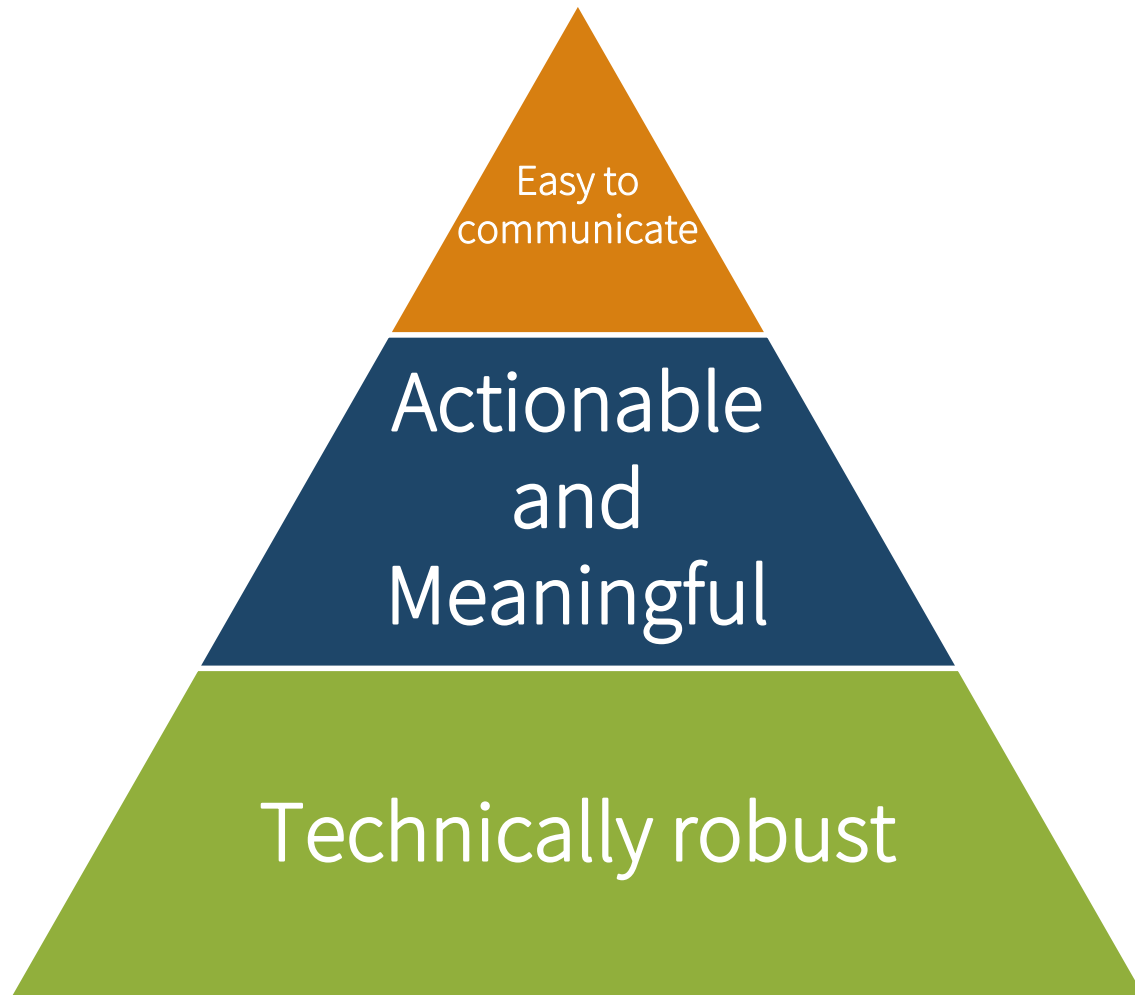NABERS UK Breakfast Event 05 July 2022:

Energy for Offices Ratings

Robert Cohen
Technical Director, Verco

USPs of NABERS Ratings

Easy to communicate

Actionable and Meaningful

Technically robust

The success of NABERS is underpinned by seven key principles

1. Measure **actual impact,** not intent

2. Assess **building operations**, not design

3. Deliver **meaningful ratings** that the market can understand

4. Support a **simple** and **easy-to-perform** rating process

5. Achieve **reliable ratings** that everyone can trust

6. Foster **strong governance** and **trustworthy management**

7. Encourage **collaborative** rating tool development

Energy efficiency in commercial buildings: How NABERS transformed the market, May 2022
https://www.nabers.gov.au/file/101477/download?token=kdpossbI

