more than 80%. Passage through a granulated activated carbon filter is also a very effective way of catching these substances. Oxidants – chlorine, chlorine dioxide and ozone – transform aromatic molecules or those with amino groups.

Treatment tests have been carried out on waste water in pilot installations at the Vidy WWTP in Lausanne. The behaviour of 58 potentially problematic substances was analysed; these included 36 medicines, 13 biocides and pesticides, 2 corrosion inhibitors and 7 endocrine disruptors. Biological treatment, alone or with nitrification, eliminated around 25%, or 50% in the latter case, of the whole of these substances. Treatment with powdered activated carbon caught 80% of the micropollutants and ozonation also reduced them by 80%. The treatment of waste water by ozonation or filtration using an activated carbon filter following biological treatment would therefore enable compliance with the future legal requirements for the release of treated water into the water systems. Companies in western Switzerland are at the forefront when it comes to developing new treatment technologies and processes.

Conclusion

In the current situation, micropollutants do not on the face of it represent a danger to consumers, but rather an environmental risk, in particular for aquatic organisms. The measured values for these substances are relatively low, of the order of a few nanograms per litre. At those concentrations the substances identified are not of consequence to humans, but hormones, especially the contraceptive pill, are potentially responsible for the phenomenon of feminisation observed in male fish. There is certainly a risk of a cocktail effect between the different substances, which it is not currently possible to estimate. Chemical analysis gives concentration values for the substances identified, but does not offer any information on the possible consequences of these substances or groups of substances on living organisms.

It is therefore necessary to use in vitro tests to evaluate the toxicity of micropollutants or groups of micropollutants in terms of genotoxicity and hormonal disturbance. These elements will not provide for evaluation of the risk to humans from exposure to these substances, but they will give indications for evaluating the efficiency of drinking water treatment processes. This research is a logical continuation of the activities that have been carried out in the region and the country as a whole for decades in the water sector. The next chapter in the history of water treatment and its impact on biodiversity is already beginning on the banks of Lake Geneva.

Micropollutants are obviously not desirable in drinking water, and measures should be taken to eliminate them, or at least to limit the appearance of these substances in surface and underground waters. It should be emphasised, moreover, that lake water treatment plants in western Switzerland that are equipped with coagulation/flocculation and active carbon filtration systems and, for the most part, an ozonation stage, are adapted on an ad hoc basis to prevent the appearance of micropollutants in treated water.

The Swiss experience in this field is ready to be exported and shared with countries and regions where these problems have not yet been overcome. New technologies for treatment processes will also see the light in the near future, and the players in this region will certainly make a valuable contribution to these solutions with their expertise and dynamism. These technologies have been tried and tested, and the ongoing developments by local enterprises, especially in response to the future challenges posed by nanomaterials, will without doubt enable Switzerland to continue leading the field in this area.

An expert talks about...

"In future, waste water treatment plants will need to face up to the challenge of treating micropollutants"

by Philippe Koller
Group of operators for sewage water treatment plant (Western Switzerland)

In 2011, the consumption of drinking water in Switzerland was 190 litres per person per day, with the majority being used for washing and disposal of our natural waste products. This water passes through waste water treatment plants before being discharged into the natural environment. In this interview, Philippe Koller, Deputy Manager for the cantonal waste water unit at SIG (Geneva Industrial Services) and member of the Western Swiss organisation of waste water treatment plant operators (GRESE), outlines the treatment of waste water in Switzerland.

What is a waste water treatment plant or WWTP?

It is a plant that comprises successive technical processes for the staged removal of the pollutants contained in water. Switzerland currently has around 750 WWTPs on its territory, although in recent years the numbers have tended to fall as processes are rationalised. In Geneva, for example, 20 years ago there were 15 WWTPs, and now the canton has only nine, where we treat around 80 million m^3 per annum.

What is the standard process for treating waste water?

A WWTP involves a sequence of consecutive processes, the aim of which is to discharge waste of decreasing size. Screens are usually installed at the head of the station to catch the coarsest waste such as cans, paper and plastics. These screens are made up of a grille with a mesh size of 6 millimetres. The next stage is the degritting and deoiling basin, where sand is deposited as sediment and collected from the bottom of the basin by pumping. Floating particles that are less dense than water are removed by skimming. A final biological treatment stage involves allowing the bacteria naturally present in waste water to colonise the basins and feed on the dissolved pollution. There are two possible processes for this stage: one uses a fixed biomass in which the bacteria are fixed to a medium and the other involves free biomass in which the bacteria circulate and need to be recovered in a settling tank. It should be noted that bacteria naturally aggregate into flocs, known as bioflocs, which sediment out very well.

They are then recovered by scraping and a proportion is re-injected at the start of the biological treatment process.

Is there a particular course of action to be followed in the case of storms?

A storm causes large quantities of water to enter the WWTP. We therefore have to take steps to prevent it flooding. Some of the water will have to be discharged into the natural environment without being fully treated, but in order to prevent pollution of water courses with visible waste, horizontal screens are in place to catch coarse waste before the water is discharged.

Sludge is discharged at the end of several of these treatment processes. How is it treated?

Sludge is made up of around 99% water. It is necessary to thicken it, either by centrifuging or on draining tables, to extract some of the water. This is done partly to enable it to be transported away at lower cost, and partly to render it suitable for use in a subsequent sludge treatment process such as digestion. This process is very interesting because, using bacteria once again, it is possible to produce biogas (a combination of methane and CO_2). For example, at the Aïre WWTP in Geneva, we produce around 20,000 Nm^3 biogas per day. At the end of the digestion process the sludge has a dry matter content in the order of 3%. We centrifuge it again before drying in hot air, and once there is only around 15% water remaining the granules generated are incinerated at a cement plant to produce energy. Once the organic matter has been burnt, the mineral matter will be recovered and incorporated in the cement. In other words, our waste products end up in our walls.

What are the differences between this and the process for treating drinking water?

There are two treatment processes for drinking water. The classic process is based on the circulation of the water over a bed of granular material in suspension, which catches the coarse waste. The membrane process, on the other hand, involves passing the water through a membrane that only allows water, together with certain minerals, through. The water is therefore purified of bacteria but retains a good mineral balance.

What are the future challenges to be faced?

The main challenge facing operators in future lies in the elimination of micropollutants. A draft law is currently at the consultation stage; it provides for a reduction by half of the micropollutants originating in waste water, and should come into force some time between now and 2017. WWTPs will have 20 years to comply with this new law. But not all WWTPs will be obliged to install new equipment, as the draft law incorporates a size criterion.

Only three kinds of WWTP are affected : those with a size in excess of 80,000 inhabitant-equivalents (i.e. they are capable of serving 80,000 inhabitants including industries), those with a capacity in excess of 24,000 inhabitant-equivalents located in the drainage basins of lakes, and those which serve more than 8,000 inhabitants and whose treated water represents more than 10% of the volume of the receiving water course. Another challenge lies in the concentration of pollutants. As domestic appliances use increasingly less water, and the tendency is to construct separate networks, the quantity of water arriving in WWTPs is reducing. But this water has a more concentrated level of pollutants. The final challenge lies in the increasing energy consumption of WWTPs. Until now it has been possible to reduce this consumption, but with the arrival of micropollutant treatments it will increase once more.

In this context, could it be envisaged that WWTPs will in future become veritable energy centres, where lost energy is recovered and utilised ?

It is true that WWTPs are significant sources of energy, both thermal, as the waste water contains a significant quantity of heat, and from biogas production based on digested sludge. In Geneva, for example, the Bois-de-Bay WWTP is fitted with a heat exchanger which can be used to heat or cool the buildings. The recovery of energy both upstream and downstream of WWTPs will be developed considerably in the years to come. Numerous projects are already in preparation.

Sewage water treatment plant 'Bois-de-Bay' in Geneva.

Focus on water sector

Water treatment in western Switzerland

1. Introduction

Not only famous for its chocolate, watches and banks, Switzerland also has a reputation as Europe's water reservoir, a unique position which it shares with the neighbouring Alpine regions in France, Germany, Austria and Italy.

In view of the scheduled withdrawal from nuclear power and the European Union climate policy, the objective of which is to integrate 20% renewable energies into the network by 2020, the importance of hydroelectricity has never been so great.

The future of energy in Europe is exemplified by the concept of the Desertec foundation, namely the generation of electricity from all the renewable sources (wind, solar thermal, solar photovoltaic, biomass, hydro and geothermal) at the places where these resources exist in abundance, and the transfer of the electricity from all the sources combined by high-voltage direct current lines. A simplified overview would envisage a future European energy system made up of wind power on the northern coasts, solar energy in the southern regions and hydropower in the centre. Hydroelectricity is thus used as an operating reserve to even out the intermittent production from the other sources, giving the Alpine countries a central role.

Who says that Switzerland has no resources other than its know-how? This may well be something to silence the country's detractors, but is not the objective of this study. Let us leave behind the energy-related aspects and concentrate on water in itself.

Switzerland benefits from an advantageous situation in terms of the supply and quality of its water, but this is not the case for the rest of the world. In the early years of the 21st century, an impending demographic explosion and an estimated population of over nine billion by 2050 mean that our society is facing two major challenges – water and energy.

An attractive opportunity for technological development

Global demographic growth and the renewal of water-related infrastructures are significant challenges, not only technological in nature but also social (see in this context the article by Chris Zurbrügg on page 10). The water sector is without doubt on the threshold of a revolution. What will the water networks of the future be like? Will we stick to centralised solutions, cumbersome and maintenance-intensive, or will decentralised distribution systems take over, as has been the case with telecommunications after the arrival of mobile technologies?

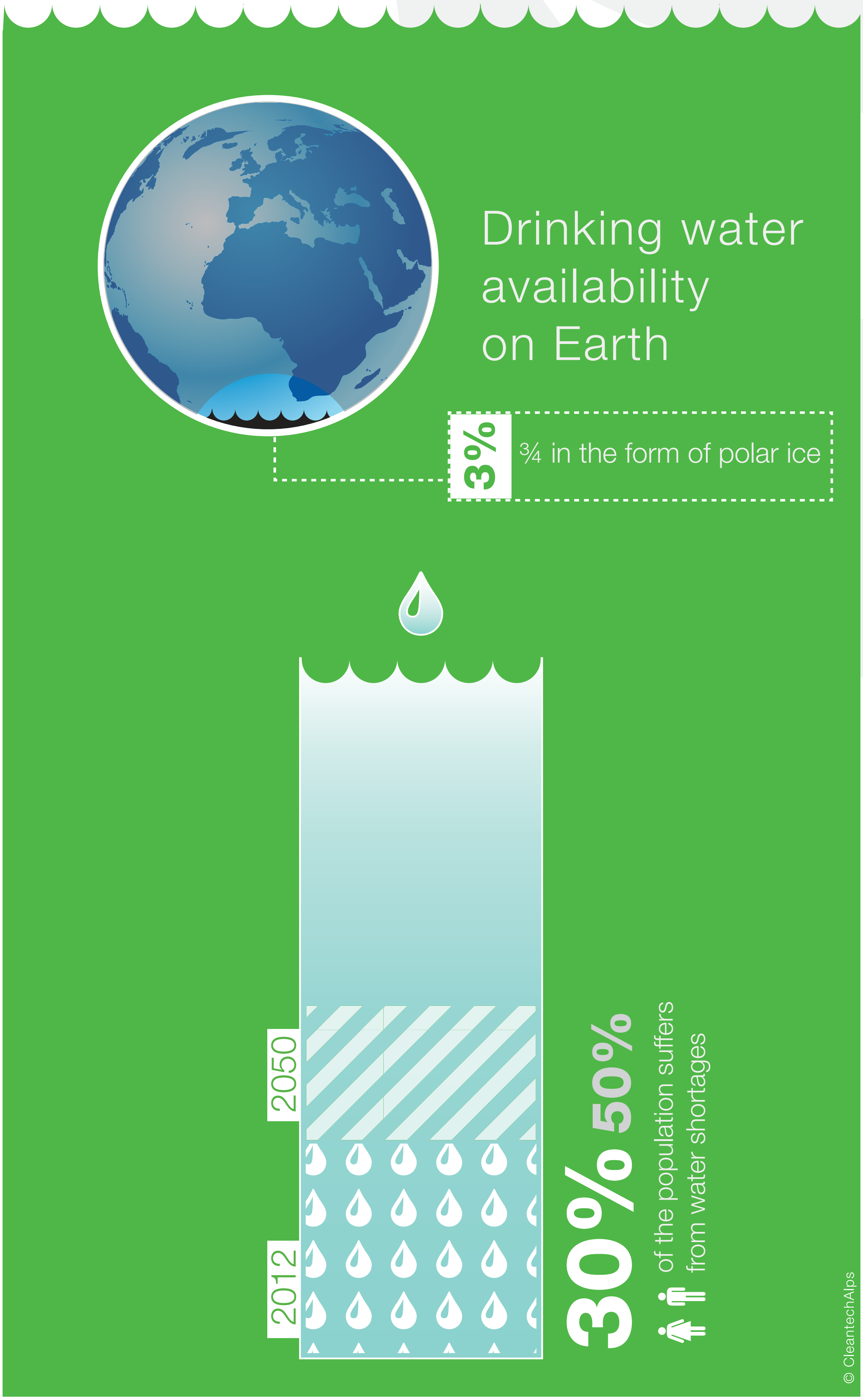
This is without doubt an attractive technological and commercial development opportunity for the enterprises of the region. Western Switzerland has a substantial ecosystem of technology enterprises in the area of water treatment, enterprises that are ready to face up to these challenges. The aim of this study is to take stock of the main players, but also to ascertain the value and relevance of this local industry as it relates to the global market.

