

In 2010, the UN appointed a "Technology Executive Committee" in the context of climate negotiations. For the climate negotiations in Bonn, the committee has been given a clear mandate to provide input and recommendations on how innovation can help solve the climate challenge. Not only because the importance of innovation is embodied in Article 10 of the Paris Agreement, but also, as the United Nations formulates, because: "technological innovation has a critical role as accelerator and enhancing measures to achieve national climate goals."

The «Technology Executive Committee» has now summarized its recommendations for participants at COP23 here in Bonn. These are important and good suggestions that should be heard loud and clear when we are going to deliver on the goals of the Paris agreement.



However, there is one thing that surprises me. When summarizing the recommendations, it's not a point, not a sentence, that encourages climate innovation in the context of some of the other key challenges the world is facing, especially related to water, food and energy.

I think we are making a big mistake if we isolate the important issue of climate and innovation to deal only with emission cuts and adaptation. I think we cannot avoid having to deal with a bigger question: how do we reach climate goals while increasing the world's food, water and energy security? When we use technological innovation to reach the climate targets from Paris, it is great to develop cleaner production processes and products with lower greenhouse gas emissions. But that's not enough. Should we achieve the required speed and implementation at a global level, we need to bring about innovation processes that deliver climate solutions that better respond to people's basic needs for food, water and energy security, now and in the decades to come.

## THE FOOD, WATER AND ENERGY NEXUS





Take for example the agricultural sector. Globally, this sector accounts for 20 of climate emissions and is considered the sector to be hit hardest by climate change. The UN believes that in order to meet population growth and change dietary habits, the agricultural sector will need to increase production by 60-70% by 2050. And it does not stop there. The agricultural sector currently accounts for 30% of global energy consumption and 70% of global water consumption. In about two decades, 600 million children are expected to live in areas characterized by extremely limited water resources.

The climate challenge is closely interwoven with food, water and energy challenges. All too often, innovation efforts have been made to address one of these challenges, with unintended negative consequences for one of the other challenges.



Now it is time that we break out of the silos and seek more holistic and integrated climate solutions. If the innovation processes that are now being now being shaped to deliver much-needed climate solutions also increase energy, water and food availability in vulnerable countries, then I am convinced that we can achieve a completely different rate of implementation of these solutions.

In the Sahara Forest Project, we have challenged ourselves to deliver more integrated climate innovation. We have set ourselves an ambitious target. We want to enable a restorative growth:

"Revegetation and creation of green jobs through profitable production of food, freshwater, biofuels and electricity"

That is our idea. Now, I think we all can agree that it is a bold idea. But I believe it is an idea with the power to become reality.

## CORE TECHNOLOGIES





The Sahara Forest Project technologies are integrated and optimized for hot and arid environments. There are three main components.

- First, we have Saltwater-cooled greenhouses. Through supplying these greenhouses with saltwater, it is possible to allow for highly efficient cultivation of traditional crops in a desert. The basic principle for the evaporative cooling and humidification of greenhouse is that they are equipped with large thick perforated cardboard walls at one end of the greenhouse. Saltwater runs over this card wall. When the hot desert air moves through this wet wall, two things happen. Firstly, small freshwater droplets will evaporate out of the saltwater and into the greenhouse air. Secondly this is an energy requiring process, lowering the temperature of the air. The result is that their air inside the greenhouse is cooler and humidified with freshwater.
- Saltwater is also be used for freshwater production for outdoor growing zones through desalination. Together with reusing run-off water from the greenhouse and efficient watering and soil reclamation techniques this allows for establishing new vegetation in otherwise arid environments.
- The utilization of solar power is the third core component of our system, either with PV or Concentrated Solar Power. Not only will this power the facilities with renewable energy. It also provides opportunities for exporting renewable energy onto the grid.



Once such a saltwater infrastructure has been established in the desert it opens up possibilities for including technological extensions, such as salt production, algae cultivation or combinations with external solar parks or desalination facilities

But why are all these technologies important? They are important because they give us the opportunity to use what we have enough of: sunlight, saltwater,  $CO_2$  and deserts to produce what we need more of: food, freshwater and renewable energy.

## RESULTS



- Yields in pilot stage competitive with leading European greenhouse operations
- Water usage is half of comparable greenhouses in the region
- Year-round production of high quality crops
- Greenhouse provided wet-cooling efficiencies for Solar Power facility
- 19 species of desert plants and vegetable and grain crops successfully cultivated outdoors throughout the year

I want to share some of the key results of the pilot phase with you:

Based on the results from the pilot phase we have initiated business development in several countries, including Jordan, Tunisia and Australia.

## FROM COP15 TO 23





We have quite some history with the UN climate negotiations.

- In 2009 we were present at the climate negotiations in Copenhagen to first present our concept.
- In 2012 we were in Qatar to show invite the delegates to the first pilot plant.
- Last year we went to the negotiations in Marrakech after putting the shovel in the sand to build in Jordan. We have traveled to all these climate negotiations with a message that it is possible to realize comprehensive and integrated climate solutions.



This year we bring evidence. This year we arrive in Bonn together with the Norwegian Minister of Climate and the Environment Vidar Helgensen and the Jordanian Minister of Environment for Jordan HE Yaseen Khayyat after opening a permanent SFP facility in Jordan. Through a consortium of supporters from Norwegian and Jordanian authorities, the EU, the United States and private actors in Norway, such as Yara and Grieg Foundation, we have shown that it is possible. On September 7th, the king of Jordan and the Norwegian Crown Prince inaugurated a 3 hectare Sahara Forest Project facility.



The Sahara Forest Project Launch Station contains saltwater-cooled greenhouses that utilizes saltwater to provide excellent conditions for production of high-quality vegetables. Photovoltaic panels provide power for electrical installations in the facility. A desalination unit provides the necessary water for the greenhouse and outdoor vegetation zones for cultivation of new biomass in what was previously infertile desert sand.

The facility further contains salt ponds for salt production as well as modern laboratory and technical facilities allowing for R&D activities.



The opening of SFP Launch Station marks the starting point for the realization of large scale SFP operations in Jordan and elsewhere. The Launch Station is the first step in what we intend to develop into a 20-hectare large-scale commercial production facility that will be combined with an innovation hub for green technologies suitable for arid areas.



It has been amazing to see how this idea has transformed into the reality you now can see in Jordan. I hope this case can provide the delegates here in Bonn with a little bit of inspiration to see the opportunities that lie in an innovative and integrated approach to climate change. For the opertunities are there. Now it's time to seize them! I believe that we can realize a restorative growth that is good for investors, good for the environment and good for people.

Thank you so much for your attention.