

Wellington, New Zealand NetZero by 2050

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Purpose

Act

As a sustainable city committee for Wellington, New Zealand

Research

City policy, politics, & environmental issues

Construct

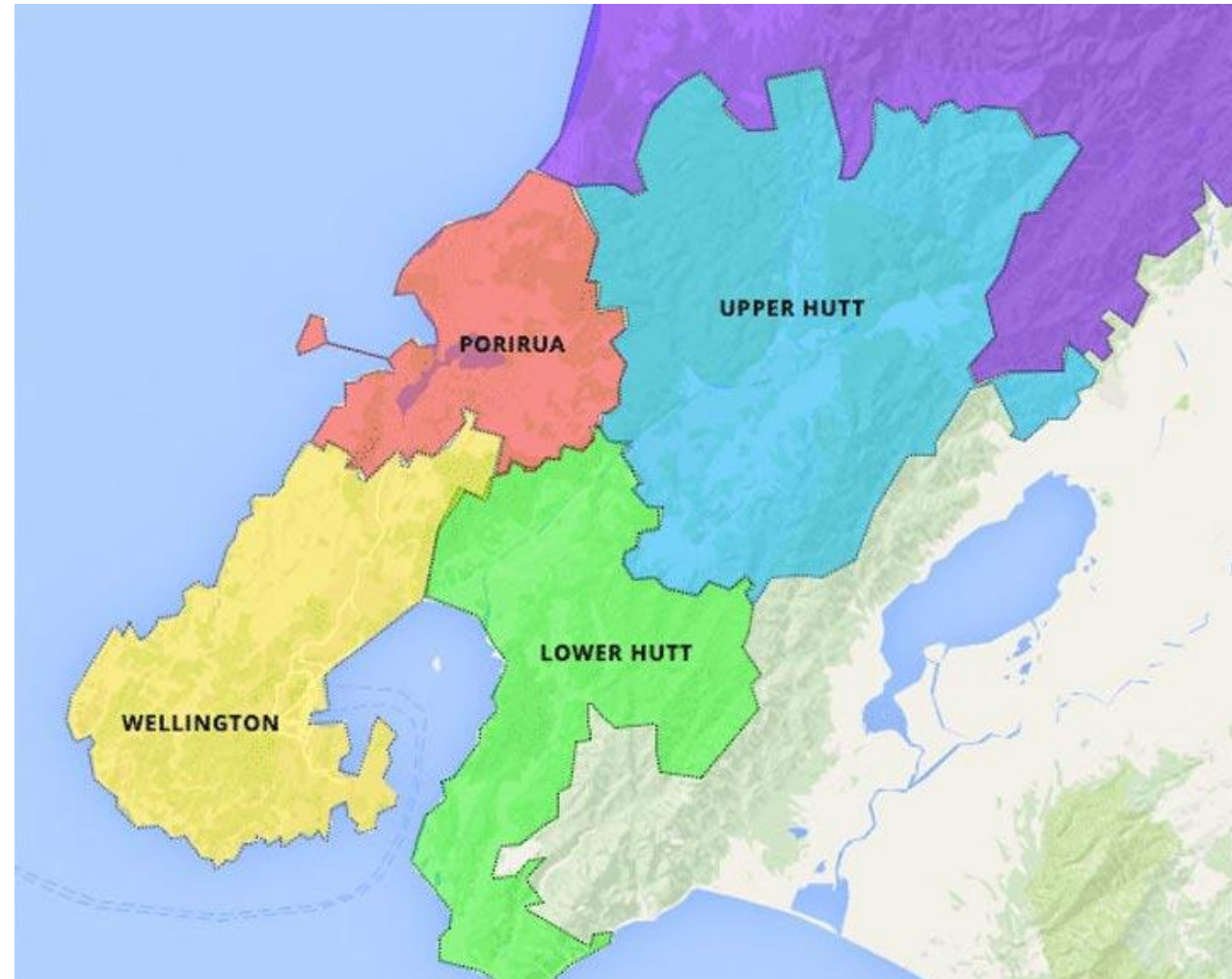
A NetZero plan using Freiburg Germany as model

