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PROFILE

International Independent Operator **Swiss Water Power International SA** designs and builds "turnkey" installations for the production of drinking water and solar energy internationally.

Swiss Water Power International SA is able to manage, under **BOOT** or **DBFOMT** contracts, the different steps related to the implementation of such projects: preliminary design, research and implementation of financing, detailed design, studies and detailed plans, construction and operation of facilities.

When designing these projects, **Swiss Water Power International SA** takes into account their social and environmental impact, in addition to promoting regional and sustainable economic development.

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VALUES & STRATEGIES

Our commitments

Swiss Water Power International SA undertakes to carry out these projects to the full satisfaction of its customers by prioritizing the most appropriate technologies, ensuring the quality of the equipment provided and the works realized, respecting deadlines as well as the contractual guarantees of the installations' operation and performance.

Social Responsibility

Swiss Water Power International SA favors the use of local labor and subcontracting to domestic companies for both construction and operation of facilities. Swiss Water Power International SA also undertakes to train the personnel recruited to operate the facilities so that they have all the required skills.

Compliance with national legislation

Swiss Water Power International SA is committed to respecting all the legislation in force in the countries where it operates, and in particular social, safety and environmental regulations.

Occupational safety and health protection

Swiss Water Power International SA pays particular attention to the safety and health of locally recruited workers. Whether during the construction or operation phase of installations, a representative of the company constantly ensures compliance with the rules and standards for safety and health protection of workers both for its own employees and for the subcontractors' employees.

Environmental Protection

Swiss Water Power International SA plans the implementation of infrastructures with the greatest respect for the environment. When needed, the company carries out landscaping of the sites on which it creates the plants. Swiss Water Power International SA also places particular emphasis on the good management of its construction waste and ensures its trace-ability. An environmental impact study is carried out for each project.

Strategy

Swiss Water Power International SA favors projects in public-private partnership such as BOOT or DBFOMT, which make it possible, among other things, to reduce the time required to carry out projects and thus to respond more quickly to the populations' expectations regarding the supply of drinking water and electricity. The company uses proprietary technologies to significantly reduce plant turnaround times, in order to respond rapidly to the expectations of local populations.

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DRINKING WATER IN THE WORLD

Currently about 2.1 billion people

30% of the global population, have no access to piped drinking water

Access to water and sanitation is **a recognized human right** and has been for long one of the key international development policies and goals (UNCESCR 2003, UNGA, 2010). By 2050, it is estimated that global demand for water will increase by 55%, mainly due to the increasing urbanization of developing countries (OECD, 2012a).

Currently **about 2.1 billion people, 30% of the global population, have no access to piped drinking water**. Every 90 seconds, a child dies due to lack of access to water. Every day, a total of 10,000 people die due to the lack of potable water or from diseases contracted through the use of unsuitable water.

4.5 billion People, or 60% of the global population, do not have safely managed sanitation services, according to a new joint report by the World Health Organization (WHO) and UNICEF.

« These services are essential to human health and it is the responsibility of all countries to ensure that everyone can access them »

said Tedros Adhanom Ghebreyesus, Director General of the World Health Organization.

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ELECTRICITY IN THE WORLD

Currently about 1.2 billion people
have no access to an electricity supply

Currently about 1.2 billion people have no access to an electricity supply. In sub-Saharan Africa, 630 million people (65% of the population) have no electricity and 800 million do not have their own cooking facilities.

Progress on the African continent has remained minimal so far. Africa is therefore at the heart of Goal 7 of Agenda 2030, the World Bank notes.

According to the International Energy Agency (IEA), hundreds of millions of people without electricity today will have access to in by **2030**.

But although nearly all the inhabitants of South Asia will benefit from this, **some 600 million Africans will not have this opportunity because of the rapid population growth**.

« Sustainable energy is the thread that connects economic growth, social equity and our efforts in the fight against climate change. »

Ban Ki-moon, Secretary General of the UN, January 18, 2016.

Sources : World Health Organization, United Nations World Program, Unicef, Swiss Agency for Development and Cooperation, Swiss Agency for Development and Cooperation (SDC).

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WHAT WE DO - **DRINKING WATER** 1/2

The company's **AQUABLOC®** range are containerized compact units, of the **"1956" type**, composed of containerized modules manufactured according to **ISO Intermodal** standards and factory pre-equipped to meet the growing drinking water needs of populations of **100,000 to over 1M people.**

The design of the units, that perform a **"1829"** conventional treatment (lamella clarification, coagulation, flocculation and pressure filtration) provides drinking water production **from 200 to 2,000 m3/hour** starting from surface water.

