

# Infrastructure Asset Management with Uncertain Data

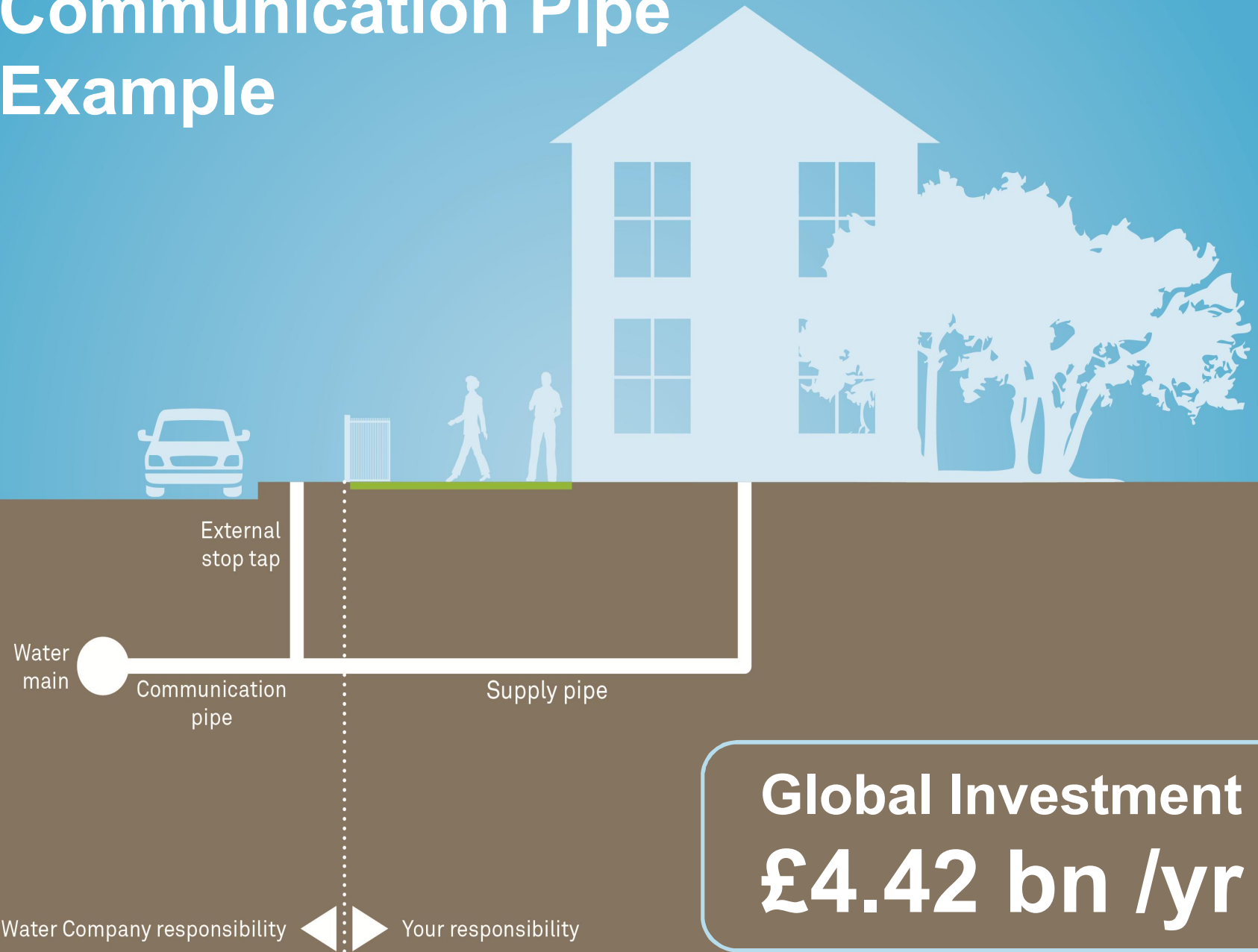
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**AECOM**

# Objectives & background

		Analytics Techniques		
		DESCRIPTIVE	PREDICTIVE	PRESCRIPTIVE
Business Requirements	STRATEGIC	What happened to our assets in the last 10yrs?	What will happen to our assets in the next 25yrs?	What future investments do we need to make on our assets?
	TACTICAL	What happened to our assets in the last year?	What will happen to our assets in the next year?	What assets do we need to replace or maintain this year?
	OPERATIONAL	What is happening to our assets today?	What will happen to our assets tomorrow?	What assets do we need to inspect or maintain tomorrow?

