

# Energy Performance of Buildings EU Directive 2002/91/EC

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# Purpose of the Directive

- Buildings consume 40% of EU energy
- To help meet Kyoto CO<sub>2</sub> commitments
- Security of energy supplies
- Set minimum energy requirements for buildings
- Market transformation

# Requirements

- Calculation methodology for the energy performance of buildings
- Application of minimum performance requirements for new buildings and large buildings subject to major renovation
- Energy certification of buildings
- Regular inspection of boilers and air-conditioning systems

# Target building stock

- New buildings over 1,000 m<sup>2</sup>
- Must consider alternative energy systems (renewables, CHP, group schemes etc)
  - This may also become a UK planning issue
  - Potentially radical proposals for L2 (with no trade-off)
- Major renovation of existing buildings (where costs > 25% building value, or where > 25% is renovated)

# Certification

- Certificate validity shall not exceed 10 years
- Certificates made available to the owner, or by owner to prospective tenant
- Public access buildings must display the certificate in a prominent place
  - There are about 100,000 such buildings in the UK alone

# Plant inspections

- Boilers between 20 – 100 kW must have regular inspections
  - Every 2 years for >100 kW
- Air-conditioning systems > 12kW
- Assessments of efficiency and appropriateness of sizing
- Advice on improvements and alternative solutions
- ODPM and DEFRA considering options – powers under Section 2 of the Building Act

# Independent experts

- Certification and inspections will be carried out by independent accredited experts
- Who will they be?
- Who will accredit them?

# Time Scales

- Comes into force 4<sup>th</sup> January 2006
  - Laws
  - Regulations
  - Administrative provisions
- Additional 3 years to complete the process (certification and inspection regimes)
- Must convince the Commission of strong grounds for deferment



# The Methodology

- Most important part will be the calculation tool
- To set standards and benchmarks
- To determine energy performance of a building
- Same tool should be used for both

# Calculation tool

- Two possible approaches
  - Simplified method
  - Simulation
- Simplified approach may have better repeatability, but not be able to capture system complexities
- Simulation more flexible, but more expensive in time and effort.

# Simulation

- ODPM methodology paper seems to suggest simulation is favoured approach
- Energy Plus is likely candidate as it is public domain and has good support
- BEST-Cert project (run by BRE) currently assessing different options

# Simplified approach

- Degree-days
- Bin methods
- CIBSE Energy Code
- No comprehensive thermal and electrical calculation method currently exists

# Setting the standards

- Buildings often defy standard classification
- Need for **Activity Schedules**, both standardised and actual
- Historical data approach – not enough data
- Elemental approach – may provide simple compliance
- **Activity Areas** or **Auto-Generated Targets**

# Determining the energy performance

- Two types of rating needed
- **Asset Rating:** the intrinsic energy performance (what is possible)
- **Operational Rating:** performance in use
  - Actual activities, management effectiveness etc

