



Institute  
and Faculty  
of Actuaries

# An opportunity to make a difference: a deep-dive into offshore wind

Gareth Mee - EY

Sam Tufts - EY

James Lumb - Macquarie



## A couple of questions to get us started

- Who is investing in infrastructure assets on behalf of themselves or their clients?
- Who is investing in renewables on behalf of themselves or their clients?

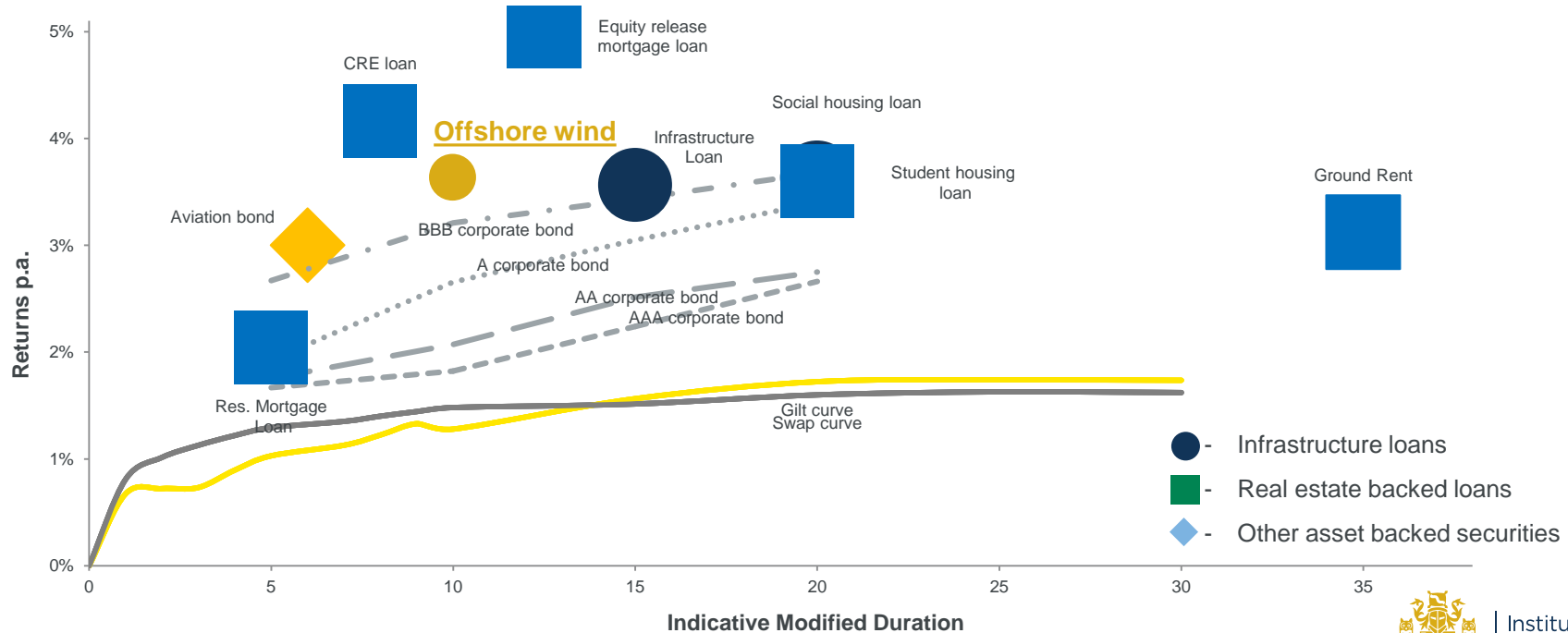


# Definitions

- **Infrastructure:** *facilities or structures required for the effective operation of a business, state or economy*
- For example roads, railways, airports, power generation and transmission, ports, communications, water and waste, together with social infrastructure, such as hospitals, schools
- **Renewable energy assets:** *Assets used in the production of renewable energy such as off-shore and on-shore wind or solar panels*



# Offshore wind offers a return similar to a number of other infrastructure assets



# Insurers have been including renewable assets in their investment portfolios

Prudential invests in Indian wind power<sup>1</sup>

Solar bond for PIC<sup>3</sup>

Allianz backs US solar project<sup>1</sup>

Phoenix debuts renewable energy investment with Walney debt financing<sup>2</sup>

Crédit Agricole in JV to buy 500MW of renewables projects<sup>1</sup>

PIC debuts offshore wind investment with Walney debt financing<sup>2</sup>

L&G makes first offshore wind farm investment with Walney debt financing<sup>2</sup>



