



# 2023 National Energy Research and Policy Conference

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SEAI National Research, Development & Demonstration Funding Programme

[energyresearch@seai.ie](mailto:energyresearch@seai.ie)

## Session 1

# Connecting Research and Policy

9.00 – 11:15am

**Morgan Bazilian (Slide 4)**

- *Energy Security & Energy Transitions*

**Cathal Ó Cléirigh (Slide 15)**

- *Ireland's energy security –import dependency and outlook*

**Issy Petrie (Slide 28)**

- *Taking concrete action to combat energy poverty: recent developments and challenges ahead*

**Mark Mellett (Slide 38)**

- *Realising Ireland's offshore potential in achieving energy security and more*

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- *Energy Security & Energy Transitions*

**Cathal Ó Cléirigh**

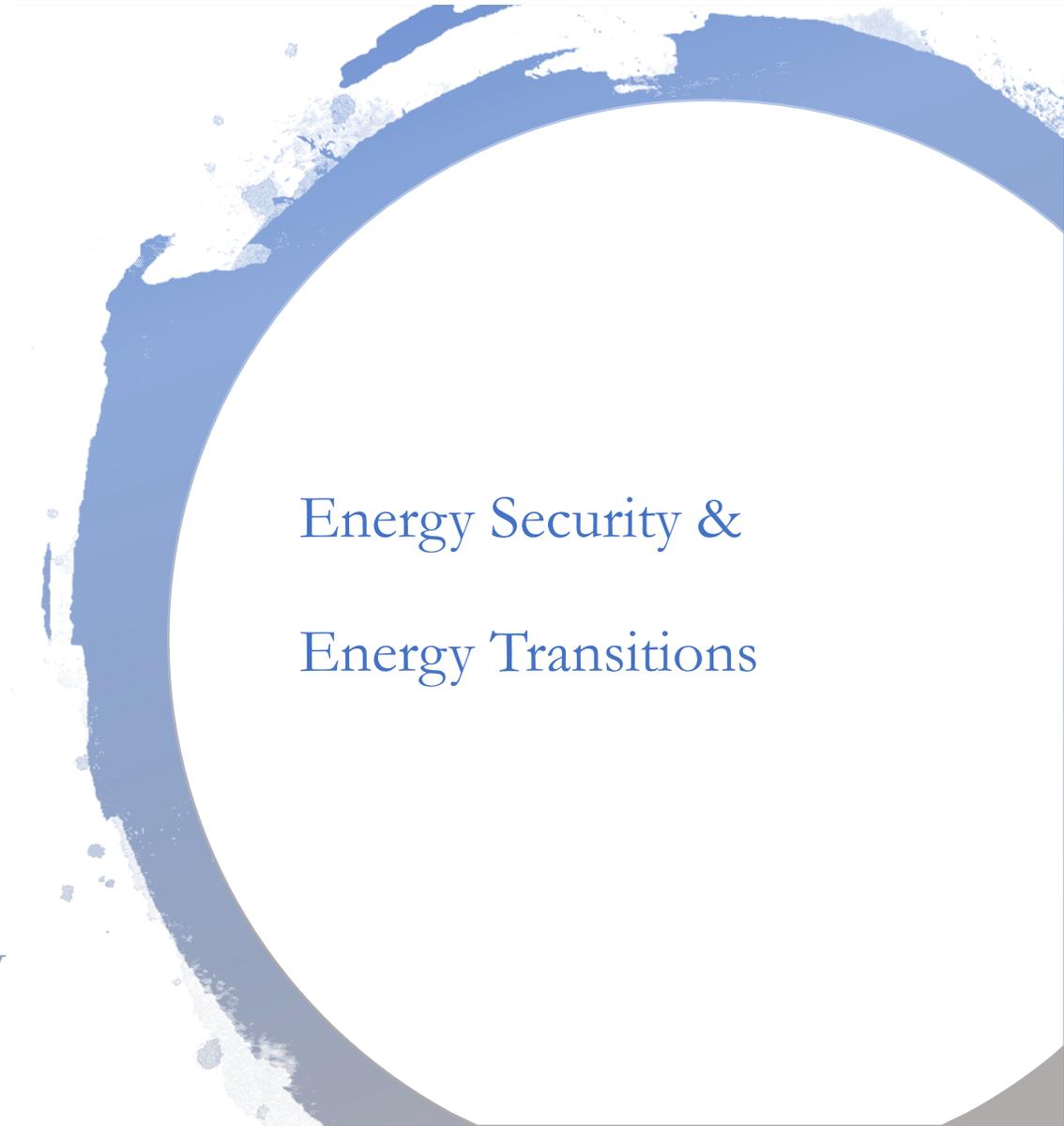
- *Ireland's energy security –import dependency and outlook*

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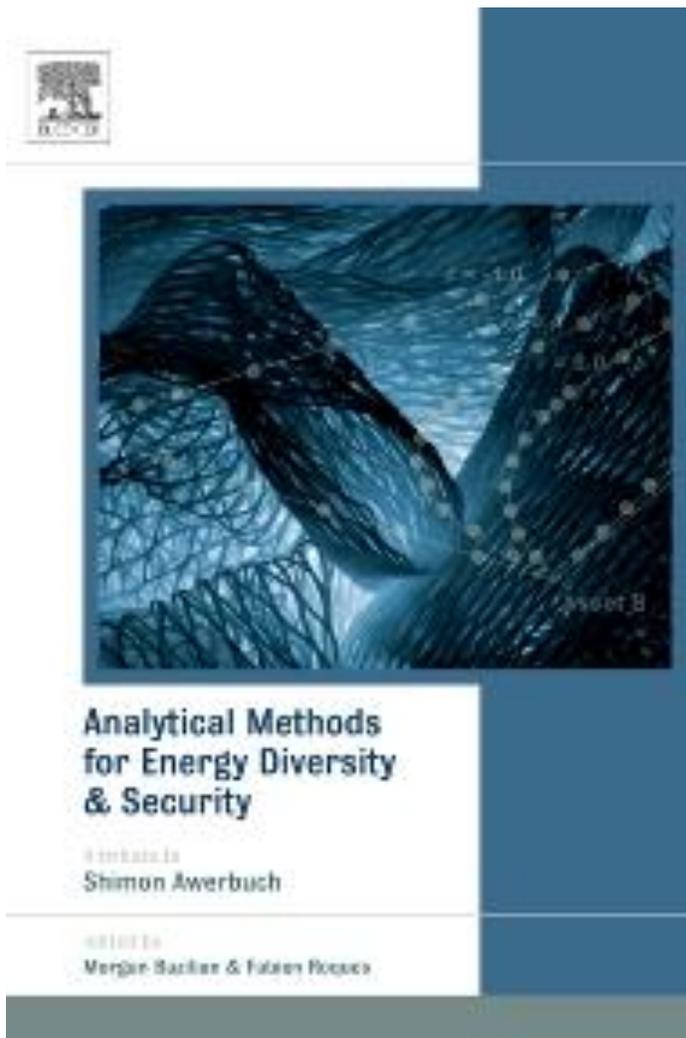


# Energy Security & Energy Transitions

Morgan D. Bazilian, Ph.D.

*The Payne Institute* for Public Policy





In 2008, we published a book on the topic.

(Noting that the risk of Russian gas supply was significant)

- Very different market types. Need to consider risk in each.
- Storage and redundancy is important and takes time.
- Interconnection can help, but not always, and takes time.
- Diversity of supply helps and takes time.
- Think across supply chains.

# Energy Security and Ireland

- Security can be a very powerful driver for clean energy.
- It is interwoven with food security, water security, etc.
- It is not one thing, but many
- A small island economy has its own challenges, and opportunities



## Security of Supply in Ireland

2007 REPORT



### French government blocks U.S. LNG deal as too dirty

The French trading firm Engie had been poised to sign the \$7 billion, 20-year contract.



“The French government, which is a part owner of Engie, stepped in to tell Engie’s board of directors to delay, if not outright cancel, any deal because of concerns that U.S. natural gas producers emit too much methane at the West Texas oil and gas fields...”

- Politico, Oct. 21, 2020

### ANALYSIS

# Why U.S. Natural Gas Is No Longer Too Dirty for France

Natural gas is key to the energy transition—but only if companies clean up their act.

By Jordy Lee, the program manager for the Supply Chain Transparency Initiative at the Payne Institute for Public Policy, and Morgan D. Bazilian, the director of the Payne Institute and a professor of public policy at the Colorado School of Mines.

Priorities change quickly

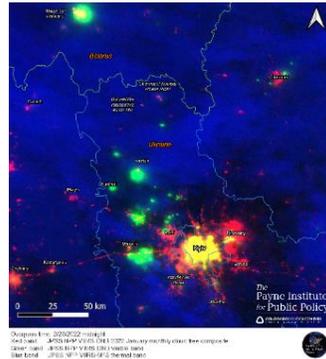
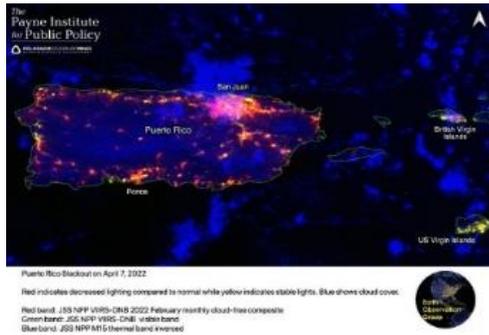
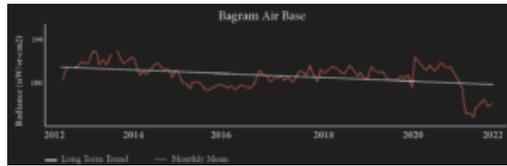
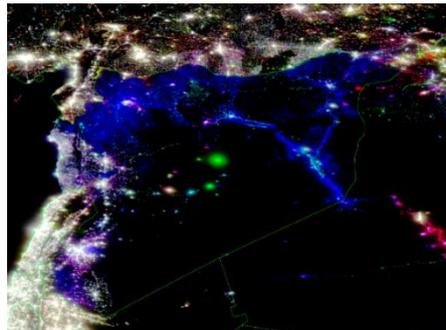
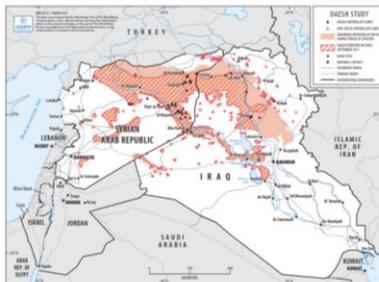
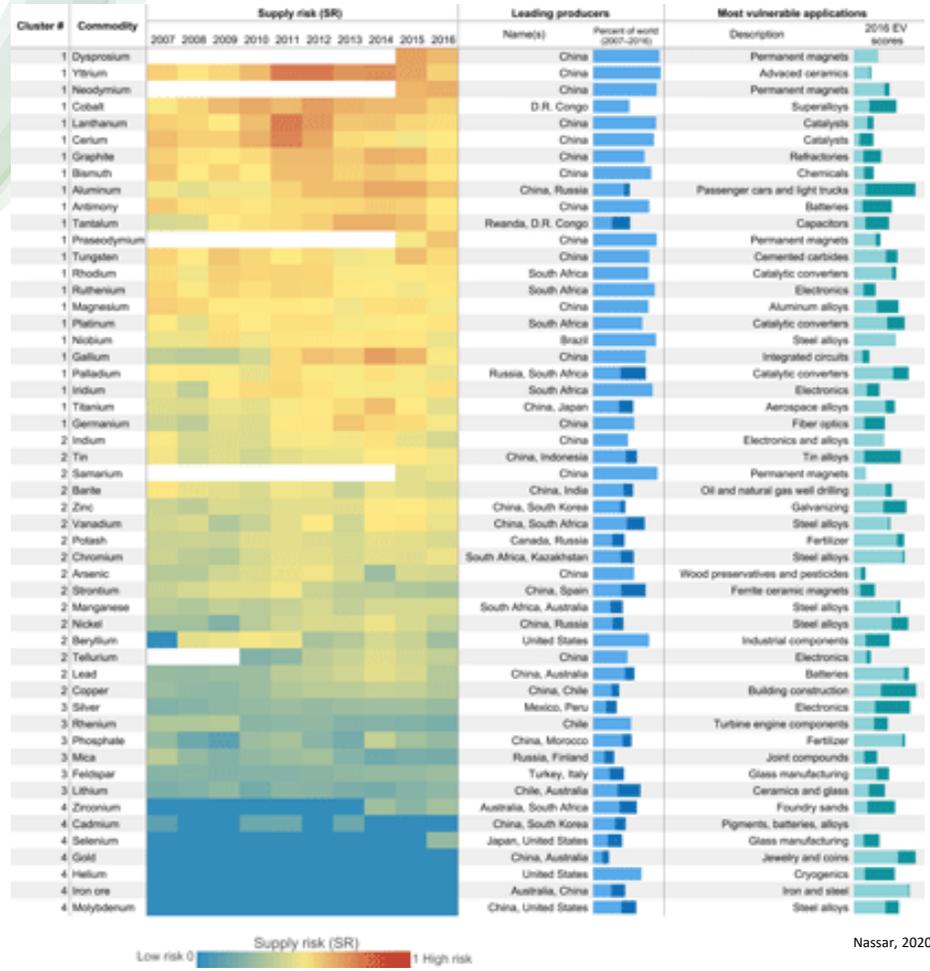


Figure 1: Iraq and Syria Oil Production, Fields, and Daesh Control, March 2016



New ways  
to monitor  
geopolitics



# Defining criticality



## An Age of Actorless Threats: Rethinking National Security in Light of COVID and Climate

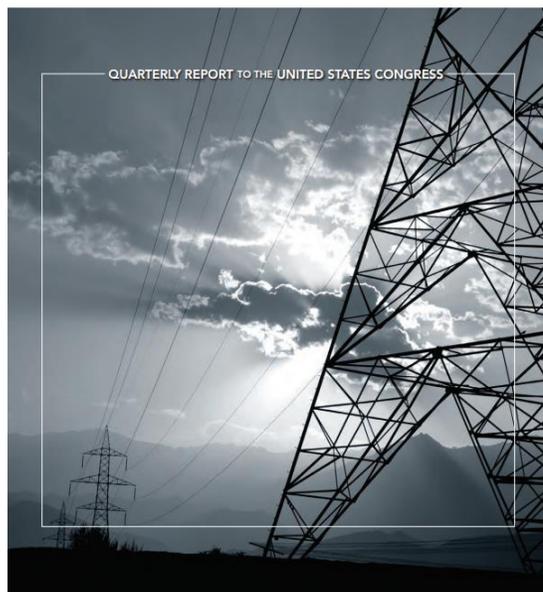
by [Morgan Bazilian](#) and  
[Cullen Hendrix](#)  
October 23, 2020



**Filed under:**

Climate Change, Climate  
security, Coronavirus,  
healthcare, national security,  
Pandemic

Climate change and the COVID pandemic are highlighting key weaknesses in U.S. national security strategy and policy. Addressing these issues will not just require making traditional national security agencies more climate- and pandemic-aware, but a reimagining of the concept of national security itself. This means everything from changing the focus of troop deployments, to altering the missions of forward and domestic bases, refocusing military research and development (R&D) spending, and refining officer education at the military academies. Beyond that, it means bringing more U.S. government agencies to the tables where national security is discussed.

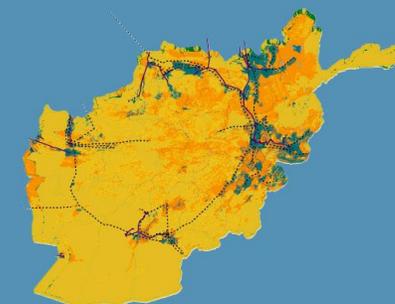


“In fragile and conflict-afflicted country settings, power system planning cannot ignore the inherent risks. . . . Such risks can, for example, manifest in projects being delayed, abandoned, or coming in at very high costs. Security issues can thus significantly hamper, or make infeasible, the delivery of power system master plans.”

