

## Assessing UK and Global Challenges and Uncertainties

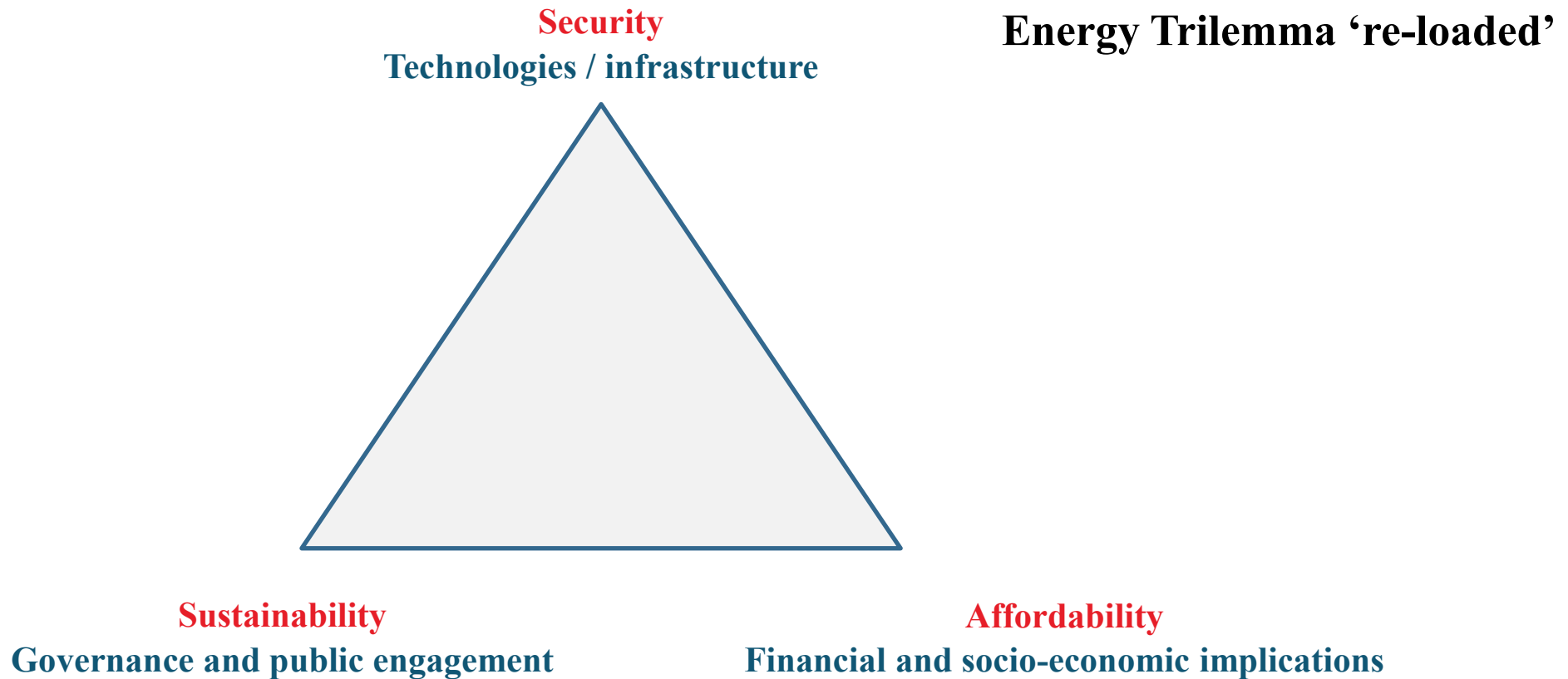
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*Head of Economics*

