

# AVOID<sup>2</sup>

Can we avoid dangerous climate change?

## Exploring the feasibility of low-carbon scenarios using historical energy transitions analysis

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# Synopsis

Modelled scenarios of 2°C exhibit rapid low-carbon technology deployment – is this realistic?

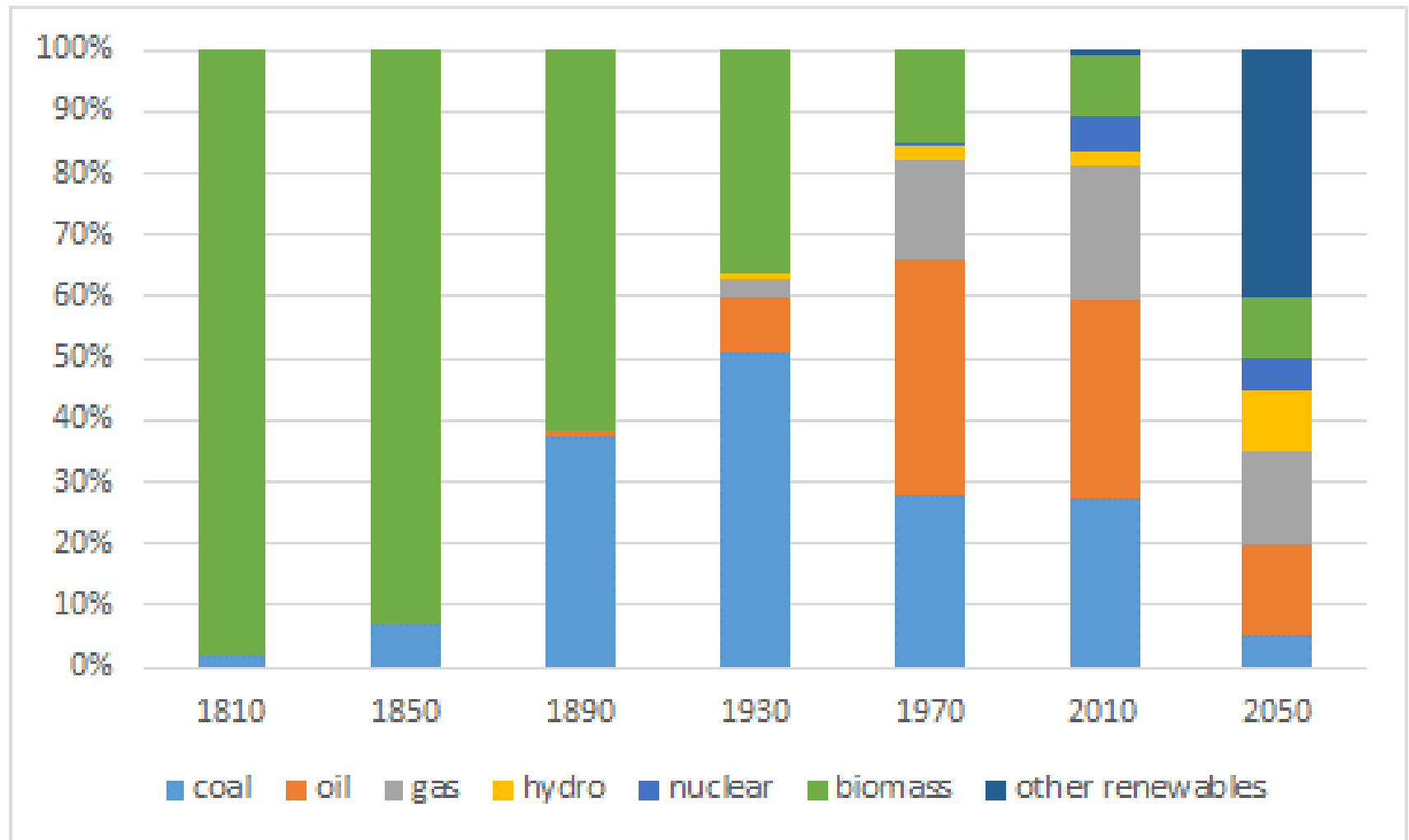
What can we learn from historical energy transitions?

