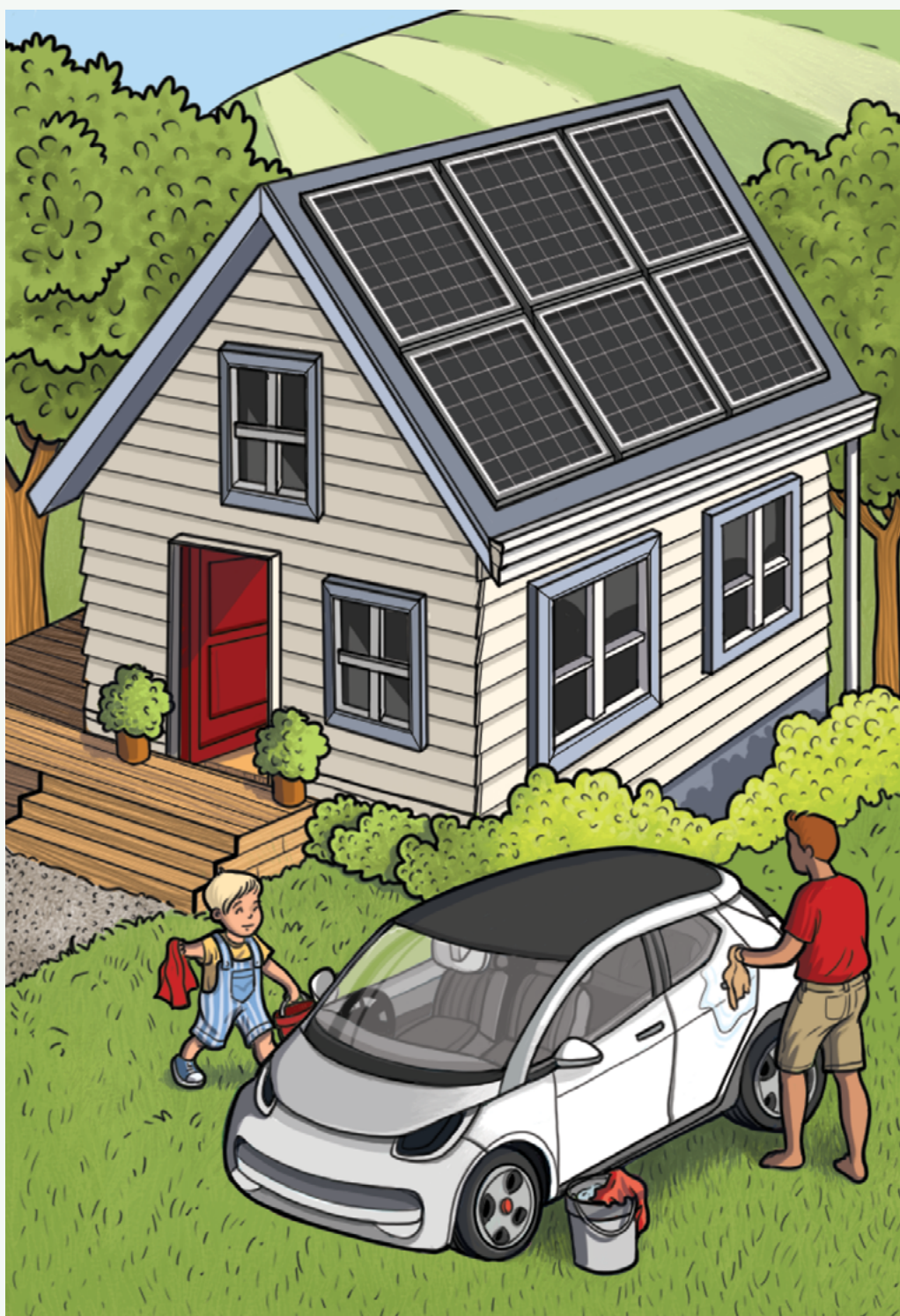


# Personal Responses to a Warming Planet

What can our household do?



# It's time to get involved, Canterbury!

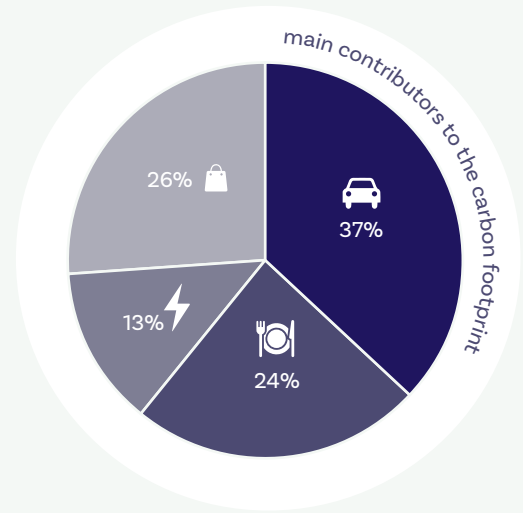
Climate change is already impacting our local ecosystems and human communities in Waitaha/Canterbury, with future projections of worse storms, floods and droughts happening more often, sea level continuing to rise, and changes in the diversity of plants and animals in our region. See [this link](#) for Environment Canterbury's summary.