WEF  
*24<sup>th</sup> February 2022*



# Net zero - implications for investments and deploying transition infrastructure

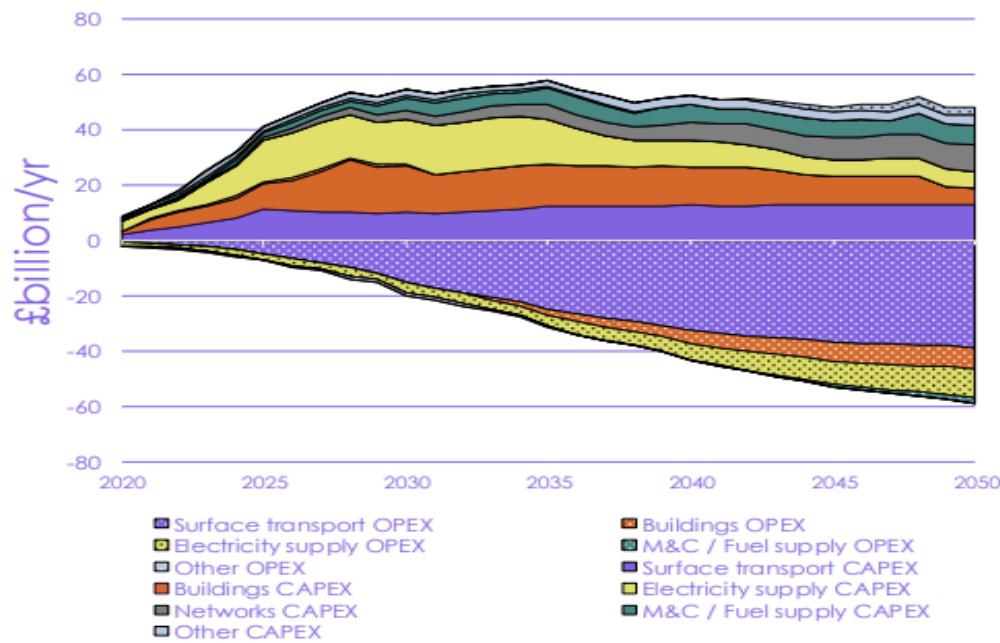
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# Energy transition challenge