—“*Considering Power System Planning in Fragile and Conflict States*”

Source: Morgan Bazilian and Debrajendra Chattopadhyay, “Considering Power System Planning in Fragile and Conflict States,” Cambridge Working Papers in Economics, 11/3/2015, p. 2.

AFGHANISTAN ENERGY STUDY



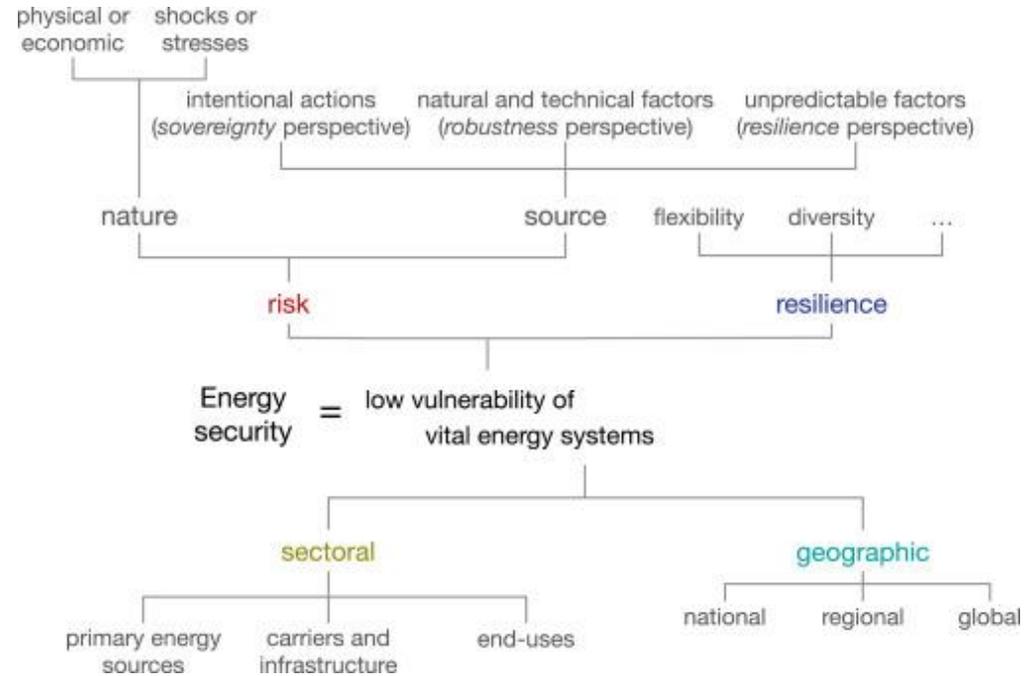
**A GIS APPROACH TO  
PLANNING ELECTRIFICATION  
IN AFGHANISTAN**

Alexandros Korkovelos, Morgan Bazilian, Dimitrios Mentis, and Mark Howells



# Security, not independence

- Independence is the wrong framing: the world is interrelated and growing more so.
- Consider and model:
  - Diversification of **sources of supply** - various fuels and technologies
  - Diversification of **supply chains**
  - **Resilience** or the ability to handle shocks and recover from failures
  - Reducing **demand** to ease the burden on infrastructure
  - Consider **institutional** landscape
  - **Geographic and temporal aspects**
  - **Allies**
  - **Market signals**



Source: Cherp & Jewell, 2014



*The Payne Institute* for Public Policy



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# 2023 National Energy Research and Policy Conference

## *Ireland's energy security – import dependency and outlook*

Cathal Ó Cléirigh

Senior Energy Analyst, Energy Statistics

SEAI



# International Energy Agency on energy security

- Energy security:



- Long-term energy security:

Environmental sustainability

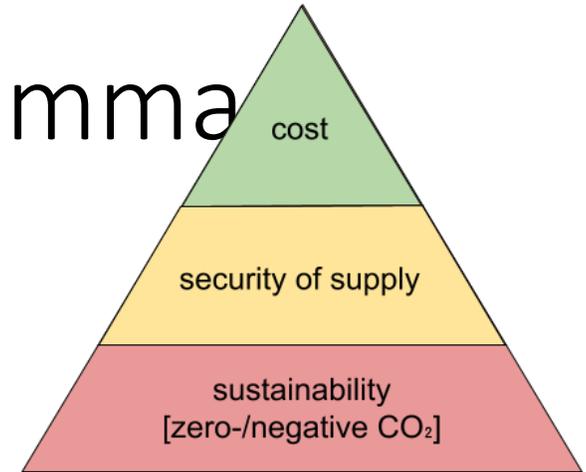
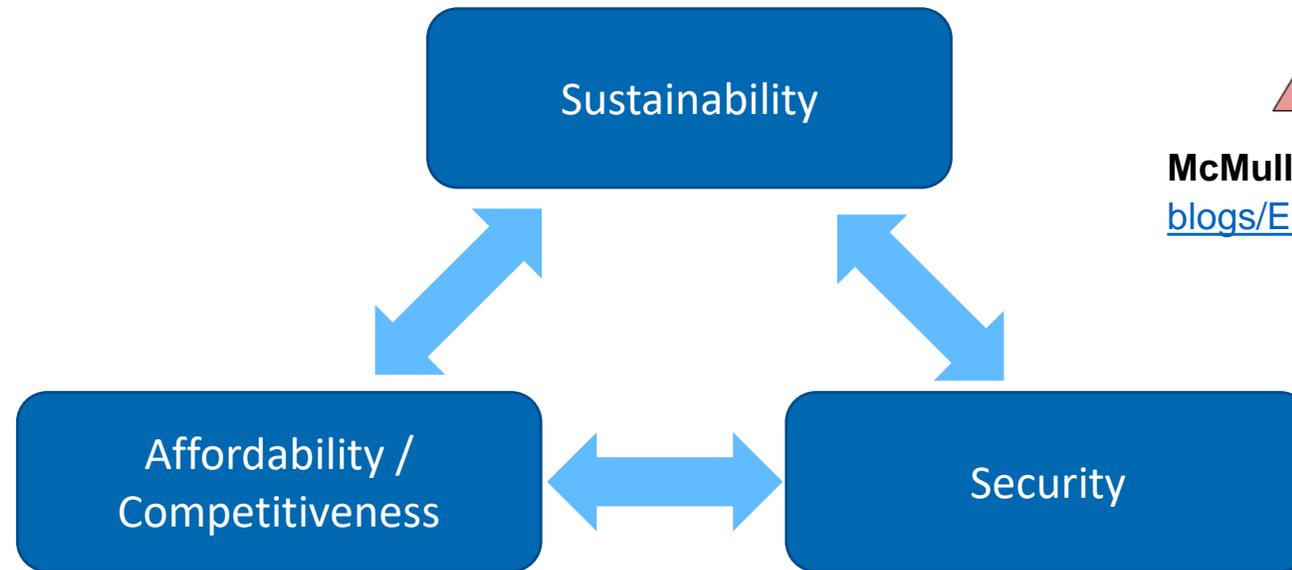
*Timely investments to supply energy in line with economic developments and environmental needs*

- Short-term energy security:

*Ability of the energy system to react promptly to sudden changes in supply-demand balance*



# Three pillars of energy policy – trilemma



**McMullin, 2018** (<http://ienets.eeng.dcu.ie/all-blogs/EnergyTrilemmaHarmful> )

# Three pillars of energy policy - what does 2022 tell us?

- Final energy consumption ↑
- Renewable energy share → (13%)
- Energy-related emissions →
- Potential overruns in carbon budgets and SECs

Sustainability

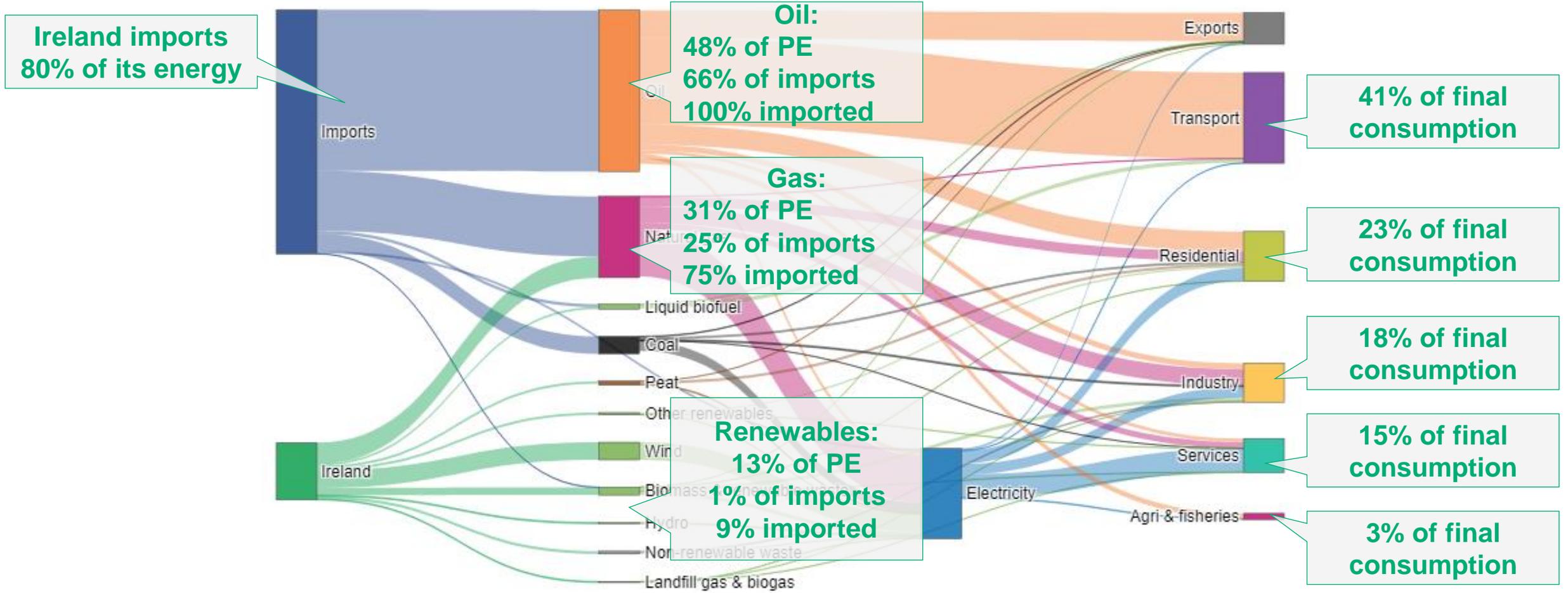
- Import dependency ↑
- Fossil fuel price volatility

Security

Affordability /  
Competitiveness

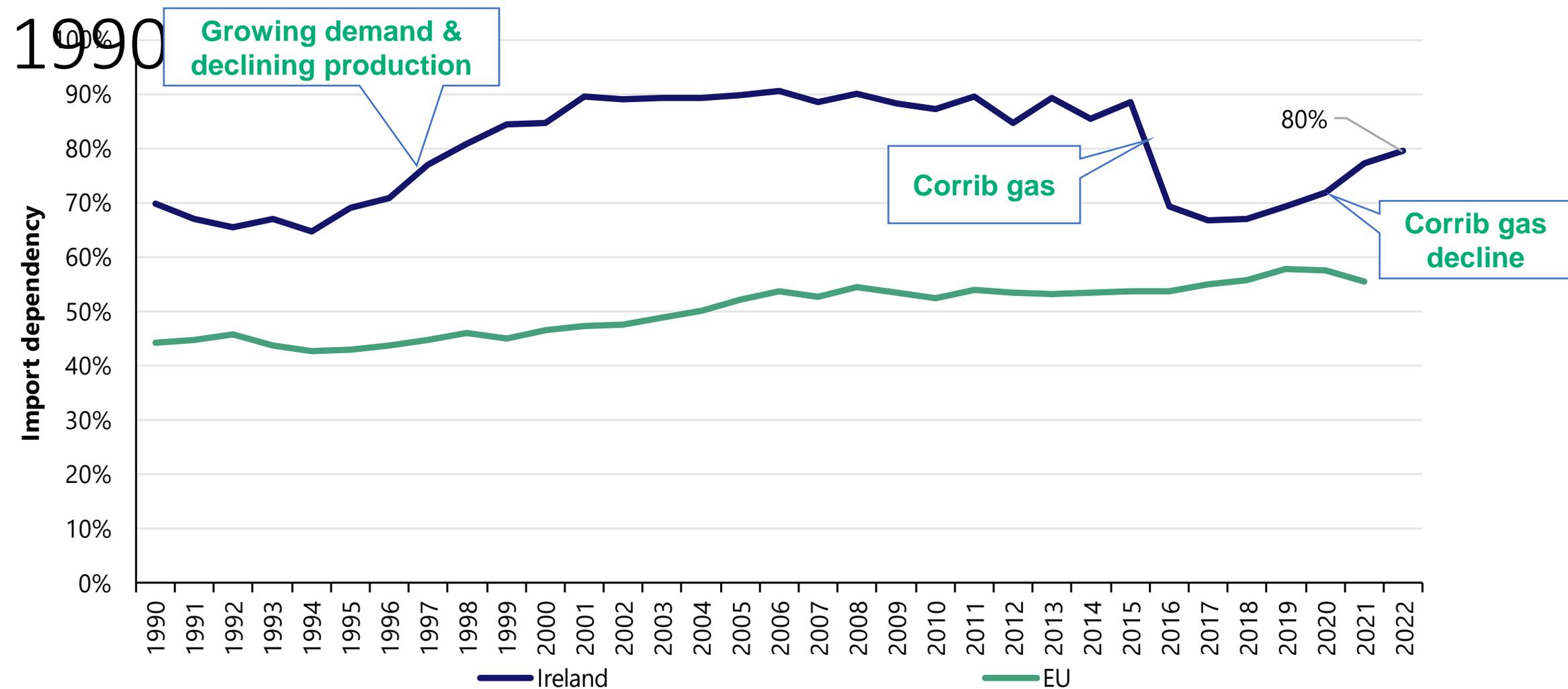
- Energy prices ↑
- Cost to business & households ↑
- Residential consumption ↓
- Inflation ↑
- Requirement for Government supports
- Easing of prices in 2023