- NetZero- a balance between emissions produced & emissions removed

City Profile



- Capital city of New Zealand
- Comprised of 4 cities:
 - Wellington City
 - Porirua
 - Lower Hutt
 - Upper Hutt
- Has a population of approximately 419,087 people
- Home to more than 55,500 indigenous Maori people





Economy

- Wellington has a serviced based economy
- Has a per capita GDP of \$ 85,105 as of September 2020
- The port of Wellington handles tons of cargo annually
- Tourism is an essential part of the Wellington economy



Primary



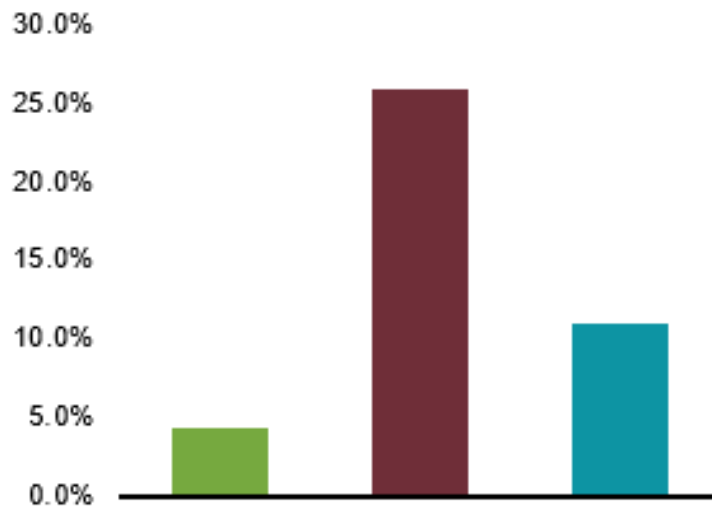
Goods-producing



Services

Source: Stats NZ

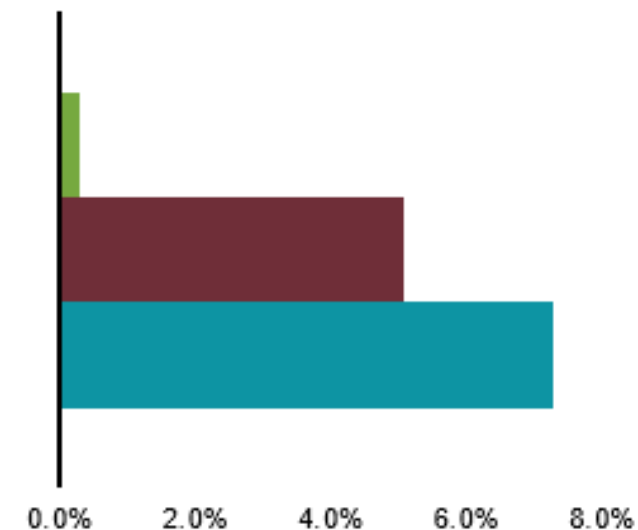
Industry growth



Share of the economy



Contribution to GDP growth





Politics & Policies

- Wellington City Council
- Carbon Management Policy
- Water Conservation and Efficiency Plan
- Outer Green Belt Plan





