Bay of Plenty Network

Supplementary Information – Substation Load Characteristics

EECA

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Document History & Status

Revision	Date	Author	Reviewed by	Approved by	Status
A	26/7/2023	WT Rawlins			Draft
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Revision	Details
A	Draft
B	Final

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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 Bay of Plenty region. This document supplements the main report titled "*Bay of Plenty – Spare Capacity and Load Characteristics*".

For each GXP, the January 2022 through December 2022 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:

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- Owhata GXP
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- Takurenga GXP
  - Figure 25 Takurenga: Apparent power (MVA) load characteristics.
  - Figure 26 Takurenga: Reactive power (MVAr) load characteristics.

Edgecumbe MVA

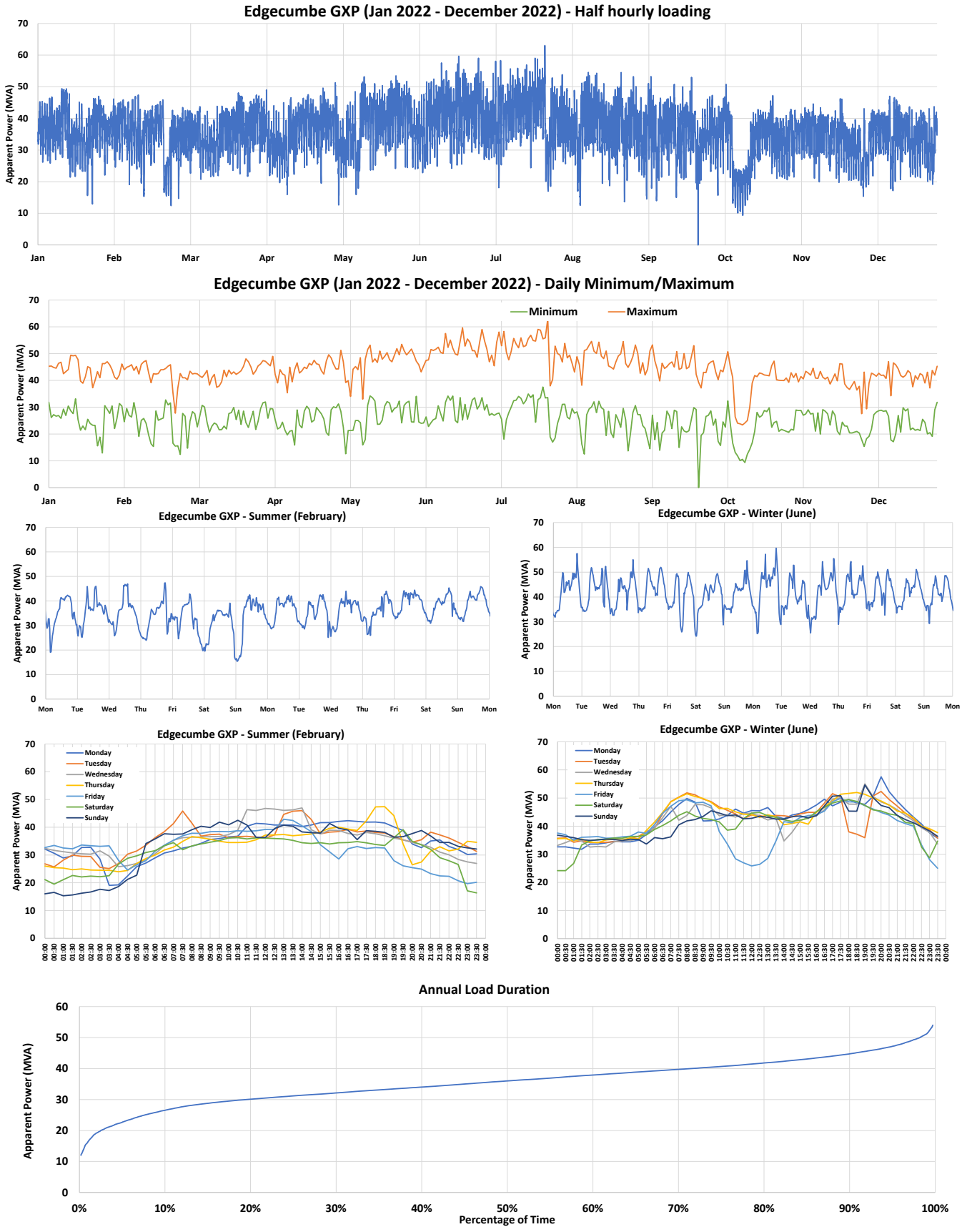

Figure 1 Edgecumbe: Apparent power (MVA) load characteristics.

Edgecumbe MVAr

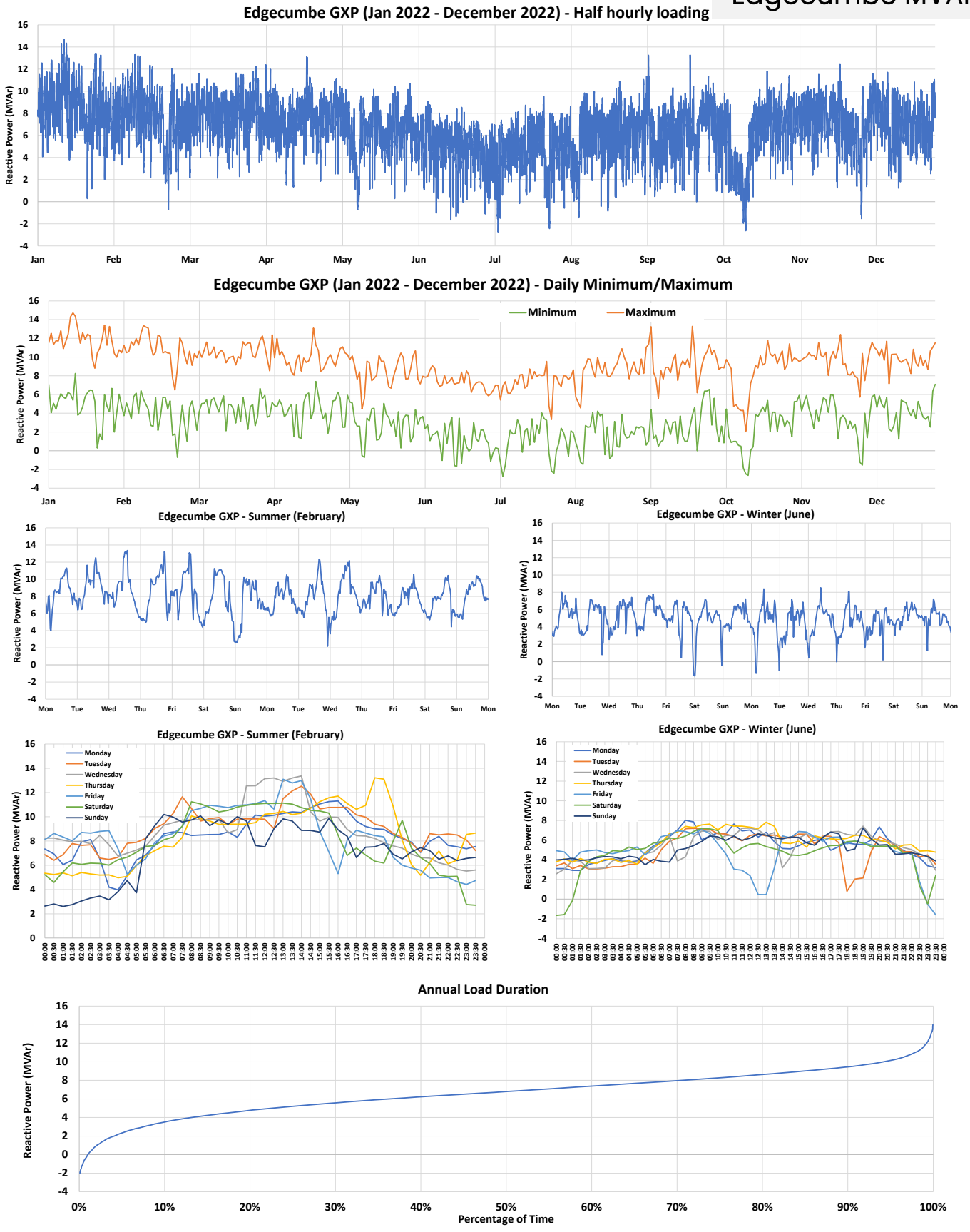

Figure 2 Edgecumbe: Reactive power (MVAr) load characteristics.

Kawerau

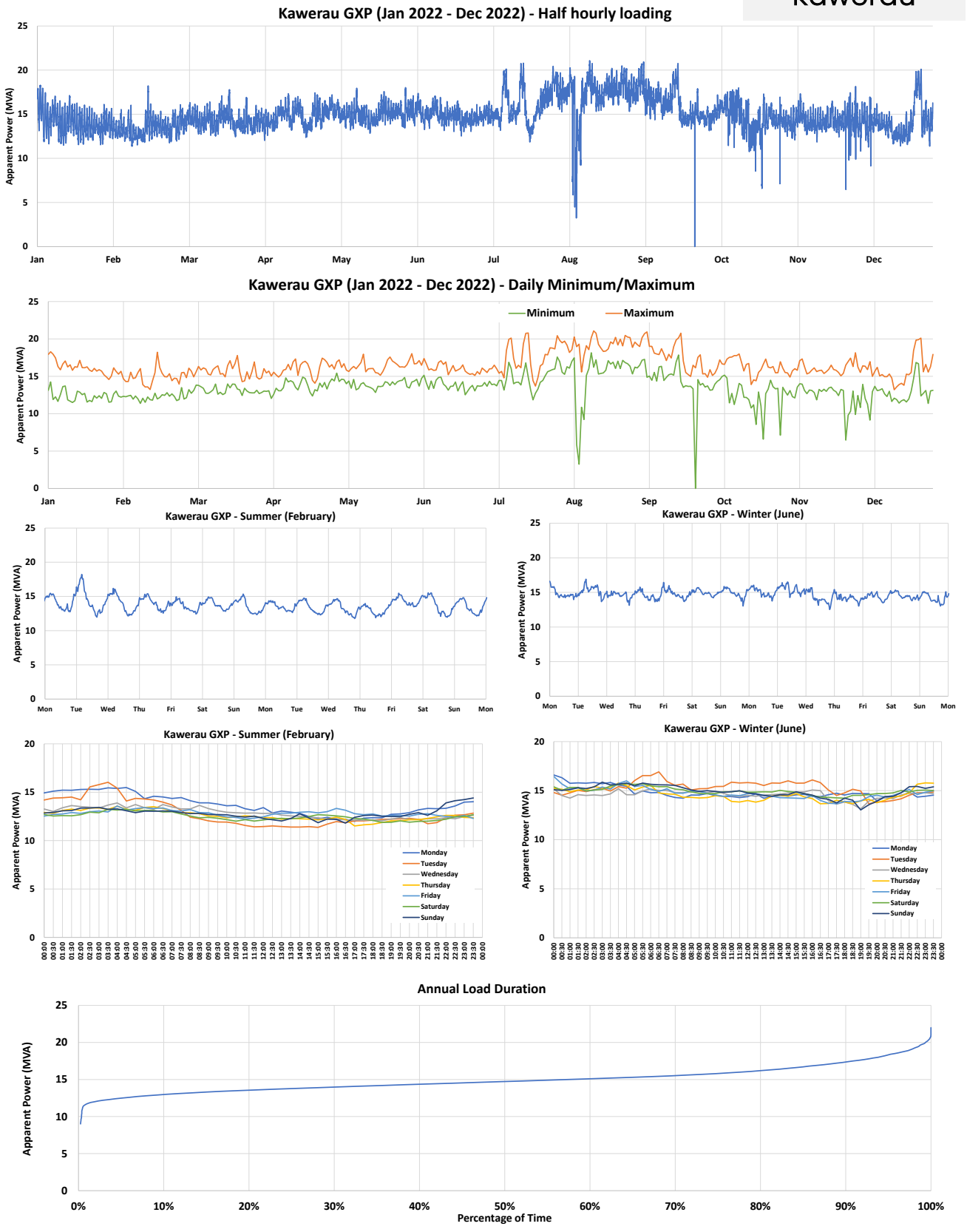

Figure 3 Kawerau: Apparent power (MVA) load characteristics.

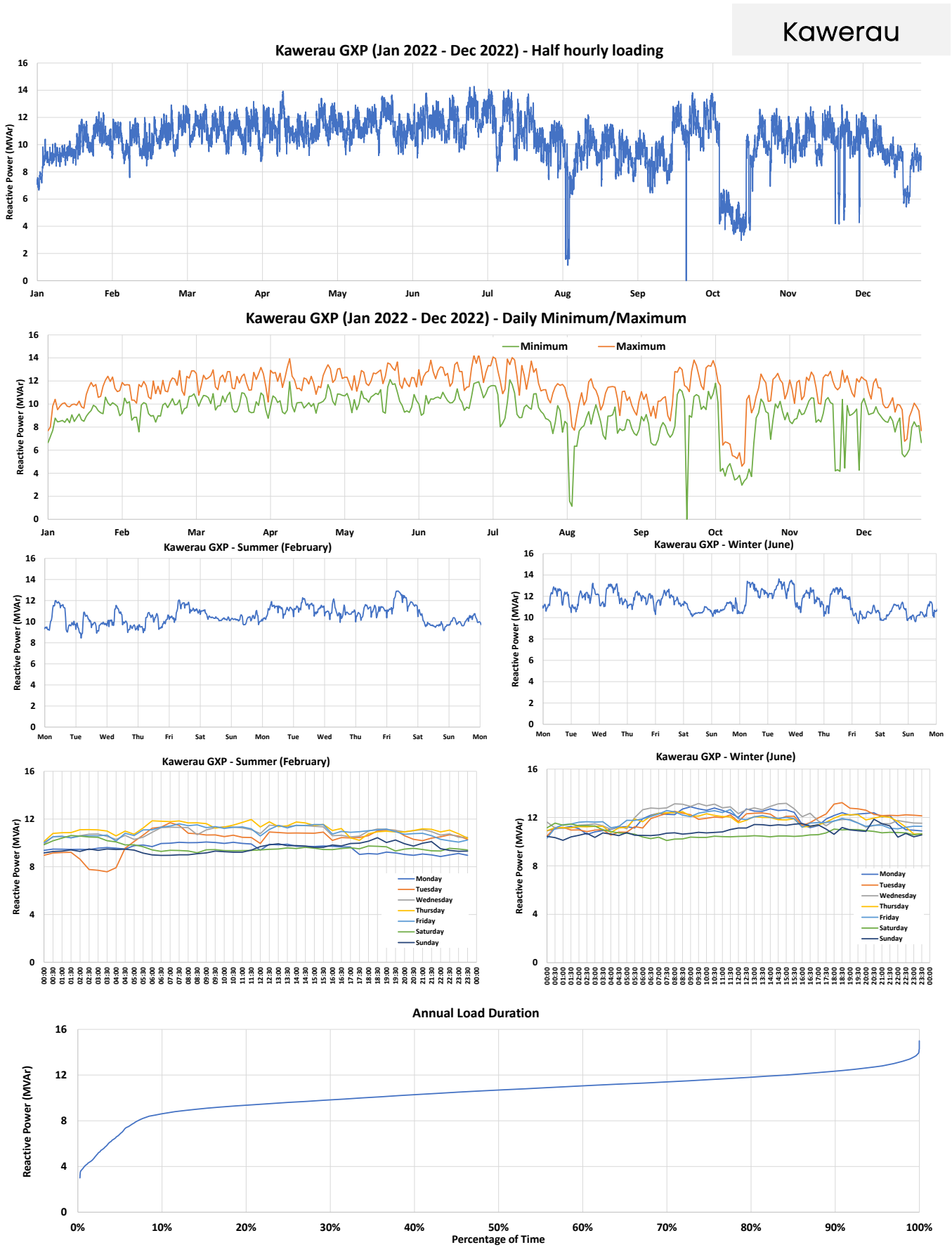

Figure 4 Kawerau: Reactive power (MVAr) load characteristics.

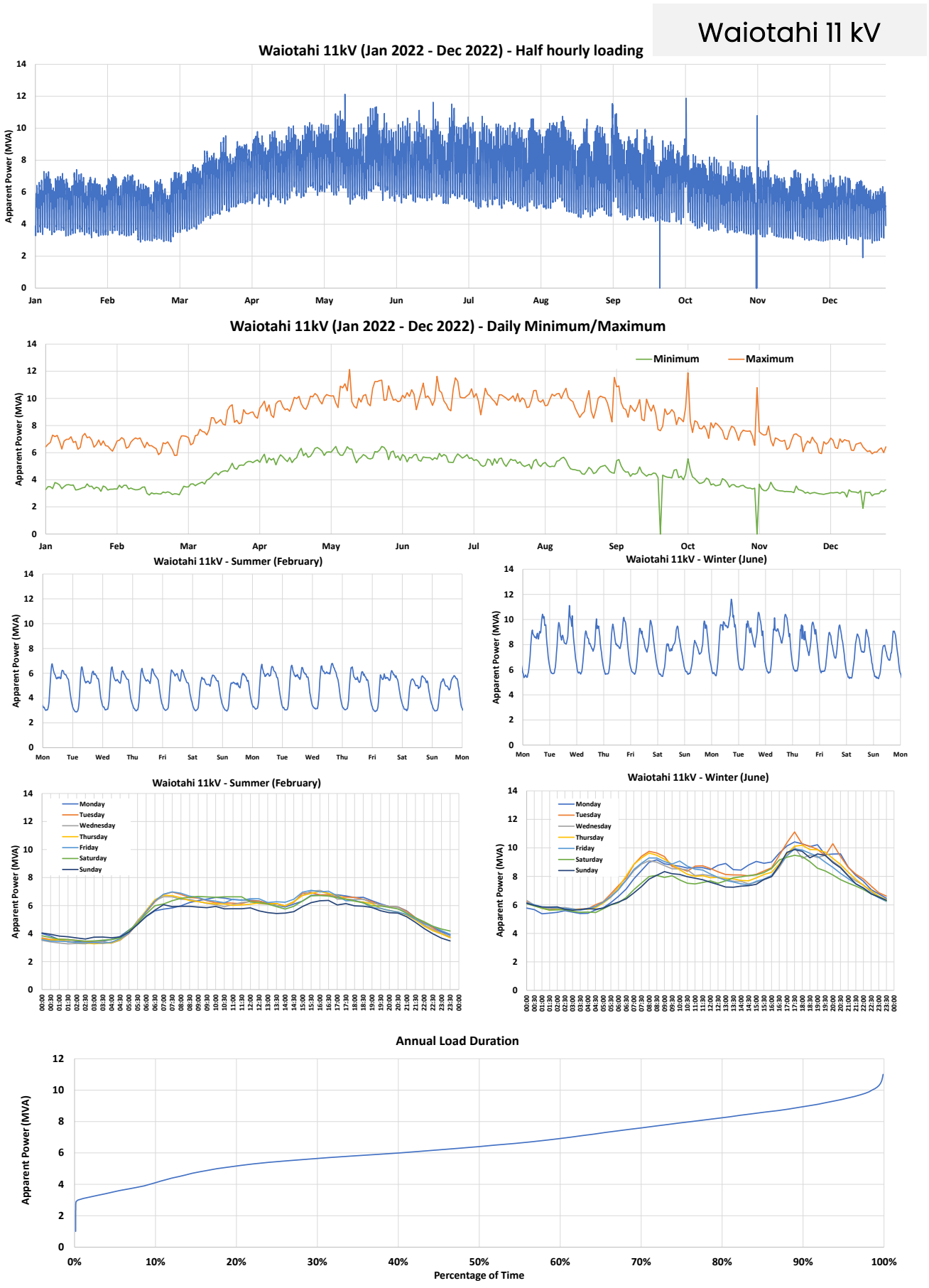

Figure 5 Waiotahi 11 kV: Apparent power (MVA) load characteristics.