# 2022 Energy flow



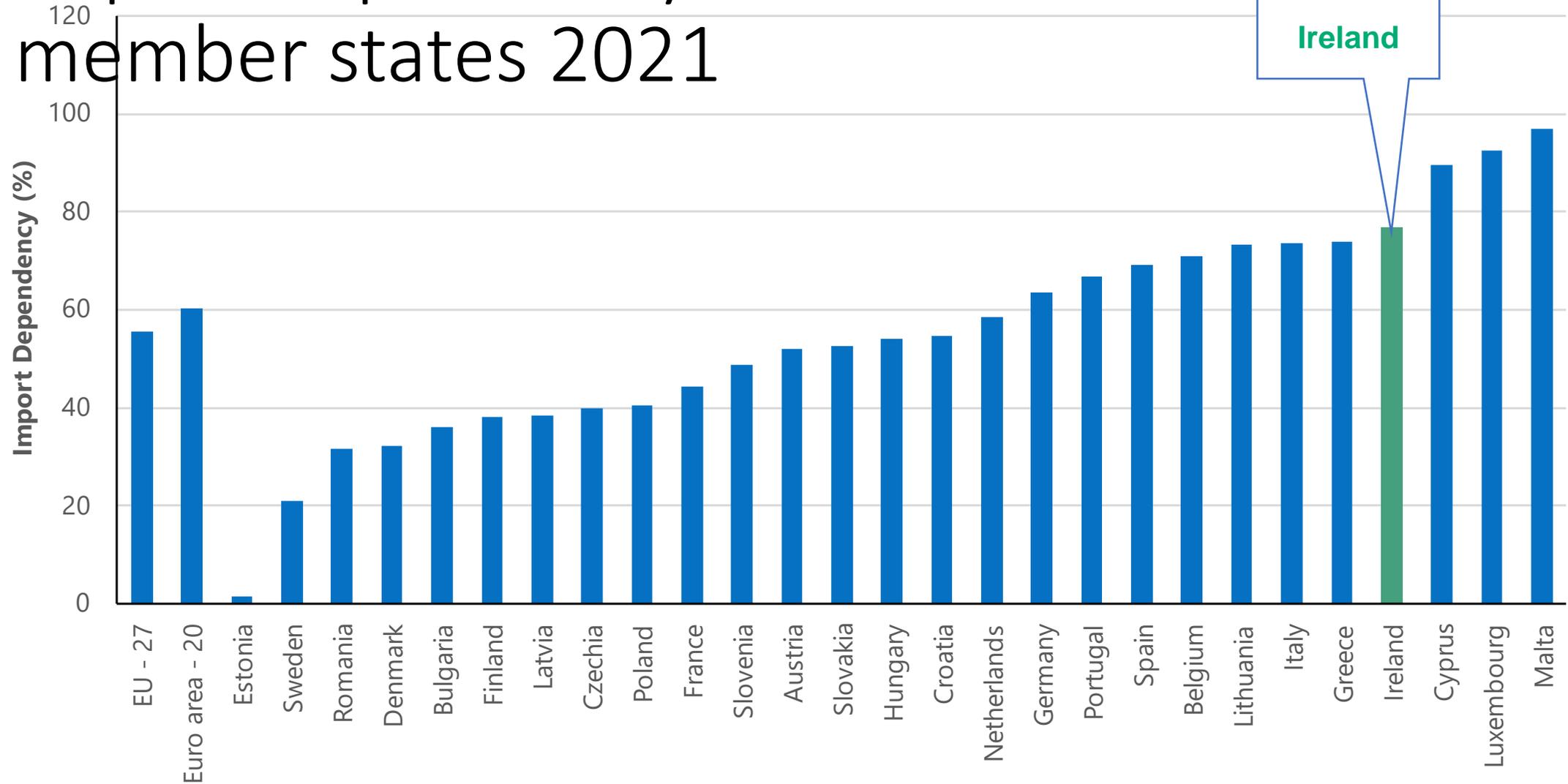
Source: SEAI

# Import dependency of Ireland and the EU



Source: SEAI and Eurostat

# Import dependency of Ireland and EU member states 2021

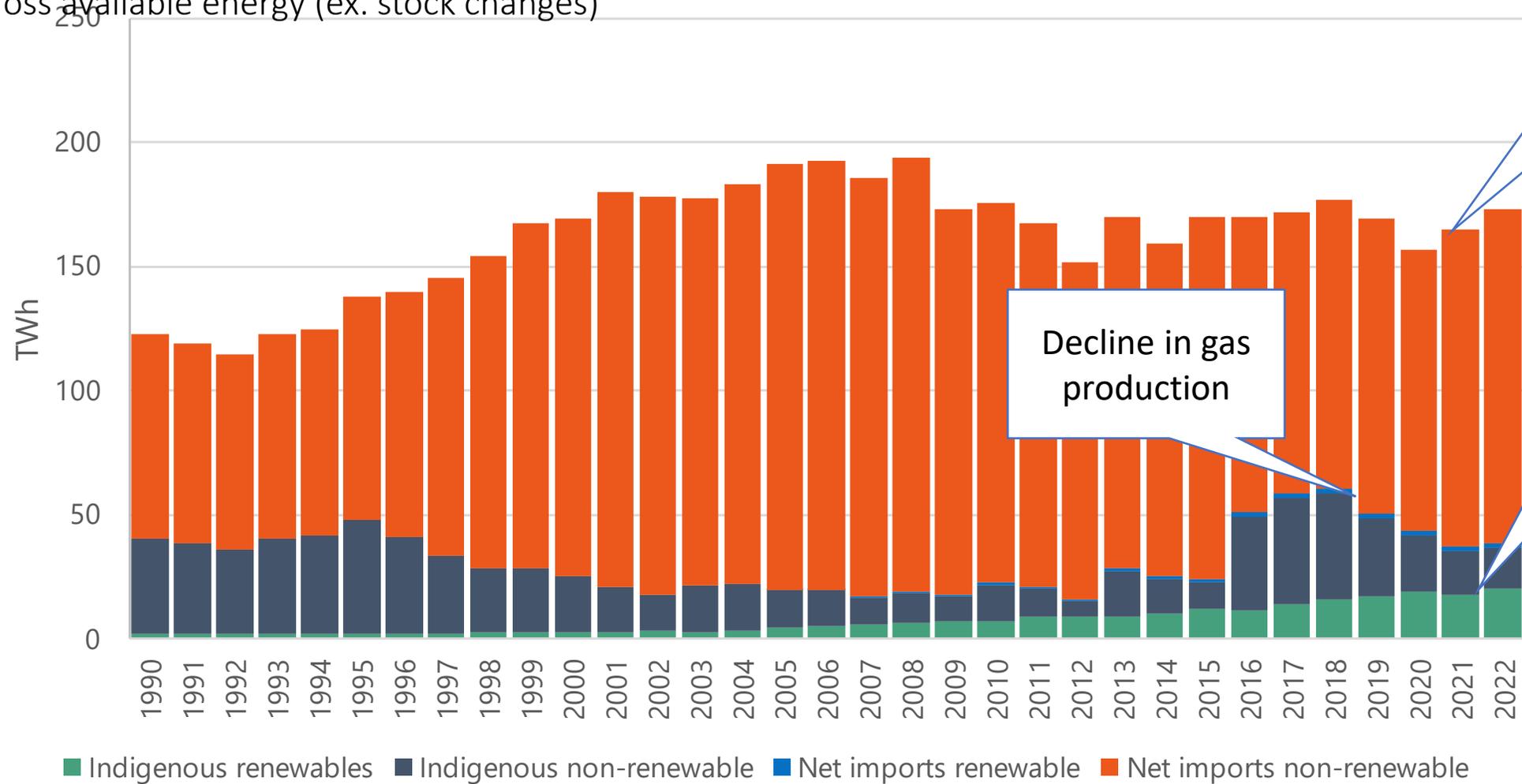


Source: Eurostat

[Energy imports dependency \[NRG IND ID\]](#)

# Indigenous production and net imports

Gross available energy (ex. stock changes)



Decline in gas production

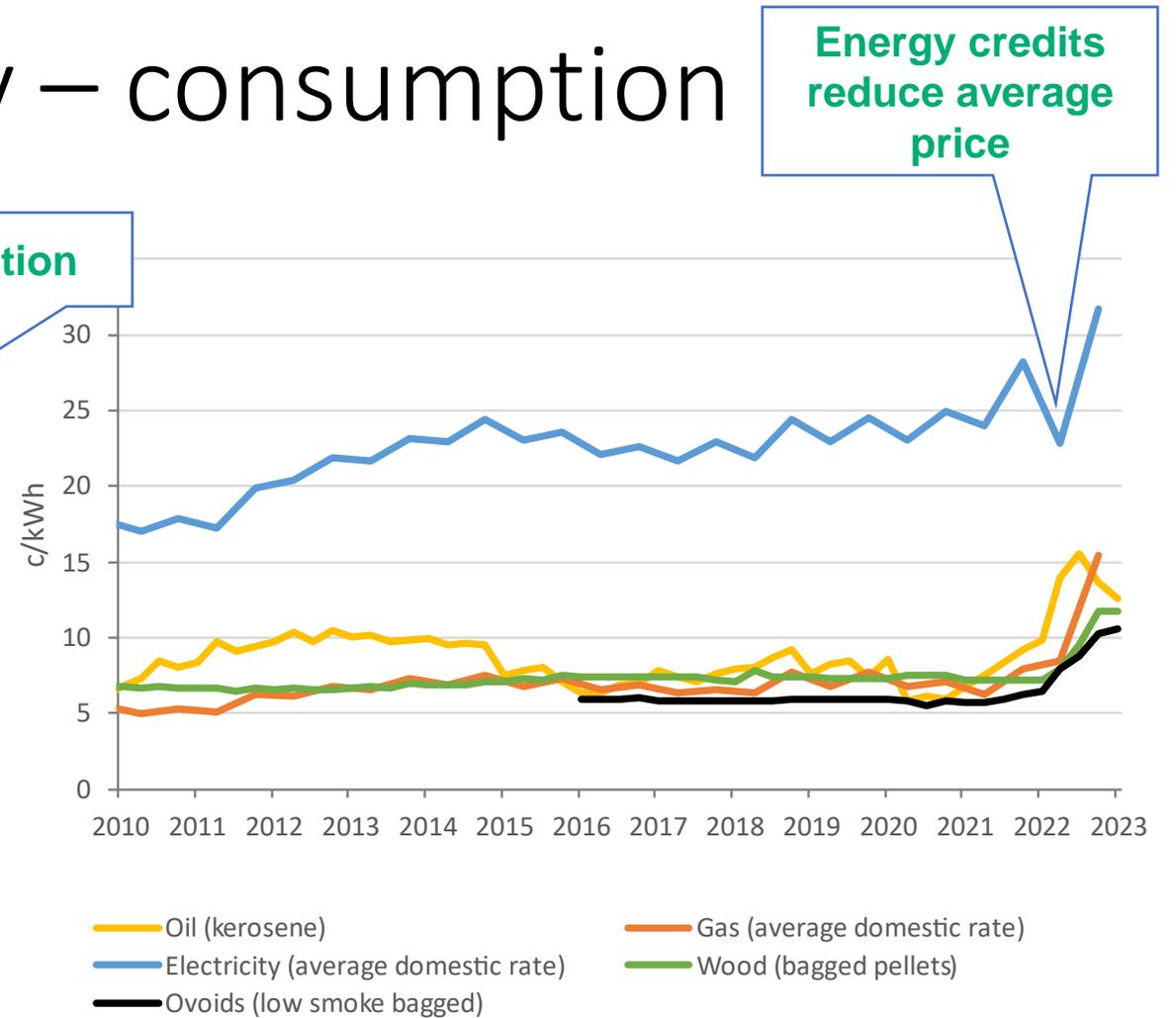
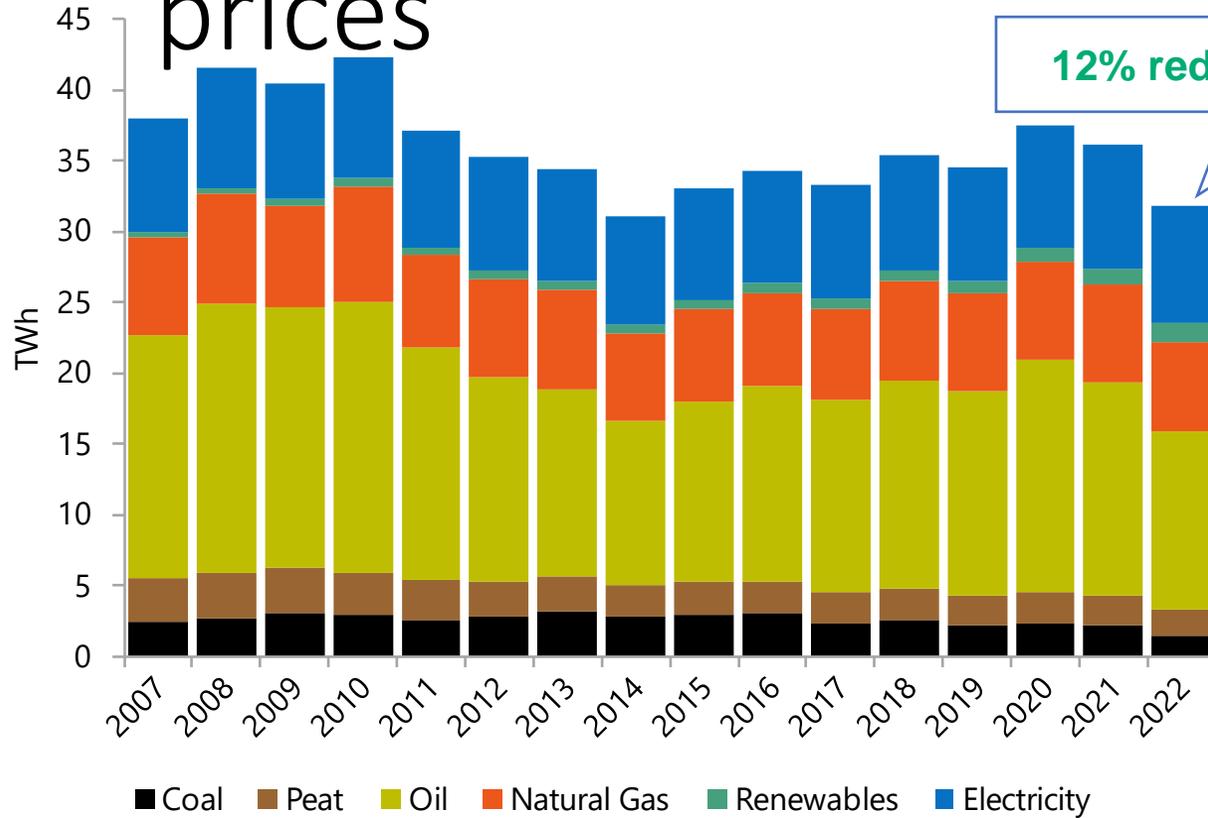
Increase in demand post-COVID