It's easy to see climate change as an issue that's too big for one person to make a difference. However, many people making little changes in their everyday lives can make a big, combined contribution to a solution. It can help us both adapt to climate change impacts and reduce our damaging carbon emissions. The main contributors to the carbon footprint of New Zealand households, from release of carbon

dioxide (and other 'greenhouse gases' which warm the planet) are 37% from transport emissions, 24% from food choices, 13% from energy use in the home, and 26% as the balance of other activity including shopping. (data pre-Covid, from 2019, published by Stats NZ in 2021).

Per person household & everyday emissions average 8.5 tonnes of CO<sub>2</sub>e. Carbon dioxide emissions are measured in tonnes – but how much is that in volume added to the atmosphere? See this [short video](#) made in the UK to help visualise a tonne of Carbon Dioxide

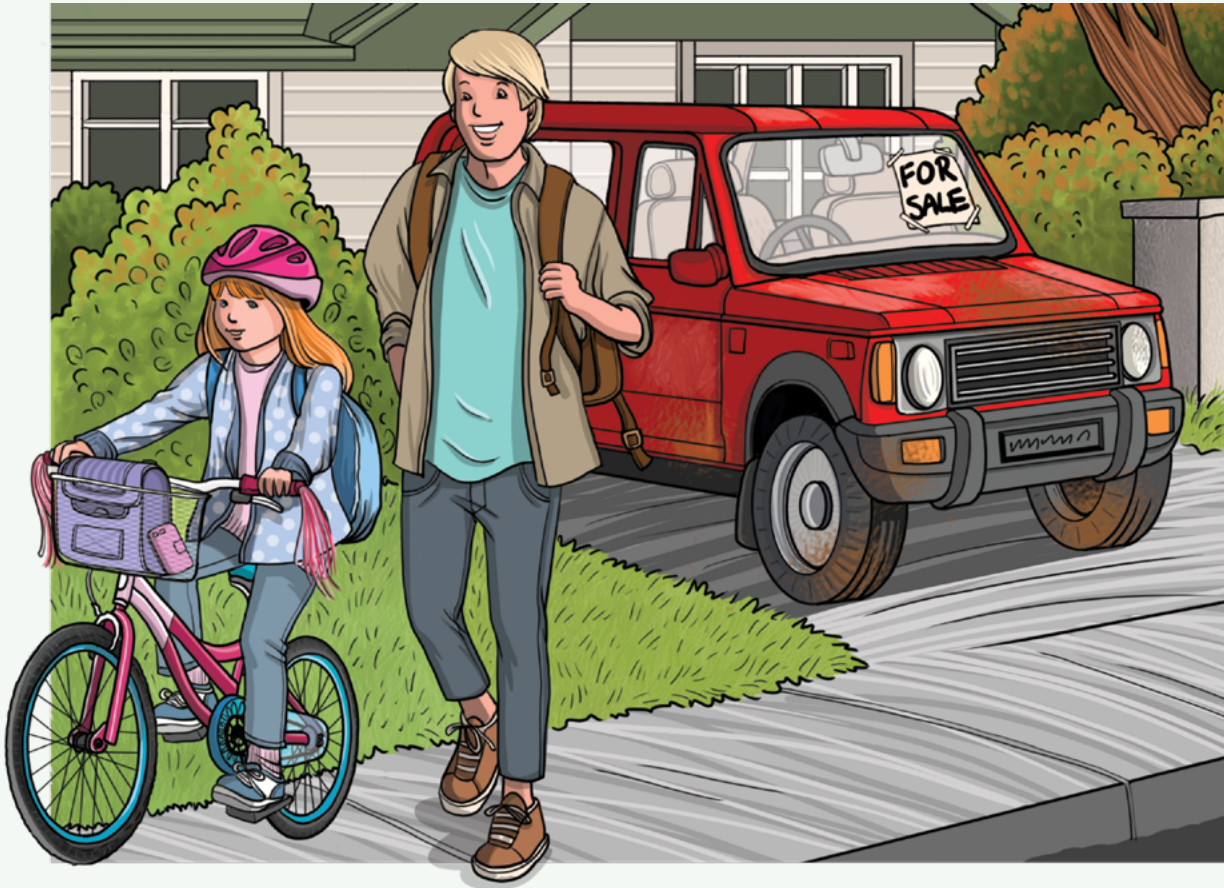
Personal and household choices do make a tangible difference to emissions, which adds up across the population.



ADAPTATION	MITIGATION
to climate warming is about finding or making resilience to more frequent, stronger weather impacts, ranging from summer heat and drought to winter rain and floods.	is about reducing emissions of carbon dioxide (and other 'greenhouse' warming gases) resulting from our activity, so that we contribute less to climate warming. When choices are available, this is by increasing the low-emission good and reducing the high emission bad!

