



# **eLighthouse – Cork County Council Energy Efficient Design Training**

# SI 243 of 2012

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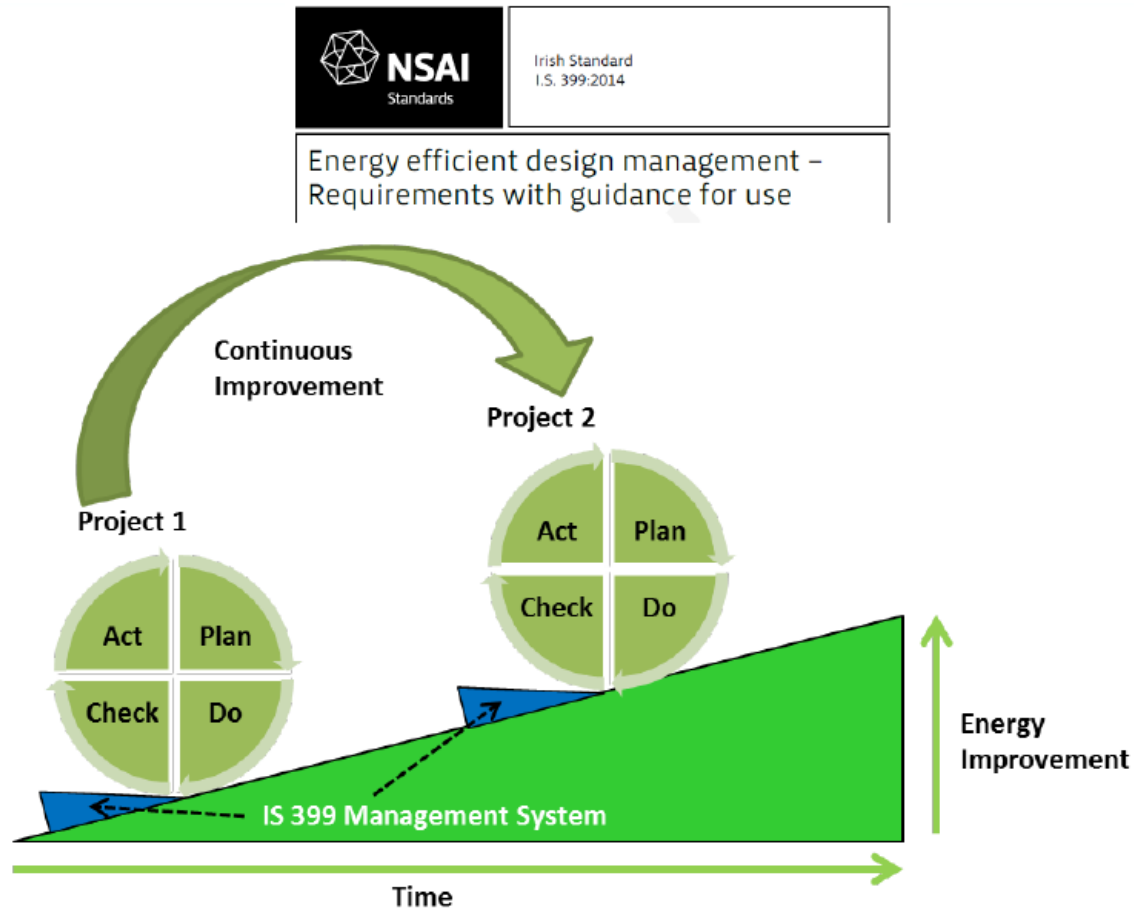
- **Design of any new building**
  - Before construction starts, the technical, environmental and economic feasibility of installing high efficiency alternative energy systems is considered
  - Shall be demonstrated by reference to a feasibility study and incorporated into the design report and retained for 5 years
- **Deep retrofit of existing buildings**
  - Consider and take into account the technical, environmental and economic feasibility of installing high efficiency alternative energy systems in the design of the renovation works

# IS 399 of 2014

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- Irish Standard focusing on Energy efficient Design Management
  - A systematic approach to the design, construction and commissioning of new investment projects
  - To minimise energy in their operating lifecycles
  - Projects may include new, modified and renovated facilities, buildings, equipment, systems and processes
- Organisation, processes, guiding principles and control implemented in design projects for the purpose of reducing the lifecycle energy consumption of its energy use

