London Industry Seminar

CRREM-ERES

Stranding Risk

1st Panel: Climate change impact on real estate- uncertainty and solutions

UNIVERSITY OF CAMBRIDGE

Stranding Risk and Real Estate Asset Prices

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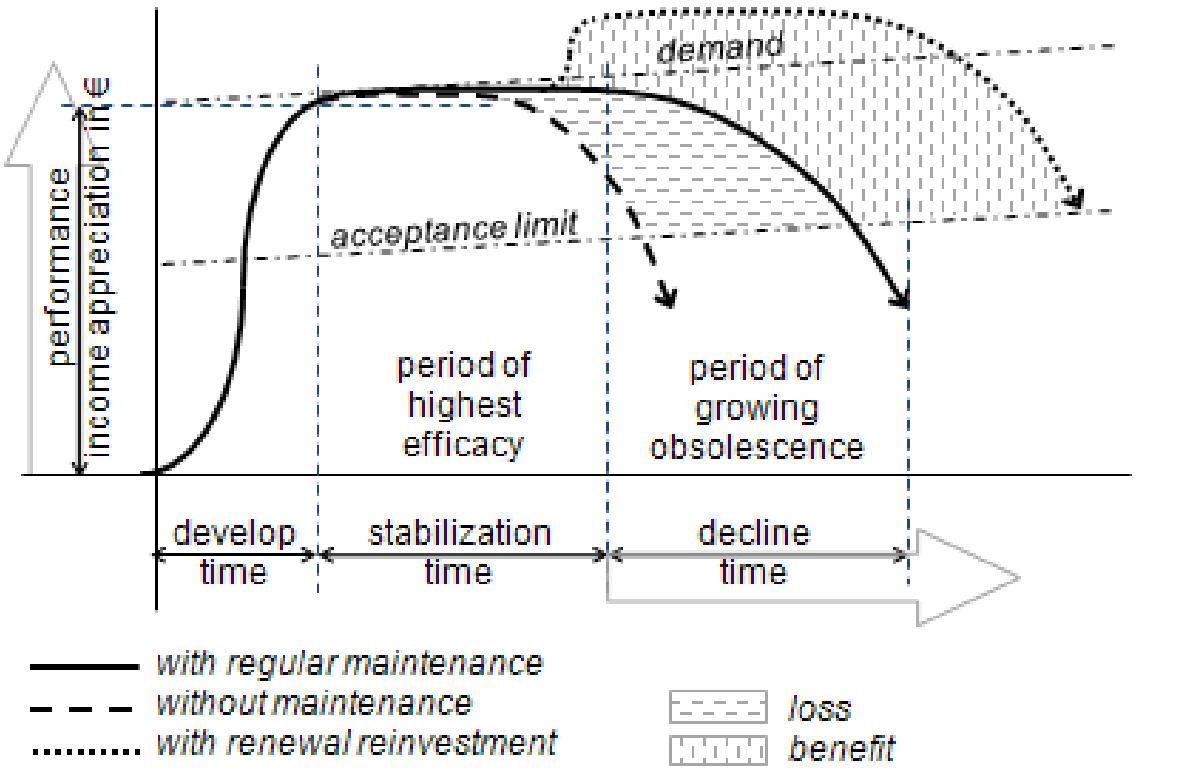
‘Normal’ maintenance & obsolescence life cycle