2. Water treatment: definition and issues involved

The field of water and the use thereof is huge. From the perspective of the CleantechAlps platform, dedicated to the development of clean technologies, the subject of water is approached from the angle of water conservation in the context of the sustainable development or our society. With regard to the fabric of the region's economy and the observation made in the introduction, the focus of this study has been on the drinking water distribution and waste water treatment sectors. The other applications, connected with energy, irrigation, health, welfare and others, have not been addressed here.

In the context of water treatment, it is relevant to recall that the availability of fresh water has not changed since the dawn of humanity – it represents around 3% of all the water available on earth, almost three-quarters of which is in the form of ice at the poles.

This is a precious resource, to be conserved, and yet... Today, around the world, it is estimated that more than 90% of the volume of waste water remains untreated and is released to pollute the freshwater systems. This is in striking contrast to the situation in Switzerland, where almost all buildings are connected to waste water purification plants. 30% of the world's population currently live in regions suffering from chronic water shortages, and in around fifteen years, more than 50% of the population will be living in regions with severe water problems. Implementing a water governance system is becoming a matter of urgency, to ensure the effective, fair management of this resource. The development goals of the United Nations Millennium Project (MDGs) directly address this worrying issue, and other programmes are in the course of preparation.


Drinking water availability on Earth
3%
¾ in the form of polar ice
2050
2012
30%
50%
of the population suffers from water shortages
© CleantechAlps

Focus on water sector

Water treatment in western Switzerland

Good news...

Despite the increase in water quality required for industrial processes, in certain industrial sectors (e.g. textiles), there is a will to reduce the ecological impact of production. This is particularly the case in India, where industries are applying the concept of « zero discharge », the objective of which is to design industrial processes that avoid discharging harmful waste into the environment. In terms of water, this takes the form of treating all waste water with a view to reusing it in the manufacturing processes or other applications, such as the water for sanitary systems in a property complex. This is a crucial element in the zero carbon society approach, which will become an increasingly widely discussed topic in future.

The economic potential of water treatment

The water distribution networks are ageing. It is a worrying fact that fresh water losses of up to 30% are not uncommon in urban areas. The networks in Geneva (managed by the Services Industriels de Genève [SIG]) and Paris are textbook cases here, with losses of less than 5% demonstrating an almost perfect management and maintenance of the infrastructure. Significant sums have been earmarked in the coming years for the renovation of water networks worldwide. Straightforward diagnostic and management solutions will be of great interest in the sector in future, and the attendant business opportunities are on a scale with the challenges.

A few figures...

By way of example, the turnover of private operators in the water supply and purification sector in France was EUR 5 billion, while their expenditure on R&D was EUR 100 million (2006 figures). This indicates the potential for « cleantech » innovation which still remains to be tapped into in a traditional sector such as water. However, it is still not as « sexy » in the eyes of investors in comparison with other related cleantech areas such as solar or wind energy. In Israel, a country where water is a strategic element crucial to the country's future, the water sector is extremely dynamic, occupying a leading position in the export markets. Israel has established this position on the basis of skills developed over the years. The export turnover was 1.4 billion dollars in 2008, and is estimated at 2.5 billion this year – a 60% growth in four years, a figure which can hold its own against those for the other sectors.

This is all evidence of a promising segment, but one to which access is not necessarily straightforward. The water sector has its own dynamic; the national western markets are very competitive and relatively closed. On the other hand, the markets in the emergent countries do not always have the necessary support from the authorities, a fundamental condition for their development, as highlighted recently by Jean-François Donzier, Director General of the International Office for Water (OIEAU): « ...in a large number of countries, water is not a priority that is worthy of reform. The lack of skills on site makes it impossible to maintain, service or repair a network... »

New business models

This observation indicates very clearly that the best way to improve the chances of commercial success in these markets is to adopt business models that integrate societal aspects right from the start of a project. This means that local governments are better placed to support their deployment. It is a matter of proposing technical solutions that the local population can take up, both in terms of use and of the impact on the activities of everyone. In general, the introduction or the implementation of a new system (water distribution, energy production, etc.) will inevitably mean a change to the local cultural ecosystem and affect the activities of the community. The key to success in this kind of situation, or at least one of the key elements, lies in the capacity to understand this ecosystem and to integrate behavioural changes or resultant altered responsibilities into the new functional model of the community. The company NV Terra, which provides decentralised solutions for the production of drinking water by treating surface water, applies precisely this approach. Its technological solution is extremely simple to utilise, with remote maintenance and involvement of local communities in the local development of water production.

An exceptional national environment

It is therefore clear that water is a complex sector, and the appropriate solution is never primarily technological. Considerations such as the climatic, geopolitical, cultural and financial aspects have an important role to play in the development of the sector. Ultimately, it is probably know-how in all these areas that is the crucial factor for success. While also important, the aspects of R&D and technological development are relegated to a secondary role.

It is for precisely these reasons that the Swiss water industry has an important part to play in the provision of answers to the problems of the future. It can draw on a national environment that is rich in experience, both of the management of infrastructures in difficult terrains (reliefs, etc.), of the management of natural dangers (landslides, alluvial deposits, etc.) and of the deployment of solutions on the ground around the world – experience gained over decades by the Swiss Agency for development and Cooperation (SDC) and by the Swiss Humanitarian Aid Unit in the case of disasters such as earthquakes or typhoons.

What makes a fertile ground...

R&D in the field of water is indisputably led by EAWAG, the Swiss Federal Institute of Aquatic Science and Technology, responsible for water supplies, waste water treatment and the protection of water courses, as the flagship. The rest of the fleet is distributed across specialised units within their field at the HES-SO, the EPFL and the universities, in particular in the sectors of chemistry and biology (micro-pollutants, contamination, etc.). On the other hand, the development of new technological solutions, or the integration of technologies into a specific solution, is mainly managed by private companies. A high level of expertise in the quality and control of water is also found in the cantonal official bodies, such as the cantonal chemists. The relevant industrial and communal departments also have proven skills in control and management.

For innovative companies...

The Technopôle de l'Environnement d'Orbe offers the providers of environmental technologies a framework for the initiation and validation of pilot installations, such as natural water purification. BlueArk at Viège, the incubator dedicated to water and renewable energies, has given a boost to the harnessing of drinking water for powering turbines with a study of the potential to be tapped in Valais.A good number of installations are currently being planned, and a pragmatic concept for gaining added value from drinking water in Alpine regions is available to interested parties. On the edge of western Switzerland, CEWAS, the International Centre for Water Management Services, a Swiss centre of excellence in the field of water treatment and the sustainable management of water resources in Willisau, completes the picture with services focusing more on the North-South relations in this field.

Close coordination between the bodies involved has come about under the impetus of the SDC this autumn. The «Swiss Water Partnership» (see interview page 50) is an organisation that still needs defining precisely in terms of form, but which already brings together the interests of public, private and quasi-public bodies (NGOs) and other players in the field (research institutes, etc.). This is an initiative to follow with interest.

Access to the export markets may be characterised by the approach developed towards India by Cleantech Switzerland. An agreement was signed this spring in New Delhi, in the presence of Federal Councillor J. Schneider-Amman, between the export platform Cleantech Switzerland and the CII-Triveni Water Institute of Jaipur. Established last July by the Indian Minister for Water Resources, Pawan Kumar Bansal, this institute is set to become a national centre of excellence for water conservation. Its main aim is to initiate public-private partnerships in the field of water treatment and to support the other industrial sectors in India. It therefore offers industry and the municipal authorities a range of services related to the sustainable management of water. This agreement represents significant potential for the development of relations between Switzerland and India in areas such as training, technology and business.

The ecosystem outlined above functions in perfect complementarity with the international organisations located in Geneva that are directly or indirectly active in the field of water, such as the WHO or UN-Water. Access to this ecosystem and its skills represents a very good reason for foreign companies to come to western Switzerland, as they can develop partnerships with local industry and will be able to tap into this concentrated know-how.

Our region has developed special skills in the area of the supply, management and treatment of water by local providers, but what roles can these providers play in the development of the market for water, in Switzerland and abroad?

Focus on water sector

Water treatment in western Switzerland

3. The value chains of water treatment

Taking account of the light we have just shed on the environment, and with the aim of proposing some ideas in response to the question posed above, we propose to analyse the composition of the economic fabric of western Switzerland, to take stock of the main players and to position them along the value chain.

We have used the same approach for all three sectors covered in this study, which was undertaken with E4Tech and which focuses on the technological players. The choice was dictated by the observation that one factor in the growth of liberal societies is the close link with innovation, which itself is closely linked to the technological players.

The second reason for focusing our approach on these players in particular lies in the fact that the technology providers represent the point of introduction of new technologies into the value chains. We have therefore chosen this option for the basis of Figures 3.1 and 3.2, in which we zoom in on the technological players in the region as well as a few major national players. These views are supplemented at the end of the study by a geographical overview (not exhaustive) of the major players identified, to which are added the R&D institutes and the engineering practices specialising in this sector (Figure 4).

A centralised sector with strong interconnections...

The development of the water distribution networks has historically been centralised in the urban zones, facilitating the management of the supply and quality of the water distributed. Over time, an increasingly weighty infrastructure was implemented. Treatment of waste water was a later addition, and is still developing to this day.
This centralised system of water treatment is made up more specifically of three interconnected branches, illustrated in Figure 1 :

- The production and distribution of drinking water
- The collection of waste water
- The purification of waste water

This diagram shows all the value chains. It sets out the positioning of the main players (technology providers, engineering and consultancy practices, service providers, etc.) and clearly shows the interconnection between the value chains relating to these activities.

Three groups of players can be identified along the value chains. There are the technology providers, to the left of the diagram, who deliver the elements (products, systems, etc.) enabling the integrators to develop their solutions. These integrators are none other than specialist engineering practices, ranging from a private practice operating with just a small staff in a very specific field, to international groups. These solutions are implemented in the form of installations which they bring into service and transfer to the third group, the operators, who then manage and maintain the infrastructures and services to be delivered.

A separate decentralised structure

Decentralised systems operate as islands and are suitable for small-scale solutions. They are currently observed mainly in emergent or developing countries, but the trend may change in the coming years. It is easy to envisage decentralised networks developing in the future eco-districts of western towns and cities.

The corresponding value chain is shown in Figure 2 for the treatment of drinking water.

This particular figure shows that the technological players are facing a market controlled by various public or quasi-public bodies. Depending on the configuration, they have to deal with governments or local authorities, or depend on development organisations such as the international institutions (UNO, WHO, etc.) or NGOs. Businesses should certainly develop specific business models, as referred to in the introduction, in order to deal successfully with these markets. The engineering or management partners like those in a centralised system only intervene at a later stage through the local players.

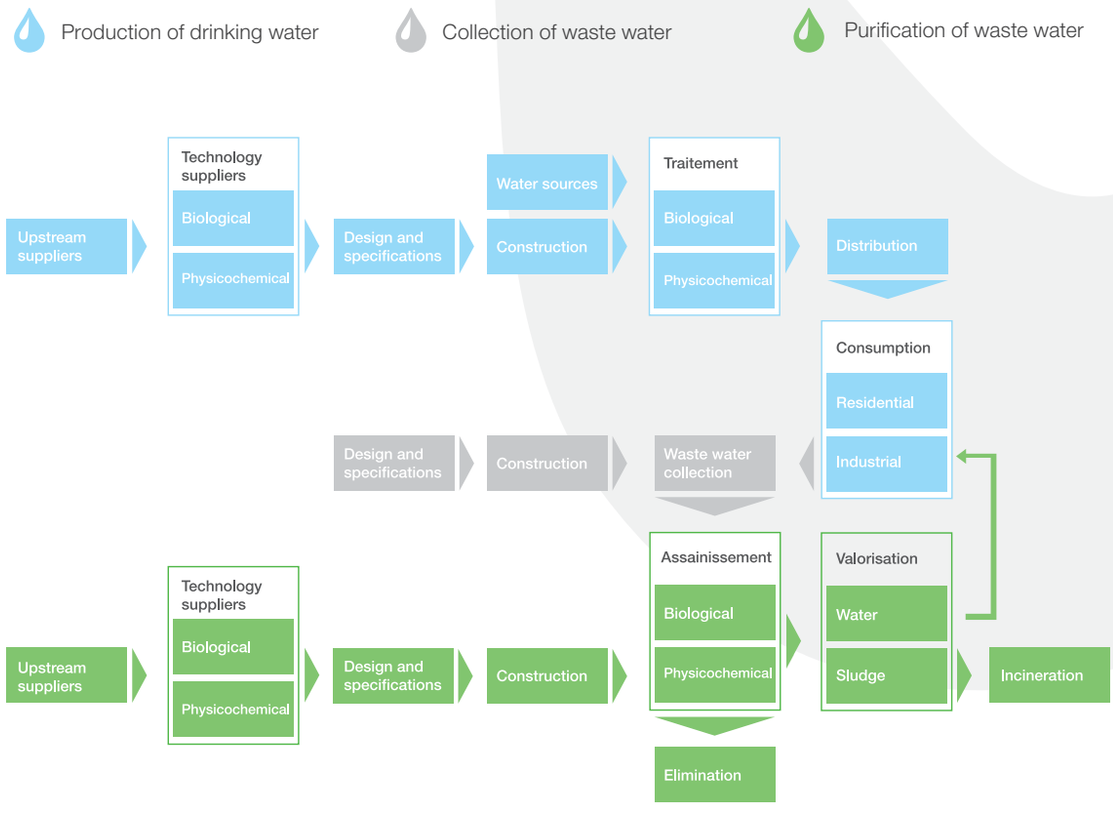


Figure 1 : The value chains of centralised water treatment (source: E4Tech)

