

2.8 – Sustainable Design - section 32 evaluation for the Proposed Auckland Unitary Plan

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1 Overview and Purpose

This evaluation should be read in conjunction with Part 1 in order to understand the context and approach for the evaluation and consultation undertaken in the development of the Proposed Auckland Unitary Plan (the Unitary Plan).

1.1 Subject Matter of this Section

The sustainable design provisions in the Unitary Plan relate to the council's response to climate change and the outcome of a quality and sustainable built environment. The rules aim to ensure all new development containing five or more dwellings and office and industrial buildings over 5000m² GFA are designed to minimise the use of energy and water resources and create healthy and comfortable living and working environments. Research has demonstrated that this can be achieved through minimal upfront costs. In turn the building will be significantly cheaper to operate with reduced bills and maintenance costs.

The sustainability of five or more dwellings and office and industrial buildings over 5000m² will be achieved using a rule requiring these developments to meet a certain star rating using the Homestar and Greenstar tools developed by the New Zealand Green Building Council. The Homestar tools assess residential development and the Greenstar tools assess office and industrial development. These tools work by assigning credits to sustainable design features of a building, such as thermal insulation. These credits are added together to give a score which then relates to the star rating. For example, 60 credits are required for a dwelling to meet the 6 star standard. The credits are awarded to design features that cover multiple aspects to sustainable design (water, waste energy etc), thereby giving a holistic and integrated assessment of a building. There is an inherent flexibility in the tools whereby the developer has ability to decide what sustainable design features are used. This enables the design of the development to maximise the potential of the site, suite the developers needs and requirements.

Rate a development against an assessment tool

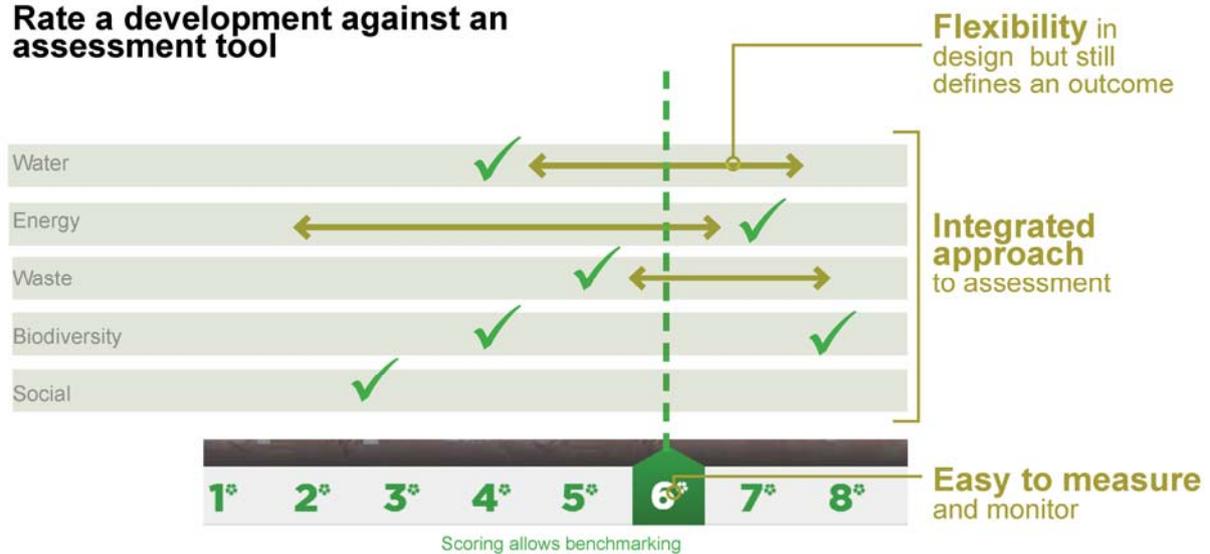


Figure 1. Table to illustrate how an assessment tool works.

The provisions are new to Auckland although Waitakere and North Shore legacy councils encouraged sustainable design principles and more recent plan changes have introduced provisions relating to water efficiency.

1.2 Resource Management Issue to be Addressed

This approach seeks to address two issues:

1. The quality of the homes and commercial building being developed in Auckland. Poorly designed and constructed homes are inefficient to operate, create unhealthy living and working environments and therefore can negatively impact on the amenity of development and its surrounds. By improving the sustainability of new homes and commercial development, such buildings will be more comfortable and healthier to live in. Running costs are reduced therefore improving affordability and economic performance.
2. Minimising the environmental impact of new homes and commercial buildings, with particular regard to energy and water use. New development can create adverse environmental effects and contribute to the causes of climate change. By designing building to incorporate best practice sustainable design, such as the use of water efficiency devices or thermal insulation, the effects on the environment can be minimised. In particular, efficiencies in energy use can assist in reducing greenhouse gas emissions.

Both issues are addressed in the Auckland Plan, see section 1.4 below.

1.3 Significance of this Subject

The sustainable design provisions in the Unitary Plan have been developed to match public expectations that the Unitary Plan will deliver a quality, built environment for Auckland and be able to respond to climate change.

The provisions are unlikely to result in much change for small developments (less than four dwellings or office and industrial buildings under 5000m²). However there will be an impact on developers of:

- greenfield land, where a large number of dwellings are proposed,
- sites in the Terrace Housing and Apartment Buildings zone
- larger sites in the Town and Metro Centres, Business Park, General Business and the Light and Heavy industry zones

This view is based on the threshold of the rules applying to development of five or more dwellings or commercial development with a gross floor area over 5000m².