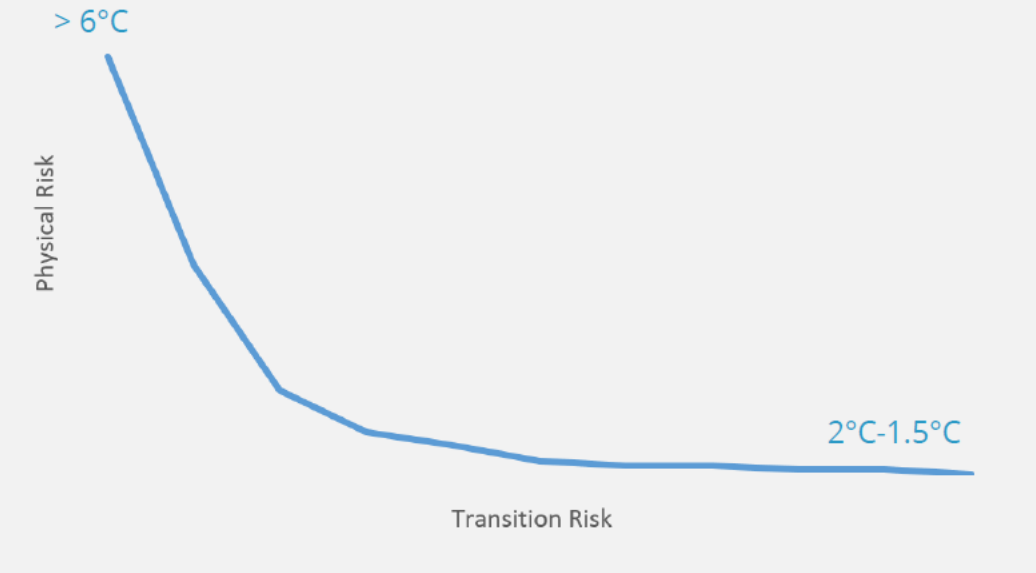
Source: Thomsen & Van der Flier (2011)

Why ‘stranding’? Climate risk considerations for real estate assets

- Environmental challenges (climate change, water constraints)
- Indirect locational effects (‘island effect’)
- Changing resource landscapes (phasing out of fossil fuels)
- New government regulations (carbon pricing, air pollution regulation)
- Falling clean technology costs (solar, wind, geothermal etc)
- Evolving social norms (fossil fuel divestment) and consumer/investor behaviour (CSR commitments, certification schemes)
- Legislation, regulation and litigation