Institute  
and Faculty  
of Actuaries

[1] <https://www.insuranceassetrisk.com>

[2] <https://realassets.ipe.com>

[3] [https://www.smartsolarukireland.com/article/76405/andpound40\\_Million\\_Solar\\_Bond\\_For\\_Pension\\_Insurance\\_Corp](https://www.smartsolarukireland.com/article/76405/andpound40_Million_Solar_Bond_For_Pension_Insurance_Corp)



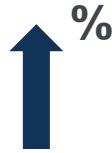
Institute  
and Faculty  
of Actuaries

# Renewable energy investment: Risk and return

17 November 2018

# The usual investment characteristics need to be considered

Return/yield



Capital



Matching



Security



Covenants



Diversification



Institute  
and Faculty  
of Actuaries

# Renewable energy assets can be an attractive match for liabilities...

1

## Duration

Like many illiquid assets off-shore wind assets are long dated and hence suitable for backing life products

2

## CPI Linked

There are very few CPI linked assets available in the market and this asset presents an opportunity to gain CPI exposure

3

## Matching adjustment

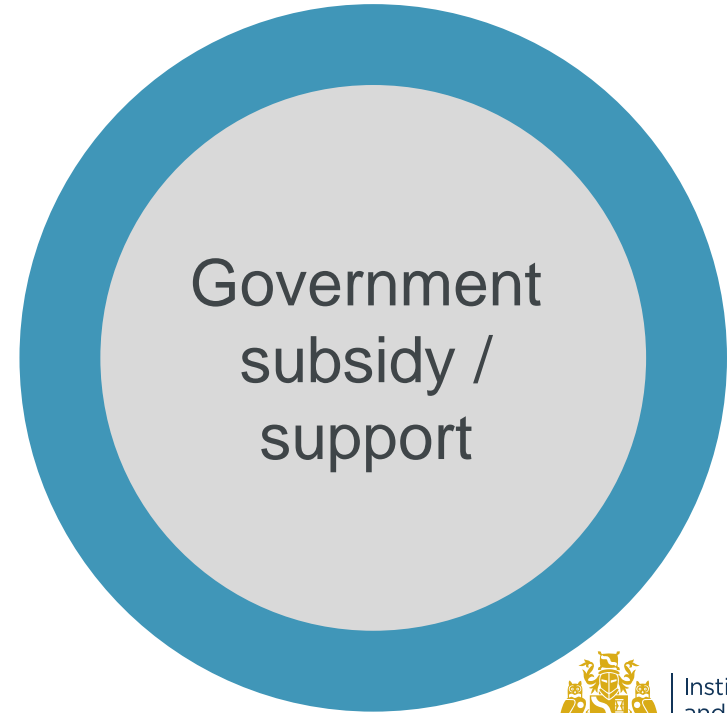
These assets can provide competitive returns with a low credit haircut relative to corporate bonds with similar yields



Institute  
and Faculty  
of Actuaries



...and also have some benefits in terms of security  
which can lead to efficient capital treatment



Institute  
and Faculty  
of Actuaries

# There are also external reasons for insurers choosing to invest in renewables

- Institutional investors are under increased pressure to invest in environmentally, socially and governmentally (ESG) responsible assets

1

## Shareholders

75 per cent of wealthy millennials consider the social and environmental impact of the companies they invest in to be an important part of investment decision-making <sup>4</sup>

3

## Regulatory

In May 2018 the European Commission (EC) proposed the implementation of new legislation to support investment in sustainable finance.

2

## Political

The signing of the Paris Agreement in December 2015 resulted in a commitment to ensure investments contribute towards low-carbon and climate-resilient development.