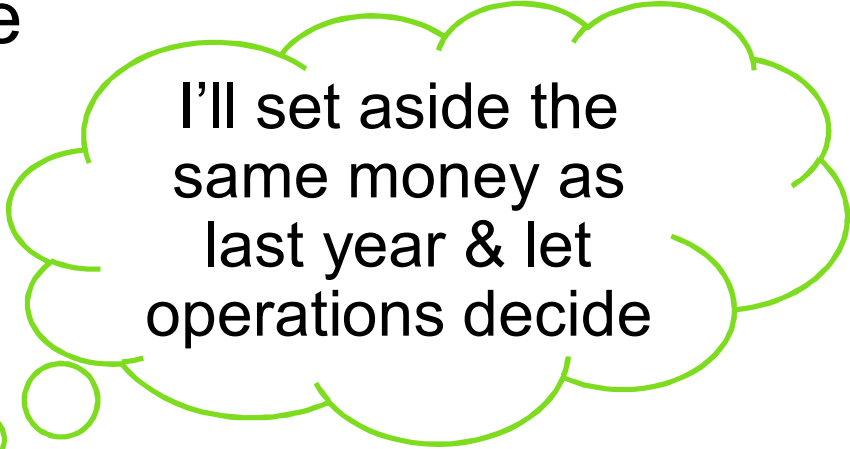
# Communication Pipe Example



**Global Investment  
£4.42 bn /yr**

# Are we optimising our investment for communication pipes?

- Less than 80% of assets are mapped\*
- Less than 90% of assets have known material or age\*



I'll set aside the same money as last year & let operations decide

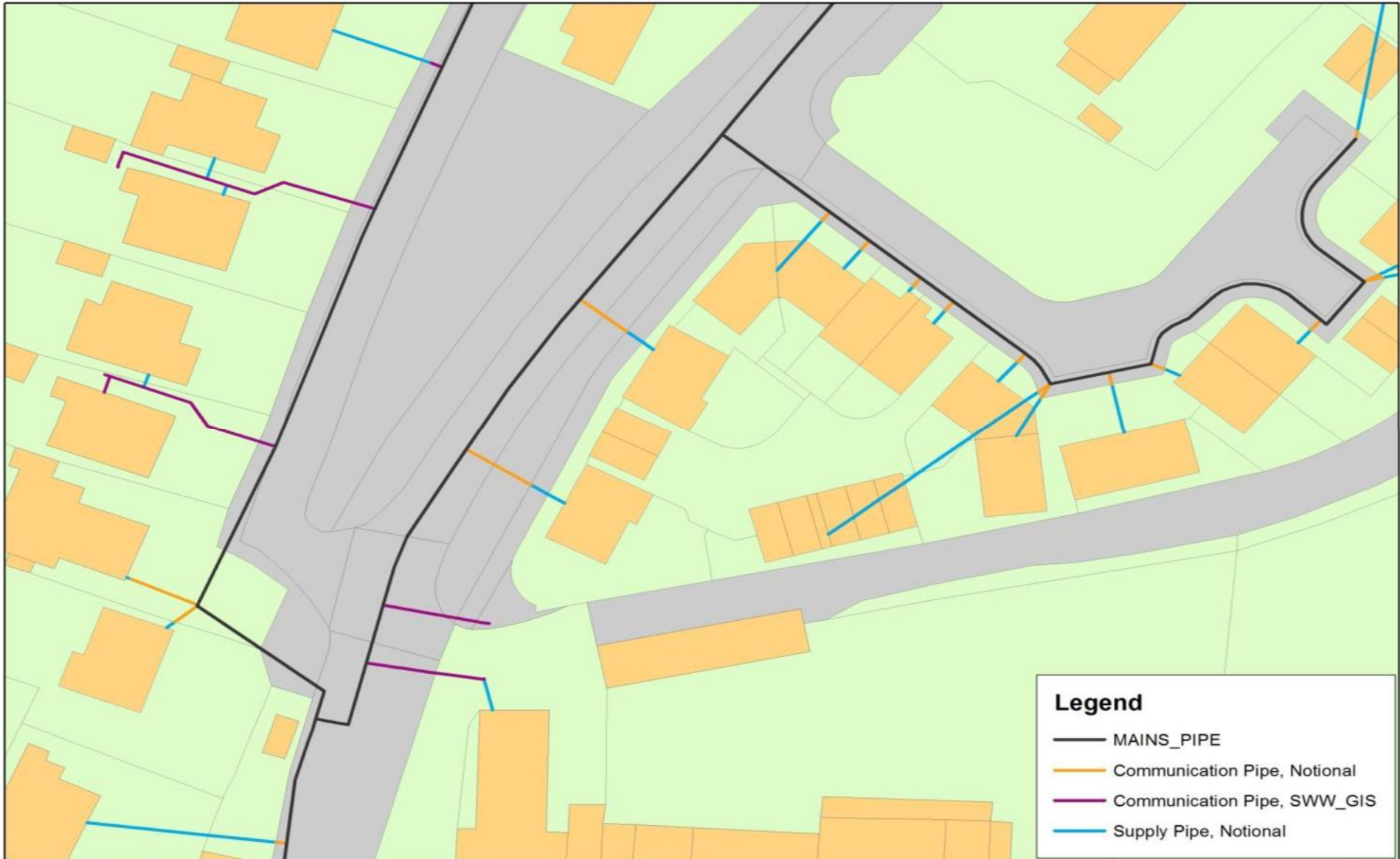


\* UK estimate from research

# | Approach

1. Build an asset stock
2. Deterioration modelling & whole life cycle analysis
3. Optimise maintenance & investment policies