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EASY TO COMMUNICATE
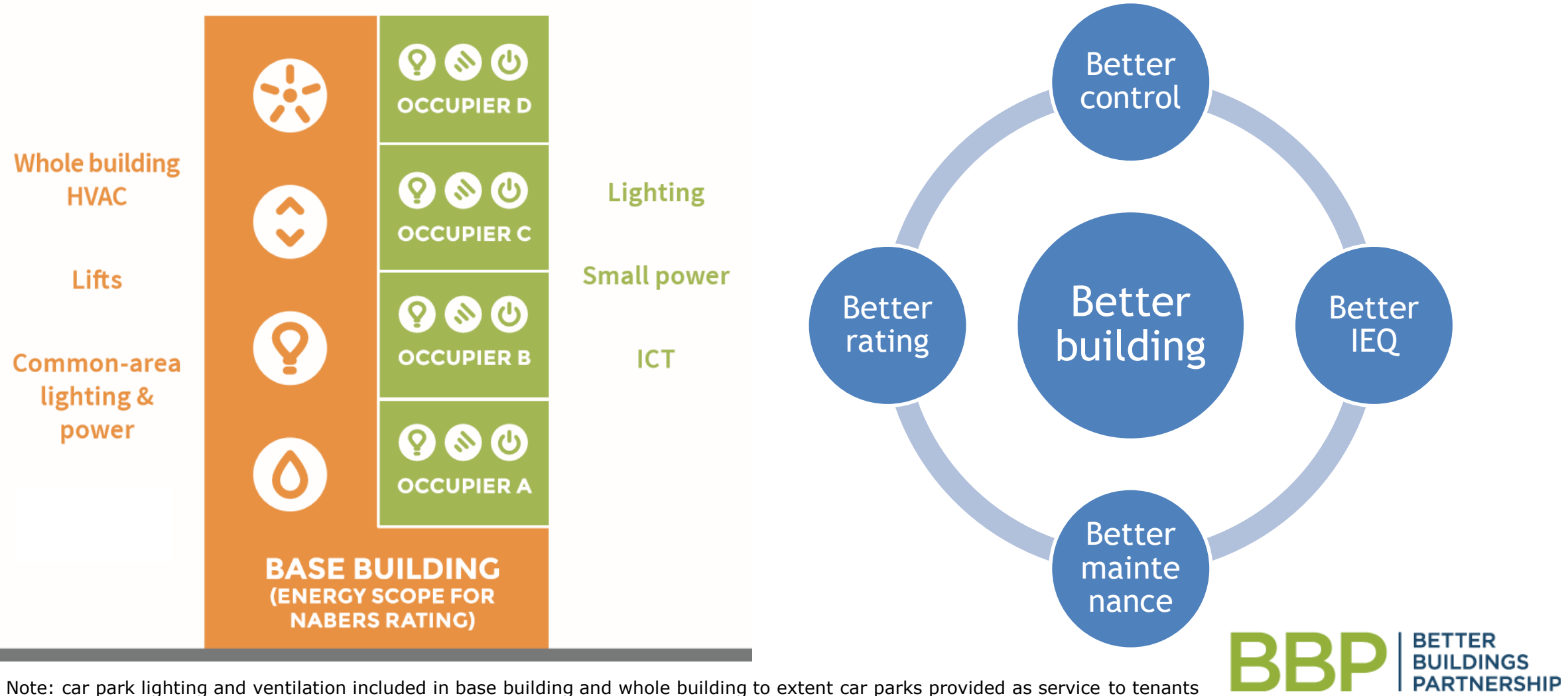
NABERS communicates through 1 to 6 star scale

Simple metric for investors, owners and occupiers:

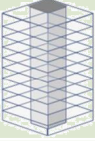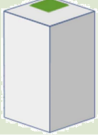measured assessment of how efficiently a building is being operated over a year

| 1 STAR | 2 STARS | 3 STARS | 4 STARS | 5 STARS | 6 STARS |
| Poor | Below Average | Average | Good | Excellent | Market Leading |

ACTIONABLE AND MEANINGFUL

Responsibility for energy uses aims to align with party in control

Whole building HVAC

Lifts

Common-area lighting & power

OCCUPIER D

OCCUPIER C

OCCUPIER B

OCCUPIER A

Lighting

Small power

ICT

BASE BUILDING
(ENERGY SCOPE FOR NABERS RATING)

Better control

Better rating

Better building

Better IEQ

Better maintenance

Note: car park lighting and ventilation included in base building and whole building to extent car parks provided as service to tenants

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Definition of 3 scopes in full suite of ratings

Type of rating	Responsibility	Scope
Base Building	Landlord	Energy to supply building central services to <u>office</u> NIA and common spaces, incl FCU motors, on-floor fans, tertiary pumps.
Tenancy	Tenants	Energy used by the Tenancy to be rated, typically for lighting and power, plus special tenancy requirements or local a/c.
Whole Building	Split	Assessment of energy used by <u>office</u> Tenancies and by Base Building services to office lettable and common spaces.

Whole building = base building + ∑ (tenancies)