Slow rollout of renewables since 2020

Source: SEAI

# 2022 Residential energy – consumption

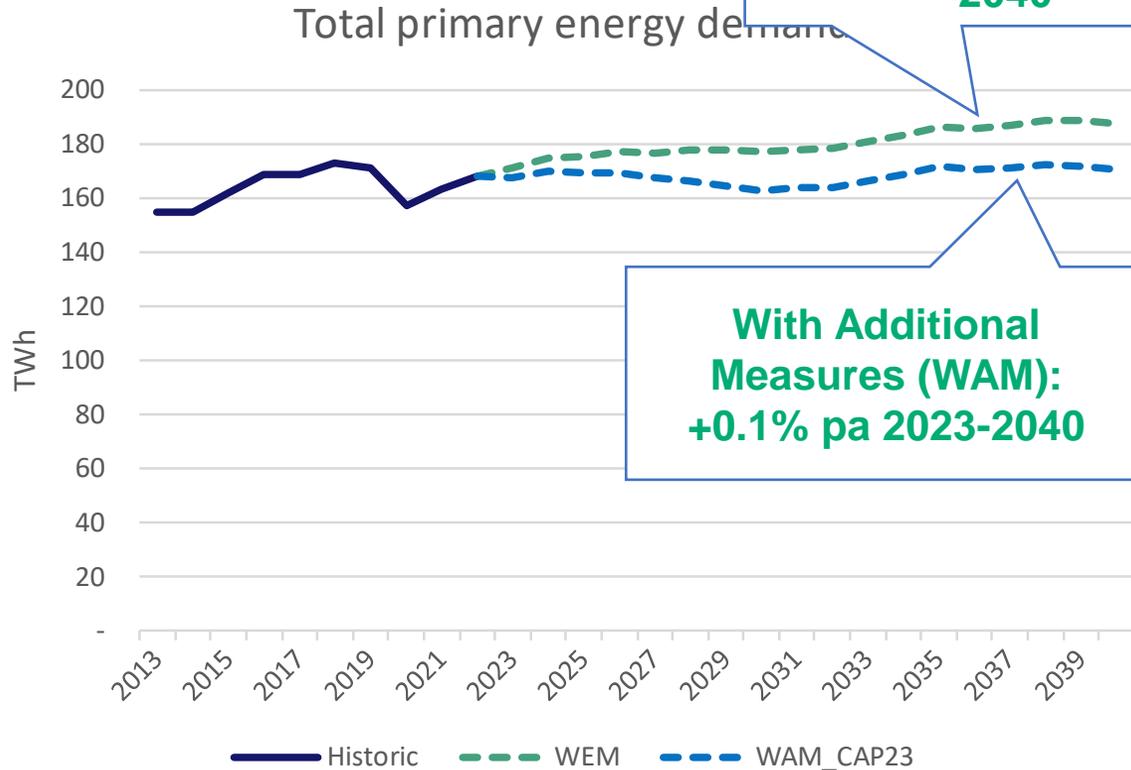
## prices



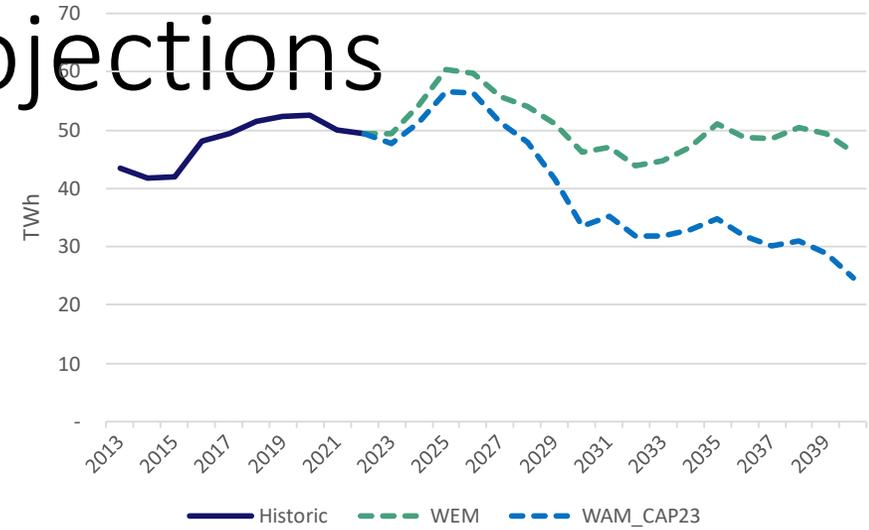
Source: SEAI

# SEAI's National Energy Projections

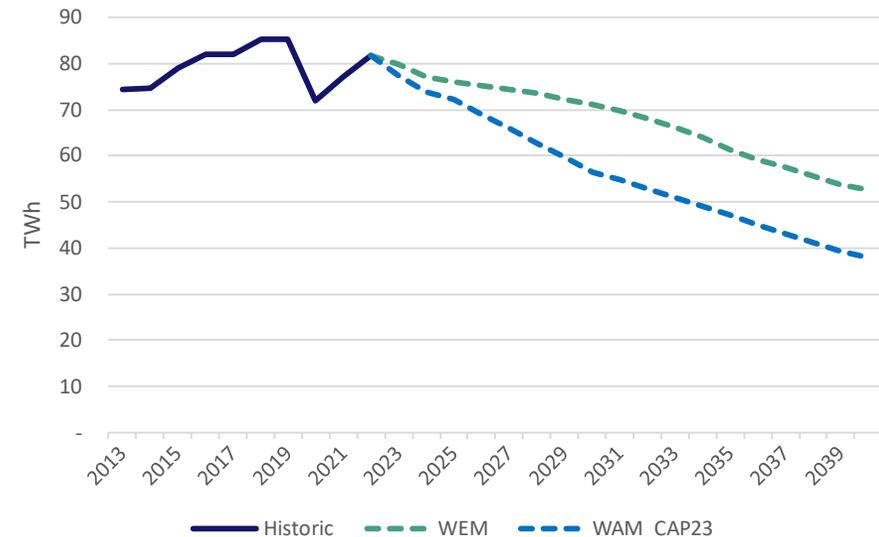
Primary energy 2013-2040



Primary demand - natural gas



Primary demand - oil

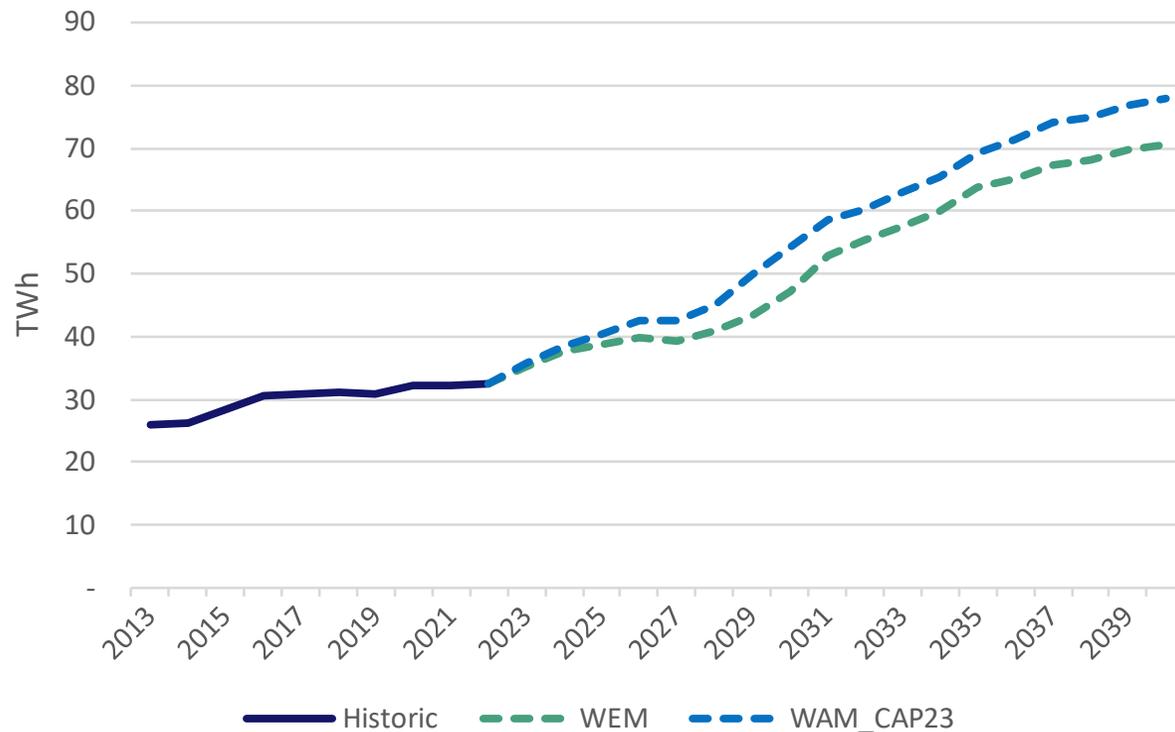


Source: SEAI

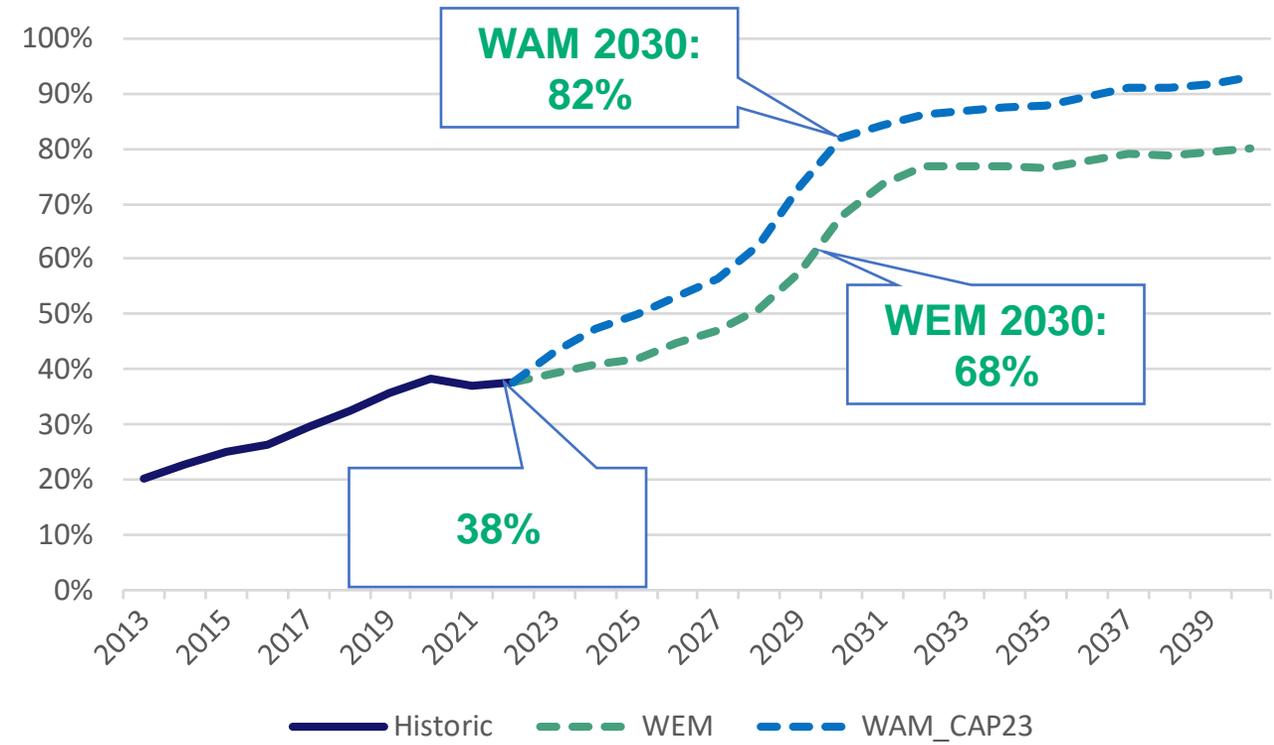
# SEAI's National Energy Projections

Electricity generation 2013-2040

Net electricity generation



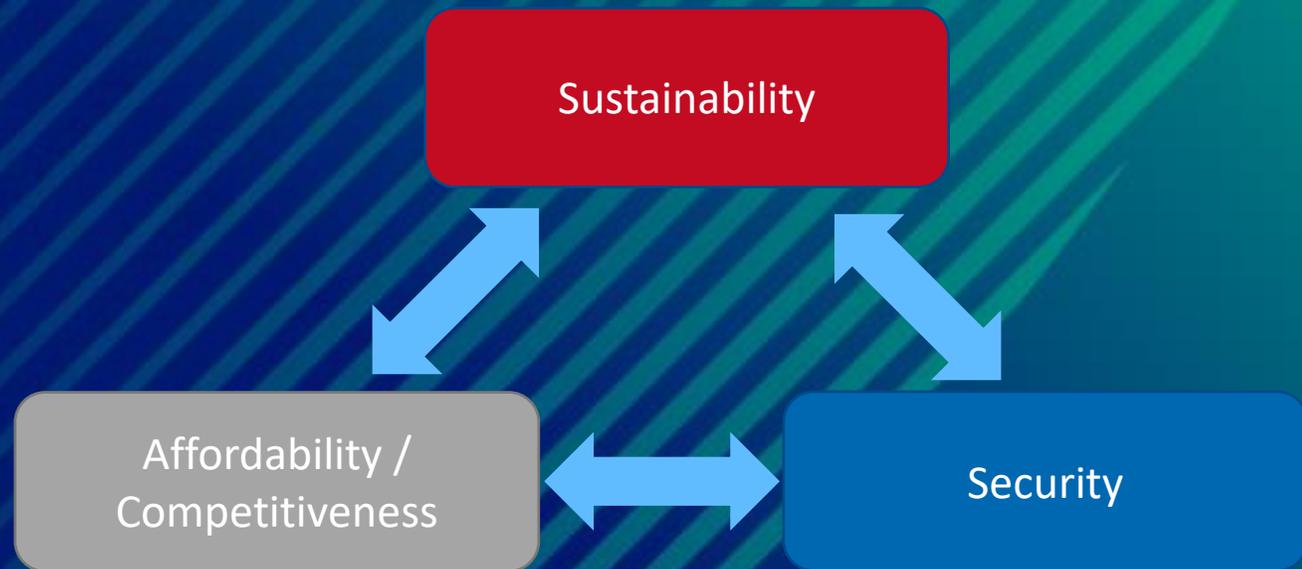
RES-E - renewable energy share in electricity



More detail in SEAI's upcoming report on National Energy Projections

Source: SEAI

# Improving energy efficiency and increasing speed of renewables deployment supports all three pillars



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# Taking concrete action to combat energy poverty: recent developments and challenges ahead

Issy Petrie  
Society of St Vincent de Paul  
September 2023

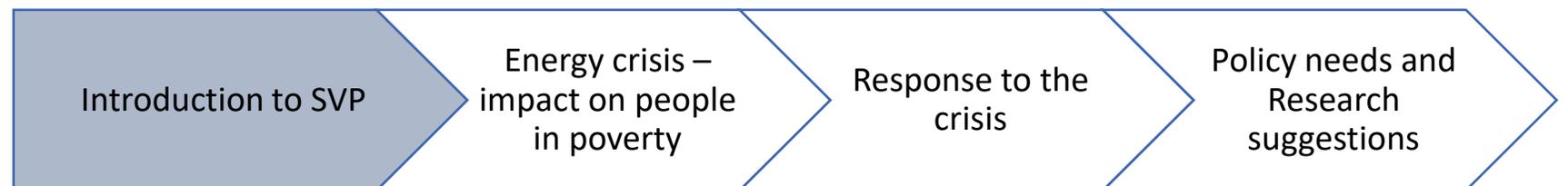


Society of St. Vincent de Paul

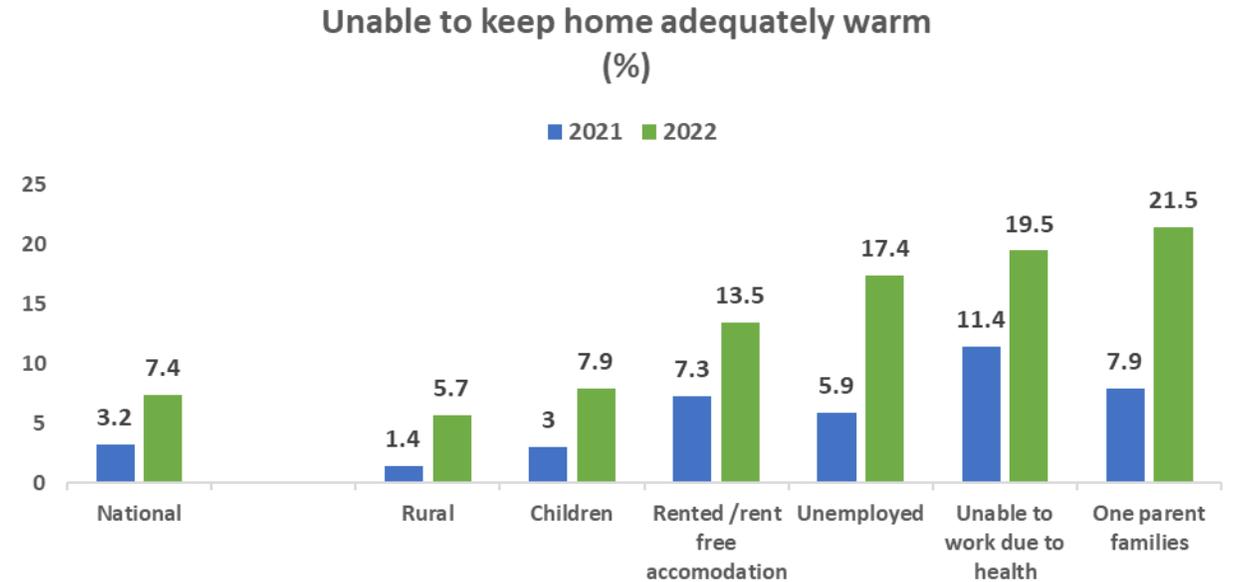
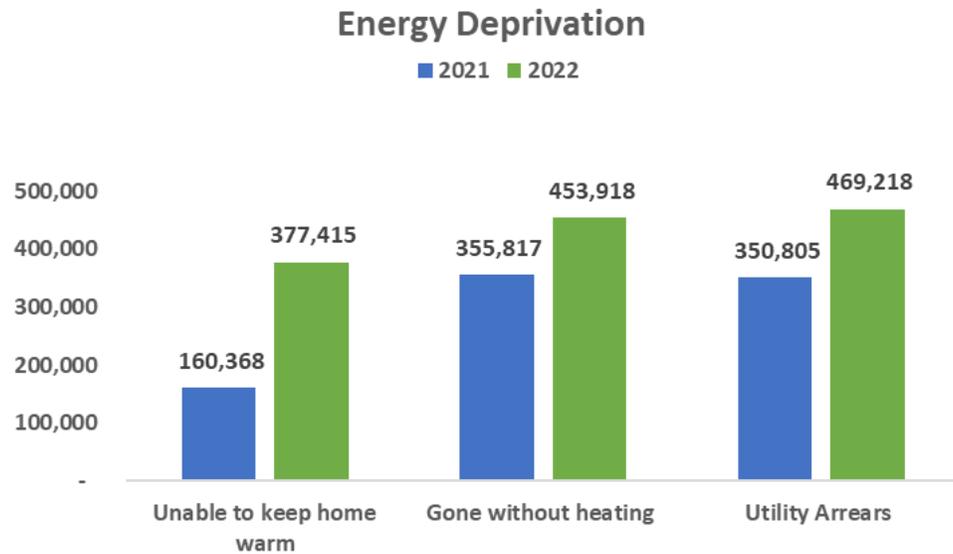
# Introduction to SVP



- The largest voluntary organisation in Ireland, founded in 1844
- SVP's core work is visitation – members offering practical support and friendship to people within their communities.
- There are 10,000+ SVP volunteers throughout Ireland responding to requests for assistance.

