

NATIONAL
ENERGY
FOUNDATION

*Improving the use of
energy in buildings*

Energy-efficient & sustainable buildings: insights and lessons from the National Energy Foundation

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National Energy Foundation

**Building Services Summit
- November 2014**

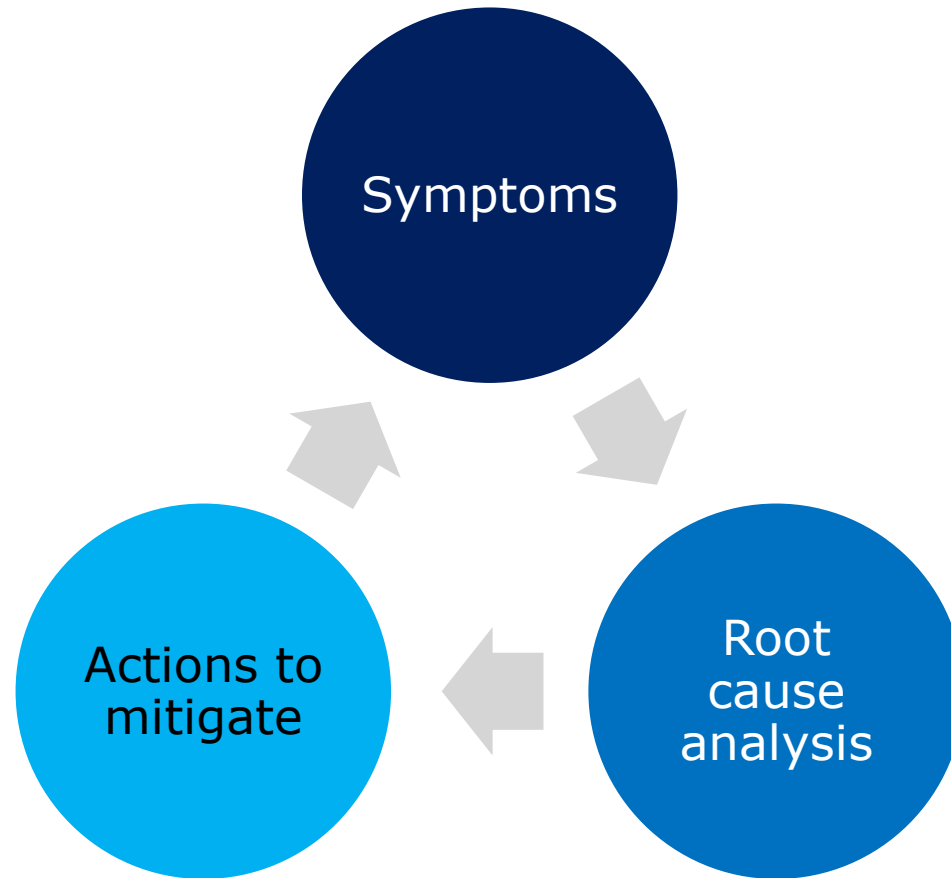
NEF – improving the use of energy in new and existing buildings

