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'État à l'économie (SECO)

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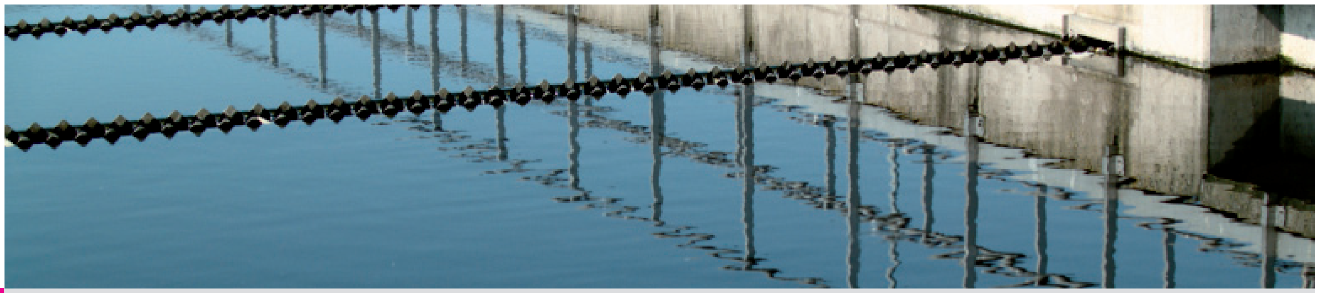

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« Western Switzerland should become a centre of excellence for water treatment. »