The provisions will result in an increase to building cost associated with these developments but these will be off-set in the medium to long term by net benefits of reduced heating costs and may lower energy use by households and businesses. There are also benefits to employee productivity and health as well as the value of a building.

Significant is also associated with the fact that this approach is relatively new to Auckland and therefore contributes to degree of change in terms of the rules new development must meet.

1.4 Auckland Plan

The Auckland Plan has a strong emphasis on the sustainability of development:

- Section C sets a vision for a 'Green Auckland' where water and energy is used efficiently, biodiversity is enhanced and homes are healthy and comfortable to live in.
- Chapter 8 has a target of a 40% reduction in greenhouse gas emissions relative to 1990 levels by 2040. The sustainability of Auckland's built form is key to reducing emissions.

- Directive 8.3 in Chapter 8 seeks to improve building performance through ensuring development is assessed using an appropriate ratings tool.
- Chapter 10 states that if Auckland is to succeed then its built environment must be more sustainable and outlines a suite environmental design principles.
- Chapter 11 seeks more sustainable housing to improve health and lower running costs.

Chapter 8 of the Auckland Plan states: “Auckland expects that we will work together to play our part in meeting the national goal of significantly reduced greenhouse gas emissions (mitigation), and that we will improve energy efficiency, resilience and security and our capacity to adapt to climate change.”

The Auckland Plan sets a goal of reducing greenhouse gases by forty per cent by 2040. The Auckland Plan identifies that the biggest contributors of greenhouse gases for Auckland are electricity generation and transport. This means that some measures to increase building efficiency should theoretically result in a reduction in energy use. The Auckland Plan states: “While there is uncertainty about the timing and exact nature of the impacts of climate change and the costs associated with taking action, the scientific and economic consensus (notable the Stern Review into the Economics of Climate Change) about climate change tells us that the costs of inaction will be far greater.”

Chapter 11 of the Auckland Plan seeks to improve the quality of existing and new housing. It notes the importance of delivering new homes which are sustainably designed to create healthy and comfortable living environments.

1.5 Current Objectives, Policies, Rules and Methods

Most legacy councils had various non-regulatory programmes to support sustainable design. Waitakere City Council supported sustainable design and environmental protection through its twin streams project and offered an interest free loan of around \$300,000 to support the completion of Earthsong, a small eco-village.

Waitakere City’s policy section states: “The central idea which underlies Agenda 21 is the view that if a truly sustainable future is to be possible, then the totality of human existence must be considered. Above all, a sustainable world must be just and inclusive of all groups, and able to recognise their needs. Human settlement patterns and economic systems, systems to produce goods and to move them, and ways of consumption, must all be organised in a way that recognises and is in harmony with the capacity of the environment to absorb their impacts. The adoption by Waitakere City Council of the draft “greenprint” in 1994, signalled further commitment to an integrated approach to sustainable development.”

Plan Change 16 introduced policies “supporting compact and sustainable urban form and sustainable land use intensification”. Interestingly, a keyword search for “sustainable” in the medium density housing and living environment (residential) provisions returned a nil result. There are no rules in the Waitakere District Plan dealing with sustainable design. However that plan did have specific rules and policies on native vegetation and stream protection.

Keyword searches for “sustainable” in the Isthmus residential chapter returned a reference to sustainable development in the Residential 8 zone explanation section. There is no reference to “sustainable” in any of the other legacy plans except where the term “sustainable management” is referenced.

Rodney District offered support for the construction of mud-brick houses designed by Graeme North which have been built at Matakana and other locations. North Shore introduced a plan change that promoted the integration of stormwater tanks into new residential development.

1.6 Information and Analysis

Auckland Council staff have developed a policy response to sustainable design based on research of best practice examples overseas, particularly the United Kingdom, United States of America and Australia. The analysis has shown that other jurisdictions have specific planning regulations on sustainable design, many of which employ the use of an assessment tool.

In acknowledging that a regulation may be needed to achieve the outcomes articulated in the Auckland Plan, research was undertaken on the most effective approach. This included the use of development controls and the use of an assessment tool.

Following this, more detail research was undertaken on the capital costs and direct benefits of sustainable homes and a study of existing research on sustainable commercial development. This can be found in the appendix.

1.7 Consultation Undertaken

Consultation on the provisions has been thorough. The provisions were prepared by staff and then considered by the Political Working Party on two occasions before being finalised for the March draft Unitary Plan. The presentations to the committee outlined the issue being addressed and possible policy responses including regulation and suggesting various thresholds. The March draft received a range of feedback that has been summarised as follows:

Feedback on draft residential standards:

- Significant support for the residential requirement
- Some people would like water tanks and solar panels to be mandatory
- Council should not require sustainable housing
- Sustainable homes will be too expensive to build

Feedback on draft office/industrial standards:

- Support for office/industrial requirement
- 5 star rating is too onerous and should be reduced to 4 stars
- Sustainable design outcomes should be incentivised, not required
- Leave it to the market

Political direction on the policy response required to amend the text was sought in August 2013.

1.8 Decision-Making

Elected members have seen early drafts of the provisions from a conceptual level through to the March draft in total. This has meant that they have had several opportunities to comment on and refine the draft policies and rules prior to notification. The Auckland Plan Committee and Chairs of Local Boards have considered attending a workshop/ presentation following the March draft. The workshop has given staff the direction to continue with the rule applying to residential development of five or more dwellings to a Home Star 6 standard and lowered the standard for commercial buildings over 5000m² to achieve a Green Star 4 standard.

