City of Kwinana

# Policy

## Green Building – new and renovated Council buildings

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| Legal Authority: | Local Government Act Section 2.7 – The Role of Council |
| Directorate: | City Living |
| Department: | Environment |
| Related documents: | Acts/Regulations N/A Plans/Strategies<br>Climate Change Mitigation and Adaptation Plan, Sustainable Water Management Plan<br>Policies<br>Policy – Asset Management Policy - Climate Change Work Instructions<br>N/A<br>Other documents<br>N/A |

*Note: Changes to References may be made without the need to take the Policy to Council for review.*

## Policy:

### 1. Title

Green Building – new and renovated Council buildings

### 2. Purpose

To reduce the environmental impacts and running costs of new and renovated Council buildings facilities by including green building requirements in the building design and construction.

## 3. Scope

This policy applies to the construction of all new Council buildings, major renovations of existing buildings as well as their surrounding car parks, lighting and landscaping.

## 4. Definitions

The following definitions are used within this Policy;

***Building Management System (BMS)*** means a system, otherwise known as a building automation system (BAS) and is a computer-based control system installed in buildings that control and monitor the building's mechanical and electrical equipment such as ventilation, lighting, power systems, fire systems, and security systems.

***City*** means the City of Kwinana.

***Environment Department*** means the department within the City of Kwinana responsible for natural area management and sustainability.

***Energy Rating*** means a rating that provides consumers with information on the energy efficiency of a product. Appliances have a label with a certain number of stars on it. The more stars the more energy efficient the product is.

***Greywater system*** means a system that takes used water from showers, baths, handbasins, laundry tubs and washing machines and treats it so it is suitable for reuse, generally for garden irrigation.

***Heat pump hot water system*** is a hot water system which absorbs heat from the air and transfers it to heat water. They run on electricity but are roughly three times more efficient than conventional electric water heaters.

***Internal Rate of Return (IRR)*** means the percentage rate earned on each dollar invested for each period it is invested. IRR allows the City to compare the return of a project to what the money would earn in a bank.

***Internet of Things (IoT)*** means the connection of devices other than computers tablets and smartphones to the internet. These objects are able to collect and exchange data using built in sensors and can be used to analyse and display data which can be used for a range of purposes.

***Net Present Value (NPV)*** means the financial value of a project to the City over its lifetime in today’s dollars.

***Passive*** means without the need for mechanical heating, cooling or ventilation.

***Rain gardens*** means a planted depression or a hole that allows rainwater runoff from impervious urban areas, like roofs, driveways, walkways, parking lots, and compacted lawn areas, the opportunity to be absorbed. It can both improve the water quality of the run-off and reduce the need for irrigation water.

***R-Value*** means a measure of thermal resistance for materials such as insulation used in the building and construction industry. It gives an indication of how quickly they will lose heat.

***Tree pit*** means a chamber filled with filter media installed beneath an urban tree designed to collect stormwater runoff from small carpark areas or roads and direct it to the base of the tree. This runoff filters through the tree roots and surrounding soil mix, trapping sediment and pollutants before flowing to a piped stormwater system. The tree pit provides the dual

benefit of providing water to the tree (thereby reducing watering requirements) and improving storm water quality.

## 5. Policy Statement

5.1 The need for new buildings should be carefully considered and align with the City of Kwinana Community Infrastructure Plan and Long Term Financial Plan. Where possible, co-located and shared facilities should be considered to maximise resource use.

5.2 The Environment Department will be included in consultations on the design, specifications and procurement of all new City buildings to determine site and building specific green building requirements. Large buildings will require specialist advice.

5.3 For large prominent community facilities the City should consider having the building built to an established Green Building Rating System such as the National Australian Built Environment Rating System, Greenstar or to an equivalent standard.

5.4 Specifications for all new City buildings and renovations should include the following;

- A preference for designers and suppliers with Green Building qualifications and experience.
- The building design should be oriented to maximise passive heating and cooling.
- Window design and placement should allow for passive heating and cooling, cross ventilation and natural light while maintaining building security.
- The buildings should be designed to reduce non-beneficial heat gain and loss through the windows through energy efficient window glazing and frames (Low U-value and Mid-range SHGC according to Window Energy Rating Scheme), eaves, and window treatments.
- The building design should consider building materials that minimise the embodied environmental impact of the building as well as enabling the building to passively heat and cool. Information on the relative merits of the proposed building materials should be provided in the tenderer's response.
- All north facing windows should be fully shaded 1 month either side of the summer solstice. Windows on the west and east sides of the building should be minimised. Where windows are required on the west and east sides they should be completely shaded in summer.
- Lighting design should;
    - Be zoned,
    - Be of a high efficiency type (LED or Fluorescent),

    - Provide lighting fit for the purpose according to Australian Standards. ie areas should not be over lit,
    - The lighting control system should allow car park lights to be set on a timer separate to the building lighting, and
    - Lighting linked to motion detectors should be included where appropriate.

