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Energy Performance Ratings in the UK

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Mandatory Energy Labelling of Buildings in the UK

- Things to think about before you do it:
 - Experiences of implementation in UK and other EU and non-EU countries
 - Countries have different priorities: issues are the same – solutions differ
 - **How the UK decided to address them**
- How EPCs can be used to support other policies
 - **Illustrated by UK policies**
- In 15 minutes. Don't expect everything to be covered or much detail!

Legal Framework

- The European Energy Performance of Buildings Directive (EPBD) applies throughout the European Union.
 - Member States (MS) have flexibility on implementation details
 - All buildings must have an Energy Performance Certificate (EPC) when they are constructed, sold or let
 - EPCs provide an energy rating scale
 - Accompanied by recommendations for improvement measures
 - Based on calculation with standardised occupancy and weather
- **In UK an EPC is valid for 10 years**

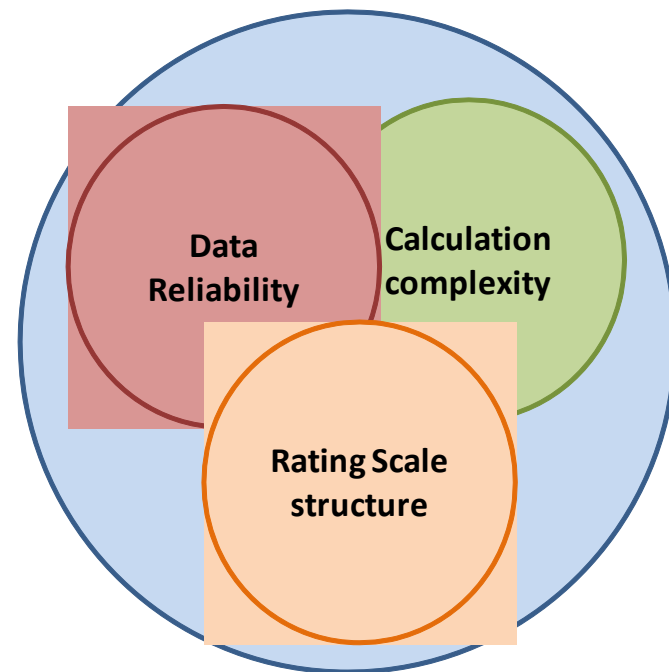
Desirable Features of EPC Process

- **Repeatability:** Different assessors and tools should produce similar results
 - **Typical MS aims: +/- 15% (preferably better)**
- **Discrimination:** More efficient options should have better ratings
 - **Typical MS aims: +/- 5%**
- **Credibility:** Technical soundness; realistic results
- **Transparency:** The data and the process should be auditable
- **Ease to produce:** To reduce cost
 - **Typical MS aims: 8 Hours dwellings; 16 hours non-residential**
- Somewhat conflicting and sometimes unrealistic targets

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Squaring the circle

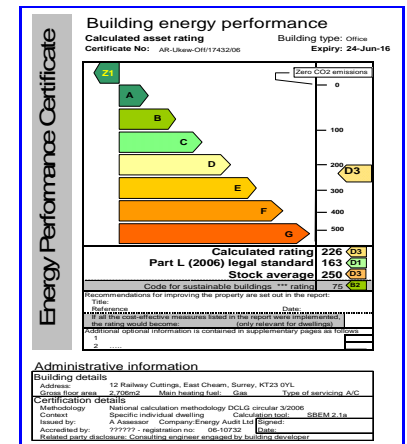
- Rating procedure needs to balance conflicting needs
- Taking into account
 - Data reliability
 - Calculation complexity
 - Rating scale structure
- Different countries have different priorities





Existing and new buildings

- In England and Wales the number of EPCs issued is approximately:
 - 11 M for existing dwellings
 - 1 M for new dwellings
 - 0.5 M for other buildings
- Most EPCs are for existing dwellings
- BUT the process must also be applicable to new dwellings and new and existing larger buildings



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Data quality issues

- Data reliability in existing buildings is often poor
- Assessors are tempted to guess
 - Restricting choice of options improves reproducibility
 - But limits precision
- **In UK: prioritise consistency over (theoretical) precision**
 - **Default values which result in a poor rating:**
 - **assessor must have evidence to over-ride them**
 - **Option lists to standardise assumptions where possible**
 - **Training and quality assurance of assessors and certificates**



Choice of rating scale

- May be absolute (e.g. kWh/m²) or relative to a reference value
- **In UK:**
 - **Scale uses “mirror building”:** identical geometry, activities
 - **This is more robust to some uncertainties:**
 - » **Areas, calculation procedures, weather assumptions**
 - **Provides consistent ratings for multi-use buildings**
 - **Allows parallel use of different calculation tools**
 - **A to G scale (numerical ratings too)**
- **Primary metric is greenhouse gas emissions in UK**
 - **Elsewhere in Europe it is Primary Energy**



Calculation Procedures

- Most MS use monthly method from EN13790
 - A few use hourly simulations
- **UK allows monthly for all buildings but also hourly for non-residential**
 - **In practice, hourly only used for complex new buildings.**
- Zoning of buildings into separate spaces is important
 - Affects consumption estimates especially with air conditioning

Recommendations and Refurbishment

- Most EPC recommendations are for *elemental* changes (e.g. windows)
 - With an indication of approximate cost-effectiveness
 - Some measures could be applied immediately
 - Others only make economic sense when replacing an element for other reasons
- Elemental improvements are *minor* refurbishments
 - *Major* refurbishment **must** meet whole-building requirements
 - Whole-building requirements not very relevant to minor refurbishments
- **In UK, EPC software produces recommendations list and indicative paybacks**
 - **But assessor has responsibility to edit this in light of inspection**

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Impact of EPCs

- Direct impact on the market:
 - **In UK: no evidence of significant impact on prices**
 - **Seems to be different in some segments of some other countries**
- Policy development and analysis
 - Database of EPCs provides building stock statistics
 - But not necessarily a representative sample!
- Enabling tool for other policies
 - **Warning!** EPCs can be misleading

EPCs and other policies: UK examples

- Prioritising renewables incentives (“fabric first”)
 - **Best feed-in tariff only available for ratings of D or better**
 - **Renewable heat incentive (FIT for heat) subject to availability of EPC to demonstrate that practical and economical measures have been implemented (and as the basis for “deeming”)**
- Constraints on market
 - **Proposal that E-rated (or worse) buildings may not be rented unless it can be shown that improvement is not practically possible.**

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EPCs and financial incentives: **UK examples**

- Calculation used as basis for financing improvements through the “Green Deal”
- **BEWARE**
 - Actual use patterns will rarely align with standardised assumptions and may change with time.
 - Savings may be less (or more) than are implied
 - Default values which are cautious for EPCs will imply savings potential that may not be realistic

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Advice (personal!)

- Think before you move: there's plenty to consider
 - Think about what criteria are important for you
 - Calculation methodology is important not the whole issue
 - Think about non-dwellings: its not just about housing
 - There's a lot of support infrastructure issues that I haven't mentioned.
- Talk to someone who has done it before
 - And probably found traps the hard way
 - Preferably several people