## Jump to Section





# On the Move

What can our household do?

	TO ADAPT	And/or TO MITIGATE
<b>Travel actions</b>	<b>Ideas useful as climate adaptation</b>	<b>Ideas useful as emission mitigation</b>
<p><b>Take fewer air flights</b>, especially internationally. Holiday nearer home.</p> <p><a href="#">Read more</a></p> <p>Use video conferencing to replace 'in person' for meetings and keeping more distant family connections.</p>	<p>Flying less reduces water vapour, N<sub>2</sub>O and CO<sub>2</sub> emission into the upper atmosphere, where it is most damaging.</p> <p>Stormier weather generated by a warmer climate may make departures less reliable and turbulent, so flying may become less comfortable and convenient.</p>	<p>12% of New Zealand's carbon emissions by 2020 were associated with air travel, up from 8% in 1990. A third of the trips were to stay connected with dispersed families.</p> <p>Flights have much greater emission impact than car journeys. As an example, a return economy class flight NZ to London, with one refuelling stop in Singapore each way, emits about 2800 kgs (2.8 tonnes) CO<sub>2</sub>e per traveller.</p> <p>So, that one trip emits the same as a whole year of 70km return workday petrol car commuting in NZ.</p> <p>Frequent flyers paying extra to 'offset' the carbon emission is a controversial response - <a href="#">see research paper</a></p>

## Travel actions

	Ideas useful as climate adaptation	Ideas useful as emission mitigation.
<p><b>Plan travel to reduce the distance you drive each week</b>, especially if you are a solo driver on a long daily commute. Actions to consider in some jobs could be a day a week working at home or regular sharing of work commute and/or school children's transport. Also plan combined work and shopping visits.</p> <p><a href="#">Read more</a></p>	<p>Sharing your car reduces the number of emitting vehicles on the road, helps reduce demand for road and parking space, and tyre wear on bitumen-sealed surfaces. As daily car use falls, there could be public space released for shade-providing roadside trees and rain-permeable gardens.</p>	<p>Transport is the top contributor to a household's carbon emissions. There is an opportunity to significantly reduce your emissions by driving less. For example, avoiding car commuting just <b>one</b> day a week (by working at home or being a passenger in another's car) on a 80km daily round trip would save 700kg CO<sub>2</sub>e per year.</p>
<p><b>For shorter work commuting journeys</b> under 10km, consider alternatives. Use buses where available, cycle, scooter, walk or jog.</p> <p>Could your household reduce the number of cars you own? Town residents might go car-free, and if licensed drivers, hire a vehicle for occasional use instead of owning?</p>	<p>Compared to cars, cycles reduce road surface wear, lane and parking space demand, so we could eventually need fewer of the sealed surfaces which don't soak up rainwater and tend to contribute to local flooding in heavy rain.</p>	<p>Significant carbon emission reductions from sharing compared to driving these journeys solo. If you switched from car to cycle or e-scooter on a 10km each-way daily commute, you'd save 875kg CO<sub>2</sub>e in a year. Battery assisted E-bike, bus travel or car sharing alternatives would still create some emissions, yet you'd still save hundreds of kg annually.</p> <p><a href="#">Weblink on E-bikes</a></p>
<p><b>Reduce average speed of travel</b> in your current vehicle and/or use a hybrid engine car.</p> <p>Lower urban traffic speeds create safer road conditions for alternative travel modes such as cycling and walking.</p> <p><a href="#">Read how slower speeds save lives</a></p>	<p>Slower traffic in towns allows use of narrower roads, so space could be released for walkers, and street trees, which absorb CO<sub>2</sub> and provide summer shade.</p>	<p>Some carbon emission reduction, as fuel is used more efficiently if you accelerate gently and brake less often. In a hybrid car, braking puts energy back into the battery which is then available to use in acceleration in slower urban traffic, replacing fuel. You might save 300 kg CO<sub>2</sub>e in a year.</p>
<p><b>Switch to a fuel-efficient vehicle.</b> Such as a plug-in hybrid or a Battery Electric Vehicle, which is charged cheaply at home overnight and can use more expensive public fast chargers in towns and along main highways. <a href="#">Read more</a></p> <p>Online map from Plugshare shows a wider range of charger providers, (including Charge Net, BP fuel, Z fuel and Meridian Zero): <a href="#">Here</a></p>	<p>Roadside air quality improvements from reduced fumes, and reduction of the urban overheating ('heat island') effect in summer. <a href="#">Read more</a></p>	<p>Significant carbon emission reductions using battery electric vehicle compared to fuel burning in internal combustion engine.</p> <p>NZ electricity is not entirely renewable (especially at peak load times), so it's best to recharge a battery electric or plug-in hybrid vehicle at home after 9pm &amp; before 7am, which may qualify for discount on some power retailer accounts.</p> <p>About two tonnes more carbon is emitted in the manufacture of a battery EV than a conventionally fuelled car, however they make up for this in a few years of use through avoided burning of petrol or diesel, after which they're a positive improvement.</p>
<p><b>Get ready to get through weather disruptions, safely.</b> Assemble a quick exit kit-bag ready for escape from home in an extreme weather event, wild-fire or a long and strong earthquake. See the Get Ready web site for suggestions of what to have packed:</p> <p><a href="#">Read More</a></p>	<p>Floods are becoming more frequent as the oceans and air warm up, transferring more water as rain onto the land.</p> <p>Read about Emergency management preparation in Timaru District</p> <p><a href="#">Read More</a></p>	