- All internal lighting and non-essential appliances such as air conditioning etc should be linked to the security alarm system to switch off when the building alarm is set.
- A Building Management System and monitoring package should be included in large buildings (usually those which have large ducted air conditioning services or require remote control of air conditioning) to allow ongoing monitoring of energy and water use.
- Buildings with a Building Management System should have water and energy end use and tenancy sub-metering included (to a standard which allows for tenant billing).
- Building design should consider the use of Internet of Things (IoT) to collect a diverse range of metrics. These may be used for identifying, analyzing and diagnosing unusual energy and water use.
- All split system air conditioning systems should be inverter based R32 or R410A refrigerant with a 5 star energy rating for 3-5kW or at least 4 star energy rating for over 5kW.
- Larger ducted air conditioning systems are not labelled under the energy star scheme but should be designed to be as efficient as possible. Ductwork should meet Australian Standards for ductwork, AS 4254. Criteria for energy efficiency in the air conditioning should be included in the specifications and information on the energy use of the chosen system be required to be provided in the tenderer's response.
- The roof should be insulated with insulation rated to a minimum R-value of 3.2.
- The roof material should be light in colour, ideally white.
- Any hot water system should be solar or, if not suitable, a heat pump high efficiency hot water system.
- An appropriately sized solar photovoltaic system with remote monitoring via a web portal should be included.
- Hot water dispensers should be high efficiency and equipped with timers.
- All fridges should achieve at least a 4 Star energy rating (domestic scale refrigerators) or be designated "High Efficiency" (commercial scale) under the "Greenhouse and Energy Minimum Standards (Refrigerated Display Cabinets) Determination 2012".
- All toilets and taps should at minimum achieve a 4 star WELS rating.

- Taps and showers should be on push button timers and vandal resistant where there is a high likelihood of vandalism.
- All showerheads should have a minimum 3 star WELS rating.
- Outdoor taps should only be provided where there is a clearly defined use. Where an outdoor tap is provided it should be constructed to be resistant to vandalism and any leaks should be easily visible.
- Purpose built washdown and chemical containment areas should be provided where the use of the building requires this (e.g. line marking paint, mechanical workshops)
- The use of rainwater tanks and greywater reuse systems in new buildings should be considered.
- Landscaping should consider the use of rain gardens and tree pits to allow treatment of stormwater before infiltrating onsite as well as minimise irrigation requirements.
- Trees must be provided in car parks at a rate of 1 tree per 4 car parks. Planting areas should be appropriately sized for the tree.
- A minimum of 8% of the land area should be landscaped (as per the City's Town Planning Scheme).
- A waste management plan for construction should be prepared and submitted as part of the proposal to outline how building and construction waste will be reduced and recycled.

## 6. Financial/Budget Implications

The cost of water and electricity has been rapidly rising and these requirements will minimise the City's exposure to potential price increases into the future. The capital cost of many energy efficiency measures is also rapidly decreasing. This means that many efficiency measures provide returns which are well in excess of bank interest rates. Therefore the measures in this Policy are financially as well as environmentally beneficial.

Complex Green Building projects will undergo a financial assessment which will be reviewed by the Environment Department. The financial assessment should include Internal Rate of Return and Net Present Value. This information will allow initiatives to be chosen which deliver the best return on investment. For smaller projects, this assessment may be carried out in-house.

To ensure that the policy remains cost effective and practical, the requirements of this policy have been intentionally limited to things that;

- must be addressed at the construction stage and can not be retrofitted (e.g. building orientation, window placement)
- add only minimal cost at the construction stage (if any cost at all) but would be costly to retrofit later (e.g. roof colour, solar hot water system)
- have very clear financial and/or thermal comfort benefits (e.g. solar panels, insulation, efficient air conditioning)
- are existing standard inclusions in new buildings (e.g. zoned lighting, timers, motion sensors).

The design and cost of planned community facilities will be refined over time to incorporate these requirements as detailed drawings are developed.

## 7. Asset Management Implications

These requirements will reduce the ongoing running costs of these buildings and in some cases maintenance costs as well. Rainwater tanks and greywater systems will require additional maintenance.

## 8. Environmental Implications

These requirements will significantly reduce the water and energy use of new and renovated buildings.

## 9. Strategic/Social Implications

This policy assists the City to address the following objectives in the Strategic Community Plan;

***Objective 3.4:*** Promote the use of renewable energy within the City of Kwinana and reduce energy use where possible.

***Strategy 3.4.1*** Continue retrofitting energy inefficient City of Kwinana assets through the City's Revolving Energy Fund and ensure new buildings are designed to be energy efficient.

***Objective 3.5:*** Encourage and exercise best practice water management.

This policy also assists the City to achieve its water conservation goals and climate change goals listed in the Sustainable Water Management Plan and Climate Change Mitigation and Adaptation Plan.

## 10. Occupational Safety and Health Implications

Electrical and plumbing work has the potential for occupational safety and health implications. It is not anticipated that these requirements will add any additional risks that wouldn't already be present as part of construction works.

## 11. Risk Assessment

A risk assessment conducted as part of the Policy review has indicated that there is currently a risk to the City of increasing operating costs. This policy assists to reduce that risk. Measures have been chosen because they are proven well established technologies with minimal performance risks.