Classification based on SSEE, University of Oxford, 2014

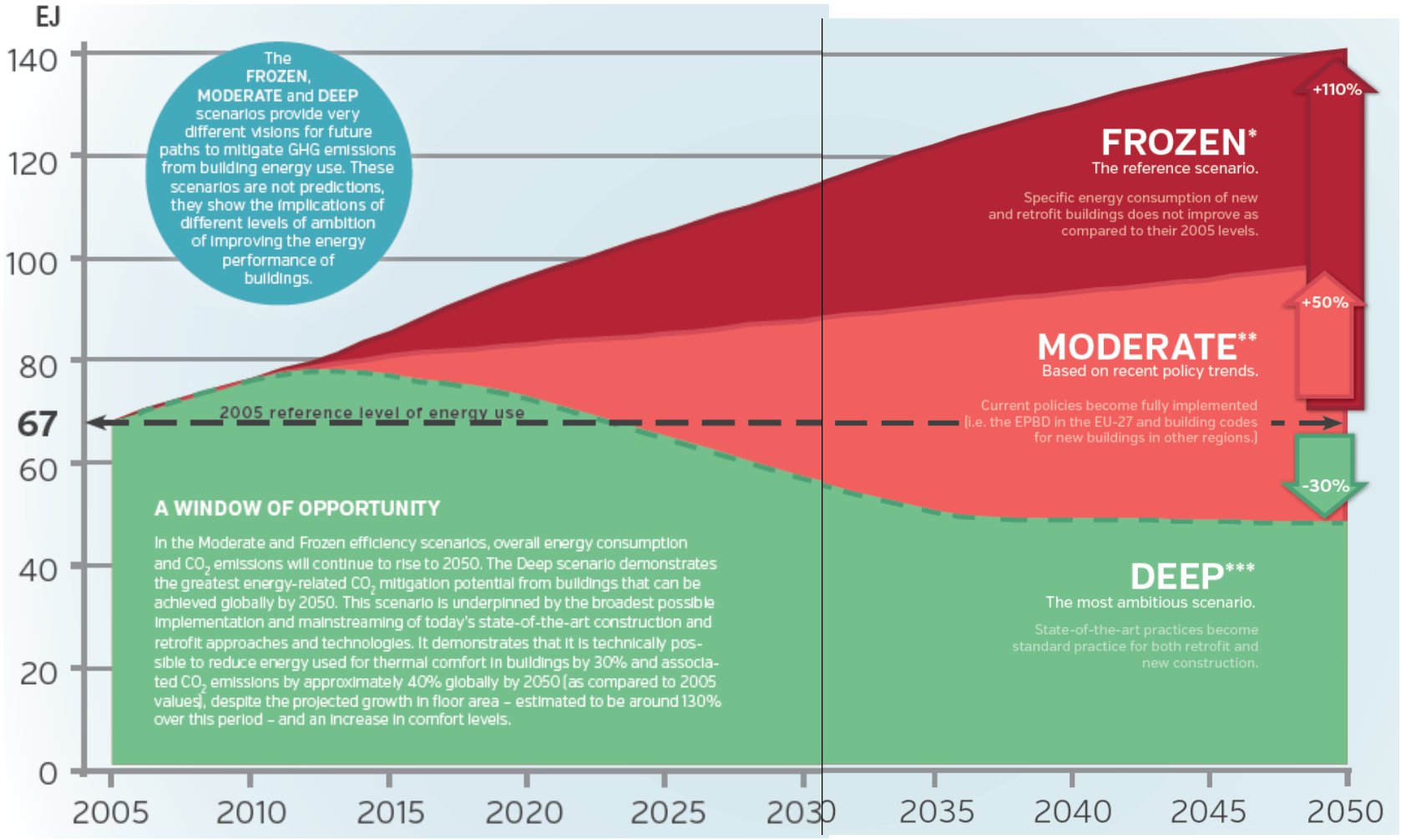
Is there a trade-off between transition risk and physical risk?



