Wellington, New Zealand NetZero by 2050

Taryn Lagor
Lynn University





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

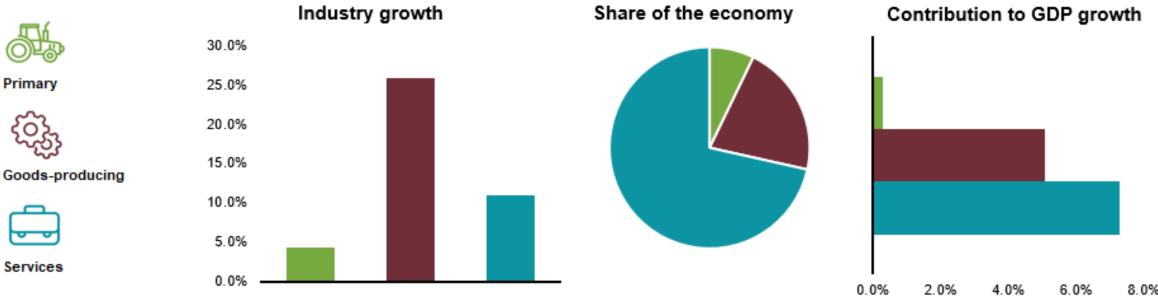
- Capital city of New Zealand
- Comprised of 4 cities:
 - Wellington City
 - Porirua
 - Lower Hutt
 - Upper Hutt
- Has a population of approximately 419,087 people
- Home to more than 55,500 indigenous Maori people





