

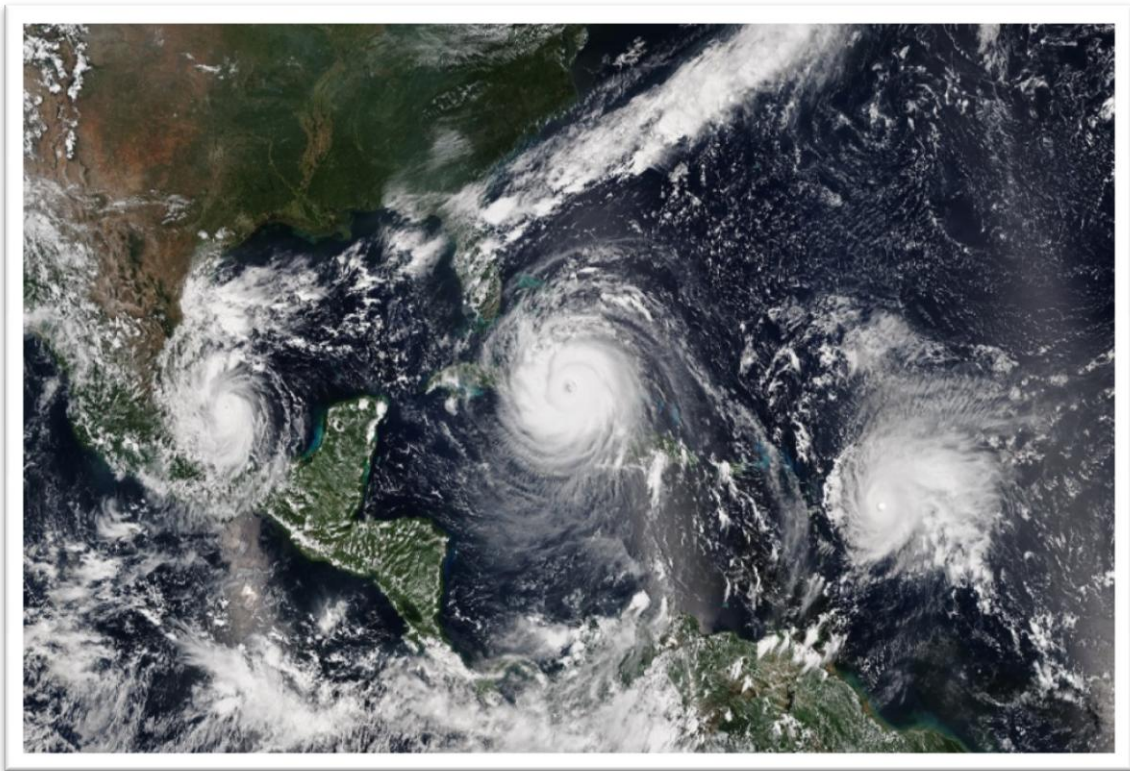
Renewable energy can turn the world around

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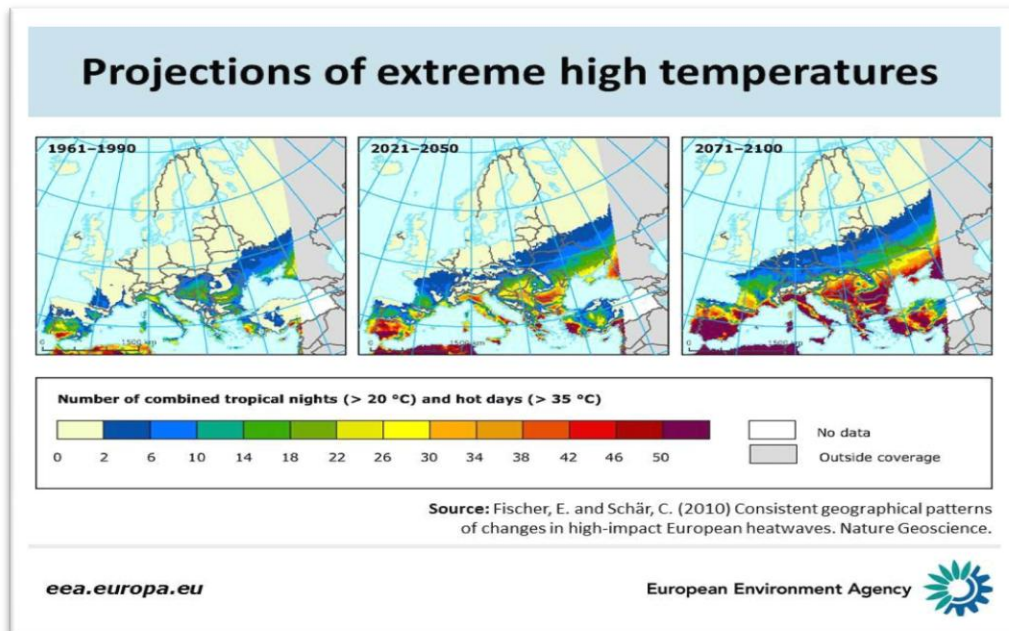
INTRODUCTION

Who can forget the year 2017? It was the year when IRMA, KATIA, HARVEY and many other boys and girls visited the Atlantic Ocean as they journeyed towards the Americas. What followed was sheer destruction. They brought the local economies at a standstill and precious lives were lost.



