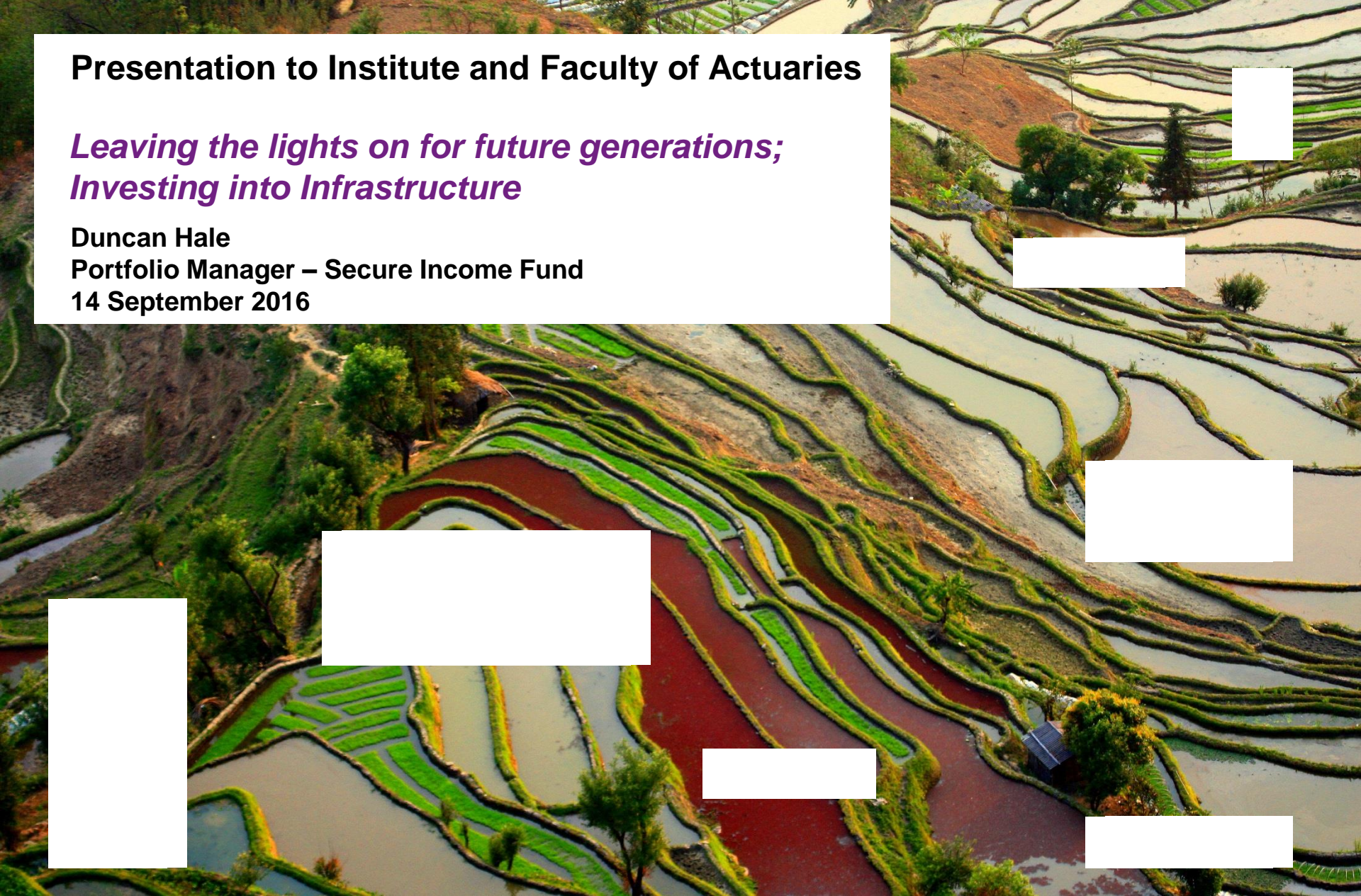


Presentation to Institute and Faculty of Actuaries

Leaving the lights on for future generations; Investing into Infrastructure

Duncan Hale
Portfolio Manager – Secure Income Fund
14 September 2016



The universe of infrastructure investments

Transport

- Toll roads
- Bridges
- Tunnels
- Ports
- Airports
- Rails
- Ferries



Energy & Utilities

- Renewable energy
- Gas distribution & storage
- Electricity distribution, transmission and generation
- Water treatment and distribution
- Waste management



