



## ABLE-ENERGY WHITE PAPER ON INTEGRATED ENERGY MANAGEMENT AND THE INTERNET OF THINGS

ENABLING EFFICIENT ENERGY  
USE MAXIMUM POTENTIAL

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## INTRODUCTION

The value of designing and constructing more sustainable buildings is no longer in question. Companies involved in managing real-estate assets, and companies with large physical footprints, increasingly measure their building emissions and seek to reduce them as a matter of policy. Adding to this is the growing evidence that more sustainable buildings can have a higher value.

So this is a good start. But even these examples are just a crude beginning to how the way we think about buildings is changing, and must continue to change.

In most cases today, even the greenest, most sustainable buildings are still effectively "dumb" infrastructure. Internal systems are stand-alone, siloed. Data is not captured, integrated, persisted and used dynamically with real intelligence.

Building managers face growing pressure to reduce energy consumption and increase operational efficiency in order to boost the bottom line. Making this difficult, many buildings have disparate systems that must be controlled independently due to a lack of integrated building automation. For instance, it is not uncommon for companies to have various types of heating, ventilation, and air conditioning (HVAC) systems and security systems across their locations or even in the same building.

In the era of smart buildings, the building is the enterprise. To create a smart building strategy you must unify capabilities to control, monitor, and manage a multitude of energy-related applications – from lighting to thermostats to CO2 sensors – in order to realize operational and energy-saving benefits across the enterprise. Wireless controls are

enabling the roadmap for smart buildings and are the foundation of what is called Enterprise Internet of Things (E-IoT) and this phenomenon is ushering in a new era of connected devices that stream real-time data, bring intelligence and enable property owners save money.

The application of E-IoT technology should accomplish three important things:

- Reduce energy costs;
- Reduce risk; and
- Improve the buildings occupant's experience.

The purpose of this paper is to describe what E-IoT is and what is its use from the built environment perspective and, the benefits that can be derived by the adopters and/or users in the building enterprise and explain the role Able-Energy (A-E) can play to assist to put the E-IoT framework in place in one's portfolio for better energy management and operational efficiencies.



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## KEY BUSINESS OBJECTIVE

Reduce facilities operating costs with the ability to monitor multiple building systems and properties at once, and optimize, finetune building performance to a degree not possible via human capabilities alone.

## DESCRIPTION OF E-IOT

Enterprise –Internet of Things (E-IoT) is a network of uniquely identifiable physical objects (e.g. lights, thermostats, and occupancy sensors etc.) that have embedded technology (wireless technology) and interact with other similar devices over the internet to help achieve operational efficiencies.

E-IoT connects together siloed devices to interact with one another in the building environment. It represents the coordination of multiple vendors' machines, devices and appliances connected to the Internet through multiple networks. The E-IoT promises to create smart buildings by uniting disparate facility systems into an integrated whole. This allows for quick resolution of issues and even makes it possible to take pre-emptive steps to resolve problems before they emerge.

With the E-IoT it can be possible to manage and control temperatures, ventilation, lighting, access, parking, room occupancy, elevators and energy usage in a facility, either on-site or remotely.

It provides solutions based on the integration of information technology, which refers to hardware and software used to store, retrieve, and process data and communications technology which includes electronic systems used for communication between individuals or groups.

E-IoT applications use sensors to collect information about operating conditions which can be combined with cloud hosted analytics software that analyse disparate data points helping facility managers become far more proactive about managing buildings at peak efficiency.

The following are some of the operational technologies in buildings that can be connected:

- Lighting;
- Heating, ventilation, & air condition;
- Plug load (wall sockets);
- Fans;
- CO2 sensors;
- Access controls;
- Video surveillance;
- Energy enterprise software;
- Building Management System (BMS) integration services;
- Intruder alarms; and
- Fire detection etc.

The E-IoT achieves simplified building control; as placing monitoring, information feedback equipment and control capabilities in a single location will make a buildings' energy management system easier to handle for the building owners, building managers, maintenance crews and other users of the building.



