Auckland Network

Supplementary Information – Substation Load Characteristics

EECA

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Document History & Status

Revision	Date	Author	Reviewed by	Approved by	Status
A	31/01/2025	C Bergervoet	K Morison	K Morison	Draft

Revision	Details
A	Draft

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1. Executive Summary

The following figures illustrate the characteristics of the major electrical substations (both GXPs and Zone Substations) in the Auckland region. This document supplements the main report titled "*Auckland – Spare Capacity and Load Characteristics*".

For each GXP, the January 2023 through December 2023 apparent (MVA) and reactive loadings (MVAr) are presented. For each Zone Substation, the apparent power (MVA) or real power (MW) loadings only are presented. The data is presented in graphs of:

- The load profile for the entire year.
- The maximum and minimum loads for each of the 365 days.
- Load profiles for two weeks in summer and two weeks in winter.
- Typical daily summer and winter load profiles.
- A load duration curve for the entire year.

2. Transmission/GXP Substations

The characteristics of the transmission substation **apparent and reactive power loadings** are shown in the following:

Albany
33 kV MVA

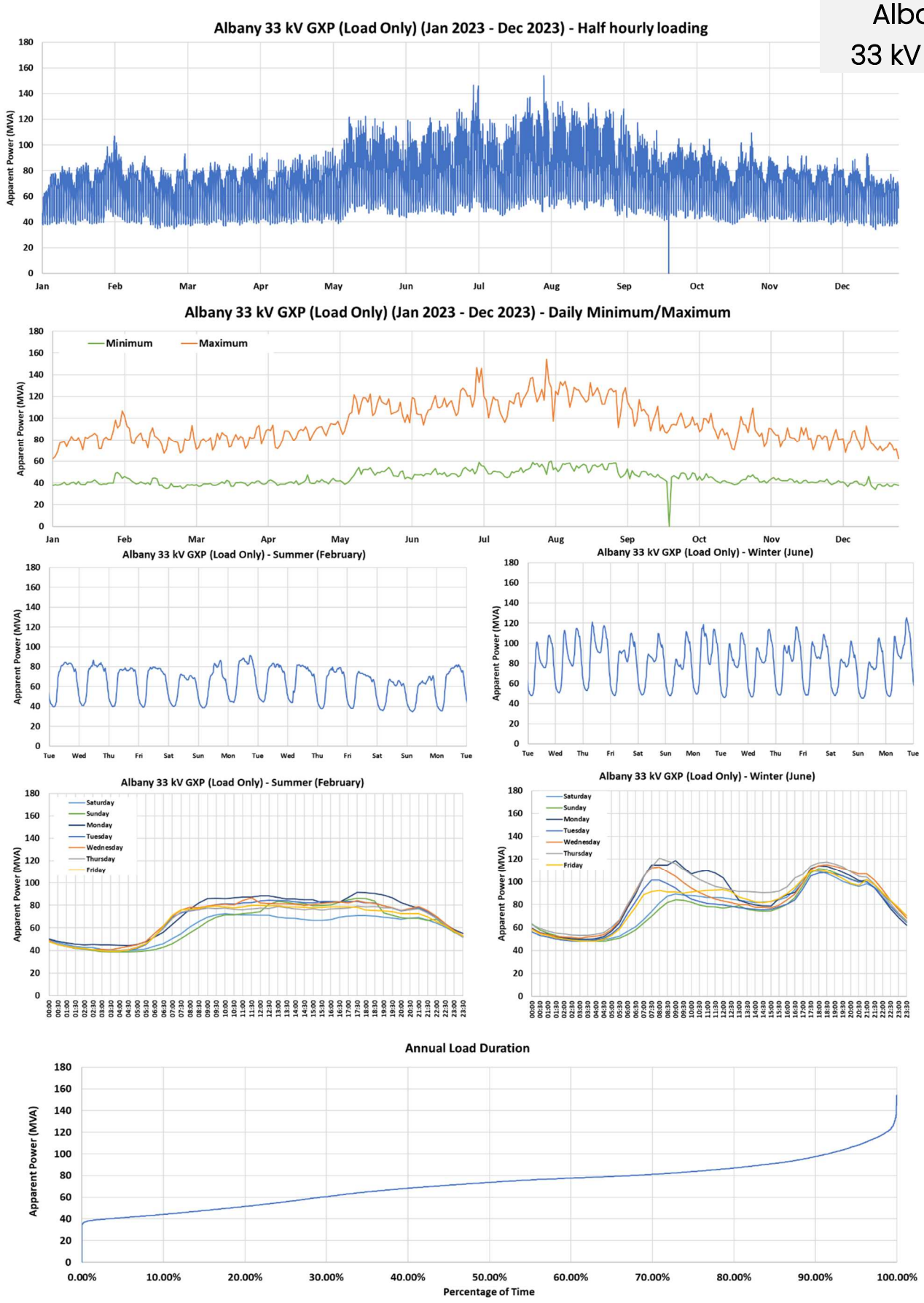

Figure 1. Albany 33 kV GXP: Apparent Power (MVA) load characteristics

Albany
33 kV MVAr

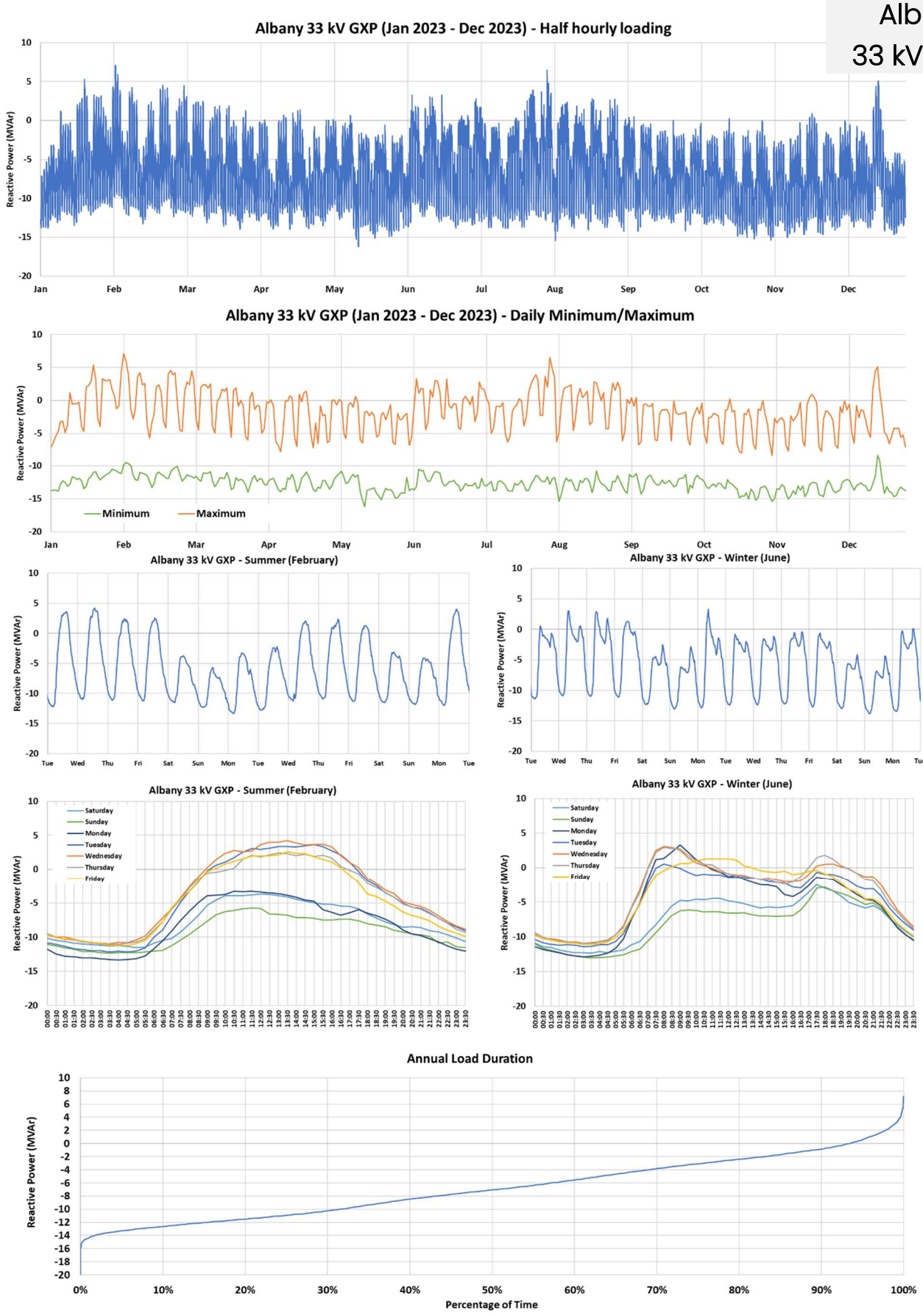

Figure 2. Albany 33 kV GXP: Reactive Power (MVAr) load characteristics

Bombay
110 kV MVA

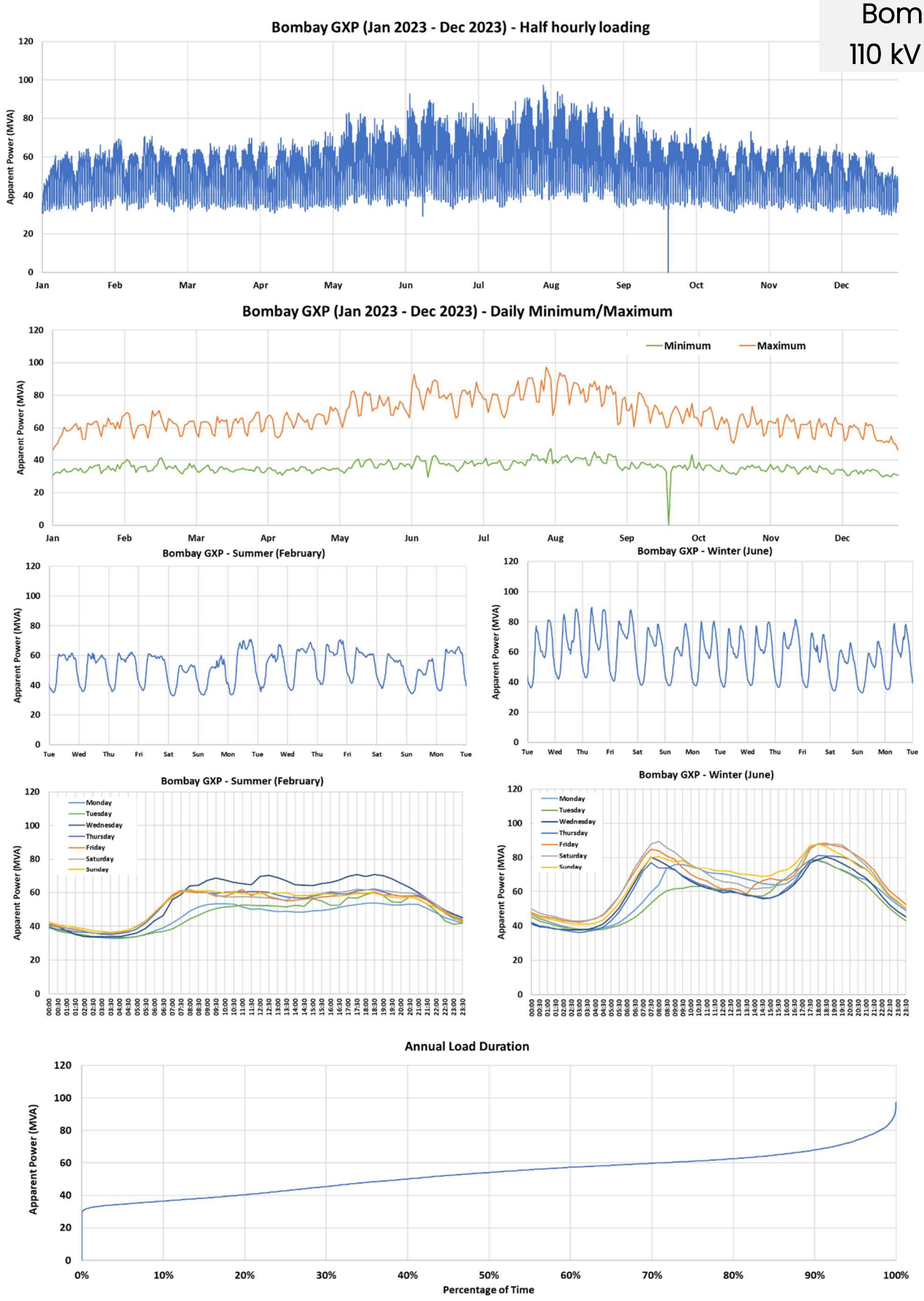

Figure 3. Bombay 110 kV GXP: Apparent Power (MVA) load characteristics

Bombay
110 kV MVAr

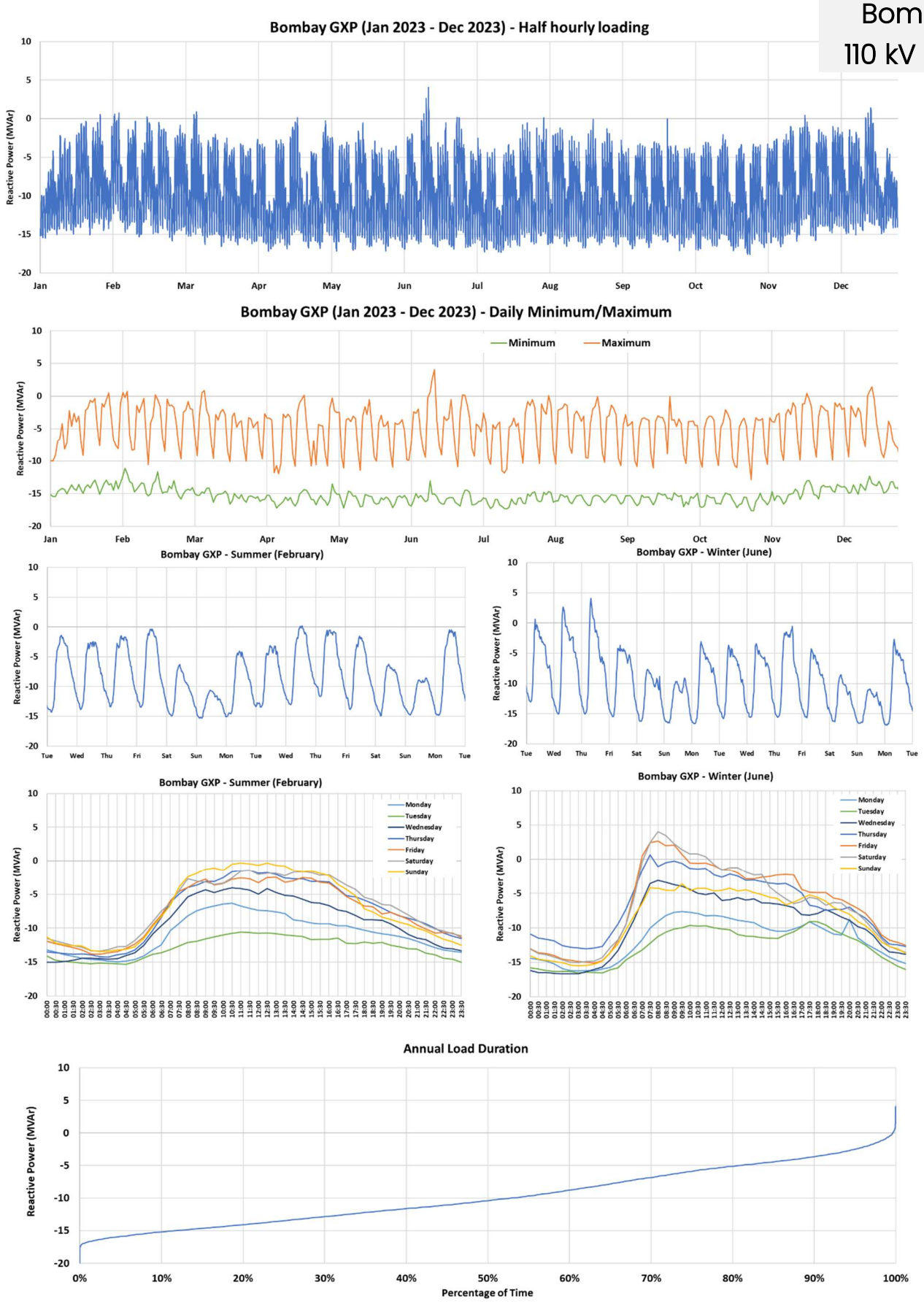

Figure 4. Bombay 110 kV GXP: Reactive Power (MVAr) load characteristics

Glenbrook 33 kV (clean) MVA

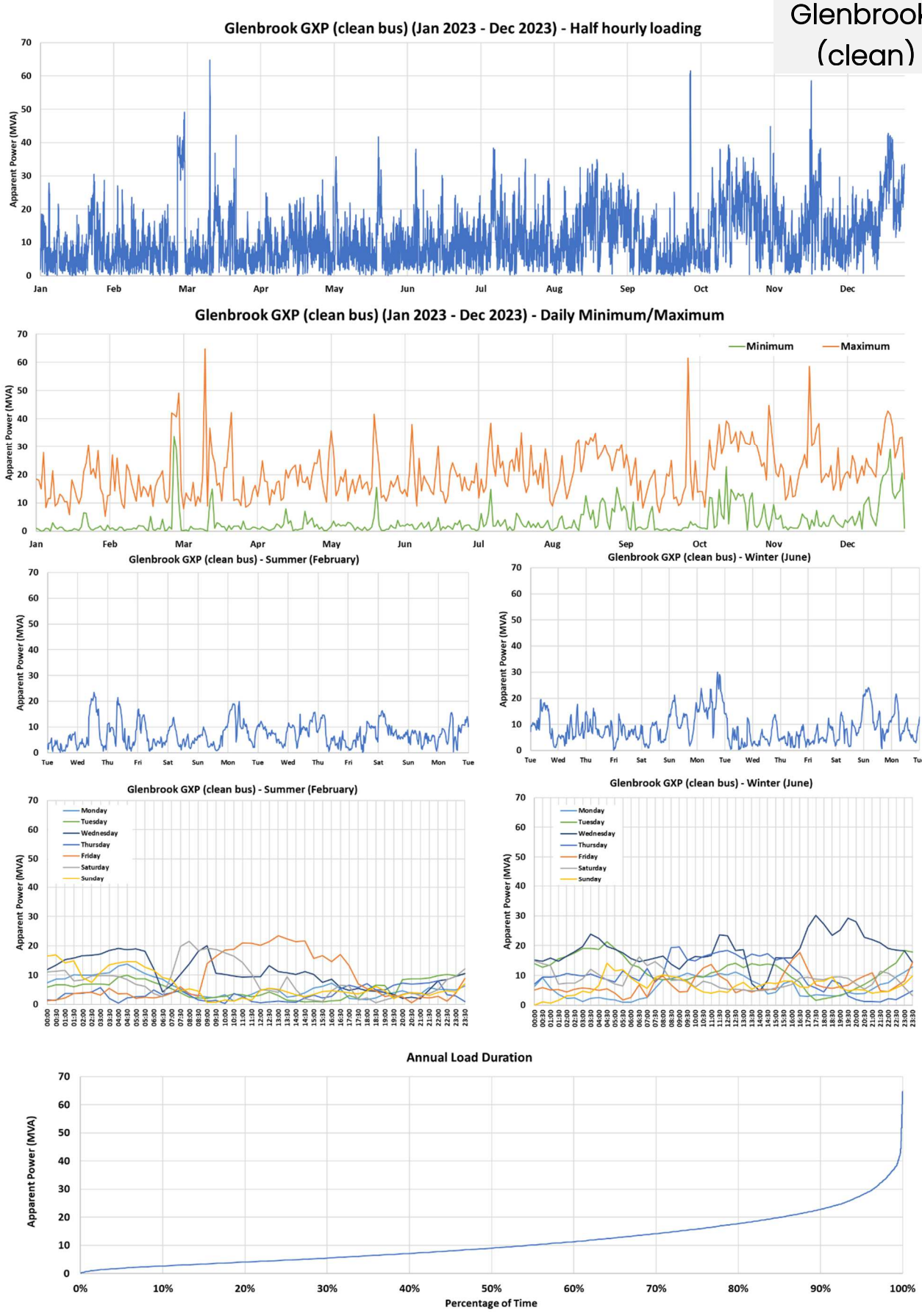

Figure 5. Glenbrook 33 kV (clean) GXP: Apparent Power (MVA) load characteristics

Glenbrook 33 kV (clean) MVAr

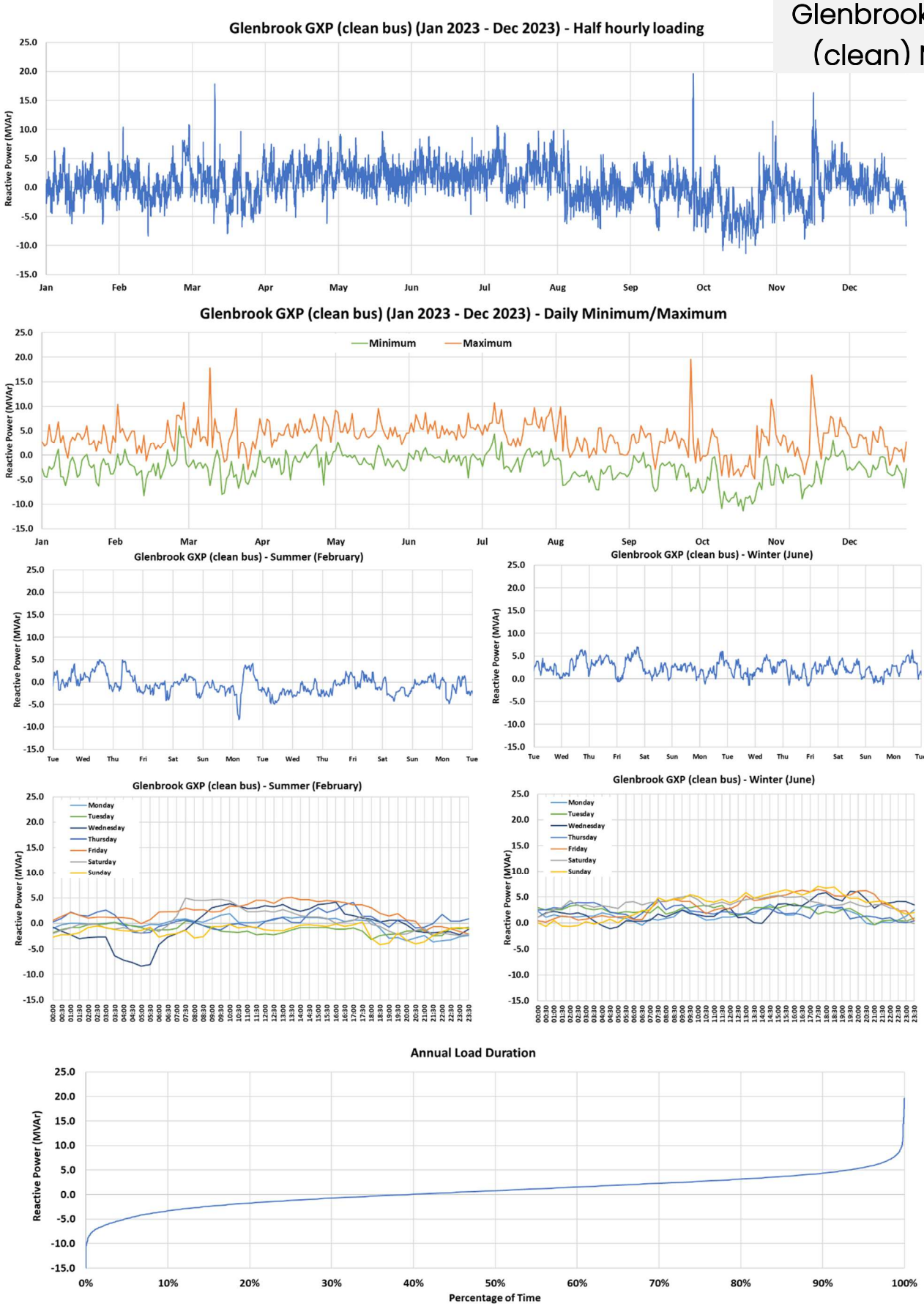

Figure 6. Glenbrook 33 kV (clean) GXP: Reactive Power (MVAr) load characteristics