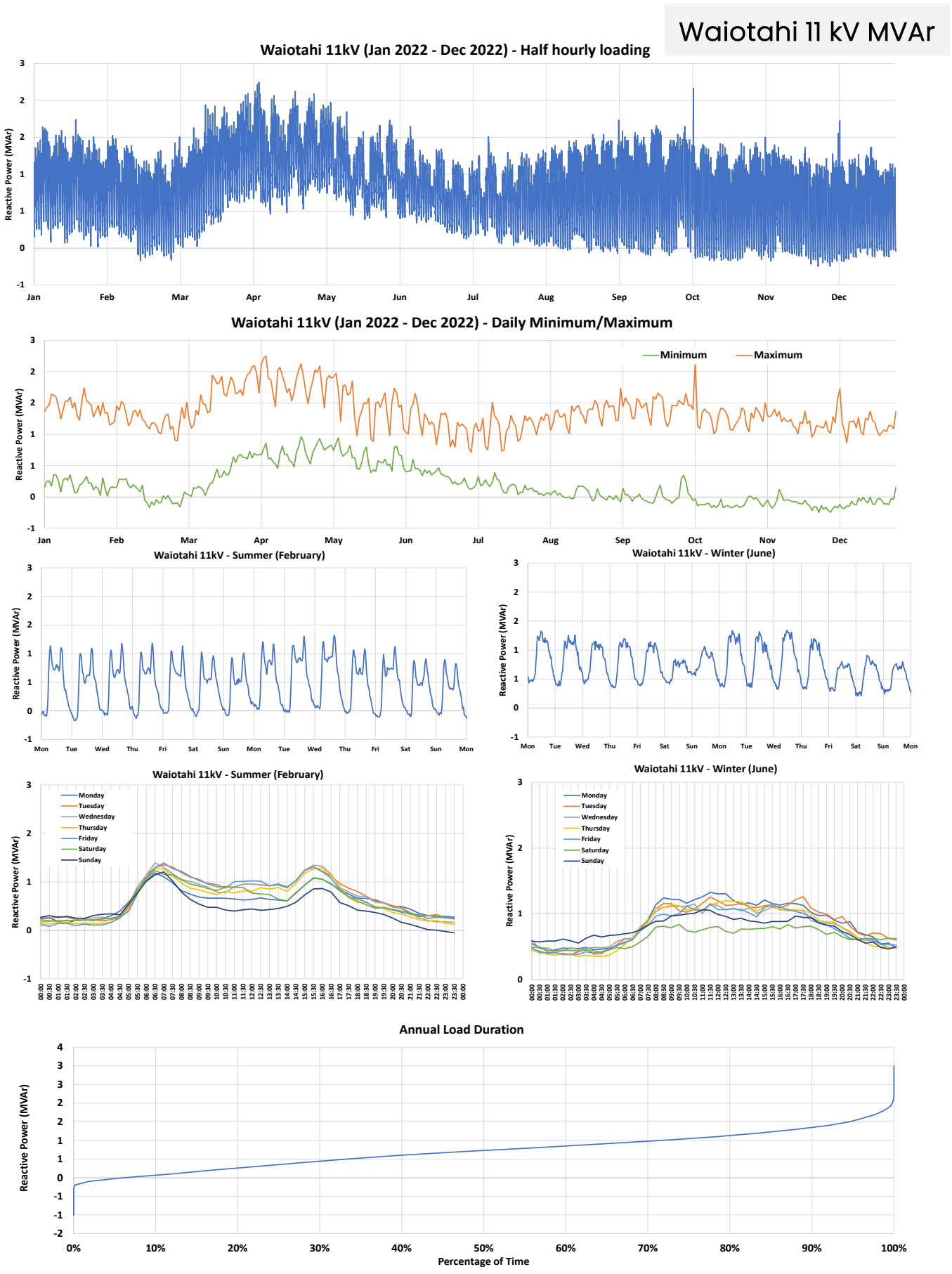

Figure 6 Waiotahi 11 kV: Reactive power (MVAr) load characteristics.

Waiotahi 50 kV

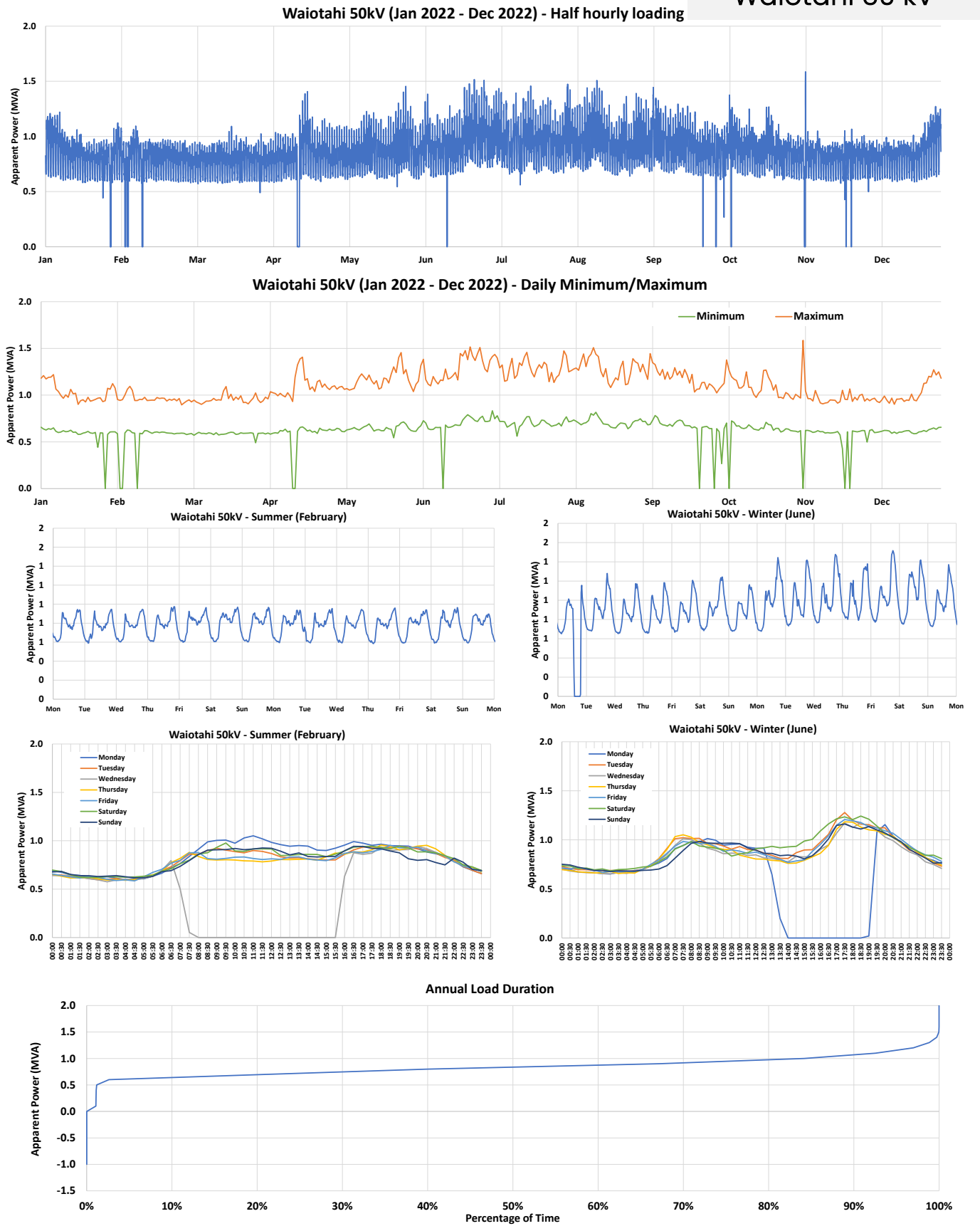

Figure 7 Waiotahi 50 kV: Apparent power (MVA) load characteristics.

Waiotahi 50 kV

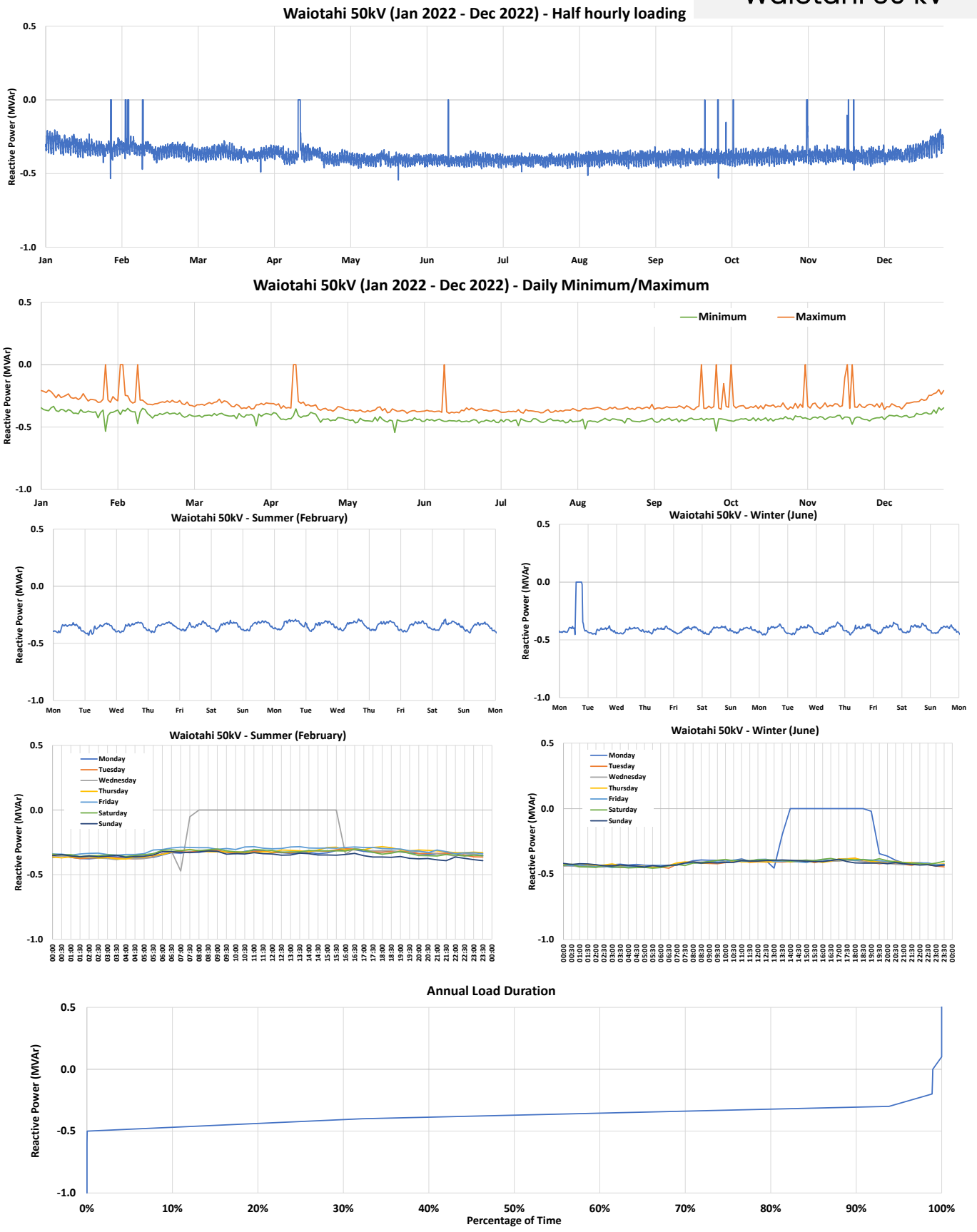

Figure 8 Waiotahi 50 kV: Reactive power (MVAr) load characteristics.

Tauranga 11 kV MVA

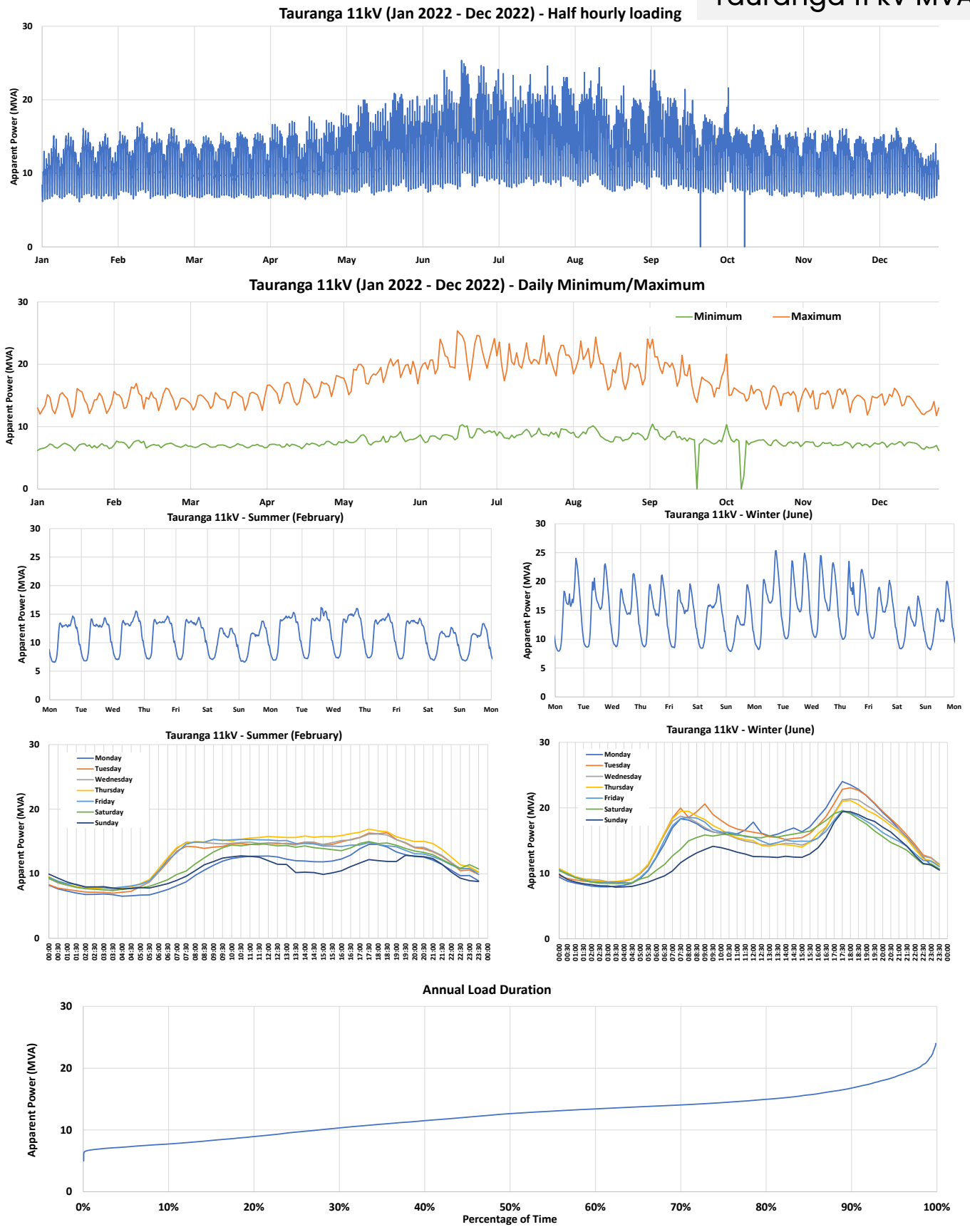

Figure 9 Tauranga 11 kV: Apparent power (MVA) load characteristics.

Tauranga 11 kV MVAr

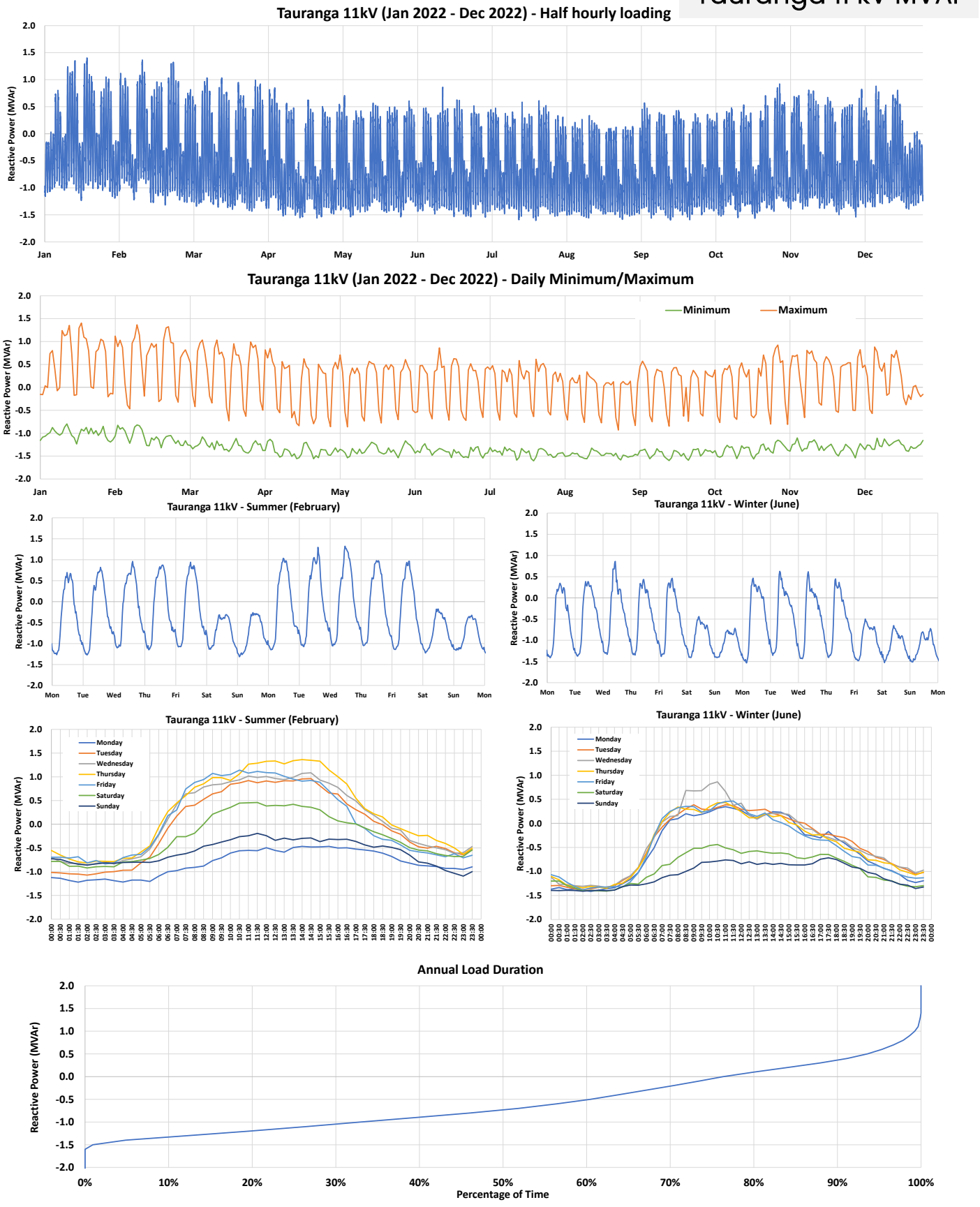

Figure 10 Tauranga 11 kV: Reactive power (MVAr) load characteristics.

Tauranga 33 kV

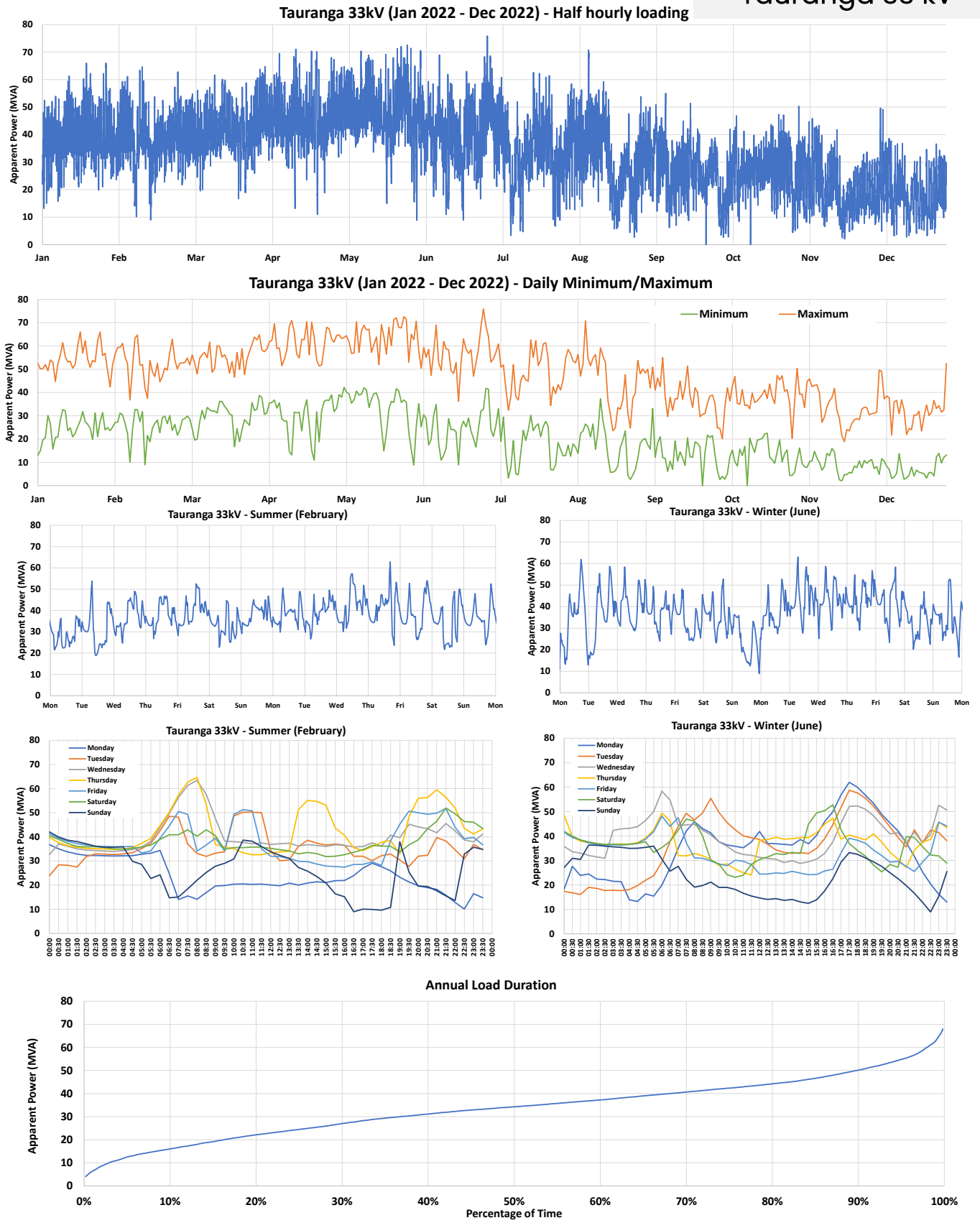

Figure 11 Tauranga 33 kV: Apparent power (MVA) load characteristics.