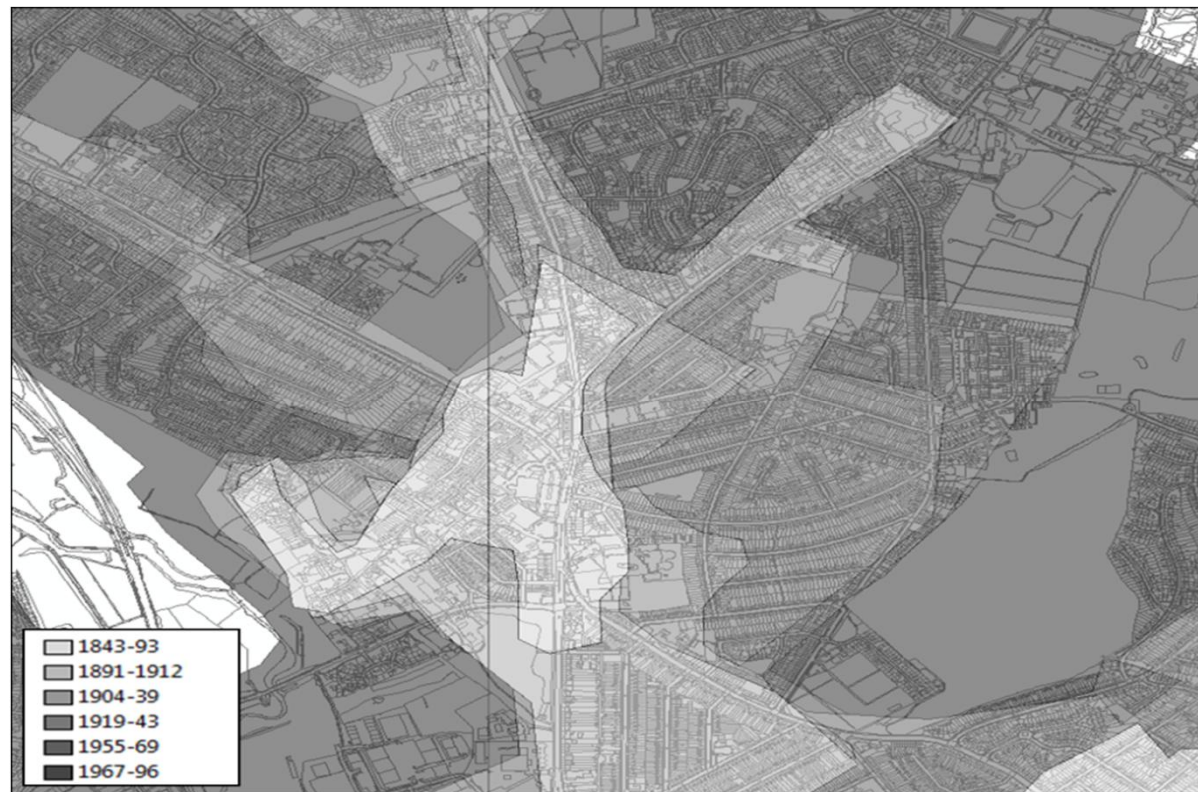
# 1a. Asset mapping





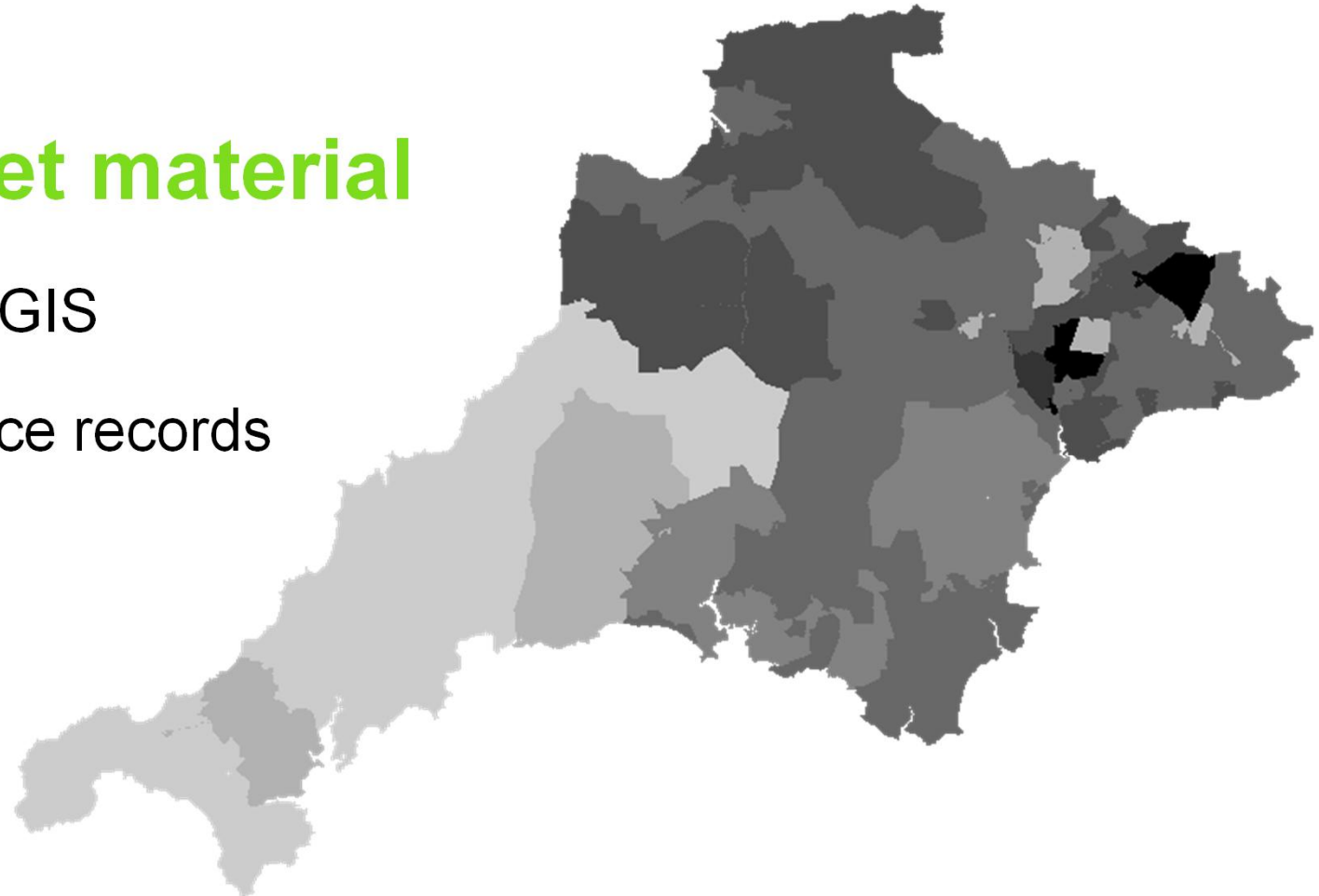
## 1b. Asset age

- i. Corporate GIS
- ii. UK Gov. Valuation Office Agency postcode age data