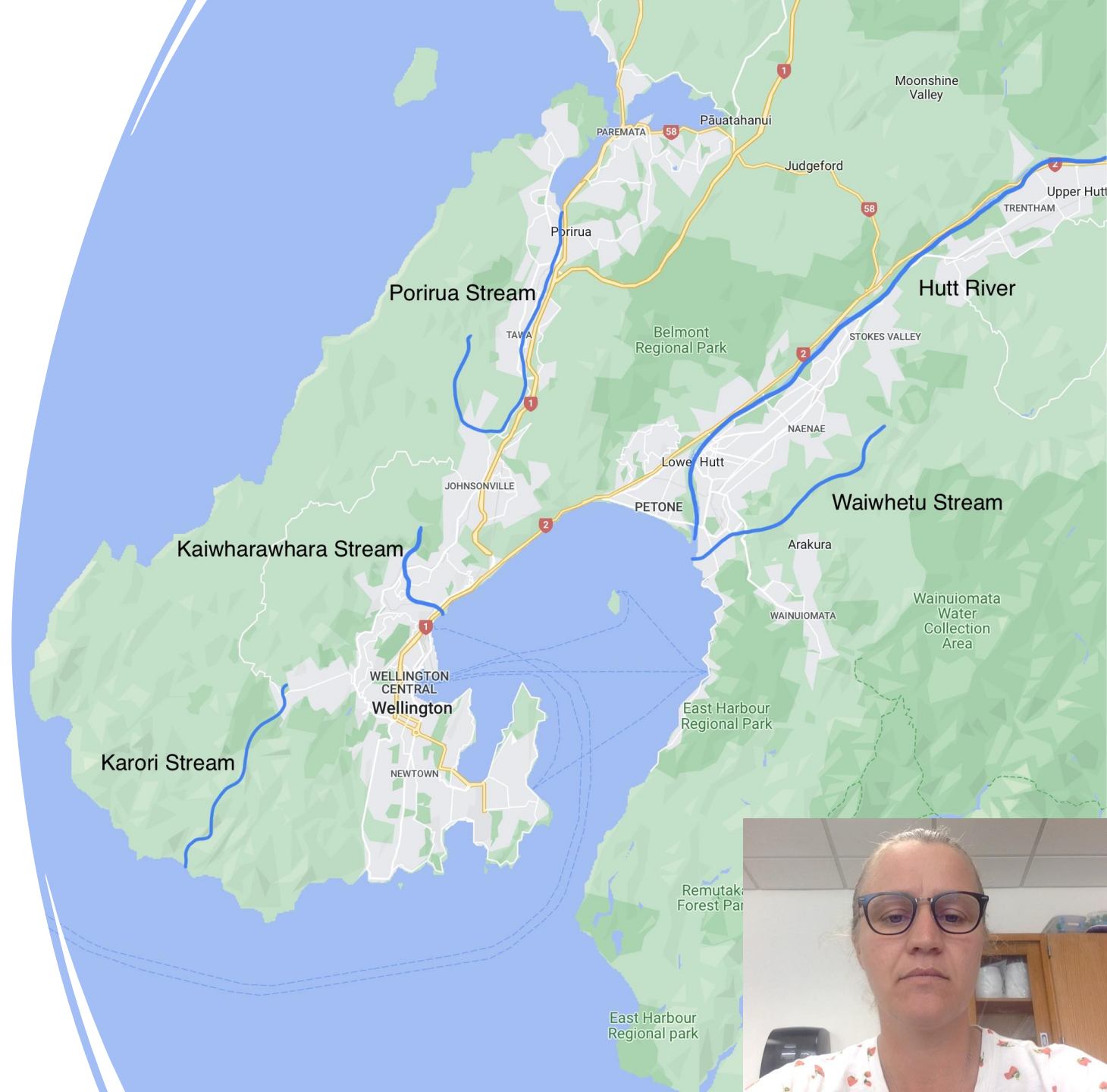
Environmental Issues



- Polluted rivers and streams
- Polluted beaches and coastal areas
- Invasive species & Biodiversity loss
- Sea level rise and flooding
- High per person green house gas emissions

Polluted Rivers and Streams

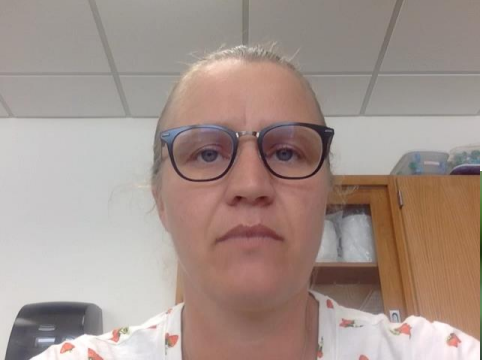
- Sediment samples showed:
 - Moderate levels of Iron, Chromium, and Nickel
 - Moderate to strong levels of pollution for Copper, Cadmium, and Mercury
 - Extreme levels of pollution for Zinc and Lead pollution
- “Traditional” pollution
 - Litter
 - Sewage contamination
 - Poor water treatment



Polluted Beaches and Coastal Areas

- “Traditional” pollution
 - Metal
 - Trash
 - Sewage
- Wellington Harbor Sediment samples
 - Higher metal contamination at run offs vs to central basin
- Microplastic contamination of Wellington Harbor and Southern Oceanic Region
 - 9 years of Plankton Recorder Tows
 - 3-monthly surveys of surface waters, beach sediment, & *M. galloprovincialis* mussel tissues