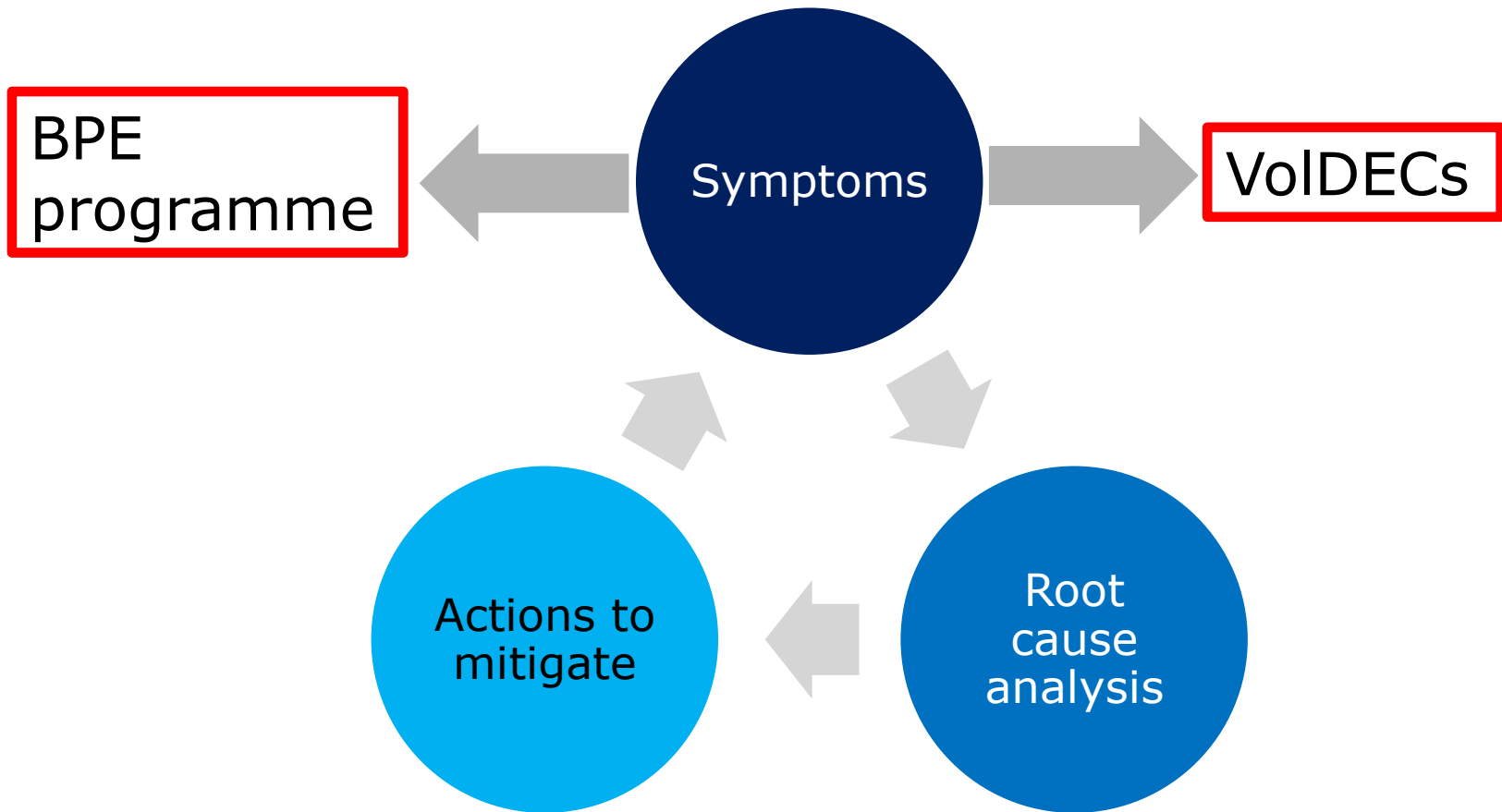
Making better buildings

- Management – existing buildings
- Retrofit and refurbishment

- Procurement