Communications

- Cable networks
- Satellite networks
- Mobile phone towers



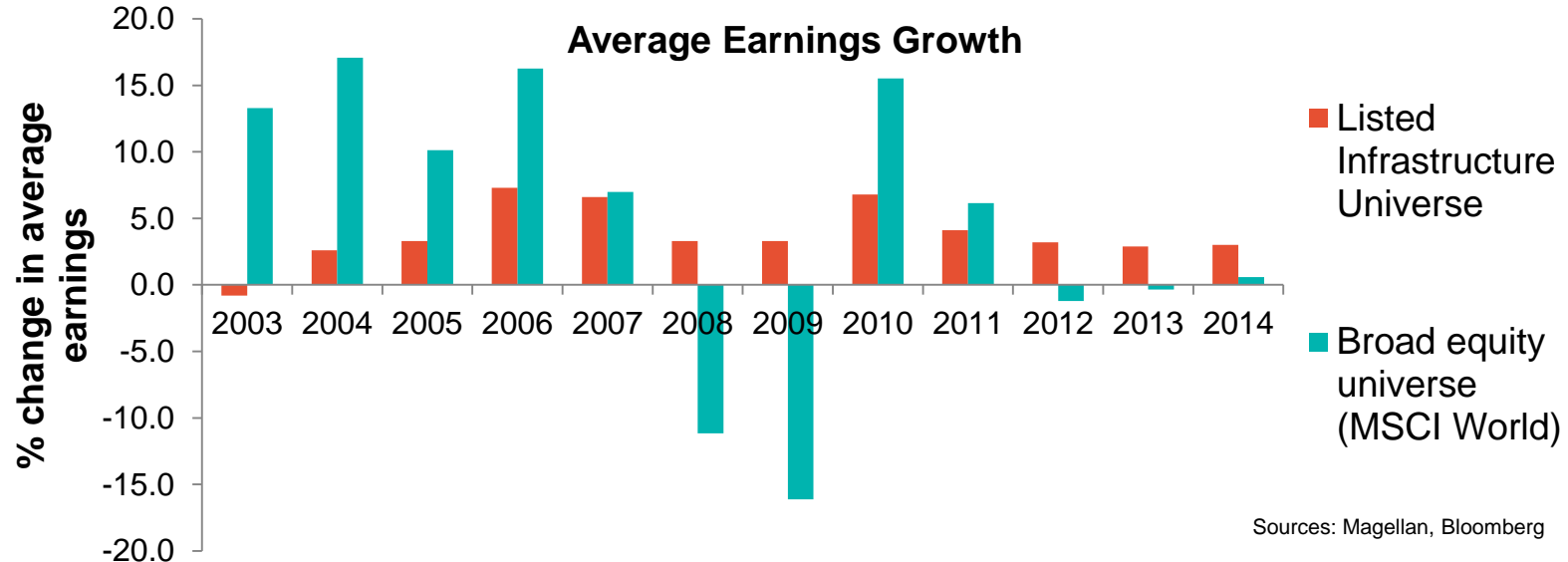
Social

- Hospitals
- Schools
- Subsidized housing
- Courts
- Prisons
- Stadiums

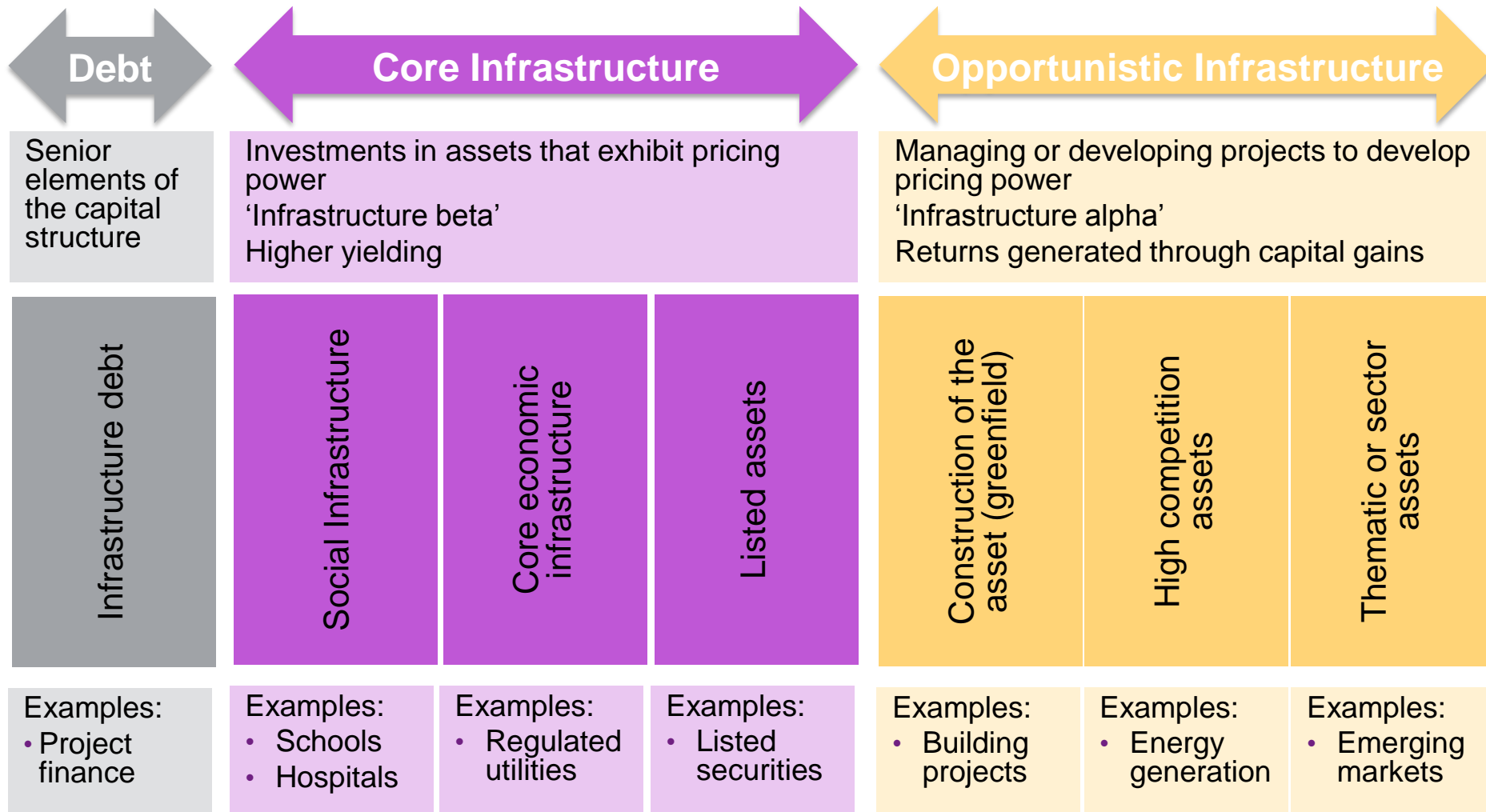


Defining infrastructure

- **Monopolistic Supply:**
 - Monopolistic supply positions and high barriers to entry
- **Essential Services:**
 - Provide services that are essential to the efficient functioning of the economy or to society.
- Provides infrastructure assets with **very strong pricing power**



Infrastructure risk profiles



Infrastructure risk and return

To 30 June 2016	Total Return (%p.a.)			10 Year risk figures			
	3 Years	5 Years	10 Years	Standard Deviation	Reward for risk	Tracking error	Beta
Core Listed infrastructure	20.8%	17.5%	11.9%	10.0%	1.19	8.6%	0.49
Infrastructure Benchmark*	14.0%	9.8%	7.1%	11.4%	0.63	-	-
MSCI World equity index	12.9%	9.7%	5.3%	14.3%	0.37	-	-

Significantly less volatility than the broader equity market

Comparison of listed infrastructure and equities	All Markets	Up Markets [^]	Down markets [^]
Number of monthly observations	120	73	47
Outperformance frequency	56%	47%	70%
Average Monthly Excess Return	0.3%	-0.4%	1.5%

Low equity beta

Strong outperformance at points when equity markets are down