Glenbrook 33 kV (dirtv) MVA

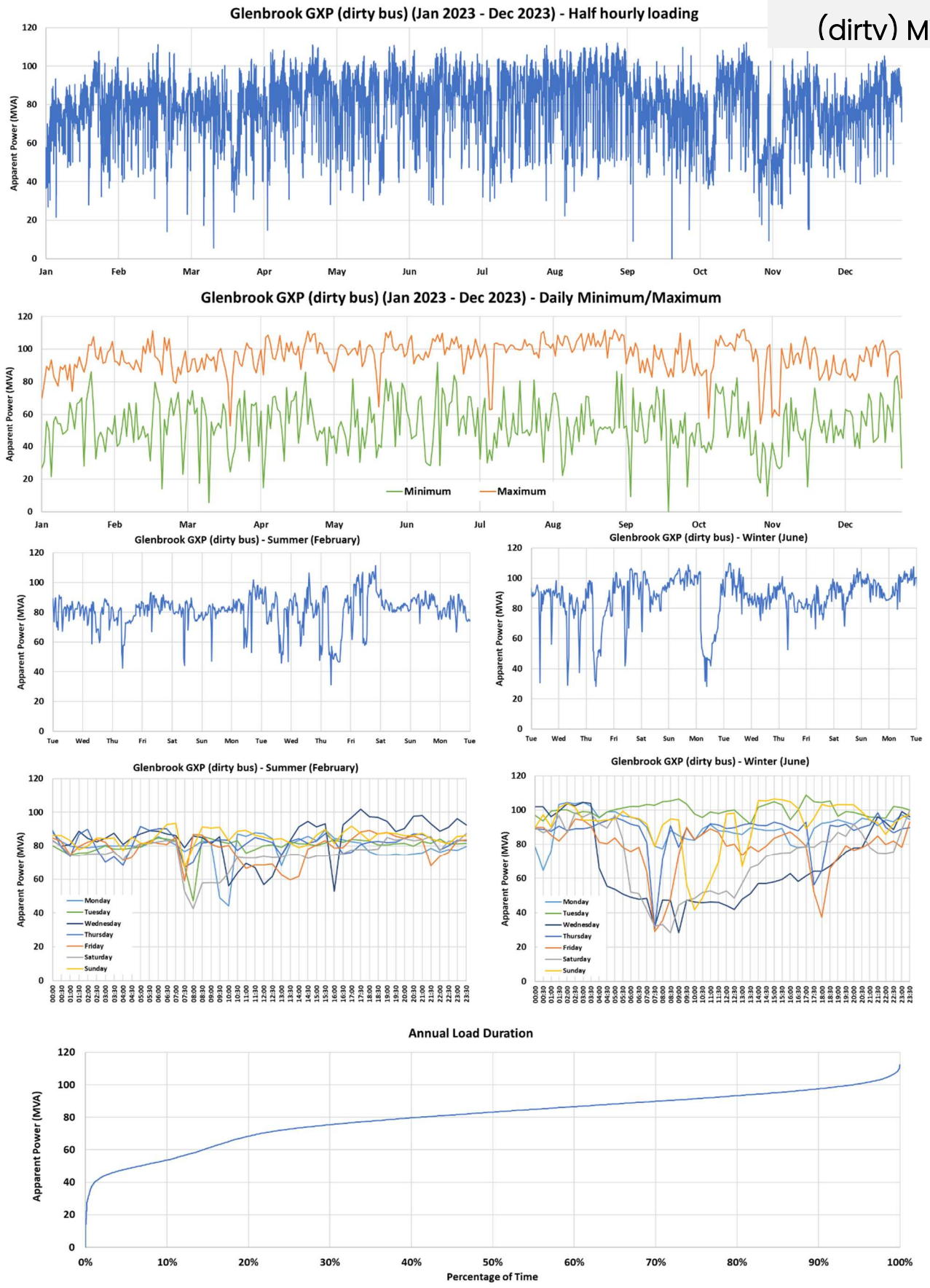

Figure 7. Glenbrook 33 kV (dirty) GXP: Apparent Power (MVA) load characteristics

Glenbrook 33 kV (dirtv) MVAr

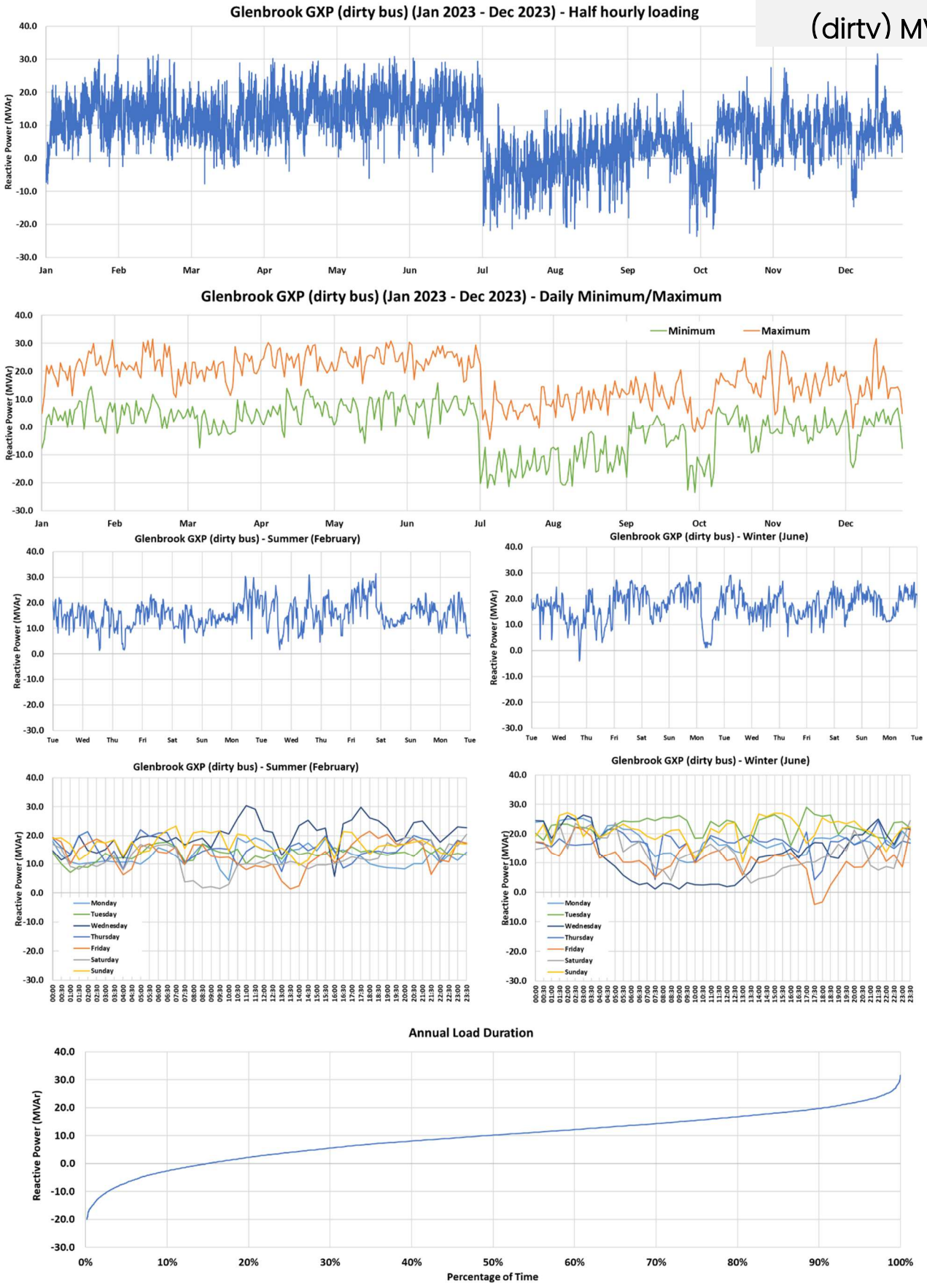

Figure 8. Glenbrook 33 kV (dirty) GXP: Reactive Power (MVAr) load characteristics