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,

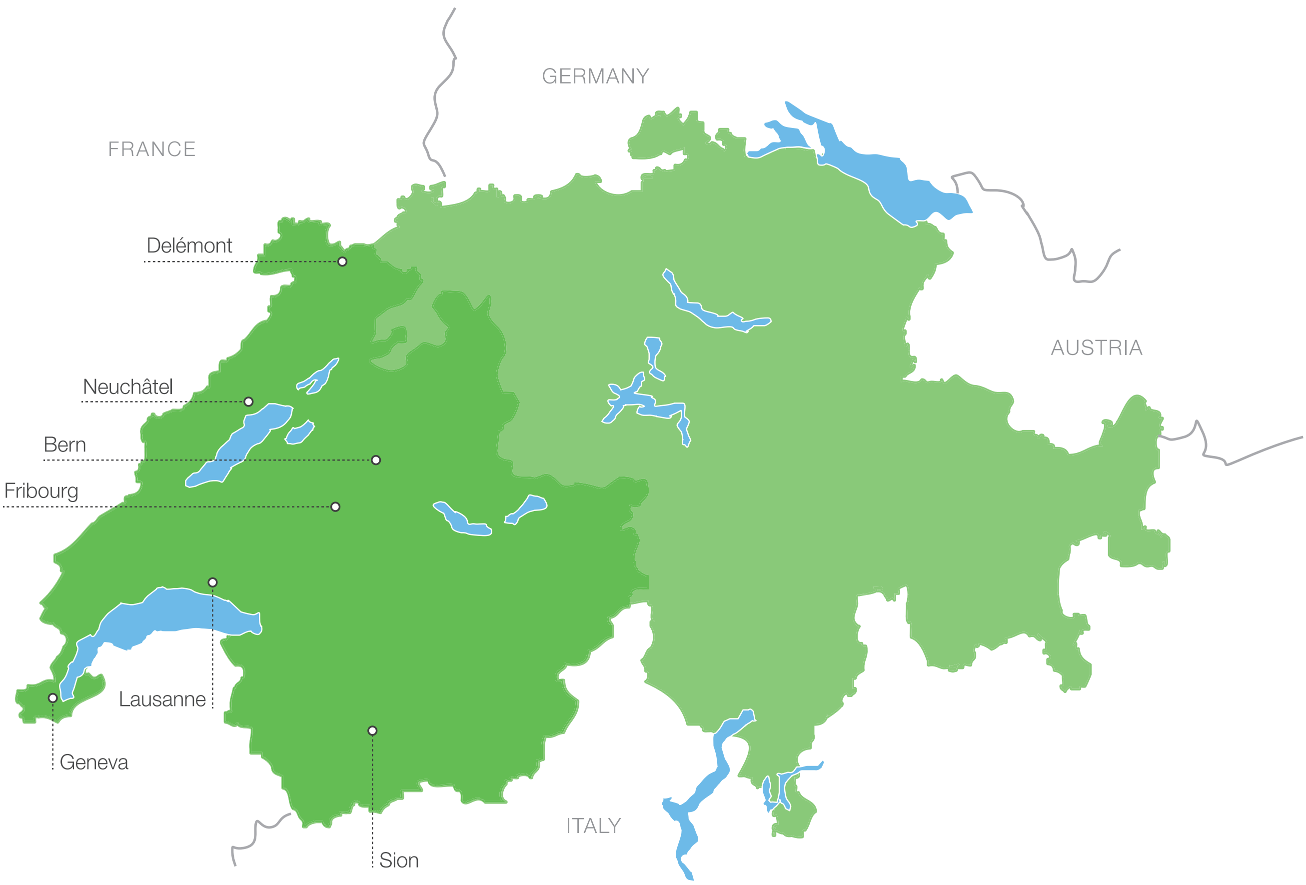
4,5 % of the total workforce

CHF 18 to 20 billion per annum gross added value

3,5% of the GDP

« 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.


© Lars Osterwalder, Eawag

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) b) Chlorination with chlorine dioxide c) Ultraviolet (UV) radiation d) Ozonation	Elimination of bacteria, partial inactivation of viruses and parasites Elimination of bacteria, partial inactivation of viruses and parasites Good inactivation of bacteria, viruses and parasites 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 b) Sand bed filtration c) Activated carbon bed 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 Reduction of the concentration of suspended solids 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

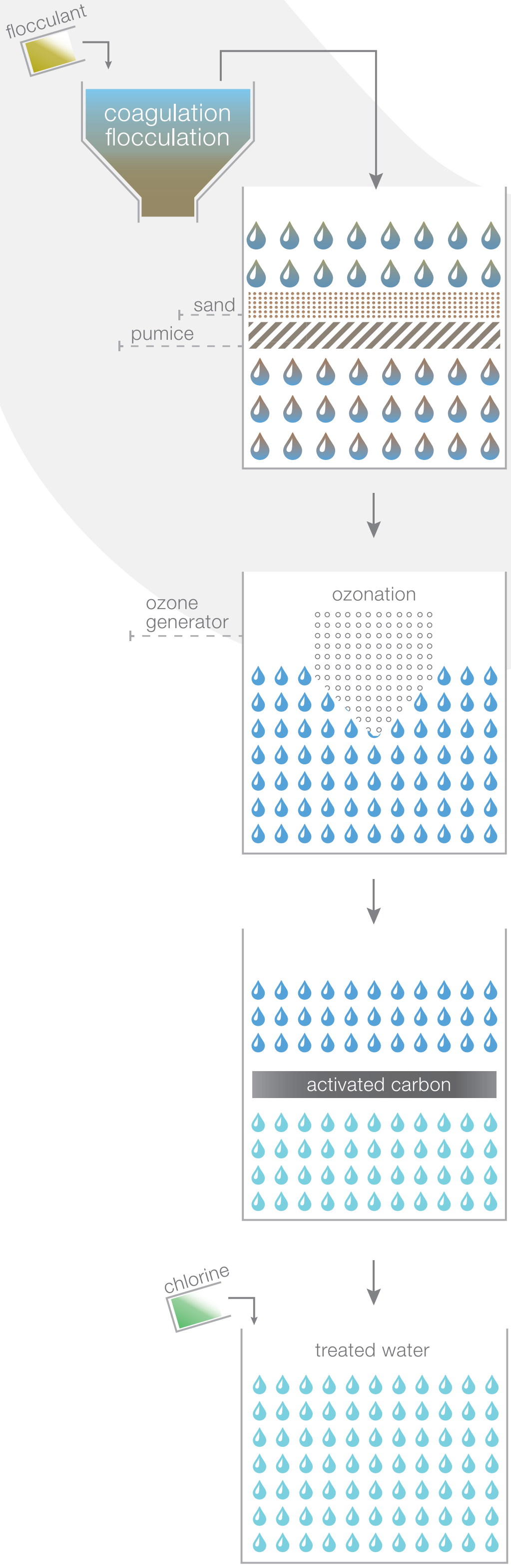
In 1973 a process – which is known today as the “conventional process” – emerged in western Switzerland following pilot tests undertaken by Sulzer in collaboration with various authorities at Federal and cantonal level. This process comprises five treatment stages (see diagram below):

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?