# When you Eat

What can our household do?

	TO ADAPT	And/or TO MITIGATE
<b>Growing food, meal choices</b>	<b>Useful as climate adaptation</b>	<b>As emission mitigation</b>
<p><b>Reduce food waste</b> by using seasonal menus, preserving (freezing, bottling, drying) surplus crops, careful grocery purchasing, plus home composting or Council 'green bin' despatch of your scraps and garden weeds. Keep food waste out of the red bin, as from there it will be landfilled and decay without oxygen causing long term emissions of methane.</p> <p>Useful weblink on avoiding food waste and climate aspects of food: <a href="#">See here</a></p>	<p>It's cheaper to buy and process foods when plentiful 'in season'. You are better prepared for agricultural production disruptions by extreme weather here or elsewhere in NZ, by adapting cooking to enjoying seasonal variation in supply quantities and varieties. For cost comparisons of food types see this <a href="#">link</a></p>	<p>Avoid carbon emissions from the air freight of out-of-season food imports. Reduce methane emission by sending less waste food to decay without oxygen inside the landfill. <a href="#">Weblink</a></p>

**Increase vegetable protein proportion within diet.**

Adults need around 0.8g to 1g of protein per kg of body weight each day (from plant and animal sources) but often eat much more. [Read about this](#)

Favours NZ growing and processing of vegetable protein, demand for which may offer options for farm diversification under climate stress. (e.g. pea crops for protein require much less water per Hectare than intensive dairying for cheese)

Many dietary guidelines around the world recommend limiting red meat consumption for environmental reasons. To optimise both human nutrition and planetary health, the EAT-Lancet commission (based in UK) recommends adults consume no more than 98g a week of red meat per person, 203g of poultry, 196g fish and lower intakes of processed meat. [Weblink](#)

A once-a-week plant-based meal could save over 100kg of emissions in a year compared to a red meat alternative. Weblink to [read more](#):

NZ research on emission impacts of different diets: [See here](#)

**Growing fruit and vegetables at home** or a shared community garden. Favour NZ-grown foods when shopping.

Read more on community gardens [here](#) or try [this RNZ podcast](#):

Diversity of fresh food sources from garden and varied retailers increases local resilience in Canterbury at times of weather disruption in food growing areas elsewhere in NZ (e.g. Hawkes Bay Cyclone damage in 2023)

Due to the efficient transport of food in bulk using larger vehicles. The large impact (per kilogramme of food) is often on the car journey home from the shop. Growing food at home or close by removes the transport impact.



# In the Garden

What can our household do?

	TO ADAPT	And/or TO MITIGATE
<b>Garden Investment</b>	<b>Useful as climate adaptation</b>	<b>As emission mitigation</b>
<p><b>Make a 'low-flammable' garden fire-break</b> close to your house, especially if the external wall cladding or adjacent deck is wood. Seek advice from FENZ on suitable plant choices. <a href="#">See here</a></p>	<p>Reduce risk of summer wildfire spreading to your rural or suburban home. Be aware of accumulating fire 'fuel' in the summer near your house, especially in the prevailing summer dry wind direction (e.g. facing Nor'Westers in Canterbury).</p>	<p>Garden and paddock fires contribute CO<sub>2</sub> and soot to the atmosphere and in a dry summer could spark wildfires downwind. In summer, check it's alright before lighting a fire outdoors. <a href="#">Link here</a></p>

