

# Sustainable Operations and Maintenance

## Practical Guide

This Practical Guide covers key principles of sustainable operations and maintenance in the built environment

### Operational Carbon

Want to find out more about operational carbon? Check out our [Operational & Embodied Carbon Explainer Guide](#).

### IN A SNAPSHOT

**Sustainable operations and maintenance (O&M)** are "practices [that] focus primarily on the actions of building or infrastructure occupants, and encompass safety, health and safety, comfort, and productivity, with an understanding of the need for subsequent generations to reuse and recycle building components. "

### WHY IS IT IMPORTANT?

A building may have been designed and constructed to be top class in sustainability, but it can only continue to be so if it is operated and maintained responsibly and properly.

Often buildings are occupied differently than intended - leading to wastage of energy. The difference between how a building is anticipated to perform based on its design and how it performs in reality is known as the '[performance gap](#)' (find out more about this on page two).

It is therefore imperative that operation and maintenance personnel are part of the project planning and development process, such as by establishing commissioning criteria at the onset of a project.

90% of the buildings that exist today [will still stand in 2050](#). Ensuring proper maintenance of these buildings and including retrofit programmes will be a key way to reduce UK built environment emissions.



### PRINCIPLES OF SUSTAINABLE OPERATIONS AND MAINTENANCE

To operate and maintain a building sustainably there are a number of key actions that should be implemented:

#### Implementing sustainable building controls

Buildings and systems are designed with automatic or manual controls that should be understood and implemented to allow for sustainability in operation. These may include: automatic blinds and shading; natural ventilation; occupancy control; thermostatic control over heating and cooling systems; water saving devices; recycling provisions; waste management. As a general rule the simpler the automated systems the easier to influence the sustainability in occupation.

#### Soft Landings

'[Soft landings](#)' refers to strategies to ensure that that operational performance is optimised during the transition from construction to operation. This should be considered throughout the development of a project, prioritising commissioning on training and facilities management.

#### Measurement and monitoring

Monitoring the usage of energy and water and sharing data statistics from utility meter readings is a key way to assess whether sustainability performance is as intended, or whether alterations need to be made. For example, with energy management this could include monitoring and reporting on building energy use and performance, and identifying unexpected increases and decreases in energy consumption, and opportunities for energy performance improvement. The [ISO5001 Energy Management System](#) is a certification scheme to help businesses to develop and meet objectives related to energy usage and use data.

#### Building optimisation and retrofit

Buildings require continuous fine tuning and optimisation. Examples of building optimisation and retrofit include night time purging of inside air to outside expel excess heat to reduce the need to cool the next day; replacing inefficient technology; and heating pump control outside of occupancy periods. There are a number of reasons why ongoing optimisation is required, such as changes in occupancy, seasonal variation and environmental conditions, and ongoing advances in technology in the market.

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### HOW CAN IT BE DONE?

Each building is unique and will require different approaches depending on context. The considerations below should be applied to each building or infrastructure project:

#### Asset owners

Asset owners are organisations that represent the holders of assets. These assets might include a piece of land, an entire piece of infrastructure or an entire building or portfolio of assets. Asset owners can take action on sustainable operations and maintenance by:

- Ensuring a **soft landing process** takes place.
- **Implementing a training programme** to upskill occupants, facilities managers, and maintenance staff in sustainable design principles and methods that will reduce system failures.
- **Providing a maintenance program** to keep all building systems functioning as designed.
- **Reducing waste** through reuse, recycling and/or composting facilities and provide monitors and controls for energy, water, waste, temperature, moisture, and ventilation.

#### Facilities managers and agents

Facilities managers are those who make sure that buildings fulfill their intended purposes, and that personnel are healthy and productive. Facilities managers can take action on sustainable operations and maintenance by:

- **Undertaking training** in sustainable design principles and methods that will minimise system failures.
- **Ensuring tenants have clear instructions on use**, including tips on energy conservation, waste management and optimum use of heating, light, and ventilation.
- **Implement a monitoring and measuring system.**

#### Occupiers

Occupiers are people or organisations who live in or use property or land. Occupiers can take action on sustainable operations and maintenance by:

- **Undertaking training** on sustainability features and how to ensure maximum efficiency.
- **Engaging** with surveys, education, signage, and incentive programs.

#### Surveyors

Surveyors provide professional advice on matters such as the structural integrity of a property or its value. Surveyors can take action on sustainable operations and maintenance by:

- **Ensuring optimum maintenance plans are in place** which focuses on repair and re-use rather than replacement for systems and building infrastructure.



#### DEEP DIVE: THE PERFORMANCE GAP

The tendency in the UK has been to design for compliance, rather than pressing for sustainable principles and features. Even when these have been included the buildings are found not to perform optimally and waste energy and resources as a result. This is known as the 'performance gap', between original design intent and actual performance.

Findings from a [study](#) looking at 62 buildings found that 15% of the buildings used twice the amount of energy initially predicted in the design stage. This may be due to a building's energy performance being modelled in a way that does not accurately reflect the intended design and operation.

A design for performance approach seeks to avoid the performance gap. This is an approach that utilises in-use energy performance metrics at design stage, and monitors construction quality and actual performance in use.

#### IN SUMMARY...

The operations and maintenance phase of a built environment project plays a key role in ensuring the sustainability of a built environment project. It is integral that buildings are optimised on an ongoing basis to ensure long term use. Proper maintenance can also avoid the need for unnecessary demolition.

#### READ MORE ABOUT SUSTAINABLE OPERATIONS AND MAINTENANCE

UKGBC: [Delivering Net Zero: Key Considerations for Commercial Retrofits](#)  
ISO 5001: [Energy Management](#)