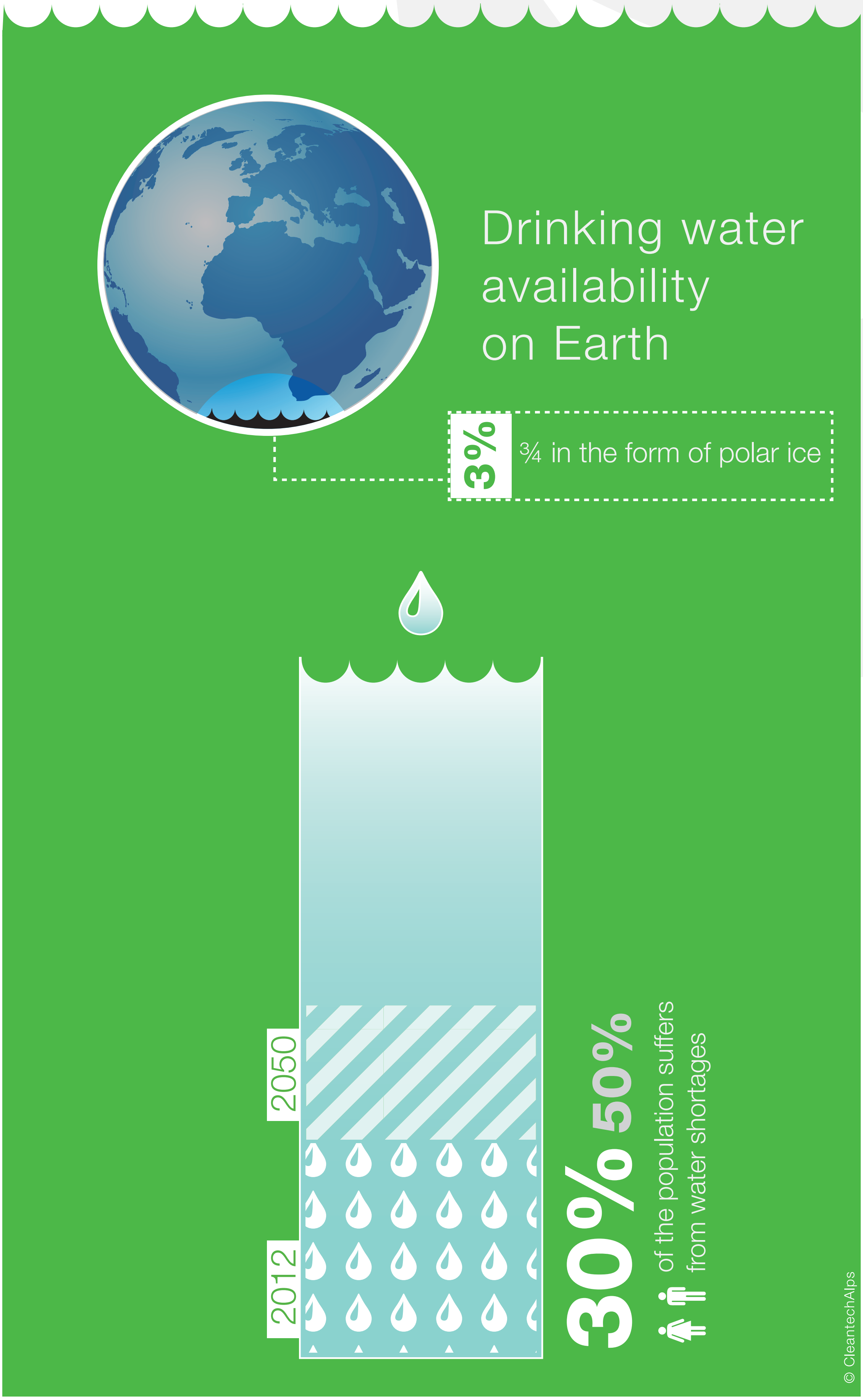
This is without doubt an attractive technological and commercial development opportunity for the enterprises of the region. Western Switzerland has a substantial ecosystem of technology enterprises in the area of water treatment, enterprises that are ready to face up to these challenges. The aim of this 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
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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.