Notes:
- Central DHW, e.g. circulating system from plant room, under landlord control so treated as base building energy (if it serves >30% of NIA). Local DHW, e.g. point of use electric water heaters, if under tenant control, treated as tenancy energy.
- Similarly, a/c for tenant servers allocated to base building (and benchmark compensated) if centrally supplied by landlord, or to tenancy if their supply
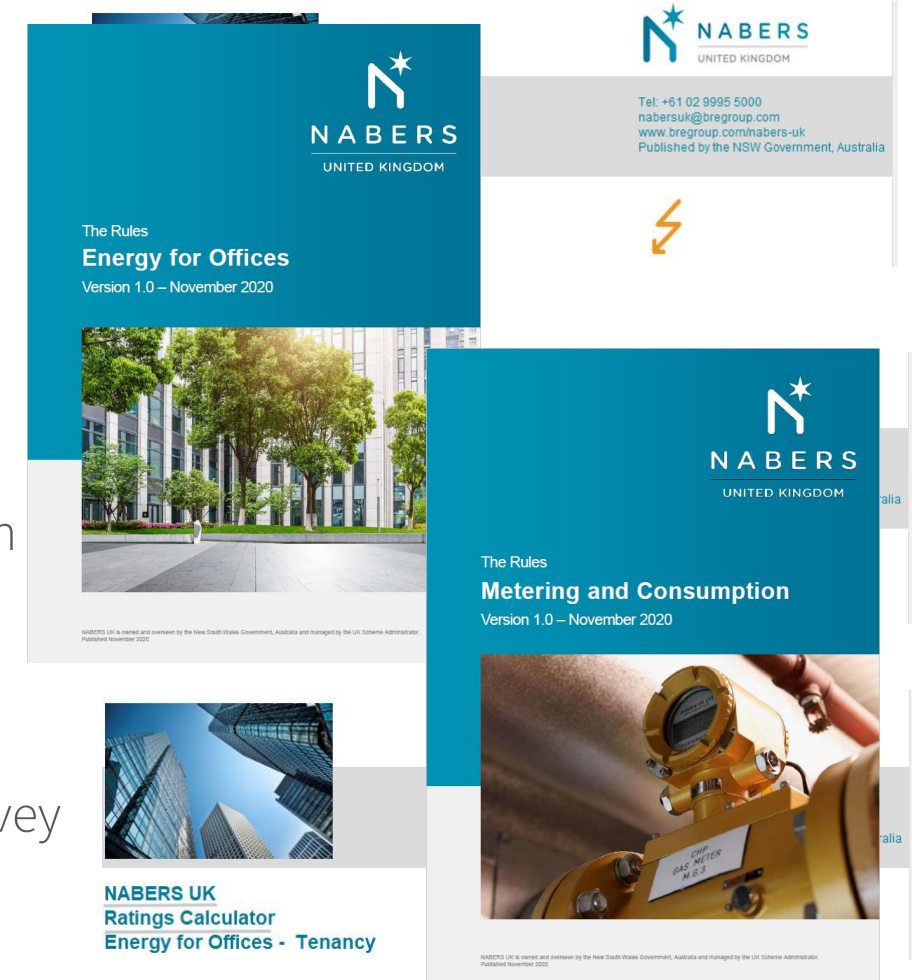
BBP | BETTER BUILDINGS PARTNERSHIP
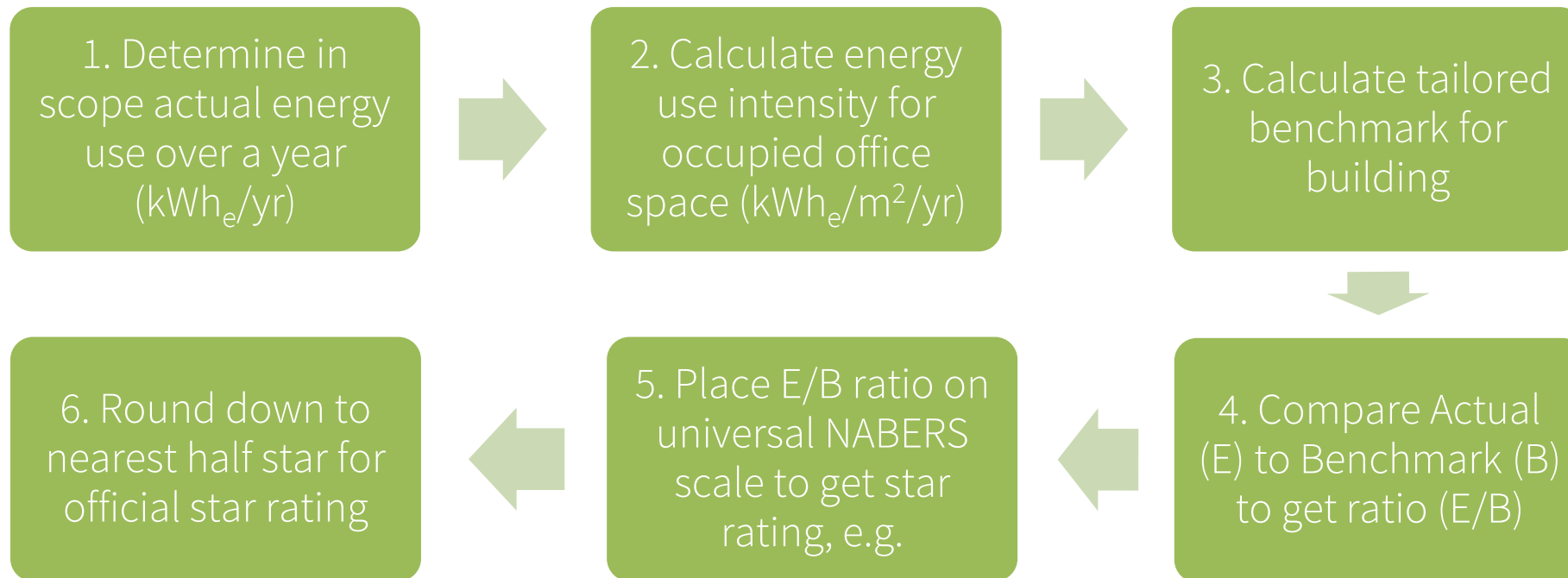
TECHNICALLY ROBUST

Tools and Rules

- ☐ **Behind NABERS UK Ratings are:**
  - ◼ The Rules (Energy for offices)
  - ◼ The Rules (Metering and Consumption)
  - ◼ The Rating Tools used by accredited assessors
- ☐ **The Rules define how inputs into rating tool are determined**
  - ◼ Rules are defined to encourage good/best practice design and operation. For example, landlord control and maintenance of whole building a/c system as an entity
  - ◼ Where metering not available, conservative defaults used
  - ◼ Independent Design Review (new build) or rateability survey (existing) will identify beneficial metering additions.

