New Zealand and Iceland: Energy Similarities and Differences

Jenna Hakun
EGEE 497
4-20-17
Overview

Geography

Population Density and Energy Loads

Energy Generation Types

Policies and Plans for Climate Change
Overview

Geography

Population Density and Energy Loads

Energy Generation Types

Policies and Plans for Climate Change
New Zealand Geography

- Located between two tectonic plates
  - Australian west, Pacific east
  - Key for volcanic activity in the North (Taupo)
  - Key for hydropower in the South (Alpine Fault)
- Climate
  - Temperate Climate
  - Much of the islands are located near the coast
  - Warmer temperatures and moderate rainfall

Credit: oregonstate.edu
Iceland Geography

Similar to New Zealand with tectonic plates

- Located on fault
  - North American west and Eurasian east
  - Utilization of volcanic activity and mountains
  - Prime for geothermal and hydro

- Climate
  - Subarctic - Just south of the Arctic Circle
  - Temperate climate - North Atlantic Current
  - Tundra Inland

Credit: USGS
Overview

Geography

Population Density and Energy Loads

Energy Generation Types

Policies and Plans for Climate Change
Population Density in NZ

4.47 Million People in New Zealand

75% of population is in the North Island
- Auckland area most populated

25% of population is in the South Island
- Christchurch most populated
Energy Loads NZ

Heavy Users

- Auckland
- Wellington
- Christchurch
- Tiwai Point Aluminium Smelter

Large Producers

- Hydropower Stations in the South Island
- Geothermal in Taupo
- Huntly Power Station
Population Density of Iceland

60% of the population lives in the capital city of Reykjavik

333,979 population

Northern, Eastern, and Western Fishing Towns house remaining 30%
Energy Loads - Iceland

Icelanders are the top energy consumers per capita in the world due to their overabundance of energy (718 GJ)

Aluminum smelting industry uses up to 75% of their electricity consumption (way of exporting their energy)

World’s largest energy consuming countries per capita

1. Iceland 18,774 koe
2. Qatar 17,418 koe
3. Trinidad 15,691 koe
4. Kuwait 10,408 koe
5. Brunei 9,427 koe
6. Luxembourg 7,684 koe
7. UAE 7,407 koe
8. Canada 7,333 koe
9. USA 6,793 koe
10. Finland 6,183 koe

Overview

Geography

Population Density and Energy Loads

**Renewable Energy Generation**

Policies and Plans for Climate Change
Renewable Energy Distribution NZ

40% primary energy supply from renewables

80% of electricity from renewables
Renewable Energy Distribution in Iceland

Primary Energy Usage:
82.5% Renewable Energy

Coal and Oil Use
100% Electricity from renewables

73% Hydropower
27% Geothermal
Overview

Geography

Population Density and Energy Loads

Renewable Energy Generation

Policies and Plans for Climate Change
New Zealand Climate Change Initiatives

1. Push back on fossil fuel subsidies
2. Funding research on reducing agriculture emissions
3. Pacific Island financial support
4. Emissions Trading
5. Improvements to Infrastructure
6. EV Program
7. Forestry Program

Reduce emissions by 30% by 2030 from 2005 levels.
Reductions in GHG

Figure 3: New Zealand’s gross greenhouse gas emissions by sector from 1990 to 2014
Iceland Climate Change Initiative

1. 10% Electric Vehicle Share by 2020
2. Improving national infrastructure for electric vehicles
3. Reducing fishery emissions
4. Climate-friendly agriculture
5. Forestry, wetland, and soil reclamation
6. Campaign against food wastes
Reductions in GHG
References


http://www.planetforward.org/idea/why-do-icelanders-consume-so-much-energy-brynj%C3%B3lfur-v-%C3%B3lafsson

http://www.nea.is/the-national-energy-authority/energy-statistics/primary-energy/

https://www.mfa.is/media/MFA_pdf/Soknaraaetlun---Vidauki-ENG.pdf
Questions?