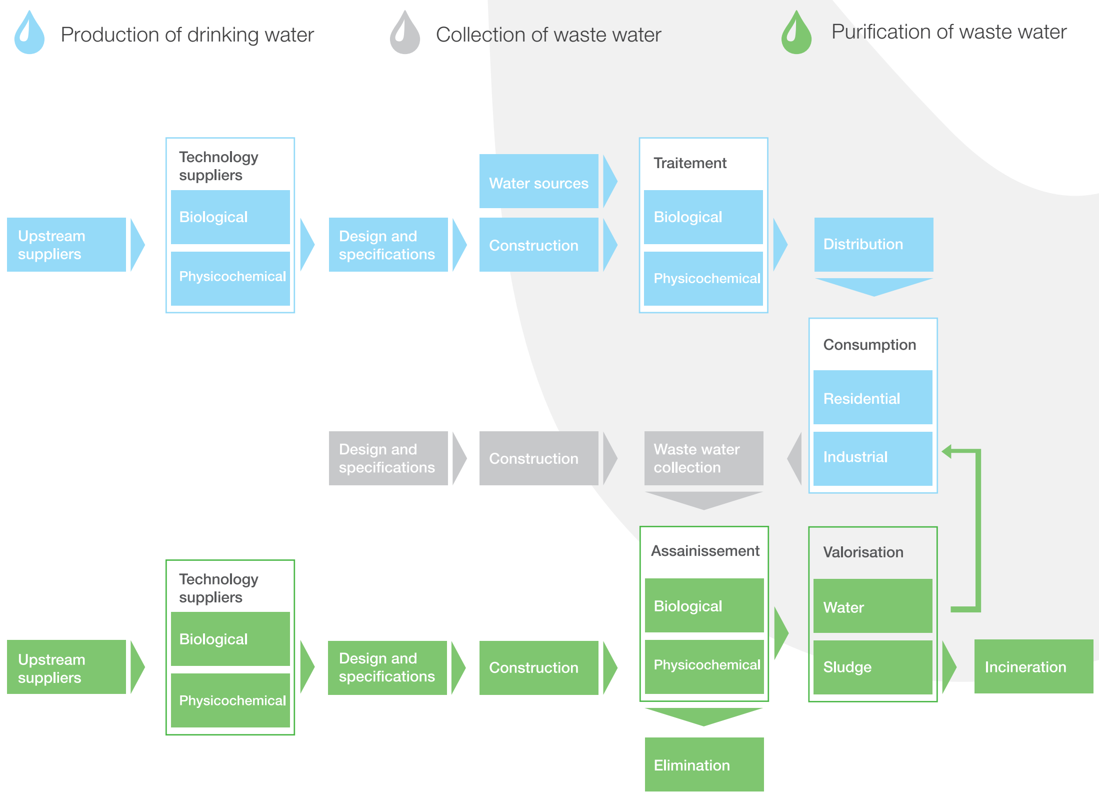


Figure 1 : The value chains of centralised water treatment (source: E4Tech)

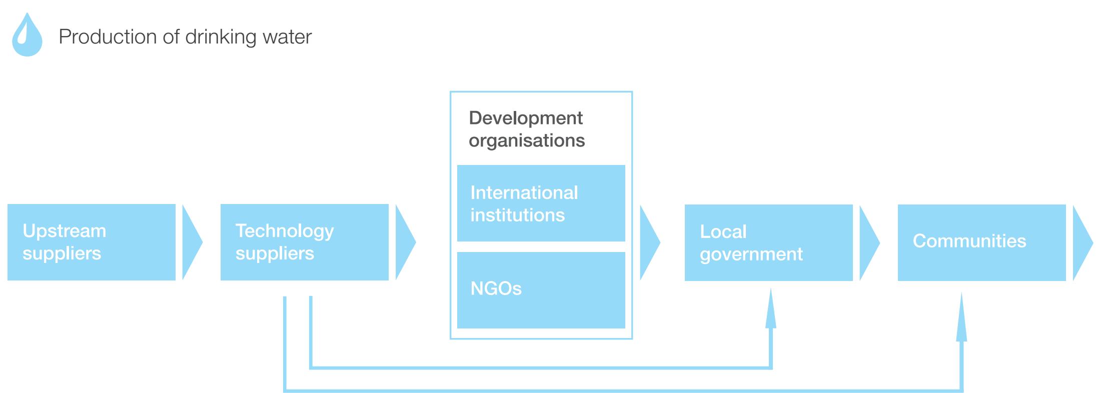


Figure 2 : The value chains of decentralised water treatment (source: E4Tech)

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.