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Published by the NSW Government, Australia

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UNITED KINGDOM

The Rules
Energy for Offices
Version 1.0 – November 2020

The Rules
Metering and Consumption
Version 1.0 – November 2020

NABERS UK
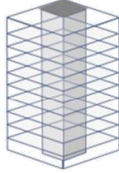**Ratings Calculator**
Energy for Offices - Tenancy

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How the rating is determined

```
┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│ 1. Determine in     │  →   │ 2. Calculate energy │  →   │ 3. Calculate        │
│ scope actual energy │      │ use intensity for   │      │ tailored            │
│ use over a year     │      │ occupied office     │      │ benchmark for       │
│ (kWhₑ/yr)           │      │ space (kWhₑ/m²/yr)  │      │ building            │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘
                                                                      ↓
┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│ 6. Round down to    │  ←   │ 5. Place E/B ratio  │  ←   │ 4. Compare Actual   │
│ nearest half star   │      │ on universal NABERS │      │ (E) to Benchmark (B)│
│ for official star   │      │ scale to get star   │      │ to get ratio (E/B)  │
│ rating              │      │ rating, e.g.        │      │                     │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘
```

E/B Ratio	Star decimal rating
> 1.59	0 stars
1	3.2 stars
0.53	5.0 stars

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Tailoring the benchmark for each type of rating

Benchmarking Components   Base Building   Tenancy   Whole Building

	Base Building	Tenancy	Whole Building
Median Energy Intensity	✓	✓	✓
Climate Adjustment	✓		✓
Hours Adjustment	✓	✓	✓
Equipment Density Adjustment		✓	✓

Operational factors affecting the energy use intensity of the building

For a fair comparison of different buildings on a single scale

Benchmark (Whole Building) $\left(\text{Median Energy Intensity} + \text{Climate Adjustment} + \text{Equipment Density Adjustment}\right) \times \text{Hours Adjustment}$

REEB empirical data is used to set median energy intensity
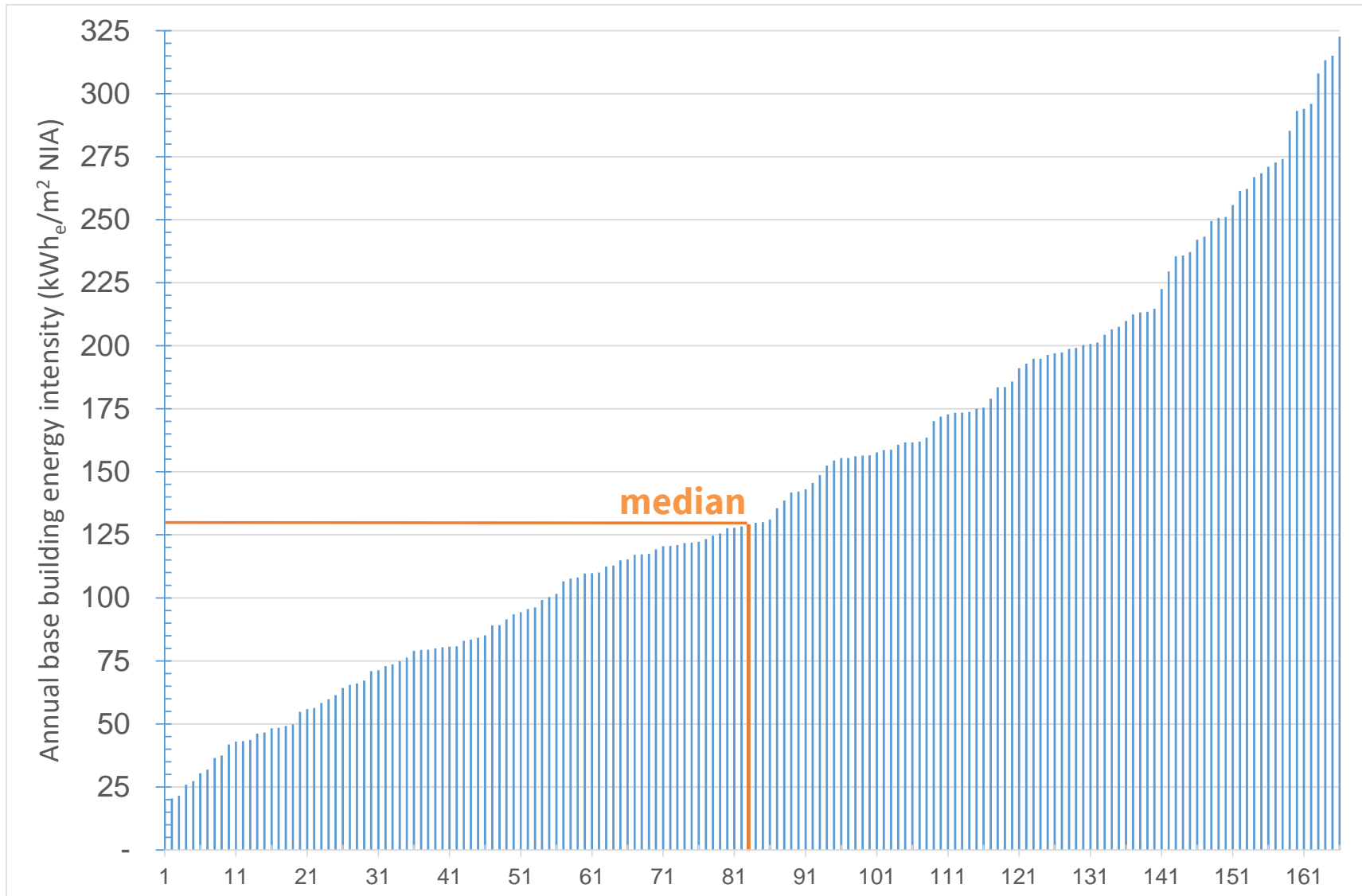
□ Example shown for Base Building data

