Certified Energy
New Zealand Energy Certificate System

# Note on variance between sources of national generation and emissions data.

**Introduction**

Certified Energy, as operator of the New Zealand Energy Certificate System (NZECS), produces a Residual Supply Mix (RSM) for use in accordance with international greenhouse gas reporting standards. The RSM provides a market-based emissions factor for parties consuming grid-supplied electricity, adjusted for explicit attribute purchase to avoid double-counting.

The RSM is the recommended emissions factor to use for the purposes of greenhouse gas reporting – derived by adjusting total electricity generation volumes for explicitly tracked and allocated energy attributes. Certified Energy acknowledges that various other parties provide information on total generation. This note addresses the variance between the data used in the calculation of the RSM, and that produced by other parties.

While this note focusses on the variance between different sources of generation data, it is also worth mentioning that this variance will drive different views on grid emissions. Assumptions about emissions rates of differing production technologies will also affect published emissions factors. Variance in emissions is documented in this note, but detailed investigations into this variance have not been performed as yet.

**Sources of generation information**

The Ministry for Business, Innovation and Employment (MBIE) has traditionally collated and published energy systems data, including generation volumes and emissions. In addition, Transpower has recently begun to publish emissions information via their information portal – EM6. Further, as part of their suite of information for corporate use, the Ministry for Environment (MfE) produces an emissions factor for application to grid-supplied electricity.

**Data comparison – MBIE and Transpower**

In the preparation of the RSM, Certified Energy first sources a summary of all electricity generated in New Zealand, by type, with associated emissions factors. This underlying dataset can be compared to other sources.

Total reconciliation is not possible, as methodologies and included data are not generally available for MBIE and Transpower calculations. However, it is expected

that the main drivers of variance are due to inclusion/exclusion of certain generation units, determined by access as described below.

Certified Energy gains access to current and historical generation data for all embedded generators that register with the NZECS. Transpower may not have access to this information. Further, MBIE has access to data for an even broader set of embedded generators, that neither Transpower nor Certified Energy can access. This difference in access can be seen in the differences in total generation shown in the table below.

| Comparison of key factors for the 2021/22 Production Year time period | | | |
|---|---|---|---|
| | NZECS | Transpower | MBIE |
| Total generation (GWh) | 41,882 | 41,613 | 43,072 |
| - Hydro | 24,012 | 23,895 | 24,265 |
| - Wind | 2,696 | 2,695 | 2,725 |
| - Coal | 1,748 | 1,796 | 2,437 |
| - Gas | 4,050 | 4,070 | 4,878 |
| - Geothermal | 8,107 | 7,893 | 7,759 |
| - Co-Gen | 1,251 | 1,251 | 503 |
| - Diesel | 16 | 16 | 21 |
| - Solar | 2 | 0 | 208 |
| Total emissions | 4,558 | 4,772 | 4,812 |
| Emissions factor | 108.83 | 114.68 | 111.71 |

More detailed investigation of the variances between data is required, however the following summary points can be made:

- It is likely that the differences in thermal generation are due to the availability and classification of embedded and behind-the-meter generation.
- Further, within MBIE figures, higher proportions of thermal generation are allocated to the coal and gas categories, which are categories with high emissions.
- Renewable generation data is generally well aligned. The volume for wind is similar between Certified Energy and Transpower, with MBIE slightly higher.
- Hydro generation is well aligned across all three sources, with Transpower lowest - presumably due to inclusion of embedded hydro generation in NZECS data.
- Geothermal is slightly higher for Certified Energy. This variance could be attributable to the inclusion of Ngawha in NZECS data, however it would be expected that MBIE would have access to this data.

- While Certified Energy and Transpower have largely similar generation data across the board, total emissions differ. Specific reasons for this variance have not been identified, however are logically driven by differing information or assumptions around operations and emissions of thermal plant.
- Acceptable margins for variance or error have not been established, and so the significance of these differences is unclear.

**Ministry for the Environment data - emissions only.**

The Ministry for the Environment publishes emissions factors for optional use. The emissions factor for purchased electricity published in May 2022 is 107kg/MWh, and is derived from generation that took place in the 2020 calendar year. Given the lag on this data being available, we have not included this in the comparisons outlined in this note.

**Conclusion**

While we recognise that there is some variance, it appears that differences are largely attributable to differences in access and inclusion of embedded generation, and differing information or assumptions around emissions of thermal generators.

Further investigation is required to reconcile these specific differences, in order to provide energy users with a uniform dataset on generation and emissions. Certified Energy will endeavour to work with other providers of data to understand and eliminate inconsistencies, in preparation for the subsequent publication of the RSM at the end of the 2022/23 Production Year.