1.9 Proposed Provisions

The proposed provisions are Auckland-wide rules with a link to Tier 1 (regional policy) objectives and policies relating to a quality built environment and climate change. The

objectives, policies and rules are triggered by the thresholds set in the rules of five or more residential dwellings being developed at any one time through a resource consent application and development of commercial buildings of 5,000m² or more. The detail of the provisions is dealt with below.

1.10 Reference to other Evaluations

This section 32 report should be read in conjunction with the following evaluations:

- 2.1 Urban form and boundary location
- 2.3 Residential zones
- 2.4 Business
- 2.6 Business building form and design
- 2.7 Design statements
- 2.22 Future Urban zone
- 2.24 Urban stormwater
- 2.25 Freshwater
- 2.26 Flooding
- 2.28 Natural hazards
- 2.40 Cycle parking
- 2.50 Retirement Villages

2 Objectives, Policies and Rules

2.1 Objectives

The following objectives are proposed:-

2.2.1. *A quality built environment that embeds the following principles of good design in development, including subdivision, across the site, street, block neighbourhood and city scales :*

d. Efficiency: Development that supports and optimises the full potential of a site's intrinsic qualities, including its shape, landform, outlook and relationship to its surroundings.

2.9.2. *Auckland increases renewable energy use and maximises energy efficiency which will reduce emissions that contribute to the adverse effects of climate change.*

Appropriateness of the Objectives

Relevance

The objective seeks a quality and sustainable built environment that limits environmental impacts.

Current sustainability practices, which aim to do less harm, are insufficient to achieve a sustainable built environment. This objective seeks to improve the environmental performance of the built environments, but along with this outcome there are significant social, cultural and economic benefits.

The definition of a sustainable built environment is changing rapidly. In this case and in relation this objective the aim is for neutral or reduced environmental impacts in terms of energy, carbon, waste or water are worthwhile targets.

Part 2 of the Act is concerned with sustainable management and development of land and resources. Natural and physical resources include land, water, air, soil, minerals, energy, all

forms of plants and animals, and all structures. The environment includes people and communities as well as what we usually think of as natural ecosystems. In this regard, how the built environment performs is intrinsically linked to how natural and physical resources are managed and effects on the environment.

A building which is sustainable is designed and constructed to provide an opportunity to use natural and physical resources more efficiently, while creating healthier and more energy and water-efficient homes and commercial buildings. Such buildings leave a lighter footprint on the environment through a more sustainable management of resources, while at the same time balancing energy-efficient, cost-effective, low-maintenance products for construction needs.

Environmental impacts can also relate to infrastructure use and capacity and future demands. Sustainable buildings will significantly reduce demands on infrastructure. For example a sustainable building will manage and re-use a larger proportion of water on site. Elevating demands on storm-water and potable water infrastructure.

Through the Resource Management (Energy and Climate Change) Amendment Act 2004, three new matters were inserted into s. 7 of the RMA:

- the efficiency and end use of energy
- the effects of climate change
- the benefits to be derived from the use and development of energy from renewable resources.

The objective integrates central government direction on climate change into the Unitary Plan and provides a basis for introducing sustainable design that increases energy efficiency and reduces energy consumption. From work undertaken by Auckland Council, a 50 per cent reduction in energy use could be expected with minimal upfront costs. In turn a sustainable built form will minimise emissions that contribute to climate change. Therefore the sustainability of buildings can be directly related to improving the efficiency and end use of energy as well as mitigating the effects of climate change itself.

It is considered that this objective and the associated rules are consistent with section 30 and 31 of the RMA

Usefulness

The objective adds value by providing various avenues to give effect to it namely promotion of public transport, designing sustainable buildings and waste minimisation. It allows sustainability to address holistically, addressing water, energy and waste to achieve, environmental, economic and social benefits.

The objective relates to the environmental outcomes sought by the Auckland Plan by implementing Directive 8.3 and supporting wider directives and priorities from Chapters 8, 10 and 11 of the Auckland Plan. The proposed objective, policies and rules align with council's Energy and Climate Change Mitigation Strategy.

In addressing the environmental impact of development, the use of energy will be reduced through increased efficiency. There is also the ability for buildings to generate their own energy through the small scale renewable energy generation. This in turn reduces outputs into the environment which contribute to the effects of climate change.

Achievability

The council has the ability to implement address the sustainability of the building environment and minimise the environmental impact of new buildings and it has been directed by central government legislation to do so.

The principle method for achieving this objective is the require development of a certain scale to meet a certain standard contained within a sustainability assessment tool. Where five or more dwelling on a site are proposed, those dwellings will need to meet Homestar 6star rating. Offices and industrial buildings of 5000m² and over will need to meet Greenstar 5 star rating.

Effectiveness of this approach has the potential to known once a development has been completed and occupied, whereby energy and water use can be monitored. As tool quantifies and benchmarks the sustainability of buildings design, the success of the tool can effectively monitored. It is likely that monitoring on a two yearly basis would be required to see how well the policy works in practice.

Reasonableness

The objective is considered to be reasonable because it relates to a key issue facing Auckland. The quality, including sustainability and environmental performance, of new development is key to achieving a successful compact built form and reducing the environmental effects of continued urban growth.

The methods for achieving this objective are considered to be reasonable because an applicant can either demonstrate that they meet the rule through a star rating from Homestar or Greenstar or an equivalent star rating from an alternative tool or that they have addressed energy and water efficiency, stormwater management, internal dwelling amenity and waste in their design through a resource consent. The financial costs in achieving this standard and the associated benefits are discussed in section 4.0 of this report. This sets an achievable level for a new policy.