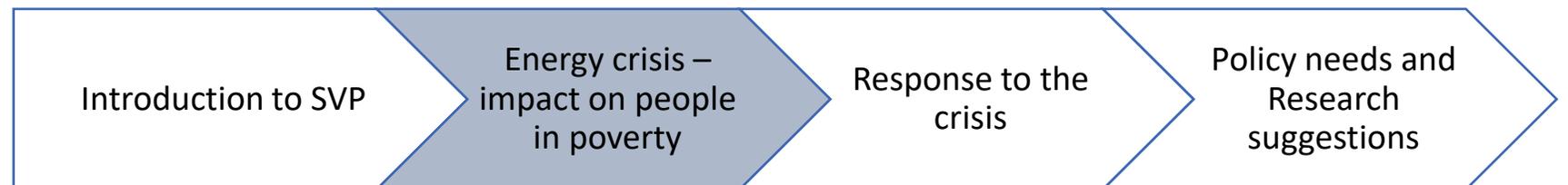


# Impact of the energy crisis (1)



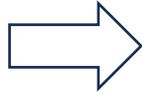
- Huge increases in numbers of people experiencing energy deprivation
- Concentration amongst at-risk groups.

Source: CSO SILC CSO SILC, Enforced Deprivation 2022 | CSO Population Estimates (Author's calculations)

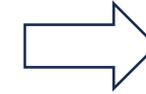


# Impact of the energy crisis (2)

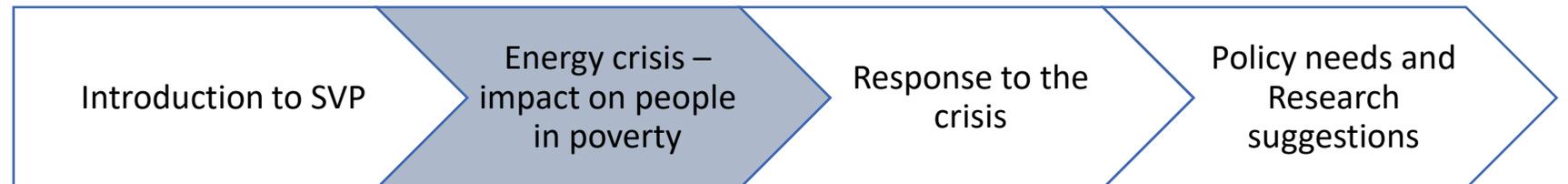
- In 2022 SVP saw calls related to energy up 40% on previous year
- Total calls so far in 2023 up 14% on 2022 – driven by requests related to energy and food



- Many prepay customers seeking assistance – top ups not getting through the week and people having to severely ration or go without energy
- Bill-pay customers receiving bills – and now multiple bill cycles – with no way of paying themselves
- Households reliant on heating oil cannot meet the cost of filling the tank, and go without or use back up fuels



- People forced to cut back and go without the essentials – hot showers, not using the cooker, living in one room, going to bed early to stay warm
- Impacts on people's physical and mental health and their ability to meet their other essential costs



# Impact of the energy crisis (3)

'I probably would have been doing €35 a week and lately it is more like €50. And that is with me being more conscious.'  
(Prepay –Dublin)

'Very aware of what's plugged in now.'  
(BillPay – Dublin)

'You budget for your heating, electric, and fuel for the week. And after that whatever is left is for shopping.'  
(Prepay – Dublin)

'You have to come to an arrangement with them. It's on your mind as well. Before you paid the bill and would not think about it for 2 months but now it stays with you.'  
(BillPay –Dublin)

'We're turning off lights and flicking off switches to beat the band.'  
(BillPay –Dublin)

'When my parents know I am coming they have all the lights and heating on but if I stop in unannounced they are in one room with the Superser on.'  
(BillPay – Dublin)

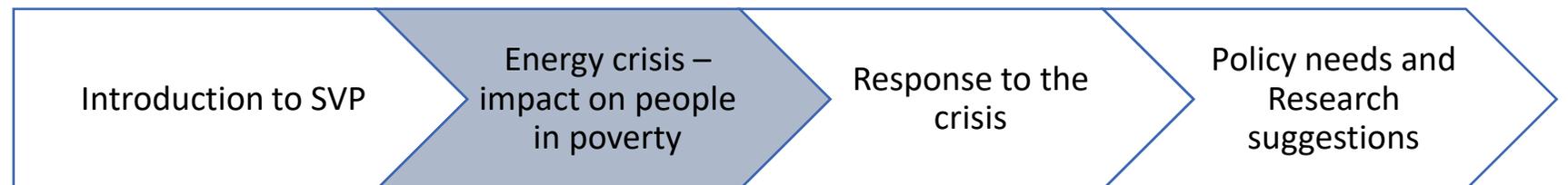
- 58%\* had curtailed essential spending to pay utility bills (9% all the time)
- 43%\* had to go without, or ration electricity (non-heating) due to lack of money (6% all the time)
- 41%\* had to go without heating due to lack of money (6% all the time)
- 79%\* (who had solid fuel) relied on it more as a result of mains heating costs (12% all the time)

\* A little, a lot, or all the time

'Keeping the Lights On' 2023: Figures include NI and ROI, research conducted Oct-Dec 2022 [Keeping-the-Lights-On.pdf \(svp.ie\)](#)



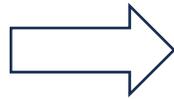
Society of St. Vincent de Paul



# How did we support people – and how can we build on these methods?

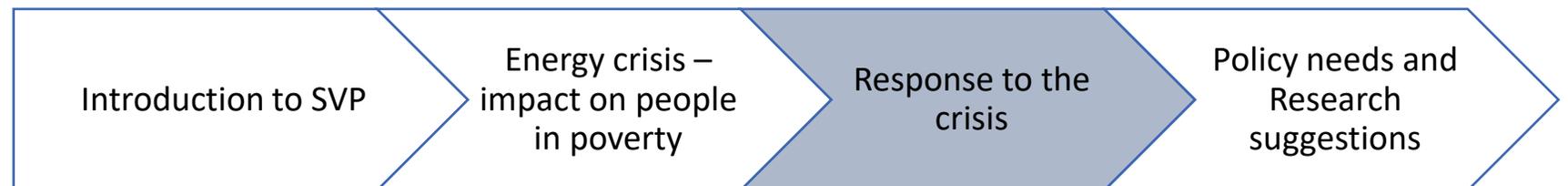
## Some of the recent measures:

- Universal Energy Credits
- Additional social welfare payments
- Consumer protections
- Supplier hardship funds
- Communication campaigns
- Energy Efficiency upgrades
- C&V sector – support, advice, assistance



## Learning from what's happened so far

- People need a guaranteed level of income adequacy to meet their needs
- We must be able to identify and target supports towards people most in need
- Flexibility to reach everybody
- Holistic energy advice and support
- Investment in long-term solutions that build resilience



# Policy enablers – achieving sustainable and inclusive energy security

## Stability

Once-off or finite supports do help, but they leave people in a precarious position.

Low-income households need a predictable and stable foundation to plan and budget around.

## Infrastructure

We need the infrastructure for medium- and long-term change, as well as crisis response.

A consumer advocacy agency could represent the needs of energy customers  
Community energy advice could offer one-to-one support

## Visibility

Do we know enough, and quickly enough, who needs support?

Better monitoring and data collection.

More use of mechanisms like the Vulnerable Customer Register.

Hearing from people directly.

## Equity

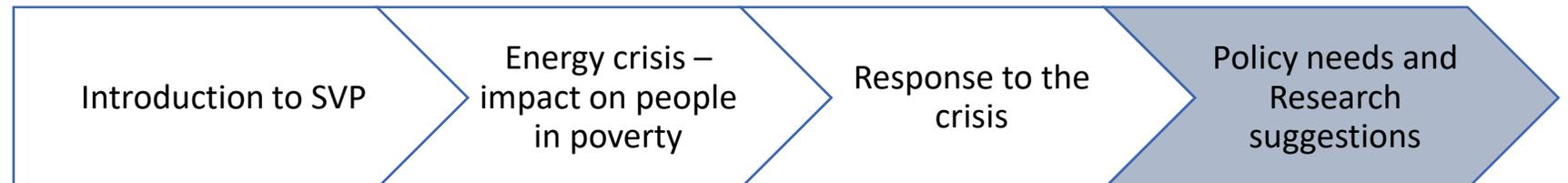
There are gaps in who is covered in energy poverty responses.

For energy efficiency, this includes private renters.

We need an energy poverty target and sub-target.



Society of St. Vincent de Paul



# Research questions and suggested focuses

?

Different groups experience of the energy market – e.g. prepay customers, private renters?

?

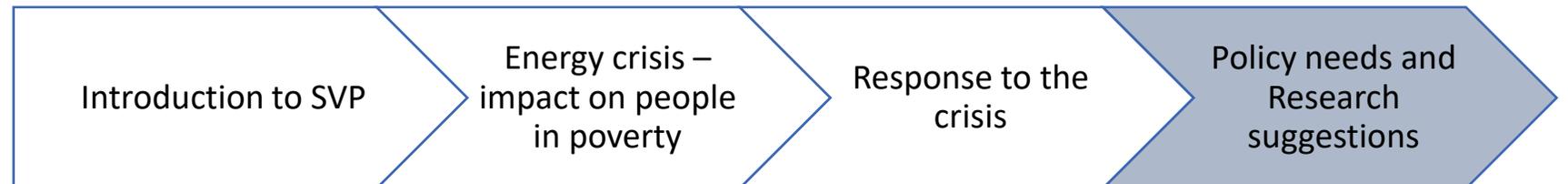
How different groups of consumers experience and navigate new technology?  
What protections are needed?

?

What new mechanisms do we need to get support to people?  
Technical and social

?

Co-design of solutions and developments with people in energy poverty?



# Thank you

Issy Petrie

Society of St Vincent de Paul

September 2023



Society of St. Vincent de Paul

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# Realising Ireland's offshore potential in achieving energy security and more

Vice Adm (Rtd) Mark Mellett



# Agenda

- Climate Crisis
- Offshore Renewable Energy Opportunity Ireland
- Some Key Messages
  - Research Area of Focus
  - Policy needs/enablers



# A healthy and vibrant ecosystem 60 years ago



*A collapsed and dying  
ecosystem today.*

Since:

**1970** - 65% loss of vertebrate wildlife.

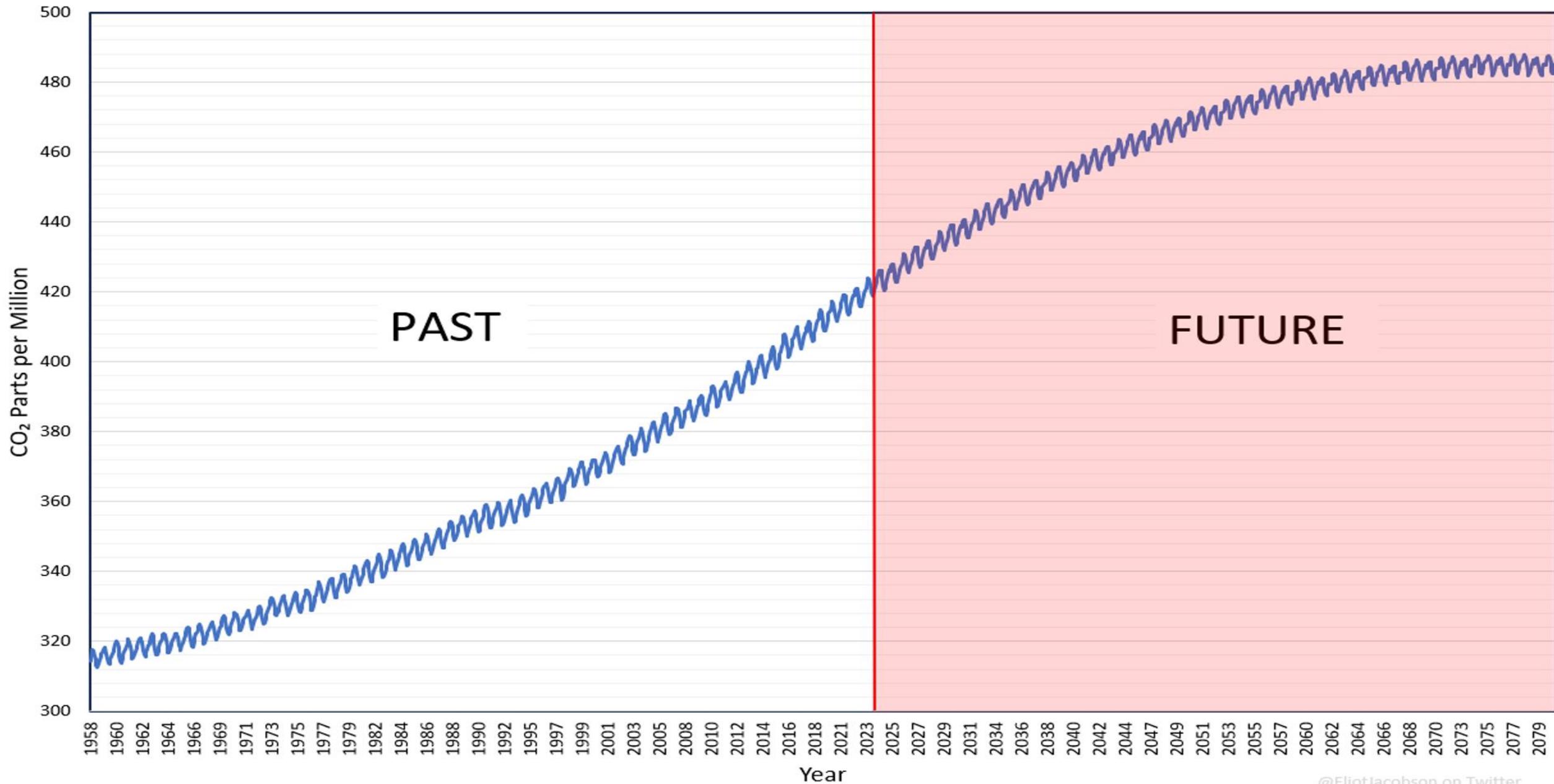
**1989** - 75% reduction in Insects including pollinators.