*UBS Infrastructure & Utilities Developed Total Return (GBP Hedged) until 31/12/2014. Thereafter S&P Global Infrastructure Index Total Return (GBP Hedged)

**UBS Infrastructure & Utilities Developed Total Return (GBP Hedged) until 31/12/2014. Thereafter FTSE Developed Core Infrastructure 50/50 Net Tax Index (GBP)

[^] Up markets and down markets refer to the monthly performance of the MSCI World Equity Index

Sources: Magellan backtested data (GBP Hedged), Bloomberg

Required infrastructure investment

	Estimated capital requirement – business as usual (pa)
Water	\$1,320bn
Transport vehicles	\$845bn
Transport infrastructure	\$805bn
Energy	\$619bn
Building & industry	\$613bn
Telecommunication	\$600bn
Agriculture	\$125bn
Forestry	\$64bn
Total	\$5,000bn

Source: *The Green Investment Report*, World Economic Forum, 2013

Required infrastructure investment

	Estimated capital requirement – business as usual (pa)	Estimated additional capital requirement – green growth scenario (pa)
Water	\$1,320bn	
Transport vehicles	\$845bn	\$187bn
Transport infrastructure	\$805bn	
Energy	\$619bn	\$187bn
Building & industry	\$613bn	\$331bn
Telecommunication	\$600bn	
Agriculture	\$125bn	
Forestry	\$64bn	\$40bn
Total	\$5,000bn	\$700bn

Source: *The Green Investment Report*, World Economic Forum, 2013

Not just a developing market issue....