- iii. Digitised historic map boundaries



# 1c. Asset material

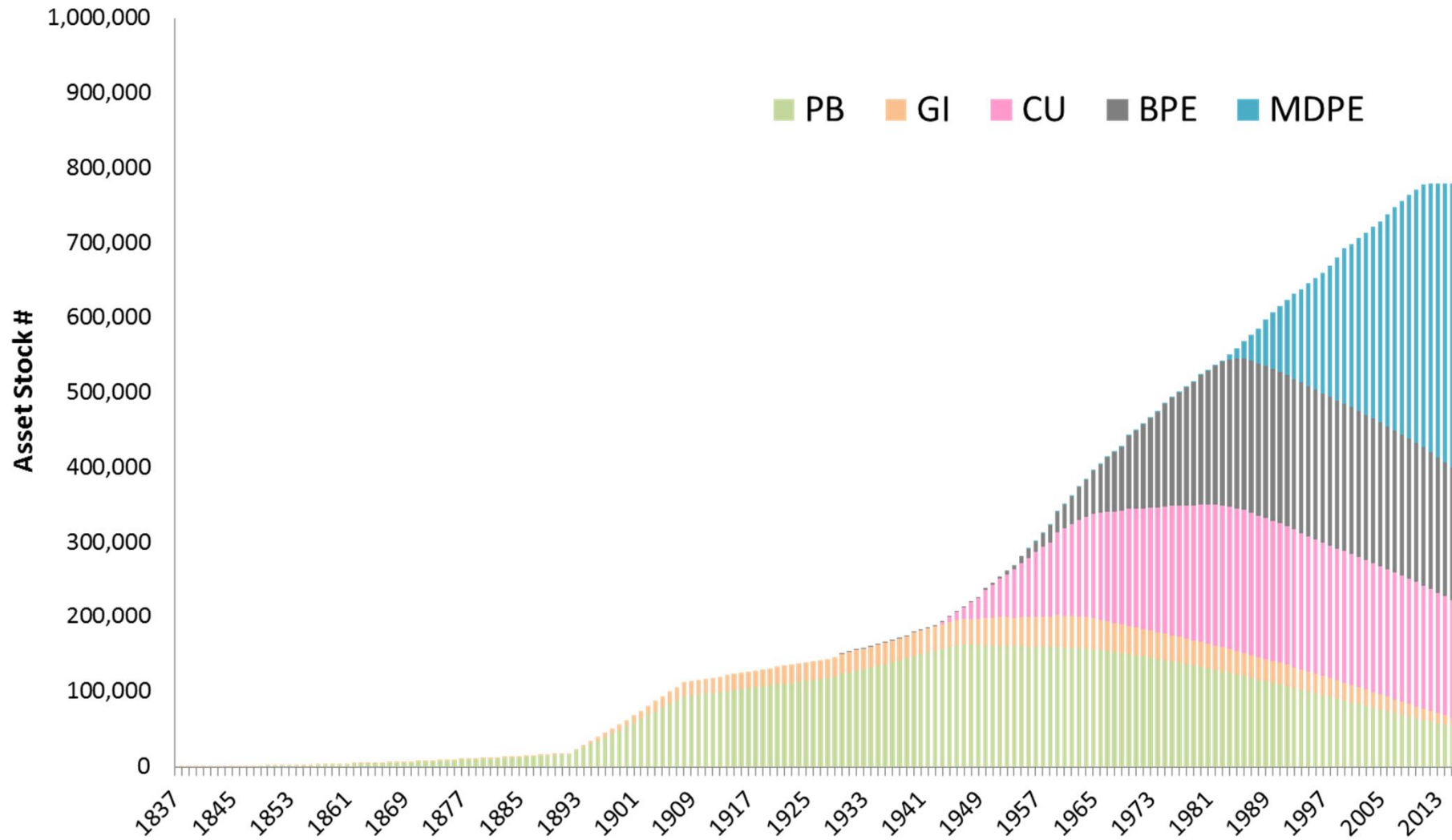
- i. Corporate GIS
- ii. Maintenance records
- iii. Elicitation