Legacy issues

Legacy plans dealt with environmental performance of buildings. Generally it was through encourage sustainable building design, particularly re-use of stormwater for non-potable purposes. More recent plan changes, particularly relating to Greenfield development have included controls relating to water efficiency. It is acknowledged that some legacy plans did not address sustainable design at all. This could be considered to be a mix of regulatory and non-regulatory methods with no consistency.

2.1.1 Policies

The policies at Part 2 are written to include a range of policy responses directed at climate change and environment performance of buildings such as:

- support for maximising connectivity
- designing for context and long term adaptability of buildings
- requiring a high standard of design for residential and business intensification
- sustainable design, waste minimisation, water sensitive design and waste minimisation

Sustainable design is promoted in relation to all development, recognising that sustainability needs to be address across all development types in order to begin mitigating the effects of climate change.

Policy 2.2.1.11 states:

“Require large scale development, and encourage all other development to minimise its environmental impact through best practice sustainable design which incorporates energy efficiency, renewable energy generation, waste minimisation and water sensitive design.”

This relates directly to Objective 2.2.2.1 which seeks to minimise the environmental effects of new buildings. This is to be achieved through a rule requiring development meet minimum standards of Homestar 6-star and Greenstar 4-star ratings. As discussed in detail below these are considered to represent best practice sustainable design for an Auckland context.

Policy 2.9.1 states

“b. requiring 5 or more new dwellings and office and industrial buildings over 5000m² to achieve best practice sustainable design

c. encouraging all development to incorporate energy efficient design through solar orientation of the building, location of windows and inclusion of appropriate insulation and thermal mass.”

This relates to objective 2.9.2 which seeks to maximise energy efficiency. This policy seeks to do this through the requirement and encouragement of sustainable design principles.

The rules evaluated in this report only consider sustainable building design. There is a clear nexus between the Part 2 policy and the rules at Part 4.

2.1.2 Rules and other methods

26 Sustainable Development

2.1 Dwellings

1. In new developments containing five or more dwellings on a site, each dwelling must be designed and constructed to

a. a minimum 6-star level from the New Zealand Green Building Council Homestar Tool (2013), or

b. certified under the Living Building Challenge (2013).

2. Where the calculation of the dwellings required to meet the Homestar rating results in a fractional dwelling, any fraction that is less than one-half will be disregarded and any fraction of one-half or more will be counted as one dwelling.

2. This rule does not apply to:

a. extensions and alterations to existing dwellings

b. converting an existing building to a dwelling

c. new developments containing four or fewer dwellings.

2.2 Offices

1. A new building with a GFA of 5000m² or greater and where 80 per cent or more of the GFA is to be used as an office, must be designed and constructed to:

a. a minimum 4-star level from the New Zealand Green Building Council Green Star Office Tool (2009), or

b. certified under the Living Building Challenge (2013), or

c. a minimum 4 star using the Australian Green Building Council Green Star Office tool (2008).

2. This rule does not apply to:

a. extensions and alterations to existing office buildings

b. converting an existing building to an office use

c. offices accessory to another use.

2.3 Industrial activities

1. A new building with a GFA of 5000m² or greater and where 60 per cent of the GFA is to be used for industrial activities, must be designed and constructed to:

- a. a minimum 4-star level from the New Zealand Green Building Council Green Star Industrial Tool (2009), or
- b. certified under the Living Building Challenge (2013), or
- c. a minimum 4-star using the Australian Green Building Council Green Star Industrial tool (2011).

2. This rule does not apply to:

- a. extensions and alterations to existing industrial buildings
- b. converting an existing building to industrial activities
- c. industrial activities accessory to another use.

Relevance

The purpose of the rule is to:

- reduce the environmental impact of new buildings
- improve the efficiency, the health and the comfort of new buildings.

This purpose is consistent with Part 2 of the Act. As described in Section 2 of this report, the way a building is designed and constructed directly impacts on the use of physical and natural resources as well as its effects on the environment. A more sustainable building will use less water and energy and generate less waste. At an individual scale, this generates significant benefits of the occupants and owners of a building. At a larger spatial scale, these efficiencies contribute to the sustainable management of natural resources in Auckland as well as promoting social and economic well-being.

The rule which requires a development to meet Homestar 6 star and Greenstar 4 star rating addresses the sustainability of buildings in a holistic way and thereby address the wide spectrum of effects associated with new buildings and the natural environment, including energy efficiency, energy generation, water use, stormwater and waste. Therefore a building that meets the standards prescribed in the rule will limit to sufficient degree, impacts on the environment and will contribute to the sustainable management of resources.

The proposed rules also relate to section 7 of the RMA by implementing measures to address energy efficiency. One of the principle aspects of the Homestar and Greenstar tools is to address energy efficiency through better thermal performance and reduced reliance on energy intensive heating.

The objective sets a clear outcome to reduce the environmental performance of buildings as discussed above. This rule is considered to the most effective and efficient means of achieving that outcome for Auckland

Usefulness

These rules are useful because they provide benchmark and the ability to quantify and measure the sustainability of a new building. The rule achieves this by requiring residential development to meet a 6-star standard using Homestar and commercial development to meet a 4-star standard using Greenstar.

The tools that the rule refers to provide a very simple and consistent framework for assessing residential, industrial and commercial development without the need for an extensive and complex list of rules covering all aspects of a building's design.

Usefulness is also obtained through the inbuilt flexibility within the tools. The tool allows the design of the building to respond to context and maximise the greatest gains in terms of sustainability. This is achieved through a method of obtaining credits against sustainable design features, such as water sensitive design. To meet Homestar 6-star, 60 credits would need to be obtained. Some credits are mandatory (water efficiency, moisture control, thermal

performance). The remaining credits can be achieved through the most effective and efficient design for the site and intended purpose.

