

Sustainable Water and Electricity- the utility of Tomorrow (SWEET)

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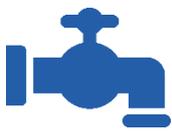
Problem

Climate change is affecting Colombia in particular. Cities depend mainly on rivers and hydrodams for fresh water as well as power supply. Severe and longer droughts threaten water collection and stable output of these needs. Meanwhile the impacts of incidental extreme rainfalls on water facilities are worsening, due to the infrastructures being dried out during droughts.

The result is that (drink)-water security and power supply are increasingly vulnerable. Fresh water and access to (clean) power are critical to foster socio-economic wellbeing in coastal communities. In Colombia, dealing with the existing risks is therefore considered a National priority.

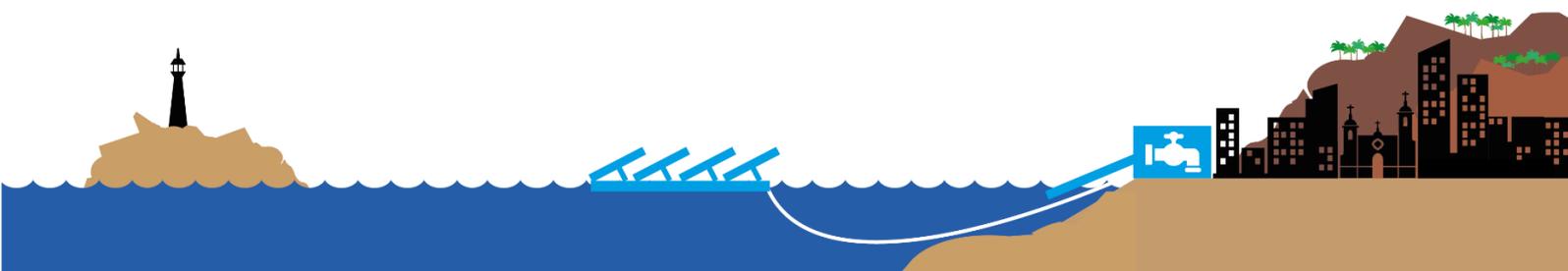
Solution

To combat these challenges, our consortium has developed an innovative approach for a combined water- and power utility concept. We want to setup a Reverse Osmosis (RO) desalination plant that is powered by solar energy from floating PV-platforms located at sea. This should lead to scalable and replicable utilities that strengthen and diversify the water and energy resources of coastal Colombia.

<p><u>Elemental Water Makers</u> (EWM) develops desalination plants based on their innovative & patented Reverse Osmosis (RO) technology. Unique to their approach is that the technology allows for low-cost fresh water and for usage of (variable) renewable energy instead of pollutive diesel powered pumps</p>	
	<p><u>Oceans of Energy</u> (OOE) develops floating solar projects at sea based on their innovative & patented offshore solar system. Unique to their approach is that the technology allows for low-cost clean power and for relieving spatial pressure on land by moving solar infrastructure to abundant sea space</p>
<p><u>Universidad Cooperativa de Colombia</u> (UCC) is the leading University for supporting the application of technological breakthroughs in the public-private domain in Colombia. Their contribution to the project includes fieldwork on stakeholders assessments and impact measurements</p>	

Project focus

We aim to determine the feasibility of developing a combined RO-desalination and offshore floating solar system by means of field-studies. The outcome of our study will be a ready to fund follow-up project to demonstrate the combined application in practice.



We focus on the large metropolises at the Colombian Caribbean coasts. Our preliminary market research has shown that the metropole of Santa Marta is facing serious threats to its water supply. Desk study has shown that our application is a very promising solution for this region.

Other cities on the Caribbean coasts are also very promising. For smaller applications, we are also orientating for projects at islands, such as San Andrés or the islands close to the North coast, and projects to support remote communities with limited access to existing utility-infrastructure.

Our approach

The RO-desalination technology of EWM and the offshore floating solar technology of OOE combine particularly well. EWM has a track-record of dozens of successful desalination projects. The existing projects are however difficult to scale to larger installations, as of the spatial needs for the solar energy modules. OOE is currently building the first offshore floating solar energy farm, at the rough North Sea in The Netherlands. Next to performance benefits, such as a 10-25% higher power yield due to module cooling, the major benefit of moving solar energy farms to sea lies in relieving land space. As the sea-space is used less-intensively, offshore solar projects can easily be scaled towards large solar farms that supply power for cities and/or upscaled EWM desalination projects:

Combining Utility Services: Core Synergies

1. By using the sea, enough space is available for developing solar projects with enough generating capacity for large scale desalination plants that can supply coastal cities
2. By combining solar power generation with RO, the desalination process is used as a storage mechanism to shave solar peak loads and to allow for smooth power integration at the grid
3. As the two technologies enable upscaling for each other, the combination leads to larger applications for both. Thereby cost reductions are enabled through economies of scale

Support us

To execute our initiative, we will apply for support in Colombia and in the Netherlands (i.e. home country of OOE & EWM). We seek local support to showcase the validity of our project. This could be for example through partnering in the project, co-funding of the project, or through expressing your interest and support for the project by means of support letters. If you would like to know more, please contact us through the mail-addresses found at the top of this letter.

It is our goal to combine clean electricity and fresh water supply to coastal Colombia in an affordable, sustainable, and reliable way

We introduce the utility of the future, based on our innovative solutions for seawater desalination and floating solar platforms at sea

**This project is part of the platform-project 'EMPower Colombia' in which UCC and OOE are cooperating with the goal "to enable offshore solar projects with large positive impacts for Colombians by providing clean and affordable electricity"*