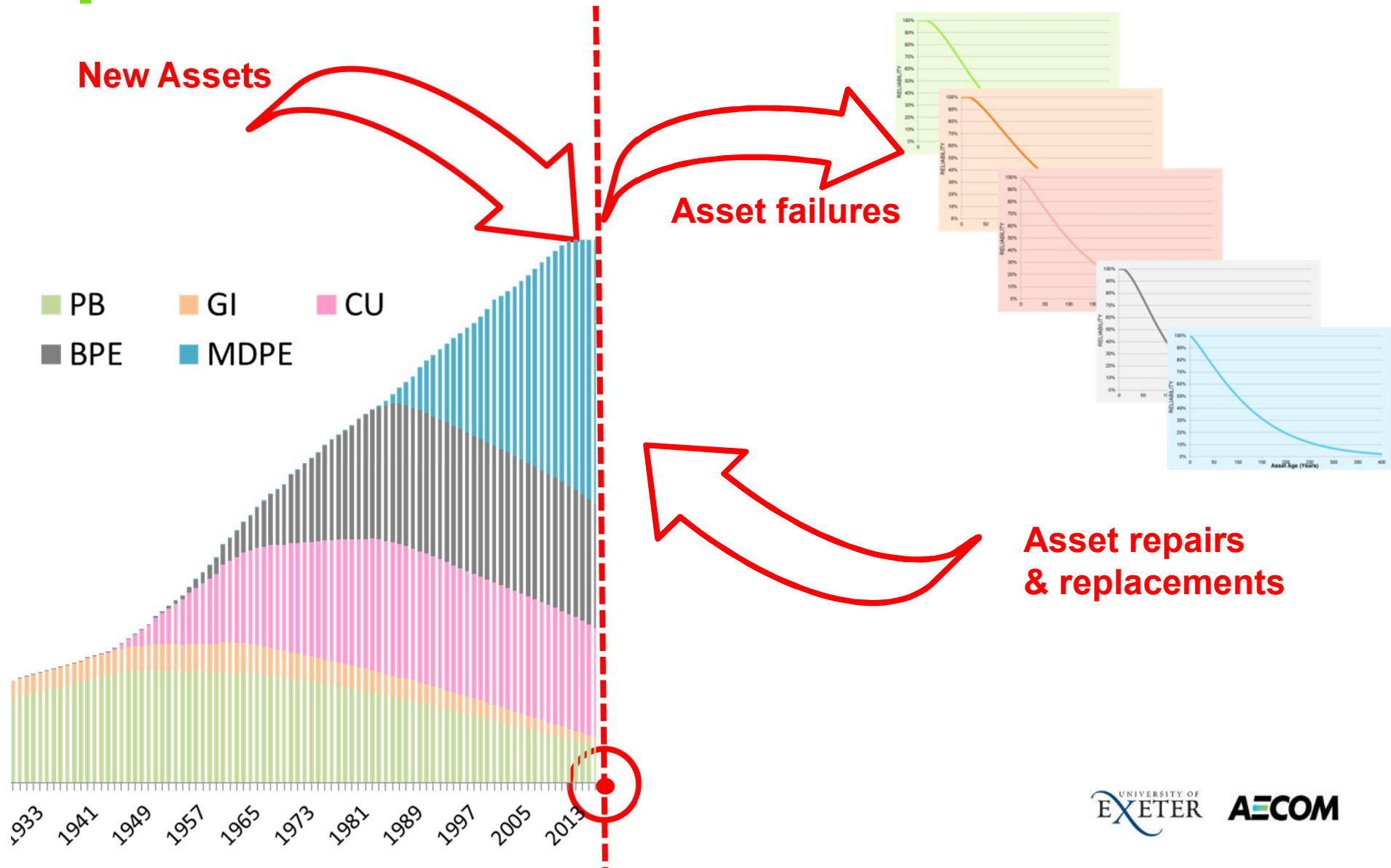
Date range	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
<1945	GI	Pb	Pb	GI	Pb	Pb	Pb	GI
1945 – 49	Cu	Cu	Cu	Cu	Cu	GI	Pb	GI
1950 – 55	Cu	BPE	Cu	Cu	Cu	GI	Pb	GI
1956 - 63	BPE	BPE	Cu	Cu	Cu	GI	Pb	Cu
1964 – 84	BPE	BPE	BPE	BPE	Cu	Cu	BPE	BPE
>1985	MDPE	MDPE	MDPE	MDPE	MDPE	MDPE	MDPE	MDPE