Closer to home, the **European Severe Weather Database** has shown that the number of tornadoes reported in Europe is on the rise. In Greece alone severe winds were responsible for damages in the islands of the Ionian Sea.

The responsible culprit for all this chaos has been identified and has a name, **CLIMATE CHANGE, CC**. The temperature rise from 1880 to 2017 is one degree Celsius. The European Environmental Agency has been reporting on this phenomena and their scientific analysis is alarming. In southern Europe the countries from Spain to Greece will experience a number of combined tropical nights with temperatures above 20 degrees C and days above 35 degrees C, **for more than 50 days per year!**



The future looks so bleak that in the last World Economic Forum the Global leading economies they named the EXTREME WEATHER EVENTS as THE number one threat with a high likelihood in happening. Weapons of mass destruction and the extreme weather events topped the list of the most devastating risks (The Global Risk Report 2018).

Risks with a high possibility to occur	Hierarchy of risks with catastrophic consequences
<p>2018</p> <div style="background-color: #008000; color: white; padding: 5px; text-align: center;">Extreme weather events</div> <div style="background-color: #008000; color: white; padding: 5px; text-align: center;">Natural disasters</div> <div style="background-color: #800080; color: white; padding: 5px; text-align: center;">Cyberattacks</div> <div style="background-color: #800080; color: white; padding: 5px; text-align: center;">Data fraud or theft</div> <div style="background-color: #008000; color: white; padding: 5px; text-align: center;">Failure of climate-change mitigation and adaptation</div>	<p>2018</p> <div style="background-color: #FF8C00; color: white; padding: 5px; text-align: center;">Weapons of mass destruction</div> <div style="background-color: #008000; color: white; padding: 5px; text-align: center;">Extreme weather events</div> <div style="background-color: #008000; color: white; padding: 5px; text-align: center;">Natural disasters</div> <div style="background-color: #008000; color: white; padding: 5px; text-align: center;">Failure of climate-change mitigation and adaptation</div> <div style="background-color: #FF0000; color: white; padding: 5px; text-align: center;">Water crises</div>

The story of CC is so well documented and the societies know well the danger ahead. Decarbonizing the economy in all sectors is paramount.

The Renewable Solution

Renewables were created from the start of the birth of our planet. The power from the sun comes in abundance on earth. It creates the climate we live in. Humanity today uses only 24.5% of this renewable gift for electricity production globally with hydropower having the largest share. The transition for fossil fuels to renewable energy is not an easy step but is the sensible step to take forward. The wind turbines in Denmark have delivered power equivalent to **43.6 %** of the country's total electricity consumption in 2017. Many countries like Portugal, Germany and the UK had time periods where electricity was GREEN for a few days.

The offshore industry is reducing the costs of power plants. The strong sea winds with remarkable capacity factors exceeding 60% are a fact! Floating technologies will revolutionize the way electricity is produced in the open sea.

Is this the future? Dutch plan vast windfarm island in North Sea

Advanced plans by Dutch power grid aims to build power hub possibly at Dogger Bank whose scale would dwarf current offshore sites