American Society of Civil Engineers; US Infrastructure Report Card, 2013

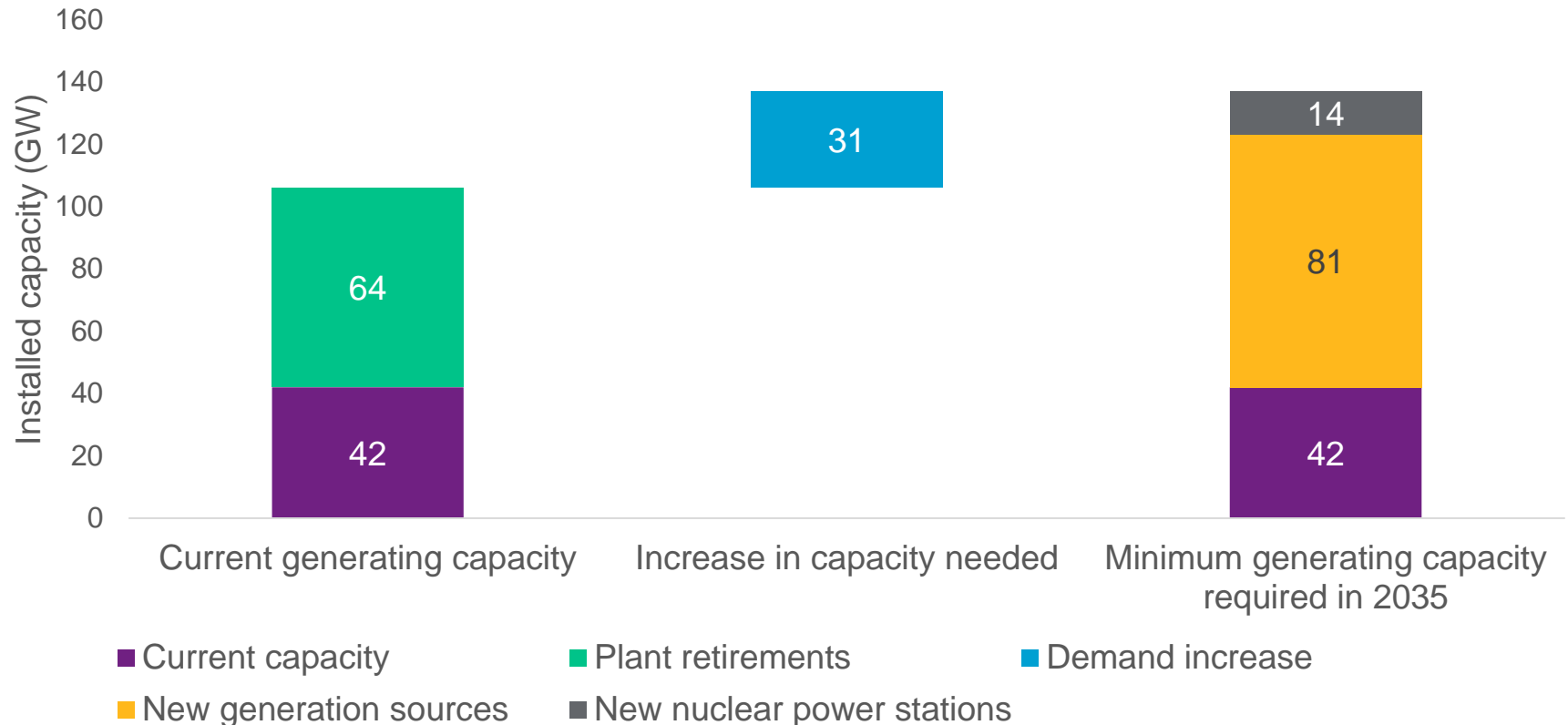
Water & Environment		Transport		Public facilities	
Dams	D	Aviation	D	Public Parks	C+
Drinking water	D	Bridges	C+	Schools	D
Hazardous Waste	D	Inland Waterways	D-		
Levees	D-	Ports	C	Energy	
Solid Waste	B-	Rail	C+	Energy	D+
Wastewater	D	Roads	D		
		Transit	D		