Significant loss of Rainforest and vulnerable marine ecosystems like warm and cold water corals.

Significant increase in sea water acidification.

# Past and Future Keeling Curve, through 2080

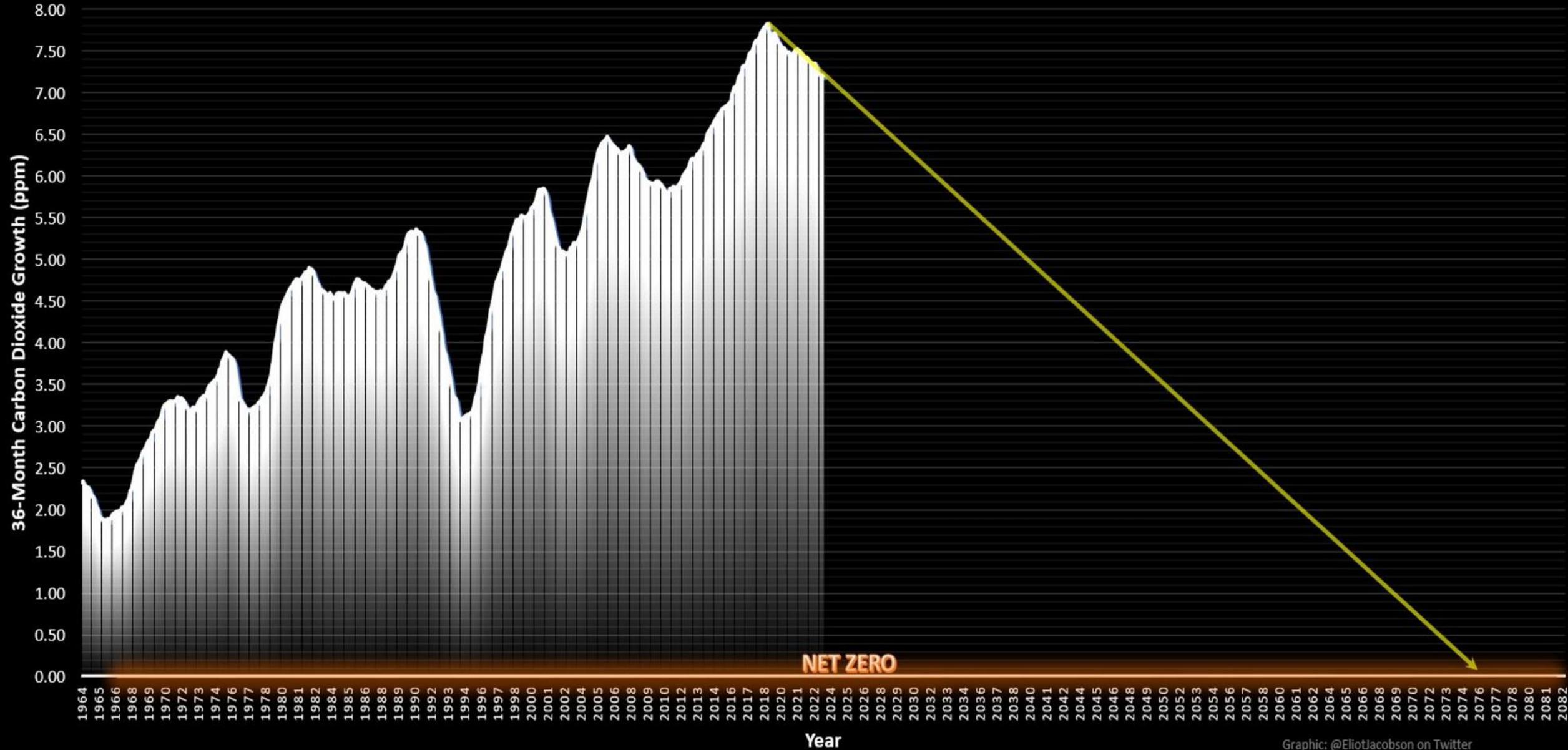
(based on observed decline in rate of CO<sub>2</sub> growth from Aug. 2019 to Aug. 2023)



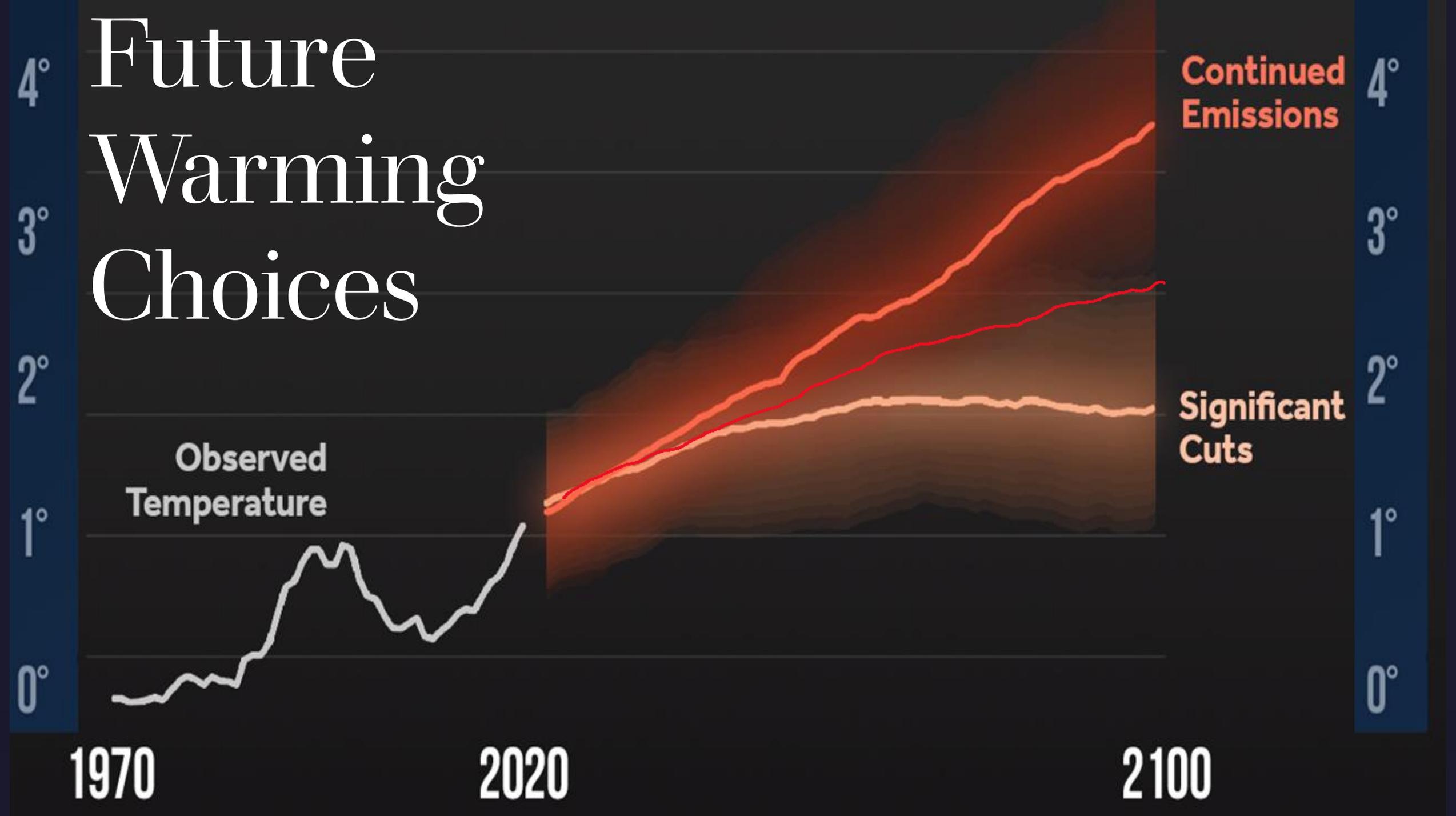
# 36-month mean rate of atmospheric CO<sub>2</sub> growth (ppm)

March, 1964 - August, 2023

Data: [https://gml.noaa.gov/webdata/ccgg/trends/co2/co2\\_mm\\_mlo.txt](https://gml.noaa.gov/webdata/ccgg/trends/co2/co2_mm_mlo.txt)



# Future Warming Choices



Observed Temperature

Continued Emissions

Significant Cuts

1970

2020

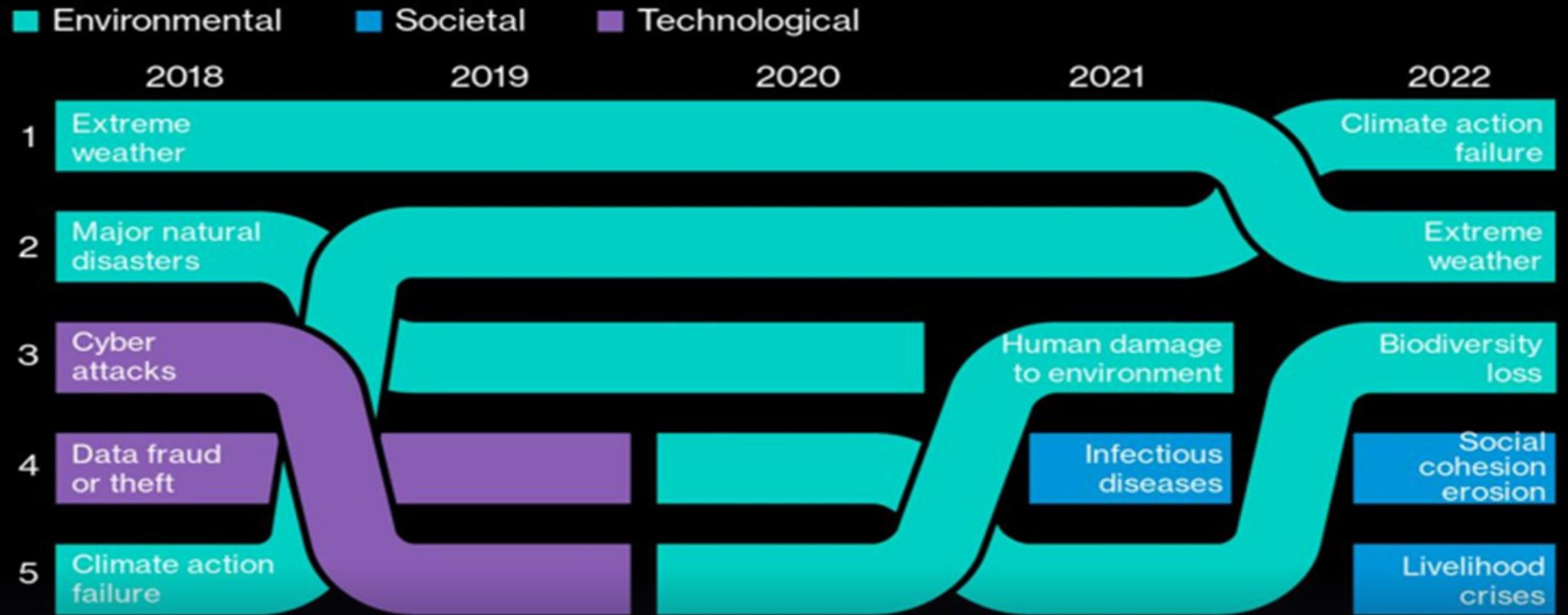
2100

4°  
3°  
2°  
1°  
0°

4°  
3°  
2°  
1°  
0°

# The World's Biggest Risks

Likelihood of top risks to occur over the next 10 years



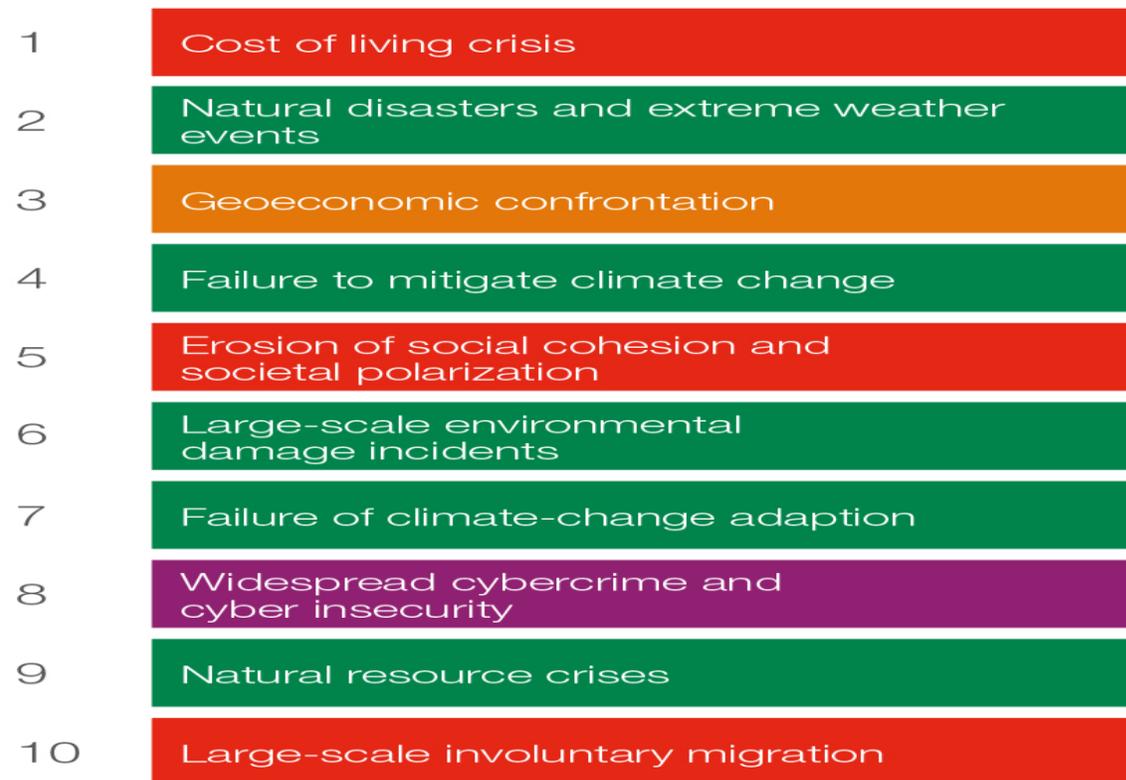
Source: World Economic Forum Global Risks Report 2022