Henderson 33 kV MVA

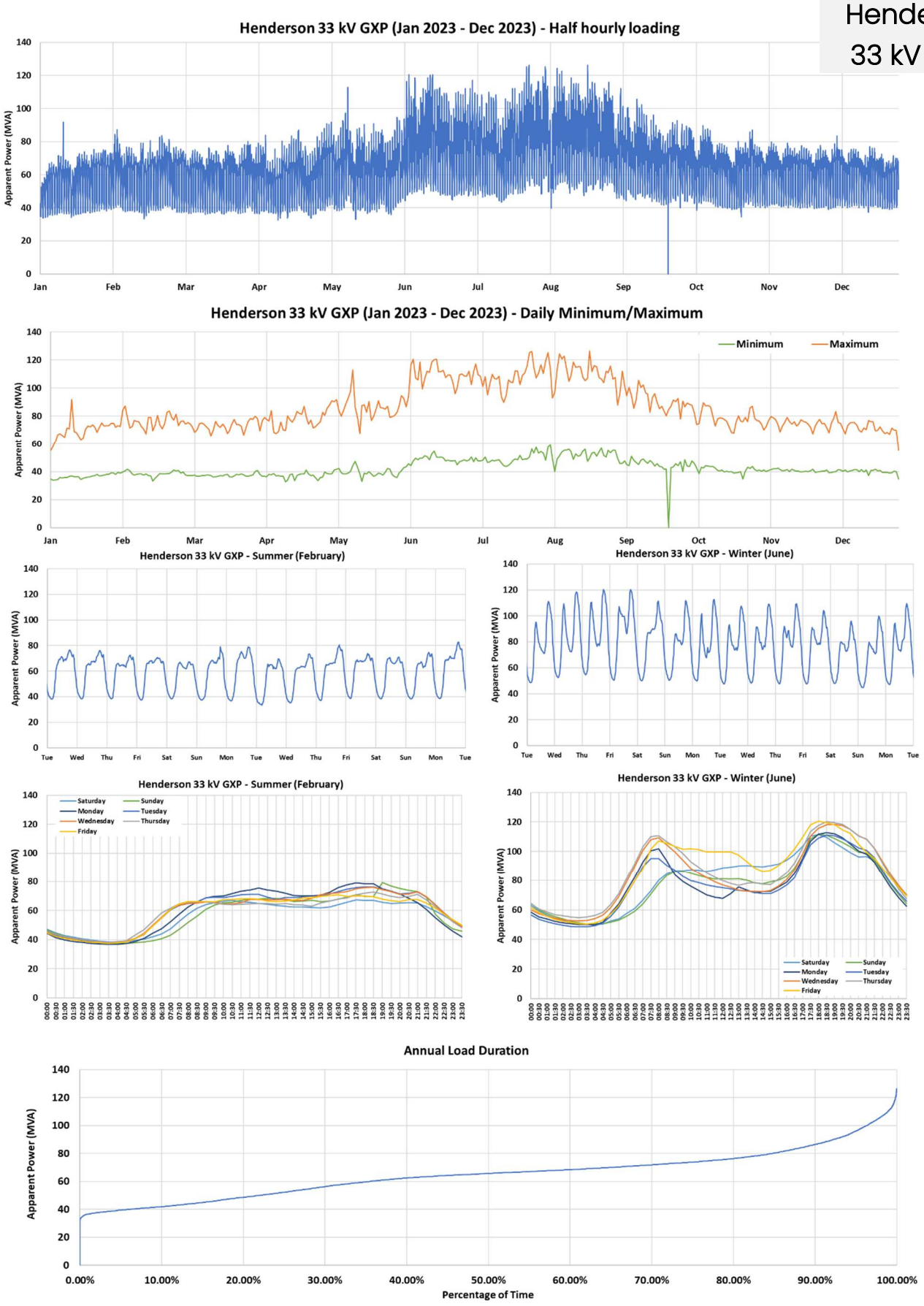

Figure 9. Henderson 33 kV GXP: Apparent Power (MVA) load characteristics

Henderson
33 kV MVAr

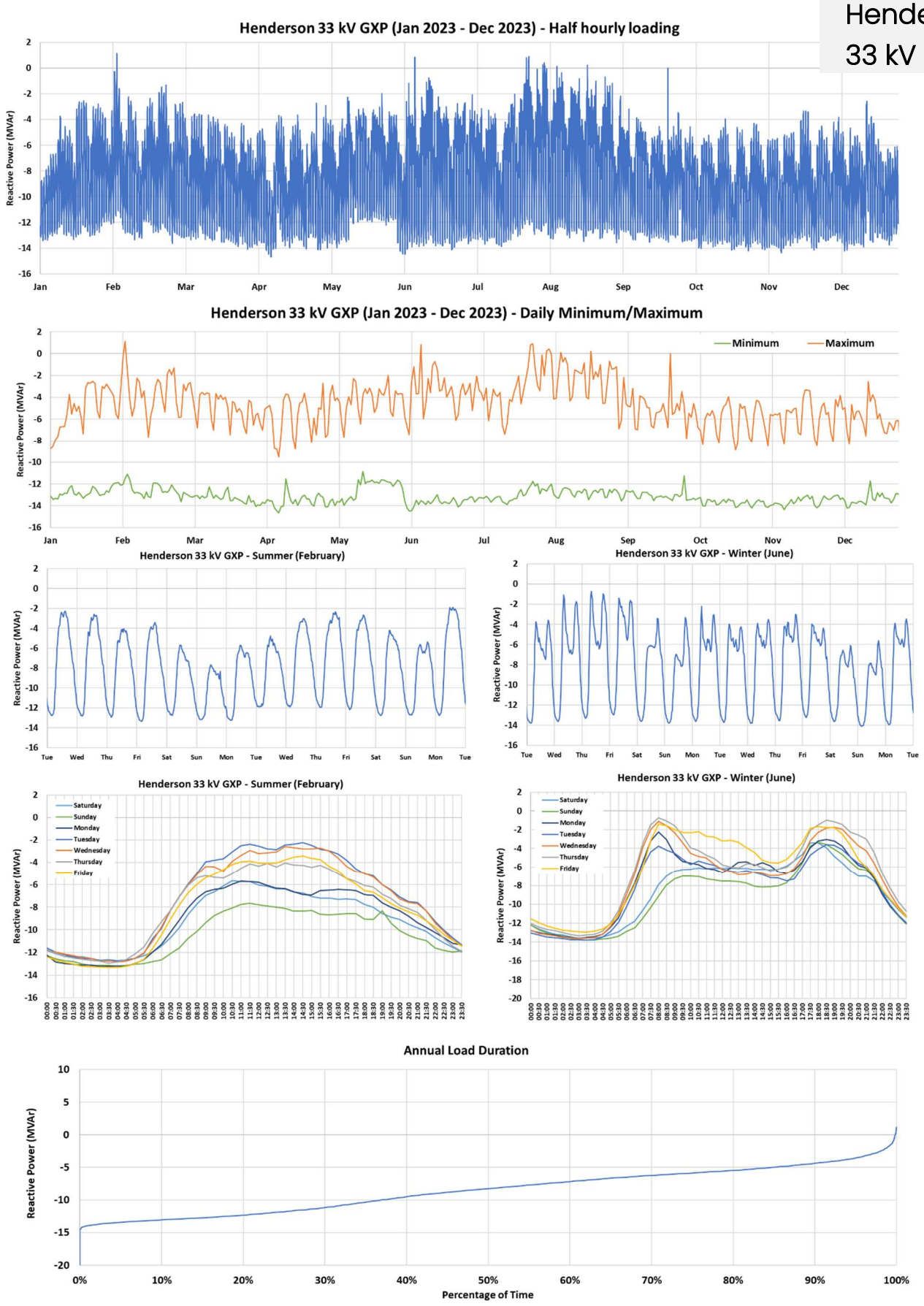

Figure 10. Henderson 33 kV GXP: Reactive Power (MVAr) load characteristics

Hepburn Rd 33 kV MVA

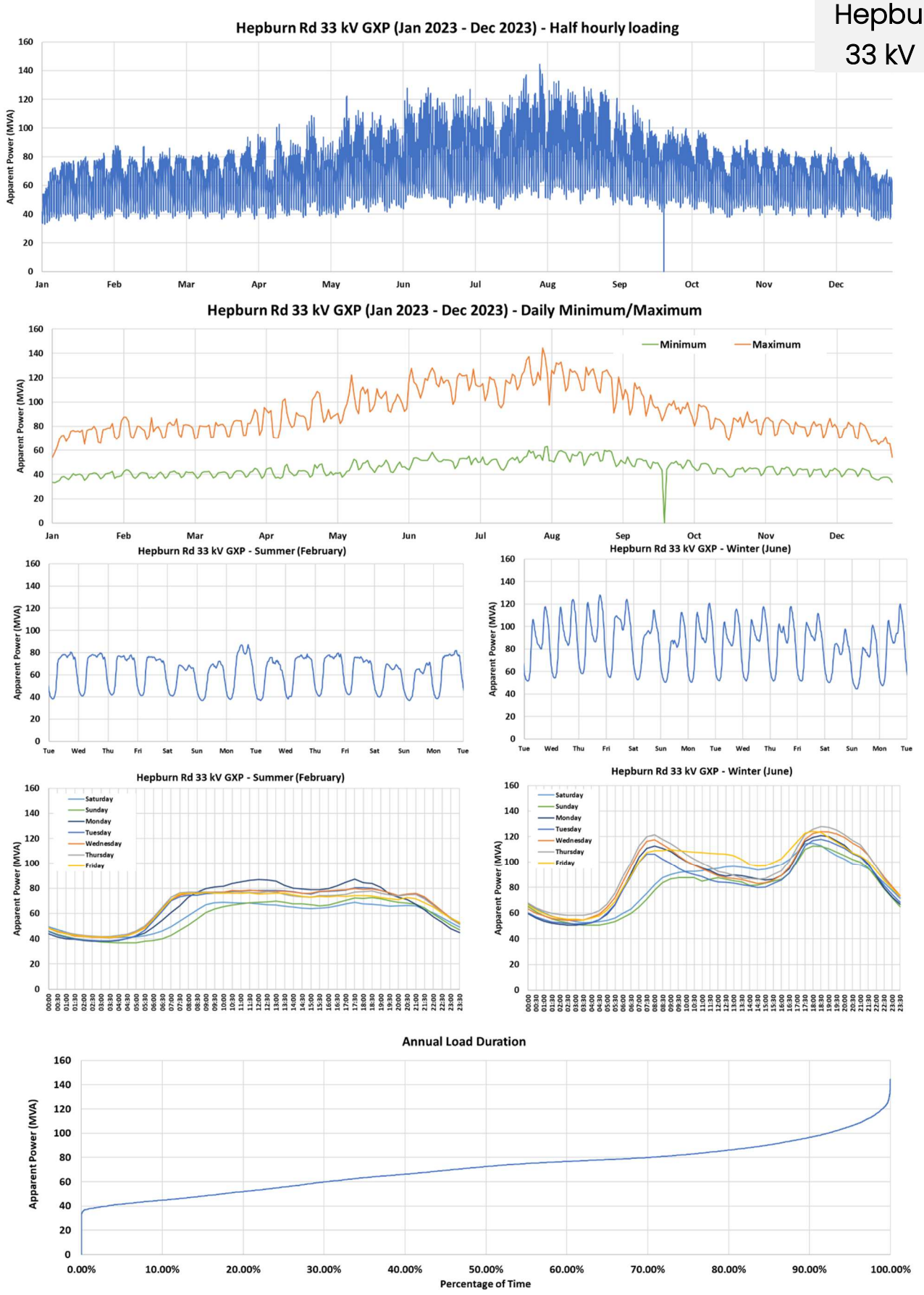

Figure 11. Hepburn Rd 33 kV GXP: Apparent Power (MVA) load characteristics

Hepburn Rd 33 kV MVAr

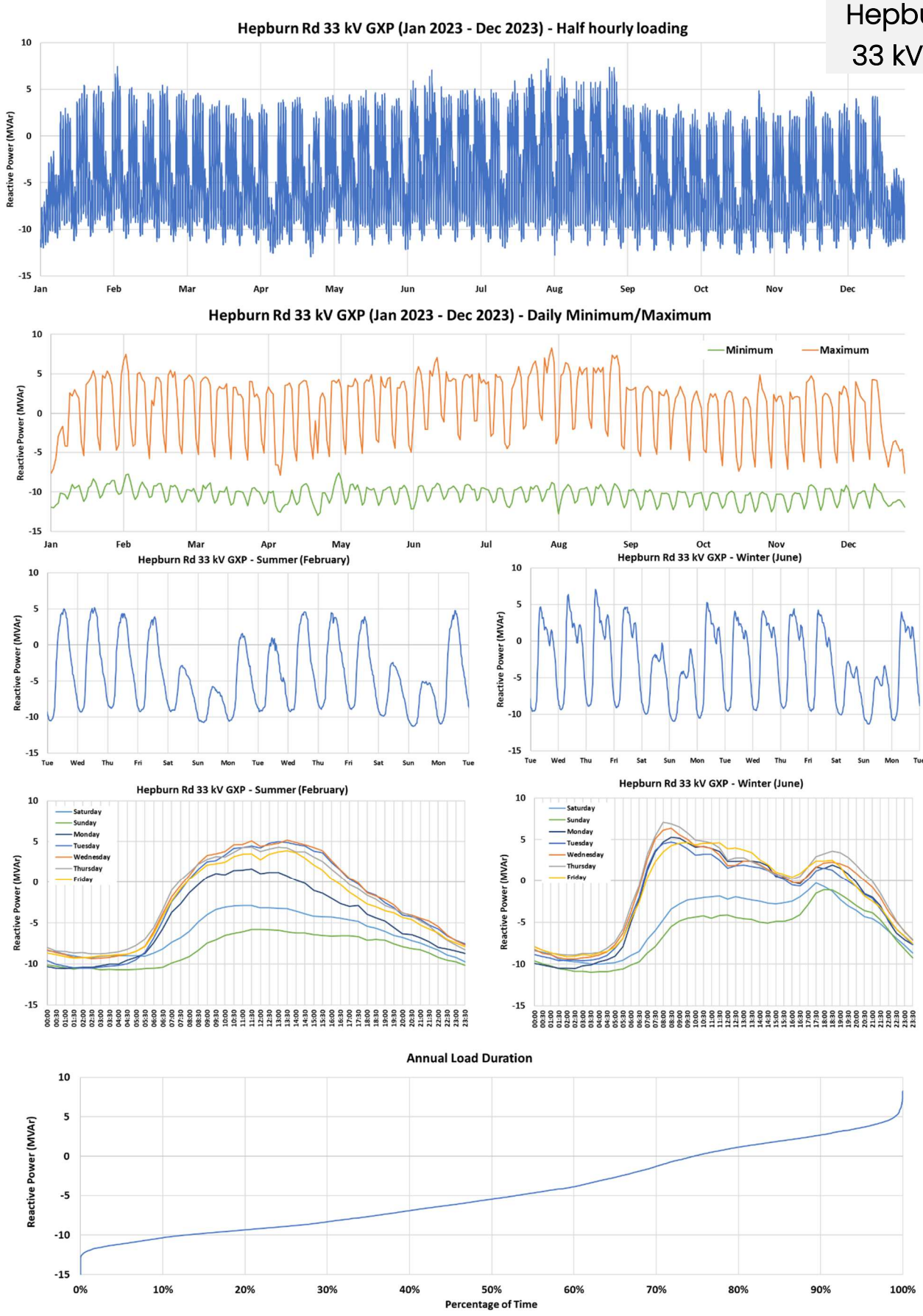

Figure 12. Hepburn Rd 33 kV GXP: Reactive Power (MVAr) load characteristics

Hobson St 110 kV MVA

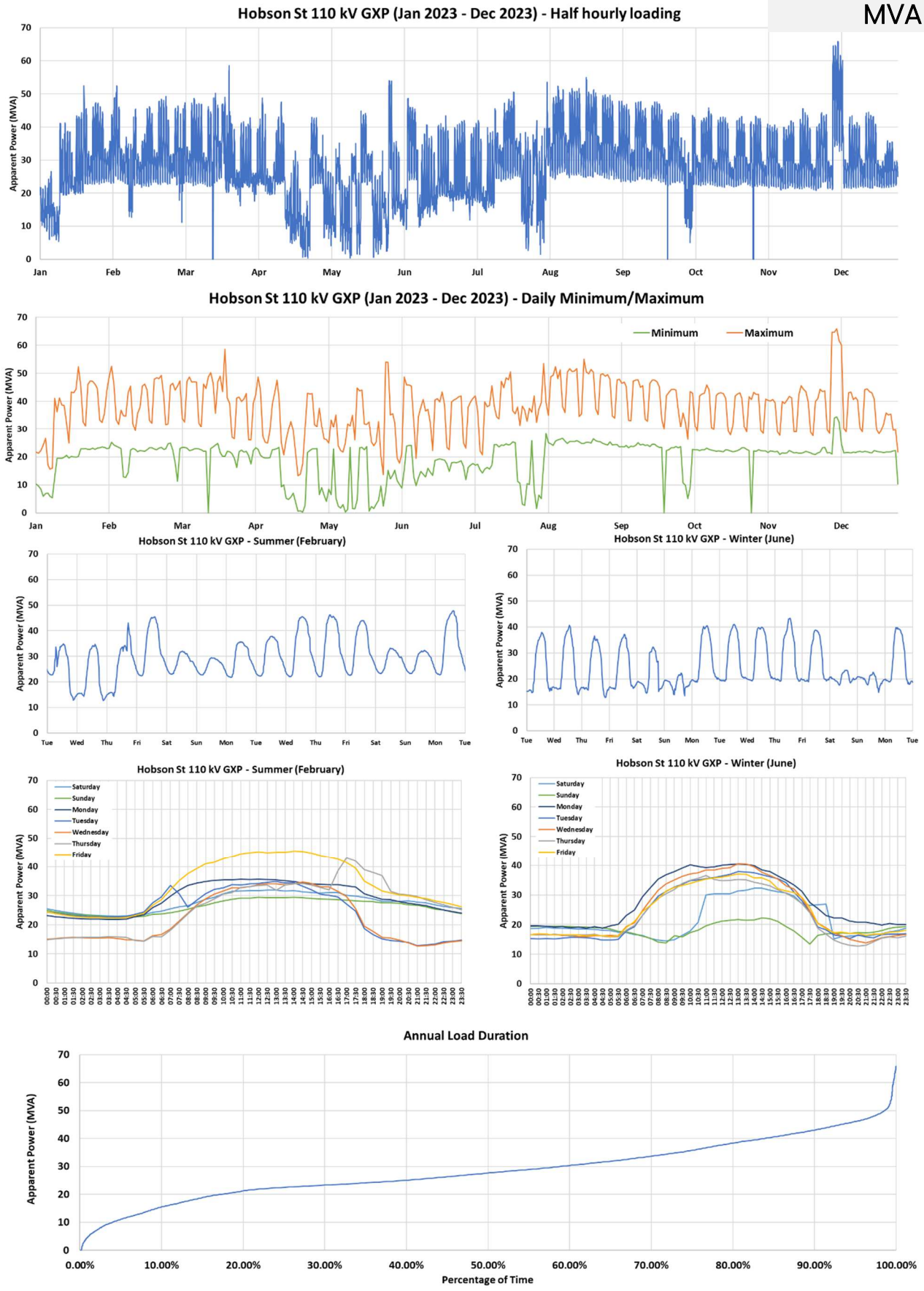

Figure 13. Hobson St 110 kV GXP: Apparent Power (MVA) load characteristics

Hobson St 110 kV MVAr

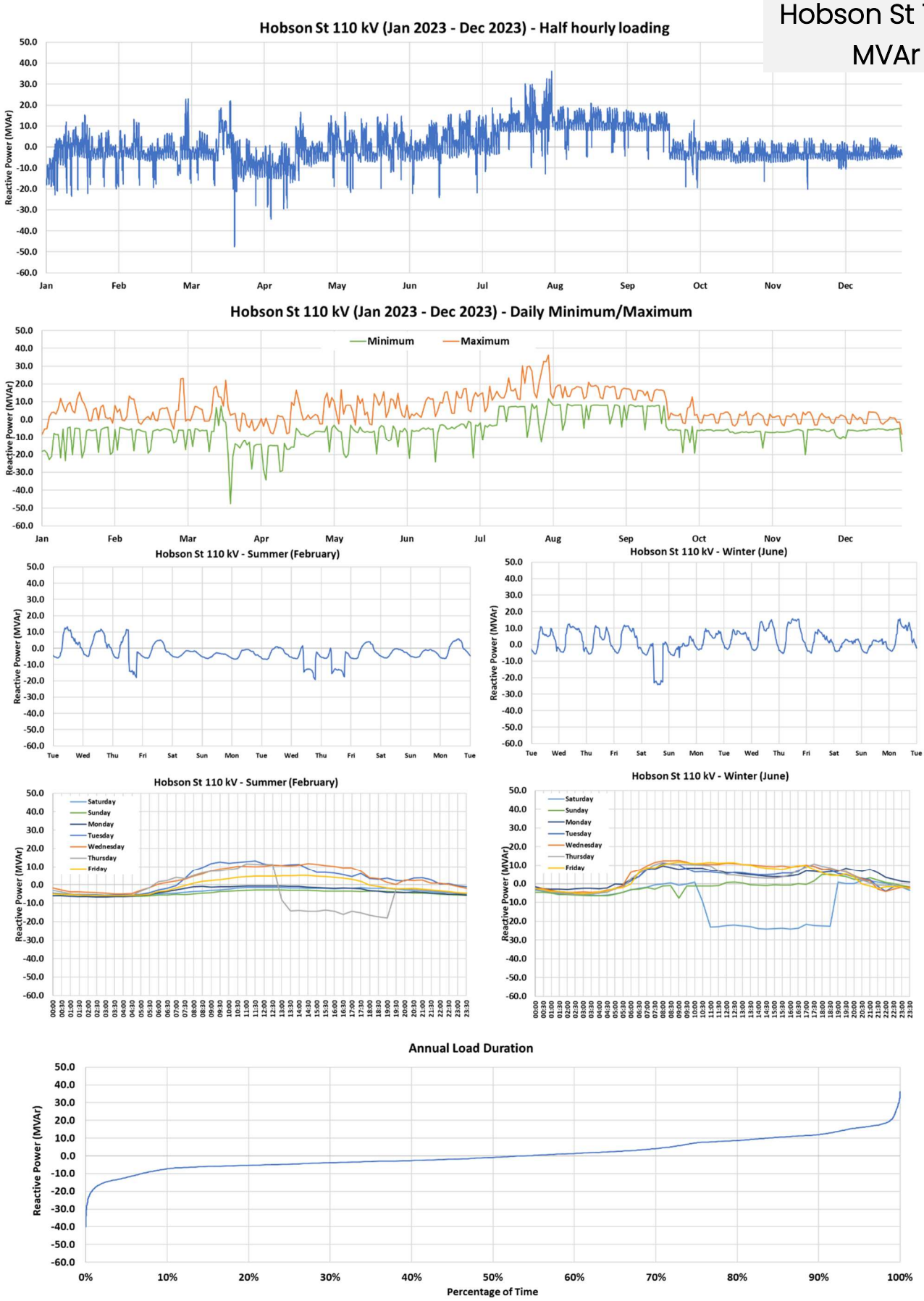

Figure 14. Hobson St 110 kV GXP: Reactive Power (MVAr) load characteristics