The operation of the installations is fully automated, from the point where the raw water is pumped to the distribution network. The production units and the pipes are made of **stainless steel** allowing the modules to last over 40 years.

Containerized compact units have several advantages: speed of manufacture (3 to 4 months), ease of transportation of the modules by sea and land, reduction of civil works (limited to the construction of a concrete platform) and assembly (1 to 2 months) on site.

Units are factory produced in **less than 12 months** compared to the time necessary for completing a traditional type of plant ranging **from 18 to 36 months.**

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WHAT WE DO - **DRINKING WATER** 2/2

The company has also developed a range of containerized compact units called **UCC AQUABLOC SOLAR® UF** for the production of drinking water by ultrafiltration, powered from photovoltaic energy and therefore with no CO^2 emissions.

The range of 5 to 100 m3 / hour allows drinking water to be supplied to villages that have no access to electricity, as well as to people in outer urban areas not connected to the drinking water distribution network.

The range is completed by the **UCC AQUABLOC® UF** (Ultra Filtration), **UCC AQUABLOC® BWRO & UCC AQUABLOC® SWRO** (Reverse osmosis) compact units for the desalination of brackish water and seawater.

1829 The effectiveness of this treatment process (decantation and filtration) has been amply demonstrated since the first filtration system made in 1829 under the direction of **James Simpson** and intended to supply the city of London.

1956 More than just a way to package goods, the container is a real system that **Malcolm McLean** invented in 1956. A system that took just a dozen years to become a worldwide standard.

Two factors were key in this success: first of all the international standardization of containers, which Malcolm Mc Lean understood to be the determining factor of their worldwide success, and for which he campaigned ardently. In **1961, he succeeded in setting the ISO standard for 20, 30 and 40 feet sizes** of containers.

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WHAT WE DO - **FOSSIL ENERGY**

Following the same concept of the **"Malcolm McLean" container** the company has developed energy production and transformation units with a capacity between **250 and 3,000 kVA**, under the names **POWERBLOC®** and **TRANSBLOC®**.

These units complete the process of producing and supplying drinking water by allowing on the one hand, the powering of **AQUABLOC®** units on sites that do not have an electricity connection and, on the other hand, by ensuring the availability of emergency power in the event of a power outage for sites that do have a connection to the electricity grid.

The **TRANSBLOC®** units incorporate electrical transformers and related equipment protection and security. These units are air-conditioned.

The **POWERBLOC®** units incorporate emergency power generators or UPSs. Fully soundproofed and climatised, they are equipped with a complementary, double walled fuel tank, of sufficient capacity to guarantee an optimum autonomy of the unit.

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WHAT WE DO - **SOLAR ENERGY**

Improving people's access to electricity is a priority in Sub-Saharan Africa. Swiss Water Power International SA has expertise in this field, combined with our international experience on building sites.

Swiss Water Power International SA is involved from conception to realization in the production of "turnkey" **CSPV** photovoltaic power plants with a capacity of **10 to 50 MW**.

Solar power stations are built within 6 to 18 months. They represent a significant time saving compared to hydroelectric and fossil fuel development projects that require a construction period of 2 to 5 years.

The company also develops solar power plants with floating panels and solar power plants with containerized panels.

The advantages of **CSFPV** floating solar plants lie mainly in the fact that they do not encroach on populated and agricultural areas. They also allow for better performance because the installation benefits from the cool air on the surface of the water improving the cooling of the electrical equipment and increasing the performance of the installation.

The **CSCPV** containerized solar plant can quickly meet the electrification needs of rural and village areas, humanitarian interventions, natural disasters, as well as relay stations for mobile telephony.

As part of its research and development policy, the company is currently studying a continuous maintenance system featuring water-free cleaning robots fed by solar energy independently of the energy produced by the power plant.

The objective is to improve the safety of the population, to optimize traffic, and consequently to optimize the management of electrical energy by reducing pollution and CO2 emissions and to **substantially reduce maintenance costs.**

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WHAT WE DO - **LAGOONING**

In the context of **environmental protection**, the company promotes eco-friendly sanitation by lagooning for the purification of domestic wastewater using microphytes or macrophytes. This technique is essentially based on the creation and planting of linked retention ponds, enhanced by "sanitation reeds" with a strong root system to ensure excellent oxygenation.

The advantage of this environmentally friendly, low-cost technique, due to the absence of electrical consumption and wear of electromechanical equipment and by definition of maintenance, is that it is integrated harmoniously into the landscape.