Source: *Failure to Act*, American Society of Civil Engineers, 2013

Overall grade: D+
Expected investment required by 2020: \$3.6tn

The UK Energy Challenge up to 2035

The UK Energy Challenge up to 2035



Source: *Nuclear power in the UK*, NAO, 2016

Nuclear generation today



Source: DECC

Type	First power	Expected shutdown
Dungeness B 1&2	1983 & 1985	2028
Hartlepool 1&2	1983 & 1984	2024
Heysham I 1&2	1983 & 1984	2024
Heysham II 1&2	1988	2030
Hinkley Point B 1&2	1976	2023
Hunterston B 1&2	1976 & 1977	2023
Torness 1&2	1988 & 1989	2030
Sizewell B	1995	2035
Total: 15 units	8,883 MW	

Source: World Nuclear Association

The UK energy dilemma



Pretend

Extend



Spend

The two elements of infrastructure investment

- **Financing**

- The investment into the capital structure of the asset to allow the asset to be built/operate

- **Funding**

- The on-going payment stream to the asset

Focus needs to be on proving the Funding position

Institutional investing through the Greenfield stage

Development

- Skill rich,
capital light

Construction

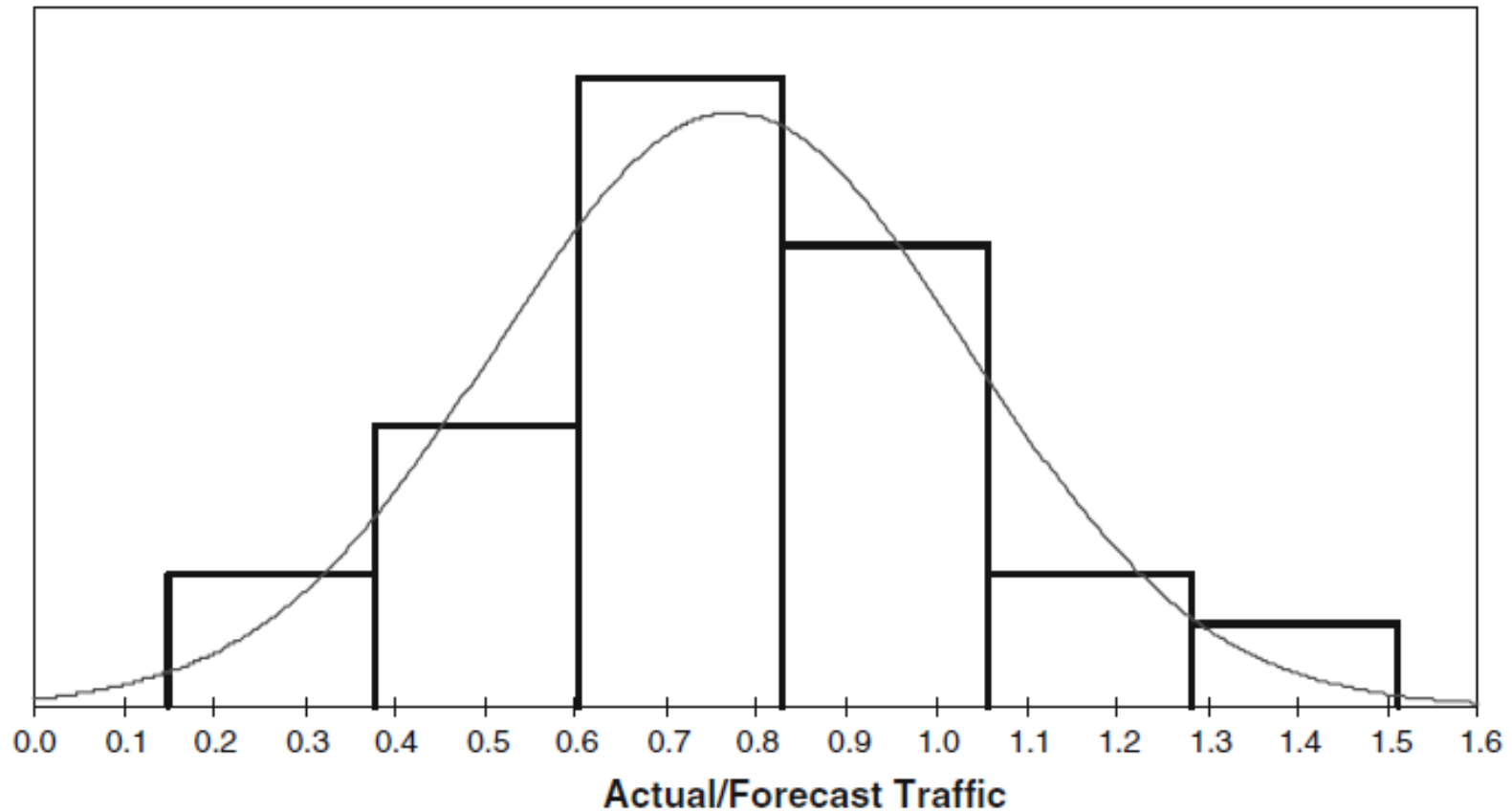
- Risks
passed to
counterparty

Ramp-up

- Prone to
estimation
bias

Why is the Ramp-Up stage difficult?

