**General comment:**

* We want you to shine and to see your ideas as well as what you achieved
* If you have a cool idea, or wanted to try something and ran out of time - please share it with your results. You have a hard deadline and very tough challenges. Ideas, failed and successful are so welcome.

To respond to this question:

* Submit your code
* Complete the following table
* Provide some really cool visualisations of your results
* In no more than 500 words (or 3 amazing slides), explain to us why you think it is the best solution

The solution with the highest amount of energy from renewables (wind, solar, hydro, battery) with the most reasonable electricity cost will win.

| **Total wind power, MW** | 130% |
| --- | --- |
| **Total solar power, MW** | 9,000 |
| **Total battery size, MW/MWh** | 0 |
| **% of electricity from hydro, wind and solar over the year** | 99.16% |
| **Total electricity cost in $ and $ per MWh of demand over the whole year** | 102.01275923681631 per MWh |
| **Any other notes** | Simulated CO2: 26.845326839042205 |

We have created a digital twin model of the NZ powergrid using the formulas from the excel spreadsheet and the flow diagram from the paper provided. This model was built in python and allowed us to test various scale values in order to find the most optimal values for reducing cost, fossil fuel use and CO2 emissions. We believe this solution to be the best as it provides the best balance between the factors listed above. We increased the solar to 9 GW and the wind by 30% resulting in 99.16% of the energy we generated being produced by renewable energy.

We wanted to use linear programming to balance the factors more efficiently however due to time constraints this was not possible.