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



Source: Stats NZ

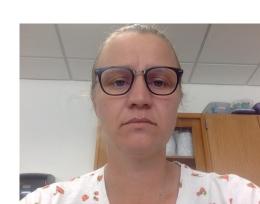
Services

Primary



Politics & Policies

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





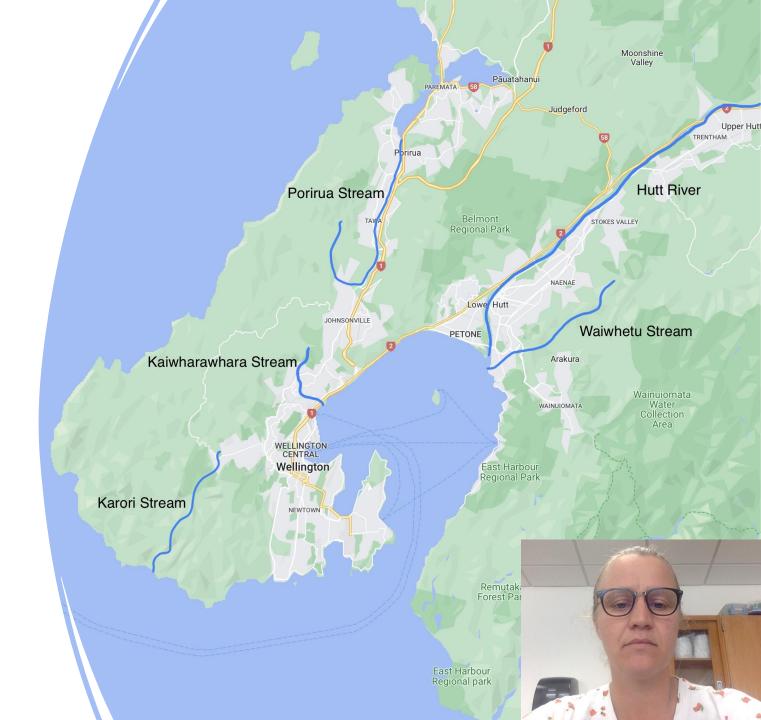
Environmental Issues



- 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

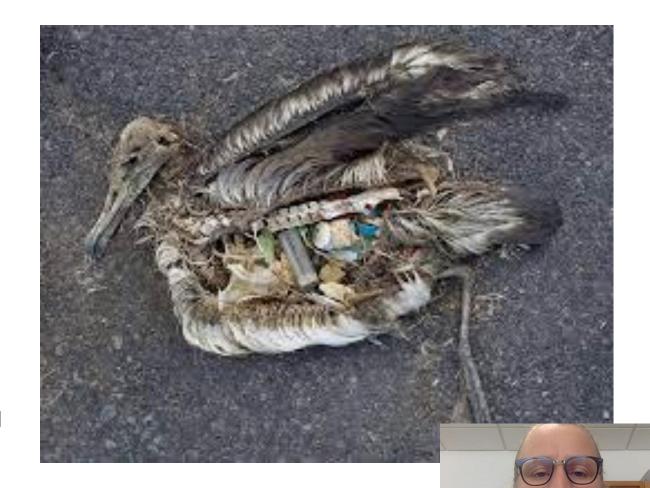
Polluted Rivers and Streams

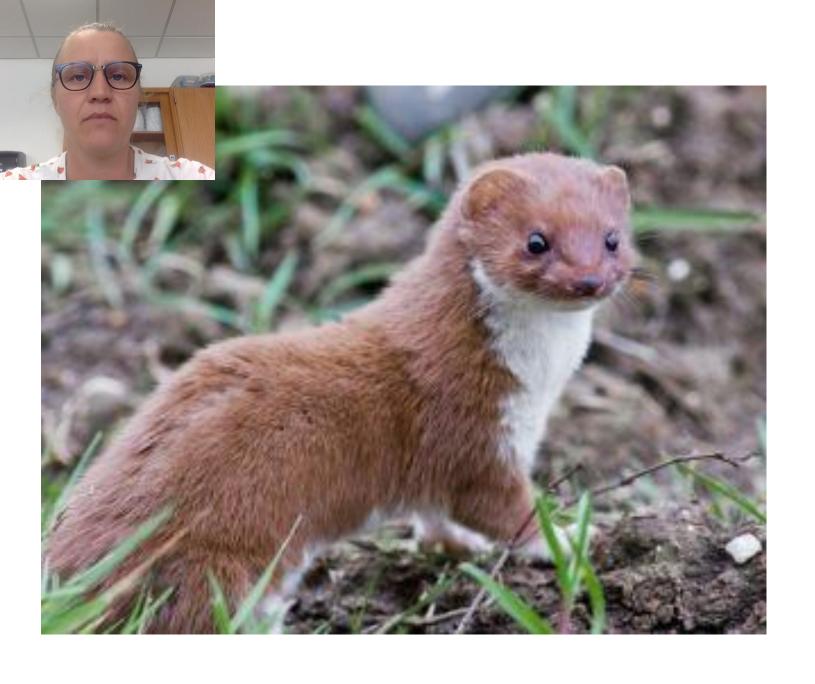
- Sediment samples showed:
 - Moderate levels of Iron, Chromium, and Nickle
 - Moderate to strong levels of pollution for Copper, Cadmium, and Mercury
 - Extreme levels of pollution for Zinc and Lead pollution
- "Traditional" pollution
 - Litter
 - Sewage contamination
 - Poor water treatment



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. gallloprovincialis mussel tissues

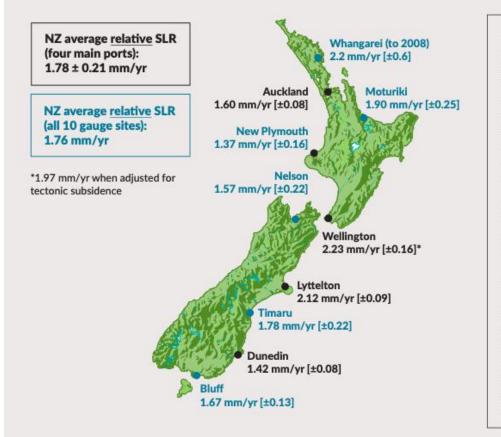




Biodiversity Loss & Invasive Species

- 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

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



Note: Determined from more than 100 years of gauge records at the four main ports (black circles) and inferred rates from gauge station records used in the first half of the 1900s to set the local vertical datums (see supplementary information sheet 10 in the guidance), spliced with modern records (blue circles). Standard deviations of the trend are listed in the brackets.

Source data: Analysis up to end of 2008 from Hannah & Bell (2012), updated with seven years of mean sea level data to end of 2015 (Hannah, 2016); sea level data from various port companies is acknowledged.

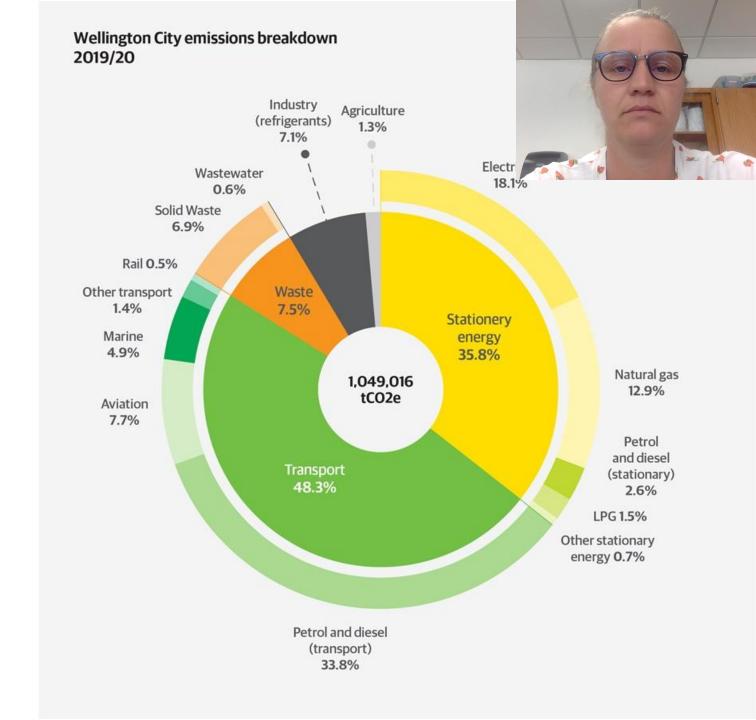
Sea Level Rise & Flooding



- 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



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

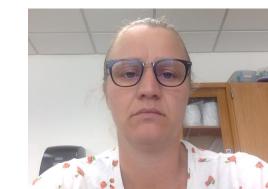
Improve:

- 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







Thank you!

Original research project team members Oloruntobi Adeniji, Dulcie Fynn, Zaccaria Orio, and Ally Krichilsky

&

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