The fact that the tool can quantify and benchmark various aspects of buildings design means that it is easier to assess, monitor and enforce than more abstract or less quantifiable design controls. There is minimal subjectivity in its application. Whether you meet the necessary star rating is clear, there is no discretion in such an assessment.

Achievability

Building sustainably is becoming more normalised in New Zealand as awareness of the economic, social and environmental benefits has increased.

The use of sustainability assessment tools is normalised at an international scale; with the first tool being used in the United Kingdom in 1990. Since then tools have been developed in Australia, China, South Africa, Europe and North America and are used in both a voluntary and regulatory frameworks. All such tools function in a similar way. Through regulatory mechanisms it has been found to be success in achieving a more sustainable built form with minimal cost. The use of such tools in regulatory framework also normalises sustainable design, thereby further reducing costs overtime as design techniques, materials and technologies become readily available.

In New Zealand, the Homestar tool was launched in 2010 and Greenstar tool in 2007 by the New Zealand NZGBC. They were developed in conjunction with the development industry, architects and sustainable design experts for a New Zealand context. Therefore it is considered that meeting these tools is achievable in comparison to requiring developers to meet standard of tool developed outside of New Zealand.

The tool provides an independent and auditable/transparent evaluation. Council could audit its resource consents on a two yearly basis to see how many sites provided information and what standard they met.

The Building Act is aimed more at addressing health and safety rather than environmental performance (with the exception of the insulation standards) of new buildings. A breakdown of the Building Act and comparison with Homestar and Greenstar tools reveal that tools address aspects of a building's design which relates directly to environmental performance (inclusive of economic and social performance) and therefore do no conflict with requirements of the Building Act which relate to the health and safety aspects of a building's construction. Although more onerous in certain aspects, such as thermal performance, the purpose of these provisions can be directly linked to the purpose of the RMA.

The outcomes sought by this method are clearly aimed at ensuring that new buildings of a medium to large-scale minimise environmental effects and maximise social and economic efficiencies. Therefore it is addressing a different purpose than the requirements of the Building Act.

Reasonableness

The rules are considered appropriate based on the capital cost of compliance. This is fully articulated in section 2.1.3.

The following considerations have been used to review potential Unitary Plan methods.

The rules do not apply to all development. It is acknowledged that this is a relatively new approach. The 5000m² and 5 or more dwelling thresholds are considered reasonable due to the fact that introducing such a standard to apply to all office and industrial development, acknowledging that no such rule exists, would have been to onerous. Therefore a threshold

was introduced to whereby the control would still achieve the objective without creating to greater burden for the development industry.

Reasonableness is also derived from the fact that the requirement enables a degree of flexibility for a developer. As explained in section 1.1, credits are assigned to particular design features. A certain number of credits are required in order to meet a particular star rating. A developer can prioritise which credits are awarded. Therefore the development can be design to maximise the opportunities of the site, the land use activity and the developers requirements, whilst still meeting the rule.

The rule references assessment tools which are currently exist in the market. Therefore many developers and architects are already familiar with the tools, albeit on a voluntary basis. It is also acknowledged that both tools have been developed with the development industry and therefore incorporate the efficiencies demanded by that sector.

2.1.3 Costs and Benefits of Proposed Policies and Rules

Costs

Detailed research has been undertaken which included modelling an industry standard 180m² 3-bedroomed, double garage detached dwelling. This provided a benchmark, meeting the Building Code minimum standard, against which the Homestar tool could be costed.

1. Each of the 58 criteria within the Homestar tool was then assessed by Jasmax Architecture and Rawlinsons Quantity Surveyors to map the minimum cost for achieving the criteria against the points available for the selected house design.
2. This allows a simple understanding of the effective value of each criteria, and provides a methodology for defining the cheapest way of compiling the points necessary to achieve each star rating of the Homestar system.

The results highlight increases to capital build costs of:

- a. \$3,237 (+ 1.1 per cent) – 5 stars
- b. \$6,437.50 (+ 2.2 per cent) - 6 stars
- c. \$16,241 (5.5 per cent) - 7 stars.

Research undertaken and collated by the NZGBC and Davis Langdon concludes that capital costs for office and industrial buildings meeting Greenstar 4-star could be between -2% per cent and -5 per cent compared to the Building Code minimum. The reduced cost is associated with ability to use natural means of ventilation rather than mechanical air conditions systems, thus saving considerable capital costs.

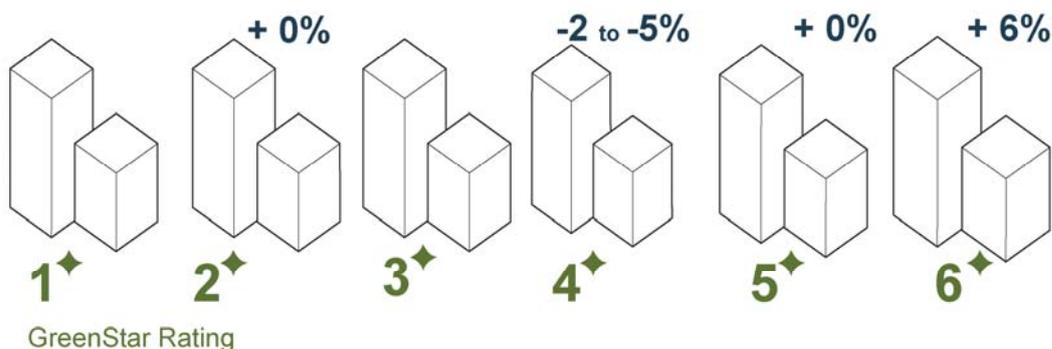


Figure 2. Capital Cost of the Greenstar Office tool.