- Delivery and verification

Making buildings better





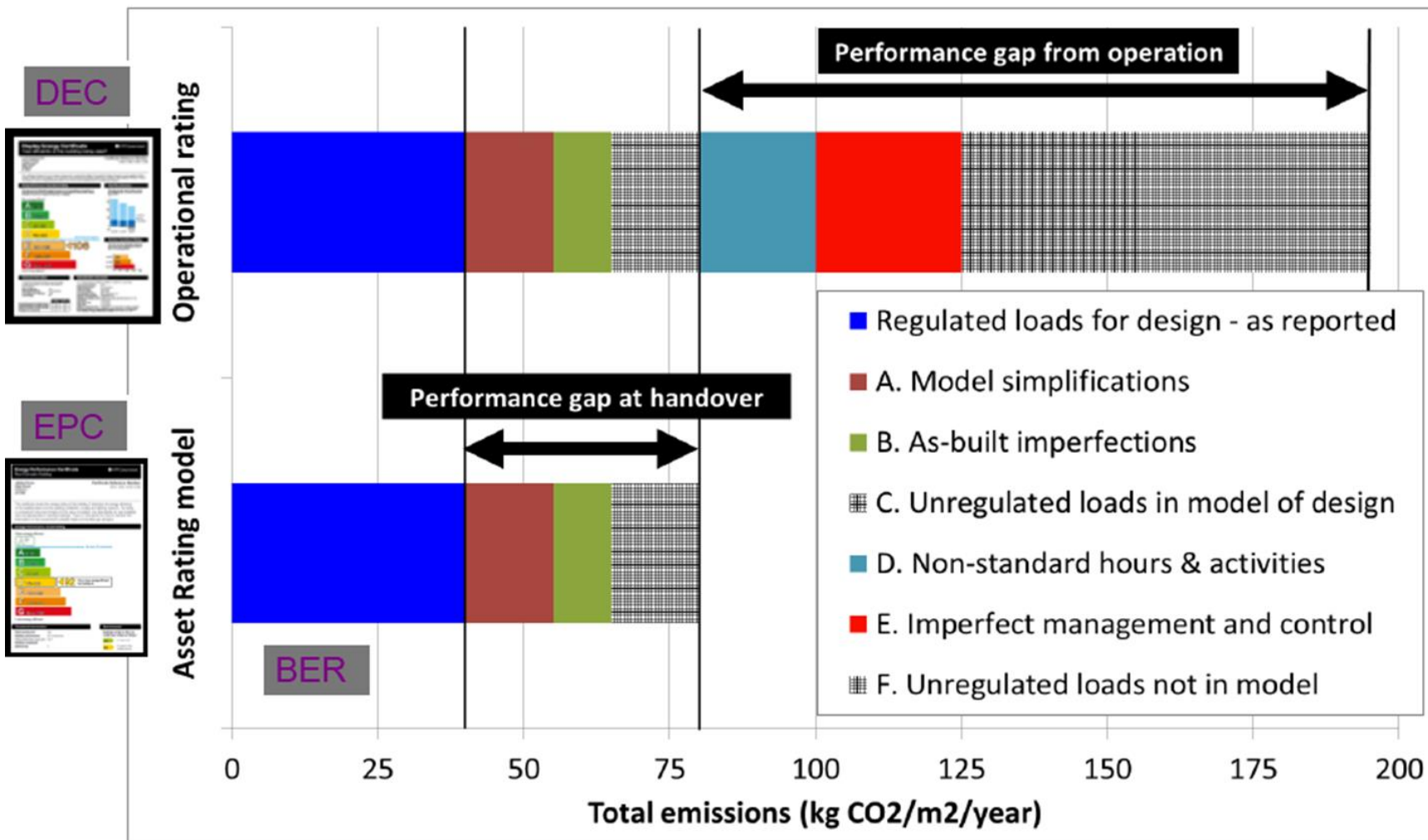
Innovate UK – Building Performance Evaluation Programme