Māngere
110 kV MVA

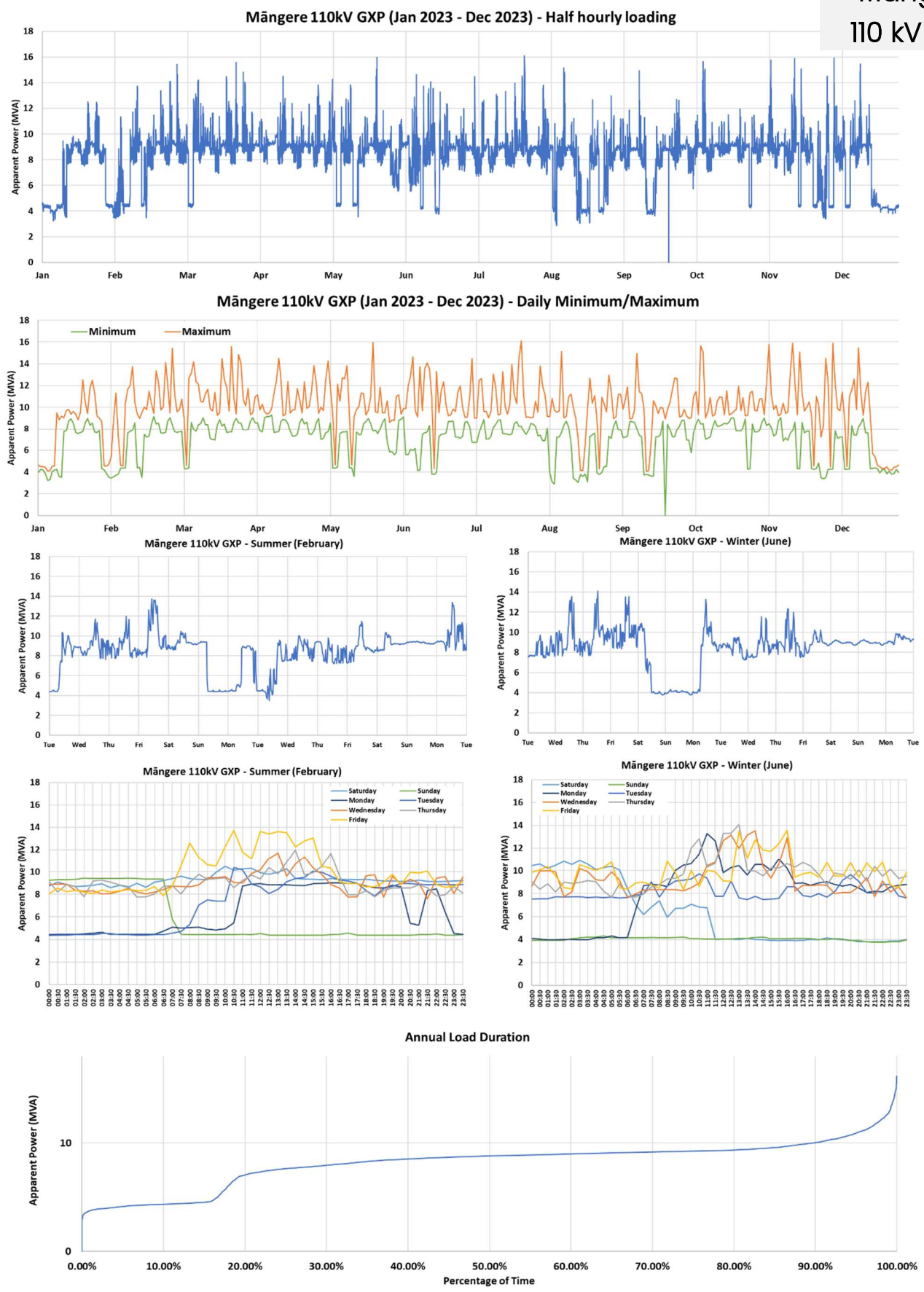

Figure 15. Māngere 110 kV GXP: Apparent Power (MVA) load characteristics

Māngere
110 kV MVAr

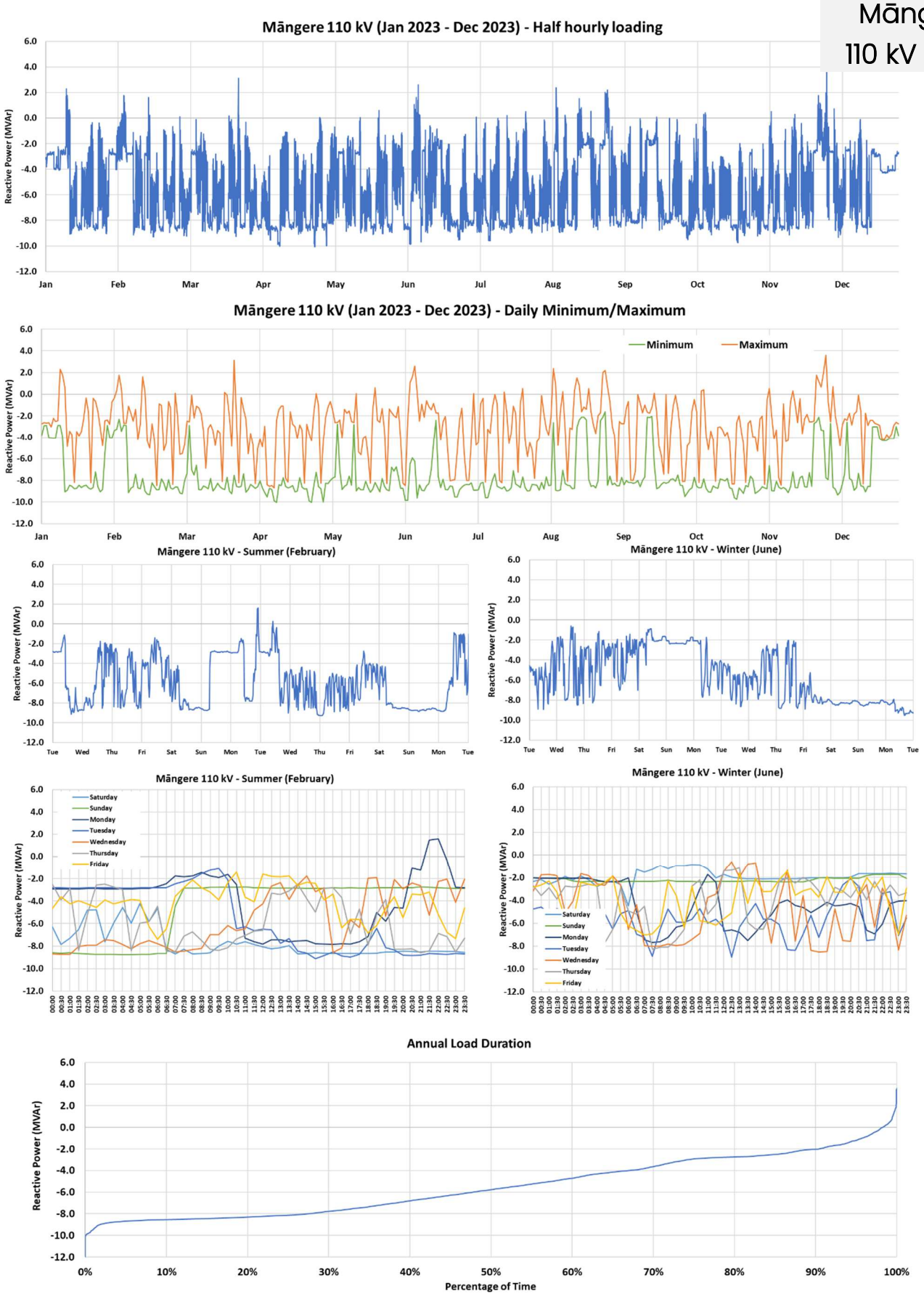

Figure 16. Māngere 110 kV GXP: Reactive Power (MVAr) load characteristics

Māngere
33 kV MVA

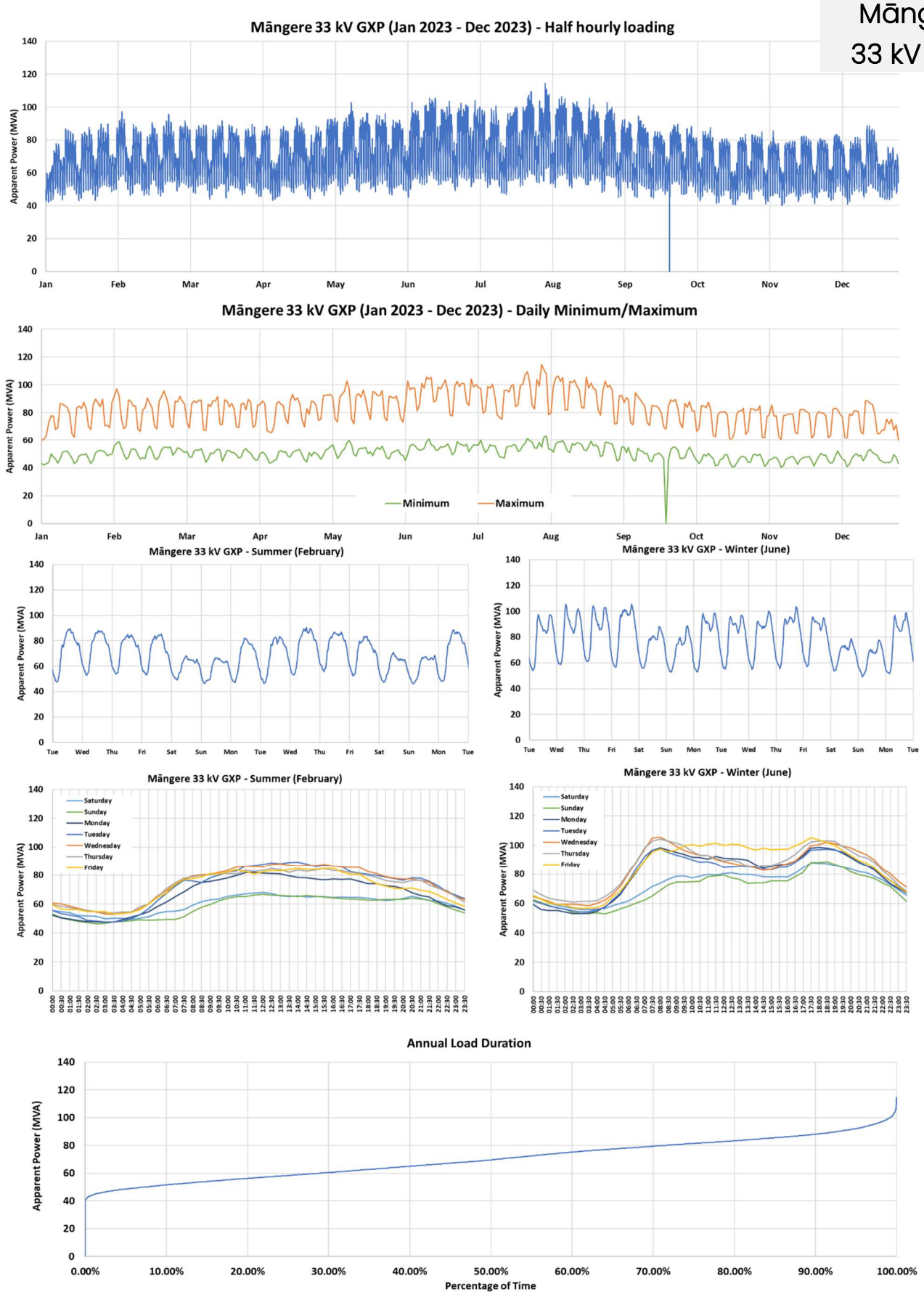

Figure 17. Māngere 33 kV GXP: Apparent Power (MVA) load characteristics

Māngere
33 kV MVAr

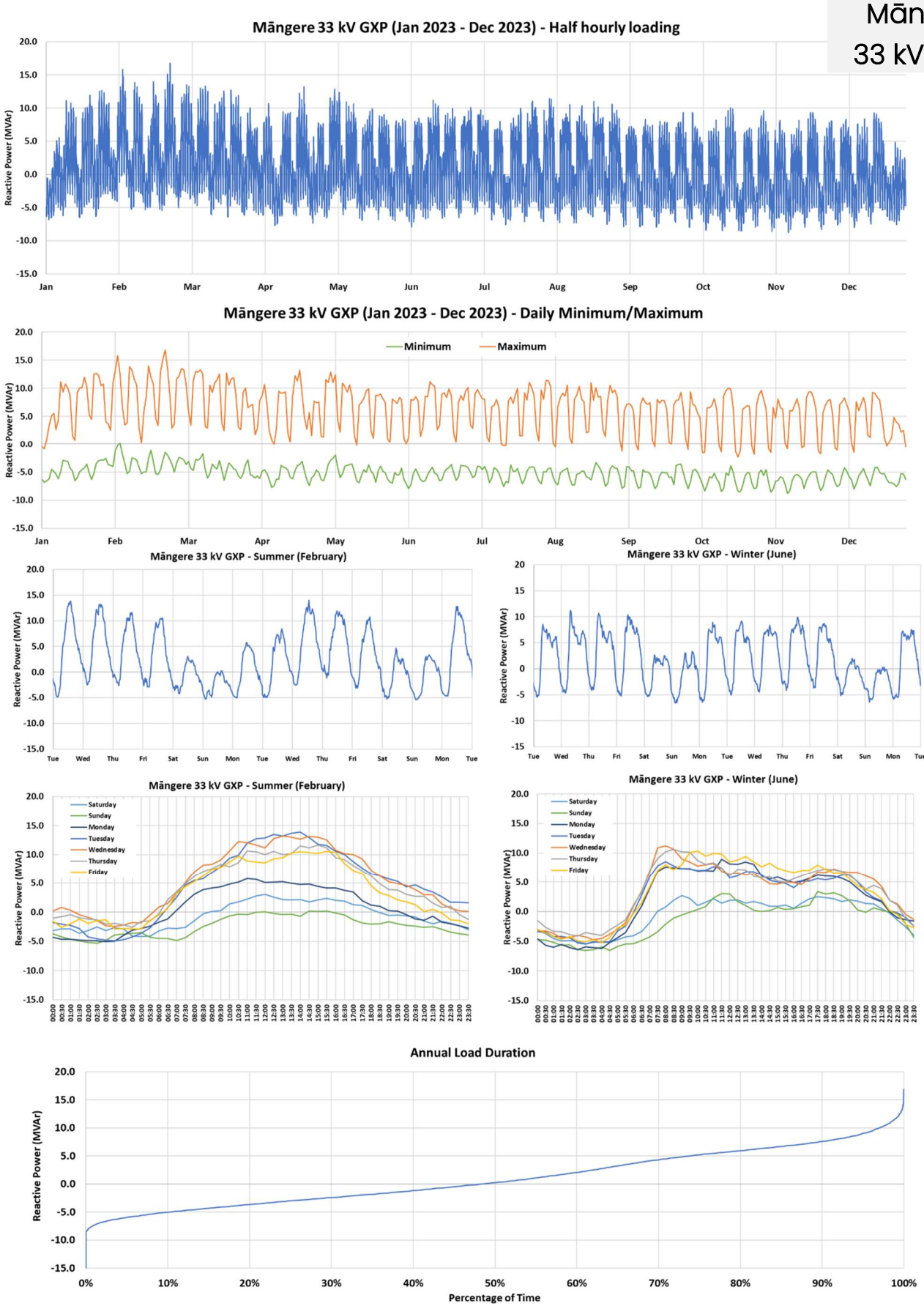

Figure 18. Māngere 33 kV GXP: Reactive Power (MVAr) load characteristics

Ōtāhuhu
22 kV MVA

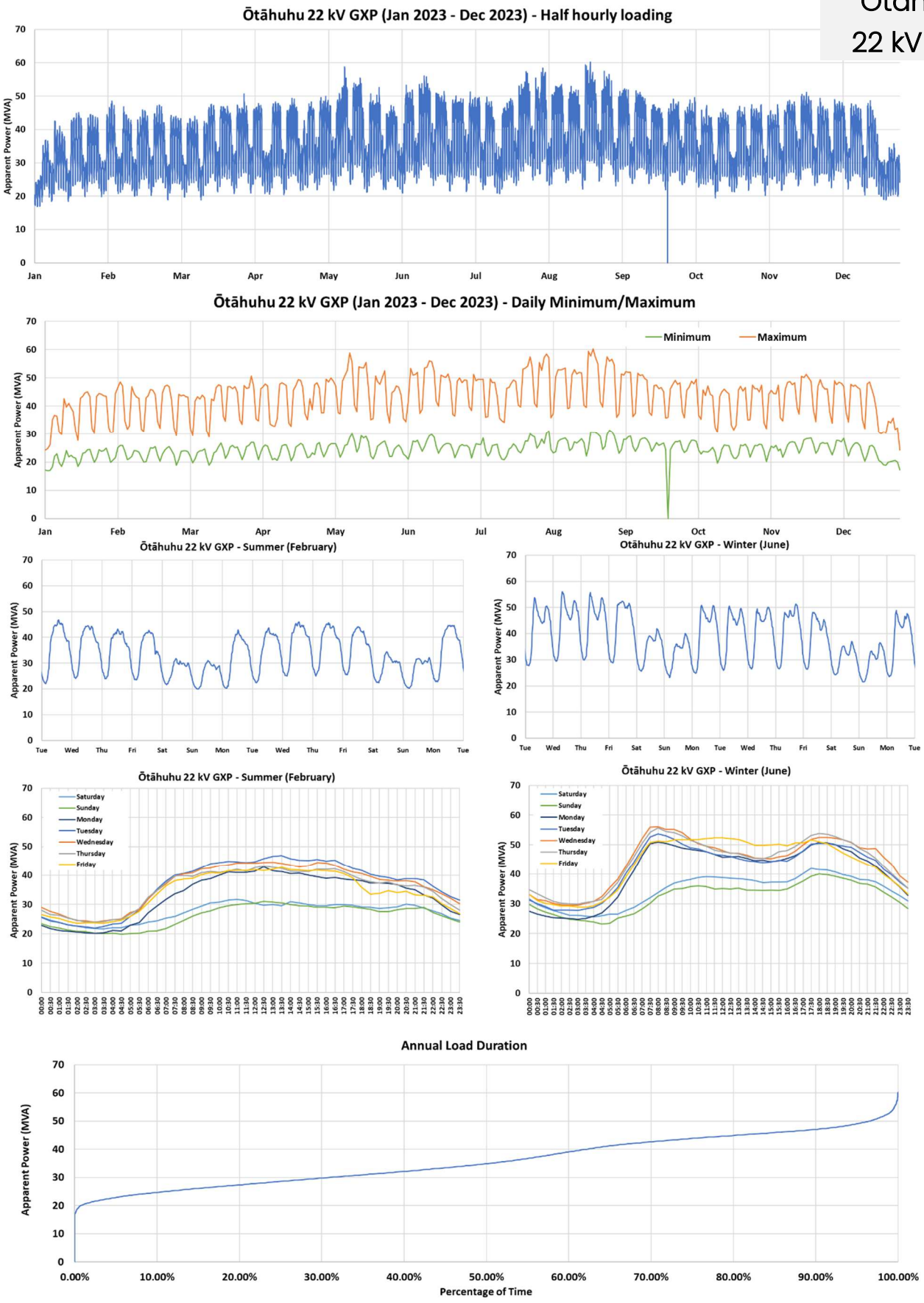

Figure 19. Ōtāhuhu 22 kV GXP: Apparent Power (MVA) load characteristics

Ōtāhuhu
22 kV MVAr

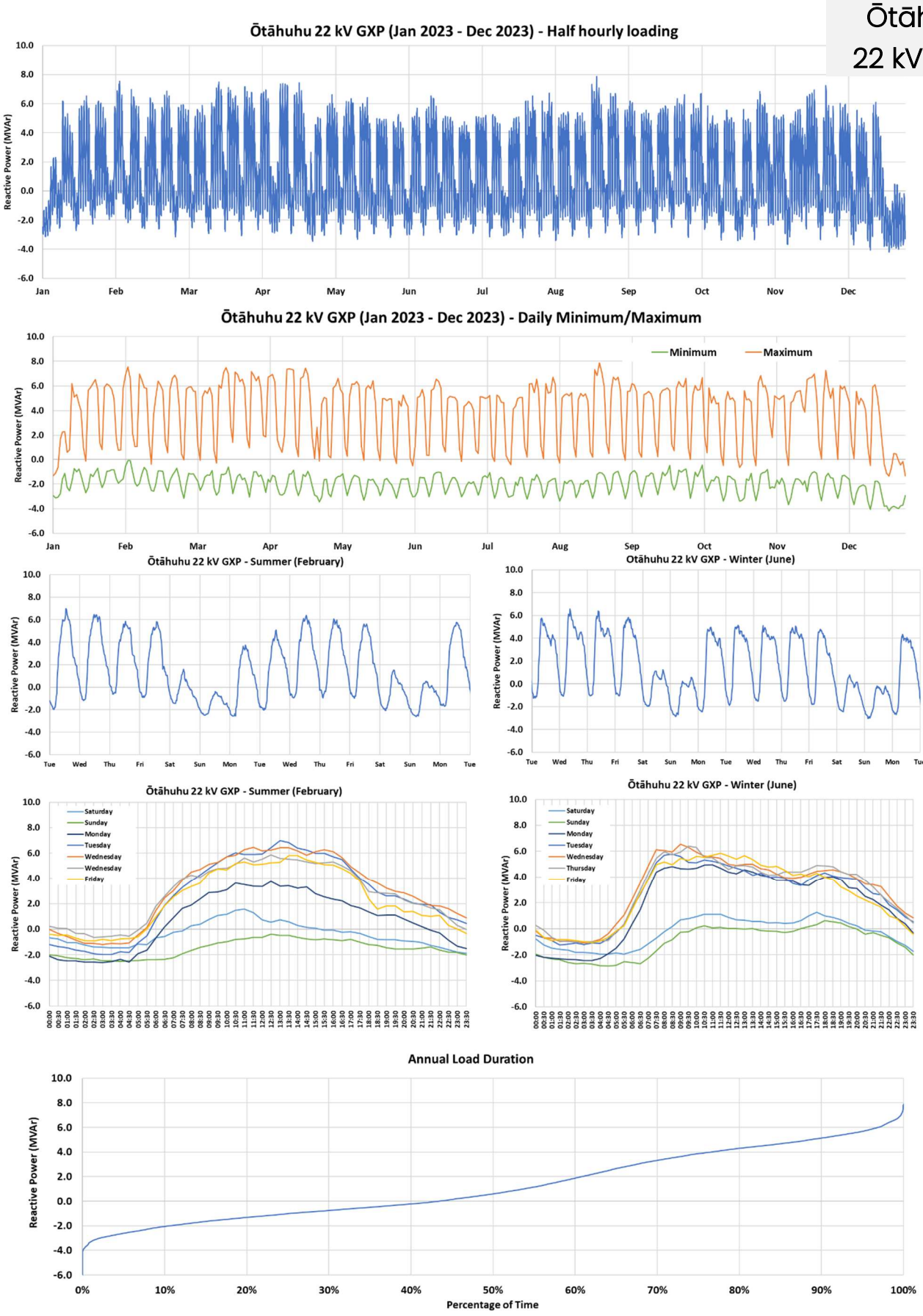

Figure 20. Ōtāhuhu 22 kV GXP: Reactive Power (MVAr) load characteristics

Pakuranga
33 kV MVA