□ N=166 ex outliers. Median = 129 kWh$_e$/m^2

□ Benchmark = 136 kWh$_e$/m^2 after allowing for FCU motors included in metered data for tenants' use

Indicative star ratings of dataset before tailoring benchmark
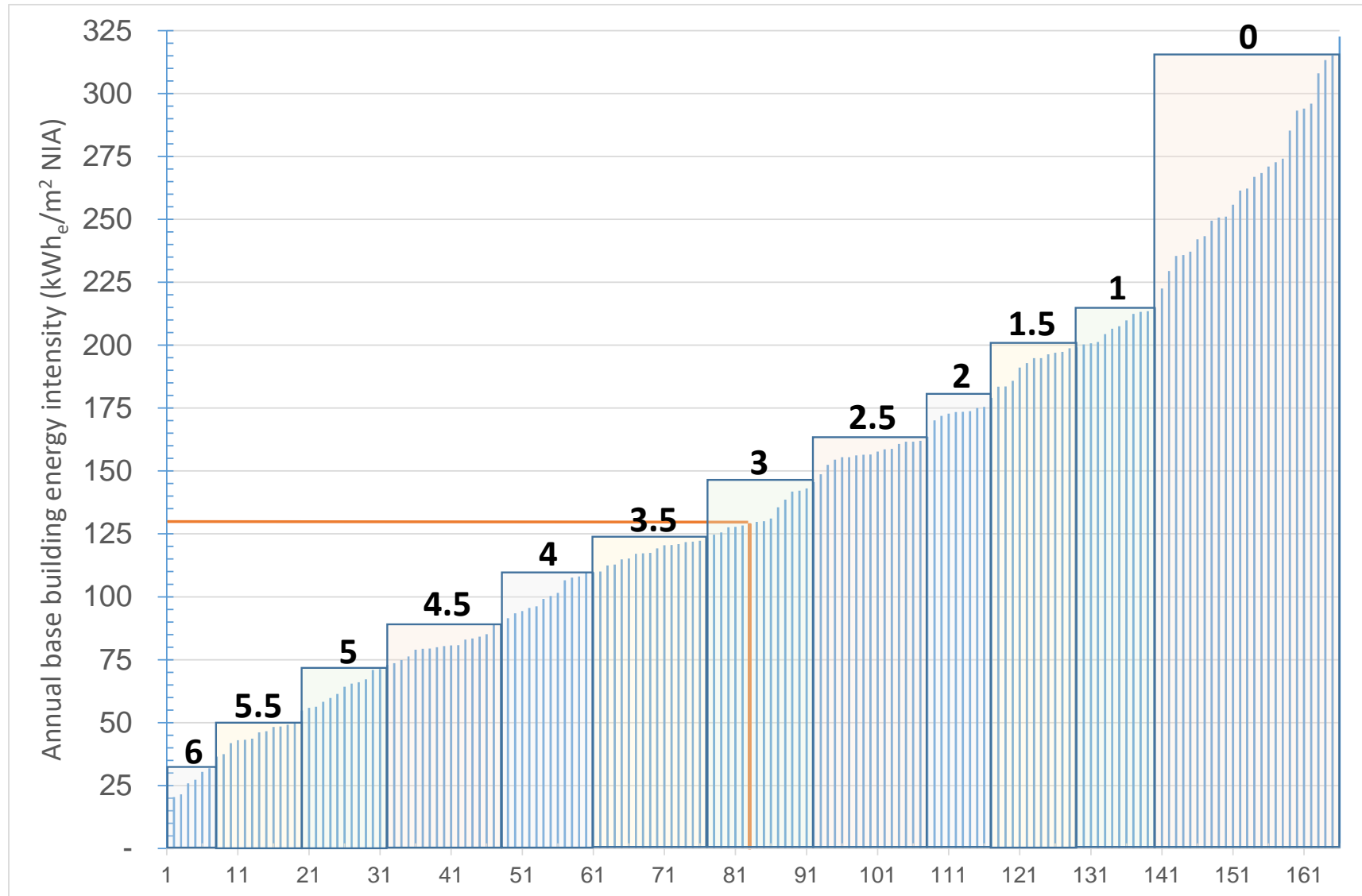
□ Example shown for Base Building data
□ N=166 ex outliers. Median = 129 kWh$_e$/m^2
□ Benchmark = 136 kWh$_e$/m^2 after allowing for FCU motors included in metered data for tenants' use]