Six methods to assess realism of a modelled 2°C pathway

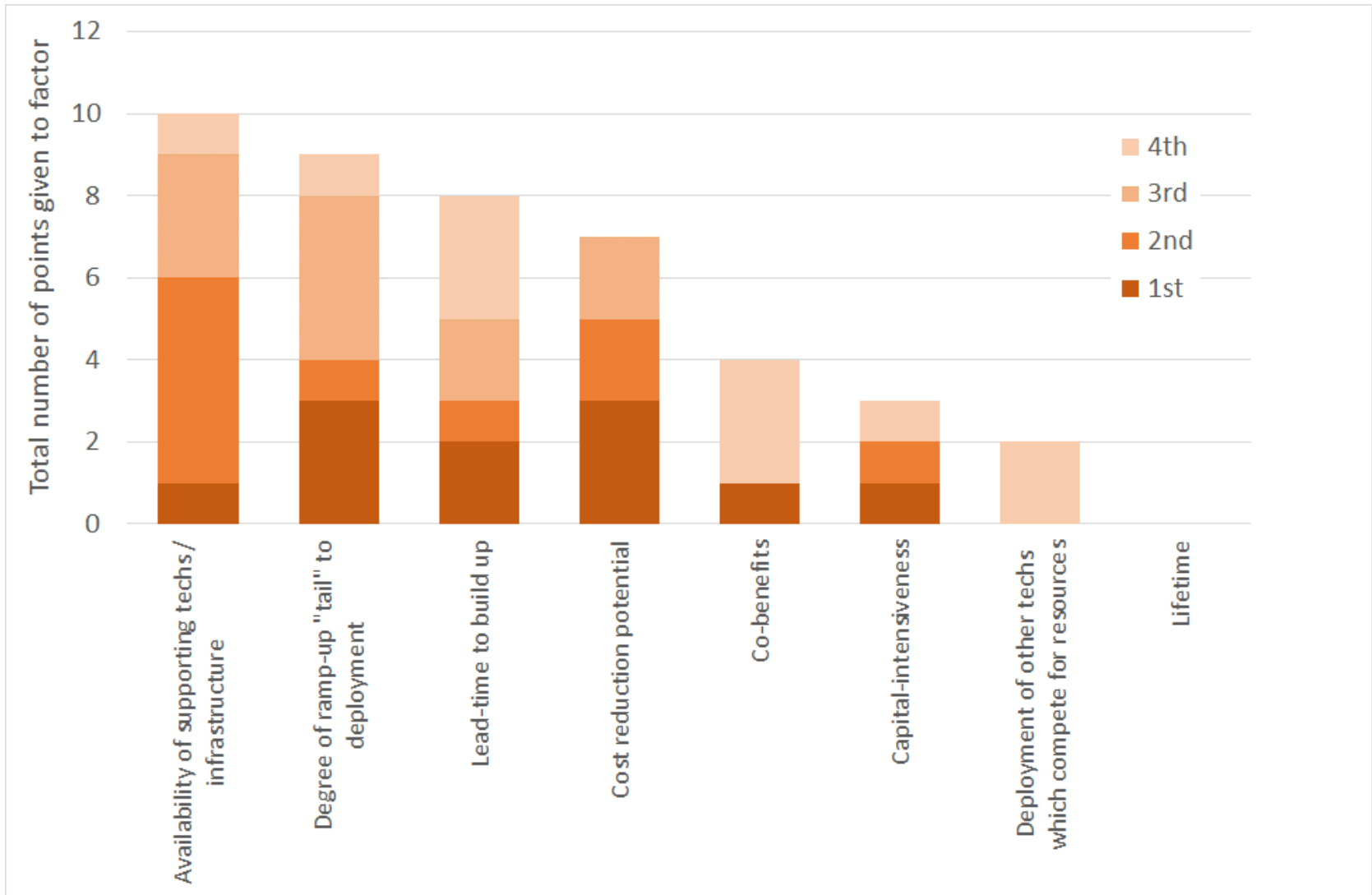
Adjustments to pathway to make it more realistic

Can we still achieve 2°C?