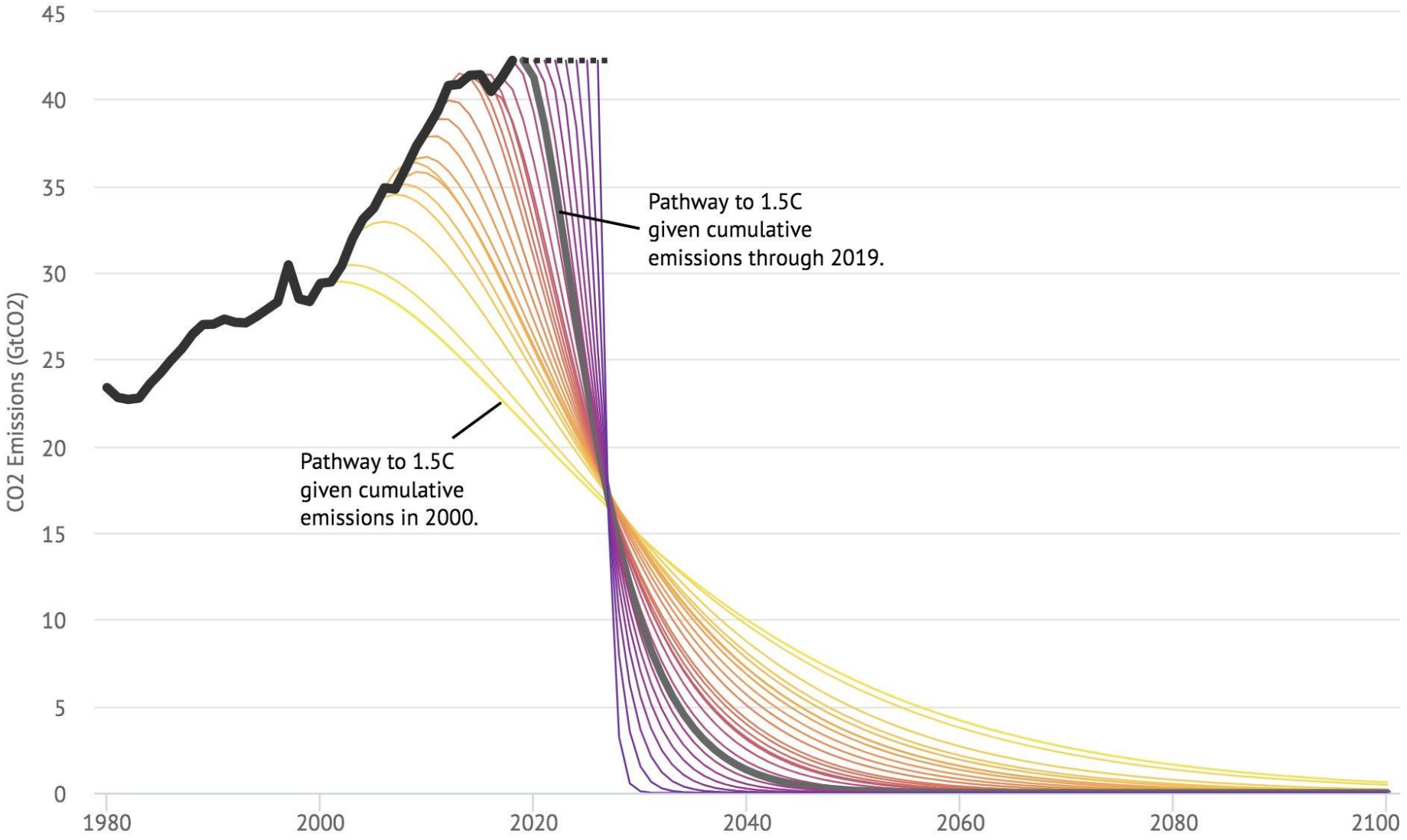
Source: TCFD (2017)

"The number of building codes implemented has grown over the past 10 years, with 69 countries now having either voluntary or mandatory buildings energy codes in place or under development. This is an increase from 54 countries in 2010. However, despite this progress, two-thirds of countries still do not have building energy codes, and most changes in 2017-18 were updates to previously existing energy codes. "
Global Status Report (2018)

Which path are we on? (1) (GBPN, 2013)