Benchmark scale 6:1 range from 1 to 6 stars

Chart — Actual annual energy intensity (kWh$_e$/m² NIA) vs Star rating (allowed range is from 1 to 6 stars). Series: Tenancy, Base building, Whole building. Annotations: "Max intensity to avoid zero-star rating" and "Median intensity".

| Star Rating	Benchmarking Factor (E/B*100)
6	0<BF≤26.5
5.5	26.5<BF≤39.75
5	39.75<BF≤53
4.5	53<BF≤66.25
4	66.25<BF≤79.5
3.5	79.5<BF≤92.75
3	92.75<BF≤106
2.5	106<BF≤119.25
2	119.25<BF≤132.5
1.5	132.5<BF≤145.75
1	145.75<BF≤159
0	159<BF

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Basic normalising inputs are floor area and hours of use

☐ **Floor area** based on RICS Net Internal Area used for 'office-like' uses

  ◼ NIA represents productive area of the building, financially for landlord and tenants

  ◼ Exclusions:

    ☐ Non-office spaces (retail, data centres)

    ☐ Vacant areas (time adjusted)

☐ **Hours of use** for the building = area-weighted average of the hours for each functional space (including documented after hours air conditioning requests)

  ◼ No credit given for a space which is conditioned when it doesn't need to be

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Regional heating and cooling degree days moderate benchmark

- ☐ Postcode defines climate zone
- ☐ Heating and cooling degree days 20 year average from weather station in that zone represent building's climate
- ☐ Adjustment for climate *not* weather
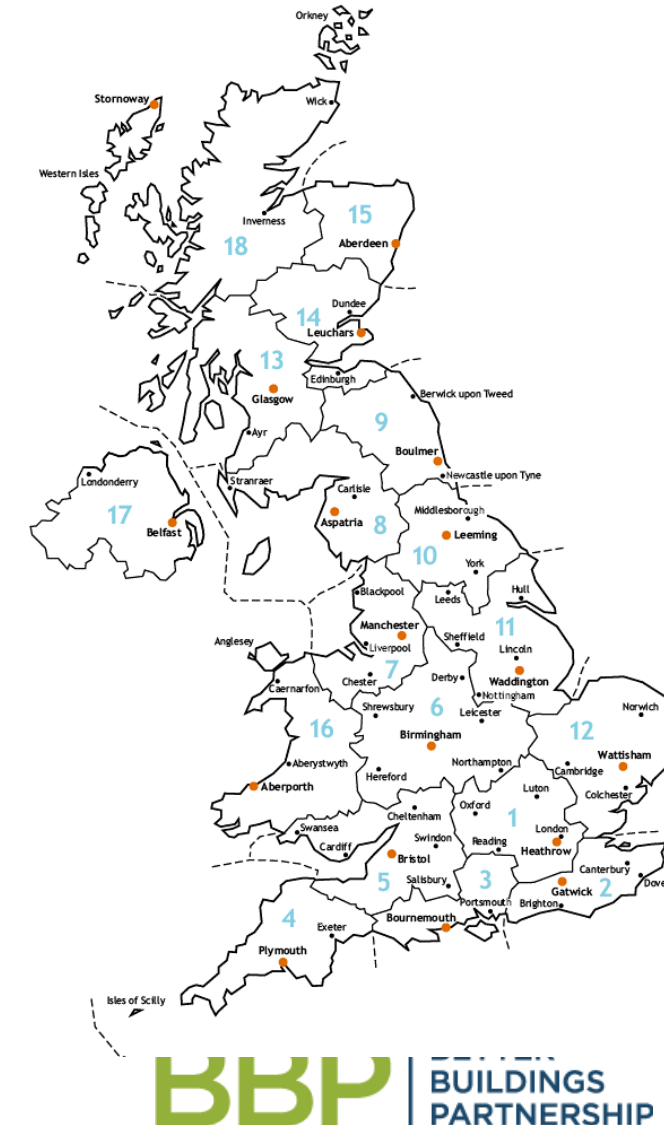
Intensity of use also taken into account