# How do future 2°C scenarios compare to the past?



# What do the experts think about factors to consider?



# What does the literature say?

Individual technologies rarely grow at >20% per year

Technologies have not been deployed at more than several 10's of GW per year

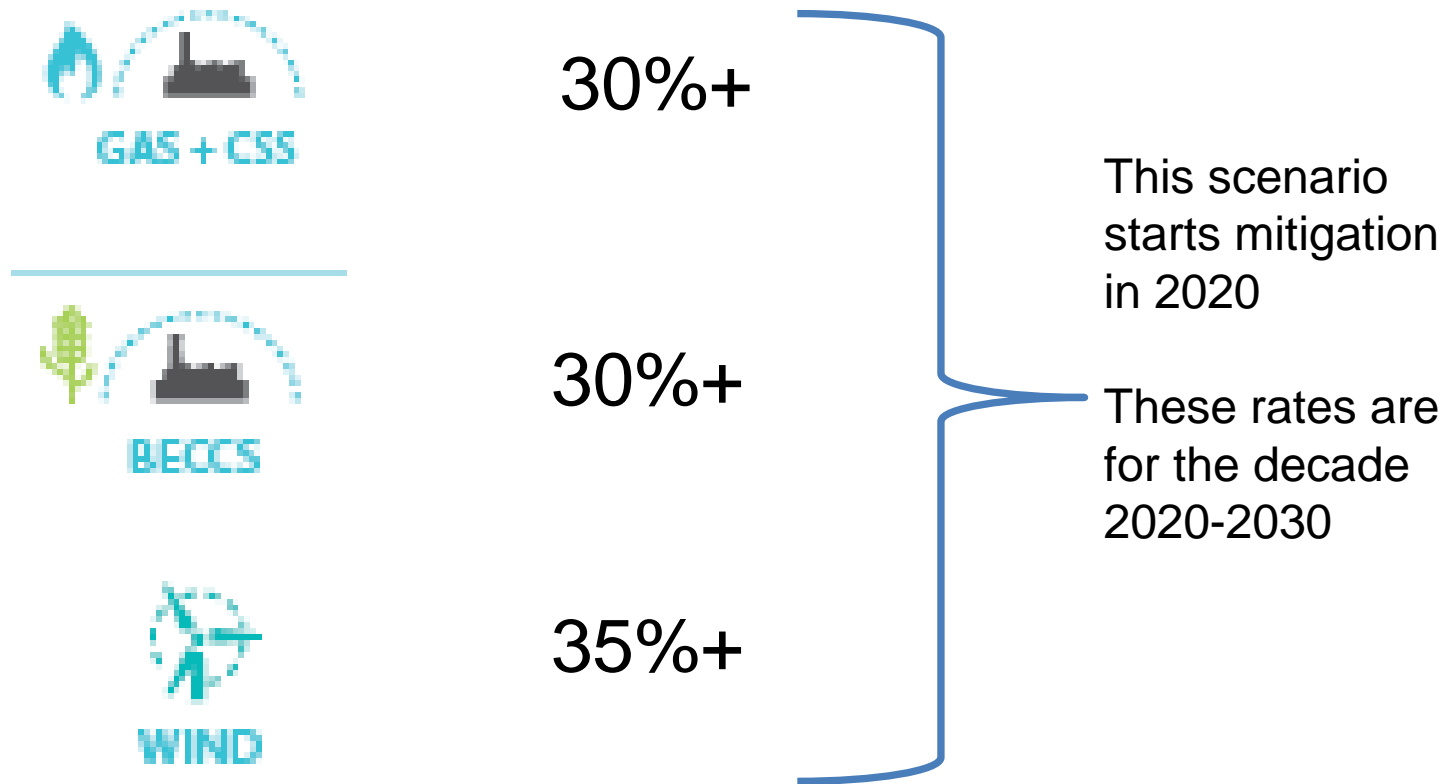
Growth curves tend to be "s-shaped"

The greater the eventual extent of deployment, the longer the duration of deployment