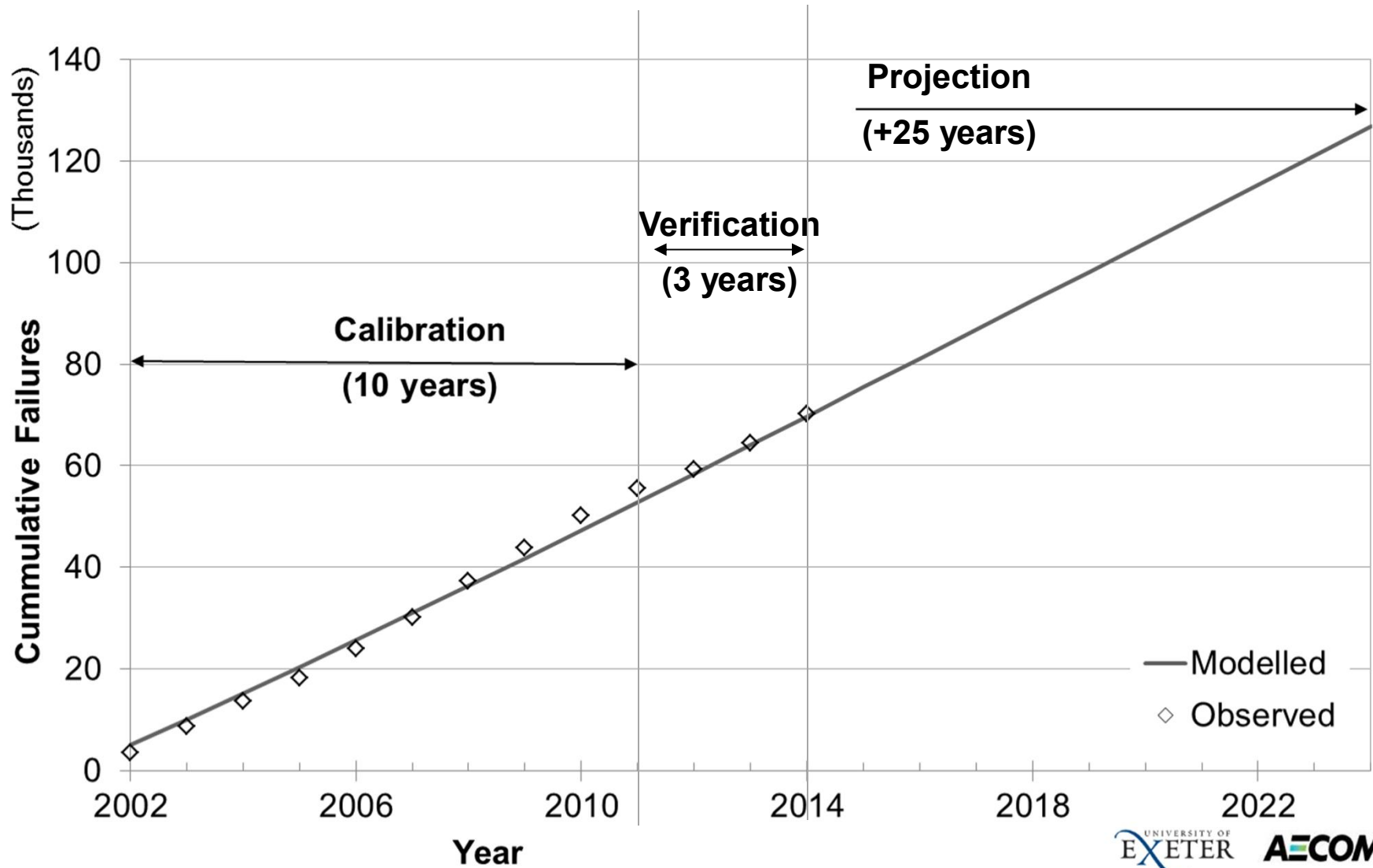
## 2. Life cycle model



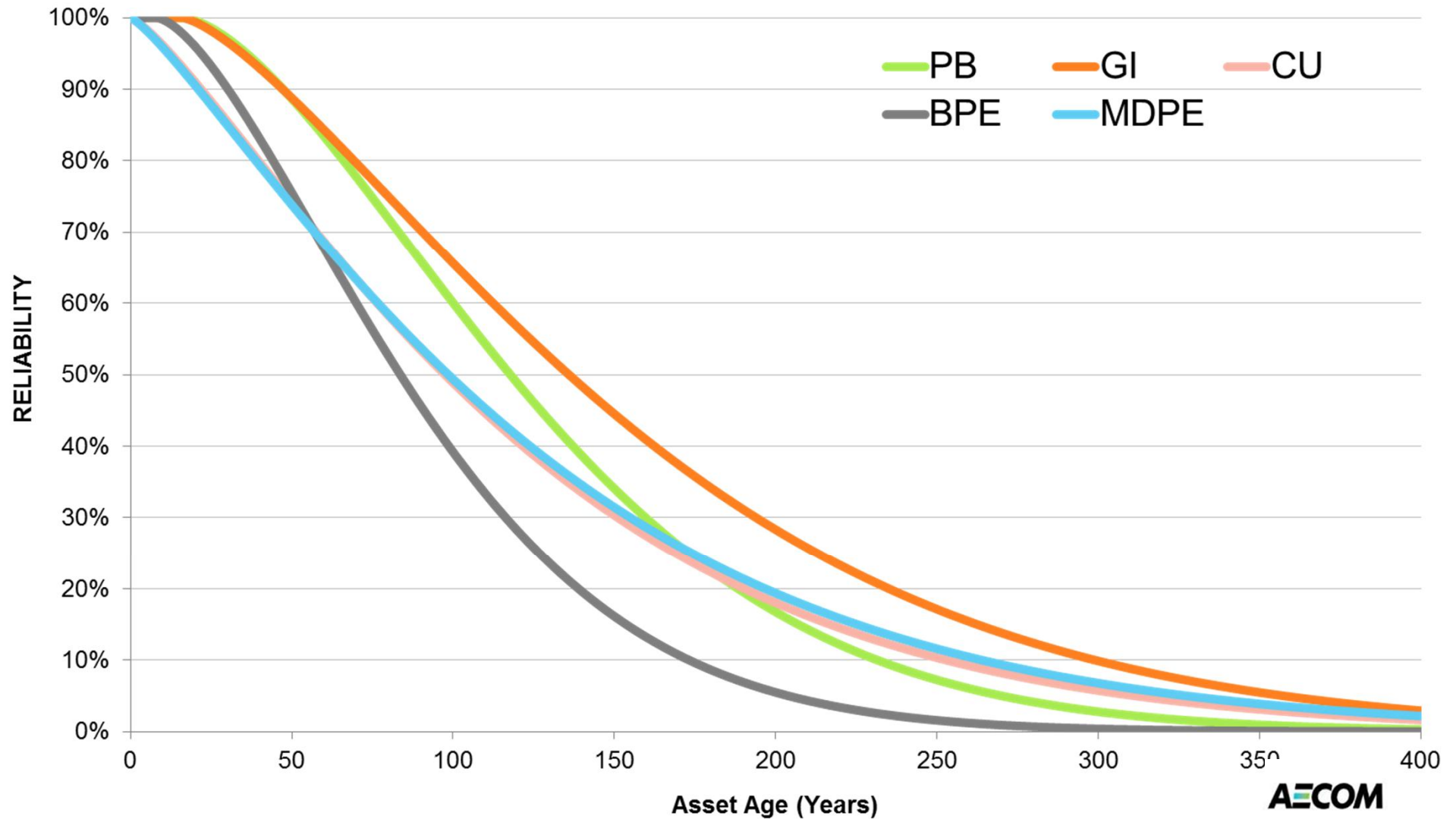
# 2. Deterioration modelling & WLC



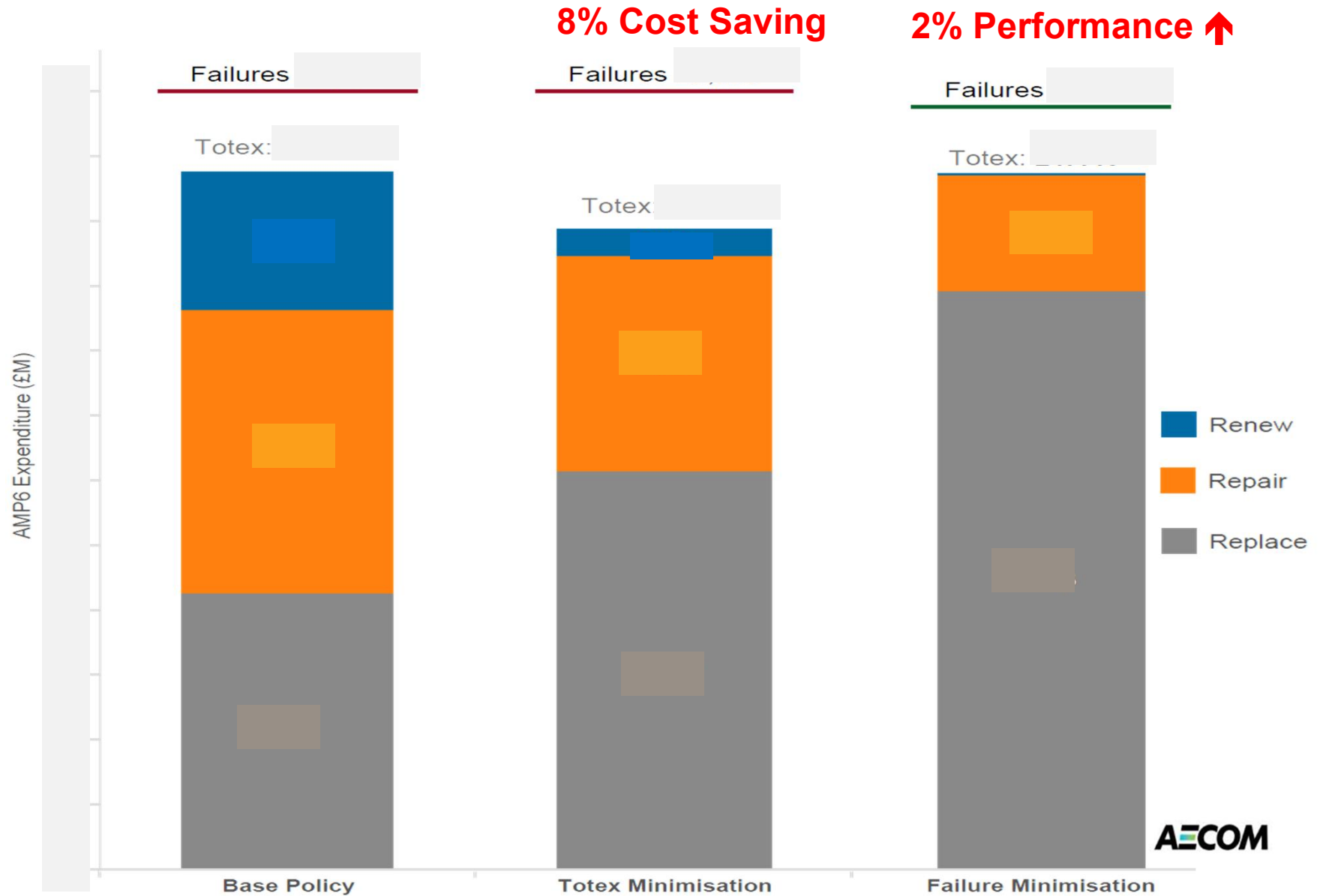