## Garden Investment

	Useful as climate adaptation	As emission mitigation
<p><b>Plant and care for trees and shrubs.</b> Consider deciduous ones (which lose their leaves in winter, that let light through) to shade north and west windows at home, and evergreen at the south.</p> <p>Smaller tree and shrub prunings can be composted or when chopped make a useful summer mulch, to keep moisture in soil.</p>	<p>Trees provide shade in summer, and wind shelter. Urban areas are losing trees as they intensify land use. Tree shade moderates urban 'heat islands.' Outdoor shade will be increasingly important as summer temperatures rise.</p> <p>Including fruiting trees and shrubs increases your resilience to weather-affected food shortages from elsewhere.</p>	<p>Trees and shrubs use and store CO<sub>2</sub> as lignin. Larger woody prunings, stored dry, become woodstove fuel for you or your neighbours' use. Use wood to substitute for oil, gas or coal, as the wood is renewable (the carbon dioxide released is from atmosphere carbon previously captured by the living trees, not a fossil supply).</p> <p><a href="#">Advice on selecting purchased firewood</a></p> <p>Purchased firewood will cost you about 11c per kWhr of heating compared to direct electric heating 25c per kWhr or efficient heat pump 9c per kWhr.</p>
<p><b>Cut grass less-frequently</b> and consider replacing older petrol lawn mower with a cordless rechargeable-battery one, which may also be quieter in use. See the <a href="#">NZ Consumer guide to mowers</a></p>	<p>Slightly taller grass (above 25mm) is more resilient in droughts and becomes less dependent on watering, but beware of creating summer wild-fire fuel of tall grass stalks, especially near your house (see above)</p>	<p>In gardening: Minimise use of petrol-powered mowers, saws, and branch shredders, which are high emission. Avoid fuel-powered leaf-blowers (collect for compost or use hand rake or broom). Battery powered alternatives are available when equipment needs replacement. Consider sharing equipment with friends or hiring it instead of buying to reduce embodied carbon.</p>
<p><b>Store rainwater from your roof</b> in a tank for use later in garden (but not for drinking water, if untreated). <a href="#">Weblink on tank installation</a></p> <p>Stored water can be used for toilet flushing, but seek a plumber's advice and be prepared to seek Building Consent for the plumbing work bringing that water inside, which may be expensive.</p>	<p>A tank moderates the storm peak water flows off your site and may need a slow (preferably automatic) after-rain-dispersal through garden drippers to part-empty the tank before the next heavy rain arrives.</p> <p>In summer it reduces your reliance on drought-restricted Council water supplies when they are under most strain.</p> <p>Stored rainwater can also be useful in summer fire-fighting.</p>	<p>Note that plastics manufactured from petrochemicals have some carbon impact 'embodied'. On-site rainwater substituted for electrically pumped and treated water supply from the District Council is only a small energy-saver. For example, much of the Timaru water supply is gravity-fed from source. Pumping of water supply from the TDC pipe network is responsible for annual 11kg CO<sub>2</sub>e per average household supplied, which is a much smaller impact than plastic tank-making!</p>

## Water action choices

<p><b>In the garden.</b> Don't use sprinklers. Prefer dripper hoses or micro-jets, limited by a timer or hand-held garden hose. Limit garden watering to direct onto soil in the cool of early morning or evening, and know it's not required on every day. Grow drought-tolerant plants in the sunniest and dry soil areas. Mulch around shrubs to reduce summer water evaporation.</p>	<p>Reduces day-time evaporation and humidity, avoids surface run off from over-watering. In a low rainfall summer, it also helps conserve Council supply or your own tank reserve. Reduced urban water demand means more water for nature in the rivers.</p>	<p>Water conservation is a small energy saver, as your water conservation reduces the volume of water to be pumped and treated.</p>
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# Running a Home

What can our household do?

	TO ADAPT	And/or TO MITIGATE
<b>Electricity investment</b>	<b>Useful as climate adaptation</b>	<b>As emission mitigation.</b>
<p><b>Consider renewable power generation (especially solar panels) with electricity storage batteries.</b></p> <p>Money savings on power bill achieved only if you can use the solar power at once during the daytime as it is generated (e.g. to charge an EV battery), or you have house battery storage of power ready to use after 5pm. To estimate solar photo-voltaic (PV) potential for your home, try <a href="#">this website</a></p>	<p>If you have PV panels plus battery installed, it can help with home or business power continuity when network sources are disconnected by storm damage. The payback time on capital investment in PV from lower power bills can be quite long.</p>	<p>Carbon savings only achieved when solar panels are substituting for generation of your electric power by coal, oil or gas burning, which tends to be used at peak demand times such as early evening or in mid-winter: so, it would mostly be the battery that reduces carbon emissions.</p> <p>NZ Climate Commission is recommending de-carbonisation of electricity generation. <a href="#">See more</a></p>

**Look for energy (and water) efficiency labels when replacing appliances.** Seek the highest star Energy Rating Labels for super-efficient appliances. As an example a front-loading washing machine uses less water and less energy than a top-loader.

Useful guide to smarter appliance shopping: [See here](#)

High efficiency appliances reduce lifetime use of power (and water). The extra purchase cost is usually re-paid over time by lower running costs.

Read more about which appliances have efficiency labels: [See here](#)

When renewing equipment at home: to reduce emissions, **avoid LPG gas, oil and coal for water and room heating, or cooking.**

Replace older fridges and freezers, use heat pumps for water and/or room heating. Use smart thermostats for control of heating input to when and where you need it. Do not run a fridge in a hot outdoor shed or garage.

Your efficiency helps avoid power cuts: Reduce cumulative stress on the power supply grid at peak demand times around breakfast and dinner. This aids power network resilience, which is particularly stressed in hottest weather or storm conditions.