## Capital investment costs and operating costs savings in the balanced pathway [UK]

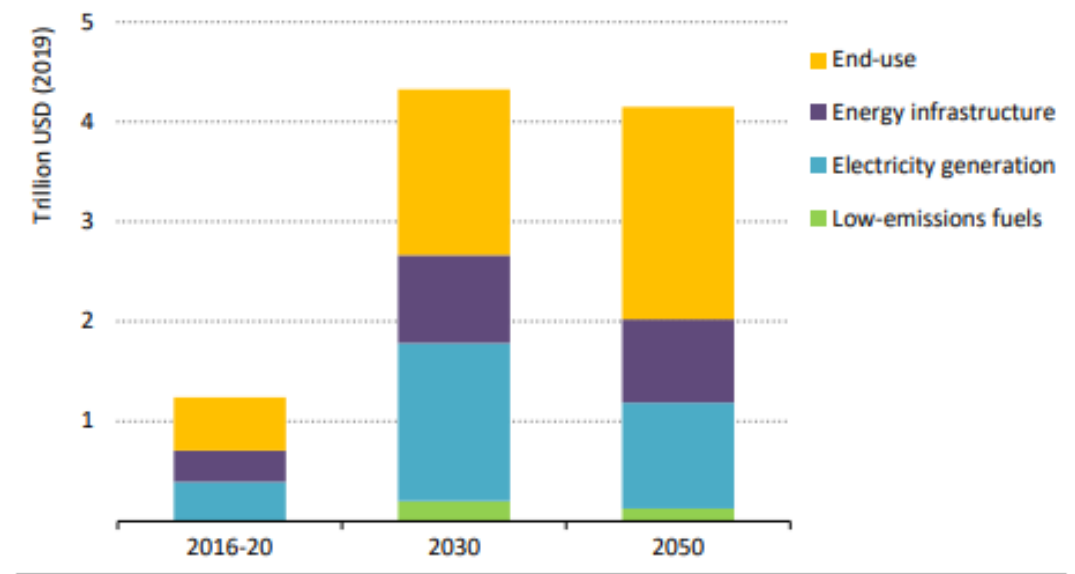
Source: CCC analysis



## Clean Energy Investment 2050

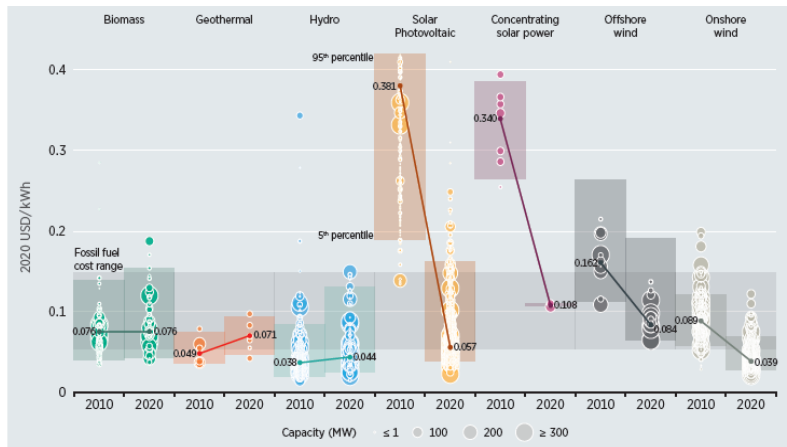
Source: IEA Net Zero Report 2021

### Clean energy investment in the net zero pathway

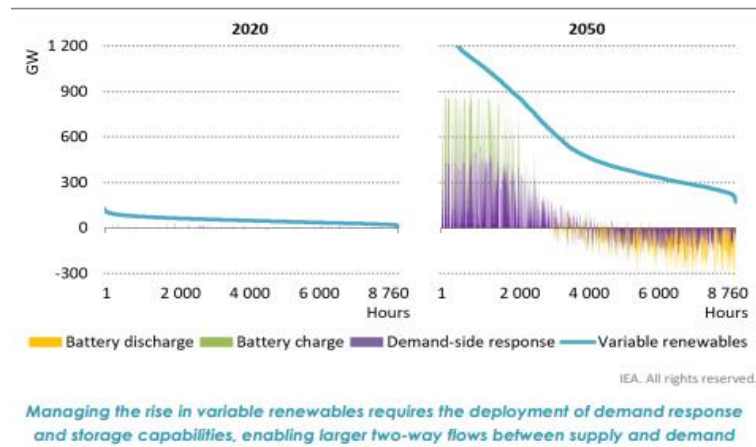


# Security – Technology / Infrastructure

## Innovation and cost reduction

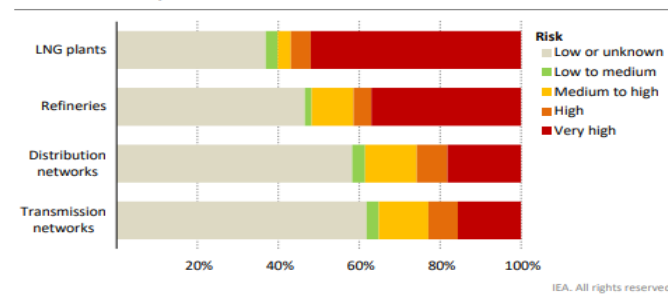


## System balancing / Integration



## Security of infrastructure – natural disasters

Figure 6.11 ▶ Share of energy infrastructure capacity at risk of destructive cyclones, 2020

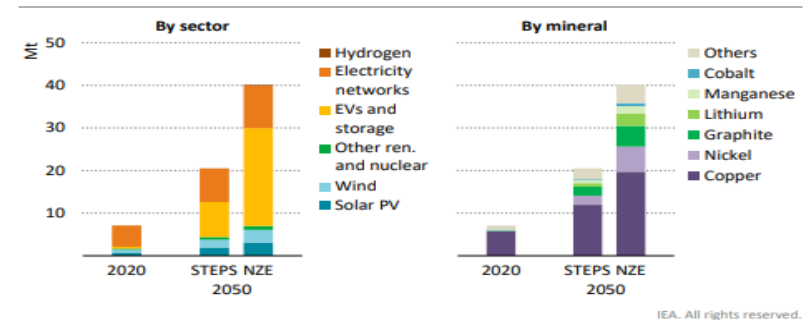


A large portion of electricity networks and fuel supply infrastructure is exposed to high risk from destructive cyclones

Notes: Risk levels are classified based on the probability of wind speed exceeding 80 kilometres per hour (1 in 50, 100, 250, 500 and 1 000 years). Those within 60 degrees latitude north and south are included in the assessment. Source: IEA analysis based on UNDRR (2015) and Arderne et al. (2020).