Along with the capital costs, the following indirect costs are noted:

- Introduction of a new method will require consultation and educational programmes with the development industry and the general public.
- For the rule to be more successful it should not stand alone. It will need commitment from Council through supporting policies and programmes.
- The introduction of new regulation may generate resistance from the development industry, particularly if it is not subsidised or incentivised. In the short term this may cause disruption as the development industry readjusts to the new requirements. However, as noted below, the assessment tools referenced in these requirements are already used by property owners and developers, so there is already a degree of familiarity.
- The proposed rules reference a tool which is not administered by Auckland Council. The Homestar and Greenstar tools are managed by the NZGBC. It is noted that Council staff and an elected member sit on the advisory and technical panels of this organisation. This means that Auckland Council will have less control over the tool and any development of new or amended tools. The role of NZGBC and their tools represent best practice, so it is reasonable to expect that this will continue, therefore any future development should be still represent best practice. An updated tool would need to be incorporated in the Unitary Plan through a plan change. Therefore, Auckland Council maintains control over whether any new or amended tools should be included in the Unitary Plan.
- An increased emphasis on sustainable design may change the way buildings are constructed and the material that are used. This may generate increased costs as the buildings techniques are normalized. The cost of material may be increased, however the tool does not require the use of materials or technology which is not currently available or used in New Zealand.

Benefits

Benefits are associated with reduced environmental effects. Buildings will be designed to run more efficiently, indoor environments will provide for a higher standard of amenity and health.

For dwellings meeting Homestar 6 benefits include

- Approximate 50 per cent energy savings
- Approximate 40 per cent water savings
- Payback on costs 5.5 years

For dwellings meeting 5-star payback is 2.5 years and dwellings meeting 7-star would be expected to achieve payback within 10 years. Based on this analysis of the economic costs and benefits along with associated environmental and social benefits a standard of six stars is considered the most reasonable.

The research demonstrates within a New Zealand context how a housing tool such as Homestar can simultaneously drive sustainable performance, while improving the affordability of new housing for Aucklanders. The initial annual savings of almost \$1000 per annum are, when viewed over the lifetime of the home, still significant in enabling the easier

servicing of mortgages by residents, and thus improving the affordability in the short-, medium- and long-term.

For office and industrial benefits include:

- **energy saving** – 25-50 per cent
- **water saving** – 39 per cent
- **productivity and health** – up to 23 per cent increase in productivity due to improved ventilation

There are also additional economic benefits which increase the reasonableness of the approach:

- **asset value**: annualised total return of 8.9 per cent compared to non-Greenstar office assets of 6.4 per cent
- **market valuations** typically 5-20 per cent higher
- **rental premium** 3-6 per cent higher
- **vacancy** reduced by 3 per cent.

In assessing the costs versus the benefits of the Greenstar 5-star standard, it is considered reasonable for office and industrial buildings over 5000m².

New buildings have a variety of environmental impacts, including air and water pollution, greenhouse gas emissions, waste generation, natural resource depletion and ecological disturbance. Sustainably designed buildings aim to significantly reduce these impacts. Sustainable design features within a building will reduce the health effects and costs associated with environmental pollution and will have other less tangible economic value to society by

- reducing energy consumption and waste generation
- reducing the need for new infrastructure required to support buildings
- may foster growth in emerging businesses related to sustainable design

The social benefits of sustainable design are related to improvements in the quality of life, health, and well-being. These benefits can be realized at different scales – buildings, the community, and society in general. At a building scale benefits relate to health, comfort, and satisfaction. More sustainable design, with an emphasis on thermal performance, materials and ventilation, can reduce illness and improve health of buildings occupants. A health benefit cost return ratio of 2 to 1 can be expected. The thermal performance and ventilation manage ambient air temperatures and moisture levels to create a more productive working environment and a more comfortable living environment. General wellbeing of a buildings occupants will be improved. Specific health complaints can be significantly reduced, particularly respiratory diseases caused by damp, mould or cold temperatures. This in turn will reduce admission to hospital and the number of people requiring medical treatment, therefore costs associated with medical care may be reduced.

Further benefits of the proposed policies and rules include:

- The use of assessment tools to benchmark the sustainability of new development are familiar to the international development industry and extensively market tested. One of the earliest tools was used in the UK in 1990. In particular the Greenstar and Homestar tools are becoming increasingly familiar to the domestic market (e.g GreenStar and HomeStar). The proposed approach will therefore bring Auckland more in line with some of the world's most sustainable cities

- Gives effect to the Auckland Plan by implementing Directive 8.3 and supporting wider directives and priorities from Chapters 8, 10 and 11. Alignment with Councils Energy and Climate Change Mitigation Strategy. Auckland Council will be seen as implementing these key strategies
- The rules provide a quantifiable evaluation of the sustainability of a development. This allows for accurate monitoring and in turn more effective policy making.
- Provides a very simple and consistent rule within the Unitary Plan, without the need for extensive list of rules covering all of the different sustainable design aspects or having to detail how to balance competing outcomes for those sustainable design features.
- Flexible in allowing applicant to decide where to invest in their project to create the most sustainable outcomes. It also allows the balancing of a wide range of different aspects of sustainable design.
- Minimum resource and capacity demands for council to implement as the assessment is carried out by the applicant through a suitably qualified expert. This approach can provide an independent auditable and transparent evaluation framework.

2.1.4 Adequacy of Information and Risk of Not Acting

It is considered that there is a considerable body of evidence on sustainable design to implement this policy and rule.