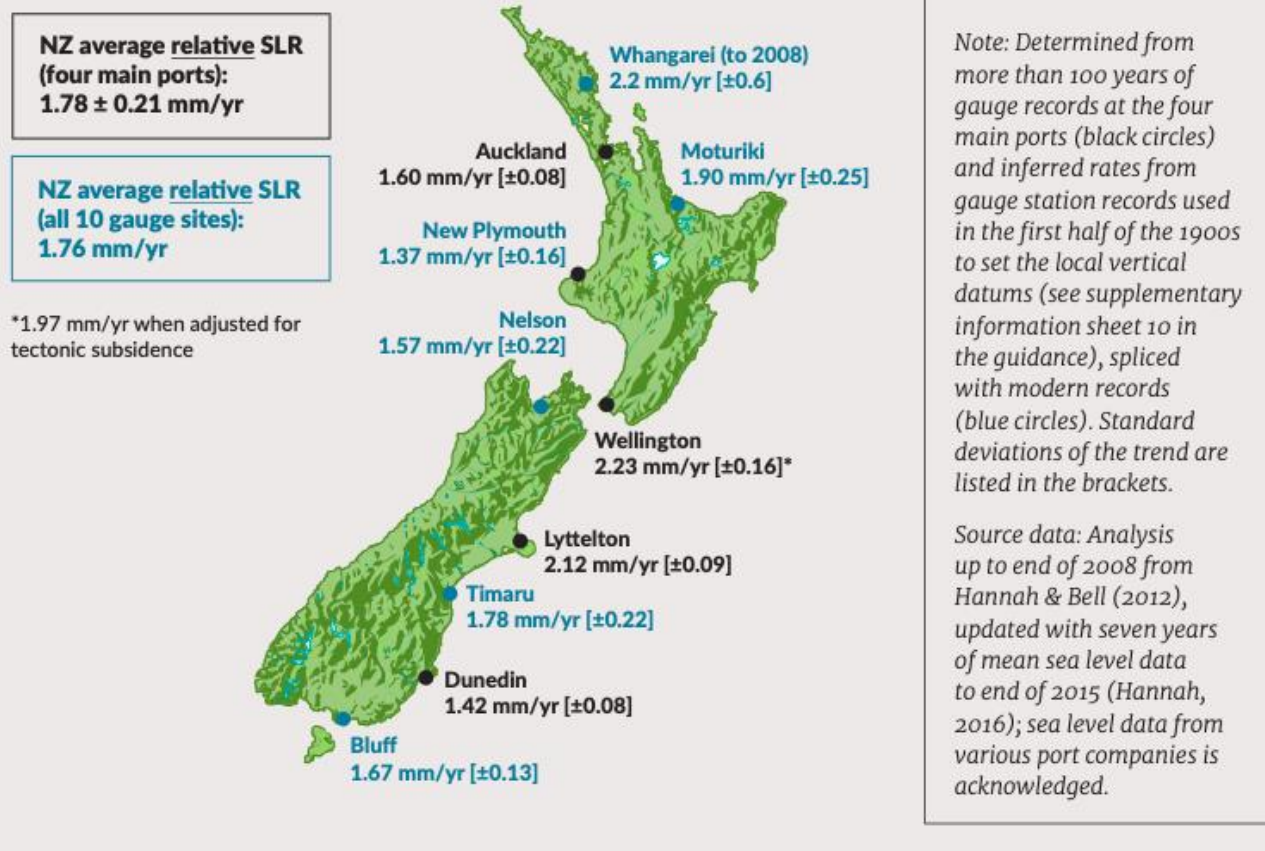
Biodiversity Loss & Invasive Species

- Historical unsustainable harvesting of native species
- Introduction & uncontrolled reproduction of invasive plants and animals
- 1/3 of native birds are extinct
- 3/4 of the remaining species are threatened
- Substantial decrease in lizards in the last five years
- Only 5% of original forest left
- Wetlands and dune systems almost completely gone

Sea Level Rise & Flooding



Figure 2: Relative sea-level rise (SLR) rates in New Zealand, up to and including 2015 (excluding Whangarei), determined from longer-term sea level gauge records at the four main ports