Global Toll Road Sample (2005)
Normal (0.77, 0.26), $n = 104$



Source: Error and optimism bias in toll-road traffic forecast, Robert Bain, 2009

Institutional investing through the Greenfield stage

Development

- Skill rich,
capital light

Construction

- Risks
passed to
counterparty

**Happy to invest
here....**

Ramp-up

- Prone to
estimation
bias

**... as long as this has
been managed**

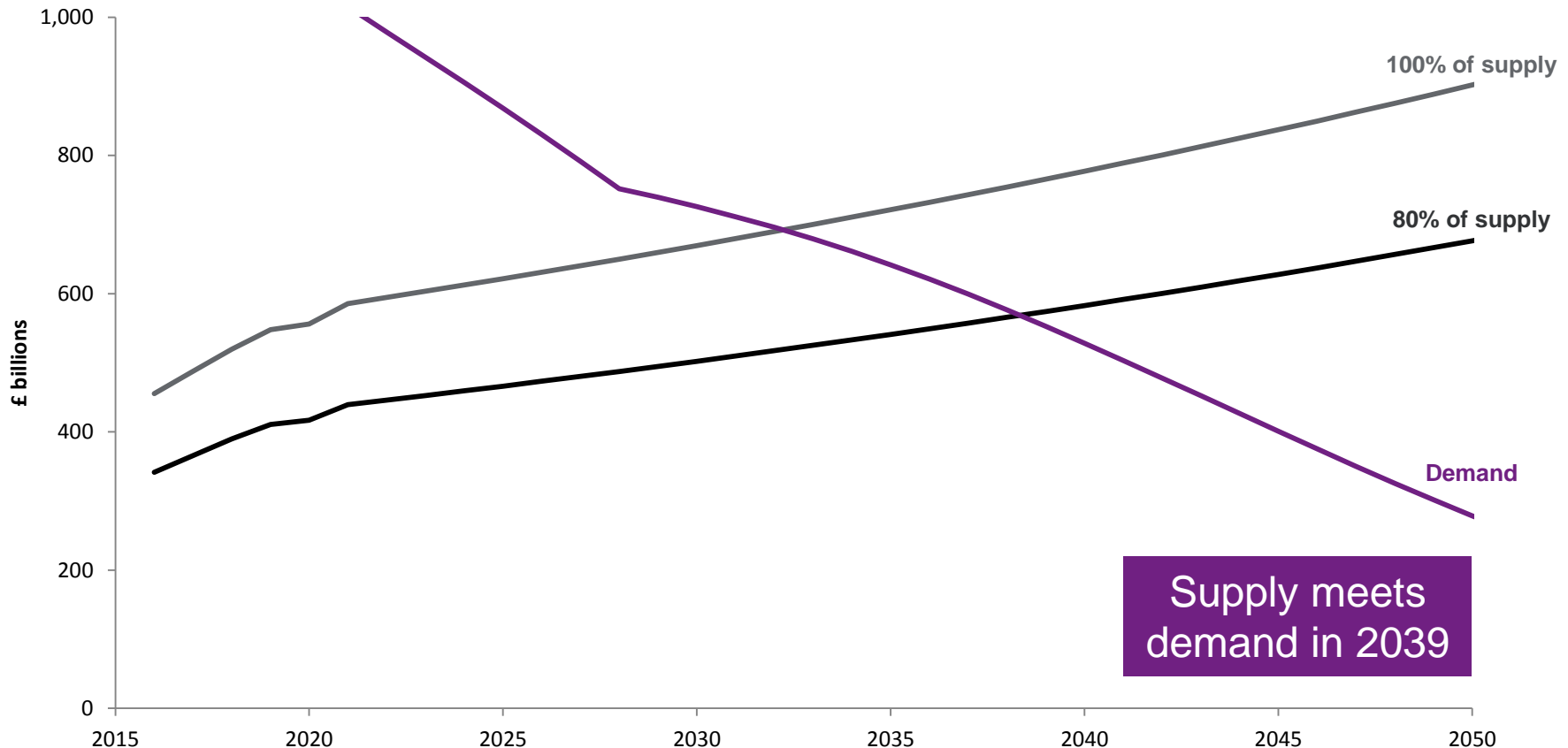
How has the UK tackled the greenfield problem?