Tauranga 33 kV MVAr

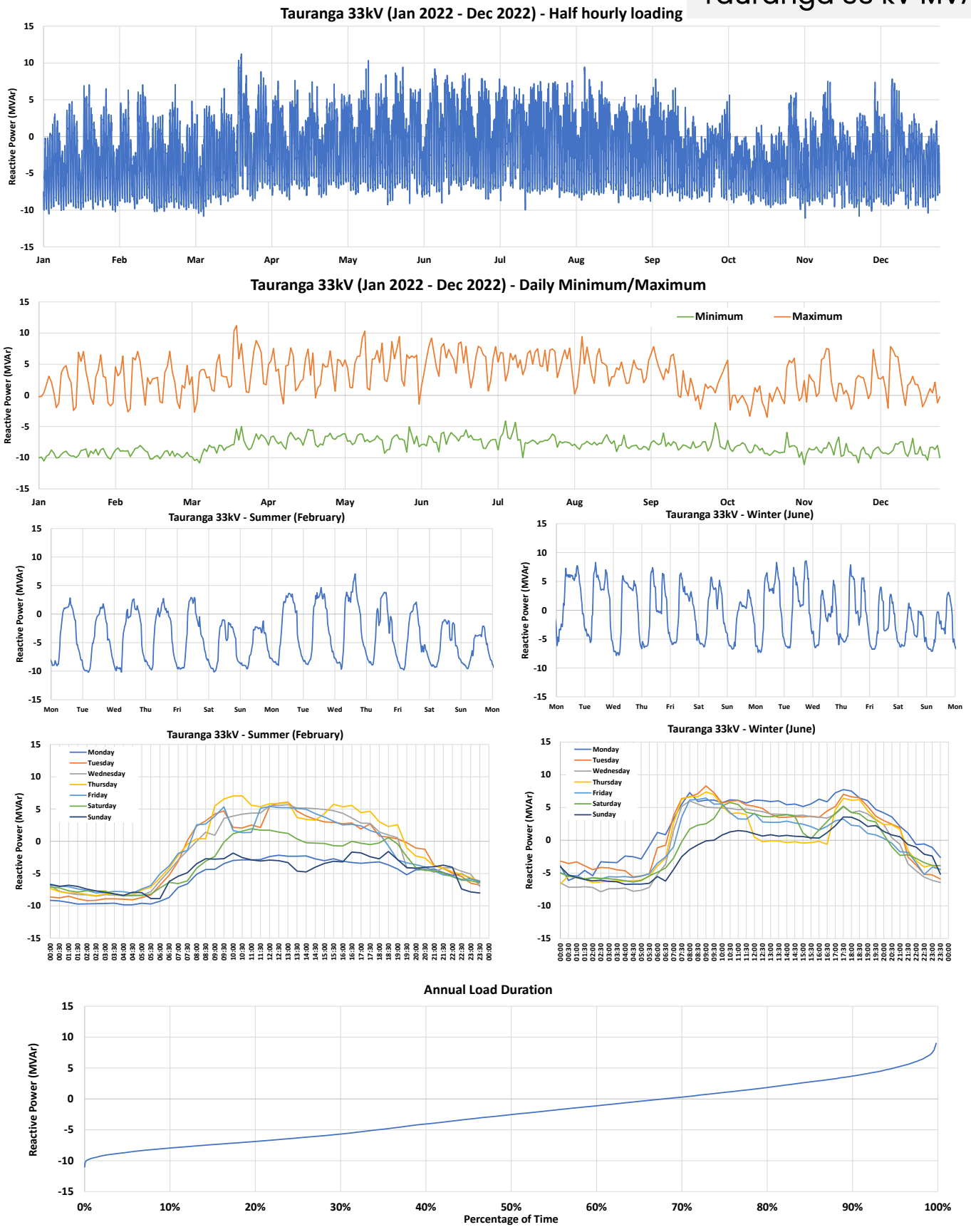

Figure 12 Tauranga 33 kV: Reactive power (MVAr) load characteristics.

Kaitimako MVA

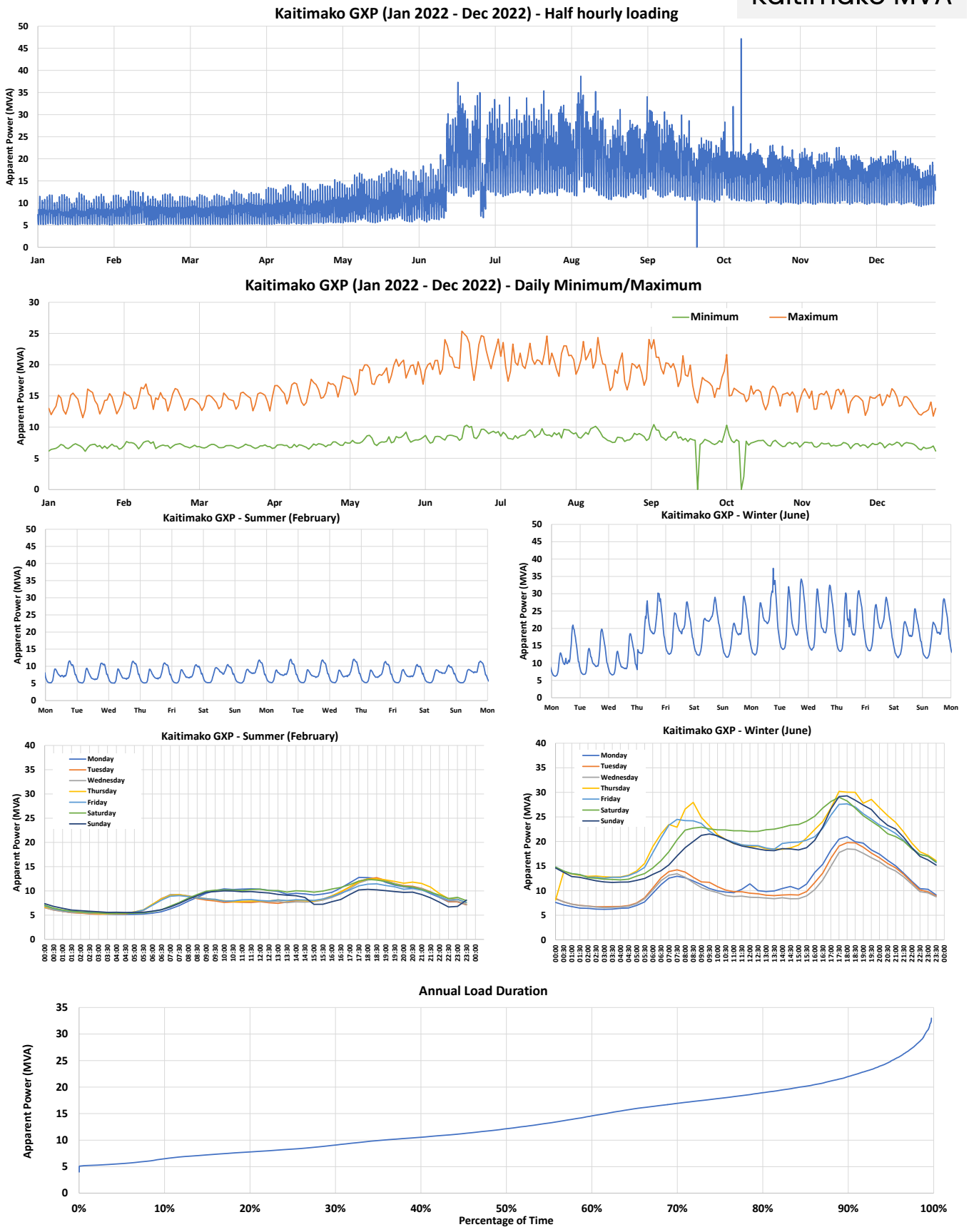

Figure 13 Kaitimako: Apparent power (MVA) load characteristics.

Kaitimako

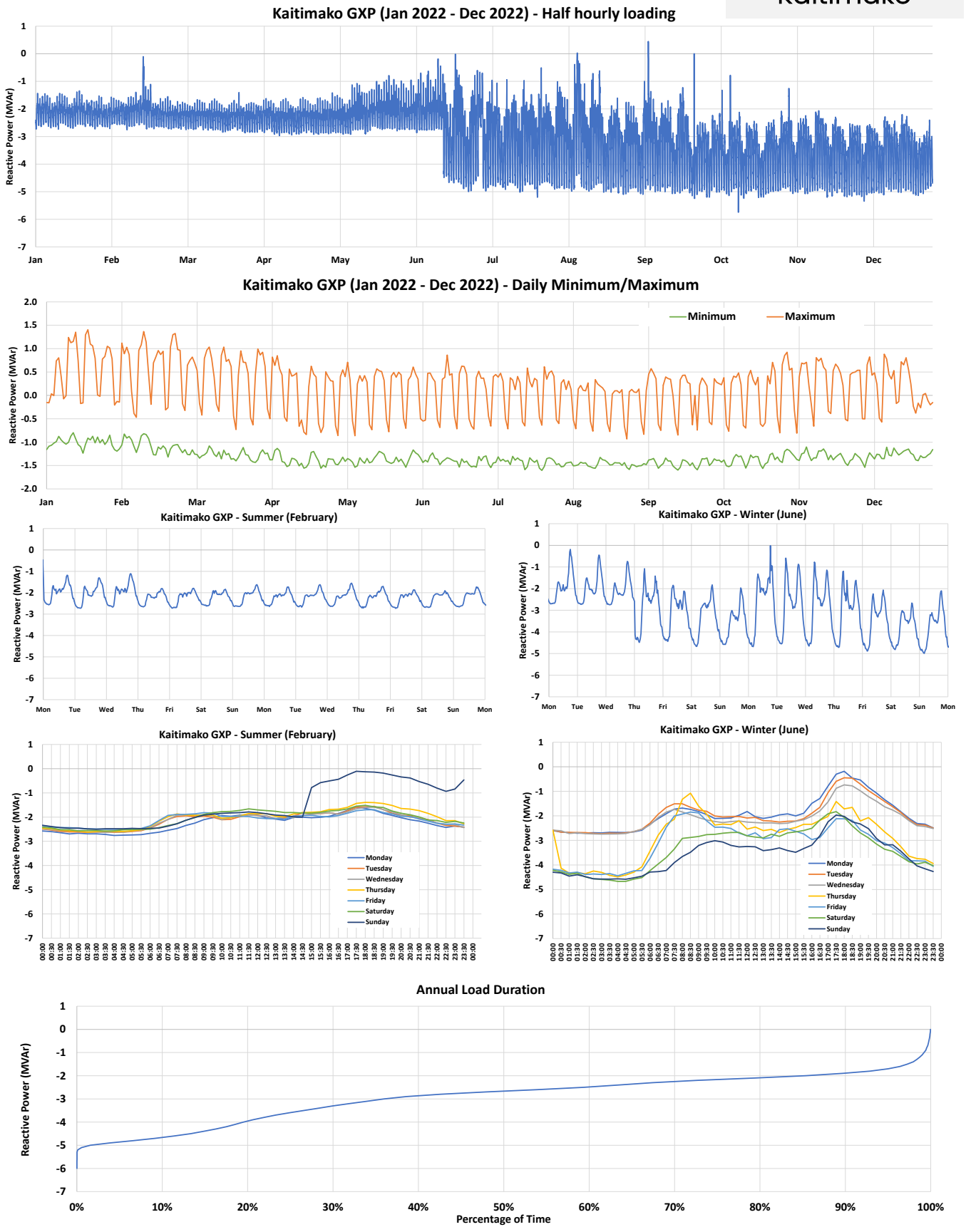

Figure 14 Kaitimako: Reactive power (MVAr) load characteristics.

Mt Maunganui

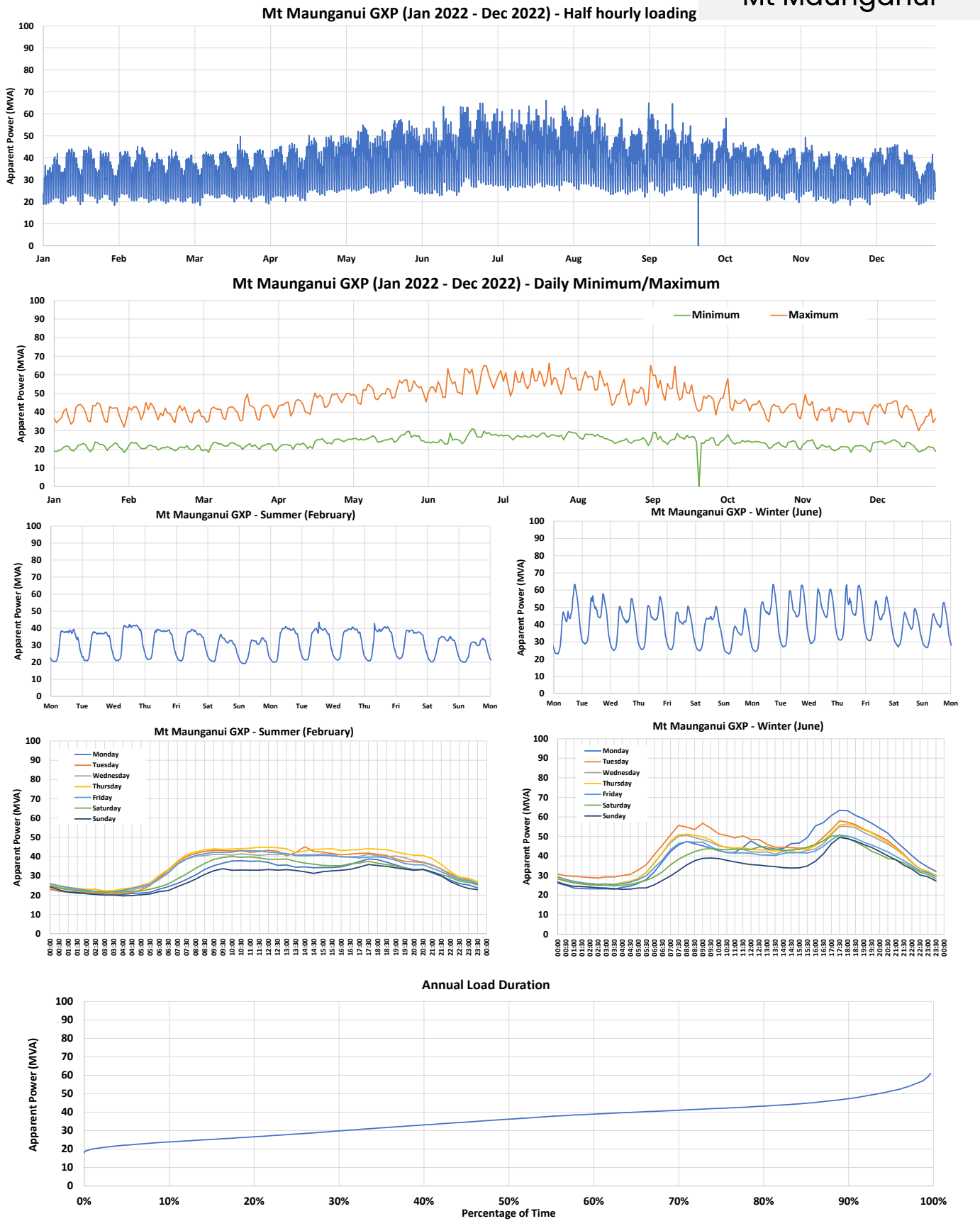

Figure 15 Mt Maunganui: Apparent power (MVA) load characteristics.

Mt Maunganui

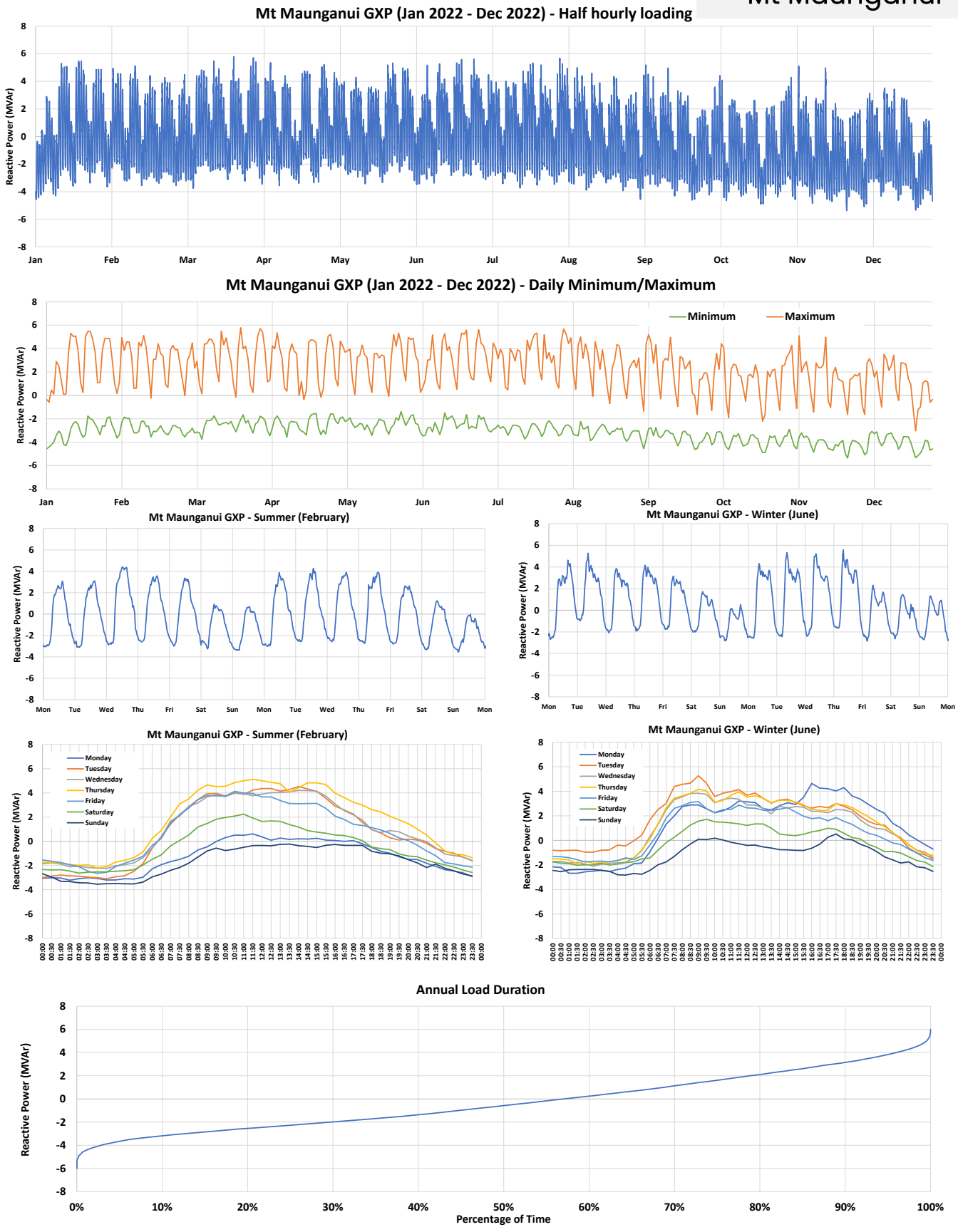

Figure 16 Mt Maunganui: Reactive power (MVAr) load characteristics.