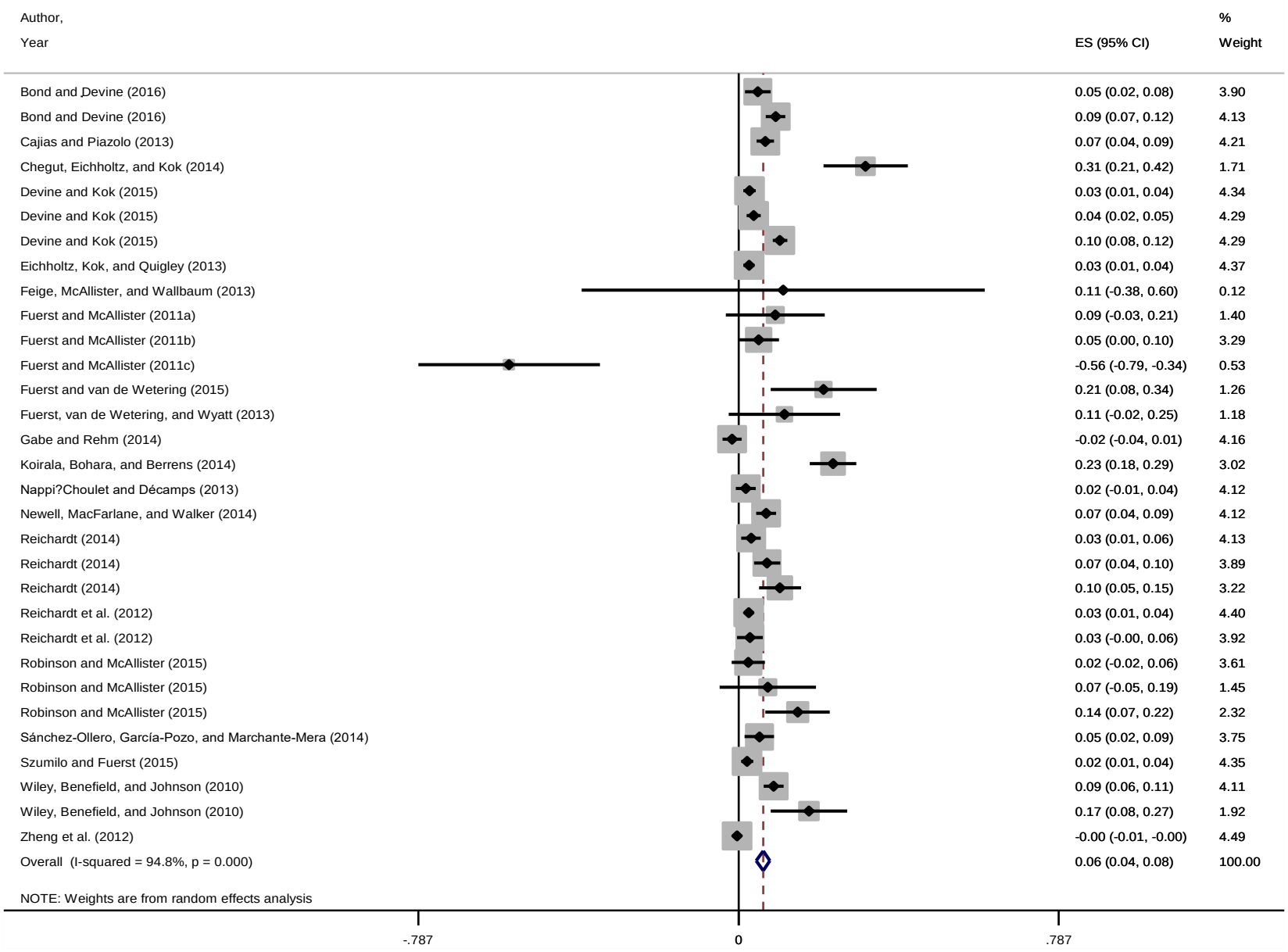


Which path are we on? (2)
(Carbon Brief, 2019)