# IS 399 Management System



# IS 399 Management System

- Intent, Manage and continuously improve EED process
  - Requires management commitment
  - Roles and responsibility
  - EED policy
  - Design planning
  - Internal auditing of design
  - Management review
- Similar to other management systems based on PDCA (plan do check action)

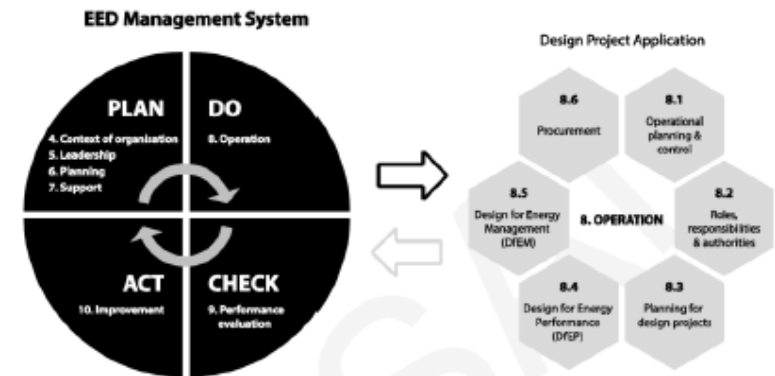


Figure 2 — Management system model for I.S. 399



# EXEED

## EXEED Designed

EXCELLENCE IN ENERGY EFFICIENT DESIGN

This certifies the asset as designed, constructed, commissioned and operational and handover to the owner/operator. The requirement for this certification is based primarily on Irish Standard I.S.399:2014 Clause 8 - Operation. This certificate has a life span of five years, unless the asset progresses to EXEED Verified or EXEED Managed.

## EXEED Verified

EXCELLENCE IN ENERGY EFFICIENT DESIGN

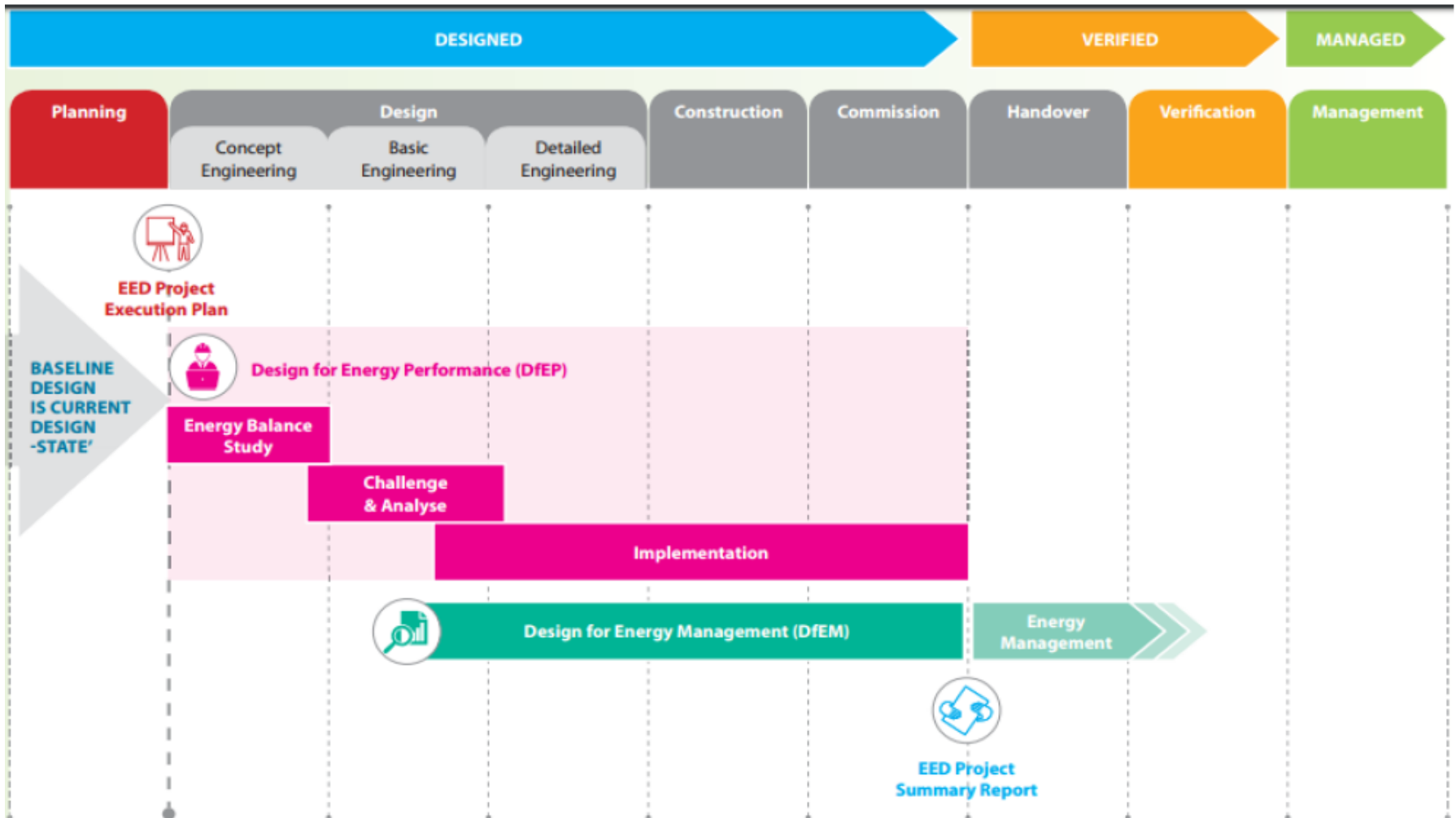
This certifies the asset against measured and verified energy performance with quantified avoided energy consumption substantiated. The additional requirements for this certification is based on International Standard ISO 50015:2014. This certificate has a life span of three years unless re-certified to EXEED Verified or progresses to EXEED Managed.