- Focus on financing
- Successful assets have focused on managing the key risks

- Focus on recycle capital
- Understand that risk-sharing during greenfield is difficult

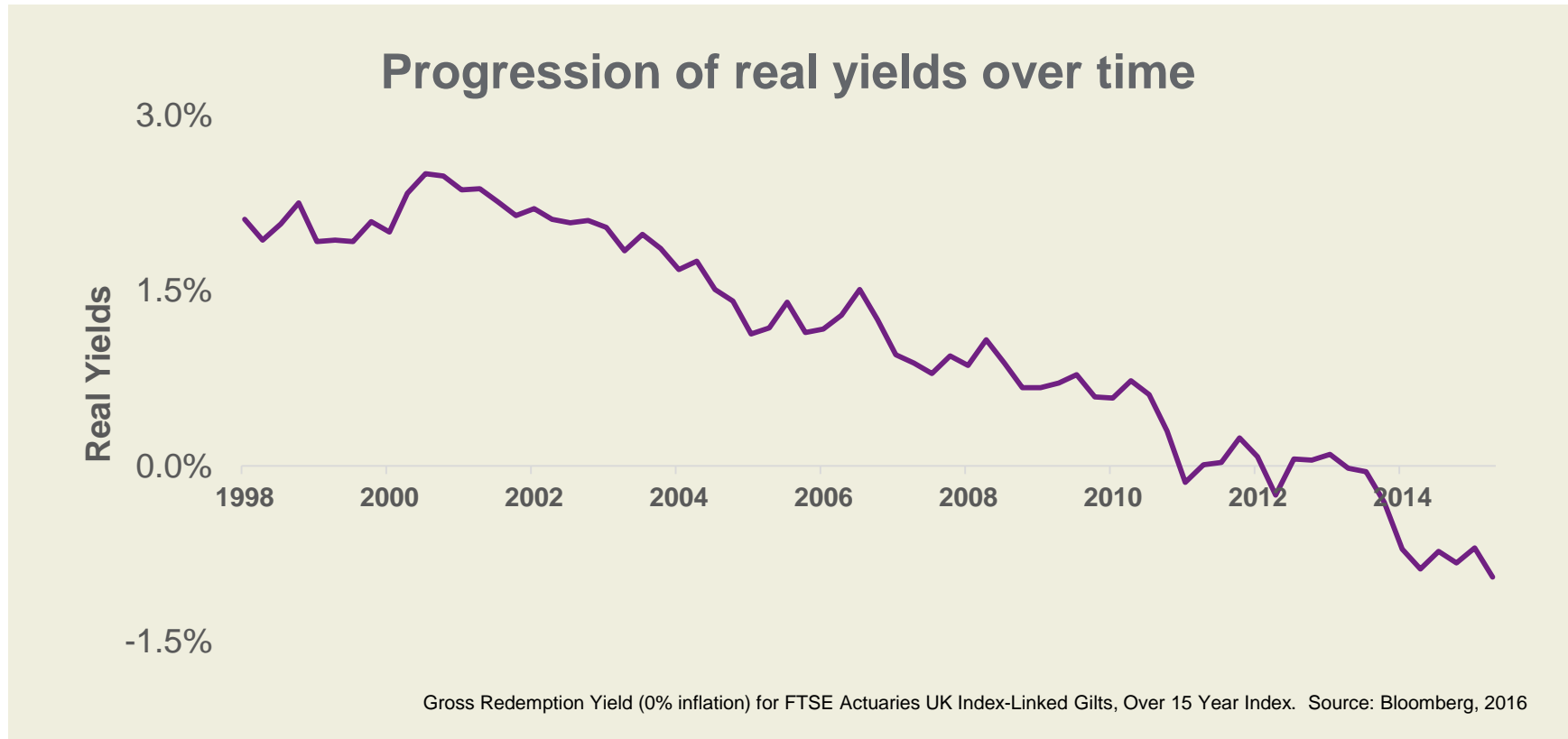
The de-risking conundrum for UK DB schemes