Alpine Energy can advise you on safe practices in tree trimming near lines: [See here](#)

Reduced electricity demand over the appliance lifetime in use means a smaller carbon footprint and lower cost to run, even if it initially costs more to buy. See independent reviews of appliance efficiency at the Consumer NZ website (monthly subscription) or the magazines held by libraries.

Electric cooking results in 50% less carbon emissions per meal than cooking with gas.

**Energy-efficient lighting.** (LED bulbs are 85% more efficient lighting than incandescent bulbs and 60% better than compact fluorescent bulbs)

[Weblink](#)

Whatever the bulb type, turn off lights when not required. Consider automatic movement detectors for outside or corridor lights.

Reduces peak load stress, increasing resilience of the network, as above.

Even at higher purchase price, the LED lights will pay for themselves in power savings as well as generating fewer emissions.

## Indoor water action

### Useful as climate adaptation

### As emission mitigation

**Inside the house.** Mostly use the shower rather than running a daily bath. Install and use low-flush toilet cisterns when possible.

Aerated flow shower heads and taps reduce the volume of water that you use without spoiling the experience.

Find out how much water your home uses [here](#)

More ideas for water saving from Consumer NZ [here](#)

Water use efficiency reduces demand on river and groundwater flows, leaving more for nature. Subsequently, the reduced input cuts outputs of wastewater volume sent to sewage works for treatment and discharge.

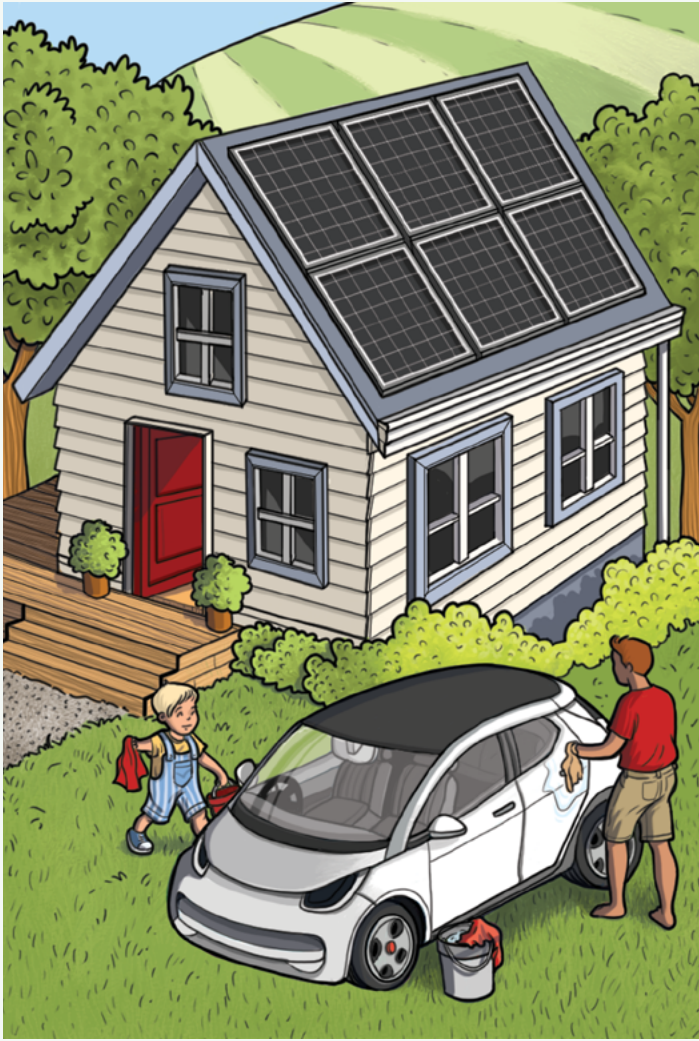
Rainstorms can disrupt water supply and treatment, particularly when sediment is washed into the water which affects disinfection processes.

Rain from your roof must not enter sewage systems as they can become overloaded. Keep pipes separate, as required in the Building Consent.

Taking fewer baths and shortening showers from 10 down to 5 minutes could save 180kg of CO<sub>2</sub>e emissions in a year from water heating, if you burn gas to heat the water. Less emissions if you use an electric heat pump for water heating.

Advice on saving water volume and heating costs/emissions: See [here](#)

Your efficiency brings a small power saving in Council water supply and treatment systems. This also helps reduce demand to expand water infrastructure, with its high embodied-carbon costs (in plastic pipes, concrete, fuel for excavators, etc).



# Buildings Better Adapted

What can our household do?

