

# World Hydrogen Energy Summit 2021

## Hydrogen and Green Energy Transition

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# Agenda

Climate change and the consequences

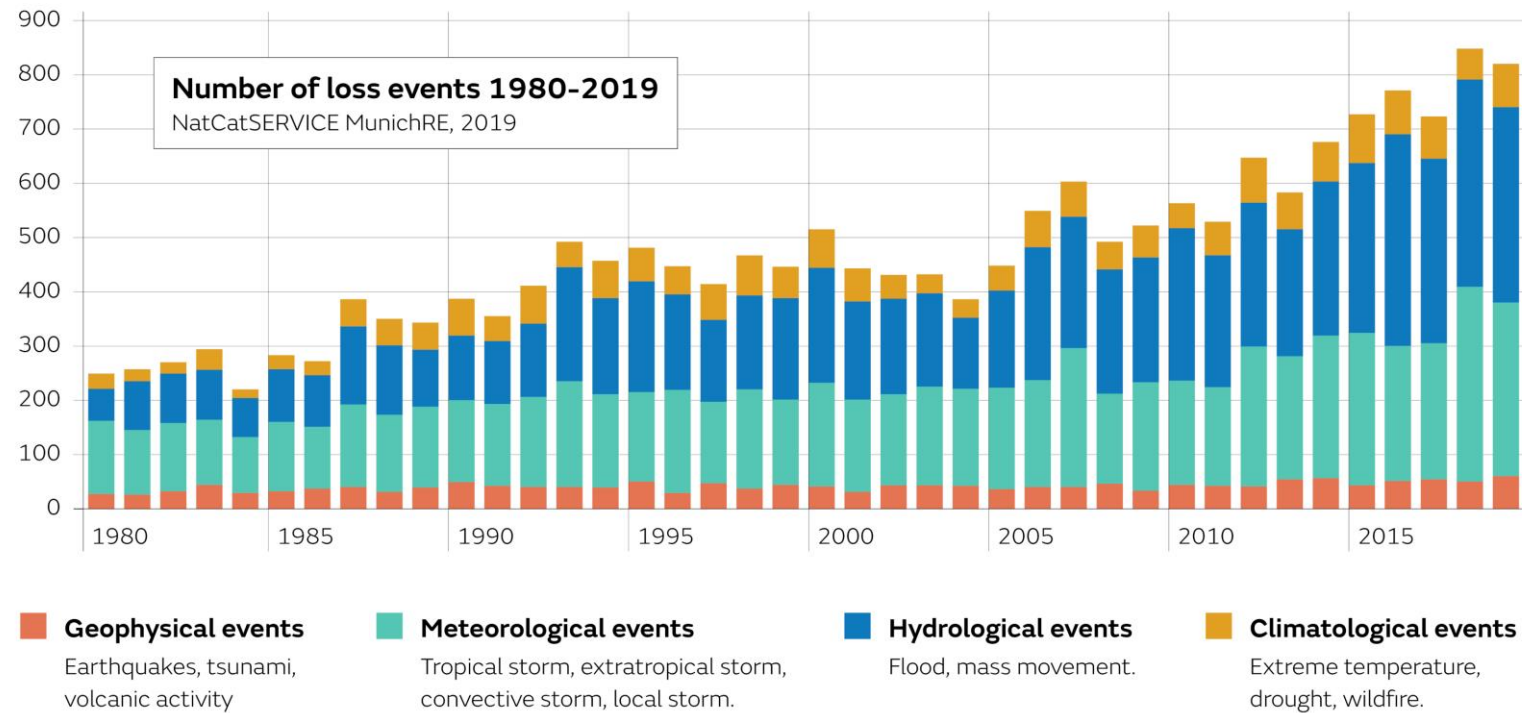
Preventing climate change and the solution

A look into the future

Opportunities and challenges

# Extreme weather is seen on a more frequent basis

 **Met Office** Are extremes becoming more frequent?





# What will be the consequences?

## Poverty

Droughts will hit developing countries the hardest and create a shortage of food for the poor.

821 million people are undernourished today (source: FAO) and in seek of better lives immigration will increase



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## Disasters

Disasters are on the rise and the world is running out of time. Storms, floods & fires are displacing millions of people.

Permafrost melting could double the CO<sub>2</sub> content in the atmosphere and this is an irreversible effect of climate change



## Deaths

700,000 deaths worldwide are attributed to heatwaves and wildfires (source: Monash University).

The human consequences of disasters and heatwaves are severe but lives are saved through early warning systems



## Extinction

Mass extinction is already happening causing a disruption of food chains with consequences for our way of life.

Up to 55 % of all plants and animals on the planet could be extinct by 2070 because of climate change (source: University of Arizona)



## Costs

Climate change equals costs in decreasing crop yields, cities swallowed by rising sea levels, diseases spreading and natural disasters.