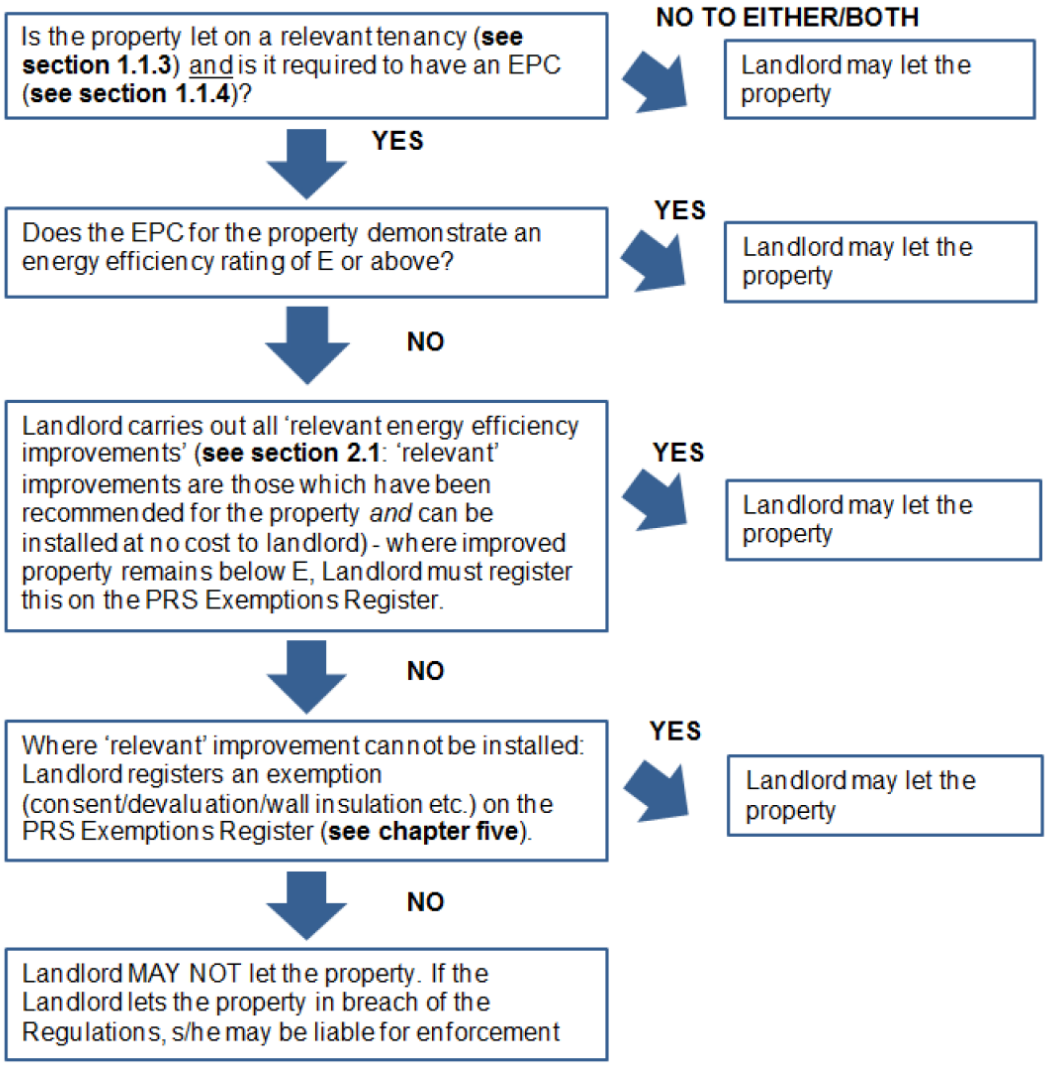
Meta-analysis of Green Premium Studies

(Dalton & Fuerst, 2018)



Building Regulations and Stranding Risk

Minimum Energy Efficiency Standard (MEES)



Property valuation during the transition phase

RICS (2018): Minimum Energy Efficiency Standards (MEES) Impact on UK property management and valuation

4	Non-compliant and will likely remain so even after all 'allowable works' completed	The valuer should fully investigate whether the property cannot be brought into compliance and should check the Exemptions Register. The valuer should also consider whether meeting the test of reasonableness is likely to change at the end of a temporary exemption period. If the property cannot now comply, it may continue to be let but the valuer should bear in mind that it could be unattractive to both tenants and investors alike and this could result in lower rental values and higher yields. The valuer should investigate whether the property might be attractive to an owner-occupier and whether redevelopment or 'deep' refurbishment provides a higher market value.
5	Incapable of being brought into compliance due to nature of the construction and will remain continuously exempt because no works would qualify	These are so-called 'hard to treat' properties. Where they are situated in areas of comparatively low rental values and high yields and they are typical of local stock, the impact on value may be small, but it is important that the valuer establishes that the exemption will continue. However. some properties, notably residential, may be highly desirable for owner-occupation despite being sub-standard in energy terms. The valuer should consider this but may also consider whether redevelopment would be a realistic prospect.