## EXEED Managed

EXCELLENCE IN ENERGY EFFICIENT DESIGN

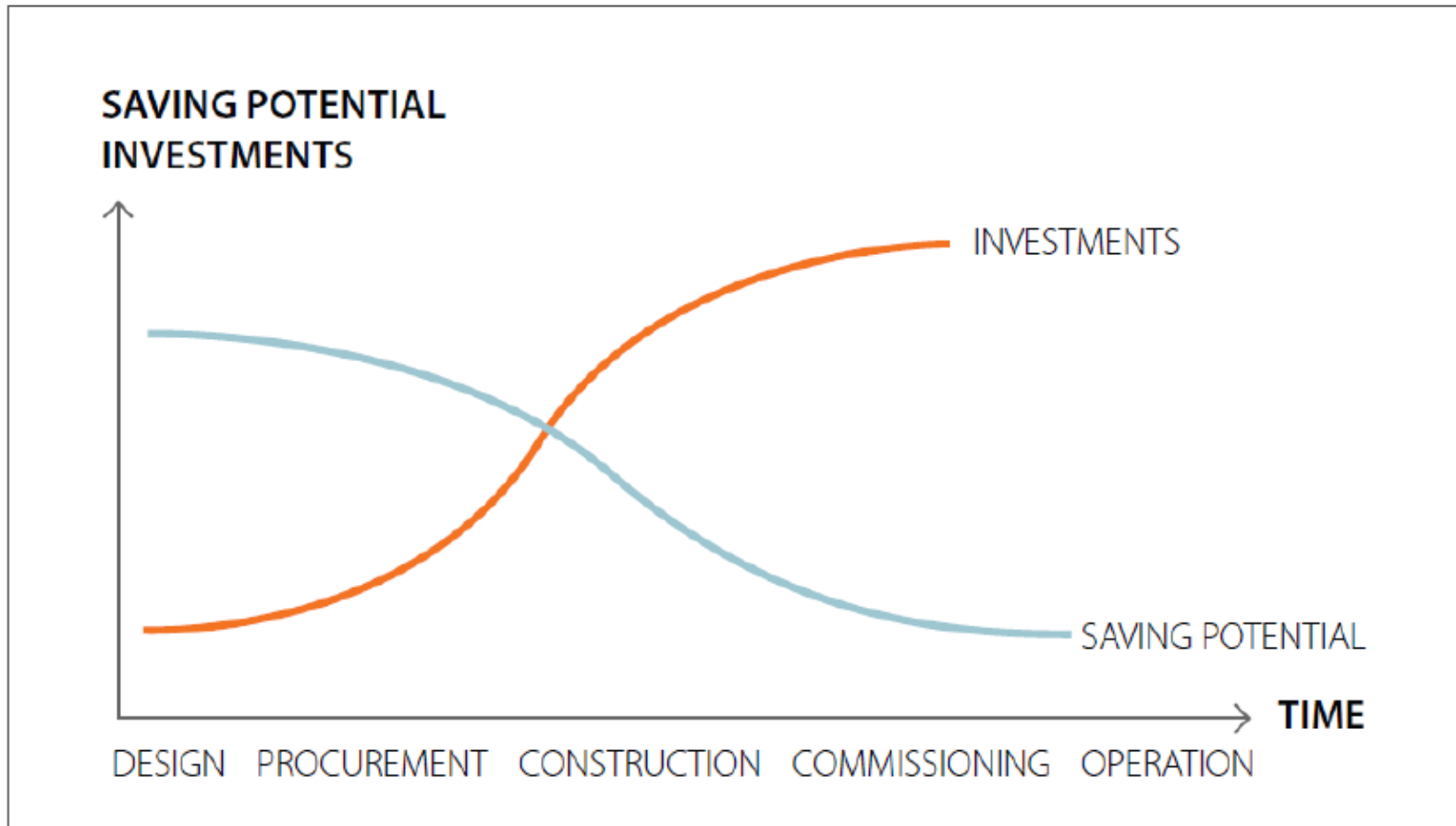
This certifies the asset at full operational conditions. It incorporates the requirements of energy management and continual improvement of energy performance. The additional requirement of this certification is based on ISO 50001. This certificate remains valid providing ISO50001 Certification is maintained.