## Supply chain – minerals

Figure 6.14 ▶ Mineral requirements for clean energy technologies by scenario



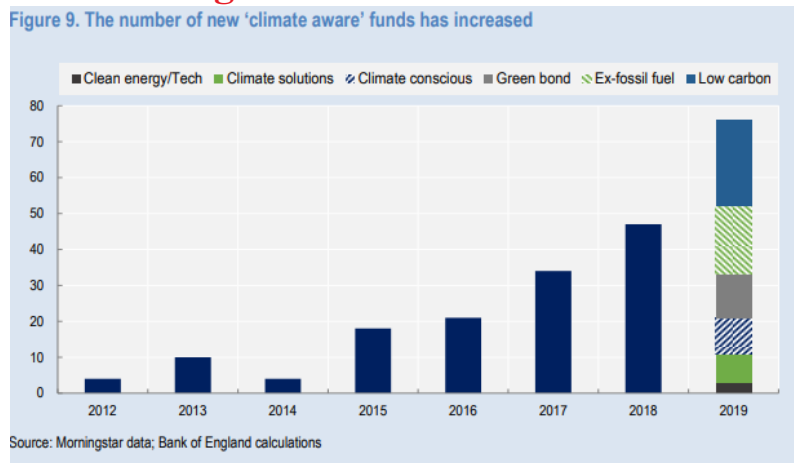
In the NZE, mineral requirements for clean energy technologies increase by up to six-times by 2050, with particularly high growth for EV-related materials

Notes: Mt = million tonnes; ren. = renewables. Includes most of the minerals used in various clean energy technologies, but does not include steel and aluminium. (See IEA, 2021g for a full list of minerals assessed.)

# Affordability – Financial and socio-economic implications

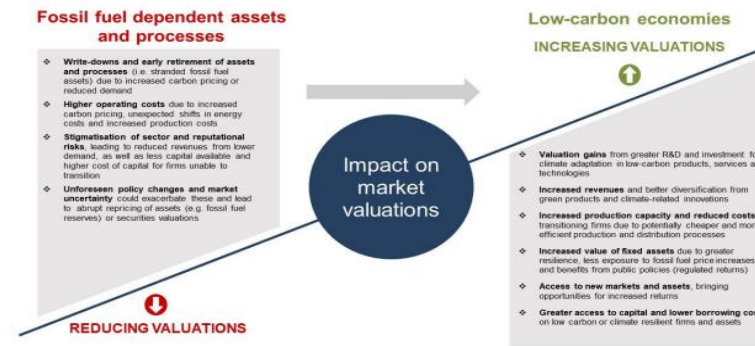
## New funding mechanisms

Figure 9. The number of new 'climate aware' funds has increased



## Financial valuations of assets and

OECD conceptual valuation framework to understand and assess key factors that may influence market pricing associated with a transition to low-carbon economies.

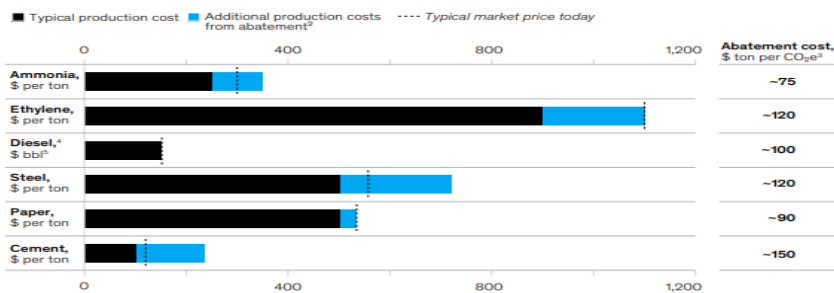


Note: Non-exhaustive illustration.  
Source: OECD staff assessment. Adapted from aspects of TCFD reporting with respect to climate transition risks and opportunities, and other market considerations.

## Unit costs change in energy and

Decarbonization can raise near-term unit costs for various sectors; these increases will need to be managed.

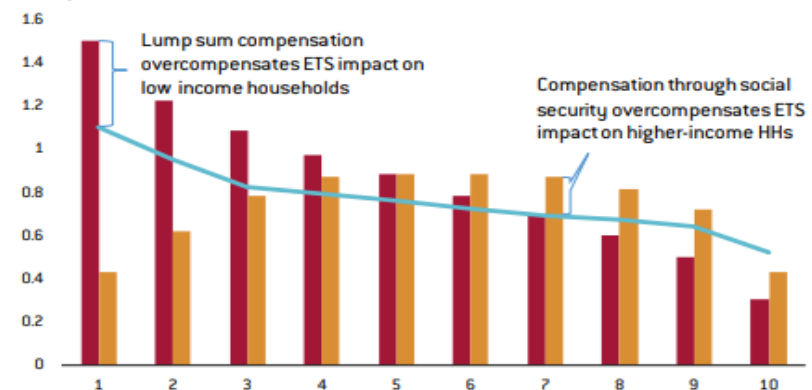
Production cost and 2030 additional abatement costs per industry<sup>1</sup>