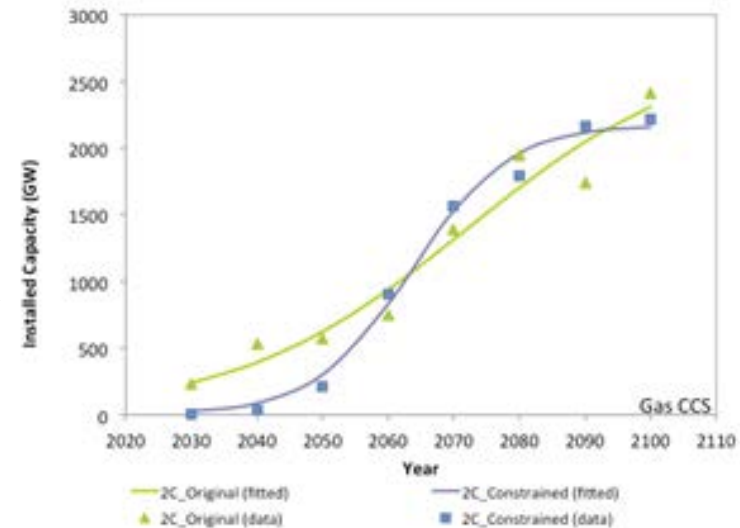
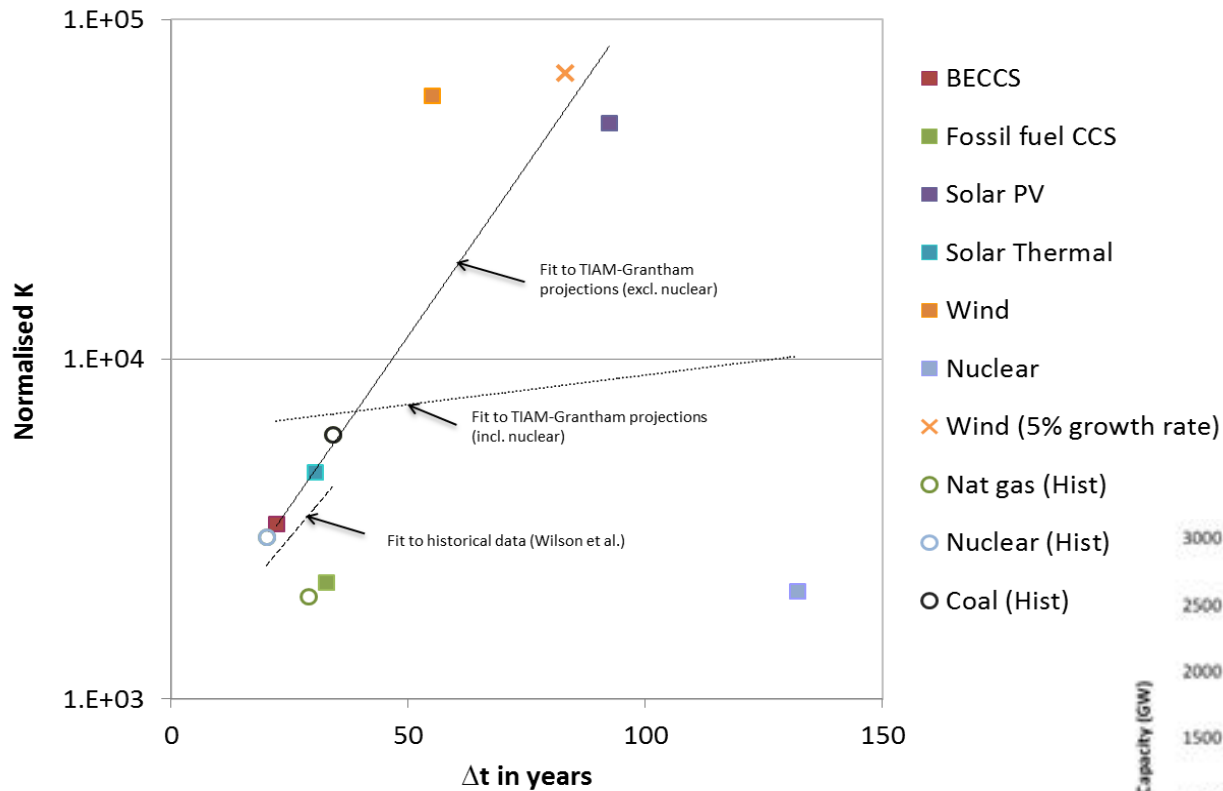
Growth does not continue to be exponential – it shifts to linear