"At this juncture it is critical that the valuer does not:

- Stray outside their area of competence, give advice or make assumptions that then prejudice their own professional indemnity insurance. This is particularly the case when a value may, in part, be based on estimates of costings to bring a building into MEES compliance.
- The valuer may identify where risk exists, but must recognise their limitations and only incorporate likely capital expenditure charges, having obtained them from a reliable source and discussed them with the client; the report must refer to the source of the figures."

RICS guidance

Sea Level Rise and Stranding Risk

Sea level rise is both inevitable and uncertain

nature COMMUNICATIONS

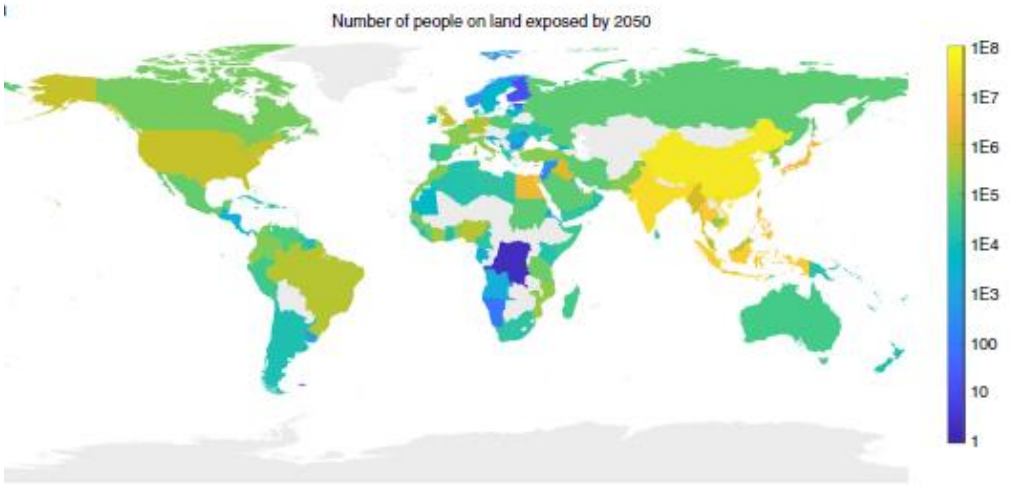
ARTICLE

https://doi.org/10.1038/s41467-019-12808-z OPEN

New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding

Scott A. Kulp[1*] & Benjamin H. Strauss[1]

Most estimates of global mean sea-level rise this century fall below 2 m. This quantity is comparable to the positive vertical bias of the principle digital elevation model (DEM) used to assess global and national population exposures to extreme coastal water levels, NASA's SRTM. CoastalDEM is a new DEM utilizing neural networks to reduce SRTM error. Here we show – employing CoastalDEM—that 190 M people (150–250 M, 90% CI) currently occupy global land below projected high tide lines for 2100 under low carbon emissions, up from 110 M today, for a median increase of 80 M. These figures triple SRTM-based values. Under high emissions, CoastalDEM indicates up to 630 M people live on land below projected annual flood levels for 2100, and up to 340 M for mid-century, versus roughly 250 M at present. We estimate one billion people now occupy land less than 10 m above current high tide lines, including 250 M below 1 m.