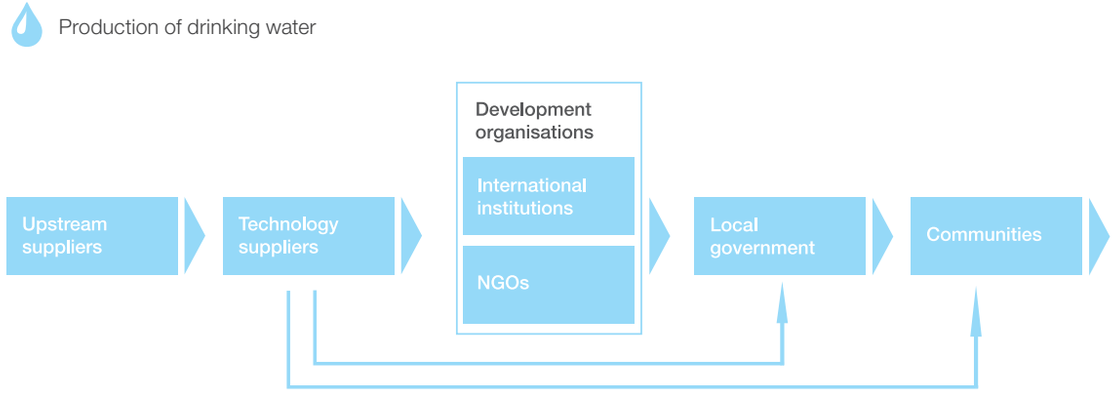


Figure 2 : The value chains of decentralised water treatment (source: E4Tech)

Focus on water sector

Water treatment in western Switzerland

4. A closer look at the technology providers

A detailed view of the players involved along the technological value chain is given in Figure 3.1 for centralised systems, and in Figure 3.2 for decentralised systems. The diagrams show the positioning of each of the players in the different links of this chain, ranging from physical-chemical/biological materials to complete installations (treatment plants), through the intermediary stages of the production of components, systems and treatment units.

The main observations about the **centralised** water treatment value chain

- Western Switzerland offers a full range of skills in this sector, as illustrated by the even distribution of these players along the value chain.

- Although the value chain is made up of three distinct branches (drinking water production, the collection and treatment of waste water), the majority of the players are active in more than one of these branches. This indicates a significant level of similarity in the components, systems and design of production units for drinking water and the treatment of waste water – an interesting characteristic that enables companies to expand their market by transferring their core skills.

- A more in-depth analysis shows that the industrial fabric is mainly made up of medium-sized businesses (SMEs and start-ups), representing an interesting force for innovation that reinforces the links with the major companies in the sector, as seen for example with the technological subsidiaries of the large international groups Veolia or Hach Lange (Züllig).

- The value chain is largely based on «implementation projects», where each project has its own characteristics and depends on the context in which it is implemented. The value added by the players in western Switzerland lies mainly in know-how, design engineering and the adaptation of technology. This is another of the main forces behind the fabric of the Swiss economy – its ability to offer turnkey solutions, without doubt a key element in the future implementation of Switzerland's Cleantech Master Plan.

- Innovation in itself, together with the application of high technology, is concentrated in certain specific niches, notably control systems and instrumentation, but also the production of biological equipment. The inventiveness and know-how of the integrators do the rest.

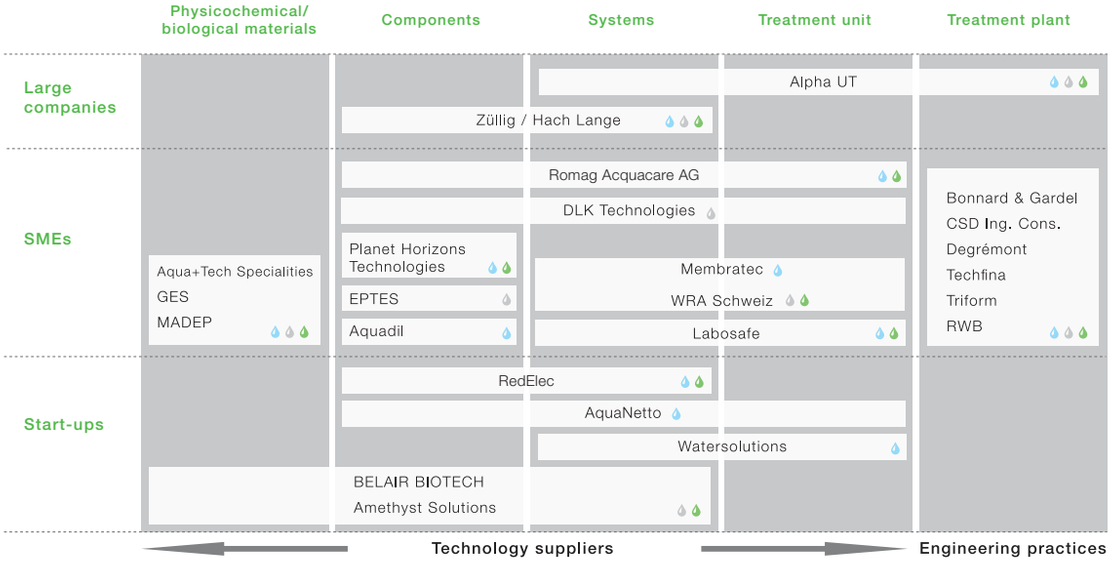


Figure 3.1: Distribution of the technological players along the value chain for the centralised treatment of water (source: E4Tech/CleantechAlps)

- Taking account of the national nature of the water legislation and the strong «implementation project and public market» dimension to water treatment units, the activities of this industry are initially oriented mainly towards the regional market. On the other hand, this characteristic of the market represents attractive business opportunities in connection with the licensing of technologies, solutions and services for the export markets.

- In the specific field of the treatment of waste water, western Switzerland offers a complete, relatively well-rounded value chain. This sector also puts to good use the skills present in Switzerland in the fields of high technology, precision manufacturing and cutting-edge manufacturing techniques. Finally, this value chain is reinforced by some key players located outside western Switzerland (Jakob AG, Grundfos, Aquafides, Aquametro, Endress+Hauser, etc.). Players from other sectors positioned upstream in the chain, or in the relevant enabling technologies (Cla-Val, Contrec, Egger Pumps) complete the picture.

This last point illustrates perfectly the complexity of the subject of cleantech. It is not a matter of a specific industrial sector, but of solutions aimed at the sustainable use of resources. In order to achieve this, it is essential to integrate skills from a wide range of industrial and other sectors in order to deliver the optimum solution, especially from an economic point of view. The water treatment sector thus affects a very large part of the existing industrial fabric. It also offers business opportunities in the area of service provision. Let us take the example of the concept of the water footprint.

The water footprint approach is really taking off at the moment. Its aim is to measure the environmental impact of all the products, services and activities of a company in terms of its water consumption, examining aspects such as the quantity of water consumed, the way in which it is consumed and in what locations on the planet. It would be no surprise to see this approach being applied more generally in corporate environmental risk analyses – a business opportunity that has not escaped the attention of regional enterprises such as the company Quantis, an offshoot of the EPFL. This company has developed strong skills in this field and currently has sites in Lausanne, Lyon, Paris, Boston and Montreal.

Quantis has developed an inventory database for water, based among other things on the Water Stress Index, which has enabled it to confirm its place among the world leaders in life cycle analysis (LCA). Other companies in the region, such as SOFIES, also operate in the field of LCA and eco-design.

Focus on water sector

Water treatment in western Switzerland

The main observations about the **decentralised** water treatment value chain

- The technological players in this value chain offer a strong concentration of skills in the development of components, systems and treatment units. They offer the potential for synergy, which should be leveraged.

- It has already been mentioned that, while the decentralised production of drinking water represents strong, growing demand at a world level, it is not in itself a buoyant market, as it responds to the needs of populations that do not necessarily have the purchasing power needed to guarantee a sufficient natural market. Consequently, international organisations and NGOs play an essential role in the value chain for these technologies, by ensuring that they have access to the markets in emergent countries, for example by means of donor-funded development programmes.

- The strong presence of these multilateral players in Geneva makes western Switzerland a natural cradle and catalyst for the development of technologies suitable for the programmes of these organisations.

- The presence of a group such as Vestergaard-Frandsen, a real driver on the humanitarian market, also offers some particularly attractive synergies. These types of company have the capacity to create the market, offering significant synergies with the innovation potential of technological start-ups and SMEs in western Switzerland.

- It should also be stressed that the decentralised water treatment sector is much newer than the centralised treatment sector, and therefore enjoys an even greater potential for innovation.

- Finally, numerous synergies exist with the related renewable energy sector, which can supply the power for the decentralised installations, in particular by means of solar photovoltaic and wind power.

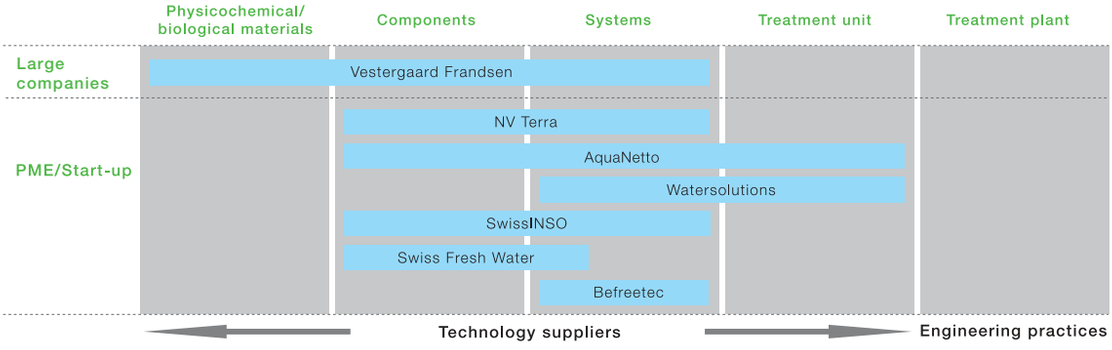


Figure 3.2: Distribution of the technological players along the value chain for the decentralised treatment of water (source: E4Tech/CleantechAlps)

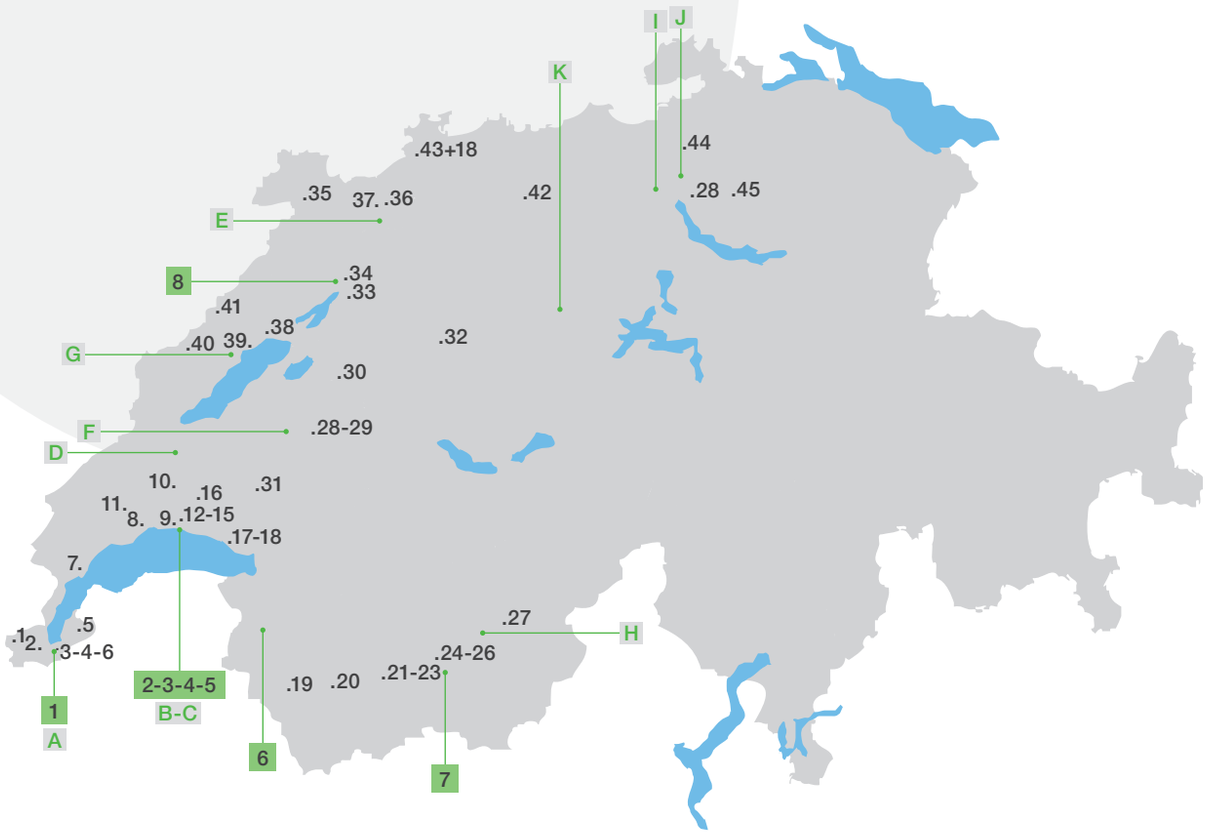
5. Conclusion

This analysis of the sector indicates that the water treatment ecosystem in western Switzerland is complete and coherent for the two market segments of centralised and decentralised water treatment. The national climate is extremely favourable for preparing the solutions of the future, thanks to the dynamism of private companies and initiatives such as the Swiss Water Partnership. However, there is still considerable potential for improvement in the area of public research along the lines of the link between the flagship EAWAG and industry via intermediary institutions such as the universities of applied science. This link could certainly be reinforced.