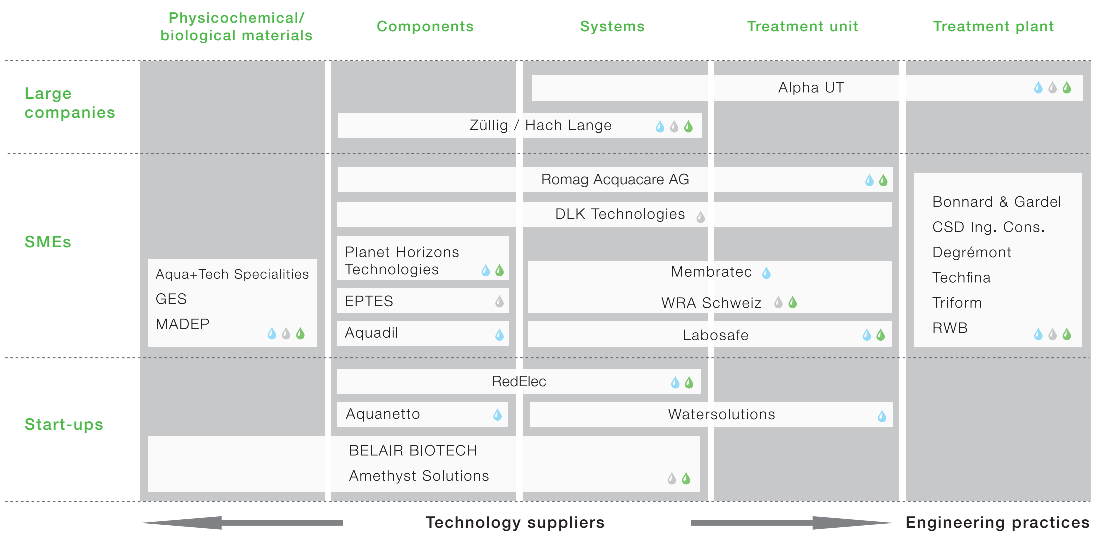


Figure 3.1 : Distribution of the technological players along the value chain for the centralised treatment of water (source: E4Tech/CleantechAlps)

- 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 ecodesign.

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.

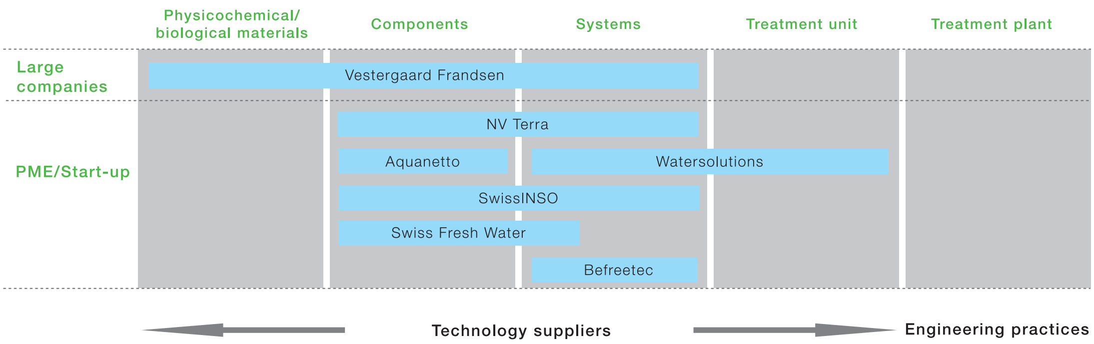


Figure 3.2 : Distribution of the technological players along the value chain for the decentralised treatment of water (source: E4Tech/CleantechAlps)