Te Matai

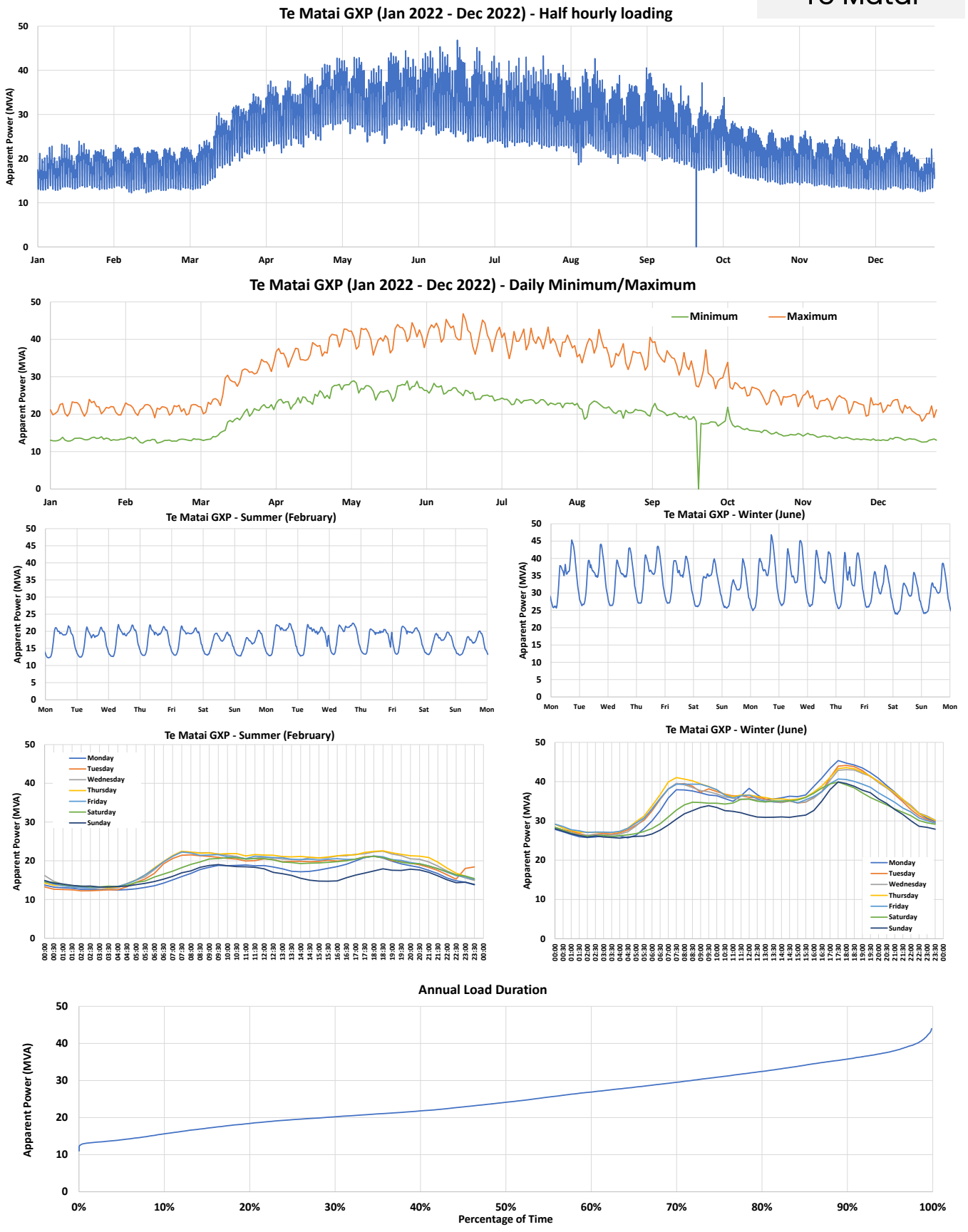

Figure 17 Te Matai: Apparent power (MVA) load characteristics.

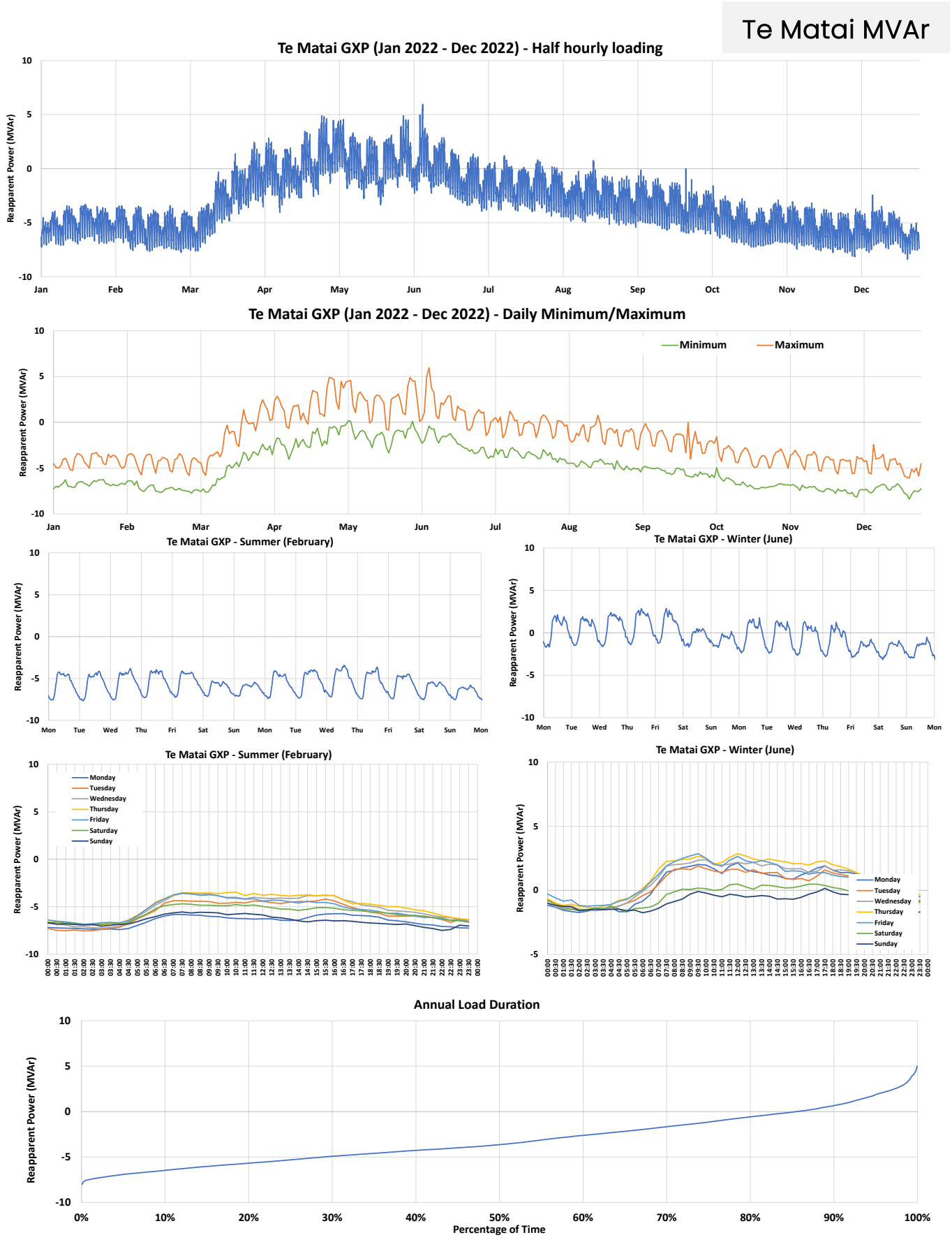

Figure 18 Te Matai: Reactive power (MVAr) load characteristics.

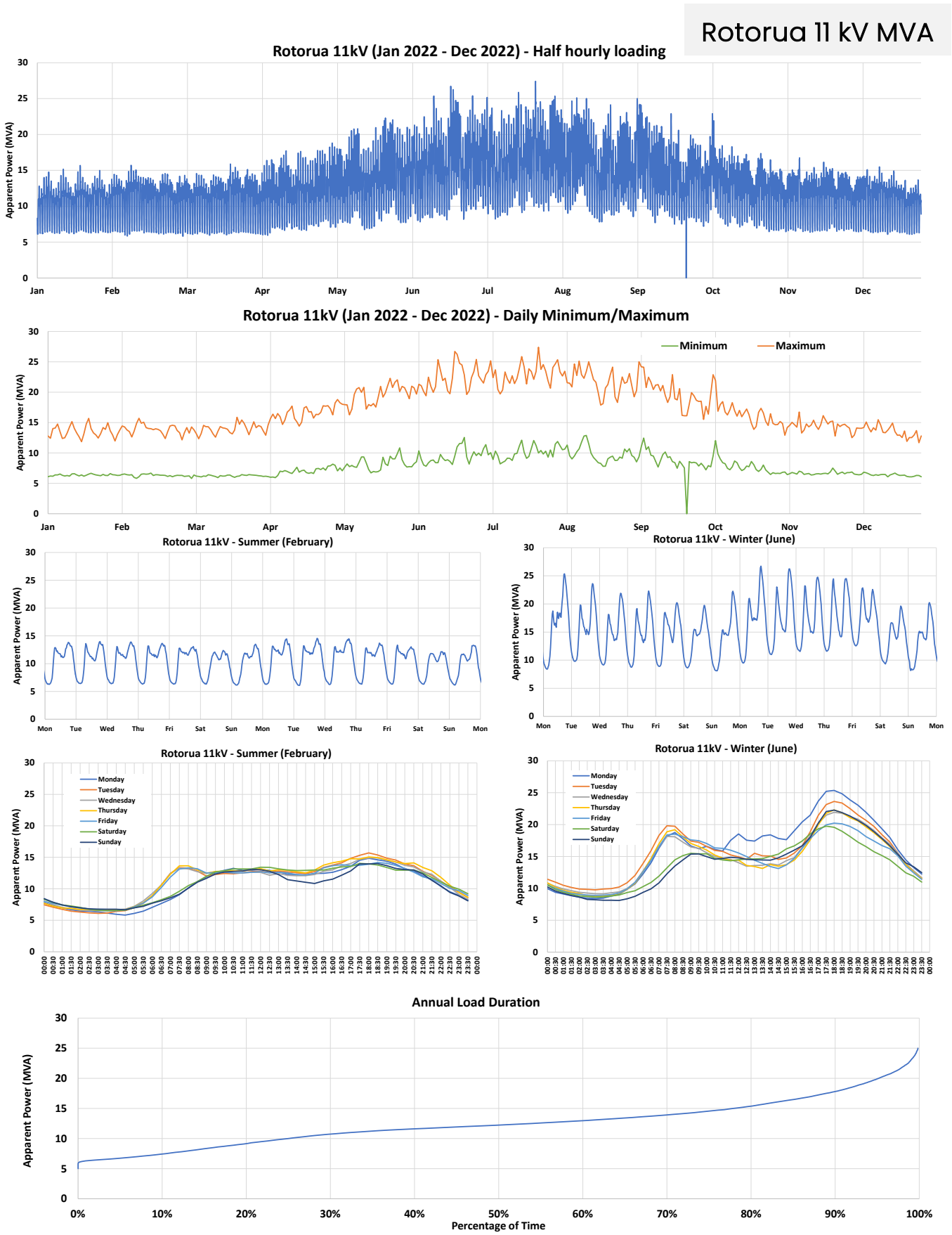

Figure 19 Rotorua 11 kV: Apparent power (MVA) load characteristics.

Rotorua 11 kV

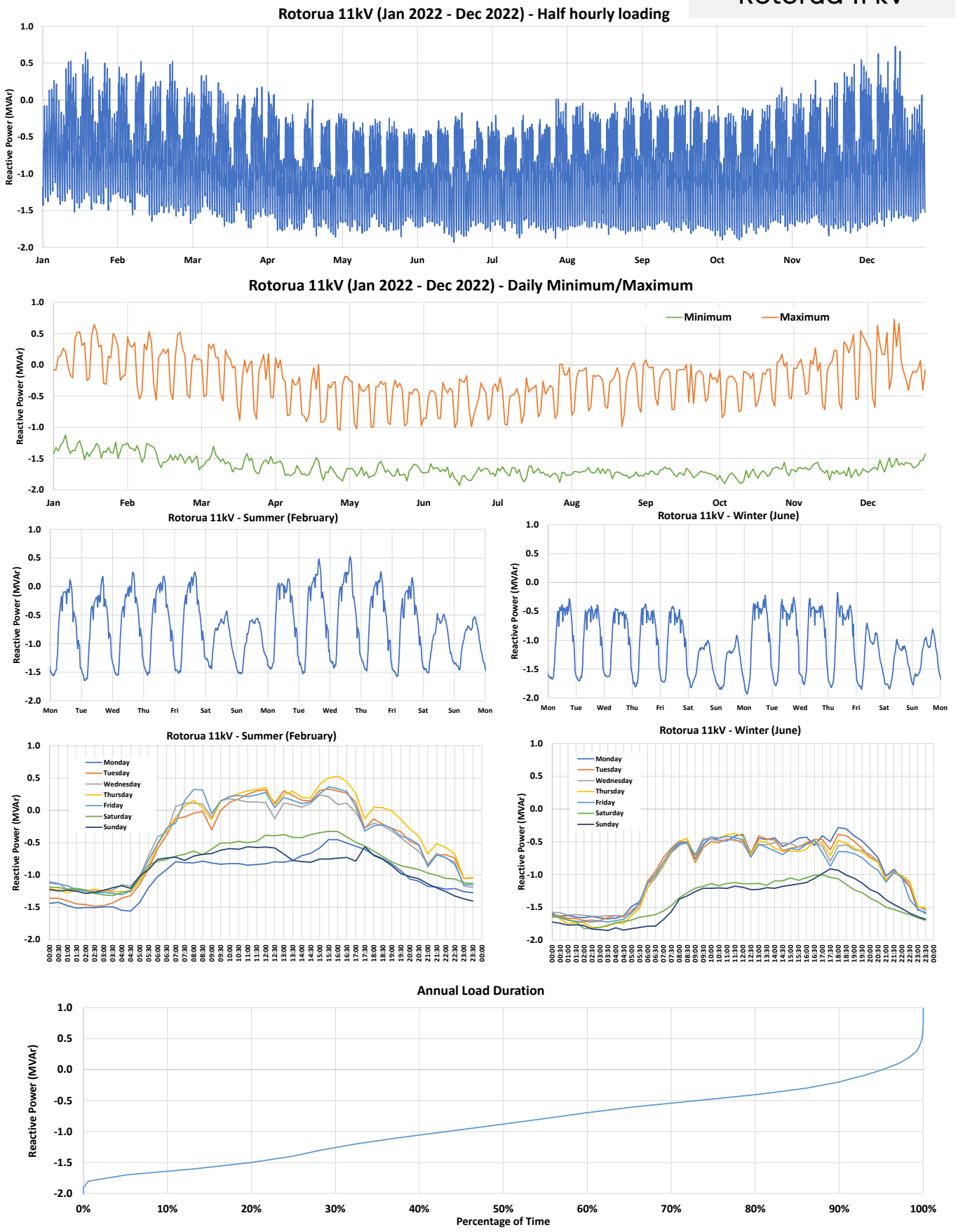

Figure 20 Rotorua 11 kV: Reactive power (MVAr) load characteristics.

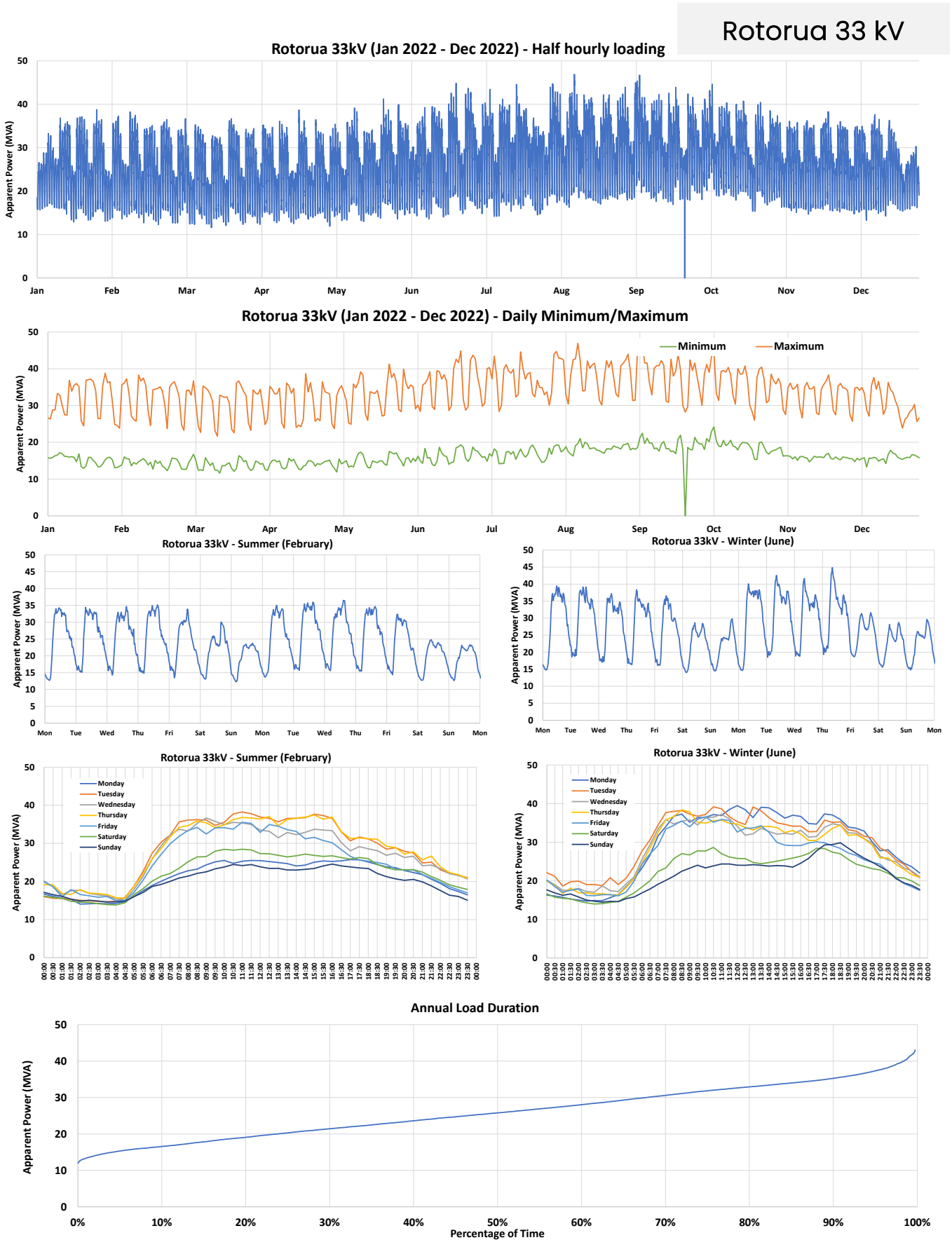

Figure 21 Rotorua 33 kV: Apparent power (MVA) load characteristics.

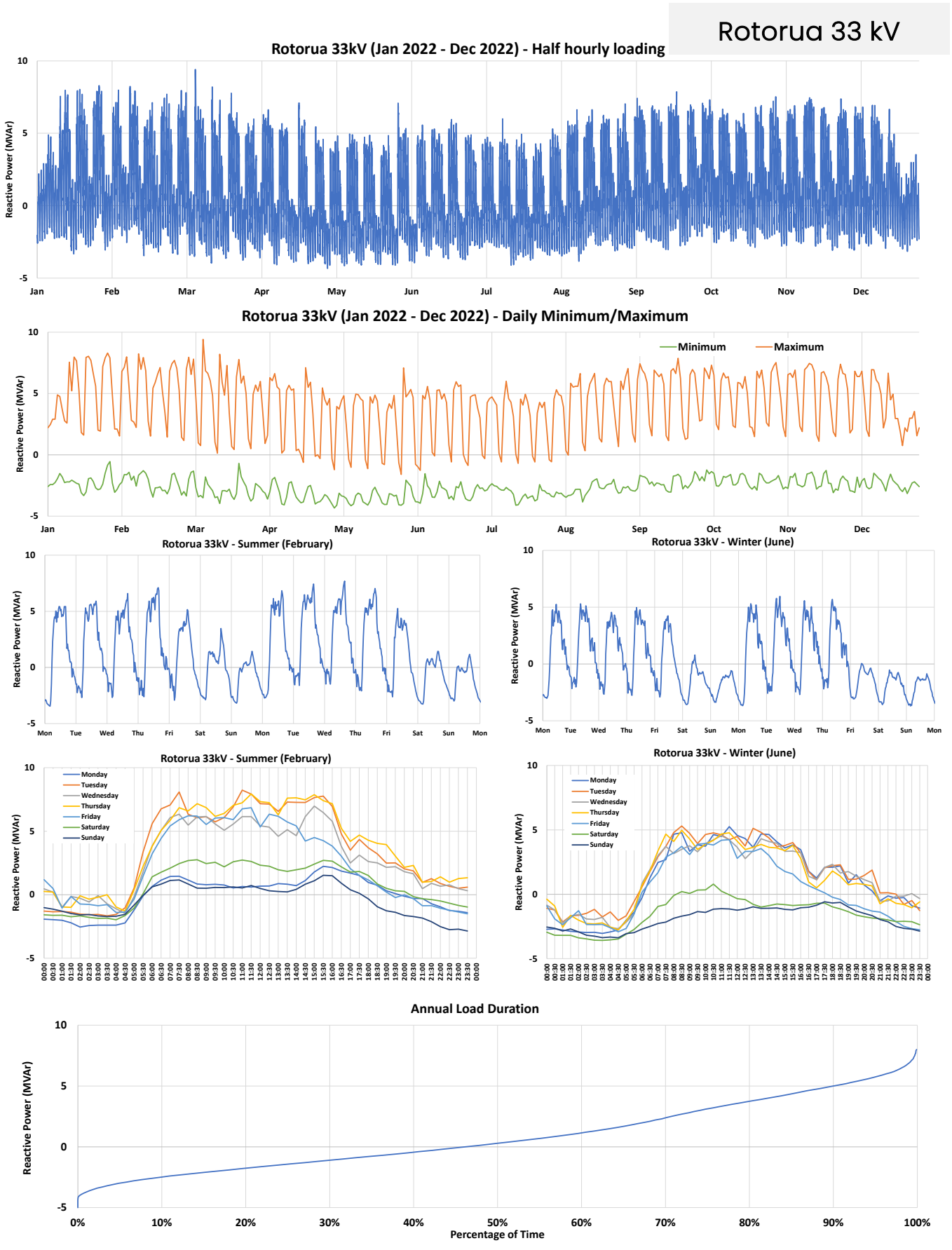

Figure 22 Rotorua 33 kV: Reactive power (MVAr) load characteristics.