Western Switzerland has all it needs to be able to derive optimum benefit from the significant potential markets in this sector, and we can be sure that we will see an increase in the installation of solutions that are «made in western Switzerland» in the near future.

Focus on water sector

Overview of the water treatment players (fig. 4)



Players on decentralised sector

1. Fondation Antenna Technologies, Genève / GE
2. Vestergaard Frandsen Group SA, Lausanne / VD
3. Swiss Green Solutions, Lausanne / VD
4. SwissINSO, Lausanne / VD
5. Swiss Fresh Water, Belmont-sur-Lausanne / VD
6. NVTerra, Monthey / VS
7. AquaNetto AG, Sierre / VS
8. Smixin, Bienne / BE

Institutes/Incubators

A. UNIGE, Genève / GE
B. EPFL, Lausanne / VD
C. UNIL, Lausanne / VD
D. TecOrbe, Orbe / VD
E. HES-SO, Delémont / JU
F. UNIFR, Fribourg / FR
G. UNINE, Neuchâtel / NE
H. BlueArk, Viège / VS
I. ETHZ, Zürich/ ZH
J. EAWAG, Dübendorf / ZH
K. Cewas, Willisau / LU

Players on centralised sector

1. Aqua + Tech Specialities SA, La Plaine / GE
2. Techfina, Petit-Lancy / GE
3. Belair Biotech SA, Genève / GE
4. Befreetec SA, Genève / GE
5. Hach Lange Sàrl, Vésenaz / GE
6. SOFIES, Genève / GE
7. NGL Cleaning Technology, Nyon / VD
8. Global Environmental Services SA (GES), Morges / VD
9. AquaVision Engineering, Ecublens / VD
10. Crystal NTE SA, Jouxtens-Mézery / VD
11. Phragmi-Tech, Pampigny / VD
12. Pentair, Lausanne / VD
13. Bonnard et Gardel, Lausanne / VD
14. CSD Ingénieurs Conseils SA, Lausanne / VD
15. Quantis Switzerland, Lausanne / VD
16. E-dric, Le Mont / VD
17. EPTES Sàrl, Vevey / VD
18. Aquametro AG, Therwil / BS et Vevey / VD
19. Alpatec SA, Martigny / VS
20. RedElec, Riddes / VS
21. Amethyst Solutions Sàrl, Sion / VS
22. CERT SA, Sion / VS
23. PRA Ingénieurs Conseils SA, Sion / VS
24. Membratec, Sierre / VS
25. Planet Horizons Technologies SA, Sierre / VS
26. AquaNetto AG, Sierre / VS
27. WRA Schweiz SA, Rarogne / VS
28. Degrémont SA, Fribourg / FR et Dübendorf / ZH
29. Triform SA, Fribourg / FR
30. Romag Acquacare AG, Guin /FR
31. Aquadil Sàrl, Châtel-St-Denis / FR
32. Samro SA, Berthoud / BE
33. Alpha UT SA, Nidau / BE
34. Smixin, Bienne / BE
35. RWB Holding SA, Porrentruy / JU
36. Reinhart Hydrocleaning SA, Courroux / JU
37. Biotec Biologie Appliquée SA, Delémont / JU
38. Labosafe SA, St-Blaise / NE
39. Biol-Conseils SA, Neuchâtel / NE
40. MADEP SA, Bevaix / NE
41. DLK Technologies SA, Le Locle / NE
42. Watersolutions AG, Buchs / AG
43. Endress + Hauser, Reinhach / BS
44. Aquafides Schweiz AG, Dietlikon / ZH
45. Grundfos Pumpen AG, Fällanden / ZH

production of drinking water

collection of waste water

purification of waste water

19 company profiles from the water sector in western Switzerland

Portrait

Vestergaard Frandsen – humanitarian entrepreneurship

Originally operating as a manufacturer of work uniforms, Vestergaard Frandsen has adopted humanitarian responsibility as its core business. Today, the company's game-changing solutions fight global health problems including malaria, HIV/AIDS and diarrheal disease affecting people in developing countries.

A backpacking trip to Africa in the 1990s convinced Mikkel Vestergaard Frandsen, current CEO of the company and the third generation at its helm, that he wanted to dedicate the company to helping people in developing countries. Consequently, Vestergaard Frandsen is now devoted to the creation and development of technologies for preventing diseases such as malaria, diarrhoea, AIDS and various tropical diseases – a far cry from the company's origins in 1957, when it produced work uniforms. Based in Lausanne and active across five continents, the company is now guided by a unique business model based on humanitarian entrepreneurship, with a "profit for purpose" approach that has turned social responsibility into its core business. Strong support of the United Nations Millennium Development Goals (MDGs) is a driving force for the company. Vestergaard Frandsen proudly points to the fact that it targets its innovations directly at the most vulnerable people living in developing countries. This, they say, is what sets them apart from most other companies who devote their innovative platforms to people living in developed countries. In order to combat and prevent malaria, for example, Vestergaard Frandsen has perfected a mosquito net impregnated with insecticide. It is the world's best selling long-lasting insecticidal bed net on the market today.

Sustainable access to water thanks to carbon

Every year around 1.5 million children die from diarrhoea caused by difficulties in accessing safe drinking water. To help alleviate this problem, and support the MDG which aims to halve the proportion of people without access to drinking water (in comparison with 1990 figures) between now and 2015, the company developed the LifeStraw Family water filter. It can produce at least 18,000 litres of safe drinking water, enough to supply a family of five for at least three years. In addition, Vestergaard Frandsen has initiated an innovative programme for financing distribution of the LifeStraw Family water filters, known as LifeStraw Carbon for Water. Under this programme, close to 880,000 water filters have been installed in Kenya's Western Province. Approximately 4.5 million Kenyans (91% of all homes) now have access to safe drinking water. Those who received the water filters no longer need to treat water by boiling it using wood fuel, which releases greenhouse gasses. Vestergaard Frandsen will earn carbon credits for reducing the emissions which it can sell to companies who want to reduce their carbon footprint. The money they get will largely be reinvested into the programme to keep it sustainable for at least 10 years. Carbon reductions are anticipated to be more than than two million tonnes per annum.

Vestergaard Frandsen says it will continue to work in tandem with governments, aid agencies, NGOs, faith-based groups and private sector partners to deliver highly effective health prevention tools to end users in developing countries as quickly and cost-efficiently as possible.

The self-sustaining LifeStraw Carbon For Water programme has provided 91% of the inhabitants of Kenya's Western Province with access to safe drinking water at no cost to themselves or their government.

Vestergaard Frandsen

1957

200

Chemin de Messidor 5 - 7, 1006 Lausanne

+41 21 310 73 33 +41 21 310 73 30

www.vestergaard-frandsen.com

feedback@vestergaard-frandsen.com

Portrait

SMIXIN, using well what is important

Minimising water consumption is the preoccupation driving Bienne-based start-up Smixin. Its hand washing system reduces water consumption by 90%, whilst achieving a higher standard of hygiene.

Hand washing system: 90% of water consumption reduction.

Water is a field where there is tremendous potential for savings. The start-up Smixin is well aware of this. Its idea is that hand washing is a simple activity that everyone performs several times each day, so it must be possible to reduce the large quantities of water used for this purpose. “This idea was born in 2004 within the innovation collective Creaholic”, explains Denis Crottet, co-founder and CEO of Smixin. “We became aware that a generation from now, water would be one of the major concerns of our society.” It was as a spin-off from Creaholic that Smixin, with its philosophy of making good use of what is important, was set up.

A potential saving of 90%

Smixin offers a hand washing system that reduces water consumption by 90%. According to its tests, washing your hands requires 1.2 litres of water – it should be noted that during these measurements, the tap was turned off whilst the person was rubbing their hands. The use of a flow limiter on the tap reduces this to 0.8 litres.

But Smixin goes even further. Its system requires just 0.1 litre of water, in other words, a 90% reduction. It is based on the simple principle of introducing the cleaning agent directly into the water and mixing the two.

A system that can be adapted to the applicable hygiene standards

This system is intended for business and commercial applications, in places specifically for use by the public and for hand washing, such as washrooms in offices, shopping centres or restaurants. For professionals, it is compatible with the most rigorous hygiene standards. “We’re able to adjust the ratio of our soap-water mix, and also the time allowed for the different phases of hand washing, in order to comply with each company’s rules. In this way, we have the potential to increase “compliance” among users. It’s also possible to incorporate an antiseptic soap to disinfect hands as well as wash them, and so tap the hospital market, especially during periods when there is a risk of a pandemic.” This permanent solution was developed together with an industrial partner specialising in commercial kitchens, and has featured in that partner’s catalogue since mid-November last year.

Hygiene at your fingertips

“We have also developed an entirely autonomous system enabling hygiene to be brought to people, and not the other way round. We will complete the development of our mobile stations this year, and the first hundred products will be available at the beginning of next year.” These stations will be used for pilot products and trials at clients’ premises. “Now, we’ve developed the technology and demonstrated the concept; in future, Smixin will be a byword for sustainable hygiene on an international scale.” After marketing the system in western countries, Denis Crottet hopes to take it to emergent countries and offer access to a higher standard of hygiene in places where water resources are very limited.

SMIXIN™ SA

2009

around ten people (2 in-house)

Rue Centrale 115, CP 7016, 2500 Bienne 7, Switzerland

+41 32 366 64 24 | +41 32 366 64 45

info@smixin.com | www.smixin.com

Reinhart Hydrocleaning prolongs the life of pipes

Based at Courroux in the Jura, Reinhart Hydrocleaning specialises in cleaning water, gas and oil pipelines. Its system reduces the quantity of chemicals required and also means that pipes are replaced less frequently.

Regardless of the type of liquid flowing through them, all pipes are going to get dirty at some time. This means that the diameter of the pipe is reduced and results in a loss of flow rate in the network. In addition, if maintenance work is not carried out, there is a high risk that the pipes will clog up, rust and deteriorate. The Reinhart family has been cleaning water pipes since 1952, as Operations Manager Robert Reinhart explains: "Our grandfather began by cleaning water pipes in the Ticino canton and then in Italy". Today, the company is still family-run, with two of the founder's sons and three of his grandsons managing the business. According to brothers Roland (R&D Manager) and Robert Reinhart, it's a logical whole: "The experience of our father and our uncle, combined with our technical knowledge, is one of our company's strengths, enabling us to be inventive and flexible."

Thanks to the pipe cleaning solutions designed by Reinhart Hydrocleaning, it is possible to extend the lifespan of pipes such as these 310 mm diameter phenol pipes.

Replacing only what needs to be replaced

The company custom-designs tools for each of its clients. "We have to be very responsive", says Robert Reinhart, "because very often our clients have a deadline for inspecting the pipes that's very close, and the pipes have to be cleaned before the inspection." There are several techniques for this purpose. The first, high-pressure washing, is limited by the length of the pipes. Another solution is to use pigs or scrapers. These are cleaning pads that push the dirt towards the end of the pipe. According to Roland Reinhart, this is not the best solution: "We've noticed that these solutions have a limited cleaning capacity because they press part of the deposits onto the pipe." The Reinhart Hydrocleaning product consists of scraping components that are adapted to the specifications of each client's pipes, plus a part required for propulsion. The aim is to clean the pipe to restore the flow rate, but also to enable the pipes to be inspected. It involves working upstream to see which parts of the network are damaged. This means that instead of replacing all the pipes, only the damaged parts are renewed. The cleaning with Reinhart hydro-mechanical tools enables inspections to made with almost 100% success rates.

From a cheese factory to an oil pipeline

Although the company's original business focused on cleaning water pipes, Reinhart Hydrocleaning has now diversified and cleans all kinds of installations, including an aluminium production system, gas pipelines, a fish farming network and pipes in a cheese factory. One solution was even used to clean the cooling pipework for the tunnel-boring machine during construction of the new Gotthard railway tunnel. An oil pipeline between Norway and the United Kingdom has been cleaned monthly using this system since 2007. "It took several operations to remove all the paraffin that had encrusted the pipes for years," says Robert Reinhart, adding, "When we started, the lifespan of the pipe was fixed for 2020. It has now been extended to 2027."