<sup>1</sup>Based on 2030 abatement cost.  
<sup>2</sup>Based on earnings before interest, taxes, depreciation, and amortization margin of companies with primary activity in production in a given commodity.  
<sup>3</sup>CO<sub>2</sub>e calculated based on 100-year global-warming potentials (IPCC AR4).  
<sup>4</sup>Additional abatement cost for diesel is small but not zero (~\$2 per bbl).  
<sup>5</sup>Per barrel.  
Source: Company reports; "How the European Union could achieve net-zero emissions at net-zero cost," December 3, 2020, McKinsey.com

## Distributional impact

Figure 23: Impact of the EU ETS and revenue redistribution by household expenditure decile

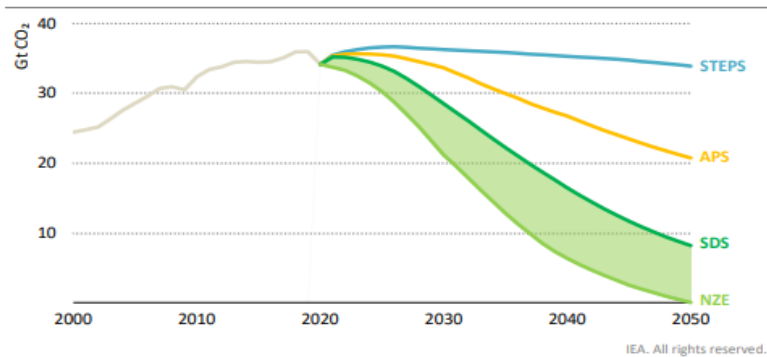


Source: Cludius (2015). Note: SCC = social security contributions.

# Sustainability – governance and public engagement

## International cooperation

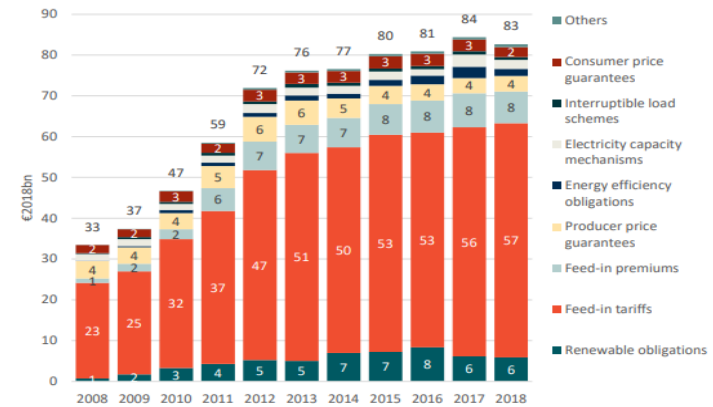
**Figure 1.4** ▶ CO<sub>2</sub> emissions in the WEO-2021 scenarios over time



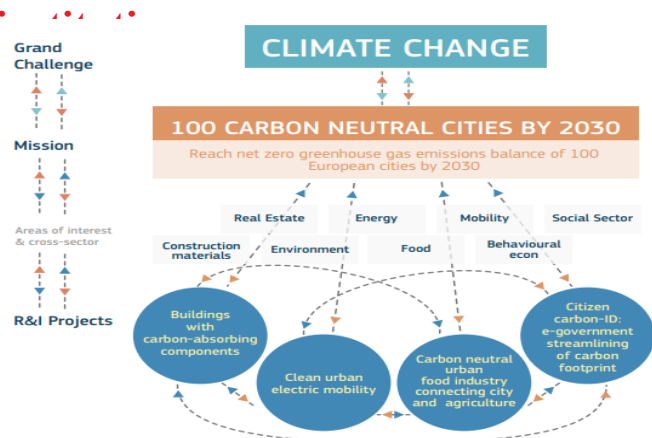
The APS pushes emissions down, but not until after 2030; the SDS goes further and faster to be aligned with the Paris Agreement; the NZE delivers net zero emissions by 2050