	TO ADAPT	And/or TO MITIGATE
<p><b>Seeking to rent, buy or build a new home?</b></p>	<p><b>Useful as climate adaptation</b></p>	<p><b>As emission mitigation</b></p>
<p><b>Avoid sites for new building close to coast or floodable valleys.</b></p> <p>If you are building, request the District Council LIM (Land Information Memorandum) report for the house location. This will tell you if your Council has classified a hazard risk there. (Fee applies)</p> <p>Environment Canterbury can provide a site Flood Hazard Assessment (Fee applies). <a href="#">Read more</a></p> <p>Timaru District Proposed Plan maps of hazards, including coastal erosion and inundation, are available online <a href="#">here</a></p>	<p>If you have questions to help understand flood probabilities, see this page from Environment Canterbury <a href="#">here</a></p> <p>Home location well above coast or river levels means you are less likely to need emergency rescue from flood or to pay for expensive after-flood-repairs; and more likely to remain commercially insurable in future. Insurance companies are retreating from providing building cover in high-risk locations. <a href="#">Read more</a></p> <p><b>Select a house to rent with similar care.</b> A flood-prone rental location will affect cost or availability of contents insurance, for example. <a href="#">See more</a></p>	<p>Also reduces potential waste of building materials, if wrecked in floods or landslips, which otherwise should have a long use-life.</p> <p>Materials such as steel, concrete and gypsum (such as GIB) wallboard have a high carbon footprint 'embodied' in their manufacture, so you'd prefer them to last 50+ years.</p> <p>See a summary of what this means for architecture, engineering and construction in NZ <a href="#">here</a></p> <p>Building Industry tools from BRANZ are available <a href="#">here</a></p>

**If selecting an older home to rent or to buy**, either avoid pre-2008 builds from the viewpoint of low energy efficiency or be ready to upgrade them, provided the roof, wall and floor structure allows strength and space to add extra insulation (get a builder to inspect it).

Insurers will not cover wear-and-tear or slowly developing faults such as small leaks in a building, so pro-active home maintenance is important to keep it dry and warm.

See EQC's guide [here](#)

Weather patterns are changing. Better-insulated homes with some internal thermal mass (such as an insulated concrete floor) and adequate shading above North and West double-glazed windows, tend to overheat less in summer and be warmer in winter.

Ensuring good ventilation reduces condensation and stops harmful black mould forming. [Read more](#)

How healthy is your home? Try the Home Fit online tool [here](#)

Summer droughts could bring increased fire risk. It's sensible to have some space around your home clear of dry vegetation, and to keep gutters and spaces below outdoor decks clear, to reduce risk from blown embers.

Insulation values required from 2021 Building Code are much higher than pre-2008, so investment in a more-recently-built home or making insulation improvements in an older one improves energy efficiency.

Replace oil or gas fuelled heating with electric heat pumps or modern wood-stoves to cut emissions considerably. [Weblink](#)

For fuel use efficiency, ensure firewood is kept dry and the wood-burner design is ultra-low-emission.

### **Design climate-smart new homes & home renovations** to have:

- better insulation in walls, roof and windows (including window frames),
- less glazing overall, reduced area especially at West (to cut summer overheating) and South (to reduce winter chill).
- Eaves or external shading above north-facing windows,
- adequate steam-ventilation fans (from bathroom, kitchen and laundry),
- & consider adding internal thermal mass (overnight heat store) in a sun-lit interior wall and/or tiled floor, insulated below.

[Read more](#)

Homes and workplaces need to be better able to cope with the extremes of summer heat to have more comfortable overnight temperature. Houses will need extra shade above north-facing windows and improved cross-ventilation to reduce overheating (intake low at shaded south and output high at sunny north)

Homes also require better moist-air ventilation all year to tackle the increased humidity expected with climate change, to ensure less condensation or mould on cold surfaces indoors.

Reducing the outside sealed (water-proof) areas of pathways and vehicle hard-standing which gather rainwater into pipes, cuts your potential contribution to flooding 'downstream'. Permeable surfaces such as gravel or surface blocks with drainage holes replenish water in the soil. Let water seep in, spread out and sink down, to be accessible for trees and shrubs nearby. [Read more](#) on managing stormwater.

Houses built to the 2021 Building Code, require less energy to heat comfortably, so carbon emissions and costs from heating are reduced. Don't use oil-burners, gas or coal for home heating. If using wood burners, with their 'renewable' fuel, they have to be Ultra Low Emissions Burners to protect air quality.

Older homes can be brought up to and preferably beyond that 2021 Building Code. To assess how easily your owned or rented home could be kept warm with insulation, dry and safe, use the free online Homefit check [here](#)

Individual 'healthy' new homes can be designed to a Homestar rating: [See here](#)

Commercial buildings in NZ can be built and fitted out to a low-carbon standard using Green Star rating. [See here](#)



## As a Consumer

What can our household do?