## 2b. Model calibration & verification



## 2a. Deterioration curves



# 3. Results – AMP6 Expenditure



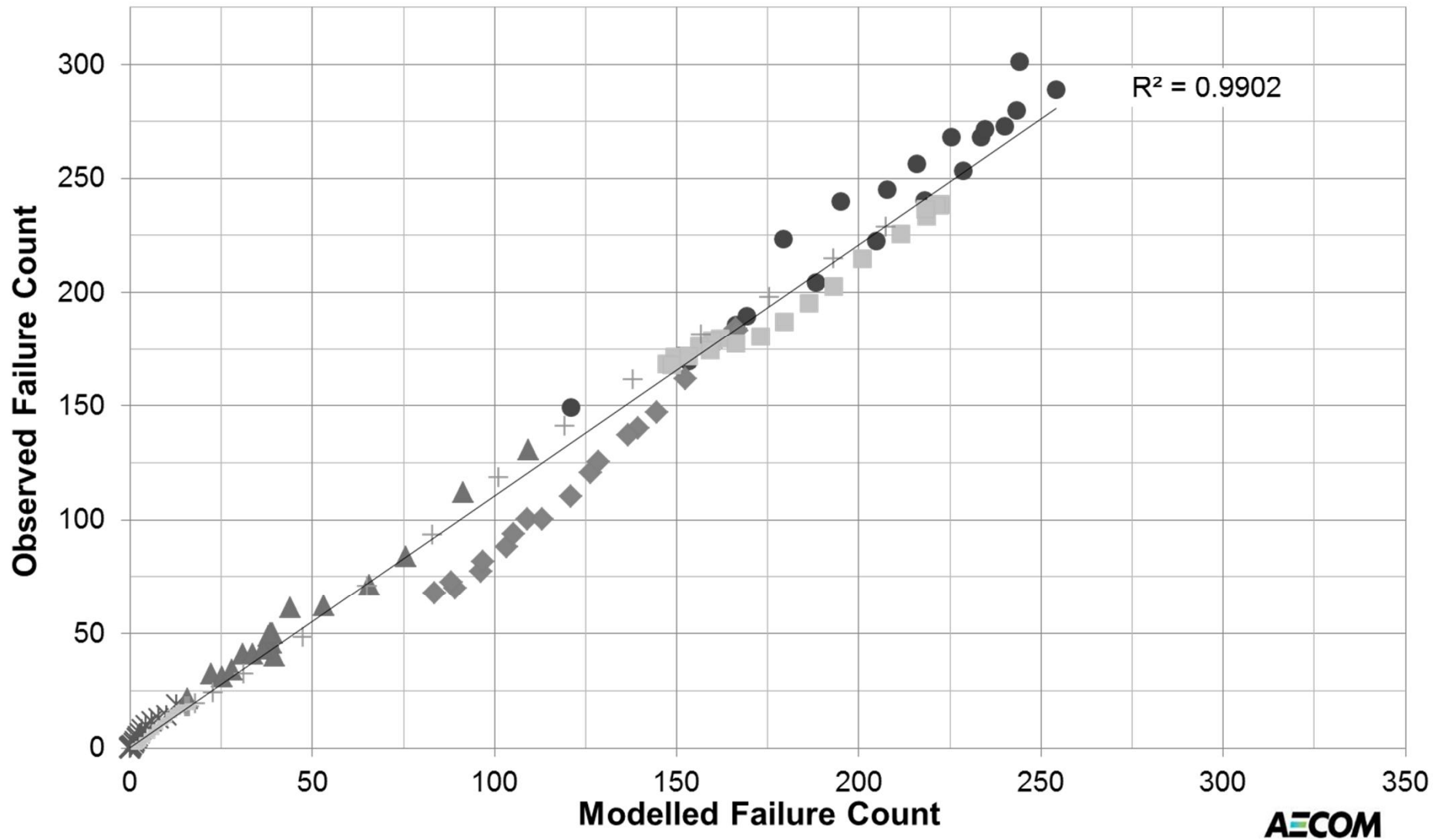
# Questions



# Pb comparison

## Age at failure

- \* <41
- ▲ 41-60
- 61-80
- ◆ 81-100
- 101-120
- + 121-140
- >140



# Pb comparison

- Observed Company 1
- ◆ Modelled Company 1