*"The goal of the Internet of Things is to enable things to be connected anytime, anyplace, with anything and anyone ideally using any path/network and any service."*



## THE BENEFITS OF ENTERPRISE INTERNET OF THINGS

The following among other are benefits to be derived by installing the E-IoT solutions in one's buildings portfolio:

1. Improves the productivity of enterprises;
2. Transforms an ordinary facility into connected, intelligent building that responds automatically without human intervention. The end result is unprecedented visibility, automated fault detection and centralized monitoring and control that truly empower the facility manager.
3. It dramatically improves energy efficiency.
4. Monitor utility consumption and control heating, lighting, safety, and security systems from offsite. This also means being able to monitor multiple properties from a centralized property management location, communicate to onsite maintenance crews, and take control of systems in a fire or other emergency.
5. The ability of E-IoT to capture real-time usage information and provide remote control, embedded mobile connectivity can make a wide range of devices and machines more efficient and effective, dramatically reducing waste and improving time productivity.
6. E-IoT enables you to track the usage and lifecycles of your building equipment. This allows you to plan proactive maintenance.
7. Connected smart devices will enable a reduction in utility bills and outages, while also improving building security via remote monitoring.



*"A truly smart building does not expect the people who use it to adapt to the building, but the building to adapt to the people."*

### ABLE-ENERGY E-IOT SOLUTIONS OFFERING

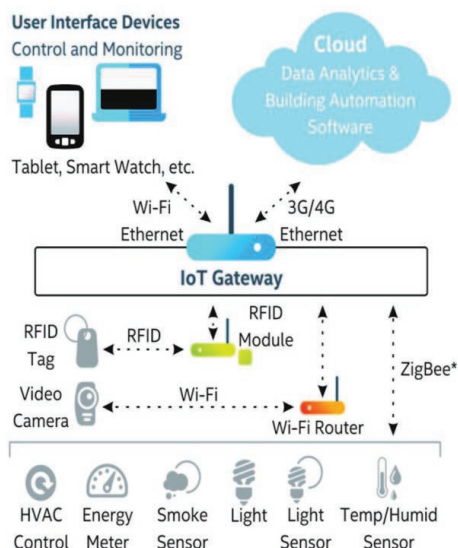
Just having technology doesn't make a building smart – it must have the technology that supports the goals of the operator and occupants and there must be people in place to apply and use the technology effectively.

E-IoT applications are complex. Smart building control solutions, the core application for EIoT, need robust design, high availability, redundancy and architecture designed to scale in order to satisfy the high performance requirements.

Able-Energy (A-E) specialises in specifying centralised Energy Management System (EMS) with the requisite E-IoT framework that seamlessly integrates with existing site based Automatic Meter Reading (AMR), BMS systems thereby reducing costs and providing a wider range of vendors for the purposes of broad based procurement.



The envisaged scenario in terms of A-E capabilities to design and operate E-IoT framework is shown below.



Using the above approach, methodology and frameworks building owners or operators may use this as the basis upon which to develop an Energy Management System (EnMS) compliant with ISO 50001. Our framework pulls together diverse building systems and provides a unified view of device data. This basically means administering buildings over the internet using a web browser.

On analytics, our framework enables us to analyse building and utility data as well as data on historical heating and cooling loads. The data crunching helps us and building owners make informed decisions on how best to reduce energy consumption and operating costs.



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## CONCLUSION

The E-IoT is an ecosystem that includes things, communication, applications and data analysis. In simple terms, IoT is about automating various processes in an enterprise through M2M (machine-to-machine) connections to gain operational efficiencies.

Innovative solutions in building automation, such as sending alerts to a building manager's interface devices such as smart watch or other mobile device regards building operational technologies performance or lack thereof is central to E-IoT.

The integration of devices and cloud-based services will help address the pressing issue of energy efficiency and security. Connected smart devices will enable a reduction in utility bills, while also improving building security via remote monitoring. While the traditional Internet is based on an open architecture that invites broad developer participation, E-IoT extends the reach to include any electronic device. This openness creates an environment that fosters a rich ecosystem and reduced costs through economies of scale..