3.1 For whole building and tenancy ratings

1. Your assessed number of workstations is *[assessor to fill in number]*.
2. Your current assessed occupancy percentage, based on observation by your assessor is *[assessor to fill in number]*
3. Over the rating period, roughly what percentage of these workstations were utilised/occupied mid-morning/mid-afternoon on an average normal working day:
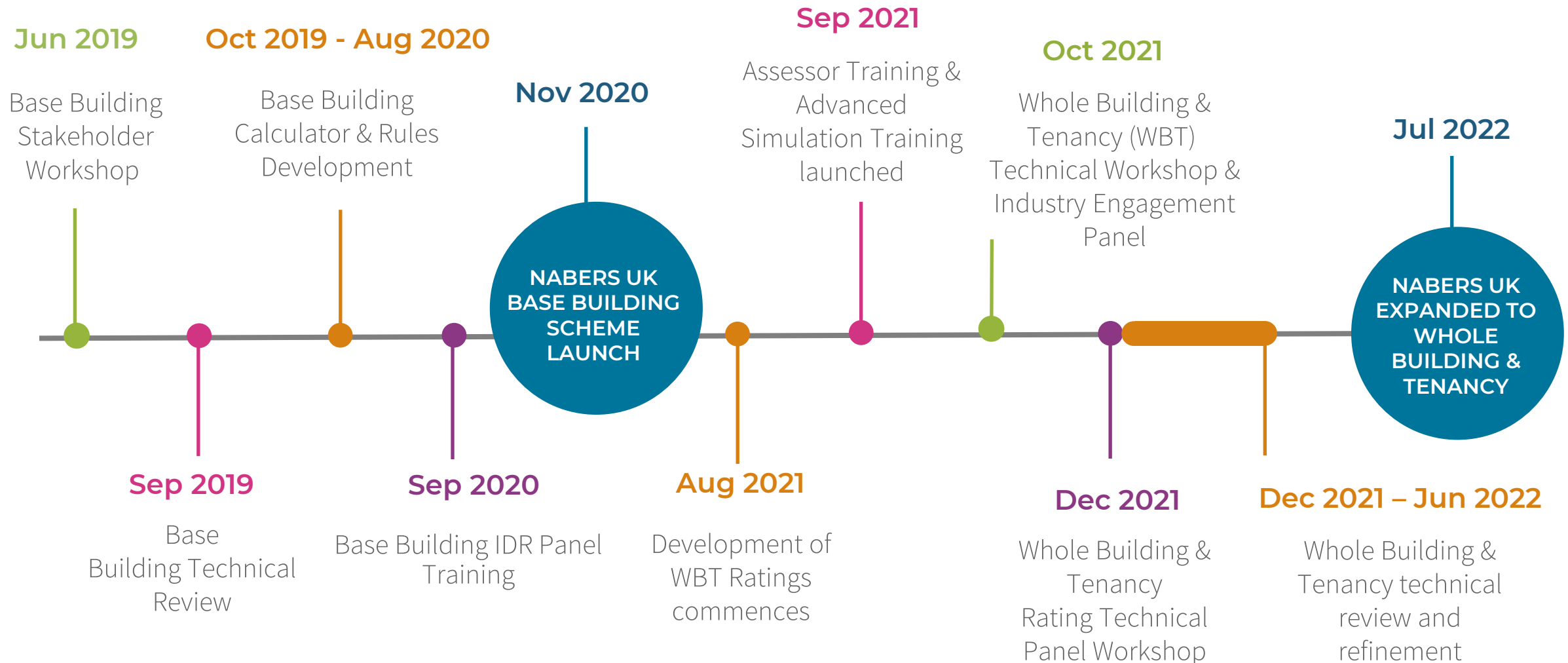
Dates	Q1 *[assessor to fill in dates]* Tick ONE as appropriate	Q2 *[assessor to fill in dates]* Tick ONE as appropriate	Q3 *[assessor to fill in dates]* Tick ONE as appropriate	Q4 *[assessor to fill in dates]* Tick ONE as appropriate
All/nearly all: 80-100%				
Most: 60-80%				
About half: 40-60%				
Some: 20-40%				
Few: 0-20%				

Table 1. Estimated average occupancy for the four quarters of the rating period.

Tenancy manager to fill in their answers in Table 1

Any explanatory comments:
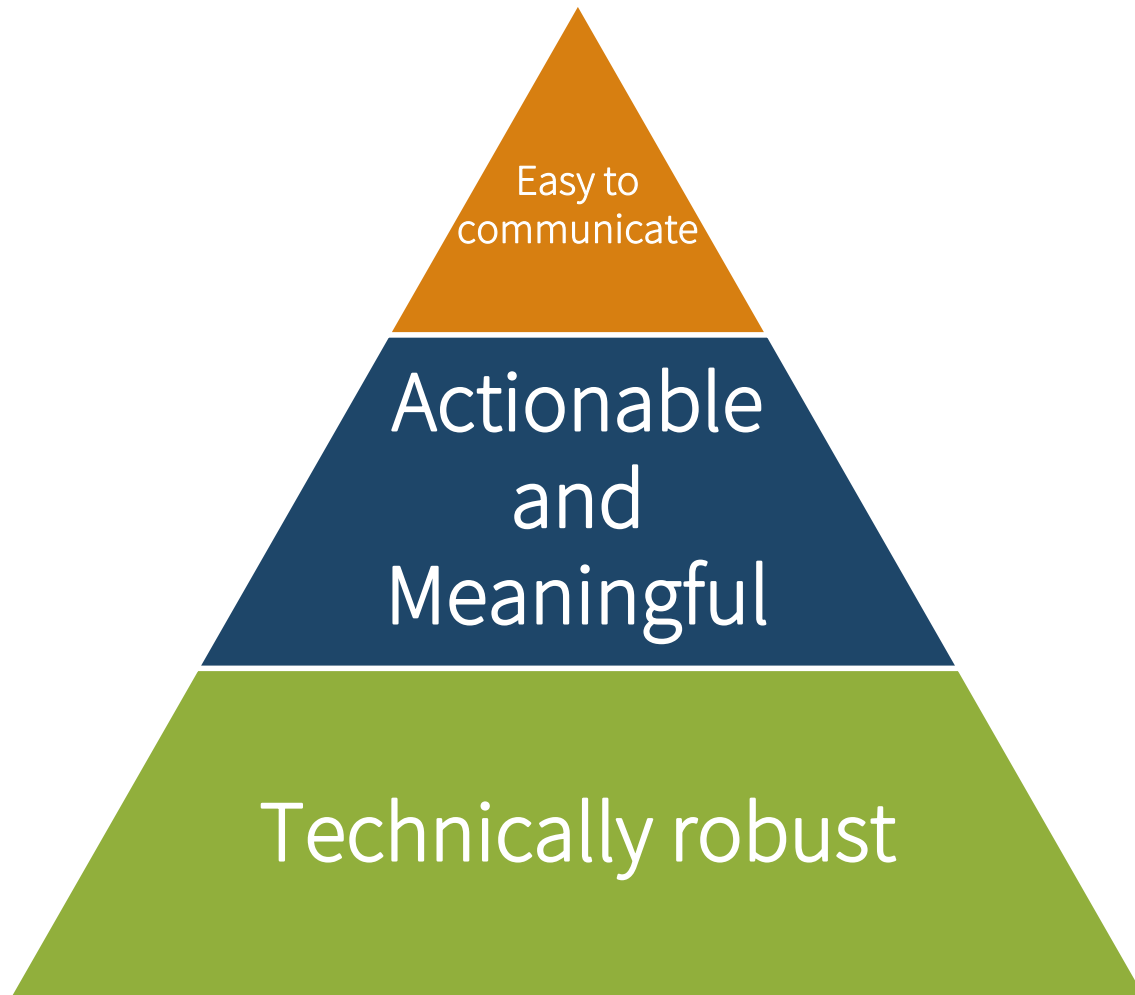
Methodology development - stakeholder engagement