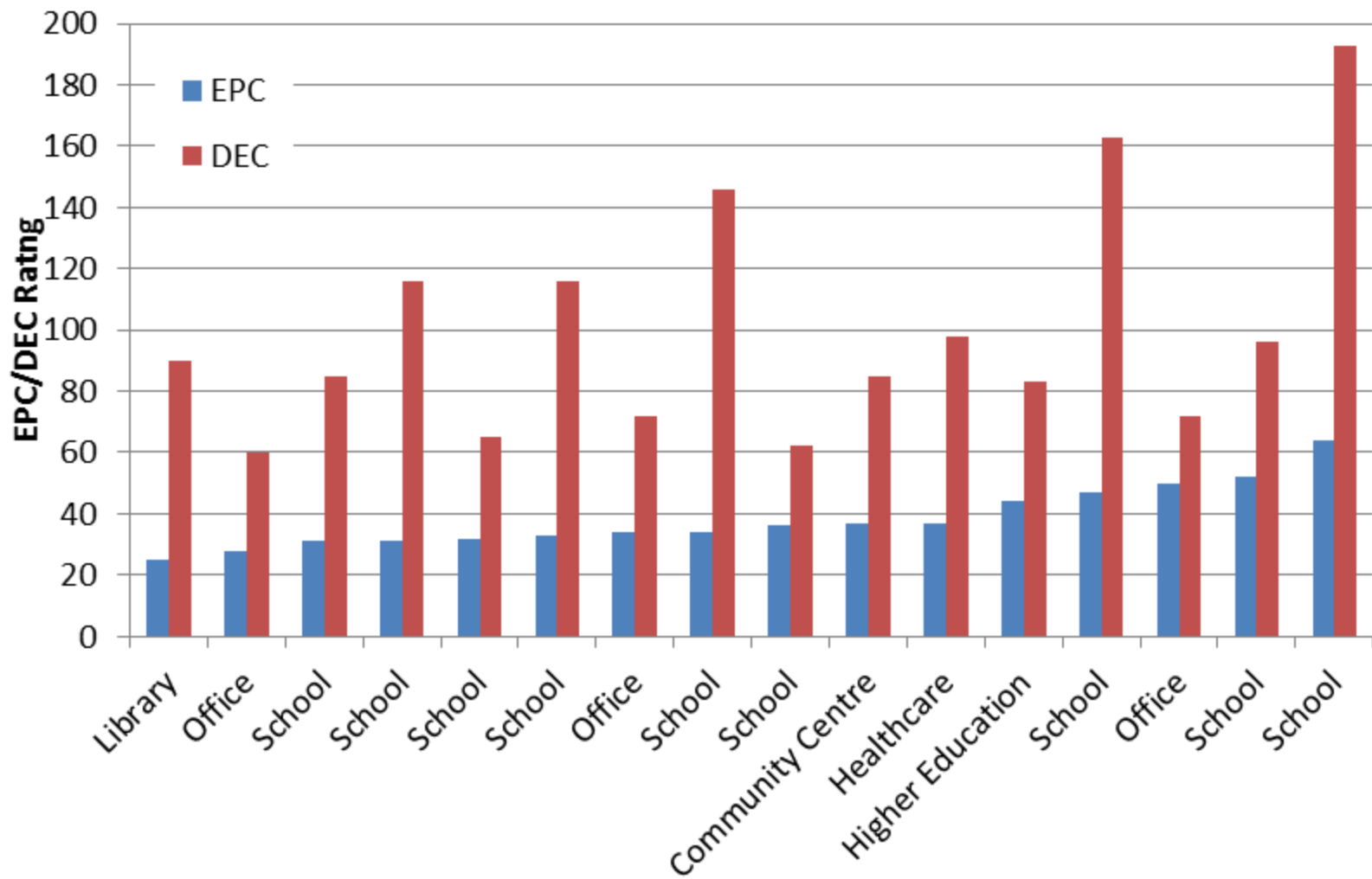
2010 - 2014

- Over 100 new build projects + 3 refurb
- 49 non-domestic studies, 56 buildings
- 366 dwellings (developments 3989 dwellings)
- Completion and early occupation / in-use
- Energy use typically 2.5- 4.5 times predicted

Composition of the Performance Gap



Source: Robert Cohen, Verco, paper for GCB, March 2012.