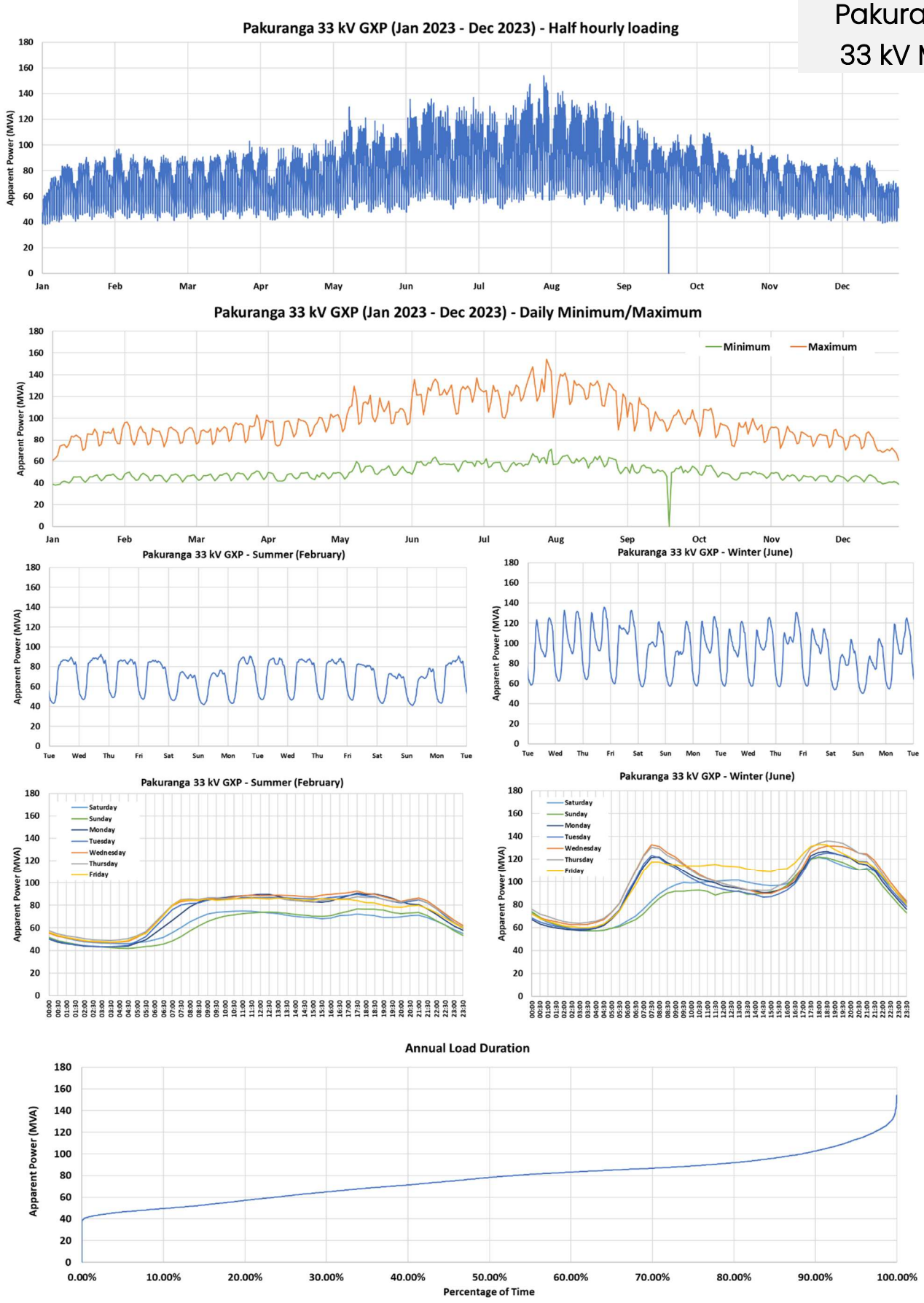

Figure 21. Pakuranga 33 kV GXP: Apparent Power (MVA) load characteristics

Pakuranga
33 kV MVAr

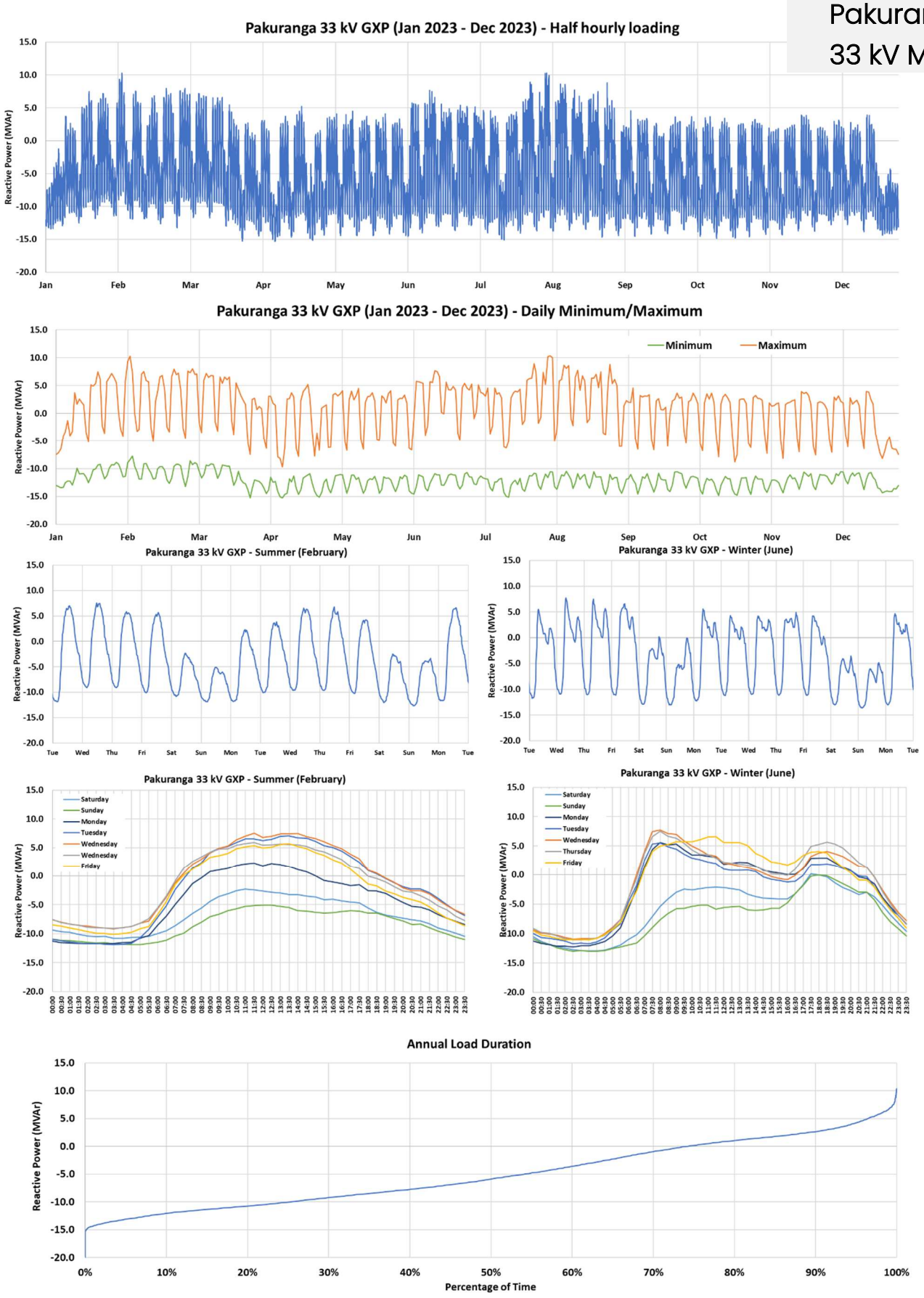

Figure 22. Pakuranga 33 kV GXP: Reactive Power (MVAr) load characteristics

Penrose
110 kV MVA

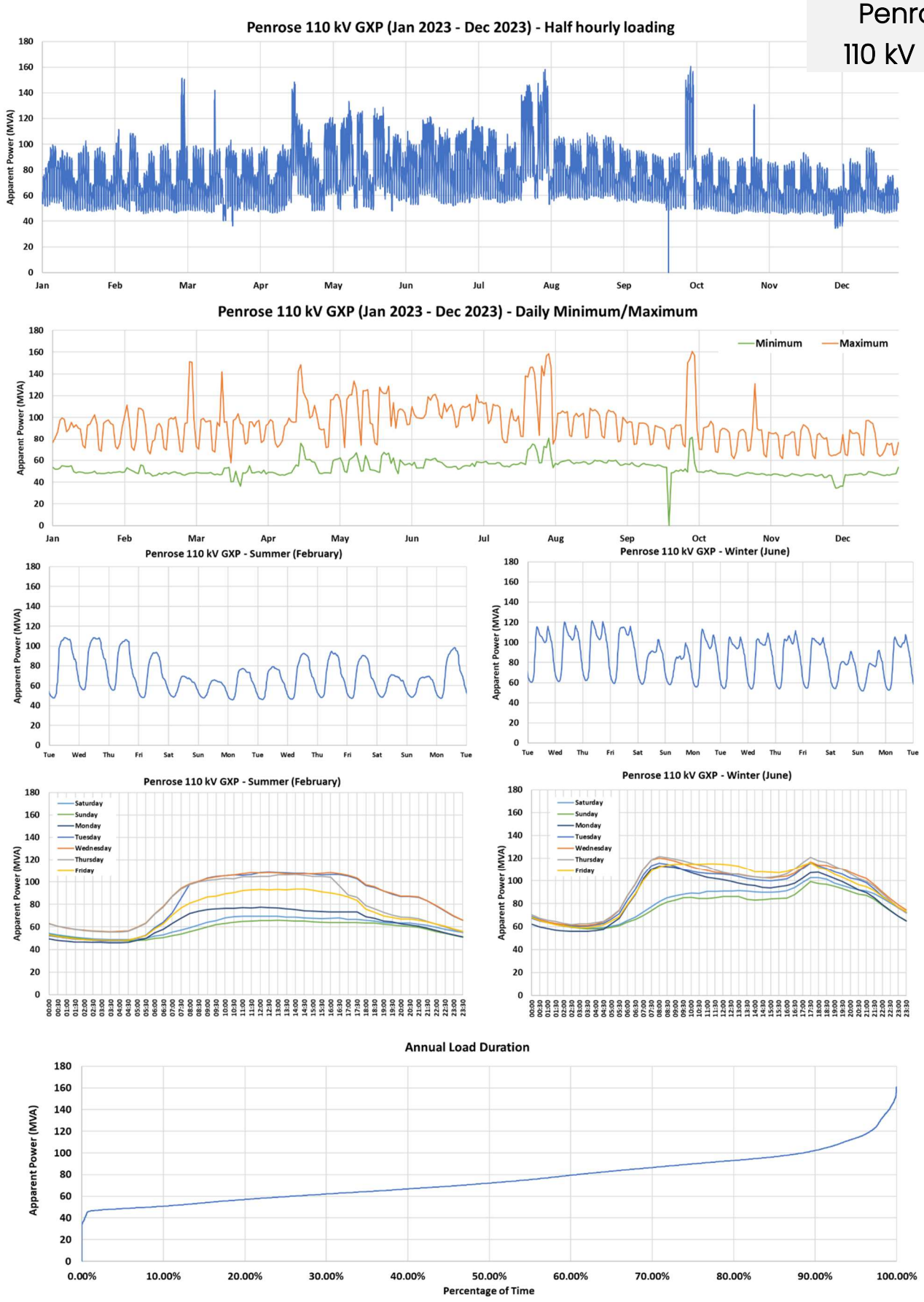

Figure 23. Penrose 110 kV GXP: Apparent Power (MVA) load characteristics

Penrose
110 kV MVAr

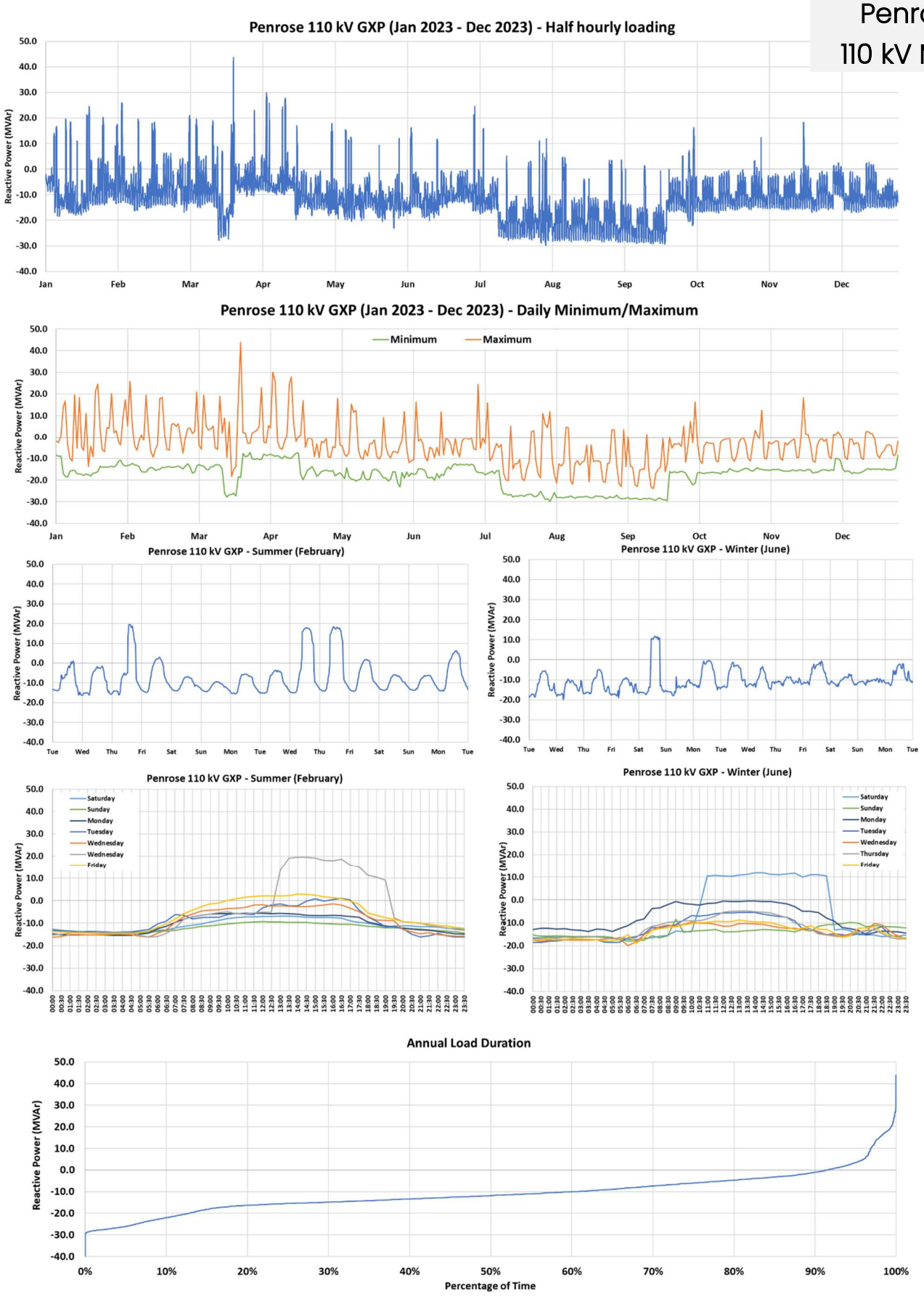

Figure 24. Penrose 110 kV GXP: Reactive Power (MVAr) load characteristics

Penrose
33 kV MVA

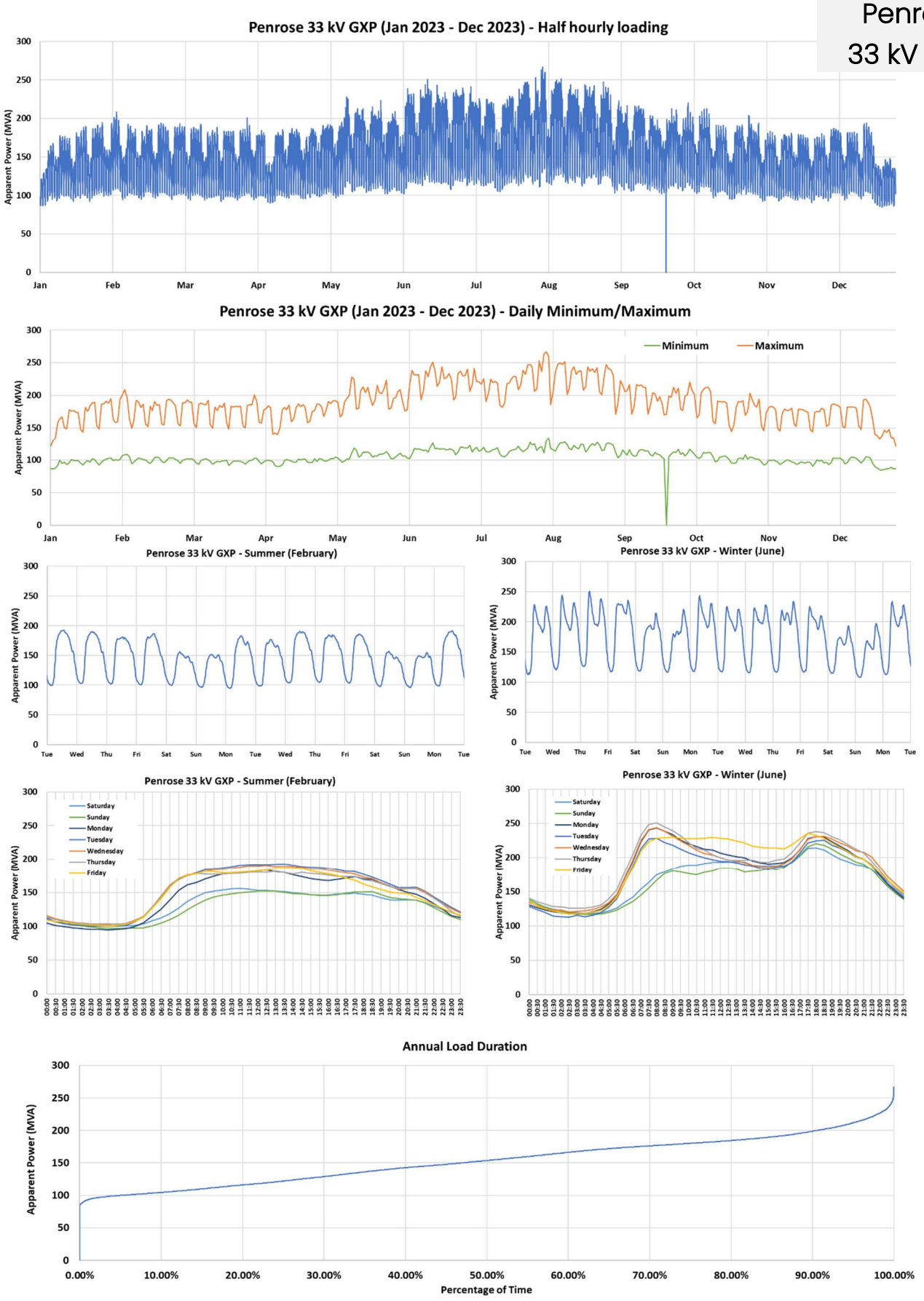

Figure 25. Penrose 33 kV GXP: Apparent Power (MVA) load characteristics

Penrose
33 kV MVAr

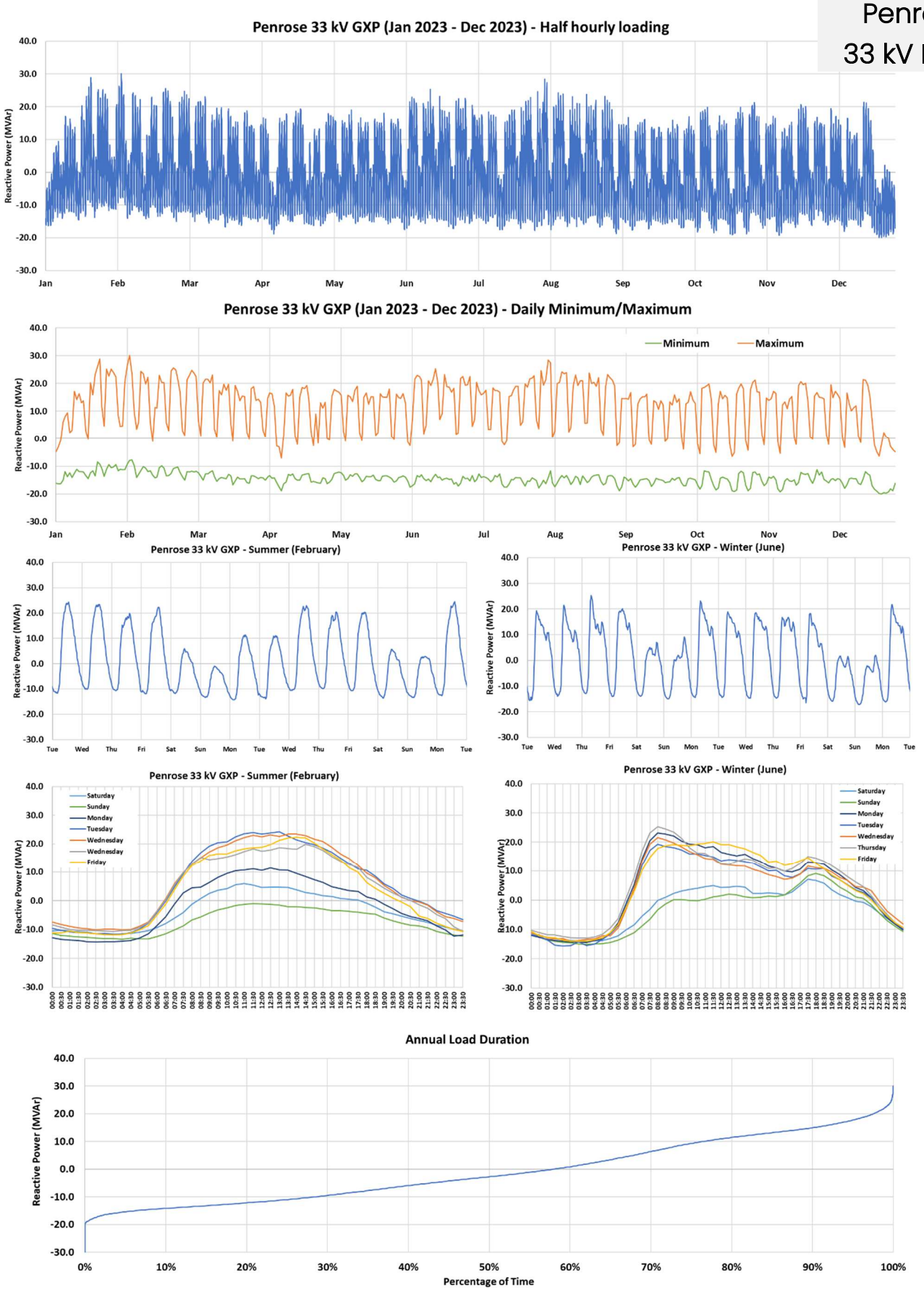

Figure 26. Penrose 33 kV GXP: Reactive Power (MVAr) load characteristics

Penrose
22 kV MVA