Lagooning, compared to other conventional systems, gives value to domestic wastewater through the annual gathering of the plant biomass for composting and fertilization of agricultural land, by creating a shelter for aquatic flora and fauna that is attracted to the lagoons by the abundance of food in the form of animal and vegetable plankton, and by the living environment that it represents throughout the seasons.

The waterproofing of the pools is ensured by the installation of **EPDM geo-membrane**, which has excellent resistance to UV and ozone aging, puncturing and roots.

This **ecological membrane** is chemically inert and has a reduced impact on the environment.

The company manages all stages from conception to completion in a "turnkey" mode.

Engineering works are subcontracted to local companies under the supervision of an expert from Swiss Water Power International SA.

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WHAT WE DO - **WASTE**

As part of the protection of the environment and the improvement of the living environment of the population, Swiss Water Power International SA implements the concept of selective sorting, recycling and recovery of waste.

It assists local authorities in setting up policies for the management of **household, industrial, hospital, medical, agricultural, construction and meat processing waste**.

The company manages the various stages of the design process up to the "turnkey" realization of intelligent solutions adapted to the country.

The management is carried out through a consortium of specific partners, of which it acts as the coordinator, in close collaboration with local companies with the required experience.

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WHAT WE DO - **INFRA & NETWORKS**

The level of drinking water losses
in distribution networks in sub-Saharan Africa is often close to 50%

These losses, which are often accompanied by a low rate of collection of charges, do not allow most of the drinking water production and distribution authorities to maintain existing networks and to build new infrastructure to meet the needs of the population.

Swiss Water Power International SA, in line with its development strategy, supports its Clients in defining and planning leak detection, repair and extension programs for storage networks and reservoirs.

To meet this demand, **Swiss Water Power International SA** brings together, within a consortium for which it provides leadership, technical partners with the required expertise.

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WHAT WE DO - **BUILDING WORKS**

For each of its projects, Swiss Water Power International SA carries out detailed studies on the execution of the earthworks and civil works required for the construction of the structures and infrastructures including access roads and external works.

The company also carries out **the construction necessary for the operation of the water and energy production facilities.**

Where appropriate, it utilizes prefabricated buildings for production units, operating offices, storage of water treatment chemicals, control rooms, maintenance and storage workshops for spare parts, as well as the dwellings of the operating personnel.

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WHAT WE DO - **REHABILITATION**

Swiss Water Power International Ltd is involved in the diagnosis and rehabilitation of existing water treatment facilities.

UCC AQUABLOC® containerized compact units can be installed temporarily to compensate for the stoppage in water production during the period of rehabilitation of existing facilities.

They can then be moved to another site or reinforced existing facilities.

Swiss Water Power International SA is also involved in the diagnosis and rehabilitation of hydroelectric power plants.

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INNOVATIONS - **THE FACTS**

The experience and the presence of our engineers in Africa for more than 10 years show the following observations.

About the payment systems revolution

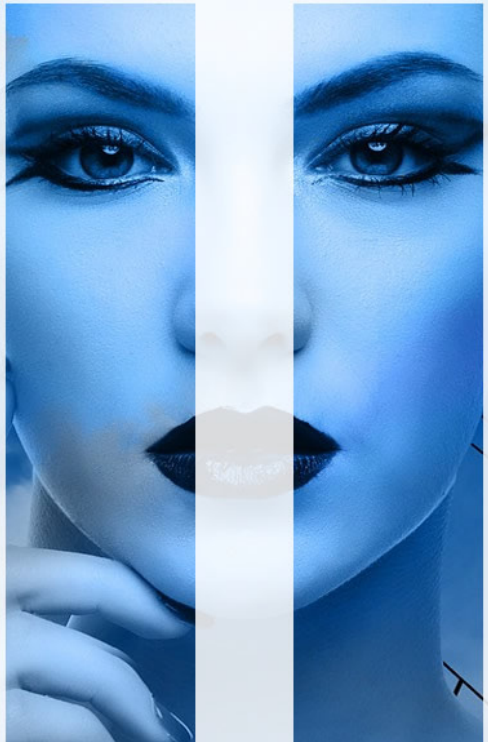
2G telephony (available in all African countries), already allows financial transactions via the Mobile Money system.
The constant evolution of the 3G / 4G coverage in the developing territories makes it possible to consider other forms of payment requiring code or image receipts, a completely innovative technology.