Owhata MVA

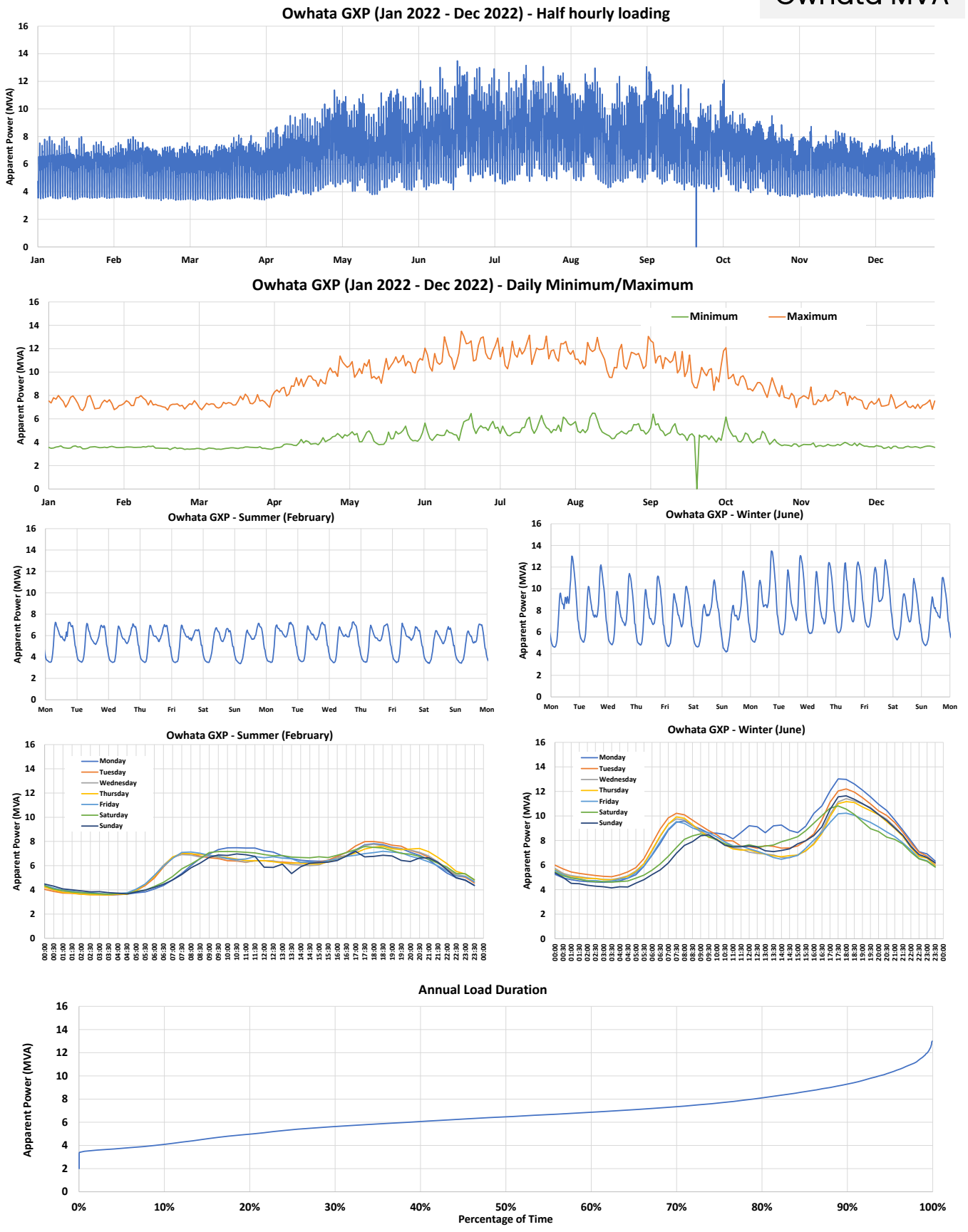

Figure 23 Owhata: Apparent power (MVA) load characteristics.

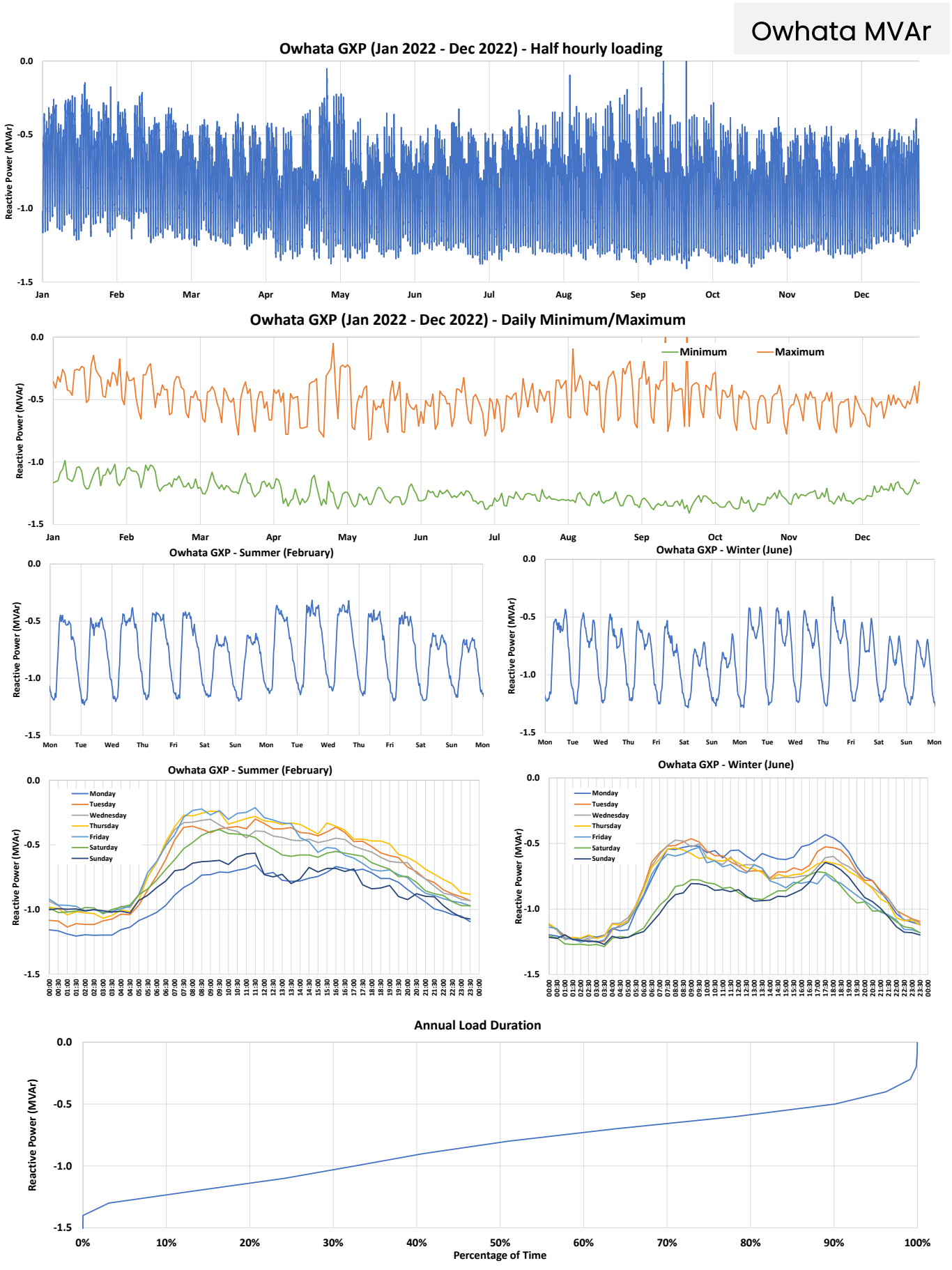

Figure 24 Owhata: Reactive power (MVAr) load characteristics.

Takurenga

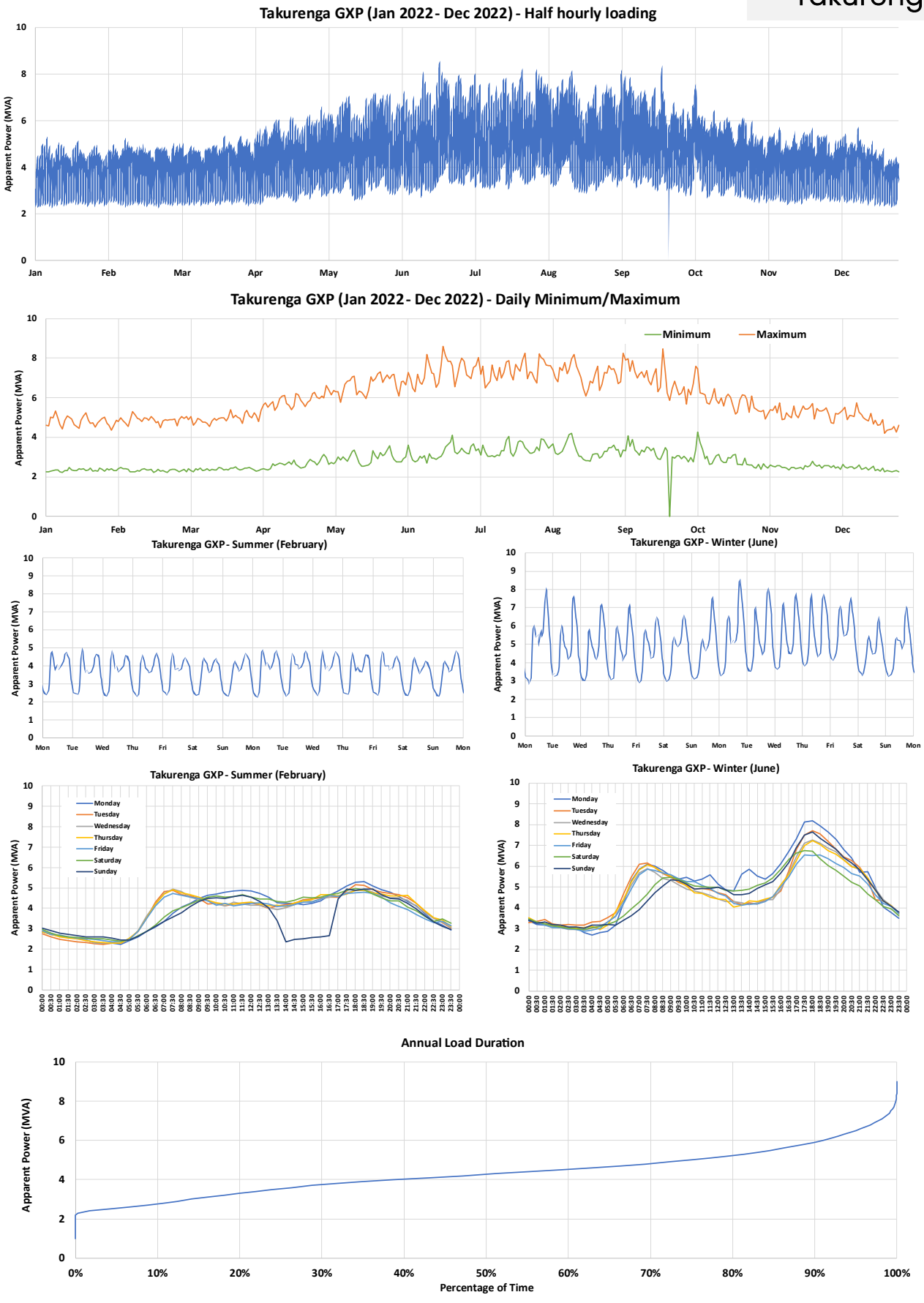

Figure 25 Takurenga: Apparent power (MVA) load characteristics.

Takurenga MVAr

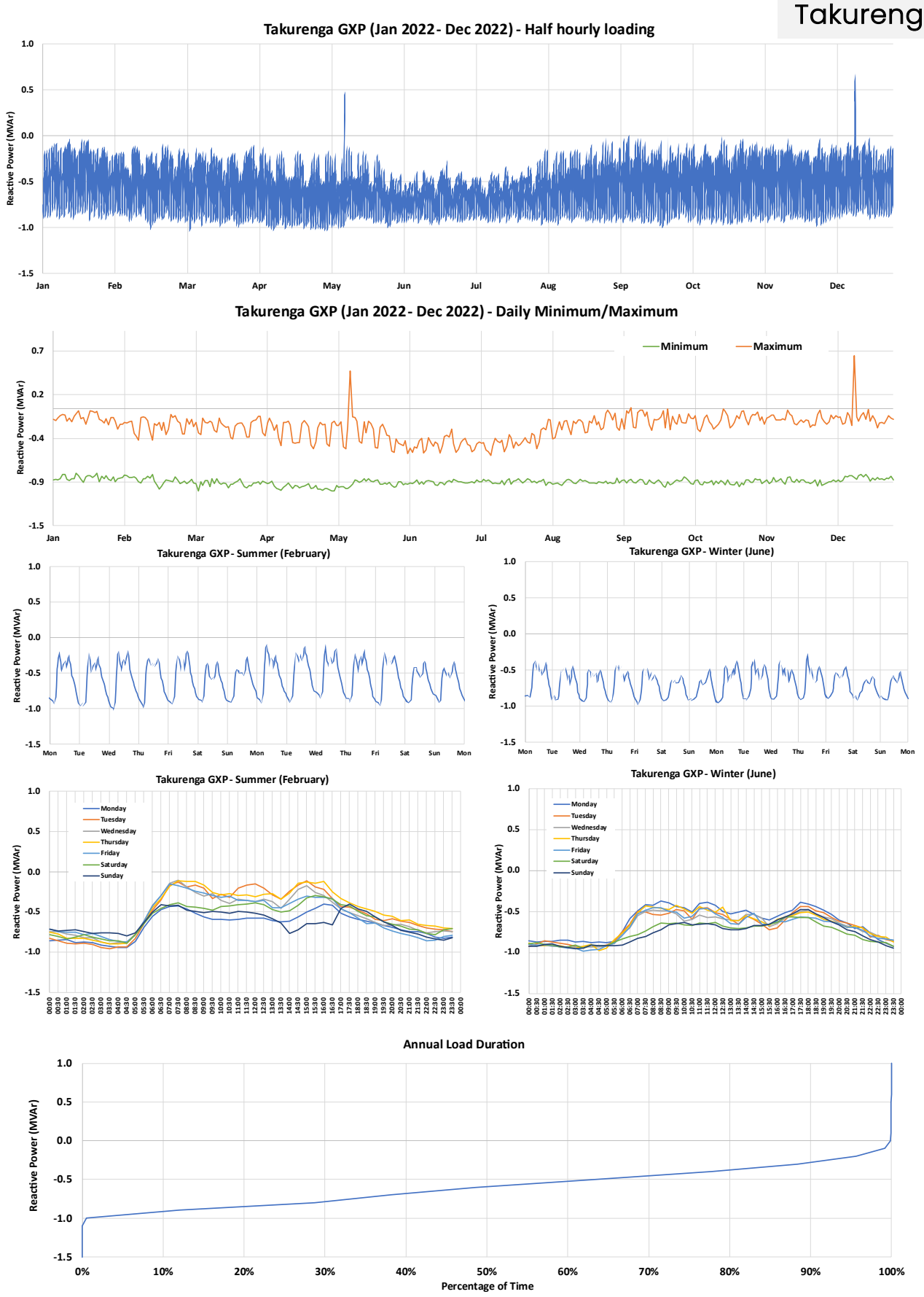

Figure 26 Takurenga: Reactive power (MVAr) load characteristics.

3. Zone Substations

1.1 Horizon Networks

The characteristics of the zone substation **real power loadings** within Horizon Network's network are shown in the following:

Te Kaha MW

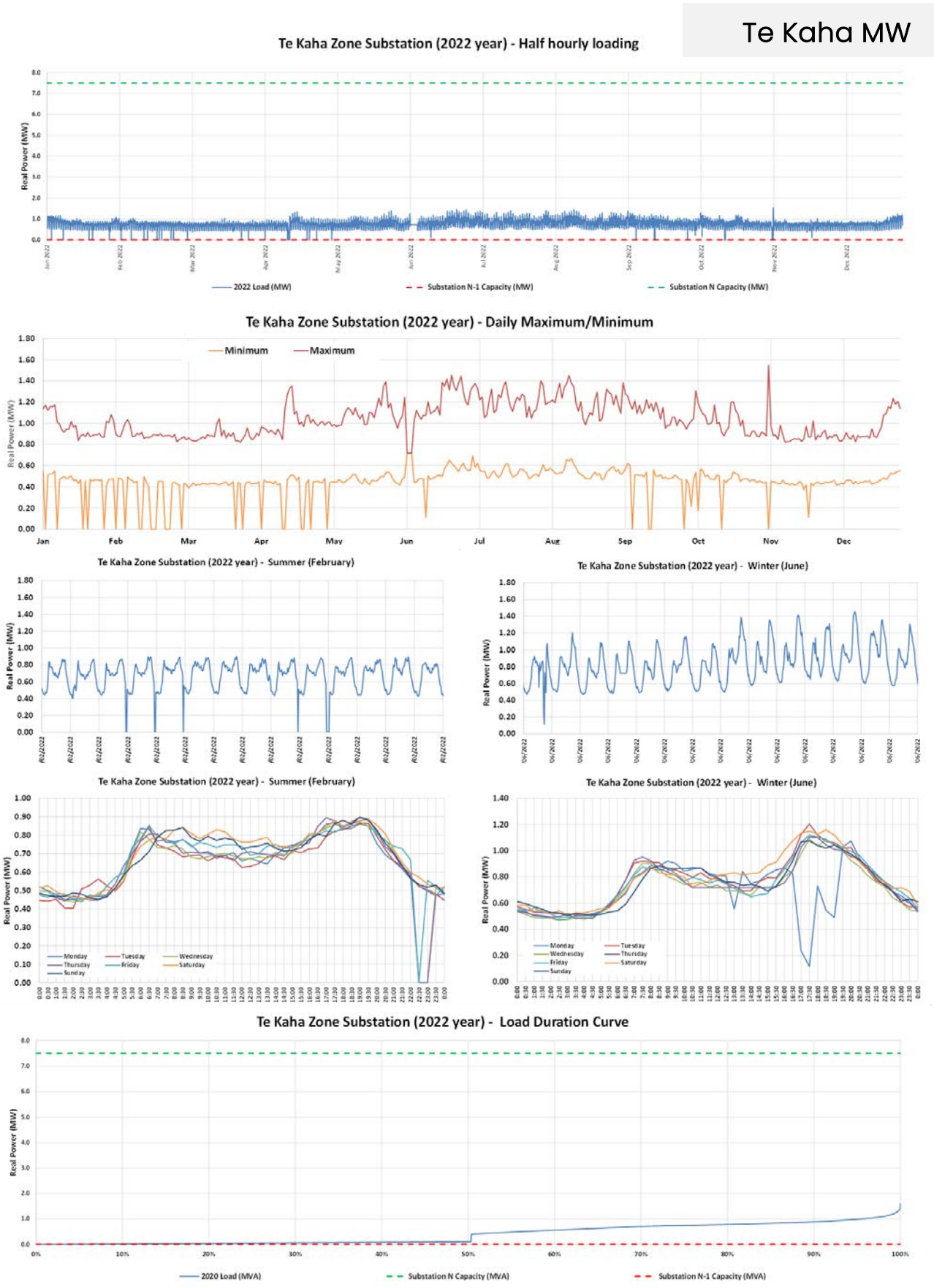

Figure 27. Te Kaha 33/11kV zone substation: Real power (MW) load characteristics

Station Road MW

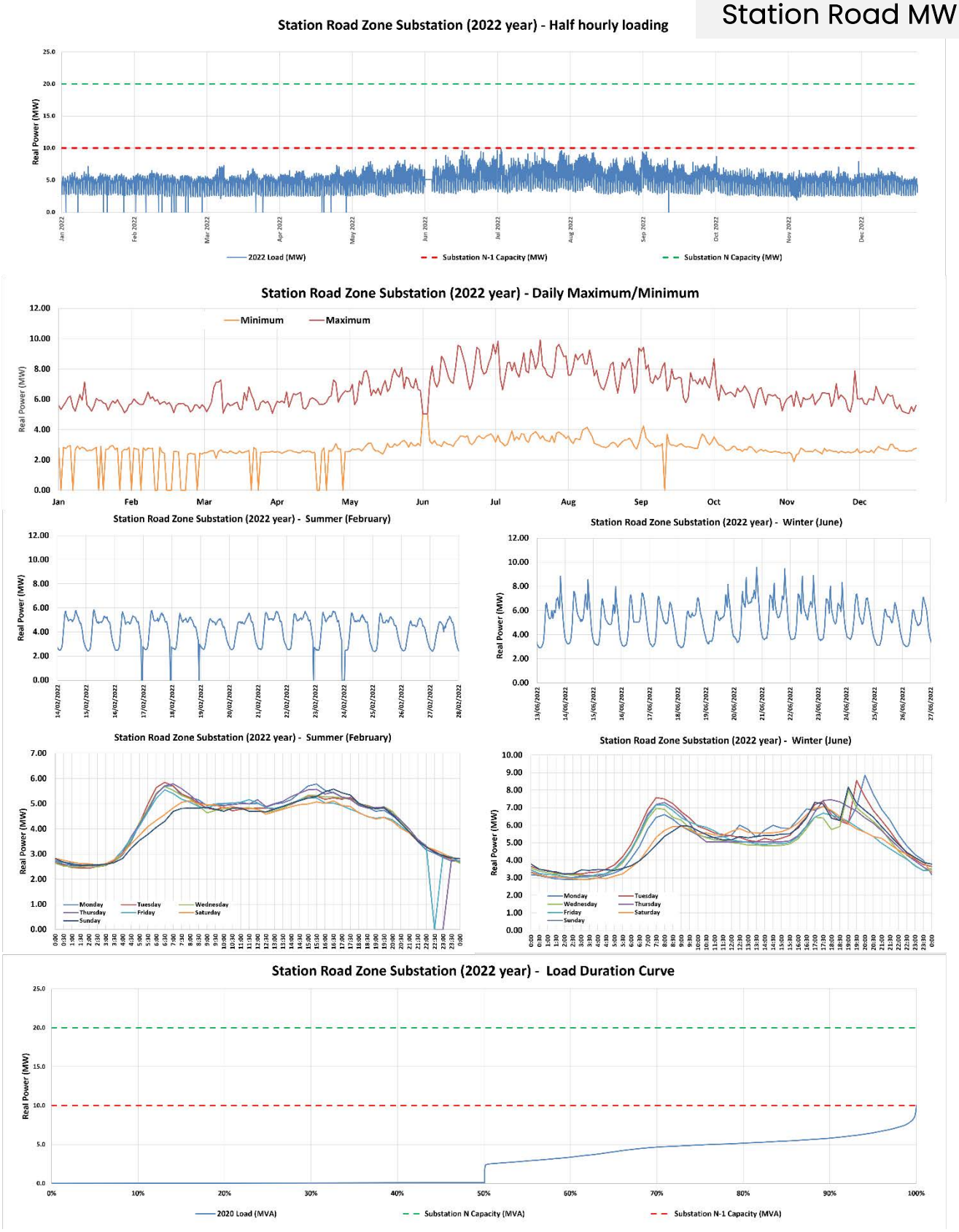

Figure 28. Station Rd 33/11kV zone substation: Real power (MW) load characteristics

Plains MW

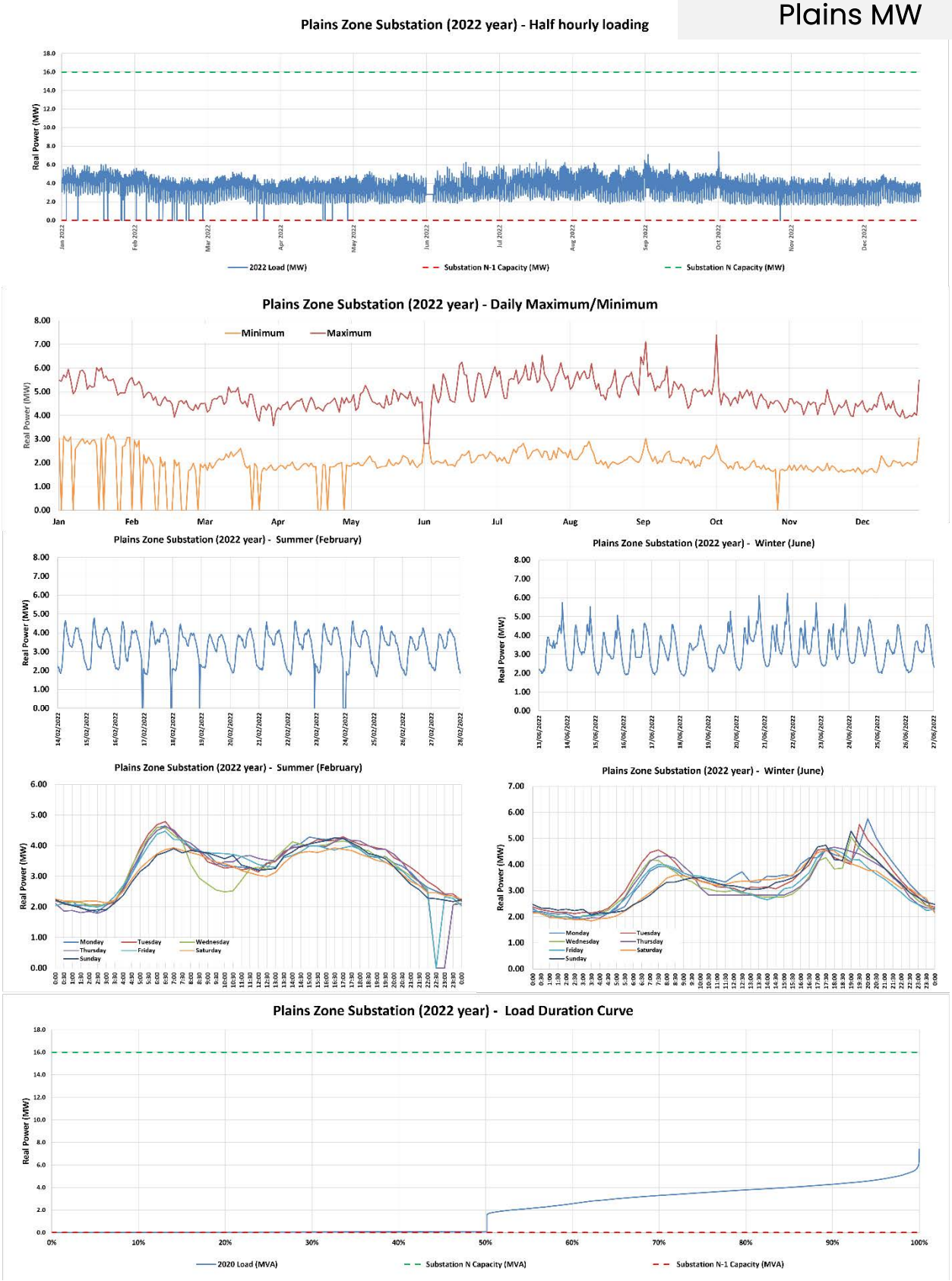

Figure 29. Plains 33/11kV zone substation: Real power (MW) load characteristics

Ohope MW

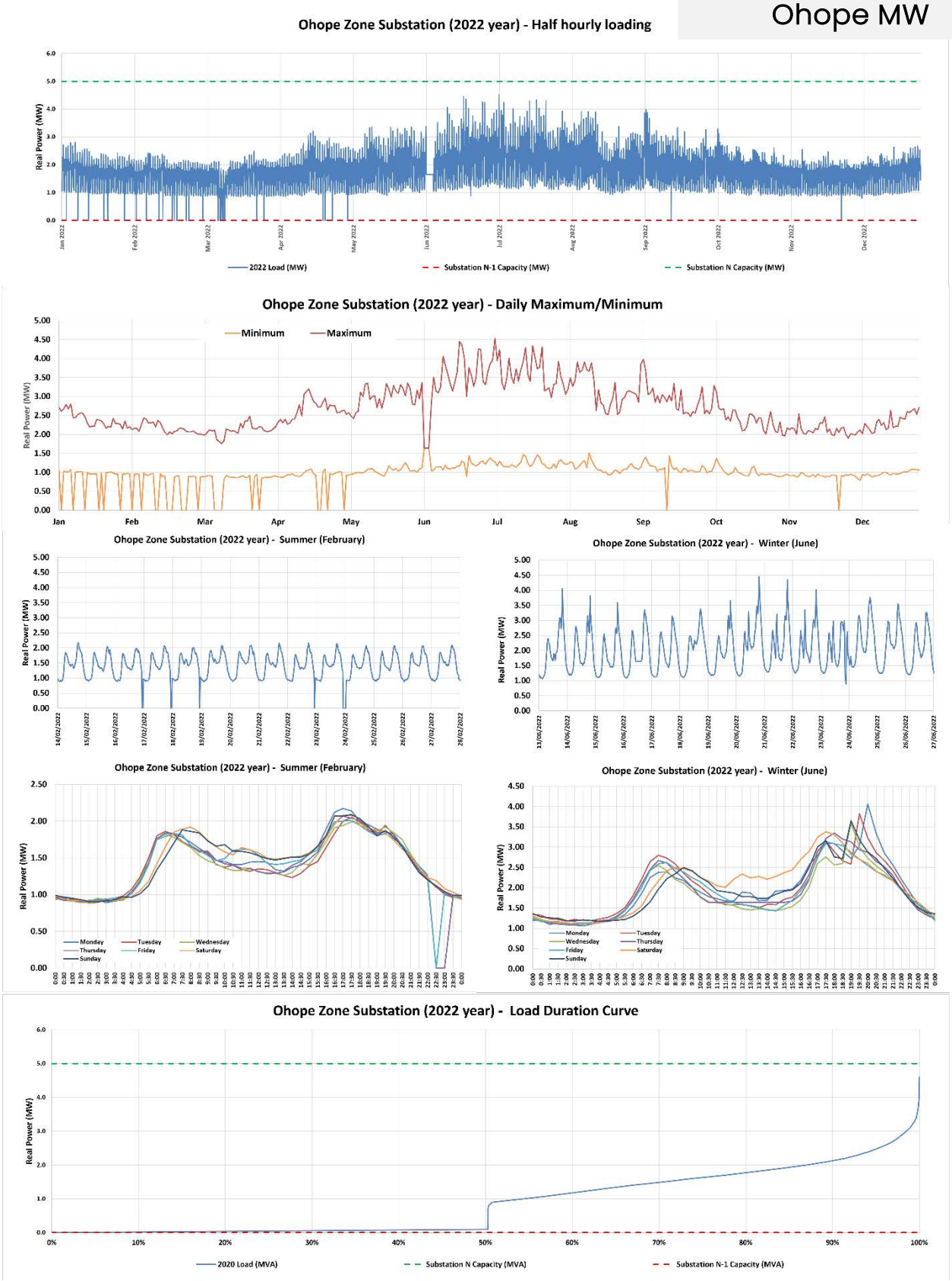

Figure 30. Ohope 33/11kV zone substation: Real power (MW) load characteristics

Kopeopeo MW

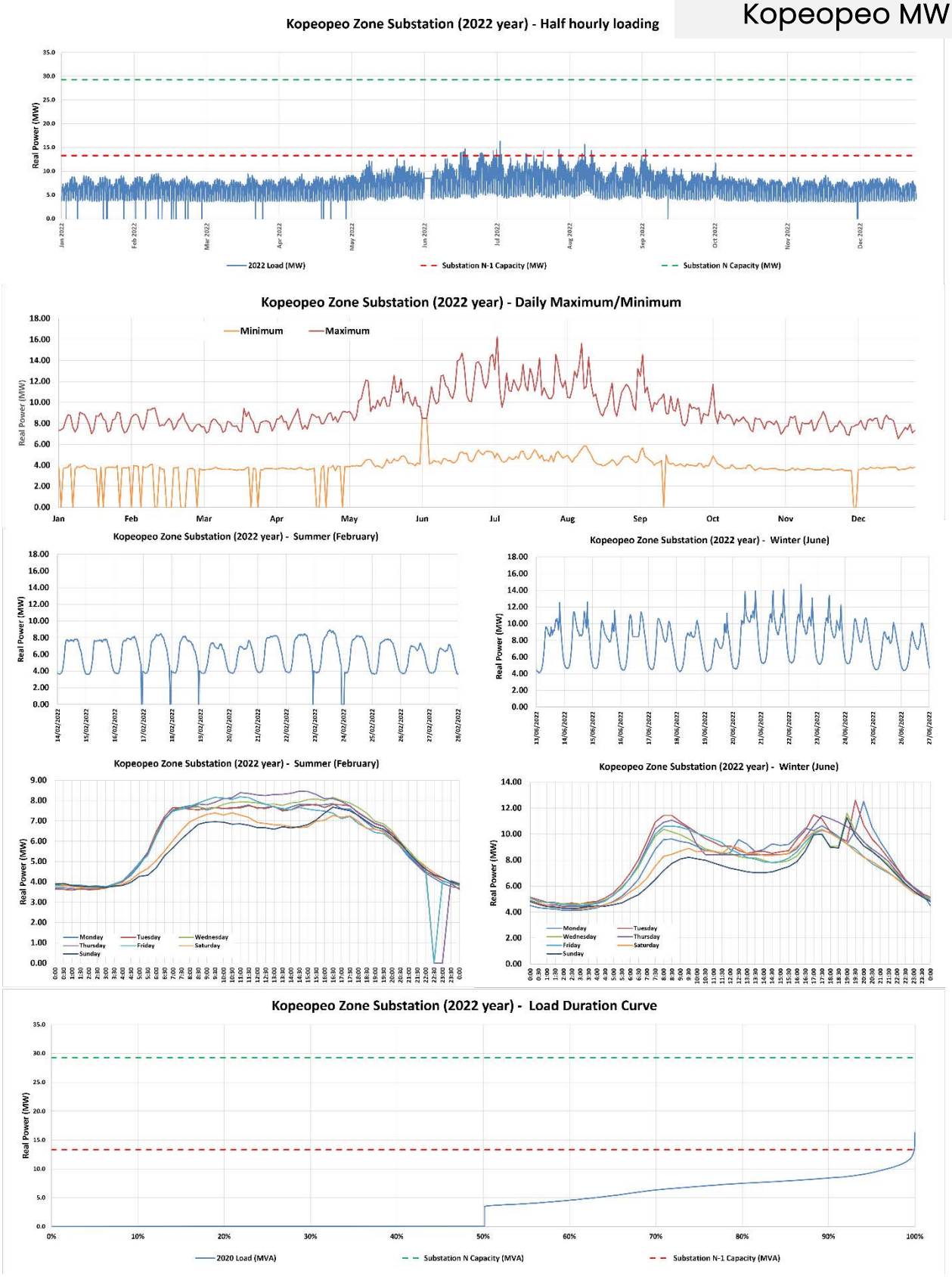

Figure 31. Kopeopeo 33/11kV zone substation: Real power (MW) load characteristics

East Bank MW

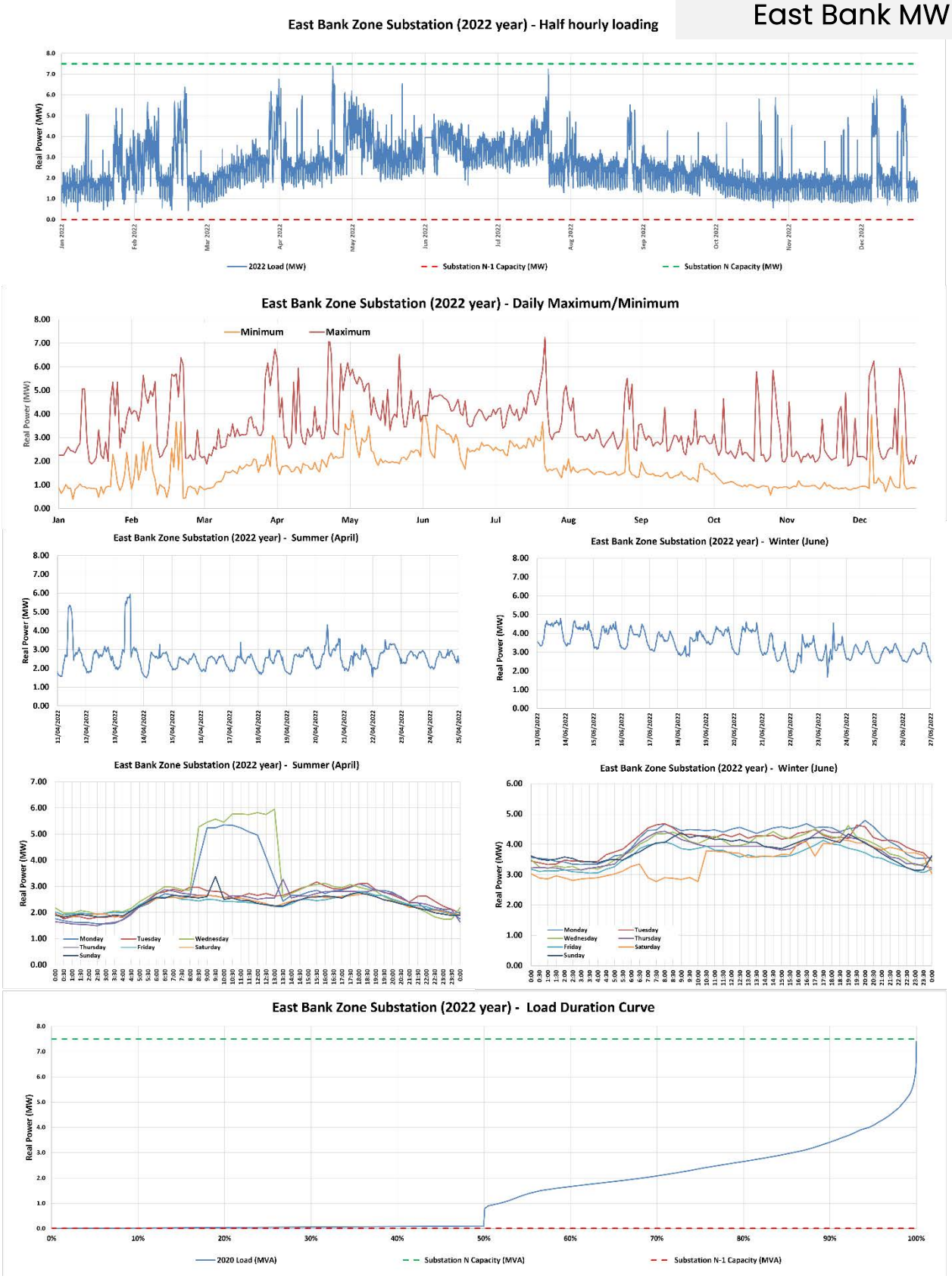

Figure 32. East Bank 33/11kV zone substation: Real power (MW) load characteristics

