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**

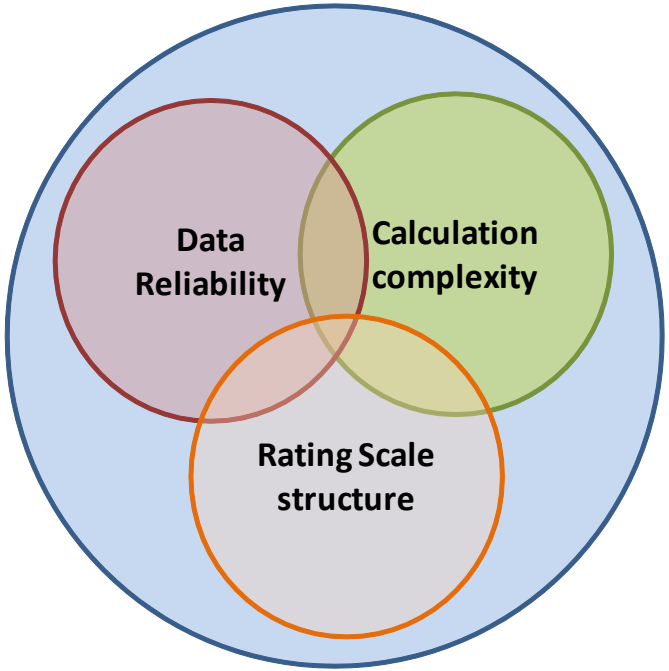
Desirable Features of EPC Process

- ***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

Squaring the circle

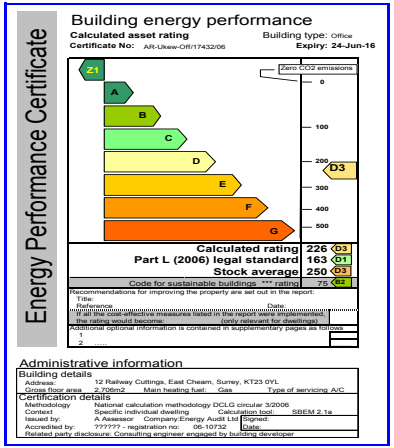
- Rating procedure needs to balance conflicting needs
- Taking into account
  - Data reliability
  - Calculation complexity
  - Rating scale structure
- Different countries have different priorities



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



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**

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.**

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

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 issus that I haven't mentioned.
- Talk to someone who has done it before
  - And probably found traps the hard way
  - Preferably several people