The genesis and evolution of TM54

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Genesis of TM54

Part L model versus actual energy use

- Annual consumption / (kW/h/m²)

<table>
<thead>
<tr>
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<th>Part L model</th>
<th>Actual</th>
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<tbody>
<tr>
<td>Lifts</td>
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<td>Servers</td>
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<td>Catering electricity</td>
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<td>Office equipment</td>
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<tr>
<td>Lighting</td>
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<td>Fans, pumps, controls</td>
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<td>Cooling</td>
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<td>Hot water (gas)</td>
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<td>Heating (gas)</td>
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@CIBSEepg
Genesis of TM54 – The vision

Aims of this document
This document is intended to help building services engineers to:

- Demonstrate to construction clients that operational energy performance is dependent on how the building is run as much as how it is designed;
- Provide better informed calculations of energy use in operation by setting out a methodology they can use;
- Address the issue of how to deal with energy targets that have been set in the brief.

"Prediction is very difficult, especially about the future."
- James H. Breckenridge (1885 - 1962)

Predicting possible outcomes
This document proposes that predicting energy use at the design stage is difficult, if not impossible, due to the many operational factors involved.

However, the energy use outputs from compliance modelling (Building Regulations Part L) is sometimes mistakenly used as a prediction of energy use.

It is suggested that this document is used to provide a way to discuss this issue with construction clients and to set out an approach to predict a range of possible outcomes, depending on the assumptions.

![Diagram of evaluating lighting energy use and operators influence and assumptions]

Assumptions in typical Part L model:
- Design output
- User controls
- Lighting intensity
- User comfort
- Sensors
- Responsibility
- Energy prices
- Operating hours

Questions for operators about design:
- What is the actual proposed installed lighting load (rather than design-stage input into Part L model)?
- Can the installed capacity be lowered?
- Can the efficiency of the lighting be improved?
- Are user controls designed to be intuitive and well positioned (see Controls for End Users)?
- Do you need glare control blinds, or control be partially automated; or external blinds be used?
5 years later

• Adopted by British Land, Crown Estate, Landsec, M&G, Derwent London, etc.
Design stage

Building in operation

Design stage assumptions

Dynamic Simulation Model

Operational information from BMS

Sub-metering data
What’s next?

Ambitious Briefs
Set challenging objectives for energy and carbon performance

Collaborative delivery
Collaborate with designers, operators, constructors to convert these objectives into binding operational targets

Verified outcomes
Instruct design, delivery and operational partners to achieve these targets; monitor outcomes, reward verified success and disseminate results
Thank you

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