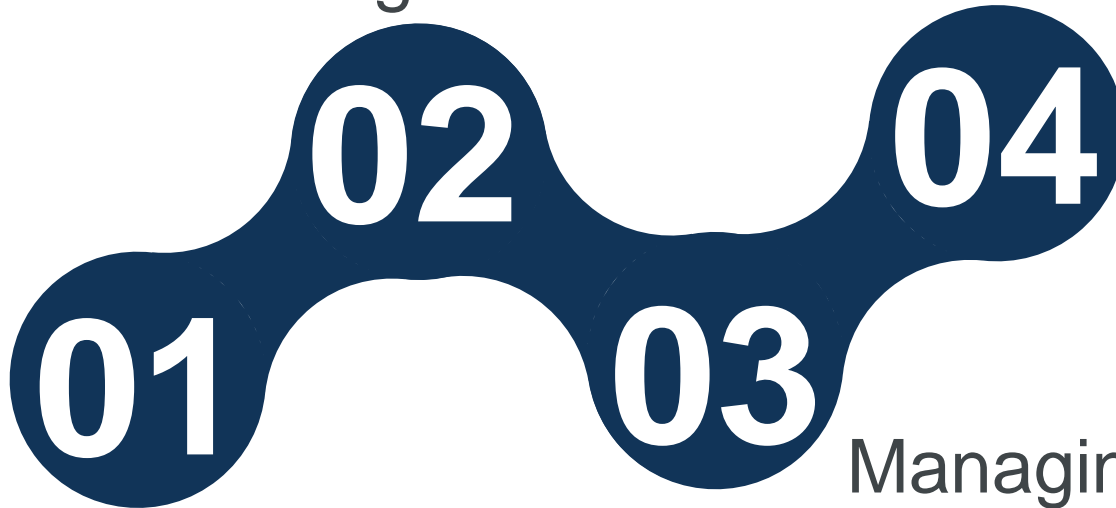


Institute  
and Faculty  
of Actuaries

# Renewable energy assets are subject to some typical risks associated with illiquid assets...

Credit underwriting

Work-out



Valuation

Managing liquidity



Institute  
and Faculty  
of Actuaries

## ..as well as some more unique risks

### Technology risk

- Equipment may become obsolete as new technologies arrive, e.g.:
  - Development of floating wind turbines, which can deliver extra efficiency further from shore<sup>5</sup>
  - Recent advances in the capabilities of solar cells

### Geophysical risks

- There is the risk that unpredictable weather patterns will lead to volatility in energy generation and revenue streams
- However, it may be possible to purchase weather derivatives to hedge this risk

### Political risk

- There is the risk that falls in energy subsidies will lead to reduced revenue, e.g.:
  - Zero-subsidy contracts<sup>6</sup>
  - Spanish solar subsidies were infamously cut

[5] <http://large.stanford.edu/courses/2012/ph240/pratt1/>

[6] [https://www.greentechmedia.com/articles/read/what-it-takes-to-get-subsidy-free-offshore-wind#gs.f\\_vzMZ8](https://www.greentechmedia.com/articles/read/what-it-takes-to-get-subsidy-free-offshore-wind#gs.f_vzMZ8)





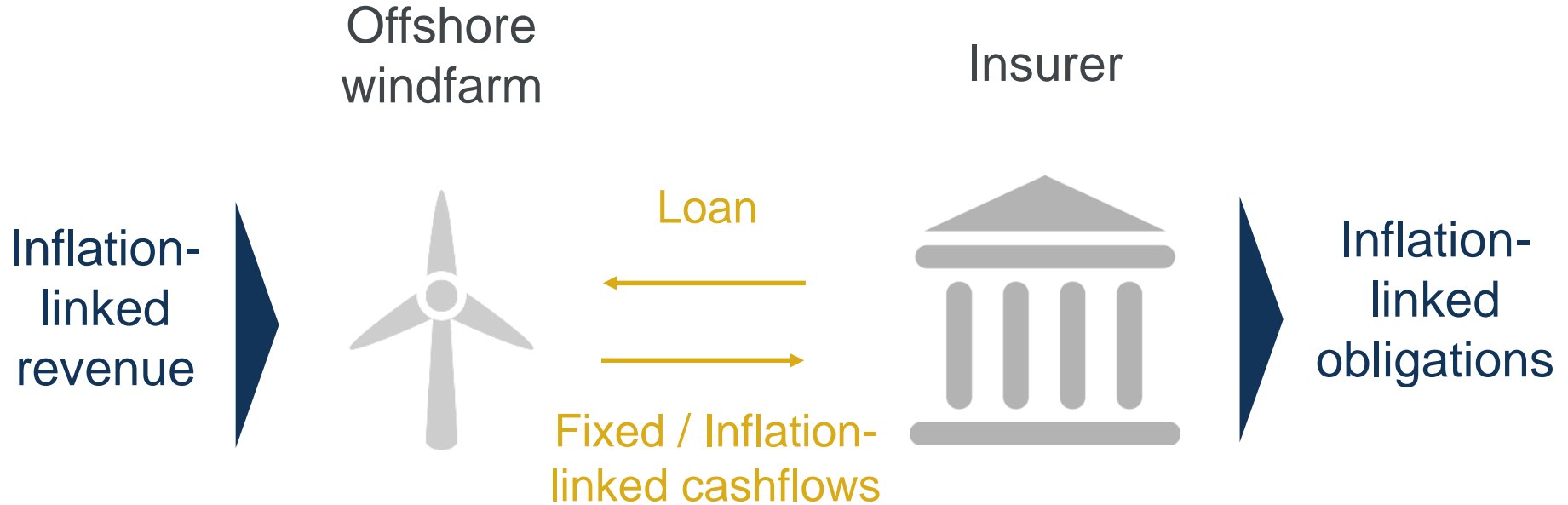
Institute  
and Faculty  
of Actuaries

# Case study

## Walney Extension

17 November 2018

# Borrower demand for infrastructure debt





# Walney Extension – Nov 2017



Worlds largest operational offshore wind farm powering up to 590,000 UK homes



Bespoke financing - two tranches of long dated, delayed draw financing – CPI linked and fixed