Emerging themes 1– courtesy Innovate UK

- Fabric thermal performance – specification and construction; overheating; risky design details; thermal bridge and bypass; air tightness
- Modelling discrepancies - non-standard hours and unregulated loads (TM22)
- Commissioning – buildings not fully commissioned
- Sub-meters and reconciliation – poor metering tree; meters not functioning or understood

Emerging themes 2– courtesy Innovate UK

- BMS –complexity; functionality; commissioning; training
- Controls – complexity; operating instructions; labelling
- Lighting – too much; zoning deficiencies; poor control
- HVAC – integration and control of multiple systems
- Renewables and MVHR – installation; operation and maintenance
- Energy strategy - not properly implemented, e.g. lead and secondary heating

VOLUNTARY DISPLAY ENERGY CERTIFICATE

How efficiently is this building operated?



LANDLORD RATING
RATING QUALITY: Medium

Focus
HP2 7BW

Certificate No: P03465NEF2014L

Overall Energy Performance

More energy efficient

A 0-25

B 26-50

C 51-75

D 76-100 **81**

100 would be typical

E 101-125

F 126-150

G1 151-175

G2 176-200

G3 201-225

G4 226-250

U unclassified above 250

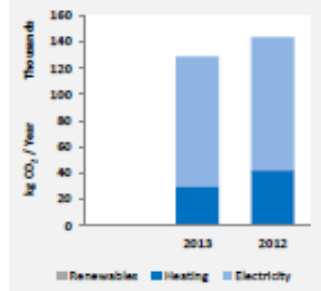
Less energy efficient

Technical & Administrative

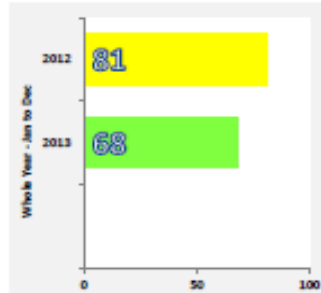
VoIDEC Selected Scenario	S3 - Air Conditioned, Tenant cooling
ECO19 Building Type	TYPE 3 Standard A/C
Gross Internal Floor Area (m ²)	4963
Main Heating Fuel	Gas
Whole Building Rating	81 (Good rating is: 55)
Landlord Rating	81 (Good rating is: 55)
Tenant Rating	0 (Good rating is: 54)
HMG Statutory OR	0
Asset Rating	N/A

Assessor name	NEF
Energy monitored in the year	2012
Issue Date	05 March 2014
Nominated Date	05 March 2014
Valid Until	05 March 2015

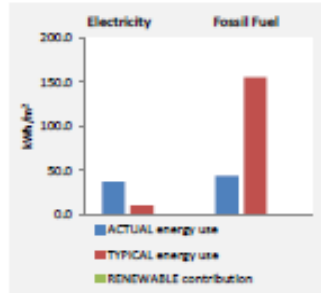
Total CO₂ Emissions



Previous Operational Rating



Energy Performance by Fuel



SEPARABLES REMOVED: None



VoIDEC Certificates are co-produced by The National Energy Foundation and Building Energy Solutions, on behalf of Legal & General, 2014

VoIDEC



VolDECs – responsibility and authority

- Legal & General, Building Energy Solutions, National Energy Foundation
- Not for profit scheme to benefit whole industry
- Separates landlord and tenant energy
- Piloted on 16 multi-tenanted offices
- Uses same methodology as statutory DEC with extended G ratings for greater differentiation

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VoIDEC - Method and benchmarks

	Statutory DEC	VoIDEC
Methodology	Produced using the methodology described in CIBSE TM47	Produced using the methodology described in CIBSE TM47
Benchmarks	Uses CIBSE TM46 benchmarks. This provides only one benchmark for all office types.	Uses CIBSE ECON19 benchmarks for offices. This provides four different office types plus energy is broken down by end use for each type.
Landlord / tenant split	Unable to provide a separate landlord tenant DEC in the same building	Uses the granular energy breakdown in CIBSE ECON19 to provide composite landlord and tenant benchmarks for 5 different building scenarios.

Increase client pull

Meter to manage

Match complexity to
client/occupant ability

Consider impact on
fabric performance

More insights available
from BPE studies in 2015





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