

Auckland Regional Public Health Service

Rātonga Hauora ā Iwi o Tamaki Makaurau



Working with the people of Auckland, Counties Manukau and Waitemata

Auckland Regional Public Health Service

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Consultation Feedback – Energy Efficiency
Department of Building and Housing – Building Controls
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Submission from the Auckland Regional Public Health Service on Energy Efficiency of Buildings: Consultation on energy efficiency revisions to the New Zealand Building Code and Compliance Documents

1. Thank you for the opportunity for the Auckland Regional Public Health Service to provide a submission on the Energy Efficiency of Buildings
2. This submission represents the views of the Auckland Regional Public Health Service (ARPHS). ARPHS provides public health services for the three district health boards in the Auckland region (Auckland, Counties Manukau and Waitemata District Health Boards), with the primary governance mechanism for the Service resting with Auckland District Health Board. This submission represents the views of the ARPHS and does not necessarily represent the views of the three District Health Boards. We are a non profit organisation.
3. ARPHS understands that all submissions will be available under the Official Information Act 1982, except if grounds set out under the Act apply.
4. The primary contact point for this submission is:

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Introduction

5. Policy to affect health gain is often marginalised to medical care. However, health is influenced by a broad range of policy decisions and is not solely the responsibility of the health sector. Planning and policy decisions by central government, local government and non-government agencies can have a large impact.
6. ARPHS has identified six 'vital few' service delivery outcomes that it believes are critical to achieving public health, these are a:
 - Reduction in the incidence and impact of infectious disease.
 - Reduction in the incidence and impact of obesity, diabetes and cardiovascular disease.
 - Reduction in the incidence and impact of tobacco and alcohol related harm.
 - Reduction in the incidence and impact of cancer.
 - Reduction in the incidence and impact of environmental inequalities.
 - Reduction in the adverse effects of environmental hazards.
7. As part of its work programme to reduce the incidence and impact of environmental inequalities ARPHS operates a Healthy Homes and Communities programme. This focuses on community renewal, urban design and sustainable development activities to help reduce the exposure of low socioeconomic groups to unfavourable living / environmental conditions. The ultimate goal of the programme is to achieve healthier physical and social environments and reduce health inequalities. A key aspect of this programme will be shifting the focus away from individual behaviour towards improving living conditions and environments.
8. Housing is internationally recognised as a key determinant of health. The location, physical quality, level of crowding and the affordability of housing are all factors that impact directly on health. Cold, damp housing is the most common problem within New Zealand.
9. ARPHS believes that it is essential that public health issues are a key consideration in all planning and decision making frameworks used by the Department.
10. Building design and Code requirements will impact on all of ARPHS vital few outcomes. Good Code requirements will encourage and direct builders, developers and others to ensure that the buildings they produce do not impact adversely on the health of those using them or the health of the communities. Significant gains in population health will also be won if those developing and preparing the Code are cognizant of the impact on population health from their decisions.
11. This submission builds on ARPHS comprehensive submission on the Building Code Review and follows the format of the on line Energy Efficiency Submission Form.

Home Insulation Proposal

12. ARPHS strongly supports an increase in the level and quality of insulation required in all occupied buildings. An international systematic review on housing improvement interventions found that improved energy efficiency (including the installation of heating) led to improved respiratory and other symptoms. Energy efficiency measures such as central heating and double glazing can directly raise temperature and reduce dampness.
13. ARPHS supports the Energy Efficiency Conservation Authority's target to achieve an internal temperature in residential and commercial buildings of not less than 18° C and not more than 24° C at reasonable cost and without the need for resorting to significant heating or cooling energy. Increasing insulation requirements in the Building Code will greatly assist in achieving this target.
14. The indoor environment has been investigated for indices of thermal comfort: in temperate climates, the optimum indoor temperature is 18–24 °C (WHO Fact Sheet EURO/04/03 Copenhagen, Rome 29 September 2003). Temperatures are higher in urban areas, owing to many factors, including increased heat production through heating, reduced loss of heat in the urban canopy layer, lower wind velocities and increased exposure to radiation. Heat-waves present special problems in urban areas because buildings retain heat at night if ventilation is inadequate. During heat-waves, city dwellers may experience sustained thermal stress both day and night, while people in rural areas often obtain some relief from thermal stress at night. Urban planning is therefore assumed to play an important role in the primary prevention of heat stress. Temperatures below 24C will be most important in the North Island where humidity levels are highest.
15. This also supports the World Health Organisations recommendations of minimum of 18° C. Ideal indoor temperatures are around 20 – 21° C and deviations above and below this range increase the risk of adverse health outcomes particularly for cardiovascular mortality.
16. Research has shown that investing in insulation pays off with lower health costs.
17. Warm dry housing is a fundamental human need. Indoor cold is associated with asthma, other respiratory illnesses and an increased risk of cardiovascular disease. Colder houses place more physiological stress on older people, babies, the sick and disabled all of whom spend more time inside. Cold temperatures have an independent effect on health outcomes and will almost certainly exacerbate existing health conditions and may lead to early winter mortality. Winter excess mortality for people over 65 years is greater in New Zealand than in Northern Europe and this may reflect differences in the quality of housing.
18. Houses that are cold are also more likely to be damp and this can lead to mould growth, which can cause respiratory symptoms. The link between cold, damp housing conditions and health has been highlighted in a number of international reports.