# EXEED



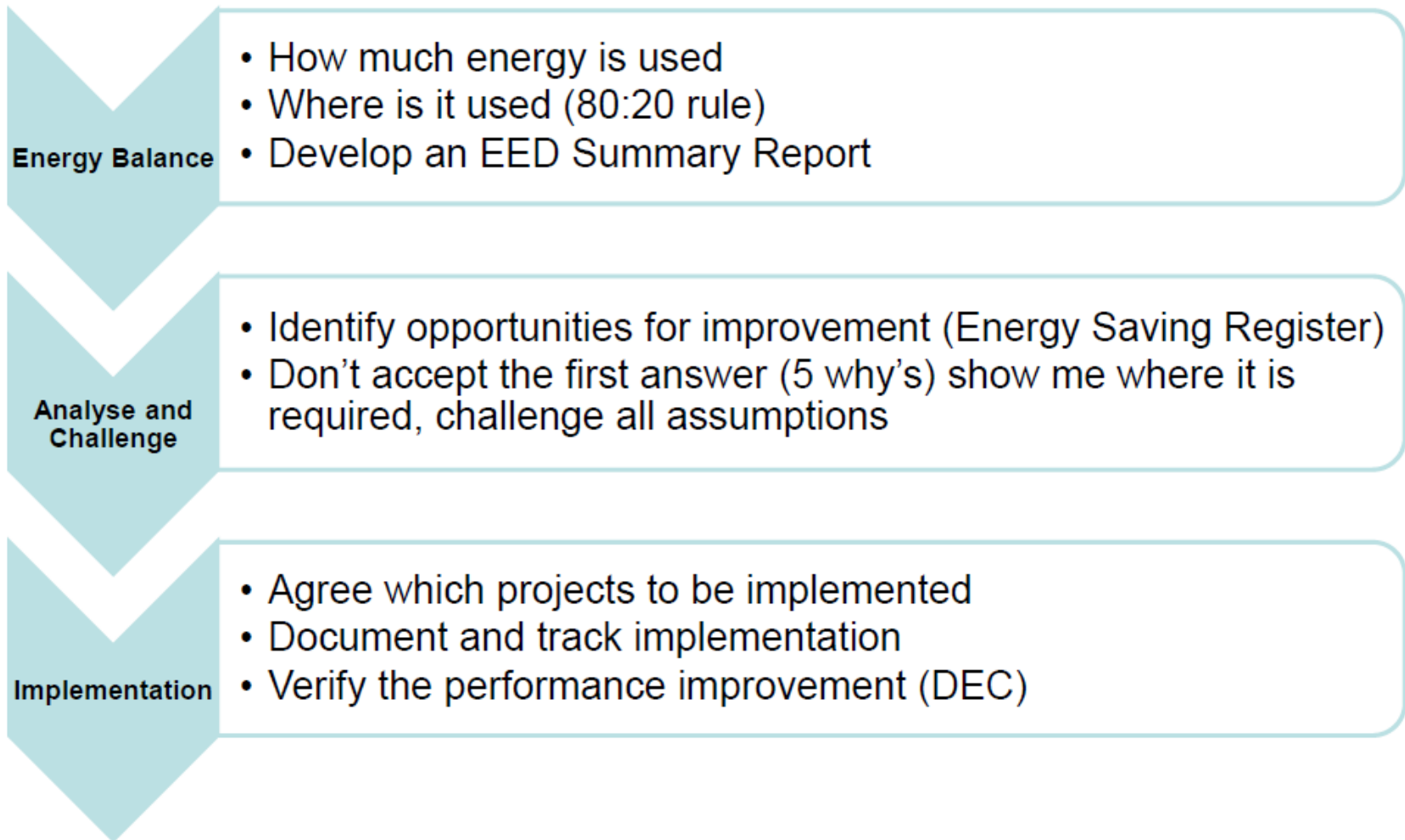
# When to Complete

- The earlier the better





# What is the process



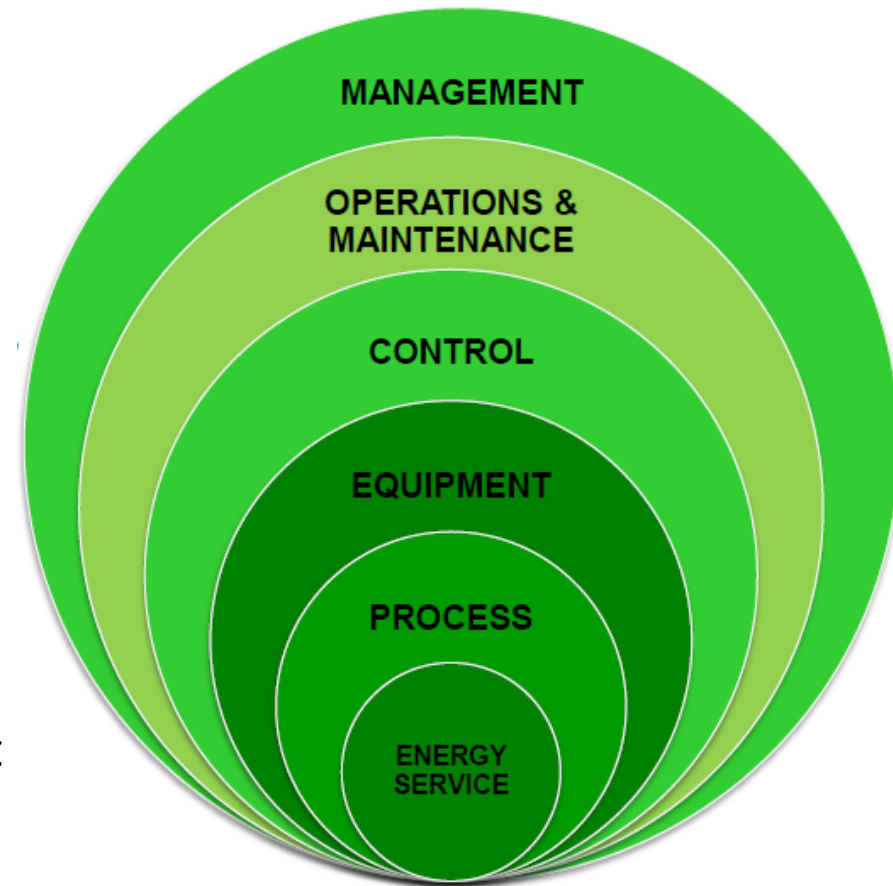
# Energy Balance Study

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- An energy balance report prepared at preliminary design & includes:
  - A list of all energy uses and proposed energy sources
  - An annual energy-consumption profile for the project including assumptions
  - An estimate of the annual energy consumption costs for the project including assumptions
  - Identification of significant energy uses for consideration in the challenge and analyse stage

# Energy Venn Diagram

- Understand the core reason for using energy
- Understand the energy consequences of user requirements
- Challenge design standards
- Minimise plant/equipment/floor-space etc
- Optimise control strategies
- Maintain system efficiently through commissioning and operation
- Facilitate ongoing energy management