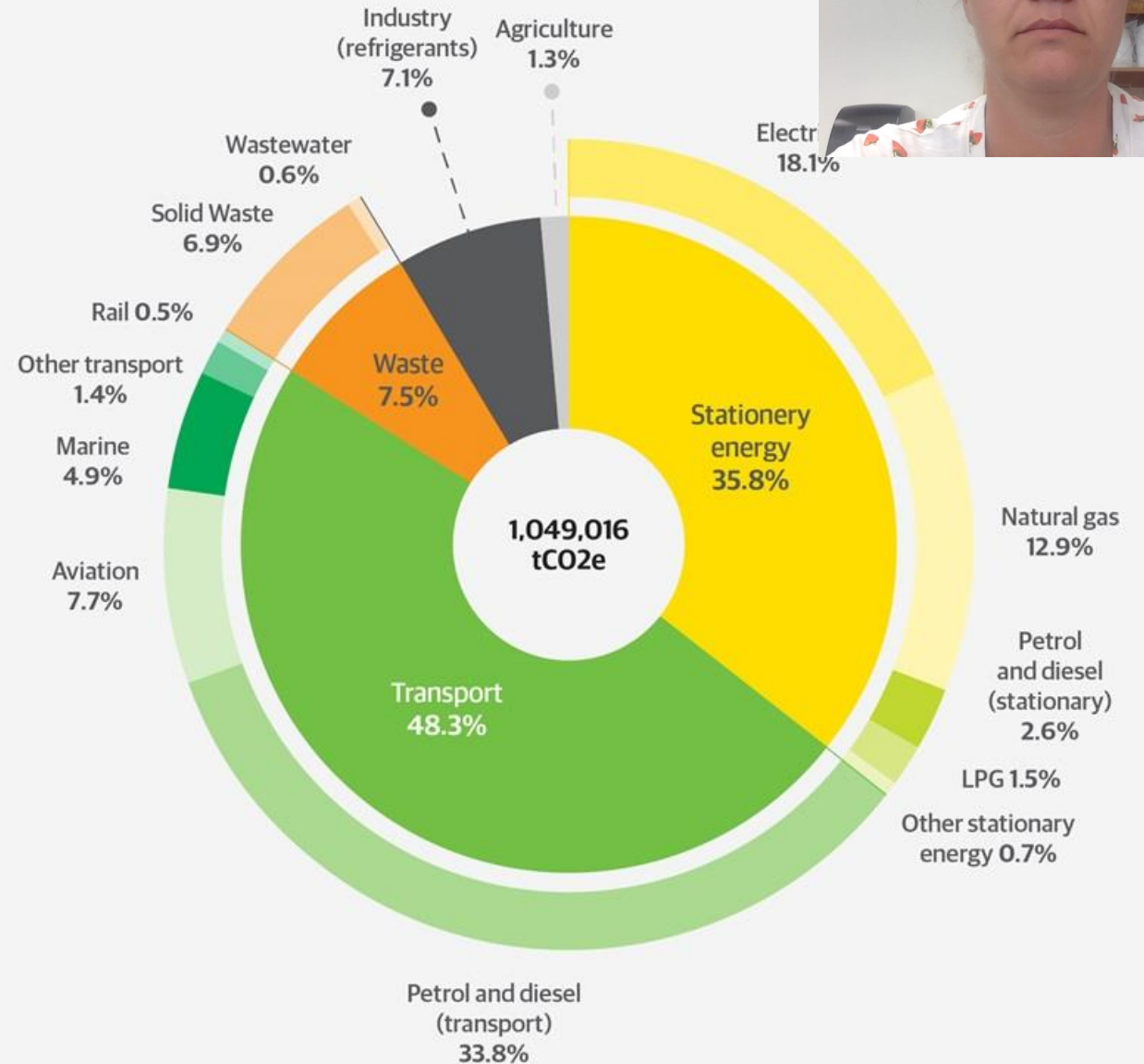


- Average sea level rise for the country- 1.76 mm per year
- Sea level rise for Wellington- 2.23 mm per year
- High tide submerging water infrastructure
- Storm surges going further inland
- Eroding beaches and coastal roads
- Hydraulic locking of water pipes