Kaingaroa MW

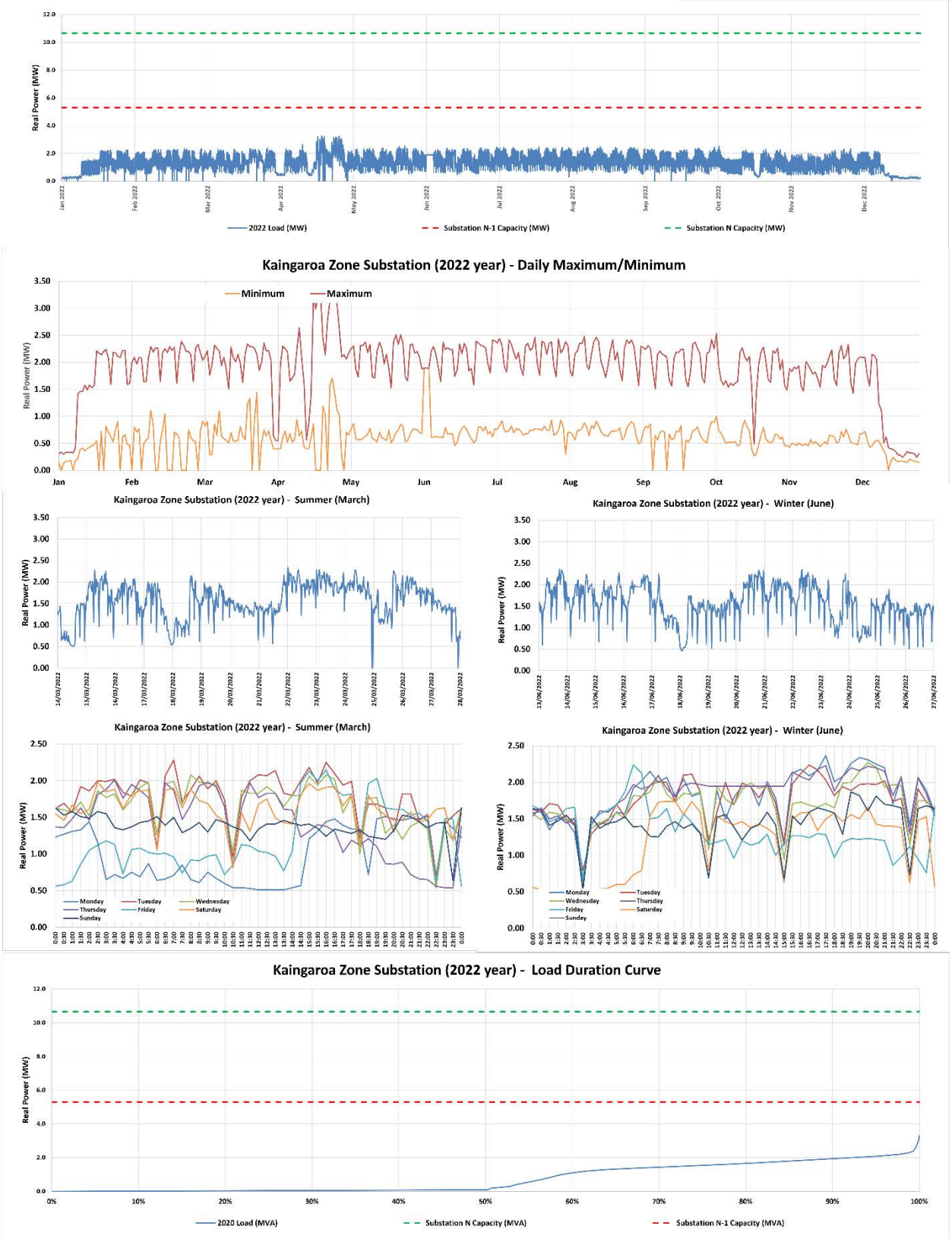

Figure 33. Kaingaroa 33/11kV zone substation: Real power (MW) load characteristics

Galatea MW

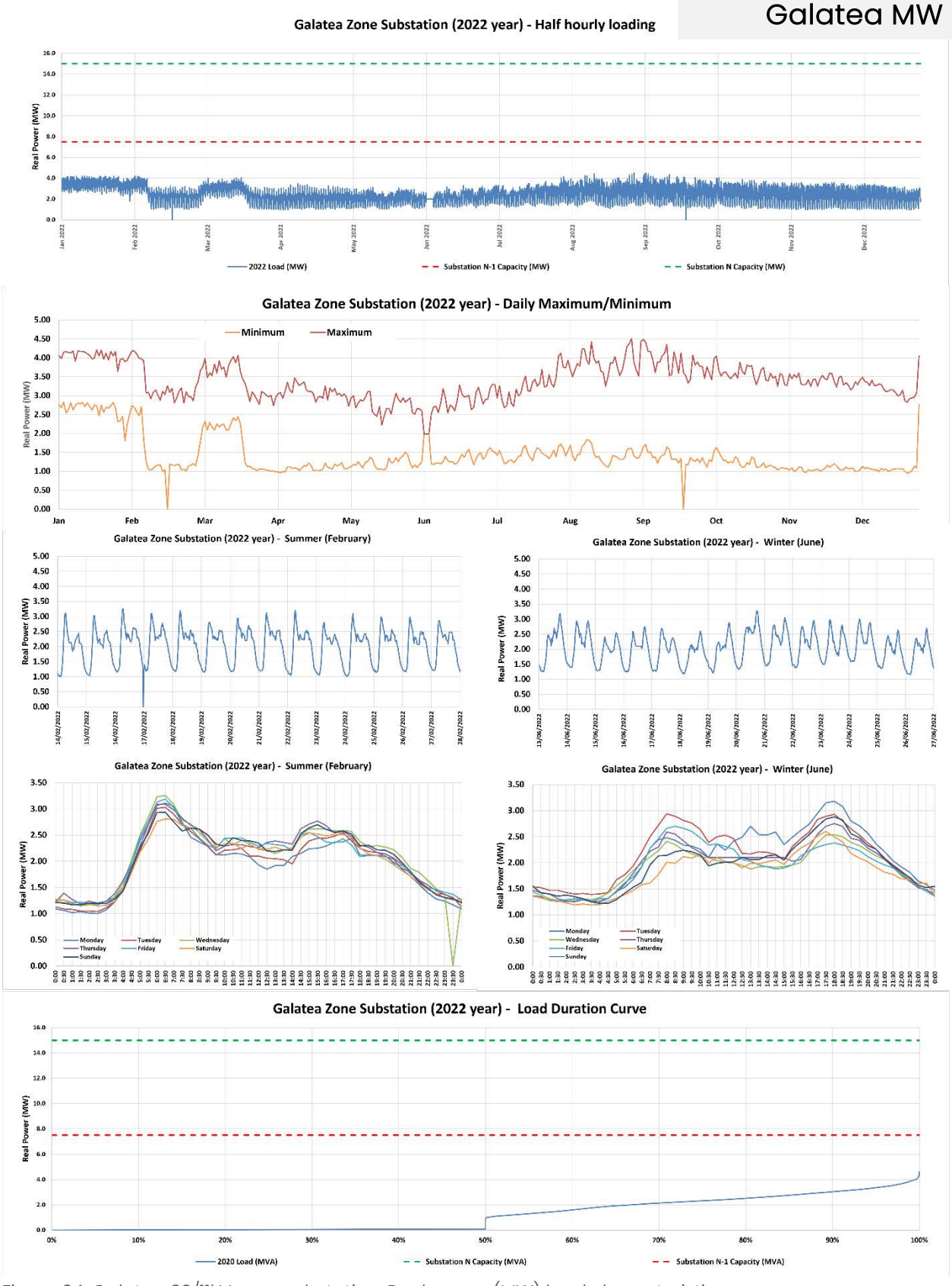

Figure 34. Galatea 33/11kV zone substation: Real power (MW) load characteristics

1.2 Powerco (East Region)

The characteristics of the zone substation **real power loadings** within Powerco's network are shown in the following:

Bethlehem MW

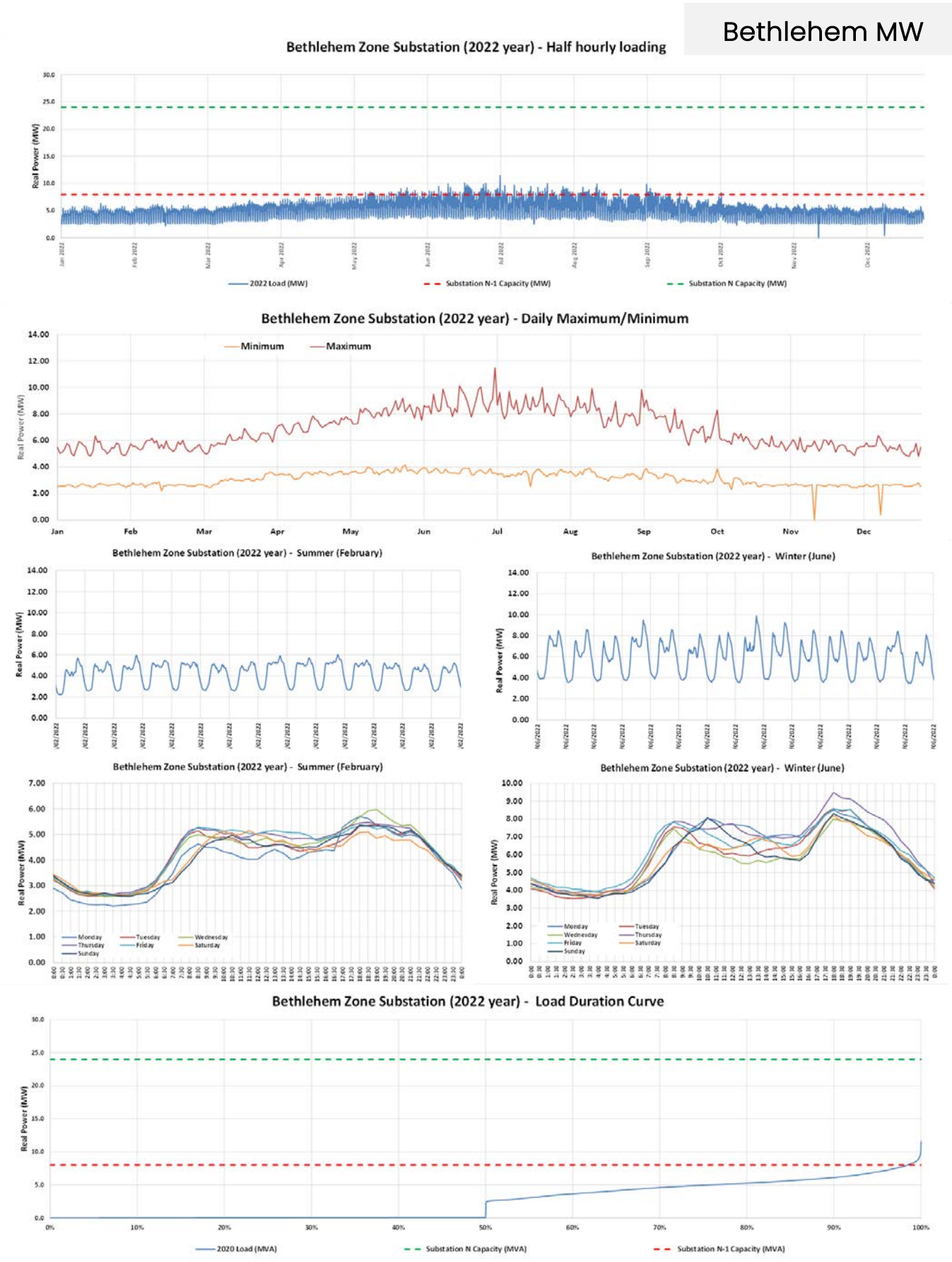

Figure 35. Bethlehem 33/11kV zone substation: Real power (MW) load characteristics.

Waihi Road MW

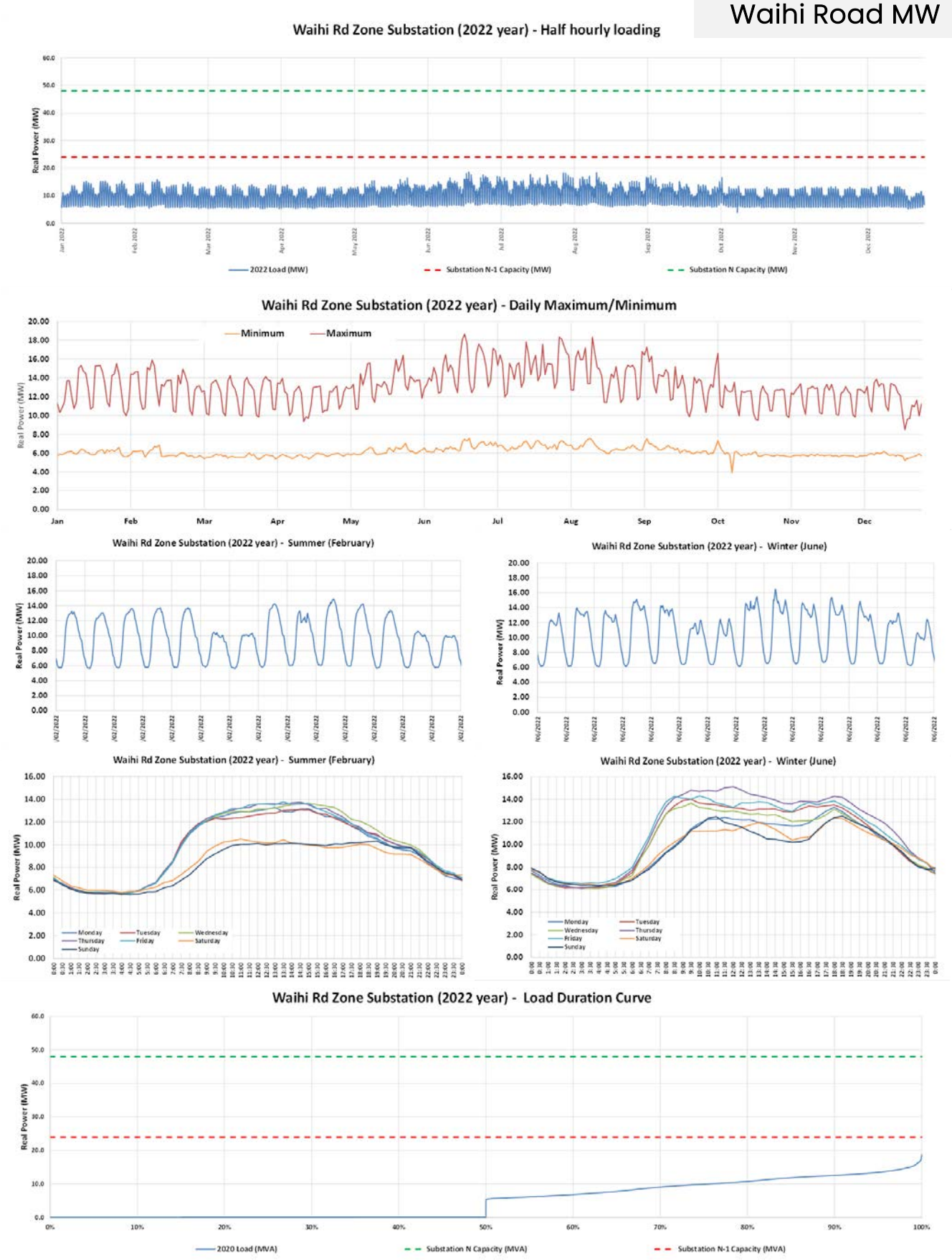

Figure 36. Waihi Road 33/11kV zone substation: Real power (MW) load characteristics.

Hamilton Street MW

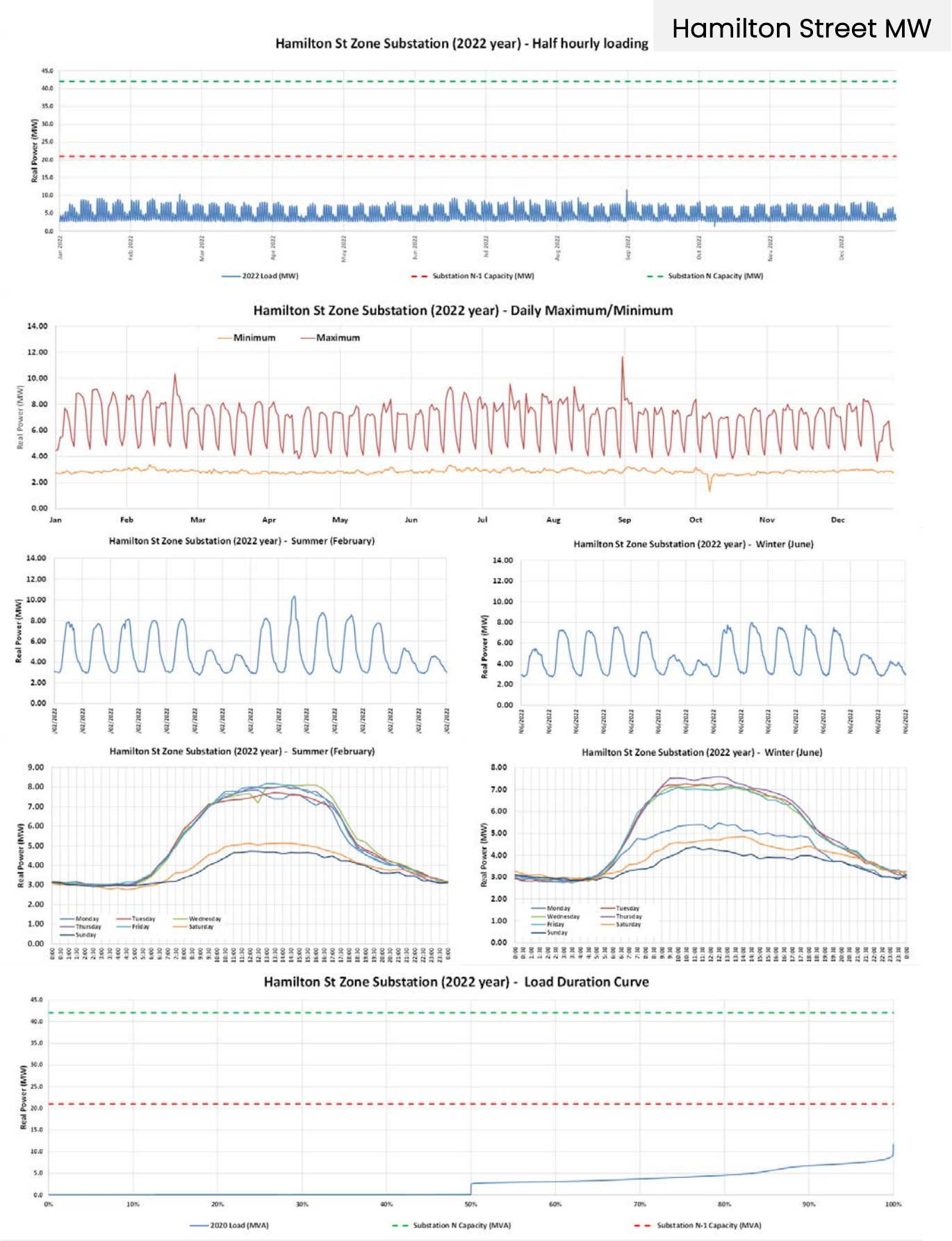

Figure 37. Hamilton Street 33/11kV zone substation: Real power (MW) load characteristics.

Sulphur Point MW

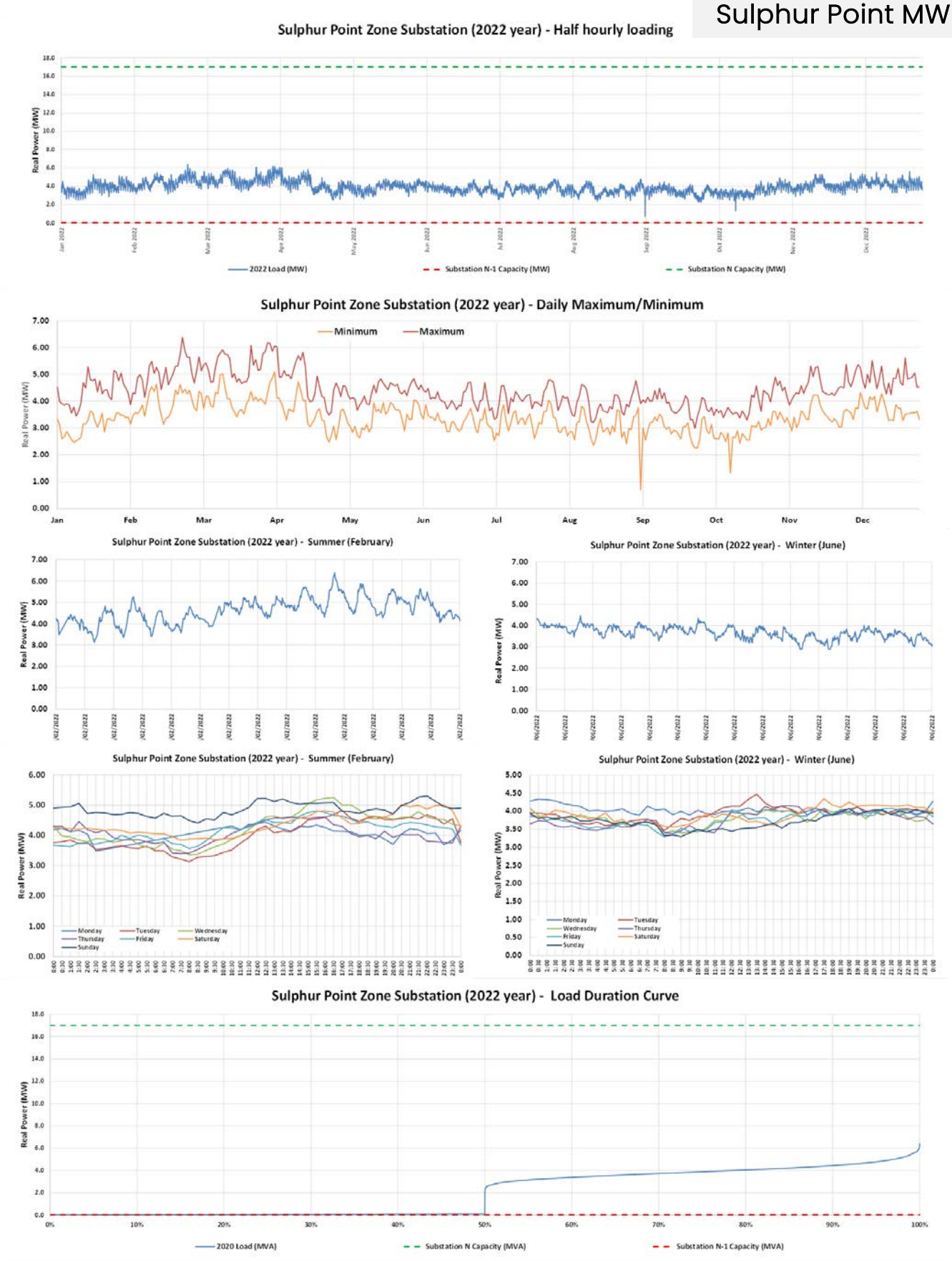

Figure 38. Sulphur Point 33/11kV zone substation: Real power (MW) load characteristics.