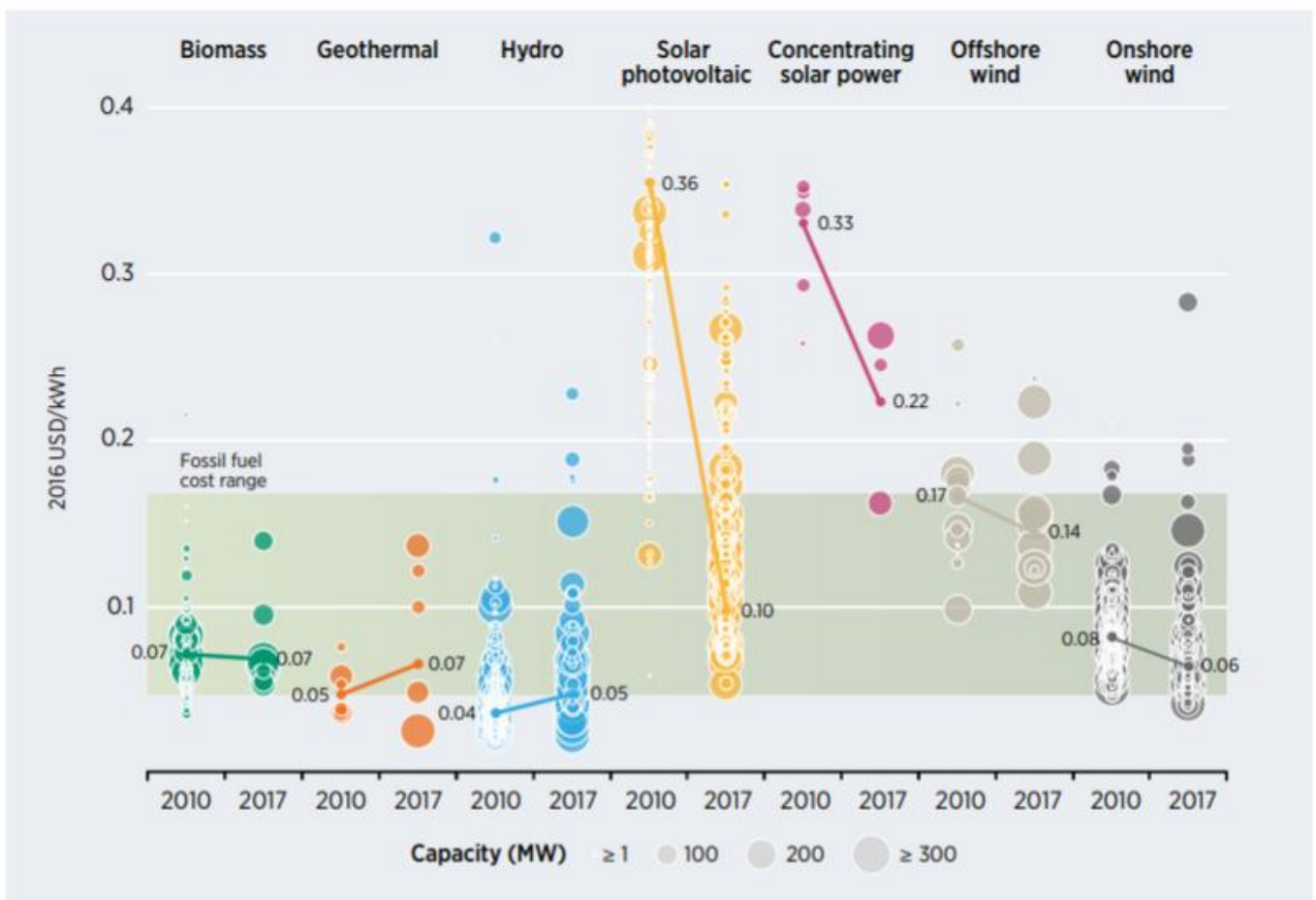


 Windfarm island as envisaged by TenneT, the Dutch equivalent of the UK's National Grid.
Photograph: TenneT

All this abundance of energy has to be properly managed and stored. The variability of solar and wind power makes it hard for electricity providers to integrate them into the electricity grid. Grids need to be reliable and stable, and continuously balance the supply and demand of electricity. Installing banks of energy storage batteries into electricity grids means that the electricity provider can easily add in wind and solar energy. Producing cost effective and environmentally friendly storage systems is critical for the future success of the renewable industry.