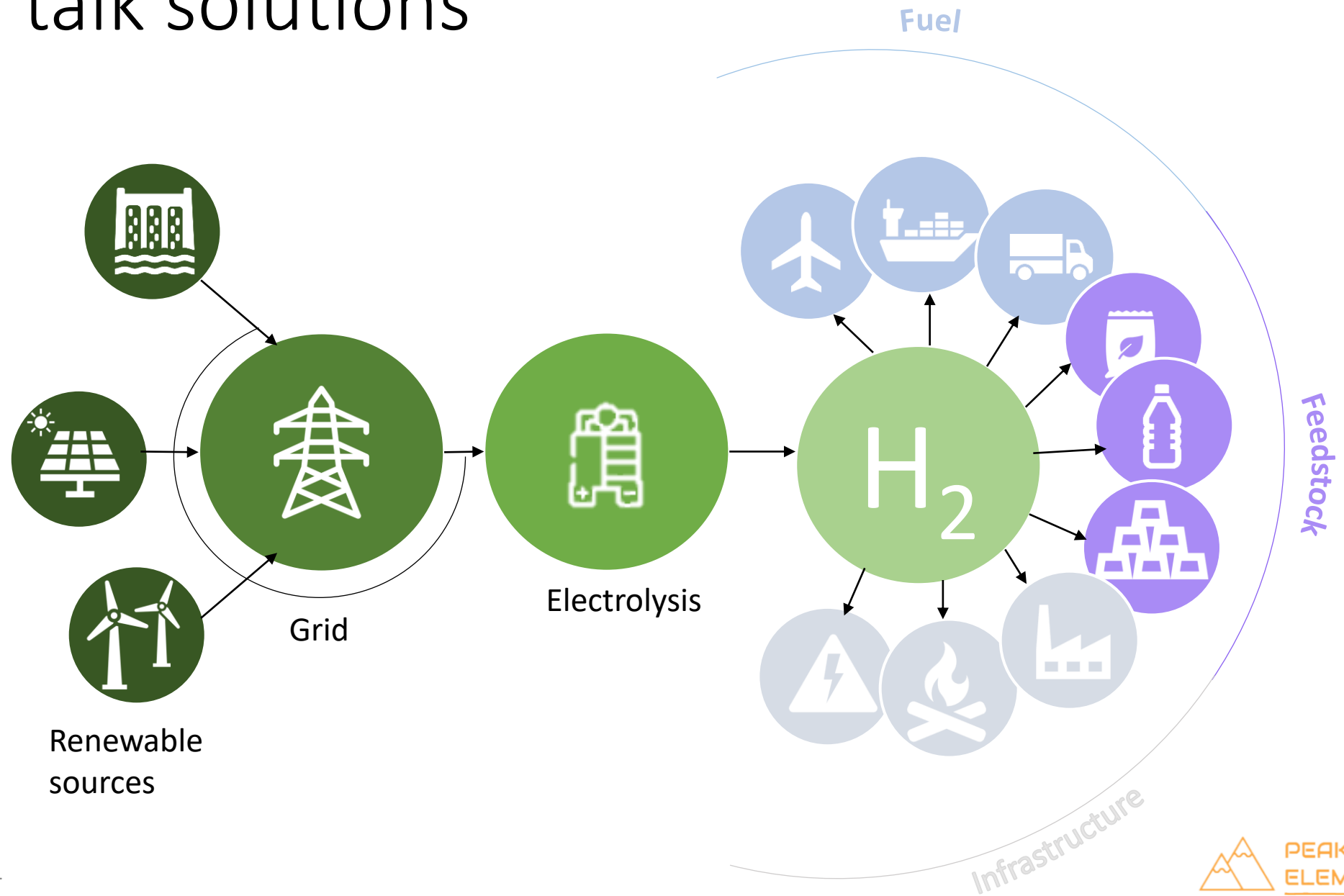
Insurance company Swiss Re has estimated that the global economic output by 2050 will be reduced by an annual 23 trillion USD due to climate change



# How can we prevent this?

- We need a way to use the forces of nature to power our civilization and create a sustainable consumption of our resources
- We need to use the toolbox that already exist and develop technologies in areas where more is needed
- We need to create the incentive for sustainable businesses to grow and flourish
- We need to solve this in a united way as human beings across the world