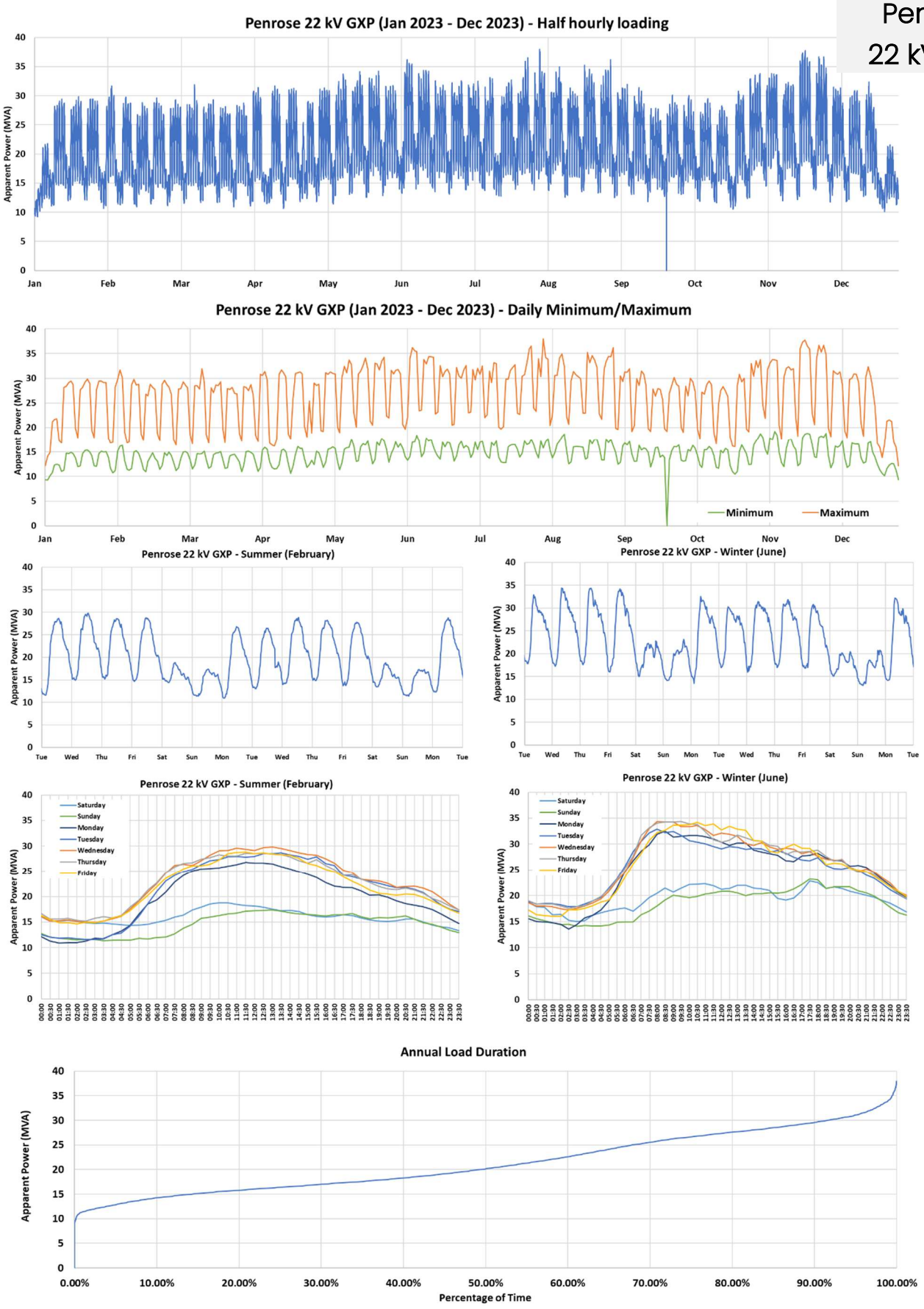

Figure 27. Penrose 22 kV GXP: Apparent Power (MVA) load characteristics

Penrose
22 kV MVAr

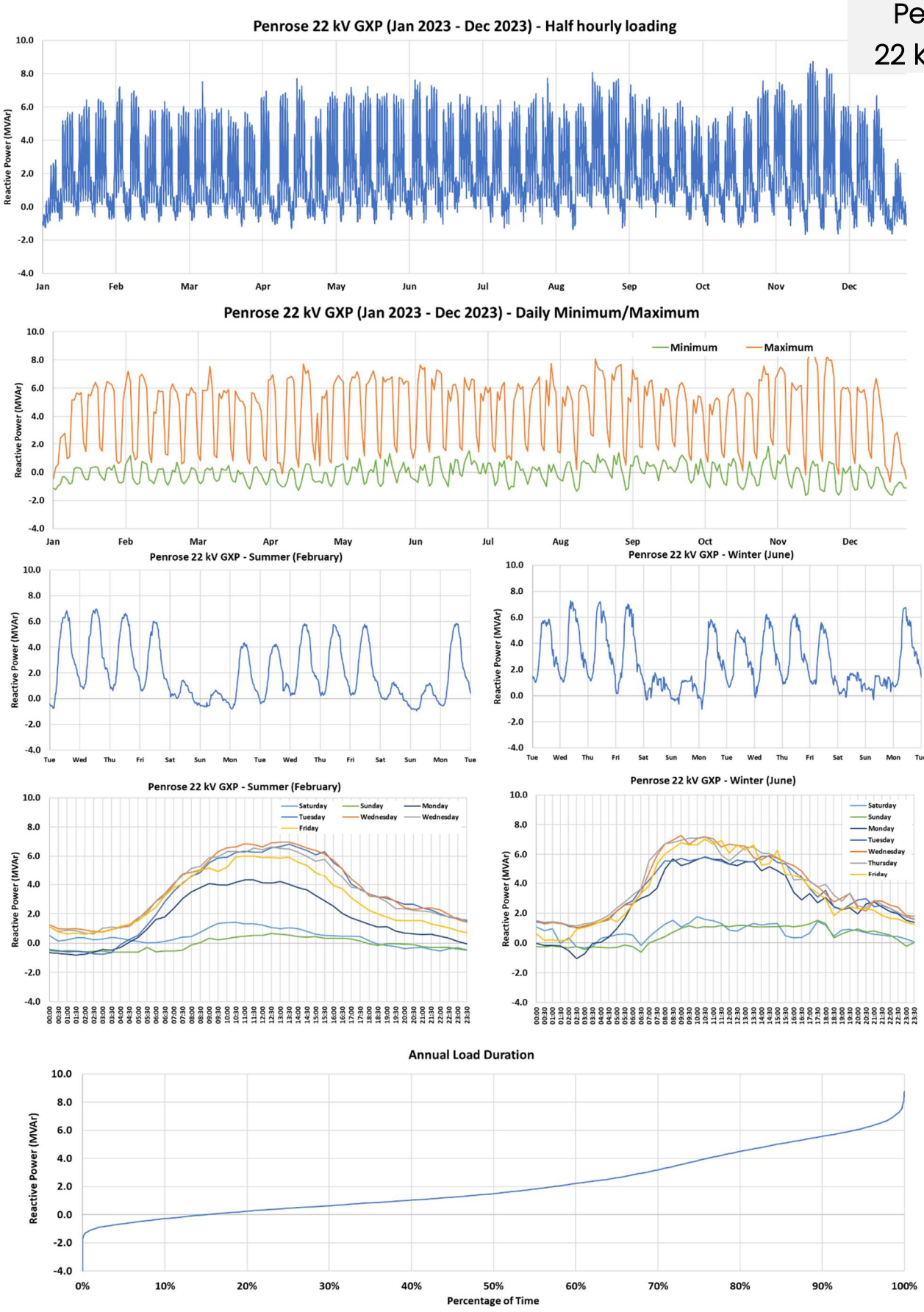

Figure 28. Penrose 22 kV GXP: Reactive Power (MVAr) load characteristics

Mt Roskill
110 kV MVA

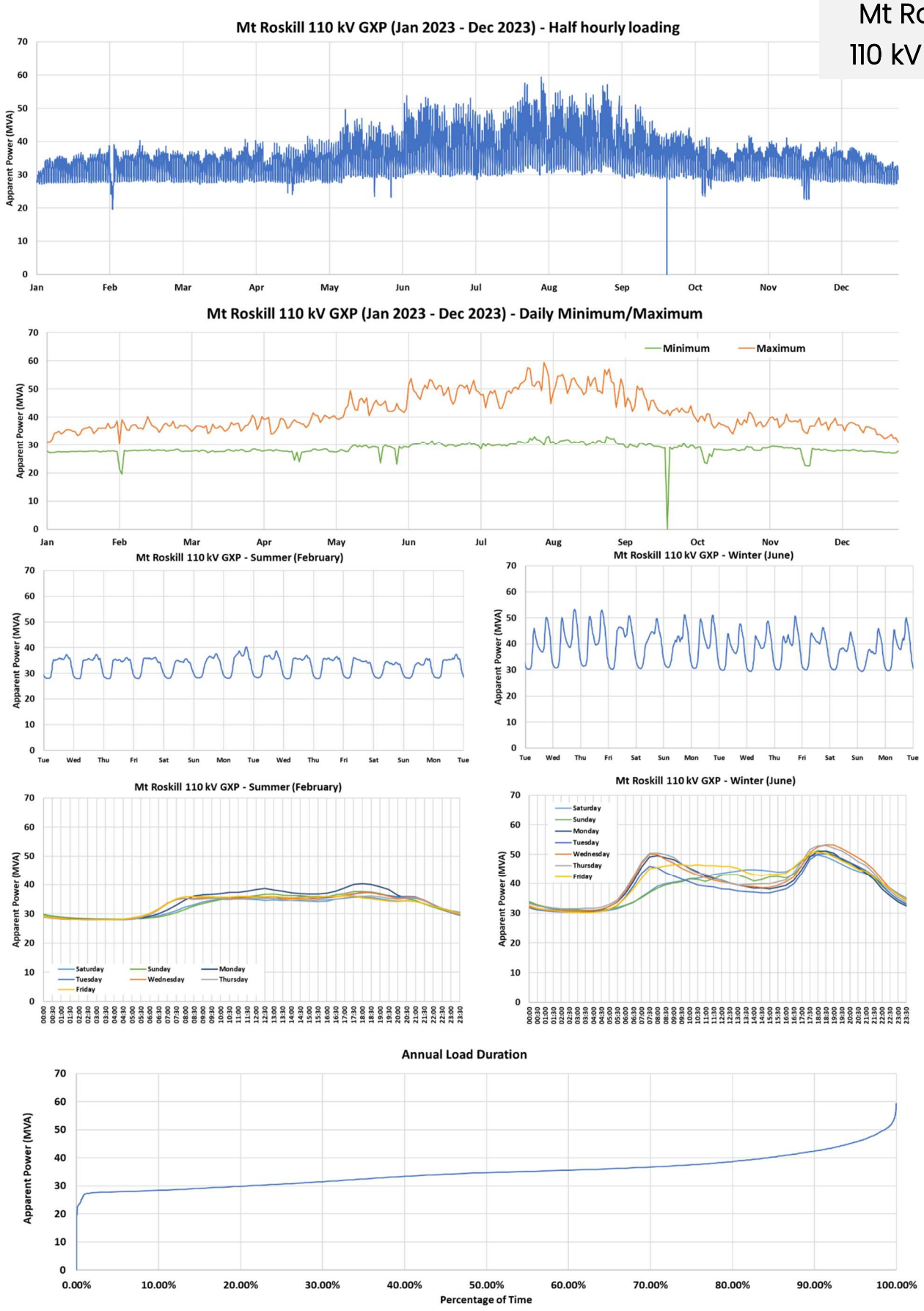

Figure 29. Mt Roskill 110 kV GXP: Apparent Power (MVA) load characteristics

Mt Roskill
110 kV MVAr

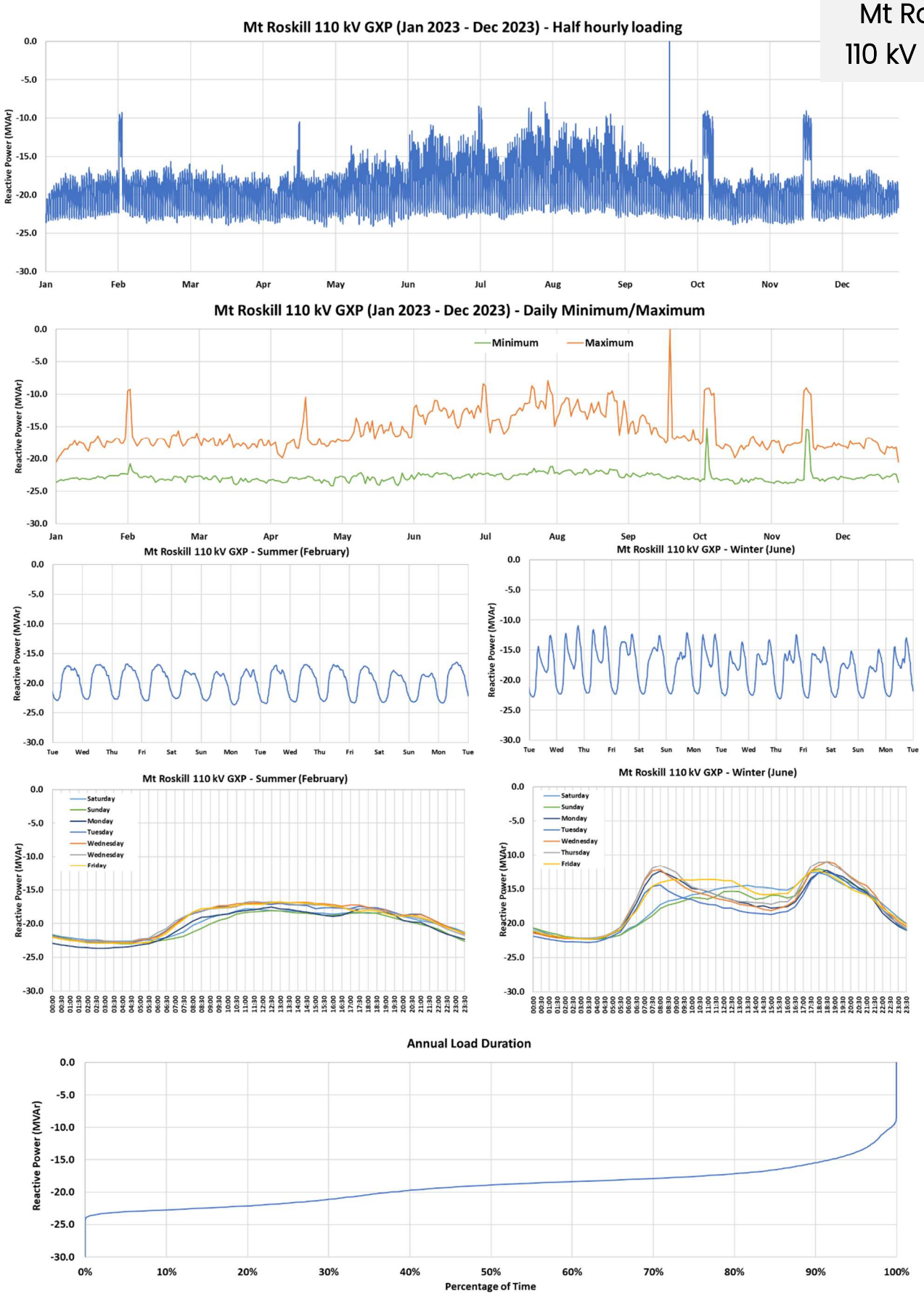

Figure 30. Mt Roskill 110 kV GXP: Reactive Power (MVAr) load characteristics

Mt Roskill
22 kV MVA

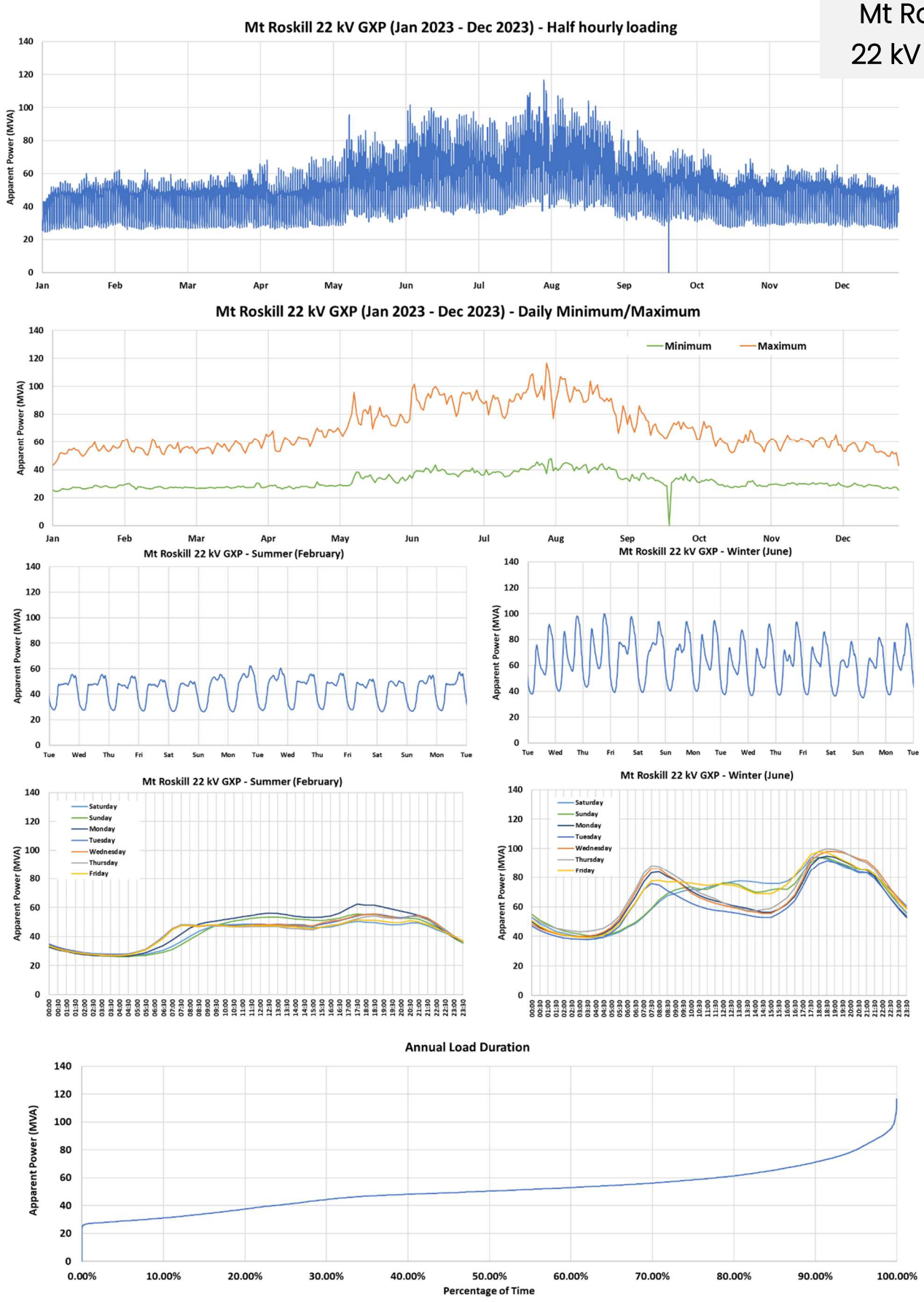

Figure 31. Mt Roskill 22 kV GXP: Apparent Power (MVA) load characteristics

Mt Roskill
22 kV MVAr

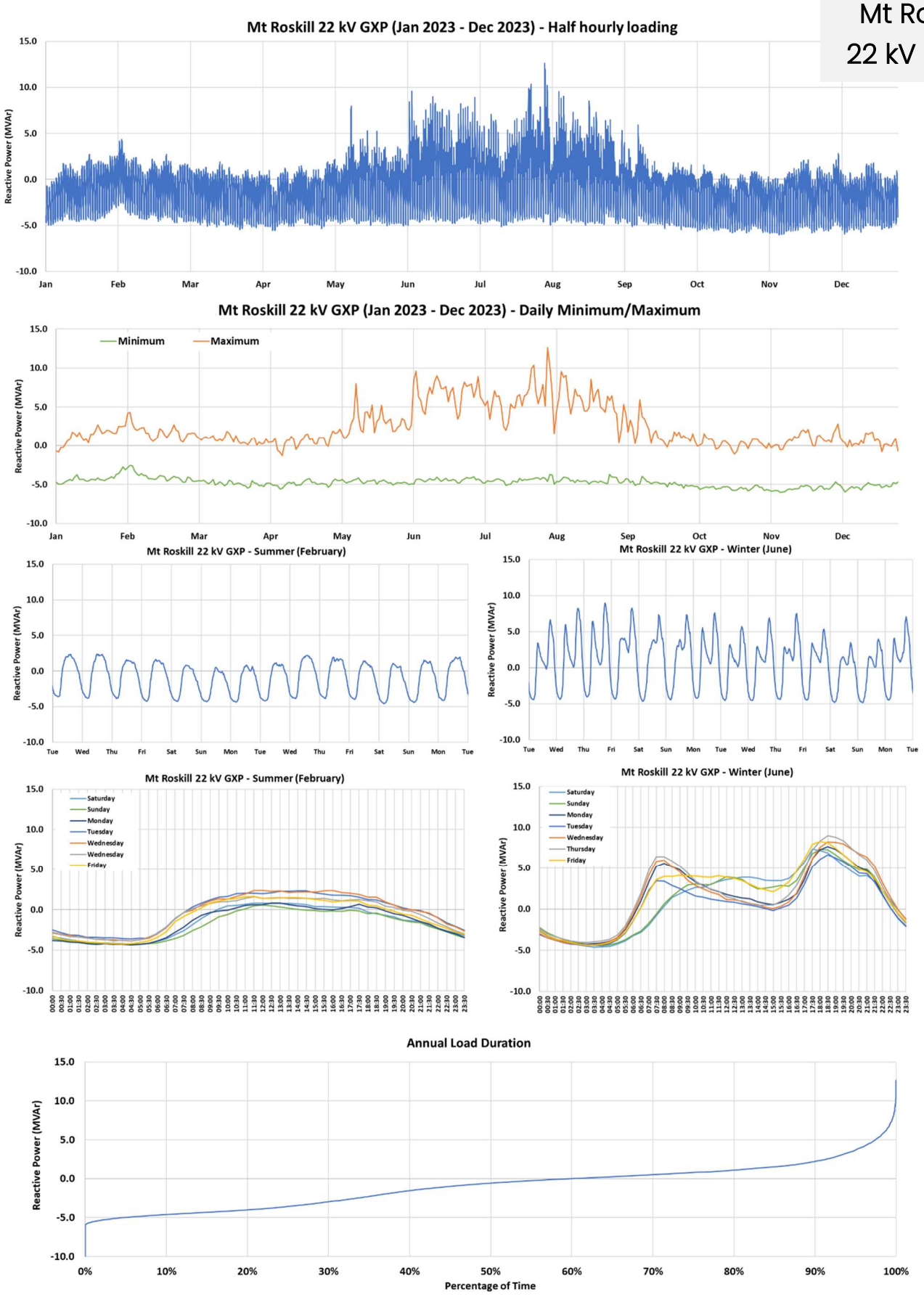

Figure 32. Mt Roskill 22 kV GXP: Reactive Power (MVAr) load characteristics

Silverdale
33 kV MVA

