# S.A.W.E.R

WATER ANYWHERE

# Solar Air Water Earth Resource

# STORY

**Learn the story of the S.A.W.E.R. device from the beginning of the idea to its design, it will soon start to transform dry and hot desert into green landscape using water from the air and solar energy: The technology developed by the University Centre for Energy Efficient Buildings (UCEEB) of the CTU in Prague will become the centrepiece of the Czech national pavilion at the EXPO 2020 world fair in Dubai. In there, it will irrigate an oasis with plants that would otherwise not survive in the harsh desert environment.**

The idea to build the S.A.W.E.R. system emerged in the end of the EXPO 2015 world fair in the head of the Commissioner of the National Participation Jiří F. Potužník, for whom the idea of interconnecting the innovations presented in Milan and show them to the world next time as one functional system. When the Ministry of Foreign Affairs started the selection procedure for the concept of national participation at EXPO 2020 in Dubai, he wrote a proposal for creating a system that would obtain water from air and then cultivate the desert.

## 2017

**1/ The S.A.W.E.R. project was introduced to the public for the first time**
The first idea of the form and operational principle of the S.A.W.E.R. system got specific shape very fast after initial discussions. Thanks to this, we could already in the autumn publicly present the specific plan in the presence of the representatives of the Ministry of Foreign Affairs of the Czech Republic at the International Engineering Fair in Brno.

## 2018

**2/ First prototype was constructed according to our design**
The first prototype of the S.A.W.E.R. system was constructed based on the requirements from consultations. We tested it in our laboratories in Buštěhrad in a custom built climate chamber simulating desert conditions. The design of the system for the Czech national pavilion at EXPO 2020 was created at the same time, and presentations at trade fairs, other events for professionals and seminars were made for the partners and media.

## 2019

**3/ S.A.W.E.R. system was among the main topic of the introduction of the Innovation Strategy of the Czech Republic 2019-2030**
A conference organised by the Office of the Government and the Research, Development and Innovation Council was held in the Liechtenstein Palace. The innovation strategy of the Czech Republic up to the year 2030 named "The Czech Republic: The Country for the Future". The introduction of several chosen projects that seem to be especially promising for the future followed. In the category "Czech Republic as a leader in energy saving technologies," the organizers have chosen the S.A.W.E.R. system, which was presented at the conference by Tomáš Matuška.

**4/ We joined the mission of the Confederation of Industry of the Czech Republic to the United Arab Emirates**
The director of the University Centre for Energy Efficient Buildings Lukáš Ferkl has, acting on behalf of the rector of CTU in Prague Vojtěch Petráček, participated in the mission of the Confederation of Industry of the Czech Republic to the United Arab Emirates. This was part of the foreign visit of the President of the Chamber of Deputies of the Parliament of the Czech Republic, Radek Vondráček. In addition to the visit to the chambers of commerce in Abu Dhabi and Dubai, Zayed University or discussion with Czech Entrepreneurs in United Arab Emirates, the programme also included a meeting at the construction site for EXPO 2020 in Dubai and discussion of technical details regarding the S.A.W.E.R. system.

**5/ The S.A.W.E.R. system started preparation for the transport to Dubai in Kutná Hora**
Employees of the University Centre for Energy Efficient Buildings of the CTU in Prague transported the S.A.W.E.R. system from its base in Buštěhrad to Kutná Hora. In here, in the facilities of the specialised company PAVELKA – kontejnery s.r.o. the whole device with all accessories was built into transport containers, in which it was to be transported to the United Arab Emirates for testing the obtaining of water from air in real desert conditions.

**6/ We started the miniaturisation of the S.A.W.E.R. system**
Works on reducing the size of the S.A.W.E.R. system 1:10 was started within TACR project Zeta (called MAGDA). The goal is to present a functional device at the EXPO World Fair in February 2021. The final parameters should allow to carry the mini S.A.W.E.R. using human power and to transport it e.g. on the bed of a common pick-up truck. In desert environment, the miniaturised system should serve as an emergency source of drinking water that will produce around 10 litres per day.

**7/ Chemoprojekt is interested in integrating the S.A.W.E.R. system into its range**
The opening meeting with he representatives of the company from the SAFICHEM GROUP AG group was very interesting. Both parties will continue to search for ways of mutual cooperation with the goal of commercial use of the S.A.W.E.R. system both in the areas already being solved and in Iraq or Syria.