Reinhart Hydrocleaning SA

1996

20 of whom 7 are members of the Reinhart family

Rue de la Croix 29, 2822 Courroux, Switzerland

+41 32 422 82 44 | +41 32 422 21 38

info@rhc-sa.ch | www.rhc-sa.ch

Portrait

hepia, combining planting with water treatment

Alongside regional development, construction and the environment, water is one of the subjects of the interdisciplinary projects carried out by Hepia – the Geneva University of Applied Sciences Western Switzerland – Technology, Architecture and Landscape. The aim of these projects is to provide a vertical system for combining the revegetation of towns with water treatment.

The objective of the Hepia school in Geneva is to provide its students with strong interdisciplinary skills. One of the ways it delivers this is to give them the opportunity of working on specific interdisciplinary projects. “This means that students, even those with a basic qualification in a different field, are capable of understanding the value added by the other disciplines.” Yves Leuzinger, the Director of Hepia, states that it also enables students to respond better to the problems posed by the management and conservation of resources.

Vertical biobeds

Concerned by the presence of agricultural pesticides in water, a team of agronomists from Hepia became interested in biobeds – installations made up of a trench filled with soil and straw for treating water that contains residues from phytosanitary treatment. This substrate absorbs the pesticides, which are then biodegraded by the microflora in the soil. In order to reduce the space required and to avoid having to add straw regularly, the Hepia team invented the VG Biobed (Vertical Green Biobed). The same substrate as the biobeds is contained within a wall planted on all sides to maximise water evaporation, without the risk of volatilisation of the pesticides. The plants bring in fresh organic matter, eliminating the need to add more straw. “These biobeds may also be used to retain rain water and limit the risk of flooding.”

Planted walls

A second project, which relates more specifically to an aspect of construction and planting, has the aim of creating conditions in which plants can live vertically. They should not only require little maintenance or water, but should also contribute to the thermal properties of the building. The team, made up of landscape architects, agronomists, heat engineers, architects, interior architects and a ceramicist, has therefore designed a new system for the planting of buildings, which consists of seeding a solid porous panel juxtaposed with a substrate. “The challenge was to obtain a vertical ground structure which served as support for vegetation, was even from top to bottom and was not affected by rain, while providing humidity for the habitat and a buffer against the temperature differences in towns.”

The prototypes indicate an enormous potential in terms of reducing pollution and noise as well as having a positive impact on the urban climate. Having demonstrated the relevance of the concept, Hepia has forged links with Swiss company Créabéton to develop commercial versions of some of the products inspired by this research, enabling the company to include this unique, innovative product in its range of materials for 2013.

These planted walls designed by Hepia are set to be installed in our towns in the next few years.

hepia (Haute école du paysage, d’ingénierie et d’architecture)

2009
280, with the addition of staff on temporary contracts
1000 students
Rue de la Prairie 4, 1202 Geneva, Switzerland
+41 22 546 24 00
hepia@hesge.ch
hepia.hesge.ch

DLK Technologies – an ecological approach with economical solutions

Based in Le Locle, the 20-year-old company DLK Technologies has become a benchmark in the treatment of water used for washing vehicles. The company treats industrial effluents using a variety of ecological processes.

In the DLK Technologies laboratory, Benjamin Reinhart, manager of the Bern branch, undertakes the analysis of all the effluent samples in order to propose the most appropriate water treatment solution.

"We have always fought to operate economically while using ecological solutions." Marc Vuilliomenet, Managing Director of DLK Technologies, believes that using chemicals to treat the water used for washing vehicles is a real ecological aberration. Since its beginnings the company, based in Le Locle, has turned to nature for its solutions. The founder, Hans Joachim Leithner, originally manufactured fans, from where the name DLK ("Damit Luft Kommt", the German for "To make air come") is derived. Later, together with the University of Heidelberg, he developed a water recycling system. Under the name FBR (Filter and Bioreactor) this system combined filtration with biological treatment. However, it did not enjoy the success he was expecting in Switzerland due to the low price of water. It was not until the FBR, which now stood for Fixed Bed Reactor, was adapted for the treatment of hydrocarbons in the water used for washing engine chassis, that DLK Technologies was finally able to establish itself with garage operators.

Expanding the available water treatment processes

As biological treatment is sometimes limited by the fact that not all effluents are the same, DLK looked into a specific treatment system for effluents polluted with metals (such as water from polishing processes or effluents from electroplating) called electrocoagulation. This involves passing the effluent over electrodes, iron cathodes and aluminium anodes. The electric current breaks down all the chemical bonds holding the metals in solution, and the aluminium produced by the decomposition of the anode promotes the coagulation of these metals. Unlike the classic physico-chemical systems, which require the addition of reagents, the electrocoagulation process only uses electric current and metal in solid form (so no transportation of water is involved), thereby substantially reducing the operating costs. In 2007, by buying the company Px Tech Environnement, then in liquidation, DLK acquired the additional facilities of membrane filtration technology and several small physico-chemical units that were missing from its range. Membrane filtration, involving reverse osmosis, enables pollutants to be separated from the effluent and concentrated, which reduces the size of the final treatment unit, thus limiting the treatment costs.

A diagnostic and analysis service

"We design tailor-made solutions for each of our clients," says Marc Vuilliomenet. "Every machine is a specific model, some of which may require several years to perfect." As effluents are rarely the same, the company has established a diagnostic service. In addition to the analysis of effluents in the laboratory, the technicians visit the client's site with one or more machines, carrying out tests in real conditions. The objective is to find the best solution for each client's environment.

DLK Technologies SA

1991

between 8 and 12 at different times

Ch. Des Aulnes 1, 2400 Le Locle, Switzerland

+41 32 930 50 50

service@dlk.ch

www.dlk.ch

Portrait

RedElec Technologie – from indigo to blue gold

A spin-off of the Swiss Federal Institute of Technology Zurich, RedElec Technologie operates an electrochemical process originally developed for making indigo dye soluble. It is now also used in the treatment of waste water.

The underlying principle of this process, perfected by Doctor David Crettenand and implemented by RedElec Technologie of which he is director, is the transformation of molecules without chemicals. The company does this using electrochemistry, whereby electricity is used to bring about a chemical transformation (oxidation or reduction). “This avoids the need to resort to chemical reagents,” says David Crettenand, adding: “Electrons are less expensive and more ecologically friendly. We have therefore developed and patented an electrochemical reactor.” The first application of this process was in the textile industry, for dyeing denim fabric. Electrochemistry is used to make indigo dye soluble. Once the procedure had been tested in the company’s laboratory at Riddes, it was ready for an industrial application, and is now used for the production of up to one tonne of dye per day. “It is very difficult to introduce a new technique to the textile industry. In order to prove that our procedure works, we would have to provide our machine free of charge. Around one million Swiss francs would be needed to undertake trials in situ at a denim production factory.” RedElec has nevertheless signed a partnership agreement with Dystar, the world leader in the production of indigo, to extend its system to the stabilisation of dye baths.

Treating waste water with electrochemistry

While waiting for the market to develop in the textile industry, RedElec Technologie has been looking at other applications for this process. The same machine can be used for the treatment of waste water, producing hydroxyl radicals, which eliminate the organic molecules present in effluents, in particular persistent pollutants (micropollutants). “This process has been tested successfully in the laboratory on industrial effluents and we are now going to develop it on a wider scale.” The technology is aimed more specifically at the chemical industries, as well as local authorities that need to treat household and agricultural effluents. In a second phase of development, the company intends to expand the use of this process to include the treatment of water to eliminate micropollutants (waste from hospitals, workshops, agriculture, etc.) at source or at the outflow of water treatment plants. The process has the advantage of being relatively low-cost both in terms of initial investment and the cost of use, as the oxidant reagents needed for water treatment are produced on site. It also avoids the need for handling and transporting hazardous substances. An initial pilot installation has recently been established.

Control step of industrial dye production by electrolysis.

Recovering metals

Another application is the recovery and/or elimination of metals dissolved in waste water. In this context the process is applied to the treatment of industrial effluents, to render them compatible with biological treatment and for rinsing bath recovery in the galvanoplasty industry. The Valais start-up also works for companies in the chemical, pharmaceutical, agrochemical and biotechnological industries, researching into the electrochemical alternative for various stages of their production processes.

RedElec Technologie SA

2007

2

Rue des Artisans 14, 1908 Riddes, Switzerland

+41 27 306 55 20

+41 78 831 18 62

www.redelec.ch

ROMAG Aquacare AG handles water from the source to the waste water treatment plant

After several decades in tube production, ROMAG has now turned to technologies and installations for the full water cycle, from harnessing at source through to treatment.

Founded in 1949, ROMAG Tubes et Machines originally operated in the production of large-diameter welded-steel tubes. “Until the early 1980s we produced steel tubes for drinking water and natural gas pipelines,” says Kurt M. Gloor, director of the Fribourg company. “But we soon became aware that the drinking water supply infrastructures needed installations that were much more sophisticated than pipes. We therefore specialised in stainless steel equipment for reservoirs, pumping stations and collection stations. And we began to offer global solutions for the treatment of rain and storm water.”

ROMAG Aquacare is active throughout the complete water cycle, as here in the collection station of a mineral water spring.

Production of welded-steel tubes ceased completely in 1999. Ten years later, the company changed its name in line with its new activity, becoming ROMAG Aquacare AG. “We offer our solutions throughout the whole of the water cycle, from collection at source through to the effluent from a waste water treatment plant.” For example, ROMAG was the first to offer high flow-rate screens for treating rainwater, mechanical cleaning solutions that are installed in discharge installations upstream of waste water treatment plants.

In heavy rain, the capacity of waste water treatment plants is exceeded and they discharge the water into the environment before it has been fully treated. The screens catch everything that is visible – cigarette ends, sanitary pads, and even food waste thrown into toilets are caught by the screens, enabling the water to be released into the natural environment without these pollutants. One of the twelve installations in Geneva, for example, enables up to 18,000 litres per second to be treated. 1,200 screens are currently installed, in more than 20 countries around the world.

Switzerland – the location of choice for the development of solutions for the environment

“The technologies in the field of drinking water and waste water are very advanced in Switzerland. At a very early stage we were forced to take an interest in these technologies because our country is very densely populated, attracts a lot of tourists and is very intensively farmed. In the 1950s, people could no longer swim in some of the lakes and rivers because they were so polluted.” The Federal government therefore imposed stricter standards on the discharge of waste water into the natural environment, a move which caused Swiss industry to move forward in this field. Kurt M. Gloor recalls the surprise of some American visitors when they saw that it was possible to swim in our water courses, such as the Aar in Bern. The future of the company’s products may lie to a substantial extent abroad, but Kurt M. Gloor believes that Switzerland offers his company the opportunity for technological development: “We can try out applications in Switzerland before selling our solutions abroad.” Today, although the question of waste water appears to be under control, there is still a problem with the treatment of road runoff. “Where traffic densities are upward of 25,000 vehicles a day it is important to treat the run-off water from certain roads.” And here, too, ROMAG Aquacare is beginning by applying its solutions here in our country before exporting them.

ROMAG aquacare ag

1949

70

Haltaweg 3, 3186 Guin, Switzerland

+41 26 492 65 00 | +41 26 492 65 65

office@romag.ch | www.romag.ch

Portrait

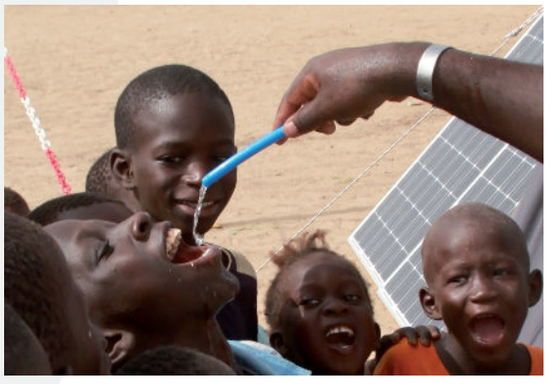
Swiss Fresh Water – the low-cost, autonomous treatment of brackish water

The company Swiss Fresh Water offers low-cost, stand-alone water desalination systems in order to provide better-quality water to low-income communities.

"One day, someone happened to be talking to me about the brackish water drunk by a large number of people on the planet. As I had travelled with my job, I could immediately relate to this problem." This is how Renaud de Watteville, founder of Swiss Fresh Water, got the idea of developing a water desalination system. "But any system had to be capable of autonomous operation and represent value for money." After two years of research and development, the machine saw the light of day. Powered either by a generator or solar panels, it can treat up to 4,000 litres of brackish water per day (with a smaller model for treating up to 2,000 litres per day). "Historically, populations have always gathered around water supply points. But now the ground water has been overexploited and sometimes, in the deserts for example, this can lead the water being brackish."

Brackish water contains 1 to 8 g of salt per litre (by way of comparison, the Atlantic contains 25 g per litre and the Mediterranean 32 g per litre). This machine reduces the total salt levels to between 30 and 100 mg. Another advantage is that, given the size of a molecule of salt, as it is removed bacteria and heavy metals are also eliminated, thus reducing diseases such as fluorosis, diarrhoea and hypertension. The machine uses the process of inverse osmosis. "Many people believe that water treated by inverse osmosis is not good to drink. Yet it is better than rainwater as it contains more minerals, and at present hundreds of thousands of people drink rainwater."

The first low-cost, stand-alone Swiss Fresh Water desalination systems have been installed in Senegal. Depending on the model, they can treat up to 4,000 litres of brackish water per day.