The risk of not acting is that:

- Auckland misses an opportunity to implement a rule which will require a certain scale of new building to meet best practice sustainable design. Without such a control, Auckland will be lagging behind its competitors both in Australasia and internationally, where such an approach is more common place.
- Auckland will lose a opportunity to minimise the environmental impacts on new buildings, particularly in key areas of water and energy efficiency.
- Key directives and outcomes of the Auckland Plan may not be met.

3 Alternatives

The proposed preferred alternative is discussed in 2.0 above. The status quo alternative is outlined in 1.5 above.

Alternatives are:

1. Development Controls/Standards - The council could develop its own minimum development controls for each aspect of sustainable building design (water, energy, waste, health, etc)
2. Council own assessment tool. Council could develop its own assessment tool rather than rely on Homestar and Greenstar developed by the NZGBC.
3. Non-regulatory - Rely on solely non-regulatory initiatives such as community education and advice. This is considered to be the status quo, as there is very little regulation in the existing district plans.

The table below discusses each alternative compared to the Proposed Alternative

	Alternative 1 - Development standards/controls	Alternative 2 – Councils own assessment tool	Alternative 2 - Non-regulatory approaches (Status Quo)
Appropriateness	The assessment above shows the development of individual development is not considered unnecessary.	The assessment above shows the development of individual development is not considered unnecessary.	Education alone can support the objectives but would not achieve much change from the current state.
Effectiveness	Although development standards could be developed to achieve a high standard of sustainable design the benefits of developing Auckland based standards do not outweigh the risks (costs, political risks, resistance from the development community and public).	A council developed assessment tool would be unlikely to be any more effective than the Proposed Alternative. However there is a far greater costs associated with this approach.	Education alone is only partially effective because it relies on an audience that is receptive to the ideas and concepts being promoted. People tend to self-select for education programmes.
Efficiency	Development standards are not considered to be an efficient policy method at this time due to the costs articulated previously	An assessment tool would likely cost between \$500,000 to \$1m dollars – based on the cost associated with existing tools. However the outcome would unlikely be any different from the existing tools such as Greenstar or Homestar as they represent best sustainable design practice	Education alone is only partially effective and it is difficult to measure whether it makes any long-term, sustained difference unless it is backed up with other measures e.g. restoration of bush areas usually occurs in tandem with outstanding natural landscapes/significant ecological areas.
Costs	<p>Auckland Council has the ability to develop its own standard for sustainable design. The standards would need to be easily benchmarked and would need to be consistent through time and still be relevant as building materials and technology changes.</p> <p>There would also be an inherent difficulty in developing a suite of standards that balances the various aspects of sustainable design, to optimise the sustainable outcomes for all development constraints. The flexible approach that is achieved using a ratings tool is not readily achievable through simple development standards.</p> <p>A large number of standards that would be needed to cover the full range of sustainable design aspects.</p>	<p>The council could spend moderate to high amounts to find that the same outcomes could be achieved through a simpler set of rules. Most existing tools for assessing sustainability have been developed by engineers, scientists, energy advisors and consultants overseeing the systems modelling, testing and marketing. A new tool would require testing and additional support during the implementation phase.</p> <p>It would be costly and complex to develop standards that would cover the full range of sustainable design for new buildings. There would be significant resource and time costs associated with the development of new standards. This would involve researching appropriate standards for a New Zealand context, testing and calibrating the standards to ensure achieve the desired outcomes, and ultimately communicating the new standards to the development industry and wider community. These costly and lengthy steps have already been achieved by the NZGBC for the Homestar and Greenstar tool.</p>	<p>The costs of non-regulatory measures are staff time and resources. The council's design eco-advisors and environmental services unit (education programmes) are examples.</p> <p>For non-regulatory approaches to achieve successful outcomes involves significant upfront and ongoing costs. Economic costs relate to staff time, resources for campaigns/educational tools. There are already a number of existing initiatives initiated by council, central government and charitable organisations aimed at improving the sustainability of the built form. However, they have limited effectiveness in improving new sustainability of new buildings in Auckland. Research concludes that regulatory measures are more successful in improving building standards compared to non-regulatory methods.</p> <p>There are also difficulties in non-regulatory measures addressing all aspects of sustainable design. The development industry and the wider public can become confused and disinterested if faced with too many or competing educational programmes</p> <p>Education programmes/advice may miss target audiences or people who have the ability to invest and make a difference on a large scale.</p>
Benefits	<p>The principle benefit of Auckland Council developing its own standards rather than utilising an existing tool is that council will maintain full control of the standards ensuring alignment with its strategic direction.</p> <p>This benefit also extends to the ongoing management and monitoring of the standards, whereby council would have full control over when and how the standards are updated.</p> <p>Such an approach can work well when there are sustainable standards which can easily be benchmarked and are unlikely to change through advancement in technology e.g site and building orientation for maximum solar gain.</p>	<p>The principle benefit of Auckland Council developing its own assessment tool is that it would provide significant control over the focus and operation of a tool, allowing the council to tailor to its specific demands.</p> <p>Could tailor assessment and streamline to better integrate into resource consenting process.</p>	<p>The benefits of education/advice are that those people who are willing to change their behaviour or adopt new ideas will find the information effective and useful.</p> <p>Many of the programmes undertaken by the Environmental Services Unit relate to re-vegetation of sites by local community groups and education at schools. This work is useful and valuable but may potentially not reach other sectors of the community involved in business/commerce.</p> <p>Relying solely on non-regulatory measure also reducing the need for regulation, but as discussed previously, the outcomes cannot be guaranteed through this approach alone.</p>
Risks	<p>The risks of acting are that the standards are not widely accepted by the community and politicians or do not differ significantly from existing international standards.</p> <p>It is unhelpful to spend public money developing new standards when existing ones are adequate.</p>	<p>The risks of acting are that it is unhelpful to spend public money developing new standards when existing ones are adequate.</p>	<p>The risks of acting on education measures are low because it always helps. However, if council has several goals in the Auckland Plan relating to sustainable design, and using energy efficiently this warrants a higher level of intervention.</p>

4 Conclusion

Based on the above discussion, the following conclusions are drawn.