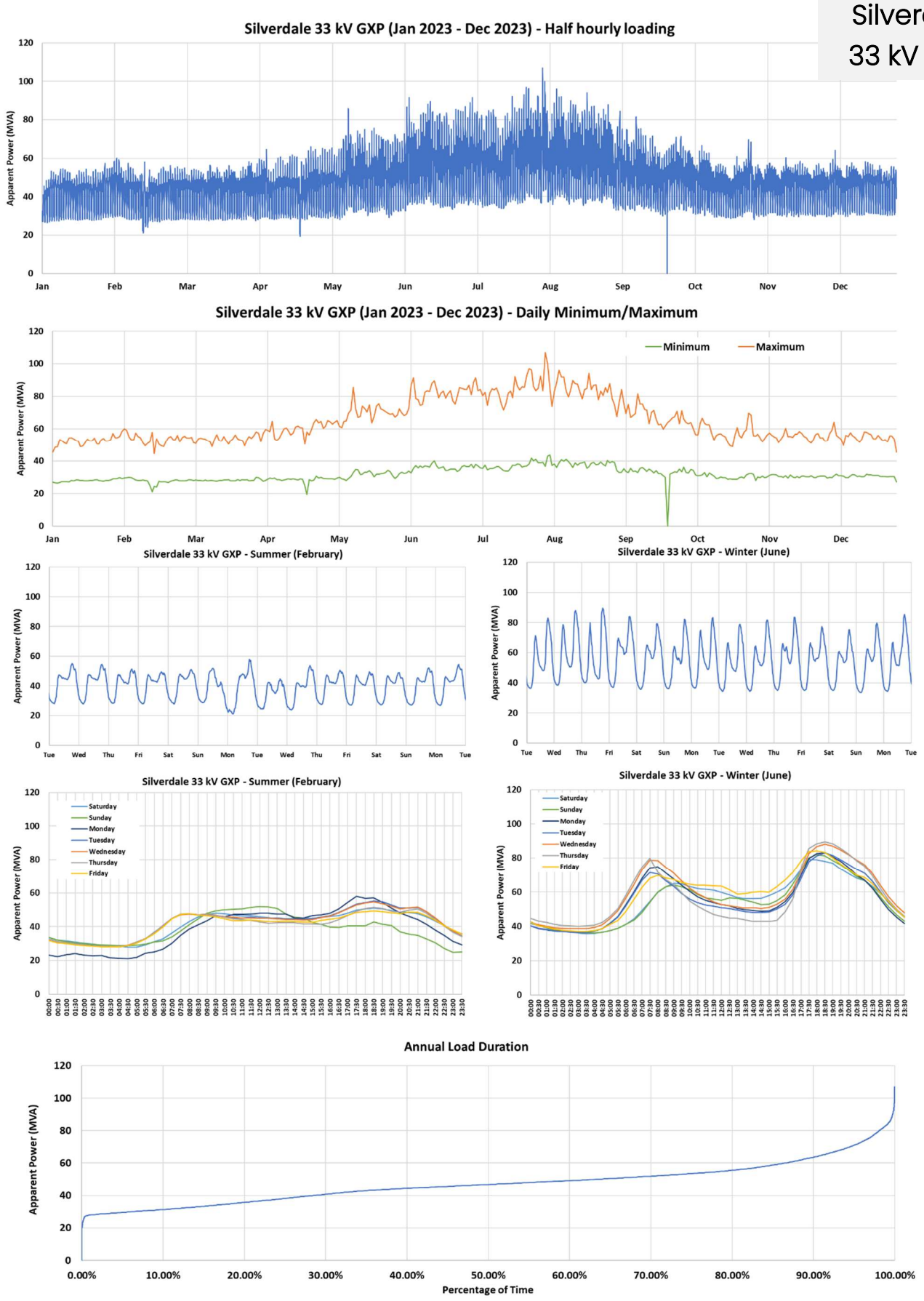

Figure 33. Silverdale 33 kV GXP: Apparent Power (MVA) load characteristics

Silverdale
33 kV MVAr

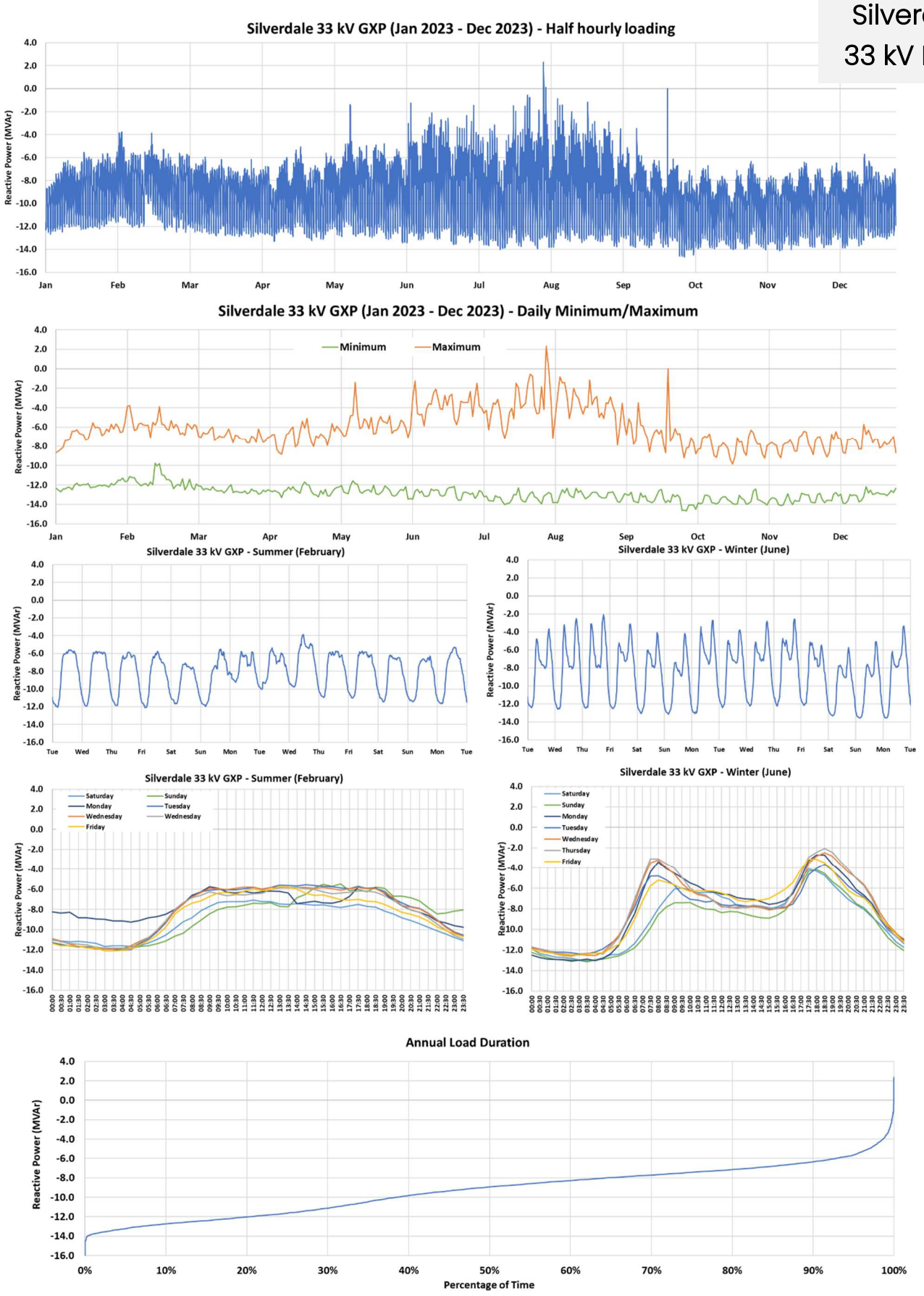

Figure 34. Silverdale 33 kV GXP: Reactive Power (MVAr) load characteristics

Takaanini
33 kV MVA

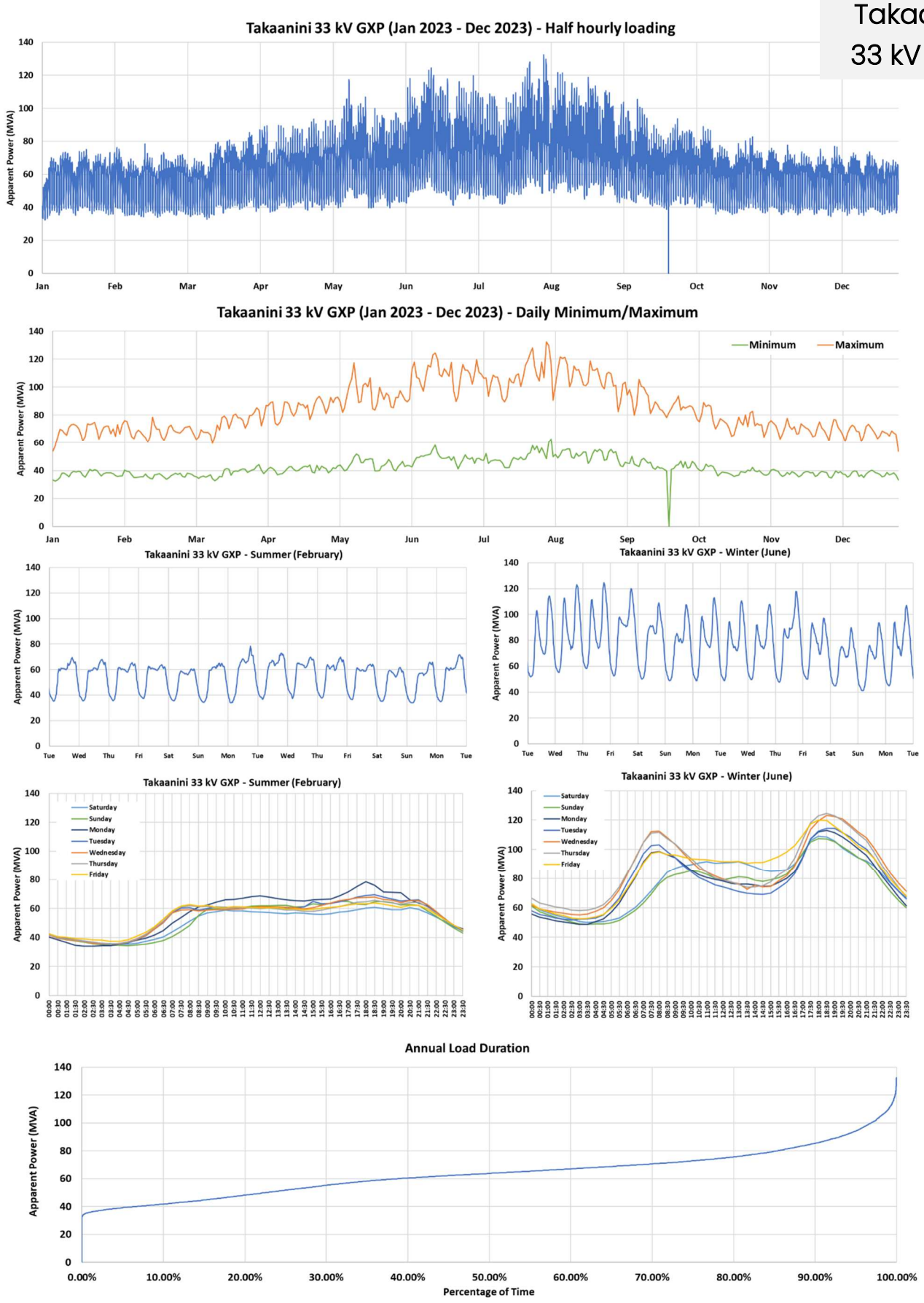

Figure 35. Takaanini 33 kV GXP: Apparent Power (MVA) load characteristics

Takaanini
33 kV MVAr

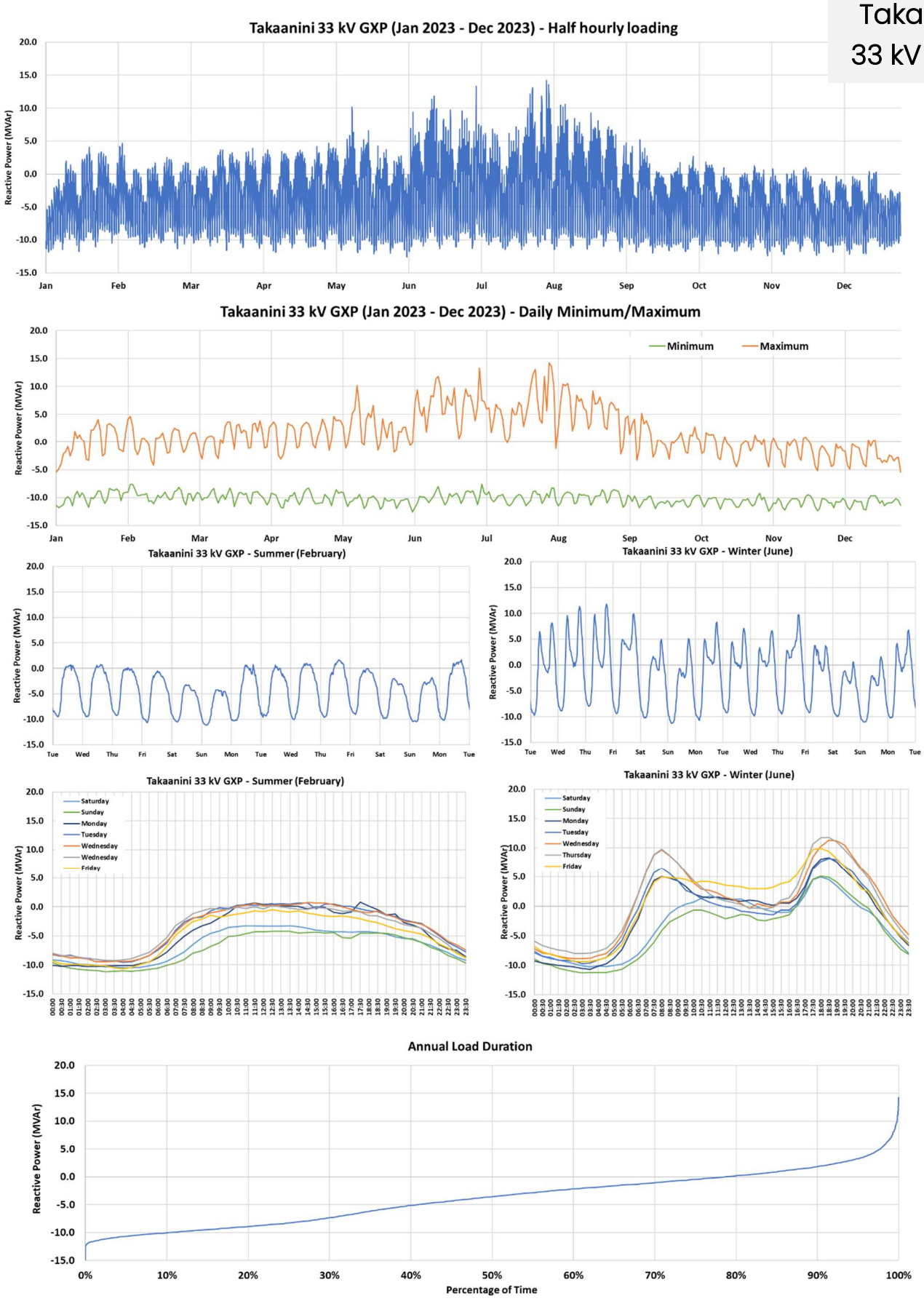

Figure 36. Takaanini 33 kV GXP: Reactive Power (MVAr) load characteristics

Wairau-Albany
33 kV MVA

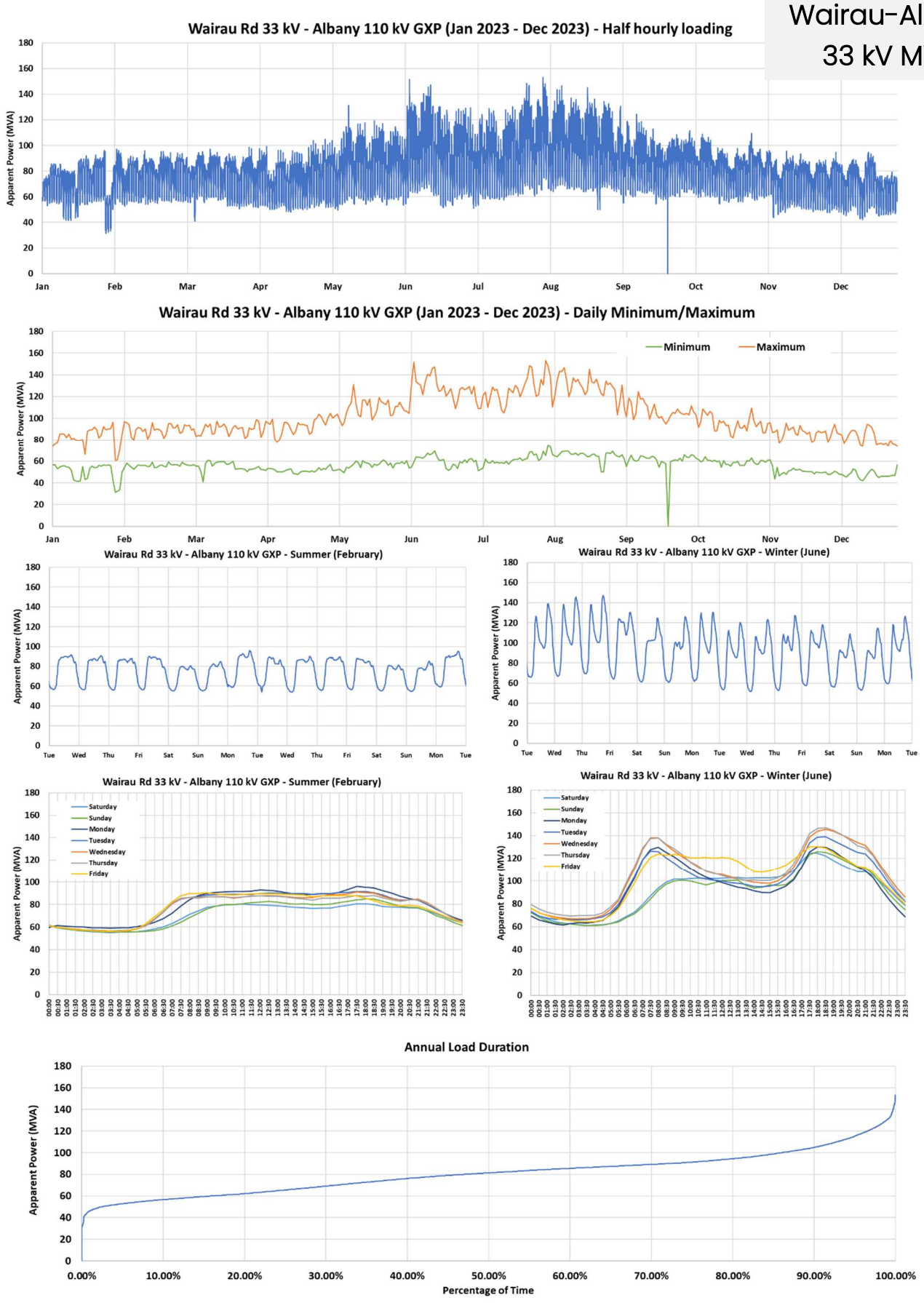

Figure 37. Wairau Rd 110 kV/Albany 33 kV GXP: Apparent Power (MVA) load characteristics

Wairau-Albany
33 kV MVAr

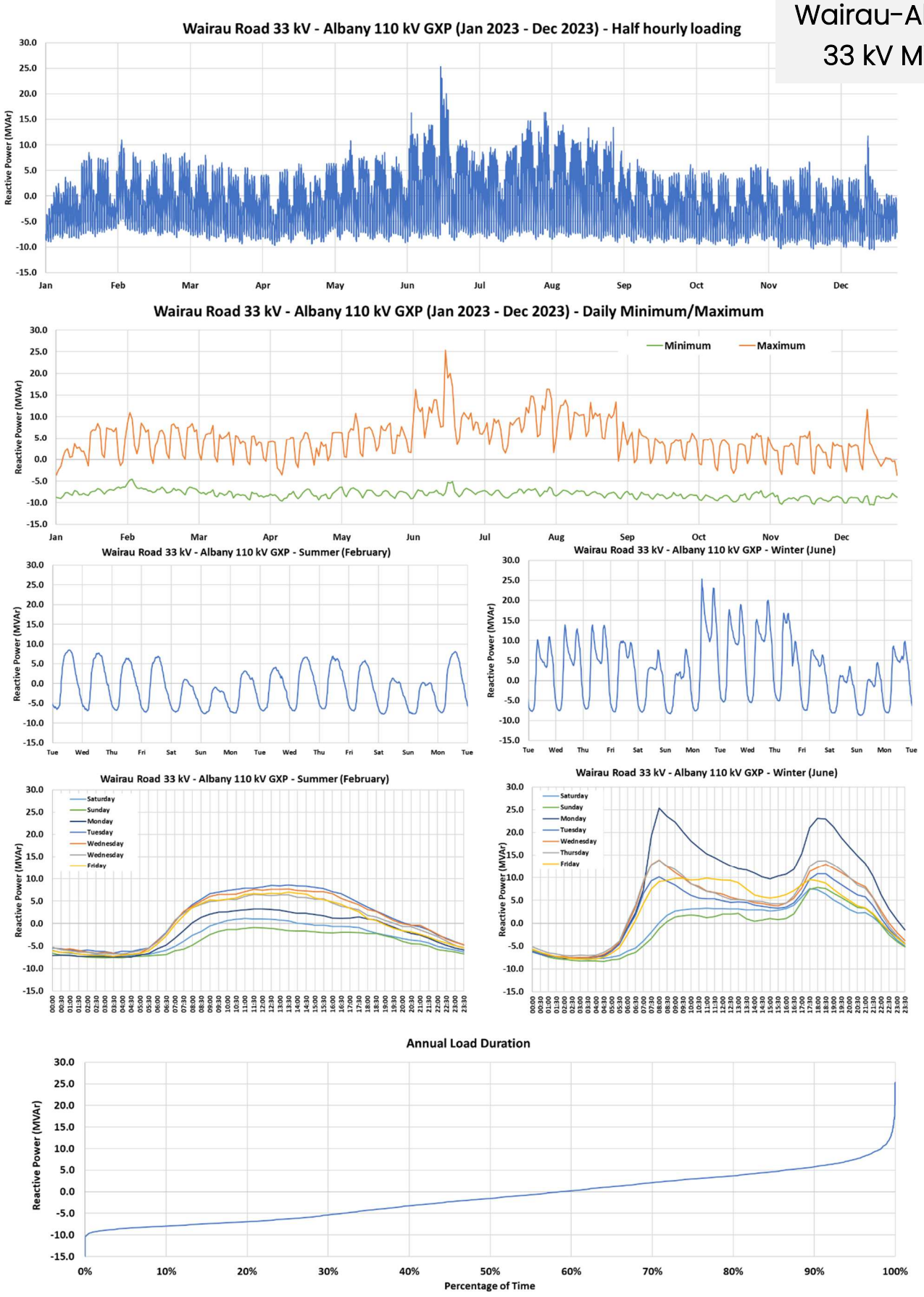

Figure 38. Wairau Rd 110 kV/Albany 33 kV GXP: Reactive Power (MVAr) load characteristics