Autonomous communities

A pilot project of twelve machines has been in operation in Senegal since June 2011. It supplies good-quality water to more than 10,000 people. Swiss Fresh Water is currently launching the production of 20 machines, with 20 more to follow. "We are looking for financial backing for our orders. Our potential clients are non-governmental organisations, non-profit-making organisations and, above all, village communities and women's associations. Our solution is sufficiently cheap to enable a village of 1,500 to 2,000 people to acquire it without external aid." In order to ensure the continuity of the system, the water is sold in the form of a "prepaid water charge" at a price that is accessible to the local population. 25% of this amount goes back to the village to finance local wages and community projects, and the balance is used to finance the cost and maintenance of the technical equipment. In Senegal, a Regional Maintenance Centre staffed by local people has also been created to provide the maintenance of the machines installed (which communicate telemetric information including in particular details of pressure, temperature and throughput). In order to help smaller communities to benefit from this solution, Swiss Fresh Water has also established the Access To Water foundation, which has the aim of installing machines in small villages and distributing the water to school children.

Swiss Fresh Water SA

2008

6, 2 of whom are in Senegal

Route des Monts-de-Lavaux 22,
1092 Belmont-sur-Lausanne, Switzerland

+41 21 711 22 77

info@swissfreshwater.ch www.swissfreshwater.com

Remote measurement with Sensile Technologies

Sensile Technologies is the European leader in the remote measurement of oil product tank levels. Its solutions have also been used for some time now in slurry pits, to prevent pollution from entering water courses.

The remote measurement of oil product tank levels is what young business Sensile Technologies, of Morges in Switzerland, is all about. It has developed a box that is attached to the shell of a tank and connected to a submerged pressure sensor on the base. Operating by long-life batteries, and equipped with a GSM modem and a SIM card, this system is totally independent, collecting information on consumption and fill levels and transmitting it to a dedicated web platform for each client. An SMS or e-mail alert warns the client if the tank level falls below a critical threshold. "We are offering this solution to oil companies so that their customers no longer have to worry about checking their tank levels," explains Cédric Morel, Managing Director of Sensile Technologies.

The aim of this remote measurement system is to rationalise the logistics of customers such as petrol filling stations in Switzerland. Deliveries arrive neither too late nor too early, but at exactly the right time, which means that delivery tanker numbers and distances travelled can be substantially reduced. Some 40,000 sensors are currently installed in oil, petrol and gas tanks in 40 countries, enabling CO_2 emissions to be reduced by 6 tonnes a day, the equivalent of the CO_2 emissions for one person per annum.

Preventing the pollution of water courses

Although Sensile Technologies initially chose to concentrate on its solution for oil product tanks, the company has since turned towards new markets. "We started to receive enquiries from other sectors. Five years ago, we would turn down these enquiries in order to concentrate on our main objective of becoming the leader in the oil market. Having achieved this objective, we are now seeking to adapt our product and to target it at different markets." The company also realises the benefits of preparing for the time when oil products are no longer available. "While there is oil we have nothing to worry about – the company will continue to grow, but we must prepare ourselves for the post-oil situation."

Since last June, Sensile Technologies has turned to a new market following an enquiry from one of its distributors based in Denmark. A recent Danish law requires farmers to equip slurry pits located in the vicinity of water courses with anti-leak systems. Sensile Technologies has therefore adapted its device to this situation, as Cédric Morel explains: "We have modified our equipment slightly to generate an alarm when there is an abnormal drop in the tank level." Around ten tanks to date have been fitted with the devices, although no alarms have yet been recorded in practice. Cédric Morel is quite confident of the way that this market, which represents more than 5,000 potential tanks in Denmark alone, looks set to develop. The Sensile Technologies team, which consists of two developers heading a total of eight people, is currently working on adapting the solution to a different area. But Cédric Morel refuses to give any more away…

Installed by Cédric Morel, Managing Director of Sensile Technologies, this remote measuring system transmits an alarm if there is an abnormal drop in the level of the slurry pit, thus preventing the pollution of water courses.

Sensile Technologies SA

1999

8

Rue de Lausanne 45, 1110 Morges, Switzerland

+41 21 805 03 10

info@sensile.com www.sensile-technologies.com

Portrait

Madep, microorganisms to destroy pollution

Fighting pollution with the aid of microorganisms is the concept put into practice by the company Madep. Apart from the purification treatment of waste water, Madep has also developed bacteria for depolluting contaminated sites and for improving biogas production yields from sludge and organic waste, as well as from dumped household waste.

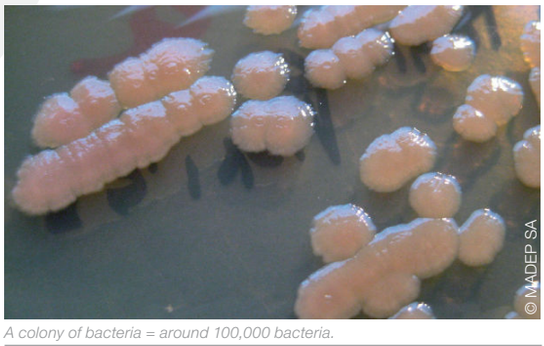
Microorganisms have for several years now been proving their effectiveness in the decontamination of the environment, from oil slicks to polluted ground. Trello Beffa, founder and Director of Madep, has found his place in this niche. Originally from Ticino, he wrote his thesis in Geneva on mushrooms, but it was while working as head of works at the University of Neuchâtel that he began to develop applied projects relating to the environment. “I was drawn towards finding solutions for the treatment of waste water and refuse. The aim was to reduce the quantities of chemicals used, and to improve the biological quality.” In 2002 he decided to branch out on his own, founding the Madep laboratory: “When I started out, potential customers took me for someone trying to sell a miracle cure. It was difficult because they thought that the use of microorganisms would be expensive while achieving nothing.” Trello Beffa therefore began by working very cheaply on a few critical cases. Little by little he was able to identify the problems, obtaining some initial convincing results on site. “This enabled me to demonstrate the effectiveness of our approach. It is encouraging to realise you are on the right track.”

Depollution and energy production

Today, the approach developed by Madep has proved its worth in the biodepollution or bioremediation of hydrocarbons (engine oils, kerosene, petrol, etc.) as well as in connection with toxic chemical solvents. This approach has also been in use for the last 4 years at purification plants for the treatment of sludges by methanisation. Specifically, Madep selects the most appropriate microorganisms that will best degrade the pollution, taking account of the physico-chemical and technical characteristics of the site. Blends of specific microorganisms in concentrated form (10-100 litres) may be injected directly into the site, or they may be remultiplied on site prior to injection in large-volume reactors (1-10 m^3). The bacteria multiply by consuming the pollution. This process has been used, for example, in the decontamination of soil and ground water in the vicinity of the Petroplus refinery at Cressier, in the canton of Neuchâtel.

Another area of application is bioactive waste – biogas production can be boosted by adding microorganisms to household waste. “The yields from the digesters will be increased by as much as double.”

Once blended with soils contaminated with hydrocarbons, these bacteria will digest the pollutants while multiplying until the contaminated site is fully regenerated.



A colony of bacteria = around 100,000 bacteria.

Microorganisms at the service of the Minotaur

Madep’s industrial experience has earned it a role as stakeholder in a European research project, Minotaurus, on the degradation of micropollutants, coordinated by the University of Applied Sciences Northwestern Switzerland in Basel. The objective of this project is to produce innovative environmental biotechnologies based on the concept of the immobilisation of biocatalysts to eliminate both emerging pollutants and classic organic pollutants. “We are working on the practical aspect while the other participants tend more towards fundamental research. At present we can say that we are active in the clean biotech or bio-cleantech sector.”

MADEP SA

2002

4

Zone industrielle Maladières 22, 2022 Bevaix, Switzerland

+41 32 846 45 51

info@madep-sa.com

www.madep-sa.com

NVTerra uses salt, iron and electricity to clean up polluted water

An offshoot of the company Bühler Electricité Monthey (BEM), the start-up NVTerra has developed units for purifying surface water to provide drinking water, based on salt, iron and electricity.

Located in Monthey, the start-up NVTerra, a spin-off of Bühler Electricité Monthey (BEM), has developed a process for cleaning up polluted surface water without chemicals, using only salt, iron and electricity. Based on the research of French scientist Jean-Marie Fresnel, this solution uses the principle of electrolysis for the on-the-spot production of a disinfectant (sodium hypochlorite) and a coagulant, called Ferilec, to remove phosphates, nitrates and other heavy metals from water prior to the filtration stages. On reaching the purification station, water has to be pretreated to prevent the filters from becoming saturated too quickly. Jean-Marc Rogivue, co-founder of BEM and NVTerra, explains how this solution enables the very corrosive chemical products that are generally used in this kind of treatment to be avoided. Everything is produced on the spot. This solution may be of interest not only for water purification stations, but also industry, where it can be used to reprocess water before discharging it into the waste water system.

Water for all

This process was not originally aimed at water purification stations – the objective of the project, developed by BEM, was to supply drinking water to the populations who need it. “Populations in Africa drink water that is unfit for consumption. This water is the underlying cause of infant mortality in these countries.” And Jean-Marc Rogivue adds: “Our solution may contribute to resolving this problem.” The company therefore developed a unit under the name of NVAqua, or MDWP (Micro Drinking Water Plant), for producing drinking water. “Even though it is at present still supported by our company, our baby has now grown up enough to make its own way in the market.”

As proof of this, Jean-Marc Rogivue has contacts in various countries to sell his solution, notably in India, Russia and several African countries – three units are soon to be installed in Ivory Coast. Potential customers for the company are non-governmental organisations, governments and mining companies, who discharge large quantities of water into the rivers. “It’s a huge market. Over the next ten years the whole world will be made aware of the fact that water has to be treated before it is given to people to drink.” And it is not only in developing countries that this process may be useful; NVTerra is waiting for approval to launch its machine on the European market, with the stated aim of reaching the most remote regions of our continent. In the meantime the company is continuing its research in order to expand the scope of its solution: “Under instruction from the Swiss Federal Office for the Environment, we are now concentrating our efforts on the treatment of micropollutants.” Jean-Marc Rogivue sums up: “This is a new direction for us.”

NVTerra has developed units for purifying surface water to provide drinking water, aimed primarily at developing countries.

NVTerra SA

2010

1 (8 by BEM SA)

ZI Boeuferrant, CP 1496, 1870 Monthey, Switzerland

+41 24 475 73 33 | +41 24 475 73 20

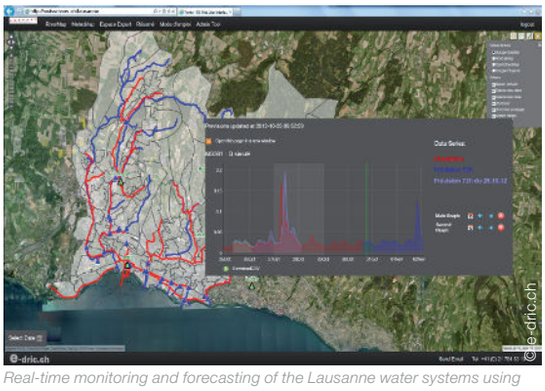
info@nvterra.com | www.nvterra.ch

Portrait

e-dric.ch, digital modelling at the service of the water sector

Founded in 2006, over just a few years e-dric.ch has become a well-respected expert consultancy in hydraulic engineering and operational hydrological forecasting. It bases its activities on digital modelling techniques using a proprietary software that is constantly updated and developed.

"Water is our passion. It's amazing to think that you can use water, an everyday product, to make electricity, the most incredible product in existence." It is therefore natural that Philippe Heller, co-founder of e-dric.ch, chose to study water at university. Like his fellow co-founder, Frédéric Jordan, a high-altitude mountain guide and another devotee of water and glaciers, he undertook his doctoral thesis at the Hydraulic Construction Laboratory of the EPFL. "We both finished our theses with products or methods oriented towards practical use. We then saw the real interest on the part of the industry in taking these methods and products on board." This is why they founded their bureau, which promotes high technology and expertise. These methods enabled e-dric.ch to respond to the demands of its early customers, before broadening the scope of its solution in the form of a proprietary hydrological modelling software package, now known as RS2012. New features are added whenever new problems are encountered.



Real-time monitoring and forecasting of the Lausanne water systems using the information system from e-dric.ch.

Predicting the flow rate of water courses

e-dric.ch uses RS2012 primarily for operational hydrological forecasting, i.e. the forecasting of flows in water courses and at dams, using digital weather forecasts. "We have two kinds of customers – hydroelectricity companies and the State. The former want to know how water course levels will change, in order to forecast their electricity production. The latter use the system to forecast flooding and warn the population in the case of danger." The company offers its services in the form of an annual subscription to a dedicated website where the forecasts are available. The French département of Haut-Rhin, for example, has opened up its dedicated website to its citizens so they can look up the flow rates of water courses.

But e-dric.ch does not stop at forecasting flow rates. It has integrated dams, production centres and economic aspects into the system, enabling it to calculate optimum turbine use and to maximise the efficiency of Swiss hydroelectricity production. e-dric.ch currently covers all the major dams in western Switzerland.