# Let us talk solutions

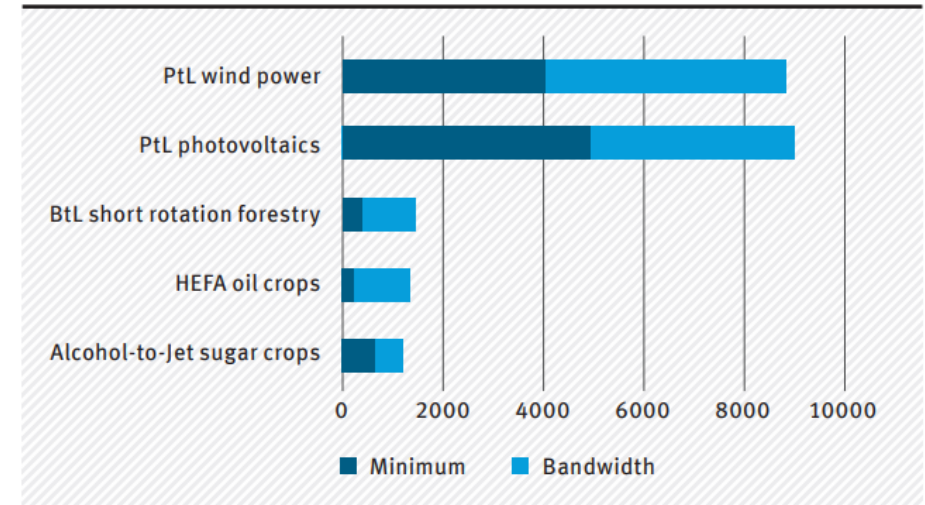


# Land use becomes an important metric

- Growing population
- Need land for food production and biodiversity
- PtL fuels are a more efficient use of land than biofuels

## How far I could fly with the energy from one hectare

**Achievable air mileage for an A320neo per ha of land**  
(km/(ha·yr))



Source: LBST/BHL, 2016

# A look into the future



We use the forces of nature to generate cheap energy available for all across the world



Hydrogen becomes a commodity and enables a sustainable deep decarbonization



A world without fossil reliance means more even distribution of wealth and far less pollution





# Power-to-X business

## Opportunities and challenges

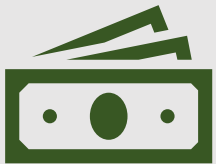
### Economy

#### Opportunity

A shift in the fueling of the world = HUGE opportunity

#### Challenge

Cost of green hydrogen needs to decrease (4-7 USD/kg to 1.5-2 USD/kg)



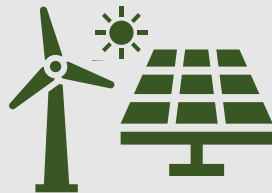
### Renewable energy

#### Opportunity

Large amounts of renewable energy is required

#### Challenge

Local opposition and land availability



### Subsidies

#### Opportunity

Governmental support to accelerate the transition

#### Challenge

Companies that do not receive funding will be at disadvantage



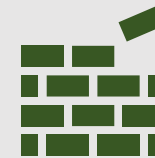
### Barriers to entry

#### Opportunity

Small players can enter and grow with this opportunity

#### Challenge

Market barriers are in the process of being created and will be with scale



### Market on the rise

#### Opportunity

This is the kind of market that will determine who gets big

#### Challenge

It is still a high-risk market with uncertain demand and supply



# Denmark as a green energy front-runner

- Denmark has 80 % renewable electricity supply and strive for 50 % renewable energy by 2030
- World's first energy islands to be constructed in early 2030's with sizes of 2 and 3 GW renewable energy respectively
- Hydrogen pipeline work in progress
- Green strategic partnership with the Republic of India

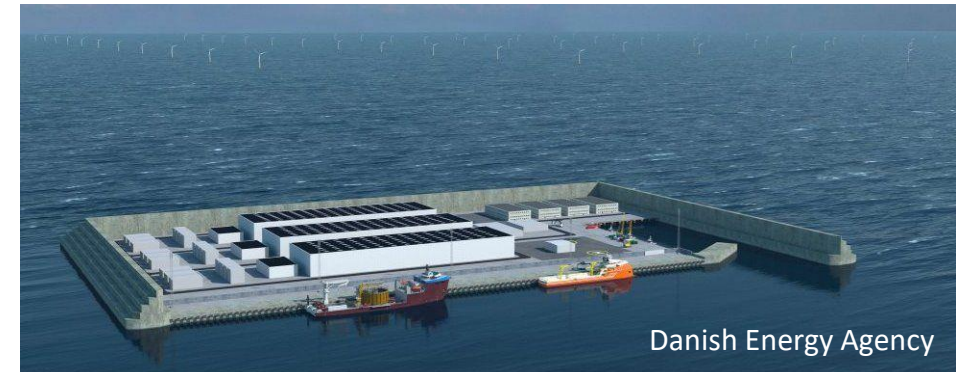


Photo: Mads Claus Rasmussen, Ritzau Scanpix



The choices we make now will define our future



And together we can make this happen

Thank you!

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