The effects of climate change can be directly linked to how our built form performs. Similarly, buildings that are not designed to maximise sustainability increase environmental, social and economic effects such as water quality, health and operational costs. It is important that as Auckland grows the use of natural resources is managed in a sustainable way. The NZGBC Homestar and Greenstar tool provide a simple, flexible and innovative method of benchmarking the sustainable design of new building. Such an approach incurs minimal upfront costs which are returned in the short-term and generate even more significant social, economic and environmental gains over the longer term. The standards selected and methods for achieving compliance indicate that this is an important first step in Auckland catching up with international best practice.

Consequently, the following are recommended:

Objective

A quality and sustainable built environment that minimises the environmental impact of new buildings and development

Policy

Require new developments containing five or more dwellings and all new large scale office and industrial buildings to incorporate best practice sustainable design and encourage all other developments to incorporate the elements of sustainable design such as:

- a. energy efficiency
- b. renewable energy generation and distribution
- c. waste minimisation
- d. water sensitive design to maximise water re-use and reduce stormwater runoff.

Method

1.1 Dwellings

1. In new developments containing five or more dwellings on a site, each dwelling must be designed and constructed to a minimum 6-star level from the New Zealand Green Building Council (NZGBC) Homestar Tool (2010).

2. This rule does not apply to:

- a. extensions and alterations to existing dwellings
- b. converting an existing building to a dwelling
- c. new developments containing four or fewer dwellings.

1.2 Offices

1. A new building with a GFA of 5000m² or greater and where 80 per cent or more of the GFA is to be used as an office, it must be designed and constructed to a minimum 4-star level from the NZGBC Office Tool (2009).

2. This rule does not apply to:

- a. extensions and alterations to existing office buildings
- b. converting an existing building to an office use
- c. offices accessory to another use.

1.3 Industrial activities

1. A new building with a GFA of 5000m², where 80 per cent of the GFA is to be used for industrial activities, must be designed and constructed to a minimum 5-star level from the NZGBC Industrial Tool (2009).

2. This rule does not apply to:

- a. extensions and alterations to existing industrial buildings
- b. converting an existing building to industrial activities
- c. industrial activities accessory to another use.

5 Record of Development of Provisions

5.1 Information and Analysis

Review of district sustainable design policy	Auckland Council	2011	Appendix 3.8.1
Review of Christchurch City Council Base Tool	Auckland Council	2012	Appendix 3.8.2
Review of New Zealand assessment tools	Auckland Council	2012	Appendix 3.8.3
Review of international assessment tools	Auckland Council	2012	Appendix 3.8.4
Warm Up New Zealand CBA	Ministry of Economic Development	2011	Appendix 3.8.5
Best Practice Policy Survey and Literature Review	Beacon	2008	Appendix 3.8.6
Homestar Case Study: Cost Benefit Analysis	eCubed Buildings Workshop	Mar-13	Appendix 3.8.7
Homestar Cost-Scoring Report V1.0	Jasmax Architects Ltd	5-Feb	Appendix 3.8.8
UP Sustainable Development Methods v8	Auckland Council	Apr-12	Appendix 3.8.9
The Value Case for Green Buildings in New Zealand	New Zealand Green Building Council	Sep-10	Appendix 3.8.10
Policy Options for Sustainable Homes	Beacon	Apr-10	Appendix 3.8.11
The Business Case for Green Buildings	World Green Building Council	2013	Appendix 3.8.12
Environmental Impacts of the Waitakere NOW Home	Beacon	2010	Appendix 3.8.13
Auckland Sustainable Homes Assessment	Auckland Council	2009	Appendix 3.8.14
Future Proofing New Zealand's Commercial Property	Jones Lang LaSalle	2006	Appendix 3.8.15

5.2 Consultation Undertaken

- Presentation to the Unitary Plan External Advisory Panel July 2012
- Incorporated as part of the wider Auckland Unitary Plan engagement programme including:
 - presentation to The Green Room March 2013
 - presentation to the Environmental Defence Society April 2013
 - presentation to the Property Council April 2013.

5.3 Decision-Making

- Presentation to the Strategic Management Group 18 June 2012 which endorsed the approach of using sustainable assessment tools for new development.
- Presentation to the PWP 27 July 2012 which endorsed the approach of using sustainable assessment tools for new development – Greenstar 5-star for office and industrial and Homestar 6-star for dwellings.
- Presentation to the PWP 21 November 2012 which gained support for the Homestar 6-star rating to apply to all new dwellings.
- Presentation to the PWP 8 February 2013 which decided that Homestar will apply only when five or dwellings are proposed for one site
- Presentation to the Auckland Plan Committee 12 August 2013 which decided that Greenstar 5 for office and industrial should be lowered to 4 and the controls on 5 or more residential dwellings to remain as Homestar 6.
- Amendment proposed by Councillor at Auckland Plan Committee to reduce the Homestar requirement from 6 stars to 4 stars. A vote was taken. The amendment lost by 5 votes to 14. The 6 star rating was therefore retained.