Existing evidence of price discounting for flood risk

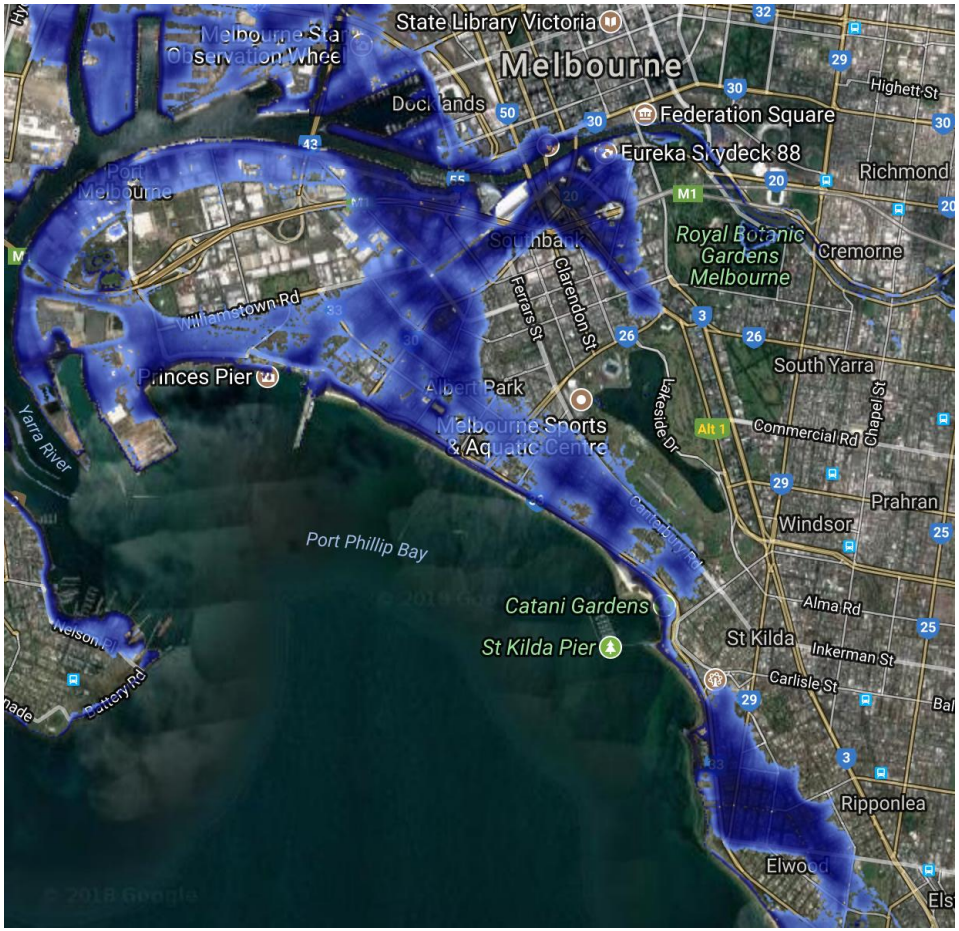
- Bin et al. (2008), Hallstrom & Smith (2005), Bin and Polasky (2004) and Shultz and Fridgen, (2001), all report a negative impact of flood zone location on the price of a dwelling.
- Bin et al. (2008), emphasise need to disentangle positive and negative pricing factors of locations adjacent to water.
- Bernstein et al (2019) find 7% SLR discount in their US study of Zillow ZTRAX transaction data.
- Bernstein et al. (2019) and Baldauf et al (2018) find that discounts only exist where majority of local buyers believe that climate change and SLR are a real phenomenon. Average discount of 7% of sale price per standard deviation from mean belief level.

Melbourne Study (Warren-Myers, Fuerst, 2020)

NOAA
2.7 Metres

US National Oceanic and Atmospheric Association (NOAA, 2017)

30% of Properties in study area



Key lessons

- Most studies/reports conclude that current efforts in building sector are insufficient for meeting GHG targets
- ‘Stranding’ risk has several dimensions, still unclear how they relate to each other.
- ‘Stranding’ risk may lead to further shortening of building life cycles. Implications for carbon life cycle assessment.
- Recent evidence suggests that energy efficiency (proxy for operational carbon footprint) is generally capitalised into property prices and rents but uncertainty persists.
- Regulations (MEES) are a further step towards tightening regulations to push up EE of low performers but exemptions and political resistance a cautionary tale for implementation of more stringent decarbonisation measures.
- Some empirical evidence that stranding risk (sea level rise) is priced but no clear consensus yet.
- Pricing effects likely to become more pronounced as both decarbonisation action and physical effects of climate change accelerate.

Thank you

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