Wellsford
33 kV MVA

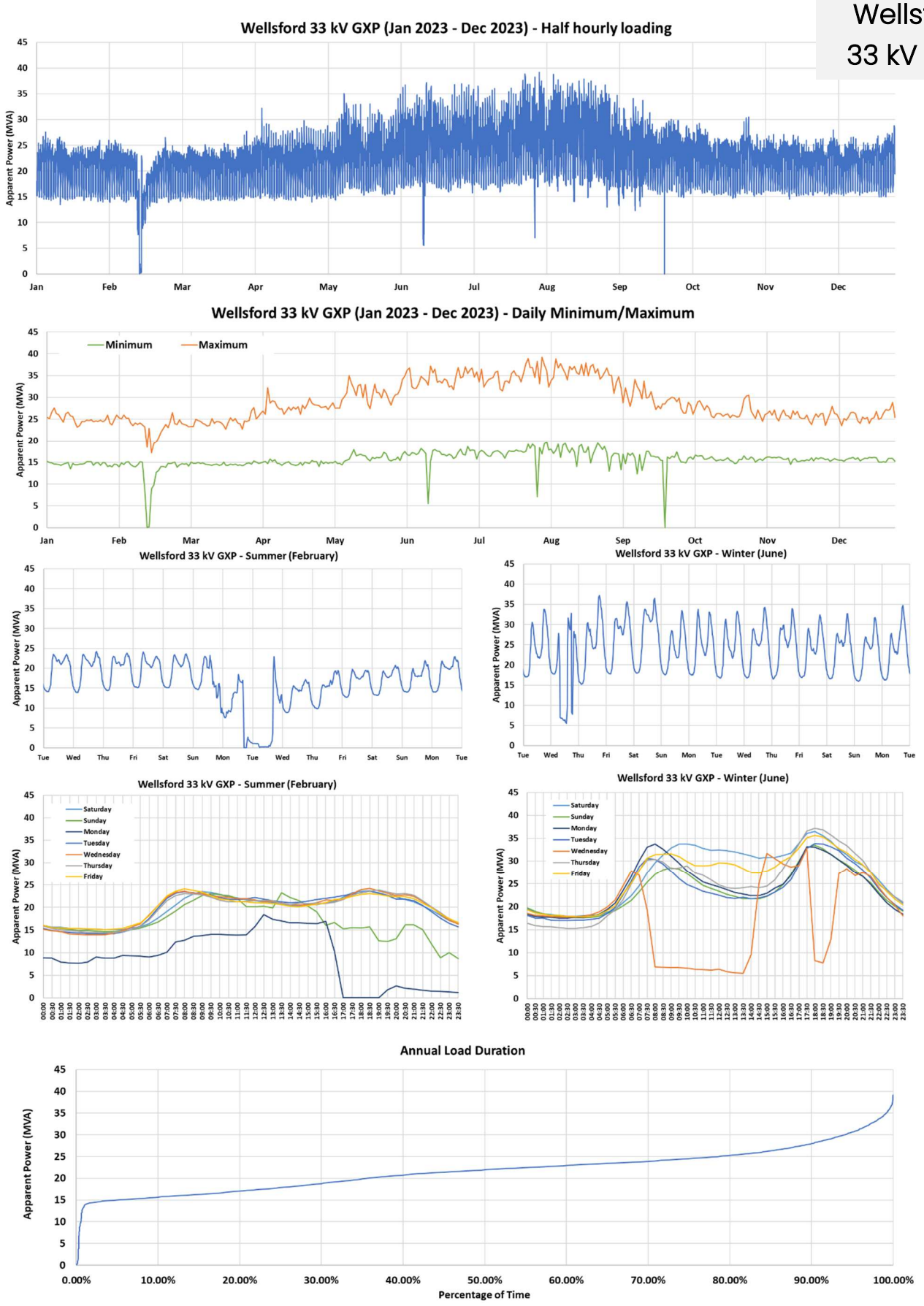

Figure 39. Wellsford 33 kV GXP: Apparent Power (MVA) load characteristics

Wellsford
33 kV MVAr

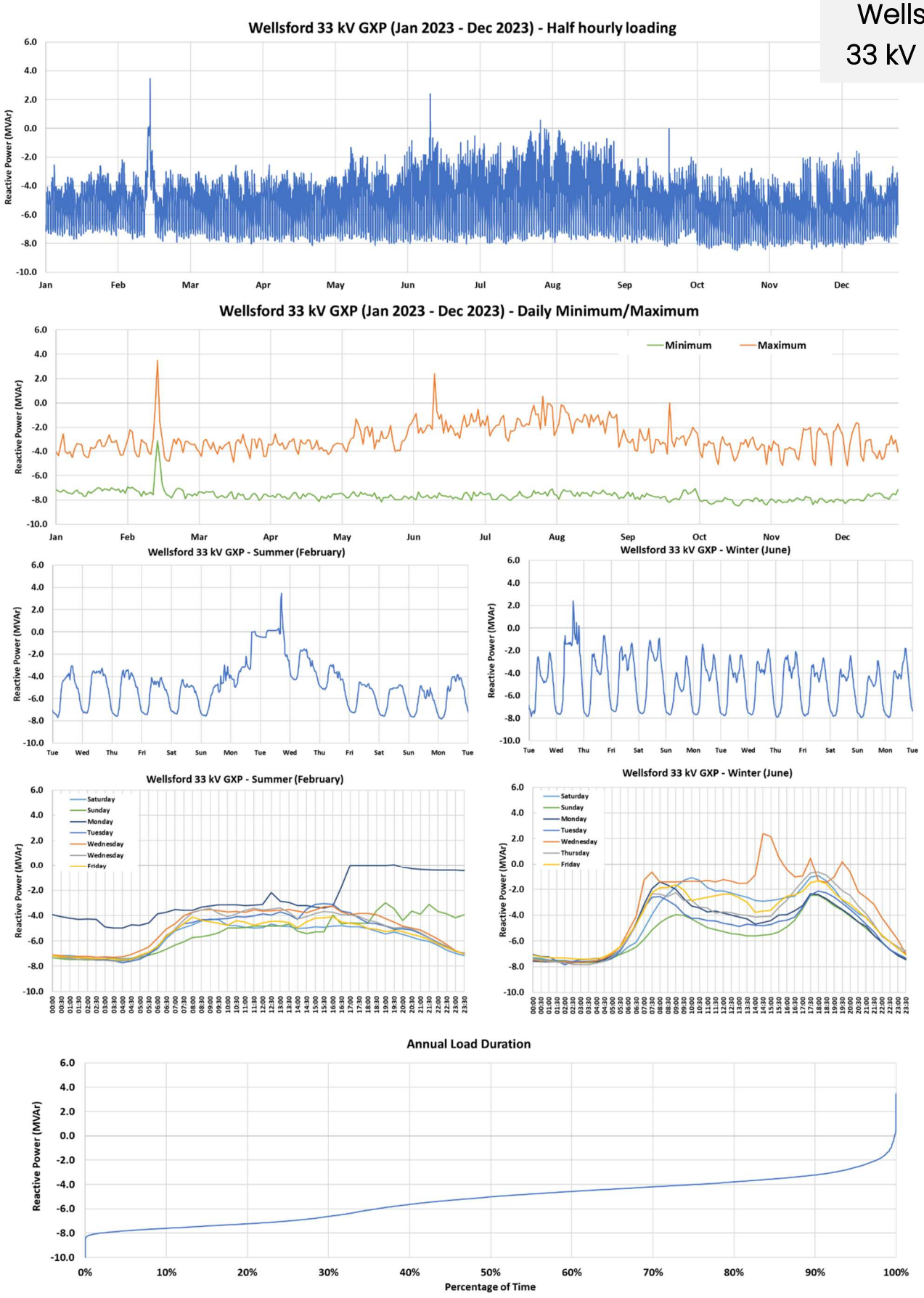

Figure 40. Wellsford 33 kV GXP: Reactive Power (MVAr) load characteristics

Wiri 33 kV MVA

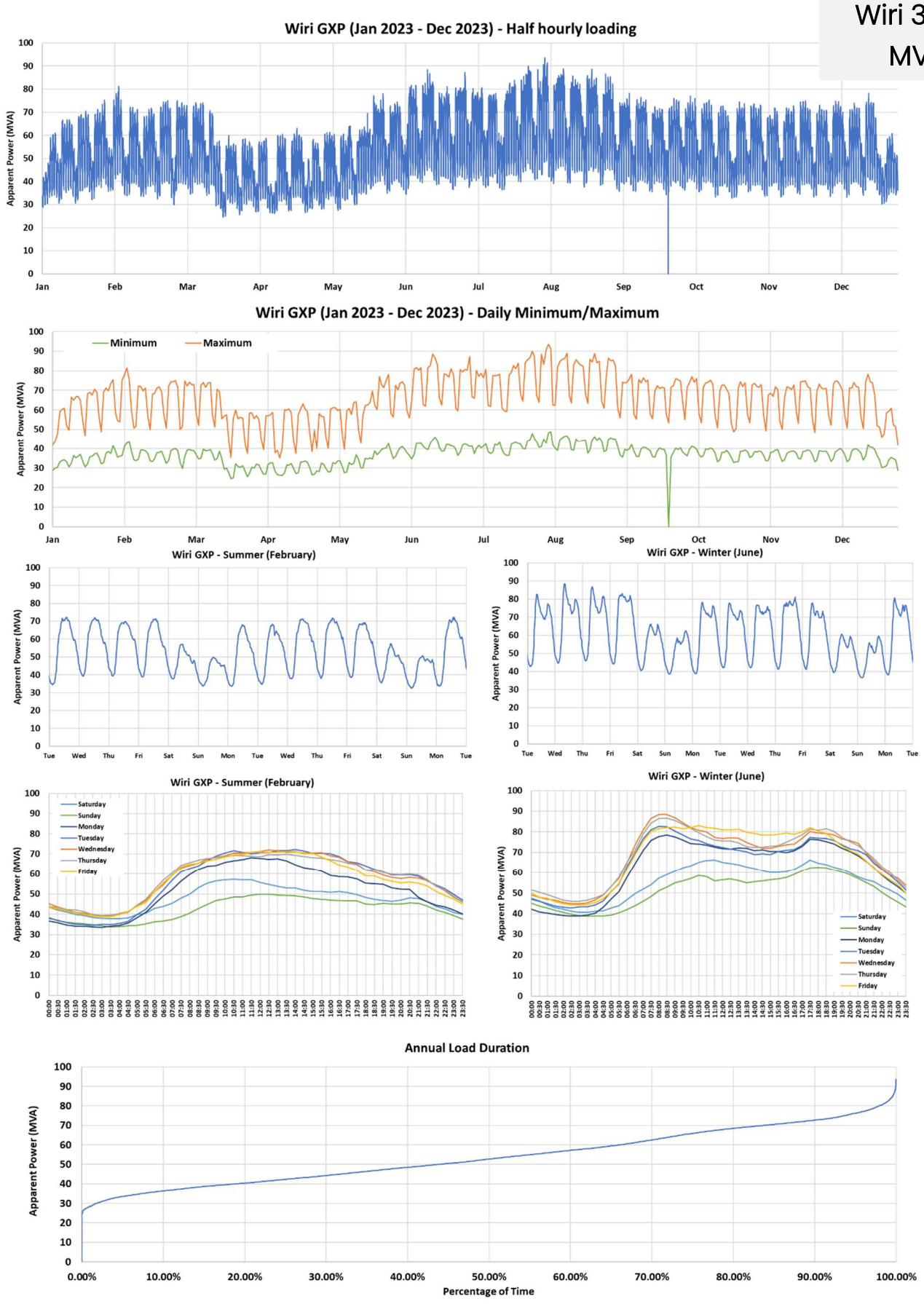

Figure 41. Wiri 33 kV GXP: Apparent Power (MVA) load characteristics

Wiri 33 kV MVAr

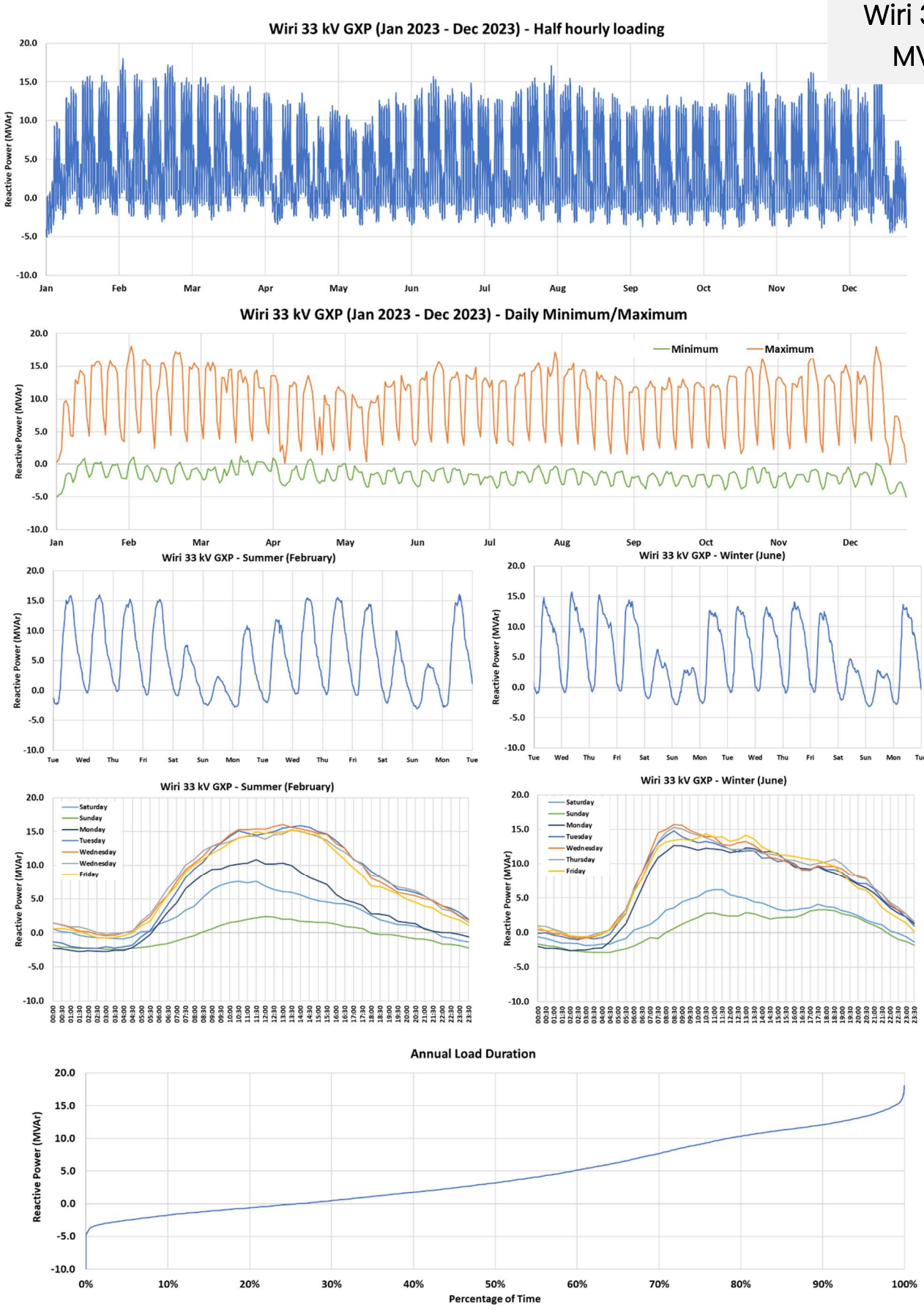

Figure 42. Wiri 33 kV GXP: Reactive Power (MVAr) load characteristics

Auckland CBD MVA

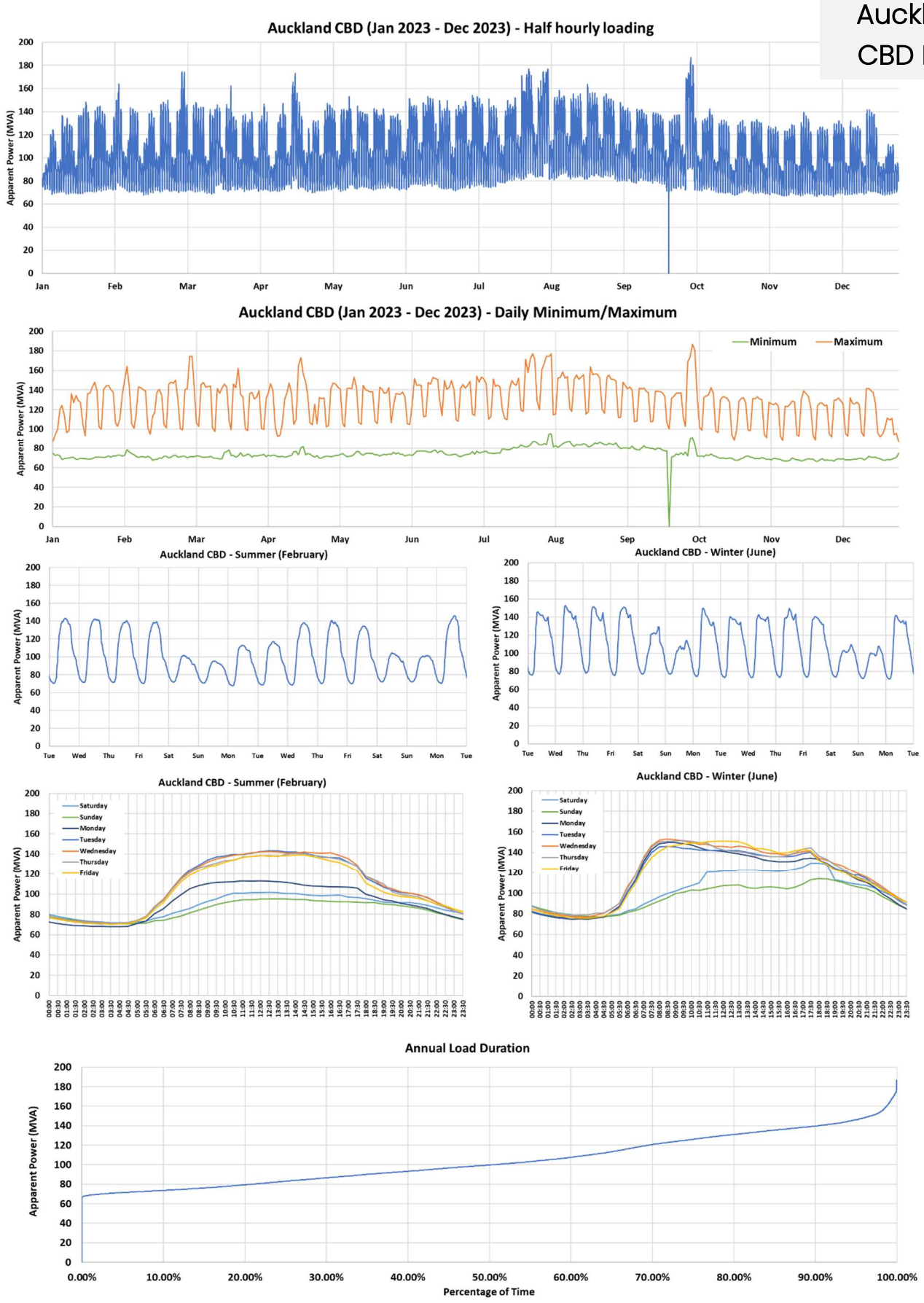

Figure 43. Auckland CBD GXPs: Apparent Power (MVA) load characteristics

Auckland CBD MVAr

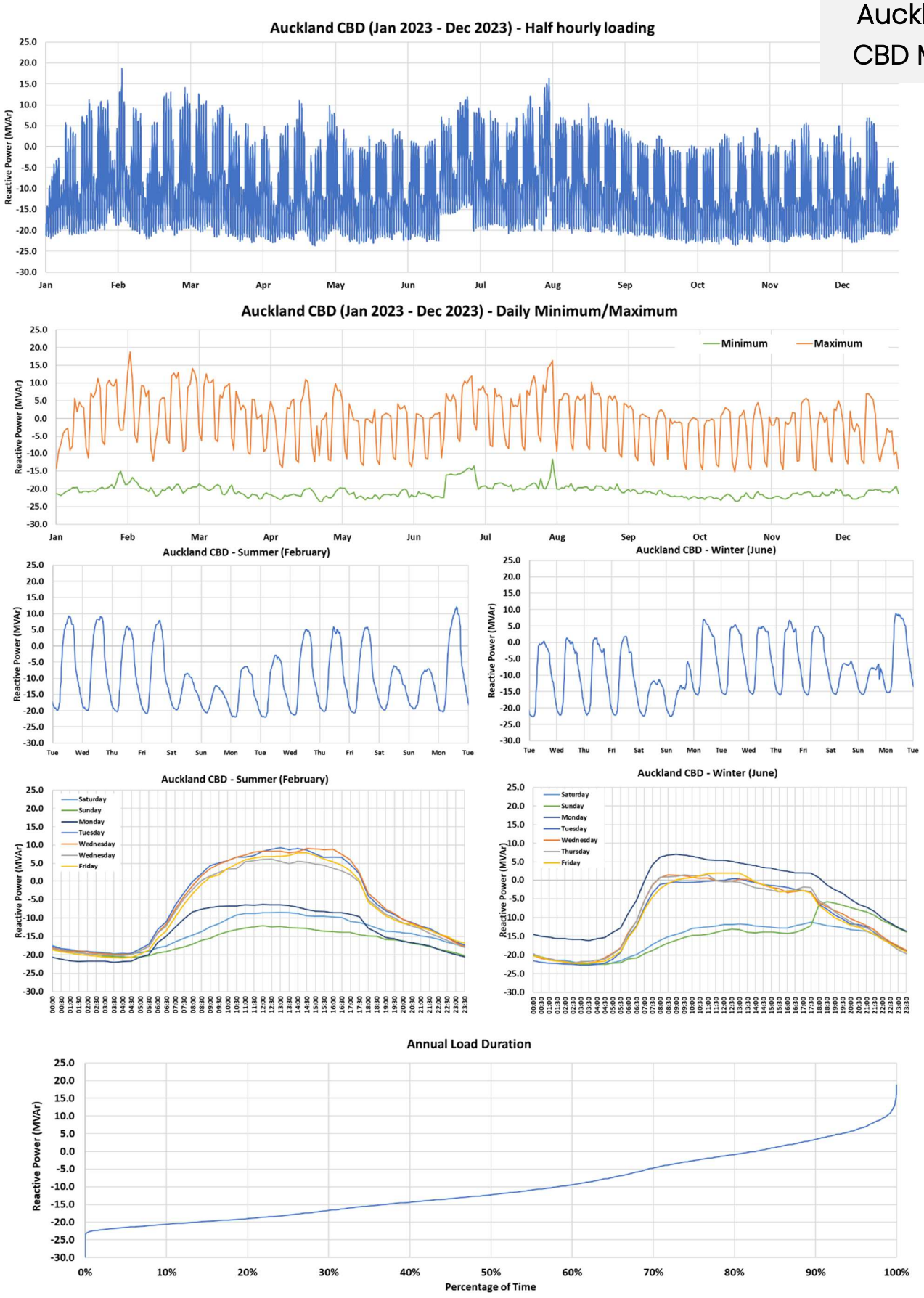

Figure 44. Auckland CBD GXPs: Reactive Power (MVAr) load characteristics