Jun 2019

Base Building Stakeholder Workshop

Oct 2019 - Aug 2020

Base Building Calculator & Rules Development

Nov 2020

NABERS UK BASE BUILDING SCHEME LAUNCH

Sep 2021

Assessor Training & Advanced Simulation Training launched

Oct 2021

Whole Building & Tenancy (WBT) Technical Workshop & Industry Engagement Panel

Jul 2022

NABERS UK EXPANDED TO WHOLE BUILDING & TENANCY

Sep 2019

Base Building Technical Review

Sep 2020

Base Building IDR Panel Training

Aug 2021

Development of WBT Ratings commences

Dec 2021

Whole Building & Tenancy Rating Technical Panel Workshop

Dec 2021 – Jun 2022

Whole Building & Tenancy technical review and refinement

NABERS UK ENERGY FOR OFFICES RATINGS: GETTING YOUR BUILDINGS READY

Use rateability survey to assess readiness for different ratings

☐ Is NIA measured to acceptable standard?

☐ Is there digital logging of out of hours a/c requests by functional space?

☐ Is energy data logging system (EMS) in good working order (and does it reconcile with utility meter data over year)?

☐ Is there documentation validating existing metering (what is on each meter, CT ratios, gas pressure factors, etc.)?

☐ Absence of metering necessary to produce a compliant or optimum rating?

☐ Do all material meters including landlord sub-metering comply with NABERS quality standard?
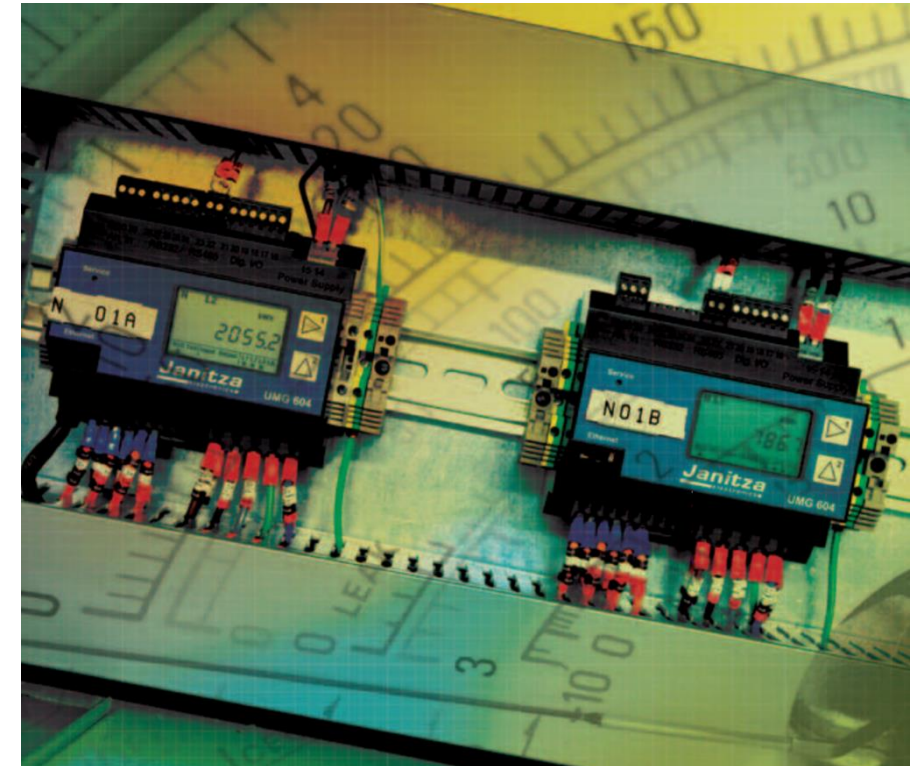
Conclusion: "**delineate, measure, rate and disclose**"

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Technically robust

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