**8/ Representatives of our army came to look on the S.A.W.E.R. system**
Representatives of the Czech Armed Forces examined the S.A.W.E.R. system during an industry day organised together with the Ministry of Defence. They were interested in both the container solution and the future mini version. In cooperation with CAF, we obtained and will obtain in future, many impulses for future improvement of the system to make it also suitable for military environment and use, e.g. on foreign missions.

**9/ Czech Republic received the plot for the construction of its pavilion at EXPO 2020**
The exhibition grounds for EXPO 2020 are in the shape of a flower, on an area of around 4.5 km² near the Al Maktoum airport and Jebel Ali port, at around one third of the way between the centres of Dubai and a Abu Dhabi. The representatives of Czech Republic here received the plot for the construction of its pavilion, part of which will be an oasis irrigated by the water obtained from air using the S.A.W.E.R. system. This is why Tomáš Matuška from the University Centre for Energy Efficient Buildings of the CTU in Prague had to be there. He was also interviewed by the reporters of Czech Radio and Seznam TV in there.

**10/ EXPO 2020 advisory board held a meeting**
Members of the EXPO 2020 advisory board met in the Czech base of the glass-making and design company Lasvit. Tomáš Matuška informed the other members about the development of the S.A.W.E.R. system and discussed the way of visualizing its function in the pavilion with them.

**11/ We started to build our own battery repository**
After long negotiations that lasted more than a year, the originally arranged supplier of the battery repository refused to supply their system to us. We thus hurriedly started the purchase of the elements and construction of our own battery repository.

**12/ We got an offer to test S.A.W.E.R. in the driest place in the world**
The Czech agency for the support of international business Czech Trade offered us the possibility to contact potential partners for testing the prototype of our device in the South American desert Atacama, which belongs to the driest regions of our planet.

**13/ S.A.W.E.R. system will be presented in Australia**
We got the invitation to participate in the October visit of the delegation of the Ministry of Foreign Affairs of the Czech Republic to Australia, where we could present the S.A.W.E.R. system to the representatives of local entrepreneurs.

**14/ The new Minister of Industry and Trade got acquainted with the S.A.W.E.R. project**
The General Commissioner of the Czech Participation at the EXPO 202 World Fair in Dubai Jiří F. Potužník introduced the S.A.W.E.R. system to the new Minister of Industry and Trade Karel Havlíček. During presentation they also discussed the possibilities of obtaining additional resources for other prototype units that could be placed in desert regions of Australia and Chile.

**15/ We presented our work to the Omani Minister Responsible for Foreign Affairs**
During a working visit to the Czech Republic, the Omani Minister Responsible for Foreign Affairs Yusuf bin Alawi bin Abdullah also came to the CTU in Prague rectorate, where he learned about the results of the work of the UCEEB. The meeting also covered the proposal for cooperation in designing the building of the newly established Czech Embassy to Oman. The design should build on the experience obtained during the realisation of the S.A.W.E.R. and Air House projects.

**16/Water from air, garden from desert. Czechs developed a sci-fi technology from Star Wars**
Tomáš Matuška was interviewed by the Czech magazine Studenta. The editor Petr Cieslar was interested in the details of the S.A.W.E.R. technology, which will in 2020 become the flagship of Czech Republic at the EXPO exhibition in Dubai.

**17/ S.A.W.E.R. system premiere at the defence and security trade fair ISDEF in Israel**
Within the Czech Republic stand at the defence and security technology trade fair ISDEF in Israel, we presented the S.A.W.E.R. system. The ISDEF trade fair belongs to the most prestigious world events aimed at the presentation of products and innovations for the defence, national and cyber security, secret services, public order provision, and protection of critical infrastructure, which is essential for catering for the basic life essentials of citizens, among which the supply of drinking water belongs for sure.

**18/ Testing prototype departed for the United Arab Emirates in containers**
In our laboratories in Buštěhrad, we successfully finished the preparations and dispatched the S.A.W.E.R. system for the transport to UAE, where it will undergo final tests in real desert conditions. The results of the testing run will serve for possible adaptations and improvements of the device, which will be the heart of the oasis in the Czech National Exposition at the EXPO 2020 exhibition in Dubai.

## 2020

CZECH REPUBLIC EXPO 2020 DUBAI, UAE

CTU UCEEB

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**21** laboratories

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