# Accelerating Energy Efficiency Through Digitalisation

A report by the **Digitalisation Working Group**

In an increasingly interconnected world, digital technologies have great potential to improve the efficiency of human systems, particularly energy. Digitalisation is creating new opportunities to optimize energy systems and decrease greenhouse gas emissions in power grids, buildings, transportation, manufacturing, oil and gas, and agriculture. Buildings are critical since they account for 36% of total energy use and 37% of direct $CO_2$ emissions.

**Buildings represent**

- **36% of global energy consumption**
- **37% of global energy-related emissions[1]**

**Digitalisation could cut**

- **10% of total building energy consumption by 2040[2]**

Many digital technologies that actively raise energy efficiency and reduce carbon emissions in buildings are less expensive and lead to faster returns on investment than physical renovations. Compared to passive solutions, digitalisation can typically recoup costs three times as fast, and can renovate 10 times the space for the same budget. Digitalisation provides an opportunity to extract more energy efficiency benefits than physical renovations and can be used where physical renovations are not feasible.

However, the wide-scale deployment of digital technologies faces regulatory and technological obstacles. A combination of policy and technology solutions are required to address five key barriers.


The Digitalisation Working Group is preparing a roadmap on near-term, mid-term, and long-term strategies for elevating the role of digitalisation in accelerating improvement in building energy efficiency. Download the report: www.energyefficiencyhub.org/DWGReport

[1] Source: 2021 UNEP Global Status Report for Buildings and Construction
[2] Source: 2017 IEA Digitalization & Energy Report

The Energy Efficiency Hub is an independent, government-to-government organisation with 16 Members. Learn more: www.energyefficiencyhub.org

Digitalisation Working Group members include the United States (lead), Australia, Brazil, Canada, Denmark, France, Germany, Japan, and the European Commission.

# Featured Case Studies: Australia, Germany and the US

**Innovation Hub for Affordable Heating and Cooling (i-Hub):** Leveraging digital innovation, i-Hub supports the delivery of flexible demand services from buildings. As part of this effort, the i-Hub developed a real-time data management platform.

**Impact**

- 60 buildings and 9 software applications use the platform
- Led to significant interview & focus group research on adoption barriers

**Lessons Learnt**

- Lower digital connectivity costs by making it a part of normal equipment investment lifecycle
- Coordination with industry stakeholders plays a key role in project success

The large-scale program delivery required significant time and coordination effort.

**Smart Meter Gateway:** A highly secure and interoperable communication module for sharing data between smart meters and service providers.

**Impact**

- Led to robust cybersecurity and privacy policy in smart meters
- Prevents manipulation of smart meter data
- Protects buildings against cyber attacks

**Lessons Learnt**

- Robust technology development can enhance cybersecurity and privacy solutions
- Increase customer acceptance via attractive offerings and noticeable benefits
- Complex product certification schemes can delay technology rollouts

Some of the notable barriers included consumer acceptance and complexity of certification process.

**Green Button Initiative:** Industry-led effort to provide utility customers with easy and secure access to their energy usage information in a consumer-friendly, digitised format.

**Impact**

- 60 million homes and businesses securely accessing energy information
- 50 participating utilities
- 35 companies developed apps leveraging Green Button Data

**Lessons Learnt**

- Leverage existing standards
- Launch marketing campaign with the support from the government
- Set up non-profit alliances for testing and compliance

Some of the challenges included lack of data standards, initial difficulty of recruiting early adopters, and testing & compliance.