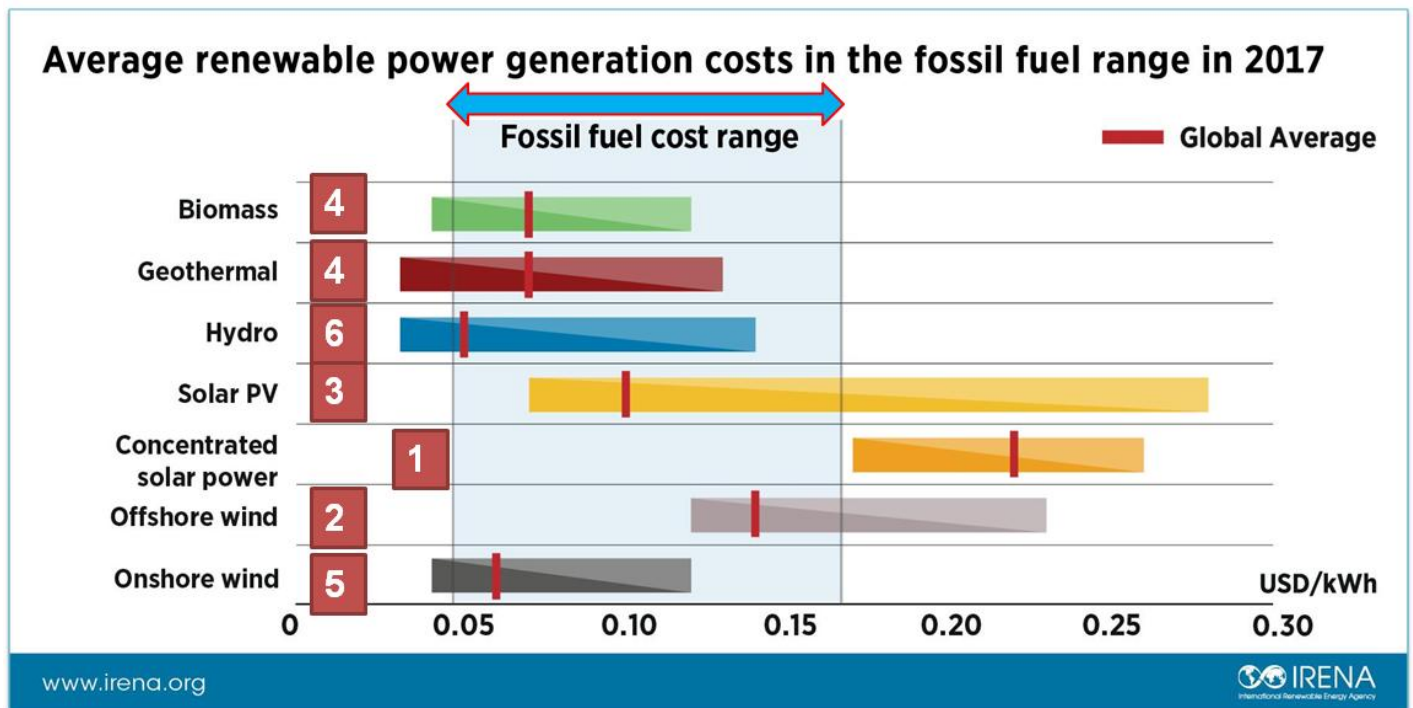
The economics of RES production.

One way to compare different technologies is to use the **Levelized Cost of Energy** in \$/kWh. Studies by IRENA and Lazard has shown that this cost for renewable generation has dropped significantly from 2010 to 2017 as shown in the figure below.



Source: IRENA Renewable Cost Database.

Data presented by IRENA for the average power generation costs have also shown



significant reductions, making onshore wind and solar PV very attractive for new investments. Hydro power remains the cheapest option. CSP is expected to be economical too as more and more projects are planned in Africa and the Middle East.

Mankind at a crossroad



“Climate Change is not a distant problem for future generations. It is here, now, and we need to deal with it.” With these words the UN Secretary General Antonio Guterres addressed the participants at the COP23, UN Climate Change Conference in November 2017.

In a recent speech he has renewed his call for governments, industry, and finance to meet the challenge of climate change through innovation, urgent action, and substantial investment. **“Investments in clean, green infrastructure need to be scaled up globally. For that, we need leadership from the finance and investment community and by local, regional and national governments who will decide on major infrastructure plans over the coming years,”** said in his remarks at the Austrian World Summit in Vienna (15.5.2018).

The International Energy Agency estimates that investment in renewable electricity last year was \$242 billion, more than half of what was invested in new fossil fuel development. The UN’s top official urged enhanced climate financing to face and address the world’s **“utmost priority”**.

“For a full-scale transition to clean energy, we must see billions invested by 2020,” he said.

Doing nothing and continue the use of fossil fuels leads mathematically to a harsh world full of international conflicts as the resources will dwindle decade by decade. On the other hand, renewable energy production and energy saving actions will most certainly increase our chances for survival.



Global mood is in favor of this new world. According to a global poll 82% of people across the globe think it is important to create a world fully powered by renewable energy (Green Energy Barometer). The UN 17 sustainable development goals comprise an excellent road map to follow till 2030.

Today 195 parties to the convention have signed the historic Paris Agreement (agreed on 12.12.2015). 176 have ratified the agreement which entered into force on 4th of November 2016. These countries account for 88.2 % of the global emissions.

The One Planet Summit in France has fired up higher momentum to the Paris Climate Change Agreement. We need to keep and accelerate the momentum.

Humans did manage to send a man on the moon many years ago. We have all the technology necessary today to go for a 100% renewable world. This will revolutionize our economies and bring a GREEN smile on the planet.



Happy wind day, EVERY DAY!

RENEWABLE energy is UNSTOPPABLE.