Modelling of urban watersheds

The company is also active in urban environments, providing diagnostic studies on the management of water in conurbations. "In addition to meteorological aspects, we simulate the trends of waste water generation as a function of the location of the population," explains Murielle Thomet, Project Engineer at e-dric.ch. "This enables various different population increase scenarios to be visualised. We use these to analyse the purification network capacity needed to take account of this population increase, and help urban authorities to calculate the dimensions of their future installations." e-dric.ch has already established modelling for the networks of Lausanne and surrounding municipalities Vevey and Montreux, with Morges to be added soon. Another application is real-time network management. In a large city with a more or less flat topography, this is crucially important in order to prevent reservoirs from overflowing and to know when to pump most cost-effectively.

e-dric.ch

2006

15

Ch. du Rionzi 54, 1052 Le Mont-sur-Lausanne, Switzerland

+41 21 784 33 13

+41 79 247 25 77

info@e-dric.ch

www.e-dric.ch

Membratec : the membrane at the heart of water treatment

Since it came into being 15 years ago, Membratec has perfected a membrane process enabling drinking water to be disinfected and clarified. It has now turned to the treatment of waste water, in particular the micropollutants it contains.

"One-third of the drinking water in Switzerland does not need to be treated at all, another third requires simple treatment in a single stage, while a final third needs more thorough treatment involving several stages." Emmanuel Bonvin, founder and director of Membratec, explains that a membrane may be used to disinfect and clarify water by means of a mechanical process, and that this single treatment stage, dubbed ultrafiltration, is particularly suited to the treatment of karstic water. The process has been installed, for example, in the Les Gonelles station at Vevey, on behalf of SIGE, the multi-municipality department for water management. As this involves treating the water from Lake Geneva, it is linked to ozonation and activated carbon adsorption stages, supplying 1,800 m^3 drinking water per hour, enough for around 150,000 to 180,000 people.

On behalf of the municipalities of Conthey, Ardon and Vétroz, Membratec has installed an ultrafiltration plant, with a capacity of 500 m3/h, for treating water from karstic springs.

Membratec has concluded a partnership agreement with Vinci Environnement in order to gain access to the French market, and as a result has installed a plant processing 1,500 m^3 per hour for the Rouen-Moulineaux conurbation.

Moves towards water softening

Since 2009, Membratec has also been working on the treatment of micropollutants in waste water. The initial pilot tests have been undertaken and the process is now ready to be developed and expanded to handle larger volumes. The possibilities offered by membrane technologies are numerous, and Membratec can also provide water softening by inverse osmosis. "By offering a denser membrane we are able to soften very hard water, in particular water from calcareous strata or from springs with a high sulphate content." Membrane treatment removes some of the mineral salts to leave water that is softer, making it more attractive to consumers and enabling it to comply with the standards controlling sulphate content. An initial plant for centralised water softening has been installed in Zermatt, a municipality whose development is limited by its water resources. "Our solution has enabled the municipality to turn to a water source with a high sulphate content in order to meet its needs."

Quality customer relations, the key to success

"The best marketing for our company comes from previous customers," says Emmanuel Bonvin. "When a municipality installs our solution, the neighbouring municipalities get in touch with us. This is why we are committed to nurturing customer relations." Every installation is made to measure, as it has to be integrated into an existing network. This means the installation has to be carefully managed, as do the upstream and downstream systems. Membratec therefore sells not only a product but also a service.

A remote management system for each plant in place provides supervision from the both the customer's offices and those of Membratec, enabling the company to monitor the machine throughout its service life. "We have a policy of preventive maintenance in order to ensure that the plant operates 24 hours a day, 365 days per year." Membratec thus provides a local, easily-accessible service. Emmanuel Bonvin sums up : "We are an SME providing a vital service for our customers on the Swiss and French markets."

Membratec SA

1997

12

Techno-pôle 3, 3960 Sierre, Switzerland

+41 27 456 86 30 | +41 27 456 86 34

info@membratec.ch | www.membratec.ch

Portrait

RWB Holding, project management for man and the environment

An engineering practice specialising in the field of drinking water and waste water, RWB Holding helps public bodies and private clients to implement their projects. The company has most notably worked on the SIGE (an association of Swiss municipalities for water management) drinking water station at Les Gonelles which supplies Vevey and Montreux.

"RWB started out as a traditional civil engineering practice, but successive directors wanted to move in a more environmental direction." Patrick Houlmann, Marketing Director of RWB Holding and Assistant Director for water, explains that in its seventy-five-year history, the RWB Holding civil engineering practice has gradually turned to environmental issues: water, town and country planning, and energy.

The planning specialists are working on the rehabilitation of the former industrial site where the ecodistrict will be located. The energy technology unit is actively investigating issues of district heating and local energy valorisation. At the same time, the water and civil engineering department is concerned with the conservation of the river which runs along the edge of the project."

Works monitoring

Within the field of water, RWB coordinated the rehabilitation of the Les Gonelles water treatment station on behalf of SIGE, the multi-municipality department for the management of the Vevey waters. This involved modernising the station to safeguard its production and increase its output. The station now supplies up to 1,800 m^3 per hour of drinking water, compared with the previous rate of 1,200 m^3/h.

In Vevey, RWB coordinated the rehabilitation of the Les Gonelles water treatment station.

With a workforce of eighty, half of whom are engineers, the company designs and follows through projects for public bodies and private clients from the formulation of objectives through to assessing the outcomes, including concept development, project planning and implementation and site management. It is represented by its slogan, "The interaction between man and the environment". RWB applies itself to implementing advanced technologies in all its projects with a view to ensuring sustainable development. It seeks not only to limit energy consumption but also to promote renewable energies. In order to provide optimum support, it has established multidisciplinary teams made up of specialists in each of the relevant fields. A given project may lead to various units from within the company being called on to work together. This is the case, for example, with one of the practice's major projects at Bassecourt in the canton of Jura – the project to develop the ecodistrict of "Les Jardins de la Tuilerie" (LJT) was initiated by the company, as explained by Patrick Houlmann: "Several teams are on call to contribute to the LJT project.

RWB's task was to integrate future developments for reducing micropollutants in the natural environment. The company has also been involved in major projects worldwide. "Our major projects include the design and implementation of the drinking water supply for the city of Riga in Latvia, which delivers up to 240,000 m^3 of drinking water to around 800,000 inhabitants." Patrick Houlmann adds: "We were working under the instructions of the State Secretariat for Economic Affairs, who released funds for former Soviet Union countries." RWB also operates in Africa where it manages the water supply in Dodoma and Tabora in Tanzania, representing a catchment of more than one million people.

RWB Holding SA

1936

80

Route de Fontenais 77, 2900 Porrentruy, Switzerland

+41 32 465 81 81 | +41 32 465 81 82

porrentruy@rwb.ch | www.rwb.ch

Water treatment by LaboSafe using UV and ozone

A spin-off from the family firm Hildenbrand, established in 1878, LaboSafe operates not only in the industrial safety sector, focussing on safety showers, but also in water treatment using technologies based on UV and ozone.

A young talent with more than 130 years' experience; a small company with the potential resources of a big one – statements that encapsulate LaboSafe. The Neuchâtel company was actually founded in 2010, but it is a spin-off from a family firm, Hildenbrand, that was established in 1878 and which specialises in sanitary hardware and fittings. It may have only five employees, but it benefits from the installation teams of its parent company. LaboSafe operates in two sectors: industrial safety and water treatment – waste water, drinking water and water for industrial use. In the first sector, it distributes safety showers, while in the second, it designs, distributes and installs water treatment systems that use ultraviolet and ozone. "We treat water without using any chemical products," explains Robert Rettby, Director of LaboSafe. "We do this in partnership with producers." In the field of ozone, LaboSafe is the exclusive distributor in Switzerland for the company Ozono Elettronica Internazionale, and with regard to UV, it represents the company Aquafides Groupe Katadyn Holding AG in western Switzerland. LaboSafe studies, supplies materials for and designs processes. "Customers do not want to buy a component and see by trial and error if it solves their problem. They have a need; we provide them with the solution using the products we represent. This enables us to guarantee the reliability and quality of our installations. We do not want to slash prices, but to offer a quality service."

Micropollutants in the sights

At a time when micropollutants are all the talk, LaboSafe is carrying out several pilot trials on the treatment of micropollutants using ozone, with the aim of eliminating 80% of the micropollutants present in water. "Together with our partner we have developed Microzon, a process for the elimination of micropollutants using ozone." Vincent Augstburger, head of Sales at LaboSafe, says the process works by passing water through a reactor where it is exposed to ozone. "In Cham, recent pilot trials have proved the effectiveness of the process, enabling substantial reductions to be achieved in the ozone dosage and contact times in comparison with previous trials." The principle is to modify the composition of the molecules to eliminate their toxicity. Other pilot trials have been carried out at Regensdorf and Lausanne. The aim of these trials is to identify the micropollutants and determine the dosages. "Without a pilot trial there is a risk of over- or under-dimensioning the installation," warns Vincent Augstburger. "This can have a considerable effect on its output and cost." The treatment of micropollutants has a significant potential for the company, as Robert Rettby explains: "The market is worth billions of francs. When the legislation from the Swiss Federal Office for the Environment on the treatment of micropollutants comes into effect, there will be around 200 WWTPs to equip in Switzerland alone..."

LaboSafe has undertaken a pilot trial in Cham to test the treatment of micropollutants using ozone.

LaboSafe SA

2010

5

Route de Soleure 10, 2072 Saint-Blaise, Switzerland

+41 32 756 96 96 | +41 32 756 96 90

info@labosafe.ch | www.labosafe.ch

Portrait

NGL Cleaning Technology – economic and ecological cleaning

NGL Cleaning Technology has been active for more than thirty years in industrial cleaning products based on aqueous solutions, and also handles treatment processes for waste discharges.

NGL Cleaning Technology produces more than1000 tonnes of concentrated detergent for cleaning, serving more than 300 customers. “Each cleaning case is specific; the formulae change depending on the geometry of the item, the substrate, the pollutants or the manufacturing processes. NGL always seeks to offer standard products, but if the specific characteristics of the items to be cleaned require it, the company will supply made-to-measure products.” There is a strong trend towards the replacement of cleaning operations using solvents with aqueous solutions, and substantial expertise is needed to satisfy this. Detergent-based products not only work in closer harmony with the environment and the user, but also offer more economical cleaning. NGL Cleaning Technology helps with cleaning operations at all levels – the development of personalised processes, the creation of precise chemical formulations, advice on the methods to be used and the treatment of waste products discharged.

Treatment of waste discharges

Who better than a manufacturer of chemical products to treat the waste discharges? NGL Cleaning Technology’s two departments, “Formulation” and “Treatment of Waste Discharges”, work hand in hand to simplify treatments as much as possible. This interaction enables the company to offer solutions that take account of the treatment of waste discharges from the moment the chemical formula is devised, and vice versa. With its mission to offer ecological and economic support, NGL develops membrane filtration-based recycling processes for refrigeration fluids, waste products from mechanical chemical polishing and detergent baths, and electrochemical processes for preparing rinsing waters.

Experts in Nyon

Depending on the complexity, providing a customer with a dedicated solution can take time. The experts at NGL Cleaning Technology are trained to research in detail all the aspects that will lead them to the optimum process. This investigation work enables tailor-made solutions to be developed in response to a specific need. The service offered by the company does not stop at the delivery of a cleaning solution ready for use – it also provides user training and after-sales service on the customer’s premises. Should the quality of cleaning suddenly change, the company’s Application Engineers will come out to analyse all the parameters.

The technical aspect is crucial to NGL, whether for the formulation of products, the testing of processes or the inspection of materials and manufacturing processes. In order to reinforce and formalise its added value, i.e. the support for customers’ processes, it has decided to transform all this into a single division with a strong identity: the Application Centre. This division brings together all the skills needed (water treatment, detergents, processes, measuring equipment, etc.) and offers its equipment to customers for carrying out tests.

A training need

NGL’s success is due, among other things, to the technical expertise offered by the Application Centre, as well as to the training given on the numerous products and processes. As a market leader, NGL pays special attention to the training of its partners (distributors, customers) and has decided to institutionalise its training activities by establishing its own school: the NGL Academy.

Automated cleaning installation provided to customers for testing purposes.

NGL Cleaning Technology SA

1979

30

7 chemin de la Vuarpillière, 1260 Nyon, Switzerland

+41 22 365 46 66 +41 22 361 81 03

ngl@ngl-cleaning-technology.com

www.ngl-cleaning-technology.com

Planet Horizons Technologies – the physical treatment of water

Based in Sierre, Planet Horizons Technologies has considerable expertise in the electromagnetic treatment of water. Its technology is used in agriculture (stock rearing and irrigation), dwellings and other buildings, water networks, hospitality and industry.

"Every material element has a natural radiation, or electromagnetic field, which can be calculated. On the other hand, there are also technical waves from wifi, aerials, etc. These two kinds of wave form a resonance which disrupts the composition of structures, especially that of water." It is in this context especially that Walter Thut, CEO and Chairman of Planet Horizons Technologies, and his team have developed an electromagnetic solution for water treatment. The basic principle is that the behaviour of materials in contact with water, especially minerals, can be influenced, with the objective of stabilising the electromagnetic structure of the water. "The multiplicity of this technical radiation makes the challenges ever greater and we are confronted with an ever-increasing range of situations." To illustrate this, Planet Horizons Technologies is currently proposing a solution particularly suited to arid regions.