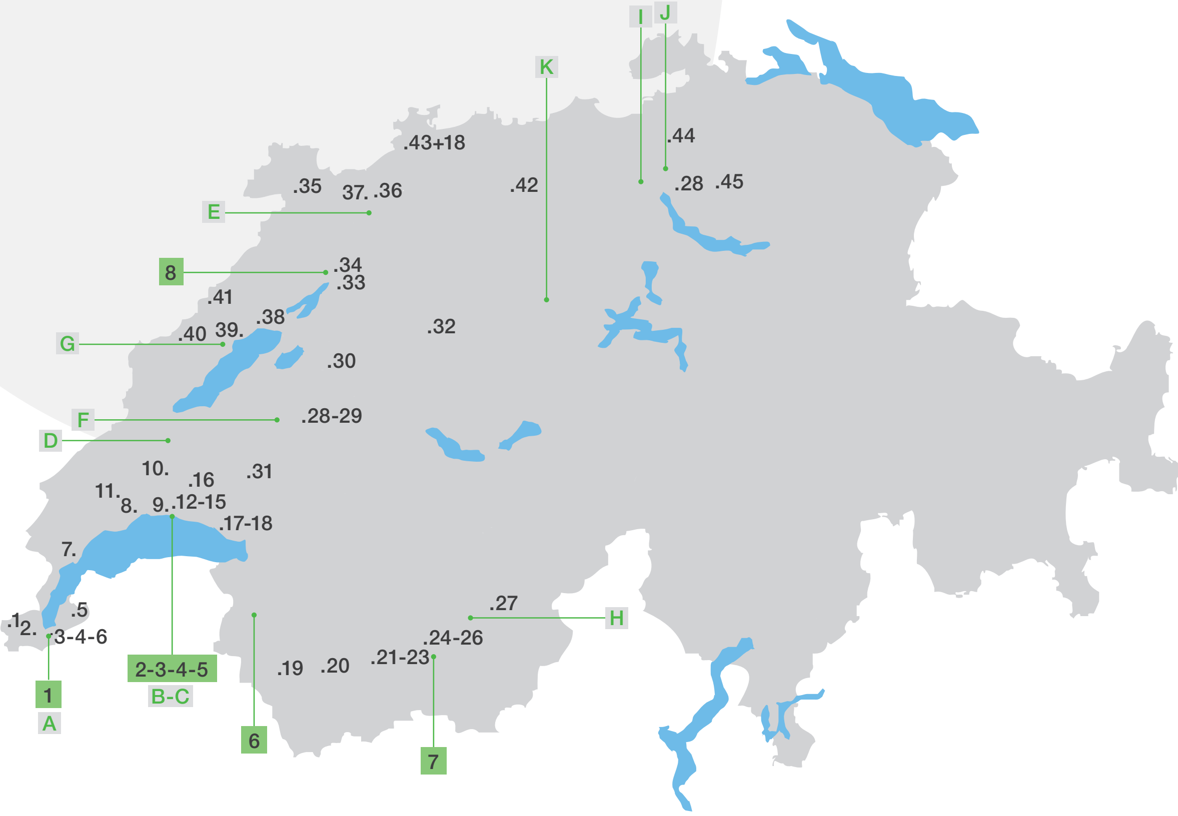
5. Conclusion

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 Sàrl, 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, 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

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

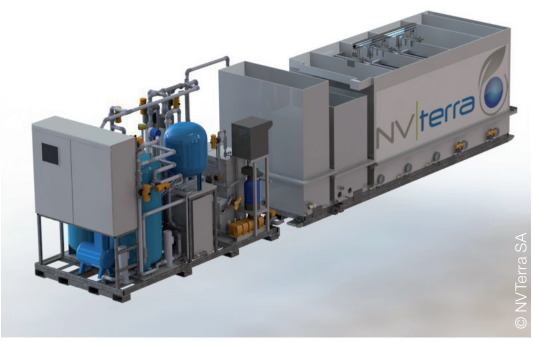
An offshoot of the company Bühler Electricité Monthey (BEM), the start-up NVTerra has developed units for purifying surface water to provide drinking water, based on salt, iron and electricity.

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)

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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).

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Western Switzerland Cleantech Cluster

Your entry point to cleantech in Western Switzerland

CleantechAlps, the link between the academic, industrial, political and financial fields within the world of clean technologies

We are in direct daily contact with :

- Companies, in particular emerging startups
- Research organisations
- Technology parks
- Western Switzerland's players and decision-makers in the cleantech sector

Are you looking for a contact in Switzerland's cleantech sector?

THEN CONTACT US – IT'S OUR BUSINESS!

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