19. The Housing, Insulation and Health research undertaken by the Wellington School of Medicine and Otago University found that families in insulated homes had fewer hospital and GP visits for respiratory conditions and fewer days off work and school. Energy use decreased a small but significant amount and houses were drier and warmer once insulated. Economic benefits were estimated to be twice the value of the initial insulation.
20. The cost of heating is an important factor to consider. A fully insulated house needs about half the amount of energy to heat it as an uninsulated house (Healthy Wealthy and Wise HIA Fact sheet 2006). Many lower socioeconomic households suffer from “fuel poverty” where families may spend a higher proportion of their income on heating than average but it is still insufficient to heat their homes to a safe and comfortable level. The main causes of fuel poverty are a combination of poor energy efficiency, low disposable income, and the high price of fuel or heating.
21. Furthermore the use of unflued gas heating (or incorrectly flued), often the heating system chosen by low income families as they are cheap to buy, emits water vapour, carbon monoxide and nitrogen oxides contributing to unhealthy air quality, dampness and mould. The production of carbon monoxide is a particular hazard. The NZ Energy Safety Service (Ministry of Consumer Affairs) has recorded fifteen fatal cases (some involving multiple fatality) with gas appliances. Three of the cases involved space heaters. Six cases involved cookers or grillers, three involved fridges, two involved lights and one involved a continuous flow water heater. They advise consumers:
 - about the need to ventilate rooms where gas heaters are being used;
 - to always make sure they have plenty ventilation when using gas appliances indoors, such as opening windows slightly;
 - not to use gas appliances in small spaces, like bathrooms, or spaces where the heater may be unsupervised, like bedrooms;
 - to have their gas heaters serviced regularly.
22. The benefits of insulation and improved energy efficiency not only have a positive impact on health but also have the potential to reduce inequalities in fuel poverty.
23. Efforts to improve energy efficiency can also benefit the environment and public health with reduced energy use and cleaner air.
24. ARPHS supports an increase in the level and quality of insulation required in all occupied buildings. An international systematic review on housing improvement interventions found that improved energy efficiency (including the installation of heating) led to improved respiratory and other symptoms. Energy efficiency measures such as central heating and double glazing can directly raise temperature and reduce dampness.
25. Homes also need to be well positioned and designed to ensure that passive solar heating can be utilised.

26. Improving house energy efficiency improves comfort in the home whether or not heating is used. Energy is a significant cost item particularly for low income households. If the houses occupied by low income households have poor energy efficiency then the addition of using heating appliances will place an extra burden on the household income. Improving thermal comfort by requiring our houses to be more energy efficient would be beneficial, however the issue of affordability needs to be considered to ensure accessibility to all people.

Solar Water Heating Proposal

27. ARPHS supports measures that make water solar heating cheaper and easier to install. Refer to comments below in G12 AS2 below.
28. Solar hot water heating would provide a substantial cut in power bills and this would be beneficial to households, and particularly to low income families.

Commercial Lighting Proposal

29. ARPHS supports measures that reduce energy consumption.
30. Natural light/sunlight is needed in commercial buildings where people spend a lot of time in order to prevent vitamin D deficiency, especially in winter time, which has a number of ramifications for health. Inadequate Vitamin D can lead to a range of health problems, including osteomalacia in adults, osteoporosis, rickets in children, and is associated with increased risk for some types of cancer (such as breast, ovary, prostate and colon cancers). Recent studies have also shown that Vitamin D insufficiencies are associated with reduced lung function, increased risk of Type I Diabetes, development of disease in peripheral arteries, and reduced muscle strength and function in elderly people. Improved lighting also improves worker productivity and workplace health.

Proposed Acceptable Solution G12/AS2

31. The regulation of water temperatures is vital to ensure protection against water-borne pathogens by regulation of hot water cylinders' temperatures, and protection from scalds and burns by regulation of temperatures at the outlet point.
32. Maintaining the hot water cylinders' temperature at $\geq 60^{\circ}\text{C}$ will reduce the risk that stored water will become contaminated with bacteria. Water temperatures below 60°C are associated with the growth of pathogenic bacteria such as *Mycobacterium avium* and *Legionella pneumophila*. *Mycobacterium avium* was recently placed on the Environmental Protection Agency's Contaminant Candidate List and was tentatively linked to Crohn Disease. *Legionella pneumophila* causes Legionnaire's Disease, a severe form of pneumonia. The regulation of water at the correct temperature or the treatment of water at elevated temperatures will help prevent unnecessary growth and proliferation of such bacteria within the hot water cylinder and reticulation network.

33. ARPHS believes that it is also necessary to have the cylinder appropriately insulated and that it is important to have the system supported by a tempering valve to reduce the temperature at the tap to a safe level to avoid burns/scalds. Therefore ARPHS supports the recommended temperature proposed in section 4.7.1. that water from the hot tap should be no more than 45 °C in childhood centres, schools, rest-homes, hospitals etc. and no more than 55 °C (50°C is an optimum temperature) in all other buildings. At 60 °C a child's skin can sustain a serious burn in one second. At 54 °C, it takes 10 seconds to burn. Young skin burns more quickly and deeply than adult skin, and at lower temperatures.
34. ARPHS also supports systems for back-flow prevention.

Conclusion

35. Thank you for the opportunity to comment on the Energy Efficiency proposals. ARPHS supports recommendations to improve energy efficiency in buildings. ARPHS also recommends that buildings be required to have energy efficient ratings. Affordable housing is an important issue to consider, however it is also important not to compromise the quality of housing/buildings.
36. Additionally, ARPHS believes energy efficiency can also be achieved through design issues such as site orientation (i.e. orientation toward the sun) and that the building code and performance based solutions need to reflect the additional benefits that appropriate design can bring.

Yours sincerely

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