ILG Supply & Demand



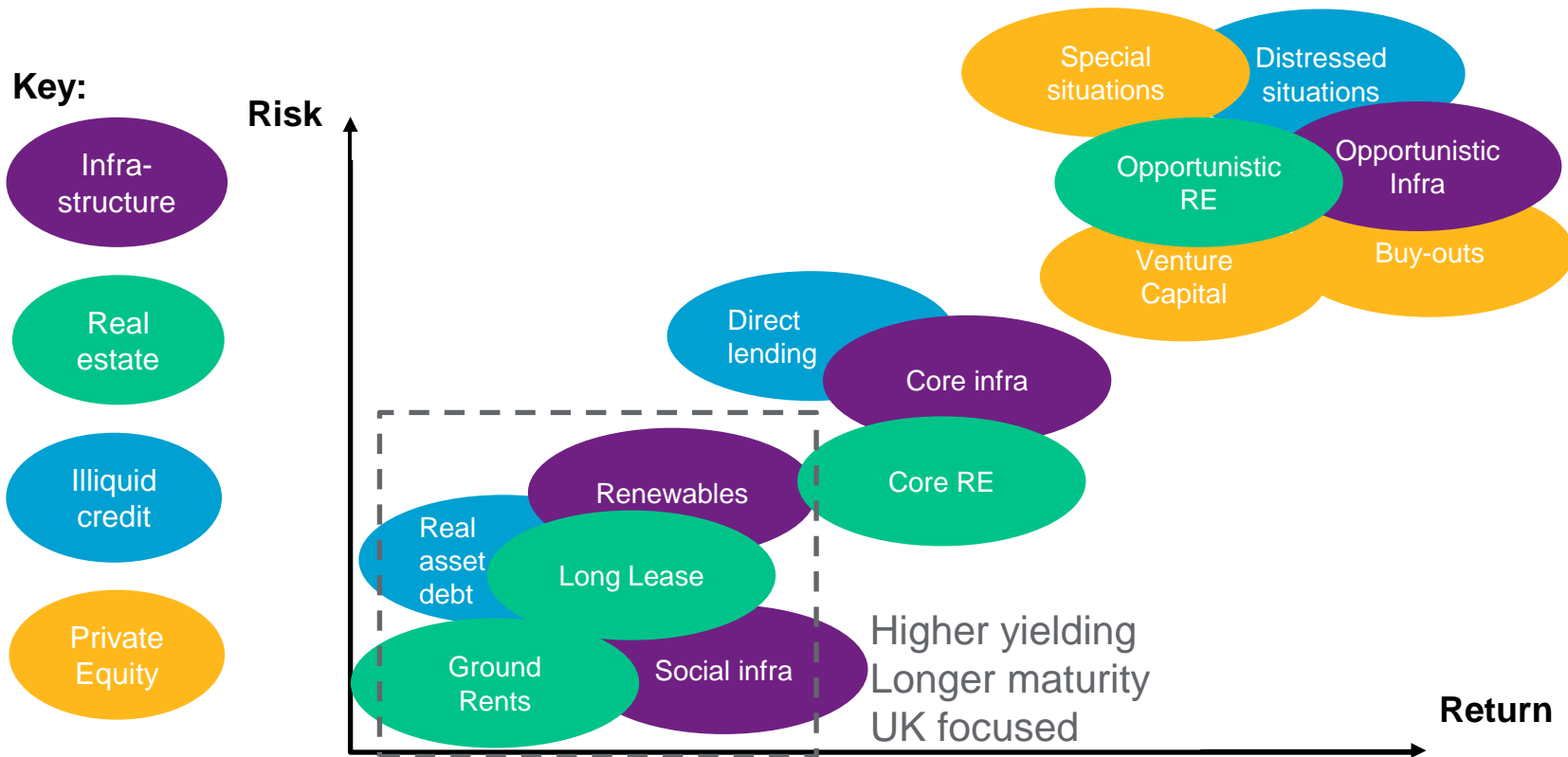
Source: Pension Protection Fund, Pensions Regulator and DMO, Willis Towers Watson, 2016

Income provided by traditional assets is inadequate



Alternative sources of inflation-linked income are needed

Can infrastructure be part of the solution



Secure Income Assets provide a higher yielding alternative

- Secure Income Assets (SIAs) are long-term illiquid strategies:

Infrastructure

Real Estate

Real Asset Debt

- Contractual, long-term cash flows, most with explicit UK inflation linkages
- Long-term leases / concessions that are difficult to break
- Strong security provided by robust counterparties or tangible collateral backing
- Most economic value from contractual cash flows, not residual value
- Limited economic exposure

Assets that help DB funds meet their mission: providing an income to members

Summing up

- **Infrastructure is a diverse asset class**
 - Parts of the asset class can provide stable returns
- **Huge requirement for infrastructure investment**
 - Institutional investors are willing and able to participate....
 - as long as the project is structured correctly
- **Think about managing infrastructure with other assets with similar characteristics**

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