# Asset Rating

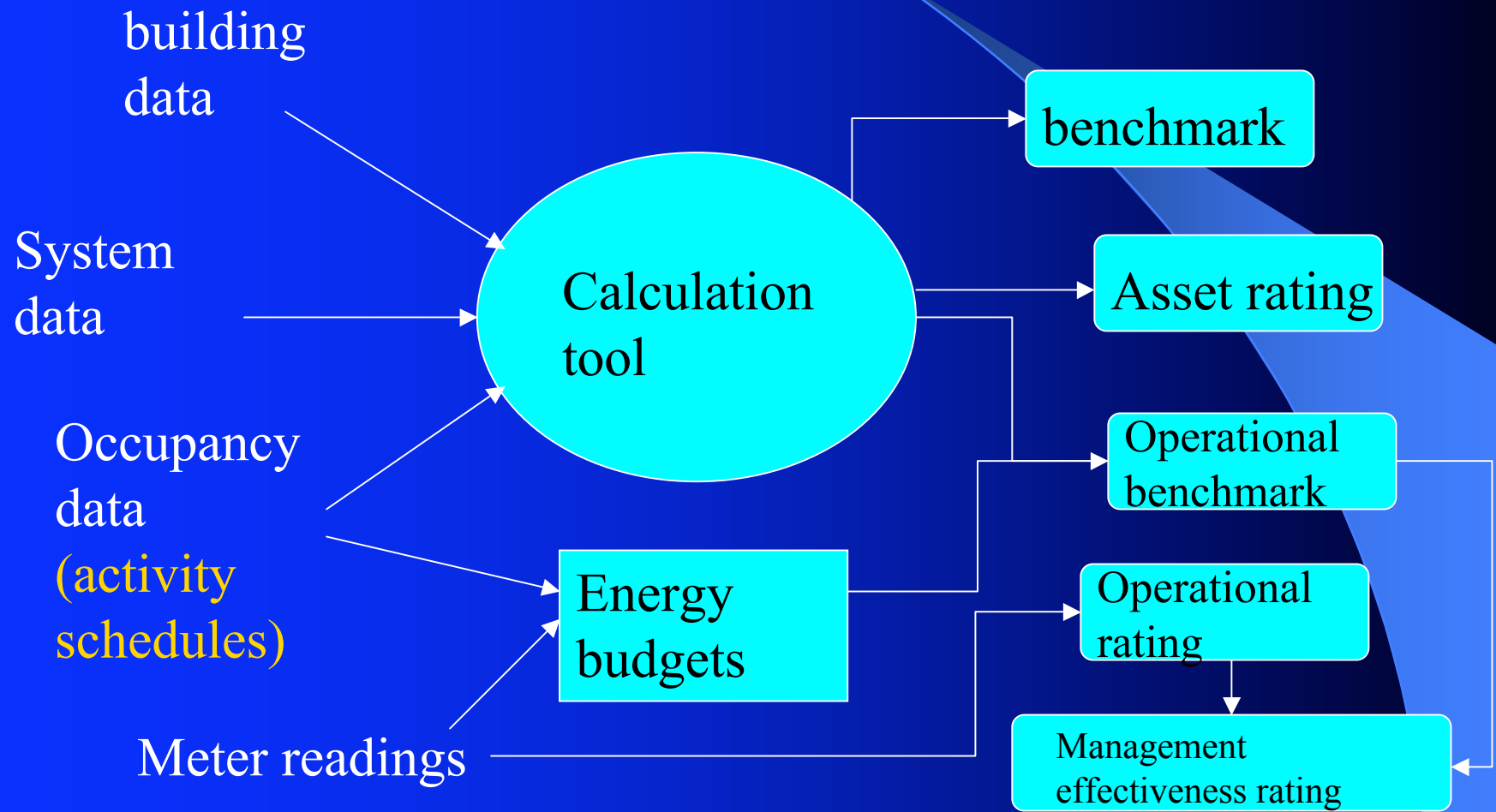
- The Asset Rating is that energy that would be used under some standard activity schedule
- Simulation appears favoured approach
- May be scope for hybrid with simplified method
- Benchmark comparison against Part L or variety of cost-benefit improvements

# Operational rating

- Based on actual meter readings
- Main issue is determining benchmarks
- Disaggregated use is a difficulty
  - EuroProsper developing method using measured data for different **Activity Areas**
  - Possible calculation method
  - **Normalisation would be an issue**



# Certification process



# Conclusions

- Improvements in building standards will result
- Being addressed as an ADL2 issue with some radical revisions
- Calculation methodology to be decided
- Setting standards will be a major issue
- ***Building Services Engineers will be key***
- ***The clock is ticking!***

# Further information

- Foundation for the Built Environment
  - [www.projects.bre.co.uk/EPBD](http://www.projects.bre.co.uk/EPBD)
- Office of the Deputy Prime Minister
  - [www.odpm.gov.uk/](http://www.odpm.gov.uk/)
  - Search for EPBD