## New and changing mechanisms

**Figure 2-16** Income and price supports in the EU27 by type (€2018bn, 2008-2018)<sup>11</sup>

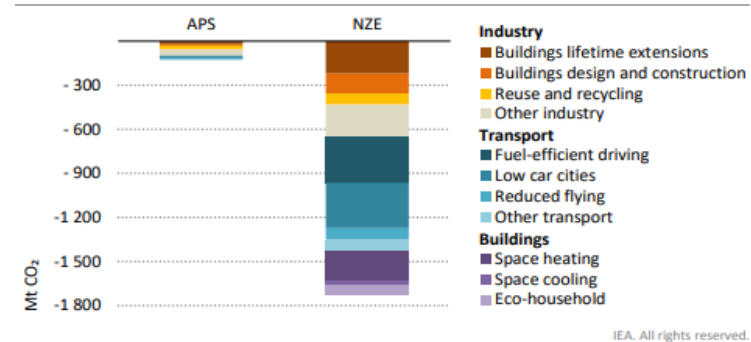


## Governance standards, metrics and



## Citizens buy-in – Behavioural change

**Figure 3.29** ▶ Impact of behavioural change and materials efficiency by sector and scenario, 2030

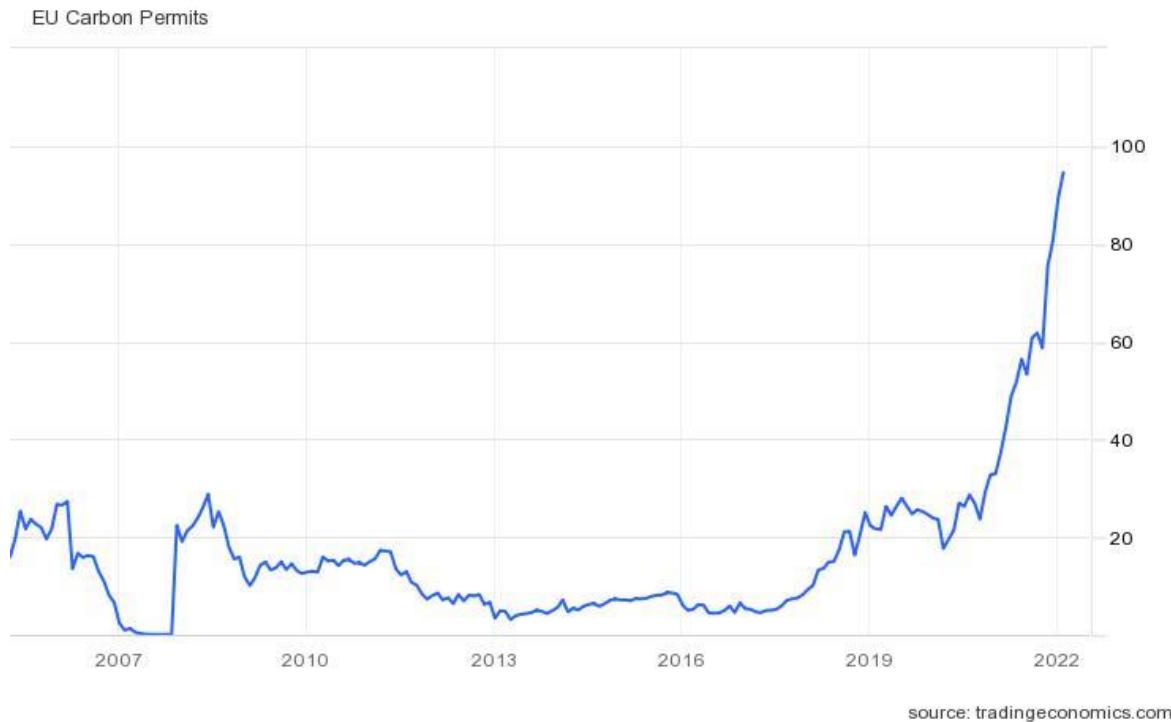


Only limited behavioural changes are included in the APS, while the NZE projects far more, but needs targeted policies to realise them



# What role for carbon markets?

## Carbon prices



## Compliance Carbon Markets

Carbon allowances could provide **downside protection** and **enhance risk adjusted returns** in scenarios involving **immediate or delayed climate actions**.



Annualised return<sup>3</sup>  
**+ 50 to 70**  
basis points



On average, approximately  
**0.5% to 1%** allocation  
of carbon allowances could  
mitigate negative impact  
of portfolio returns<sup>4</sup>

## Voluntary Carbon Markets

VCMs are expected to **experience significant growth** with the potential to reach market value of **US\$5B - US\$30B** in 2030



Natural climate solutions account for **65-85%** of total supply potential by 2030



Number of corporate net-zero pledges has increased by **2x** in 2020



**15x** increase in potential demand for carbon credits by 2030

*“The Spirit of Green is a conceptual framework for the design of institutions, laws and ethics for an interconnected society.”*

*William Nordhaus 2021*

ARUP