**Bloomberg**

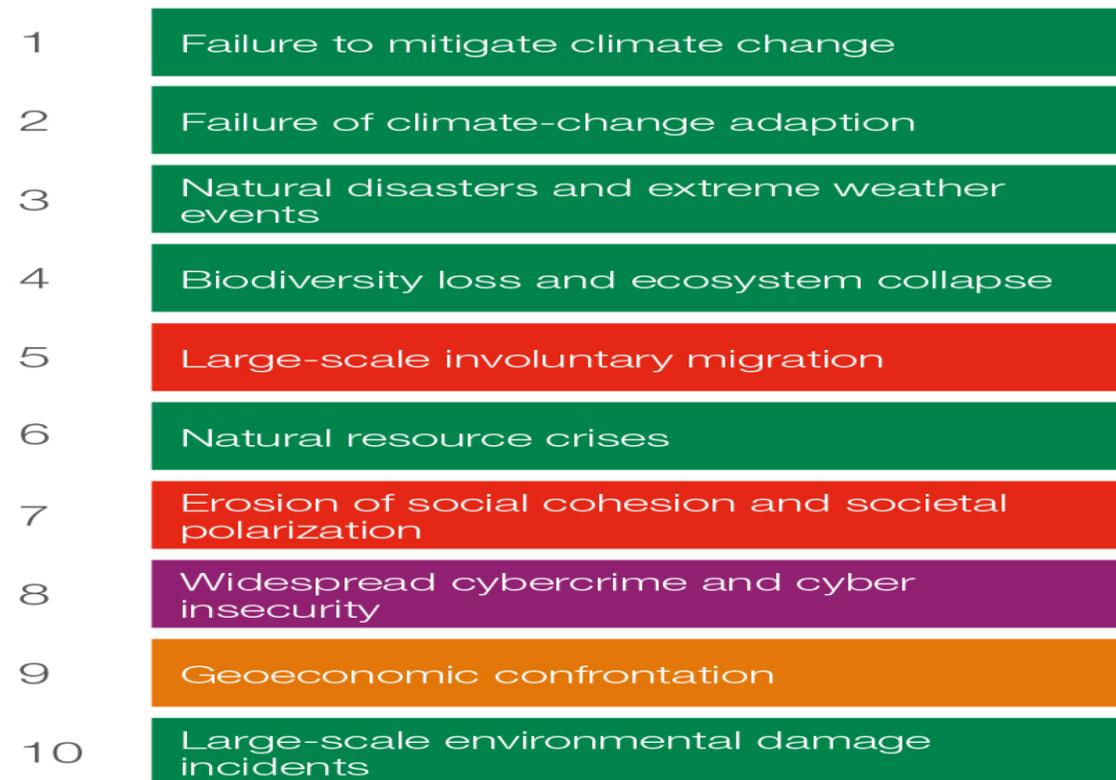
# Top 10 Risks

“Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period”

## 2 years



## 10 years



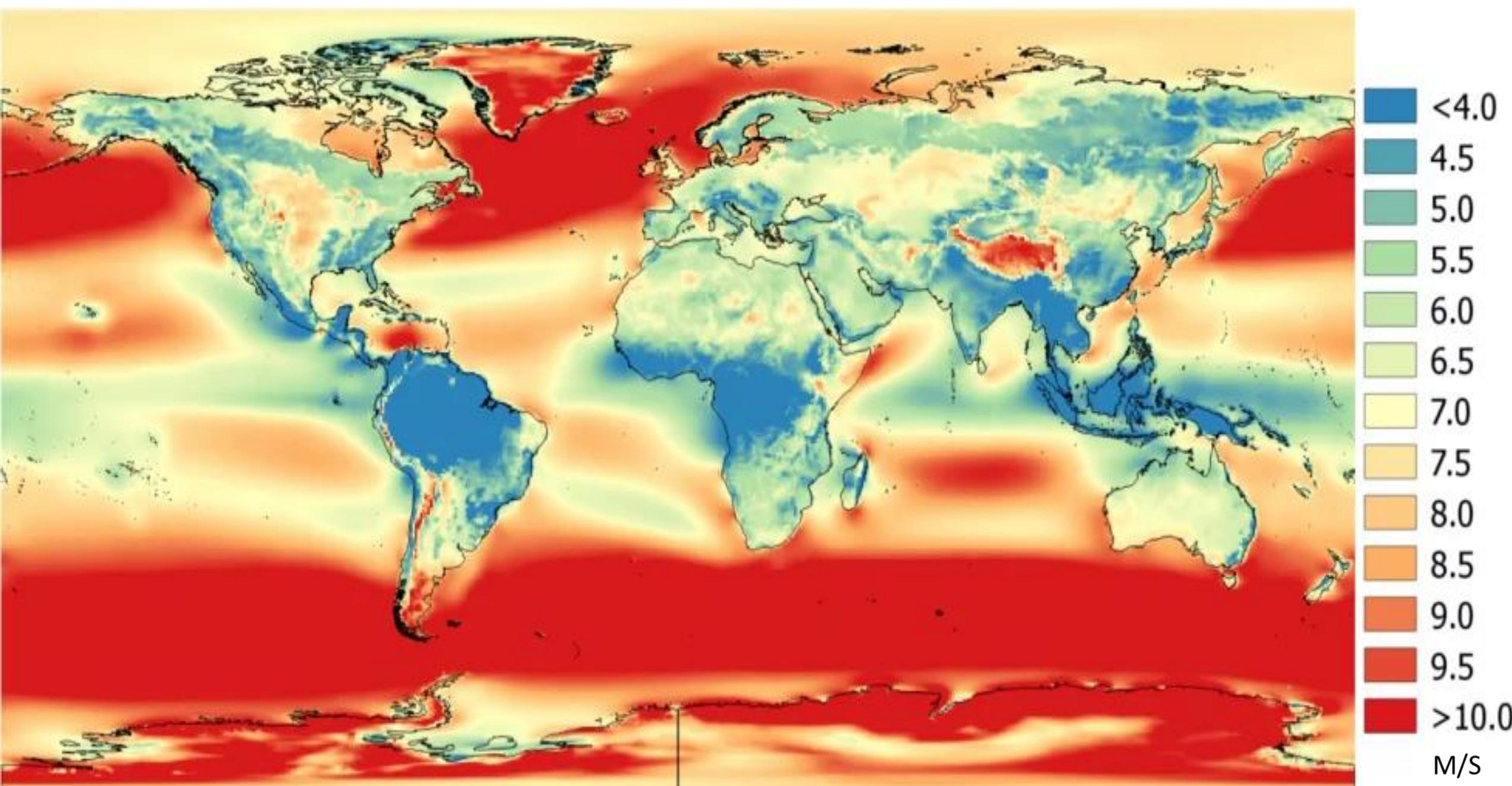
### Risk categories

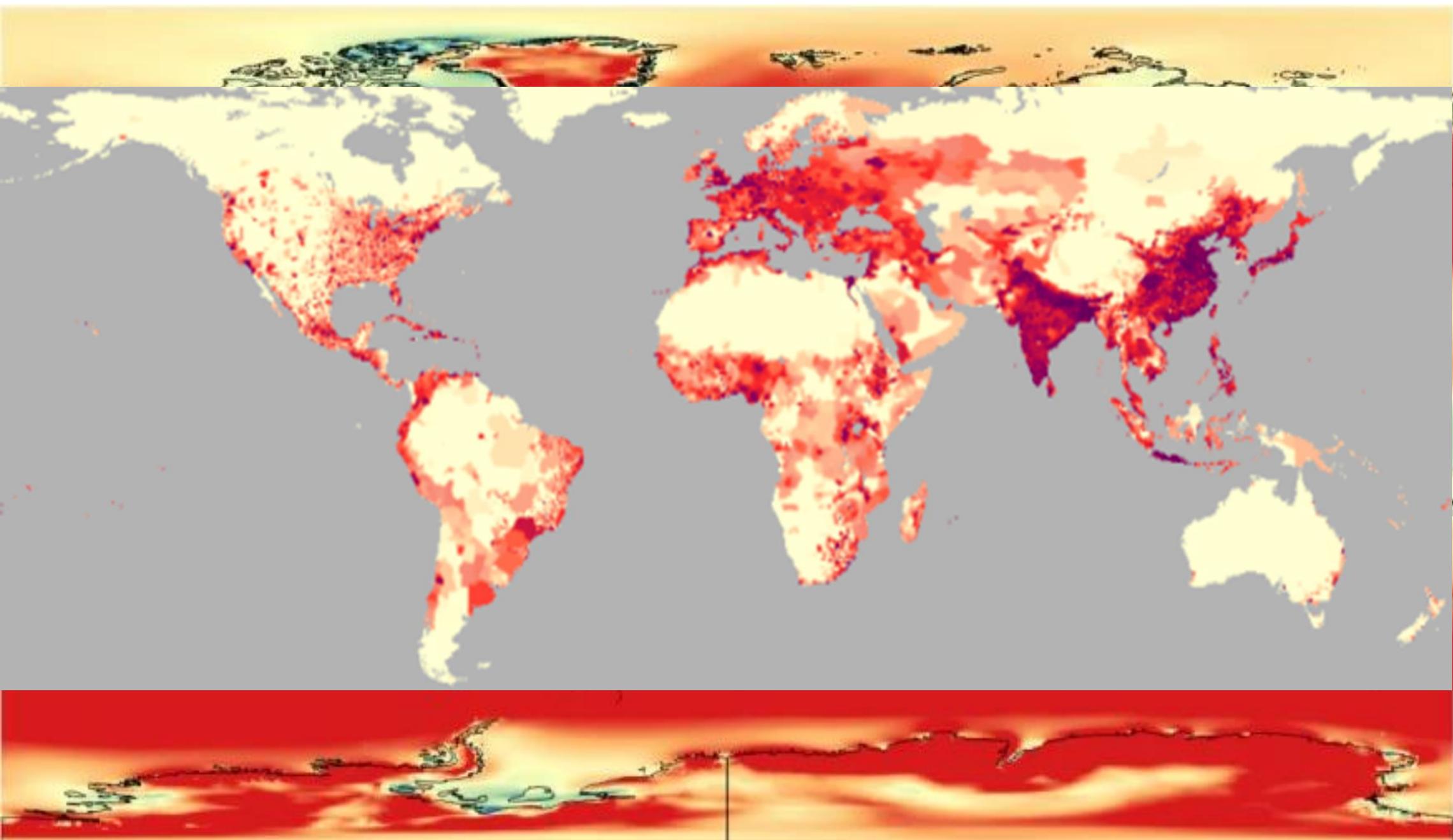
■ Economic   
 ■ Environmental   
 ■ Geopolitical   
 ■ Societal   
 ■ Technological

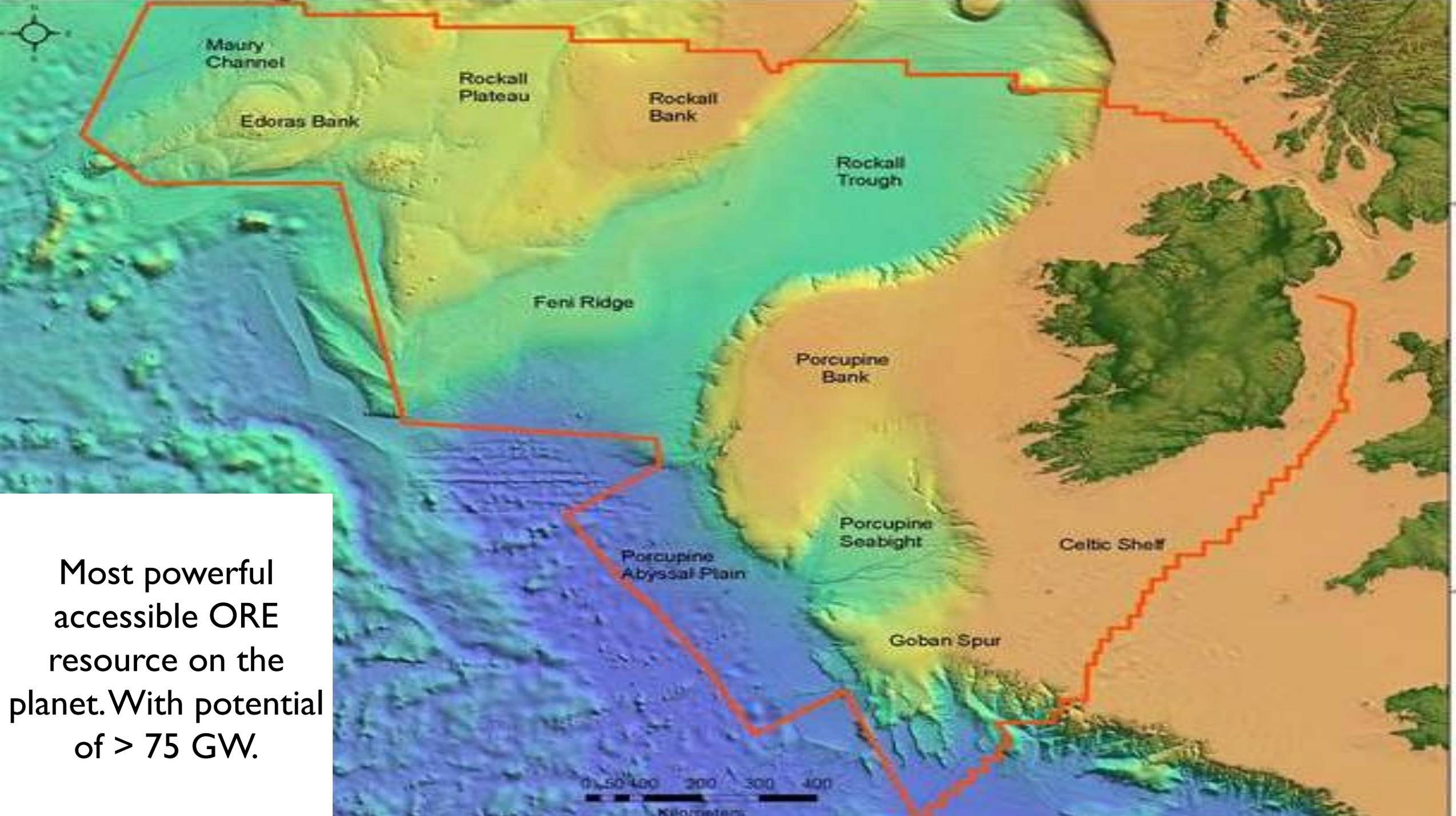
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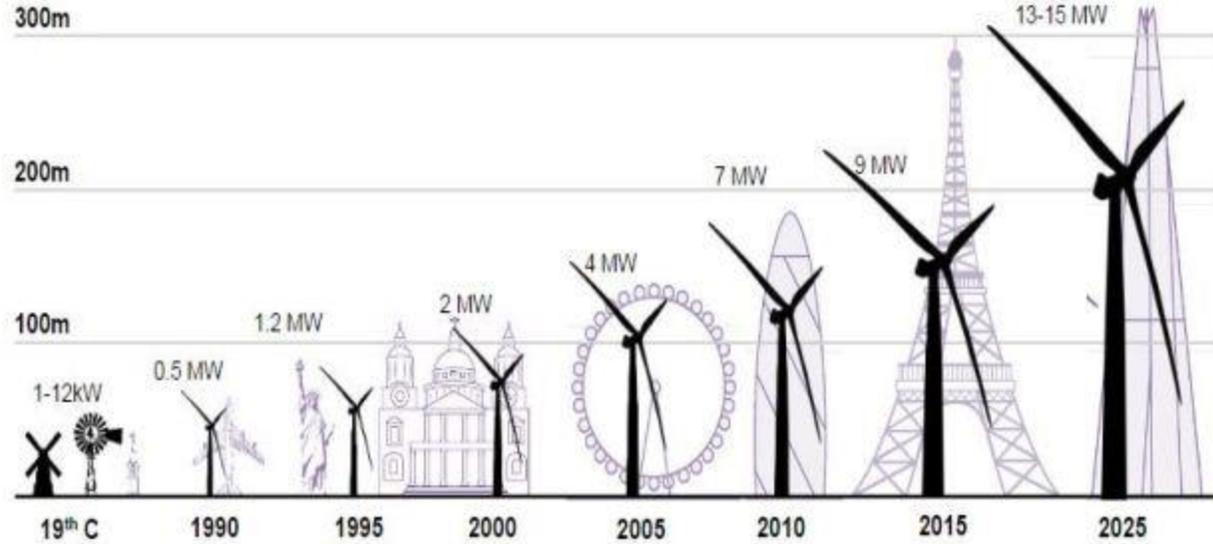