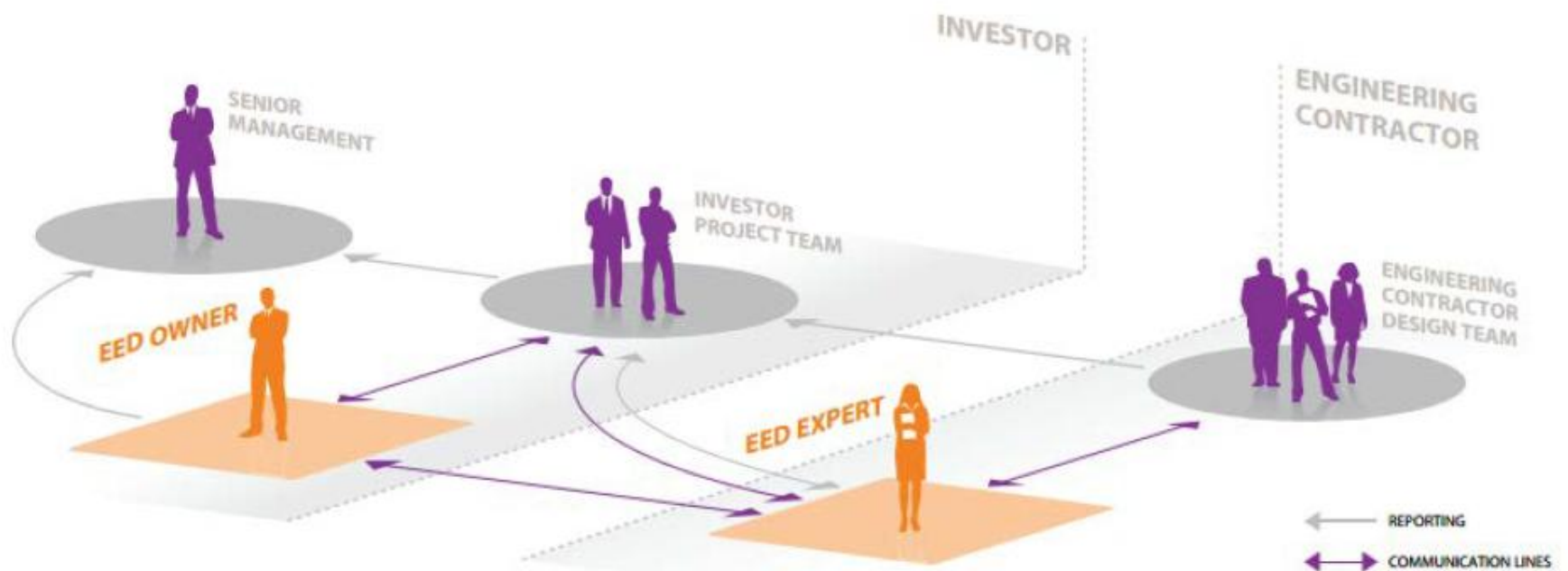
# Commissioning

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- The EED extends through full life cycle of project through commissioning and handover
- Examples of great design but poor operations
- Commissioning team need the following:
  - Adequate time
  - Understanding of design intent
  - Expertise in the area (not just get it working get it to work correctly)
  - Lowest commissioning cost may come back to haunt you
  - Handover learnings to operations
- Don't let the commissioning time get sacrificed

# EED Team

Figure 3.1: Project organisation for EED implementation



## EED Owner

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- Client role
- Responsible for ensuring that EED is implemented
- Report directly to top management
- Appoints competent EED expert
- Set the energy efficient design project objectives
- Approves the EED project execution plan
- Resolves barriers to implementing EED opportunities
- Communicate the summary report in the organisation
- Communicating with top management and with the project team

## EED Expert

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- Design Team Lead Consultant designee
- Reports directly to the DT Lead **but operates independently of the project design team. (Plan for change)**
- Has responsibility for:
  - Developing & implementing an EED project execution plan,
  - Implementing design for energy performance and design for energy management within the design project
  - Ensuring that technical specifications developed for specialist suppliers incorporate energy performance requirements

# Design for Energy Management

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- **Measurement system**
  - How will you determine the energy performance of the project
  - Consider an M&V plan
  - Consider EnPI's and baselines for ISO50001
- **Energy variables review**
  - For project SEU's
  - Similar to Energy review of ISO50001
  - Consider part load, weekend operations, design for 1 in 100 events etc
- **Energy Performance deterioration**
  - Consider performance deterioration in operation
  - Consider mitigation in design or detection for operation control



# Benefits

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- Confidence in energy efficient design of project
- Enhanced knowledge of “why we must do it this way”
- Proof that we are exemplar
- Comply with Legal and other requirements
- Savings **always greater than cost of review**
- Aligned to best practice
- Challenges user requirements and expectations
- Reassurance through “independent” review
- Significant Life Cycle Cost savings
- Potential Capital cost savings
- Structured review process
- Is built into existing functions and processes