	TO ADAPT	And/or TO MITIGATE
<b>Shopping choices</b>	<b>Useful as climate adaptation</b>	<b>As emission mitigation</b>
<p><b>Re-use containers and bags, to avoid single-use packaging.</b></p> <p>Your food and grocery shopping could have a smaller footprint if you avoid buying all but glass, cardboard and code 1,2 or 5 plastics. Also carry re-usable lidded containers or mesh bags for fresh and loose items, in your strong shopping bag.</p> <p><b>Enjoy clean tap water</b> and if you need to carry it, re-use a stainless-steel screw-top bottle in preference to single use plastic.  <a href="#">See video</a></p>	<p>Insulated shopping bags help keep food fresh on hot days.</p> <p>If cycling, consider detachable waterproof panniers to carry shopping from store by bike to home.</p>	<p>Re-use of packaging such as glass with screw-lids and recycling of used aluminium cans has a lower energy demand than making new, which means a smaller carbon footprint.</p> <p>Treated drinking water arrives at home in bulk via pipes, more carbon-efficiently than heavy single-use bottles distributed both to and home from stores by vehicle.</p>

**Beyond food choices** above, you can influence makers and retailers of any products that have a high carbon impact. Favour those that help and avoid those that do not. Seek the best quality you can afford and equipment durability. Avoid the plastic packaging types not easily recyclable in NZ (only codes 1,2,5 can be recycled here).

Consider shopping at op shops or re-use stores to give extended life to domestic items. South Canterbury has several to choose from. [Map here](#)

Some food makers also commit to environmental restoration, care of waterways, tree planting and lowering use of fuels and nitrogen fertilisers. Reward these positive contributions with your custom.

Beware competition for high quality productive land between food crops and the feedstock for bioplastics and biofuels (e.g. maize, soy, starch from potatoes, softwood timber).

Reduces the embodied carbon in purchases such as plastics. (Especially an issue if the plastics are single-use 'disposables' and of a type non-recyclable in NZ.)

Consumer choices may result in less import of short-life non-durable items, typically made overseas at a high carbon cost, coal or oil-fuelled.

The longer you can use a durable manufactured item the lower the carbon impact per year of that original purchase. Repairing and recycling reduces emissions. [See here](#)

**Clothing fashion choices have a carbon footprint.** Natural fibres such as wool, bamboo and cotton avoid petrochemical plastic fibre sources and do not create microplastic waste. They may however have required insecticides and much pumped water in their growing and processing. [Read more](#)

Workwear, including safety gear, is often short-life too, but can be recycled. A Timaru-based firm has taken on the challenge. [Read more](#)

As an example - Cotton is very thirsty to produce and is often grown in dry countries. A cotton T-shirt requires approx. 2,700 litres of water to grow and process it to a garment. Our demand may exacerbate drought in those countries. So, wear and repair cotton items, to prolong their use: don't treat as throw-away!

[Read more](#) on environment-friendly fibres.

"Buy less, choose well and make it last"  
- quote from fashion designer Vivienne Westwood

Cellulose derived fibres (e.g. bamboo, hemp) are lower carbon emitters overall than plastic fibres (such as polyester, polyurethane and nylon).

Wool as a by-product of sheep meat, and leather production from cattle skins, has associated methane emissions and create a global pressure to de-forest areas for yet more paddocks and ranches. However, wool is safely biodegradable, unlike most synthetic new or recycled fibres derived from gas, oil or some packaging plastics, which break down to smaller plastic particles that persist in soil or water and are eaten by animals.

[Weblinks](#)

# Handy Links

A free NZ calculator for households can help you estimate your carbon emissions in tonnes per year.

[Household questionnaire](#)



Another free online calculator estimates carbon emissions from a small business.

[Business calculator](#)



Talking about climate change can be hard, so listening to others is an important skill and starting point to **conversations about the future**. This short video explains why:

[See short video](#)



The most important thing you can do to fight climate change: talk about it, and potential solutions” TED Talk by Katharine Hayhoe (Canadian climate researcher, now working in USA)

[See 17 minute video](#)



What does a significantly lower-carbon lifestyle feel like? The BBC have a 2024 podcast, interviewing people from several countries who have made strong choices.

[Listen to podcast](#)



If the world responds too slowly and we reach two degrees C of warming?

[Read article online](#)

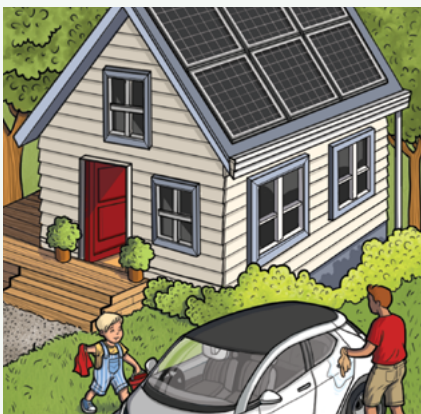


## Production

Text by Rhys Taylor (TDC), Andrew Oliver (WDC), assisted by Stephen Doran (TDC);

Original Illustrations by Polly Rabbits;

Layout design Bailey Barlow - Corporate Print



Published for South Canterbury residents in 2024 by [Timaru DC](#) and [Waimate DC](#)