AAA Tranche guaranteed by Danish Export Credit Agency EKF



Construction phase with significant risk mitigation



Investors including Macquarie, Legal & General, Pension Insurance Corporation, Phoenix Group



Institute  
and Faculty  
of Actuaries





Institute  
and Faculty  
of Actuaries

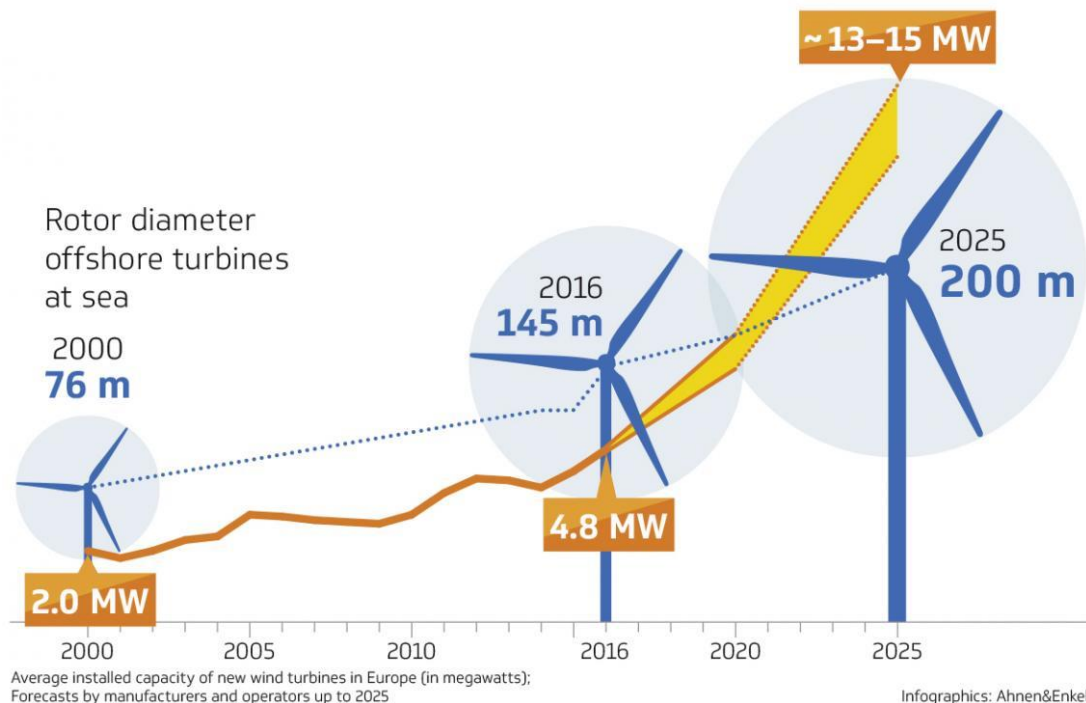
# Looking to the future

17 November 2018



# Growth of offshore wind

## A GROWTH IN CAPACITY



### UK Renewable Energy Consumption<sup>1</sup>

2016	2020 Target
9.3%	15%

UK continues to lead the world in offshore wind with over 7 GW installed capacity (33% of global installed capacity) and another 7 GW in construction or with contracts secured.



Institute  
and Faculty  
of Actuaries

- 1. Eurostat
- Stiftung Offshore Windenergie
- Green investment group

# Expected continued flow of opportunities from offshore wind

Re-  
financings

Continuation  
of CfD

Subsidy Free  
/ Zero  
Subsidy

Corporate  
PPA

Global  
Opportunities



Institute  
and Faculty  
of Actuaries

# Questions

# Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



Institute  
and Faculty  
of Actuaries

# Concluding remarks

- Life insurers continue to find the high risk adjusted yield of infrastructure assets attractive
- Renewable assets offer interesting characteristics for matching life insurance liabilities whilst also offering public benefits and portfolio diversification
- The pipeline for renewable assets looks strong through commitments to new projects and refinancing opportunities for existing structures



The views expressed in this presentation are those of invited contributors and not necessarily those of the IFoA. The IFoA do not endorse any of the views stated, nor any claims or representations made in this presentation and accept no responsibility or liability to any person for loss or damage suffered as a consequence of their placing reliance upon any view, claim or representation made in this presentation.

The information and expressions of opinion contained in this publication are not intended to be a comprehensive study, nor to provide actuarial advice or advice of any nature and should not be treated as a substitute for specific advice concerning individual situations. On no account may any part of this presentation be reproduced without the written permission of the IFoA or authors.