Established primary energy sources decline gradually

# What does an unconstrained 2°C scenario show?

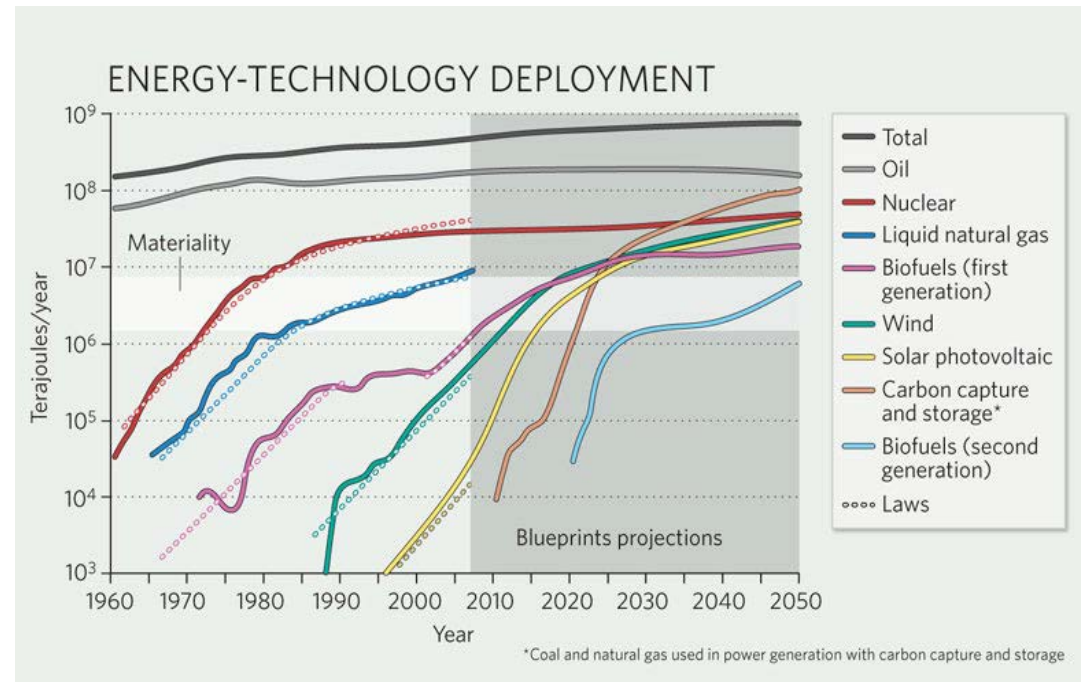
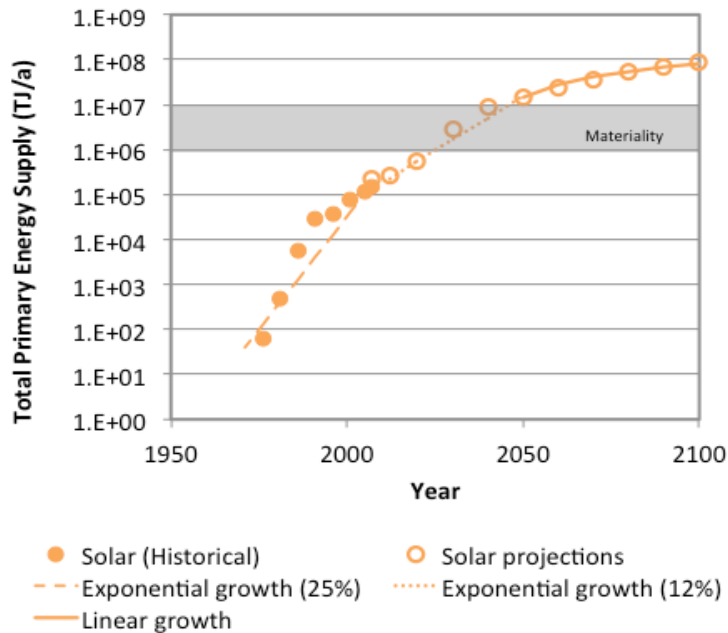


# What does a more constrained 2°C scenario show?



# What does a highly constrained 2°C scenario show?

B.3) Solar





# Consequences of constraints

No technology  
growth constraints:  
1,340 GtCO<sub>2</sub>  
can be achieved

2°C can be met

Technology growth  
constrained to  
historical maxima:  
<1,540 GtCO<sub>2</sub>  
can't be achieved

2.1°C can be met

**BUT: Concerted policy can lead to very rapid technology growth (e.g. solar)**

# Limitations and further research



History a guide to the future?



Demand side technologies?



Resources, skills, materials, finance  
for simultaneous technology deployments?



BECCS!