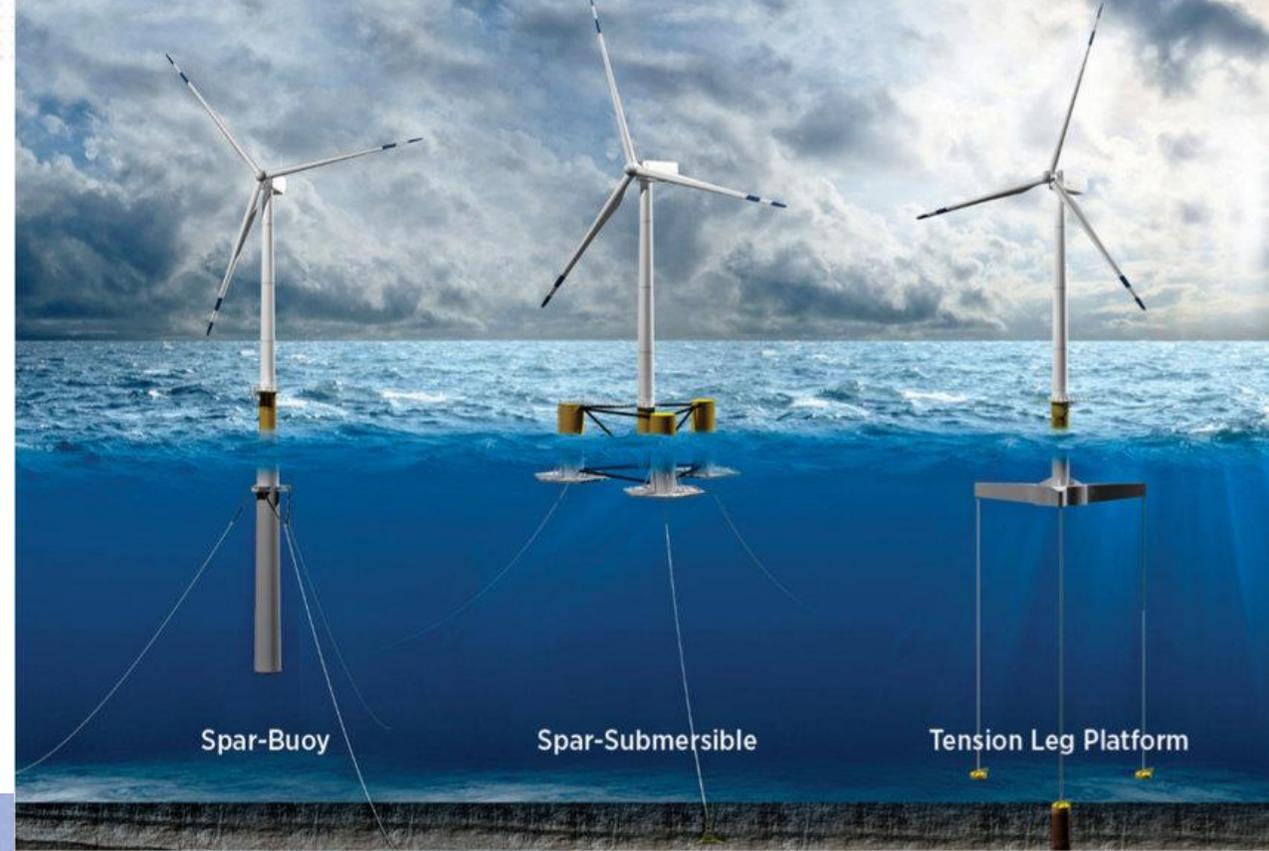


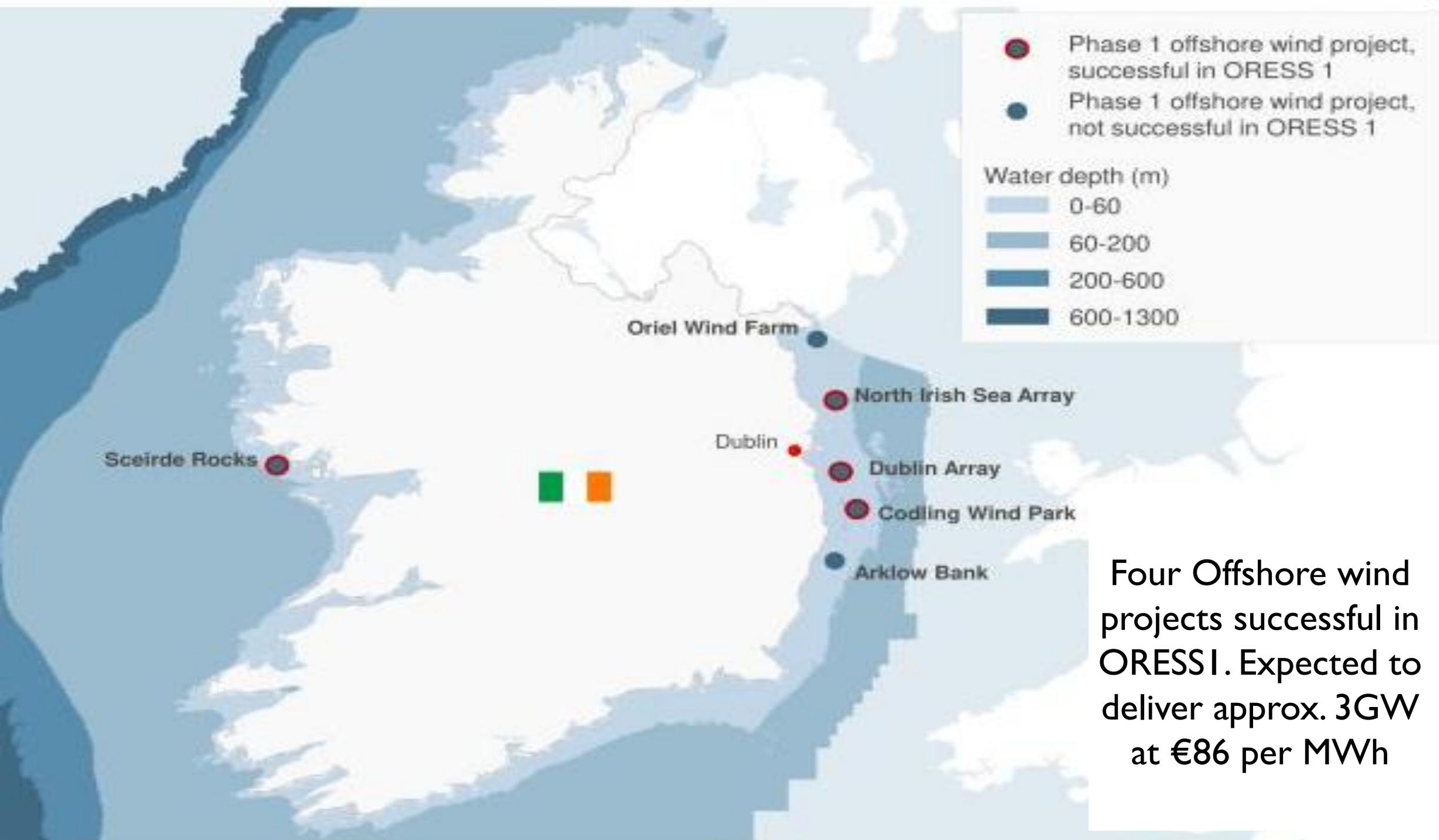
Most powerful accessible ORE resource on the planet. With potential of  $> 75$  GW.

# Evolution of wind turbine heights and output

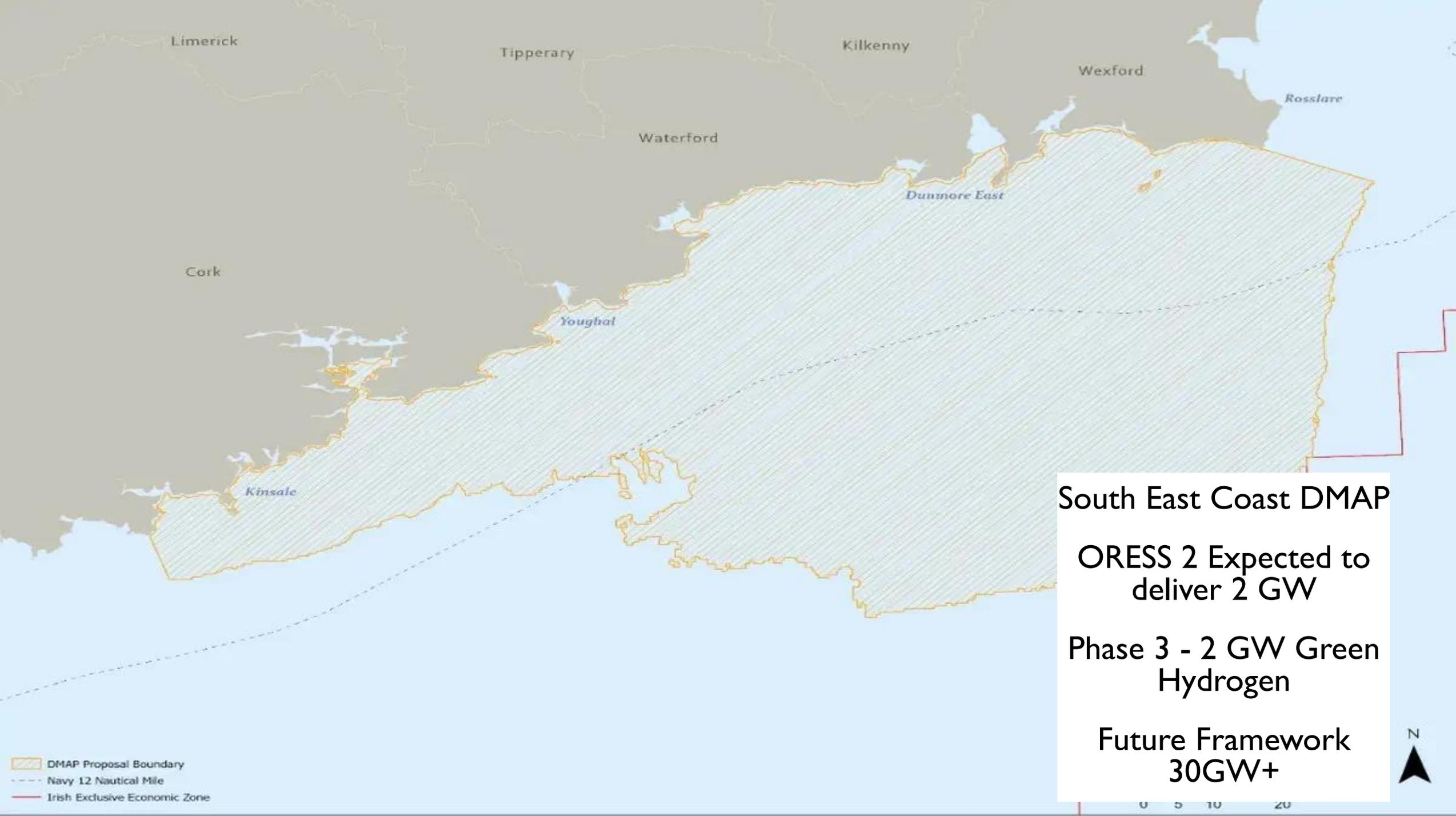


Sources: Various; Bloomberg New Energy Finance





Four Offshore wind projects successful in ORESS I. Expected to deliver approx. 3GW at €86 per MWh



# Agenda

- Climate Crisis
- Offshore Renewable Energy Opportunity Ireland
- Some Key Messages
  - Research Area of Focus
  - Policy needs/enablers



# Research Area of Focus

Further an innovation policy that facilitates prototype testing and demonstration and energy park development with appropriate revenue support centred on the Atlantic Marine Energy Test Site (AMETs), Galway Bay and elsewhere incorporating *inter alia*.

Offshore Renewable Energy, Wave, Wind Tidal

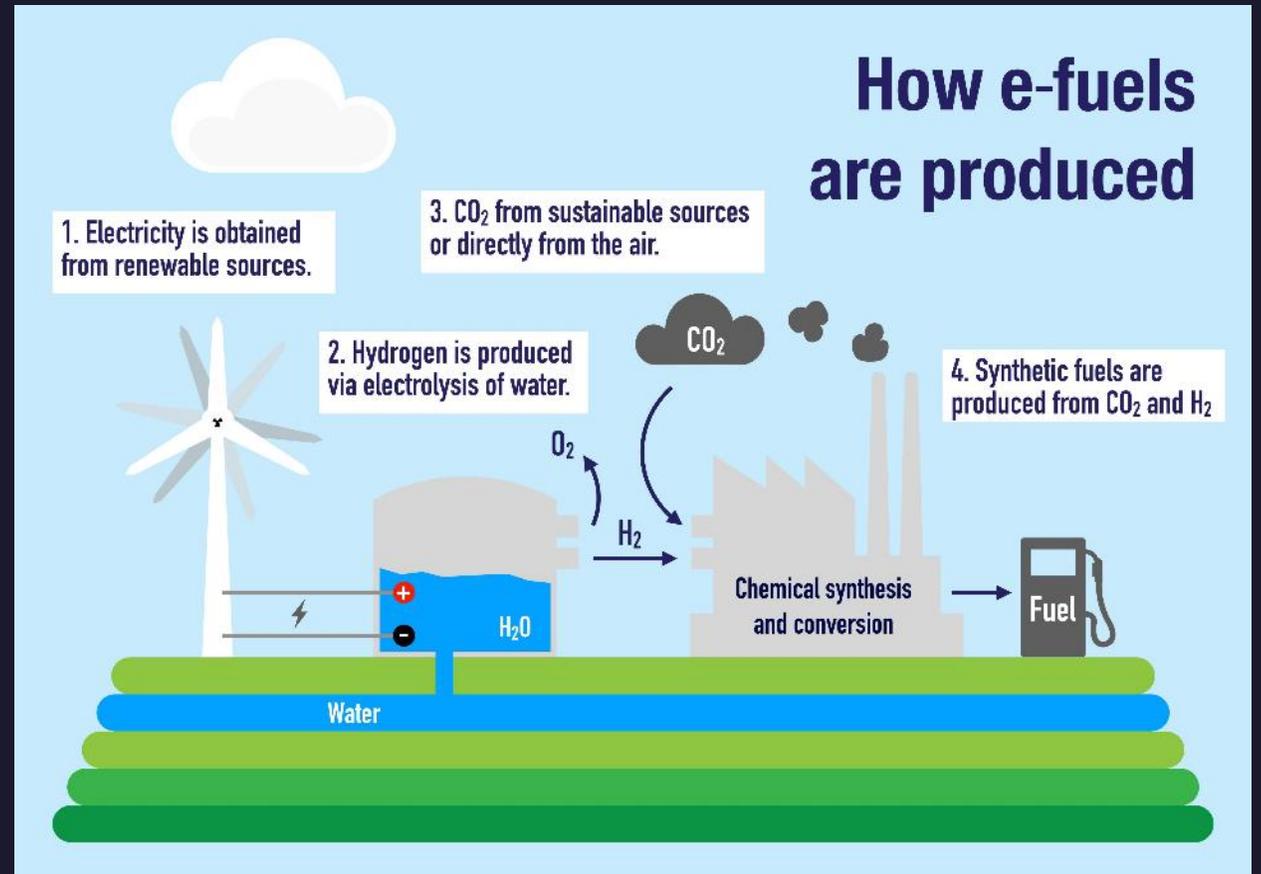
Green Hydrogen

Carbon Capture and Sequestration

E-Fuel production

New Generation Grid

Defence and Security technologies.



# Policy Needs/Enablers

Move towards improved cross-cutting integrated maritime policy coordination and integration encompassing *inter alia*:

SEAI

Marine Spatial Planning

DECC

NPWS

DAFM

Maritime Area Regulatory Authority

Defence and Security



**Enhance coherence in  
Government Policy &  
Institutions**

**Government  
& Policy**

**Incentivise Technology,  
developers & supply chain.**

**Market &  
Enterprise**

**Ecosystem  
Governance**

**Implicate Civil Society in  
sustainable leadership**

**People  
& Values**