High Green house Gas Emissions per person

- 1,049,016 tons of CO2 emissions
- 84.1% stationary energy and transportation
- 31.0% Electricity and natural gas emissions
- 33.8% Petrol and diesel transport emissions

Wellington City emissions breakdown
2019/20



Project Goals & Outcomes

Overall goal: Evaluate Wellington & make NetZero by 2050

👎 Reduce:

- Greenhouse gas emissions
- Individual pollution
- Individual Consumption
- Plastic production/Microplastic pollution
- Invasive species

👍 Improve:

- Infrastructure
- Sustainable access to healthy foods
- Biodiversity & Natural habitats

Solutions:

- Target political communication and consensus
- Citizen engagement through marketing campaigns & outreach programs
- Green transport incentive programs
- Incentivize biodegradable product use/production
- Education
- Maori involvement
- Improved government policies & programs



Conclusion

- Evaluate Wellington, New Zealand current green standard
- Use Freiberg, Germany as model to create NetZero by 2050 plan
- New Zealand is an eco-minded country
- Strong indigenous population and culture
- Environmental issues clearly identified
- Achievable goals & solutions



Acknowledgements



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&

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References

- Craig, J., Anderson, S., Clout, M., Creese, B., Mitchell, N., Ogden, J., ... & Ussher, G. (2000). Conservation issues in New Zealand. *Annual Review of ecology and Systematics*, 31(1), 61-78.
- Degree Heatpumps, Electrical, and Refrigeration (2017) *Wellington Region Map*. [Photograph] <https://www.degree4comfort.co.nz/heat-pumps/>
- Jordan, C. (n.d.) *Laysan Albatrosses Plastic Problem* [Photograph] Smithsonian. <https://ocean.si.edu/ocean-life/seabirds/laysan-albatrosses-plastic-problem>
- Mackay, S. (n.d.) *No Title*. [Photograph] NIWA Taihoro Nukurangi. <https://niwa.co.nz/education-and-training/schools/students/climate-change/impacts-for-NZ>
- MacManus, J. (2020, May 25) 'We can't delay this': Fresh water cleanup under pressure from Covid-19 economy. *Stuff Limited*. Retrieved from <https://www.stuff.co.nz/environment/121618438/we-cant-delay-this-fresh-water-cleanup-under-pressure-from-covid19-economy>
- New Zealand Government (December 16, 2020) *Gross Domestic Product: September 2020 Quarter*. Retrieved from <https://www.stats.govt.nz/information-releases/gross-domestic-product-september-2020-quarter>
- New Zealand Government. (n.d.). *How we track our city emissions*. Absolutely Positively Wellington City Council. Retrieved from <https://wellington.govt.nz/climate-change-sustainability-environment/climate-change/what-were-doing-about-climate-change/tracking-city-emissions>

References

- New Zealand Government. (n.d.). *Pests and threats*. Absolutely Positively Wellington City Council. Retrieved from <https://wellington.govt.nz/climate-change-sustainability-environment/environment/discover-nature-in-wellington/pests-and-threats>
- New Zealand Government (December 2017) *Preparing for coastal change*. Ministry for the Environment Manatū Mō Te Taiao. Retrieved from <https://environment.govt.nz/assets/Publications/Files/coastal-hazards-summary.pdf>
- Orr, B. (2000). New Zealand stakeholders' views of company environmental reporting.
- Shannon, C. (2020). *Spatial & Temporal Patterns of Microplastic Pollution in Wellington, New Zealand, and the Southern Ocean* (Doctoral dissertation, Open Access Victoria University of Wellington | Te Herenga Waka).
- Stoffers, P., Glasby, G. P., Wilson, C. J., Davis, K. R., & Walter, P. (1986). Heavy metal pollution in Wellington Harbour. *New Zealand journal of marine and freshwater research*, 20(3), 495-512.
- Watkinson, C. (July 26, 2016) *The Least Weasel*. [Photograph] Live Science. <https://www.livescience.com/55542-predator-free-new-zealand.html>
- World Population Review (2022) *Wellington Population 2022*. Retrieved from <https://worldpopulationreview.com/world-cities/wellington-population>