The largest installation provided by Planet Horizons Technologies to date is in Tunisia. The Aqua-4D system treats a throughput of 520 m³ per hour over an area of 280 ha.

Until now, water used for irrigation would vanish too quickly into the ground water. Water treated using their method now penetrates better into the fine pores and the soil remains moist for longer. "We can help to ensure that plants are able to survive in these regions." This process is also suitable for the treatment of brackish water. It is used to make salt that is crystallised in the soil soluble so it can be removed little by little. This has allowed the company to bring land saturated with salt back into cultivation. The first projects have been initiated in India and Spain, and distribution partners have already been established in Tunisia, Palestine and Israel.

Maintaining water networks

Planet Horizons Technologies is also active on the Swiss and European markets, where its technology is used in water supplies to buildings, as Walter Thut explains: "We are not only able to prevent and eliminate scaling in pipework, but also, if the water is too acidic or too chlorinated, we can remove this aggressive quality to prevent the corrosion of pipes." The company has also developed another application: the treatment has the effect of breaking up biofilms – mucous layers in which potentially-dangerous bacteria such as legionella can develop – and creating an environment that prevents bacterial development. This taps into a new market that includes property management companies, hotels and spas, local authorities, industry and farms. These applications are all the more attractive for the fact that they use no chemical products. The potential savings for the customer, in some cases in the short term but always in the long term, are therefore excellent.

An interesting potential for development

The company intends to develop further its distribution network in India and Spain. "We are also involved in a US Aid project in Palestine and I think we will be working more and more with this organisation." For 2012 the company envisages growth of around twenty percent. Walter Thut has great confidence in his team which is made up of both "dynamic young people and experienced old foxes." His confidence is magnified by the direction in which the legislation is heading: "Firstly, we are more technologically advanced than our competitors, who are offering more expensive treatment processes or who use chemical products. Secondly, the legislation favours this technology."

Planet Horizons Technologies SA

2004

10

Techno-pôle 5, 3960 Sierre, Switzerland

+41 27 480 30 35 +41 27 480 30 36

info@planethorizons.com www.planethorizons.com

Portrait

Ultraviolet rays for disinfecting fluids and surfaces from AquaNetto

Located in Sierre, AquaNetto has developed selective, modular solutions for disinfecting water, air and surfaces by means of exposure to ultraviolet rays. The company's idea is to offer solutions based on an open architecture approach and to supply the appropriate technology for specific requirements. Their credo: ensuring that the solution can be maintained by anyone capable of assembling an item of flat-pack furniture.

"In today's society we should face up to the challenges posed by shortages and the unequal distribution of resources," says Guido Kohler, founder and Managing Director of AquaNetto. "It is therefore our duty to offer sustainable access to drinking water for all, satisfying the needs not only of households, but also of food, energy and industrial producers." Based at the Techno-Pôle in Sierre, AquaNetto has developed disinfection systems that combine treatment using ultra-violet (UV) with other, complementary methods including filtration, ozone, and ultrasound. Exposure of water, air or surfaces to UV rays with a wavelength of 240 nanometres results in the killing or deactivation of bacteria and viruses. AquaNetto sells a complete solution, as Guido Kohler explains: "In 80% of applications a pre-treatment is needed before UV treatment can be carried out.

With our solution we can use an adapted filter before the water enters the UV chamber." An adapter enables peripheral systems such as filters or water softeners to be connected without restriction, independently of the manufacturer. At the outlet is a sensor for verifying whether the treatment has been sufficient. If it has not, the water is reinjected into the circuit. The AquaNetto treatment system may either be operated as an autonomous installation or integrated into complete solutions offered by third parties, and is suitable for a wide variety of applications satisfying a range of market requirements. "We have obtained patents in Europe, Canada, the USA and Japan."

Water kiosks

The potential market for AquaNetto is a broad one. Guido Kohler says that even during the crisis, sales of UV water treatment systems continued to grow by 12% per annum. This market includes not only companies already operating in the field of water treatment, but also those in developing countries. In these countries, NGOs or individuals can buy "water kiosks", and the company is currently in the process of installing kiosks in several countries. They run on photovoltaic energy and generate benefits on the spot – all the more so as the AquaNetto's unique selling point is its commitment to simplicity of installation.

This means that maintenance can be carried out on site, creating jobs in these developing countries. "If you are capable of assembling an item of flat-pack furniture you will be able to install our system."

The disinfection systems developed by AquaNetto combine treatment using ultra-violet (UV) with other, complementary methods including filtration, ozone, and ultrasound.

AquaNetto AG

2011

10

Techno-Pole 4, 3960 Sierre, Switzerland

+41 27 787 20 20 | +41 27 787 20 21

info@aquanetto.ch | www.aquanetto.ch

Samro : handling potatoes from the ground to the table

Originally a producer of machines for harvesting potatoes, Samro now develops cleaning and disinfecting solutions for equipment, using electrochemically-activated water.

Samro harvesting machines have been a familiar sight on potato fields for 60 years. But as this area seemed to open up few real new opportunities, Samro decided to move along the value chain of the potato. While continuing to ensure the maintenance of its potato harvesters, it has turned to offering solutions for processing and storing fruit and vegetables, in particular potatoes, and for the cleaning of equipment. “We have developed an electrochemical process to activate water,” says Lorenz Wüthrich, COO of Samro. Specifically, brine is introduced into the machine, where it is activated using diamond electrode technology. The resultant activated water, called ActiWa by the company, has proved to be an excellent cleaning and disinfectant product, with no danger and produced at the request of the user. This activated water contains free radical oxidising agents capable of destroying inorganic and organic substances. The advantage of this solution is that it considerably reduces the quantity of chemical products used in the food industry for the cleaning and disinfecting of buildings, equipment and containers. ActiWa destroys microorganisms such as bacteria, viruses, spores, fungi and moulds, without side-effects on humans or animals.

Offering information to prove the effectiveness of this new solution

Lorenz Wüthrich explains that the situation in this market is made difficult by the presence of other solutions that are already proven. “We have to show that our technology is effective and that it is without risk to equipment, especially in terms of corrosion. We have already confirmed with breweries, where our solution is in use, that if the system is configured correctly there is no more corrosion than would be caused by other solutions.” He adds : “The quality criteria in today’s food industry are currently based on the use of chemical products. We have to inform our potential customers of the effects of our solution and show them that this new way of cleaning is just as efficient.” Despite these difficulties, the Samro system is already in use by brewers, dairies and cheesemakers in Germany, and by fishmongers, salad producers and apple juice manufacturers in Switzerland.

Expanding the market

Having developed modules aimed at large-scale industries (production of 150 or 1,000 litres of ActiWa per hour, per module), Samro has now decided to expand its market to include SMEs. “We have created a module that produces up to 30 litres of cleaning solution per hour. This is sufficient for small and medium-sized enterprises, and keeps their outlay to below CHF 20,000.” Samro has already sold the first prototype to a cheese dairy in Germany.

Samro AG

1952

50

Kirchbergstrasse 130, 3401 Burgdorf, Switzerland

+41 34 426 55 55 +41 34 426 55 59

info@samro.ch www.samro.ch

Interview

The Swiss Water Partnership, a showcase abroad of Swiss expertise

The Swiss Water Partnership (SWP) brings together the major Swiss players in the water sector. This non-partisan association, created in February 2012, currently has 54 members from the public and private sectors, the academic sector, NGOs and associations, all of whom operate internationally in water-related fields and share joint values of solidarity and integrity. The areas covered by the SWP include, among others, access to drinking water and sanitation, water for irrigation, and the integrated management of water resources and ecosystems.

An interview with Olga Darazs,
Chair of the SWP

How did the Swiss Water Partnership come about ?

Water is an indispensable resource for human and economic development. The SWP came about as a result of the observation that our country, while especially well-provided with water resources, "imports" more than 80% of the fresh water used to produce the goods and services consumed in Switzerland. It is therefore in Switzerland's interest, and a Swiss moral obligation, to support those countries that are less well-supplied with water resources and to contribute its expertise towards facing the global challenges in this field.

What are the aims and philosophy of the SWP ?

The specific objectives of the SWP are as follows :

- To enable its members to meet, to exchange information on their activities and international initiatives, and to share knowledge ;
- To ensure that Swiss expertise, solutions and research are widely known by means of improved coordination of the Swiss players at an international level ;
- To contribute to the shaping of water policies in agreement with the general objectives of the SWP, and to initiate an intersectoral dialogue between the players.

Have you backed any specific projects yet ?

The SWP is a very recent platform and specific activities are still in the course of being initiated: networking activities, group work to facilitate the development of intersectoral partnerships between members, the organisation of a members' fair with development banks, attendance by the SWP at the next global energy and water summits in Abu Dhabi (January 2013) and the World Water Week in Stockholm (August 2013), and the formulation of joint approaches to the major global issues.

What added value can the SWP offer to Swiss SMEs involved in water treatment ?

The SWP enables Swiss SMEs involved in water treatment at an international level to establish contacts, exchange knowledge and strategic information, and to develop partnerships with others. For example, a partnership between an SME and an NGO or a Federal office may enable pilot technology to be tested under real conditions. The SWP "umbrella" may also enable these SMEs to highlight their expertise and solutions at key international events in the water sector, multiplying their visibility and their impact.

Additional information :

www.swisswaterpartnership.ch

info@swisswaterpartnership.ch

Swiss Bluetec Bridge helps poor countries to benefit from Swiss technologies

The Swiss Agency for Development and Cooperation (SDC) is about to launch the Swiss Bluetec Bridge (SBB) initiative, with the aim of accelerating sustainable access to quality drinking water within the financial reach of poor populations, by offering them water-related technology and innovation.

A meeting with François Muenger,
Head of the Water Initiatives division of Global Cooperation at the SDC

How did the Swiss Bluetec Bridge project come about ?

One-third of people today live in regions afflicted by water shortages and unless there are drastic changes in the management of this resource, half of the world's population will be living in a country subject to water stress by 2025. For the sake of the development of humanity, the management of water resources must be drastically improved. Good governance is essential, but innovation and clean technologies have a role to play.

Switzerland has a lot of experience in the field of water and benefits from efficient water services. Our agriculture and industry have made substantial progress in the way they manage water and effluents. Several of our universities lead the field in this area, and a number of start-up businesses and SMEs are emerging. It was all these considerations and observations that led to the creation of Swiss Bluetec Bridge.

What are the aims and philosophy of the project ?

The challenge is to attract the most inventive social entrepreneurs to offer a water-related service to the poor, at a price in line with local tariffs. SBB will provide support for Swiss entrepreneurs, who will implement pilot projects on site following a competitive process. These entrepreneurs or start-ups will come forward with an existing financial support commitment. This instrument will be the bridge between public finance for research and private finance with a social aim. An initial competition will be launched in 2012.

What will make SBB attractive to Swiss SMEs operating in the field of water ?

We are hoping that Swiss start-ups and SMEs will take action to contribute their inventiveness to meeting the challenges of access to water for the poor. These approaches are not solely technological – they call for the design and development of the complete operation, maintenance and replacement systems. This requires an in-depth knowledge of the reality of the regions in question, and must without doubt include a substantial amount of local expertise.

What are the next foreseeable stages and developments for SBB ?

The secretariat for the initiative and the selection system are now operational. Swiss Bluetec Bridge should see the first fruits of its efforts during the course of 2013.

Additional information :

www.sdc.admin.ch

CleantechAlps, your preferred partner for all issues related to clean technologies.

CleantechAlps, serving businesses and institutions

CleantechAlps, the platform dedicated specifically to clean technologies in western Switzerland, was launched at the initiative of the seven cantons of western Switzerland. It is supported by the State Secretariat for Economic Affairs (SECO).

The missions of CleantechAlps are as follows:

- To ensure the reputation of and to promote western Switzerland as a European hub for clean technologies related issues.
- To enable the introduction of cleantech players on international markets.
- To develop synergies between regional and national cleantech stakeholders.

CleantechAlps is the intercantonal driving force behind the development of cleantech and is the enabler at the interface of the economic, academic, financial and political worlds. In this context, CleantechAlps is definitively the main point of contact for coordination in western Switzerland of national initiatives such as the « Cleantech Switzerland » and Cleantech Master Plan».

Join CleantechAlps

Businesses and institutions of western Switzerland who wish to join CleantechAlps and benefit from good visibility may do so simply by e-mailing info@cleantech-alps.com (free subscription).

info@cleantech-alps.com

www.cleantech-alps.com

cleantech switzerland
Innovative. Reliable. Precise.

CleantechAlps' partner for export
www.cleantech-switzerland.com
info@cleantech-switzerland.com

Swiss Water Partnership
committed to global water

CleantechAlps is member of the SWP
www.swisswaterpartnership.ch
info@swisswaterpartnership.ch

Impressum

Text
CleantechAlps
Hélène Lelièvre (portraits)

Translation
Conchita-Plus, Sierre

Photography
Entreprises
CleantechAlps
Olivier Maire (p. 5)

Graphic Design & infographics
CleantechAlps

Publication

Find us on social network



Cleantech ALPS | Western Switzerland Cleantech Cluster

CleantechAlps
Western Switzerland Cleantech Cluster
c/o CimArk, Rte du Rawyl 47, CH - 1950 Sion,
+41 27 606 88 60
+41 27 606 88 69
info@cleantech-alps.com
www.cleantech-alps.com