By 2019, the mobile payment services of more than 80 mobile operators operating in Africa are expected to reach more than 250 million users.
The stakes and opportunities of the Mobile Money revolution are not a fad. Today in Africa, it's becoming the preferred system. The Mobile Money ecosystem is unlimited.

About drinking water distribution

More than 2 billion people do not have access to safe drinking water in their homes, nor safe sanitation.

The six countries with the largest freshwater reserves in Africa are located in Central and West Africa, holding 54% of the continent's total resources.



However, **only 65% of Africans have access to an improved drinking water system** (running water, public fountain) and only a very small proportion of these populations have access to running water.

Financial management of water and energy consumption

The traditional ways of water and electricity sales do not make it possible to fight against the fraud, the theft and the diversion, causing the water and energy distribution managers significant complications and important losses due to these exploitations.

There are some "smart" meter experiments, but they are not convincing, because of these 3 factors:

The purchase of "credits" for the prepayment of consumption is mainly done by prepaid card, but the networks of point-of-sale are not always located close enough to the users and haven't flexible nor stable schedules.

There exists no critical supervision to quickly manage the various problems that may occur.

No customer service to resolve an incident that would affect the water supply or electricity of an user who has already paid for its consumption.

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INNOVATIONS - **OUR SOLUTIONS**

ecashwater

eCashWater® is a free mobile application, developed by the group's digital department, which communicates in real time with the services of telephone operators offering payment solutions in Mobile Money. Swiss Water Power International SA has designed an **eWater®** unit with a flow rate of 5 or 10 m3/h, which, due to an integrated server, can distribute pre-paid drinking water **in self-service 20/24h - 7/7d**. The **eWater®** unit meets the needs of a population of 10,000 people (20 l/day/hbt).

The user of the **eCashWater®** application receives, after payment, a QR-Code or an encrypted code by SMS, which allows him to use the quantity of drinking water purchased. This system also allows a third party to remotely pay for water and transmit the codes received to the person of their choice close to the **eWater®** unit. Finally, it makes it possible to supply drinking water to faulty areas and to secure the operator's payments, whether public or private.

ecashmeter

In the same vein, the **eCashMeter®** application allows you to pre-pay for water and electricity consumption at any time with the help of smart meters, equipped with a built-in box for reading a QR-Code or enter an encrypted code. **This system operates 24/24h - 7/7d** and has a permanent hotline.

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CASE **STUDIES**

Swiss Water Power International Ltd. claims its leading position in **AQUABLOC®** Containerized Compact Units, with **capacities of 200 to 2,000 m3/h**, to meet the population needs of up to 1 million inhabitants.

The **AQUABLOC®** facilities of Swiss Water Power International SA, currently supply:

In Mali, *the city of BAMAKO, 39,600 m3 / day of drinking water production (Eq 776,400 inhabitants)*

In Algeria, *the city of Algiers, by reinforcing 62,400 m3 / day of drinking water production (Eq. 1,223,500 inhabitants)*

In Iraq, *the cities of BAGDAD, AL AMARY, AL MUSSAIB, AL TARYA, ANBAR, BABYLON, BASRAH, DOHUK, DYALA, KARBALA, MAYSAN, MOSUL, MUTHANA, QADISSYAH, SALAH ALDEEN, SUHEILIYA, TA'MEEM, THEQAR, WASSIT, totaling 1,022,400 m3 / day of drinking water production (Eq 20,047,000 inhabitants)*

In Congo, *the cities of EWO and BRAZZAVILLE totaling 29,000 m3 / day of drinking water production (Eq 580,000 inhabitants), and soon 29,000 m3 / day for the town of POINTE NOIRE*

These facilities currently produce **around 1,170,000 m3** per day, meeting the need of **drinking water supplies for more than 23.2 million inhabitants** (based on average consumption rates).

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PPP FINANCING

As part of the implementation of a **BOOT** (Build, Own, Operate, Transfer) or **DBFOMT** (Design, Build, Finance, Operate, Maintain, Transfer) type of public private partnership, Swiss Water Power International SA is in a position to raise all the financing needed for the project.

This financing is carried out through an **SPV** (Special Purpose Vehicle) Entity structure dedicated to the project.

Such structures may relate to the realization of:

> compact installations for the production of drinking water of type UCC® AQUABLOC with capacity from 200 to 2,000 m3/h

> photovoltaic solar power plants with capacity from 10 to 50 MW.

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The company is a member of: :

Social Stock Exchange (London)
BIC Bureau International des Containers « SWSU»
Chamber of Commerce and Industry of Geneva
African Water Association
Global Water Partnership
Société des Eaux de la Suisse Romande