Otumoetai MW

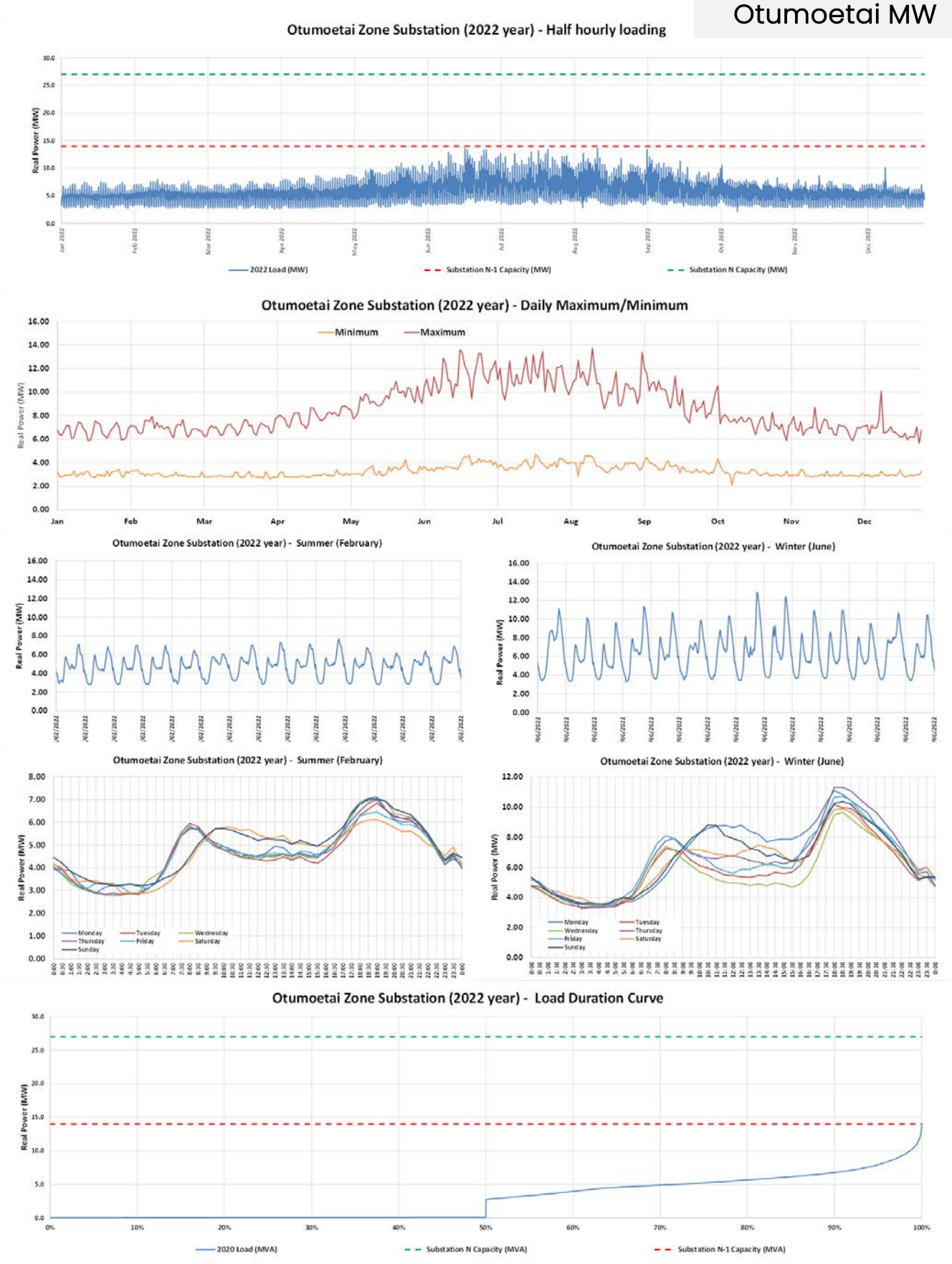

Figure 39. Otumoetai 33/11kV zone substation: Real power (MW) load characteristics.

Matua MW

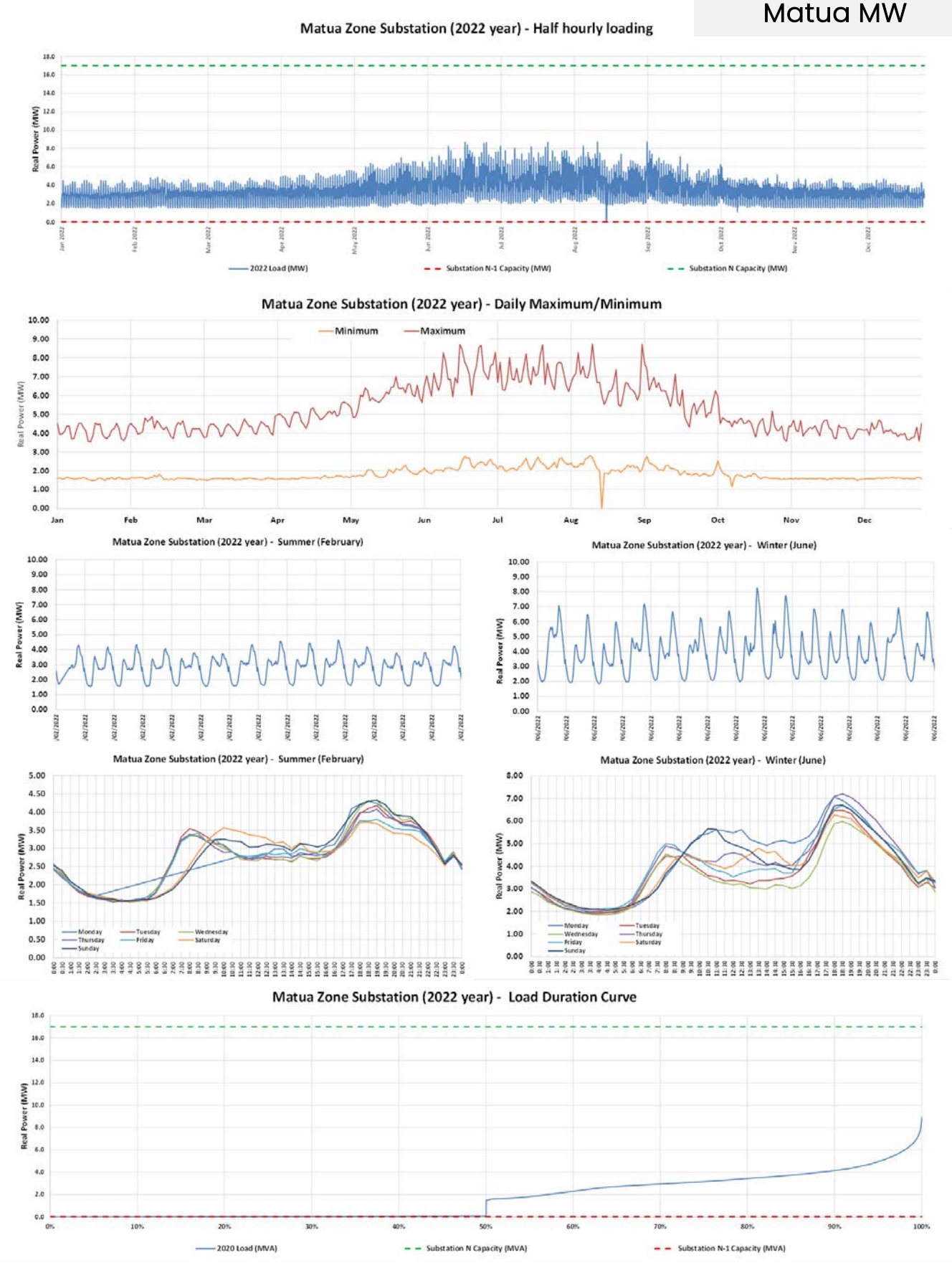

Figure 40. Matua 33/11kV zone substation: Real power (MW) load characteristics.

Omokoroa MW

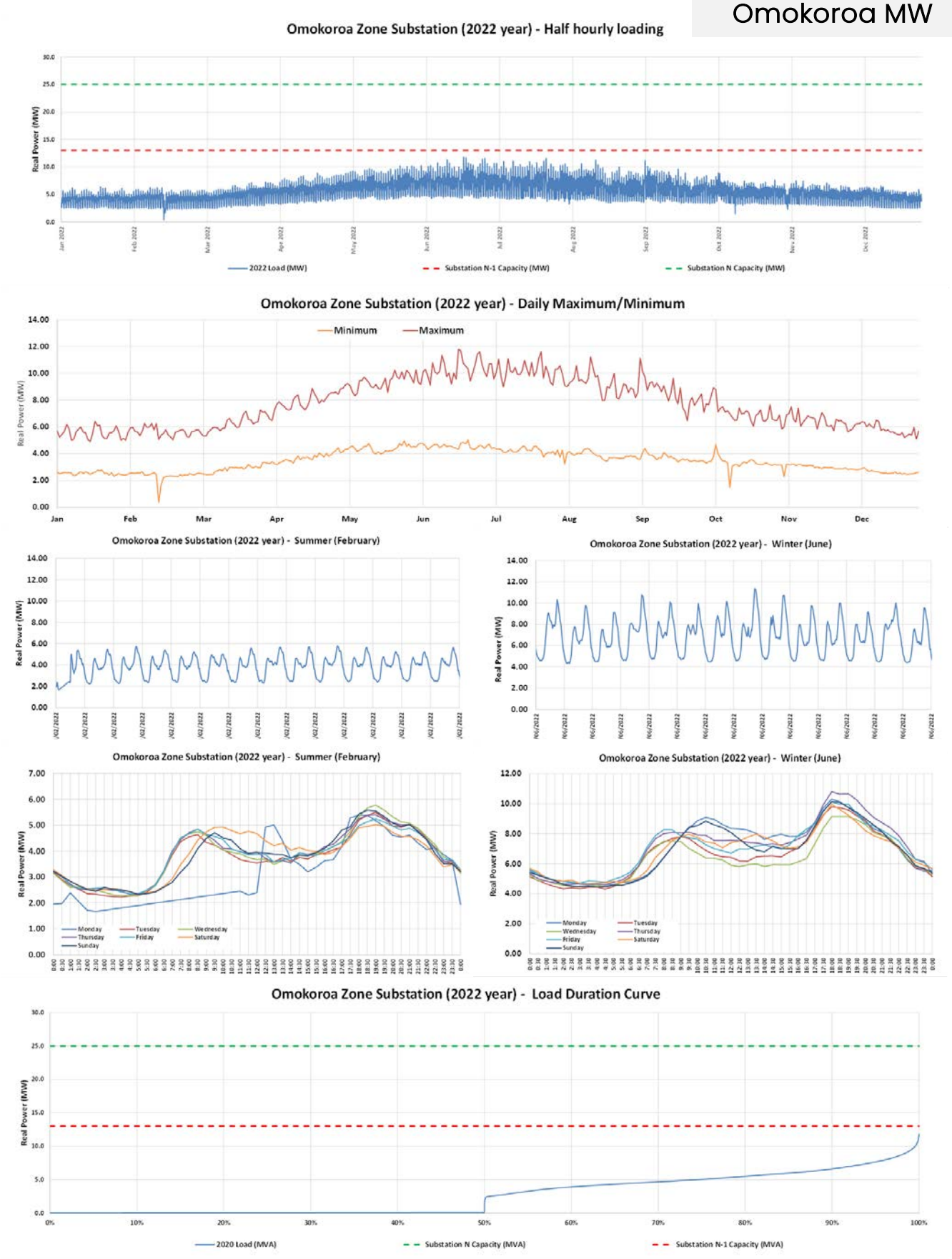

Figure 41. Omokoroa 33/11kV zone substation: Real power (MW) load characteristics.

Aongatete MW

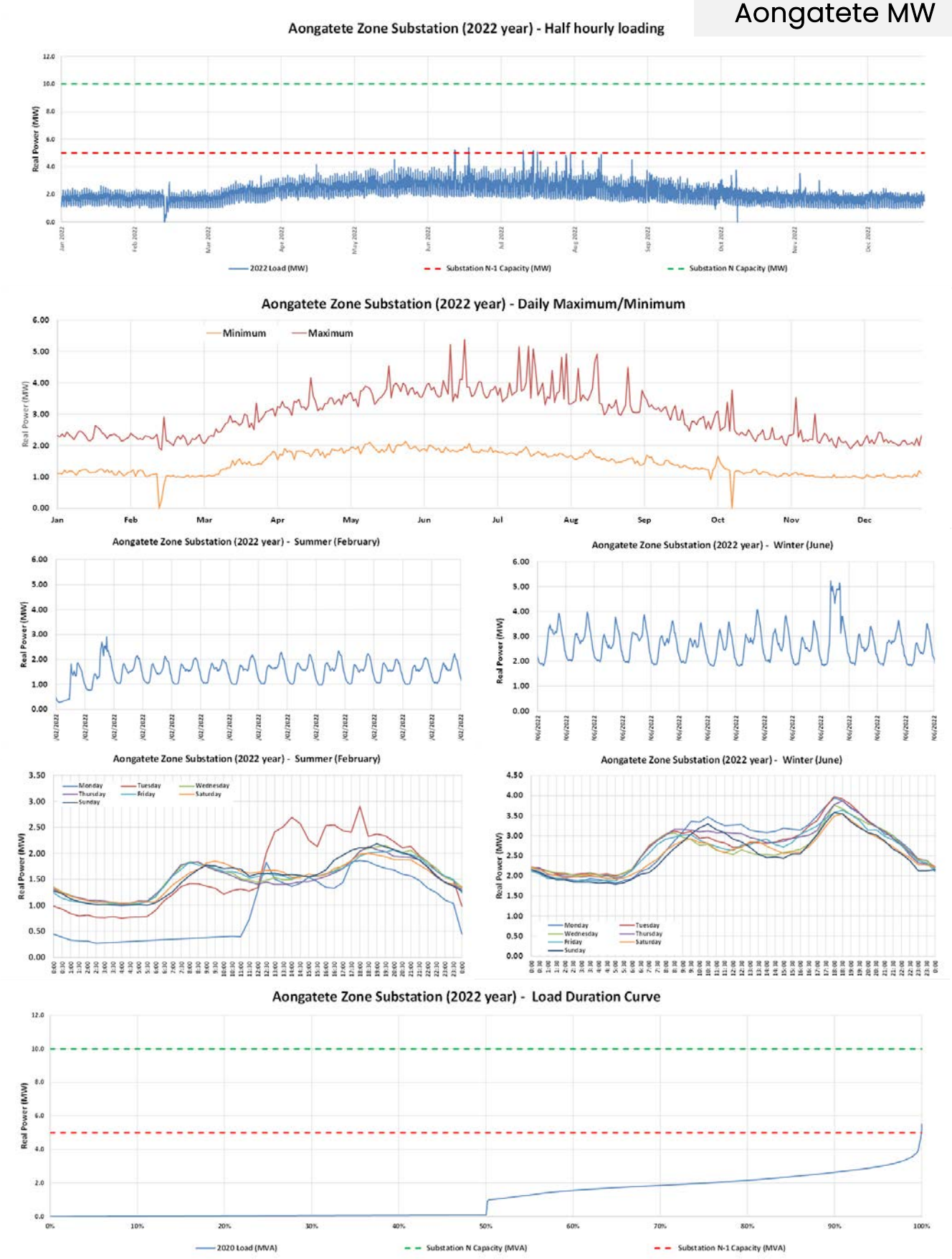

Figure 42. Aongatete 33/11kV zone substation: Real power (MW) load characteristics.

Katikati MW

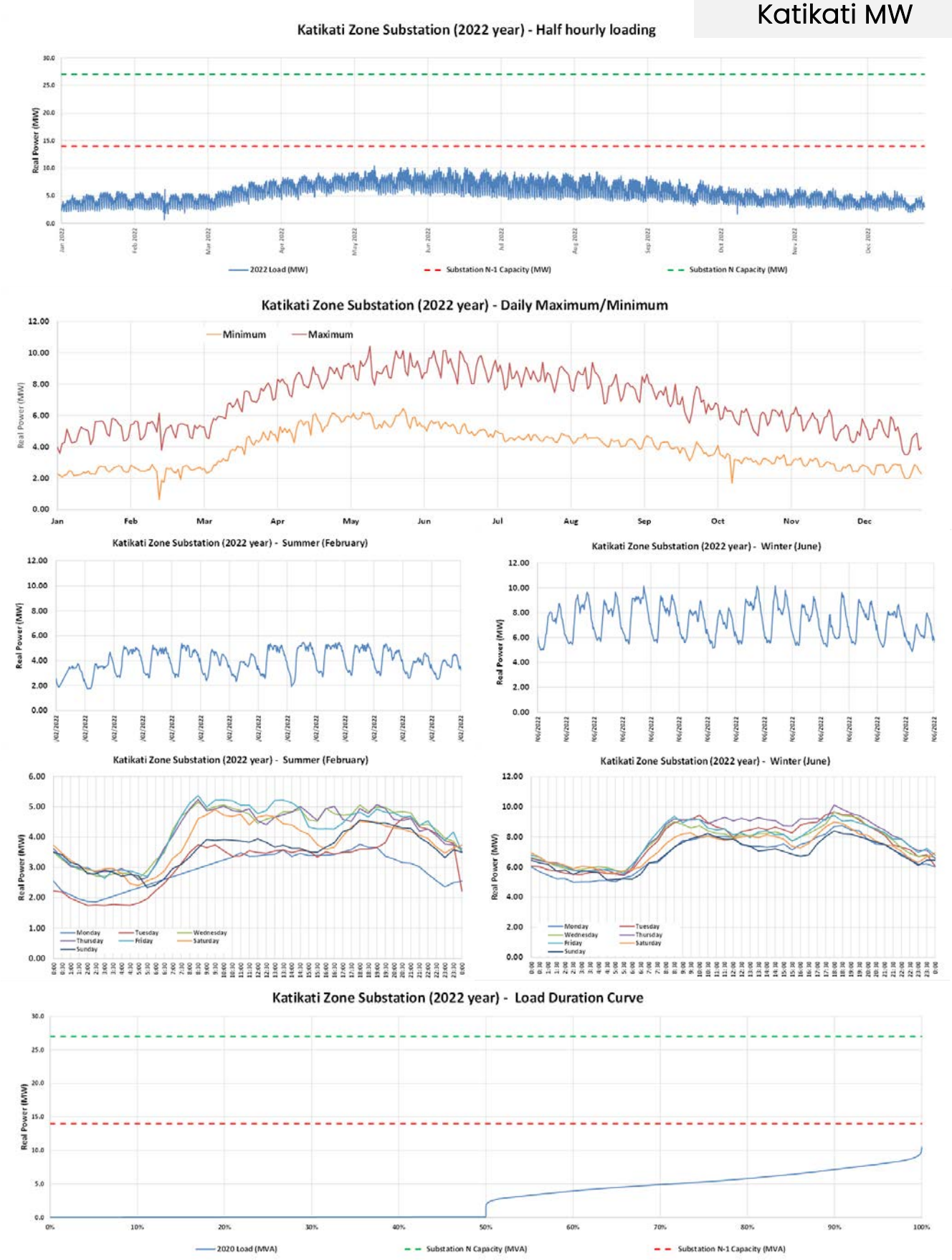

Figure 43. Katikati 33/11kV zone substation: Real power (MW) load characteristics.

Kauri Point MW

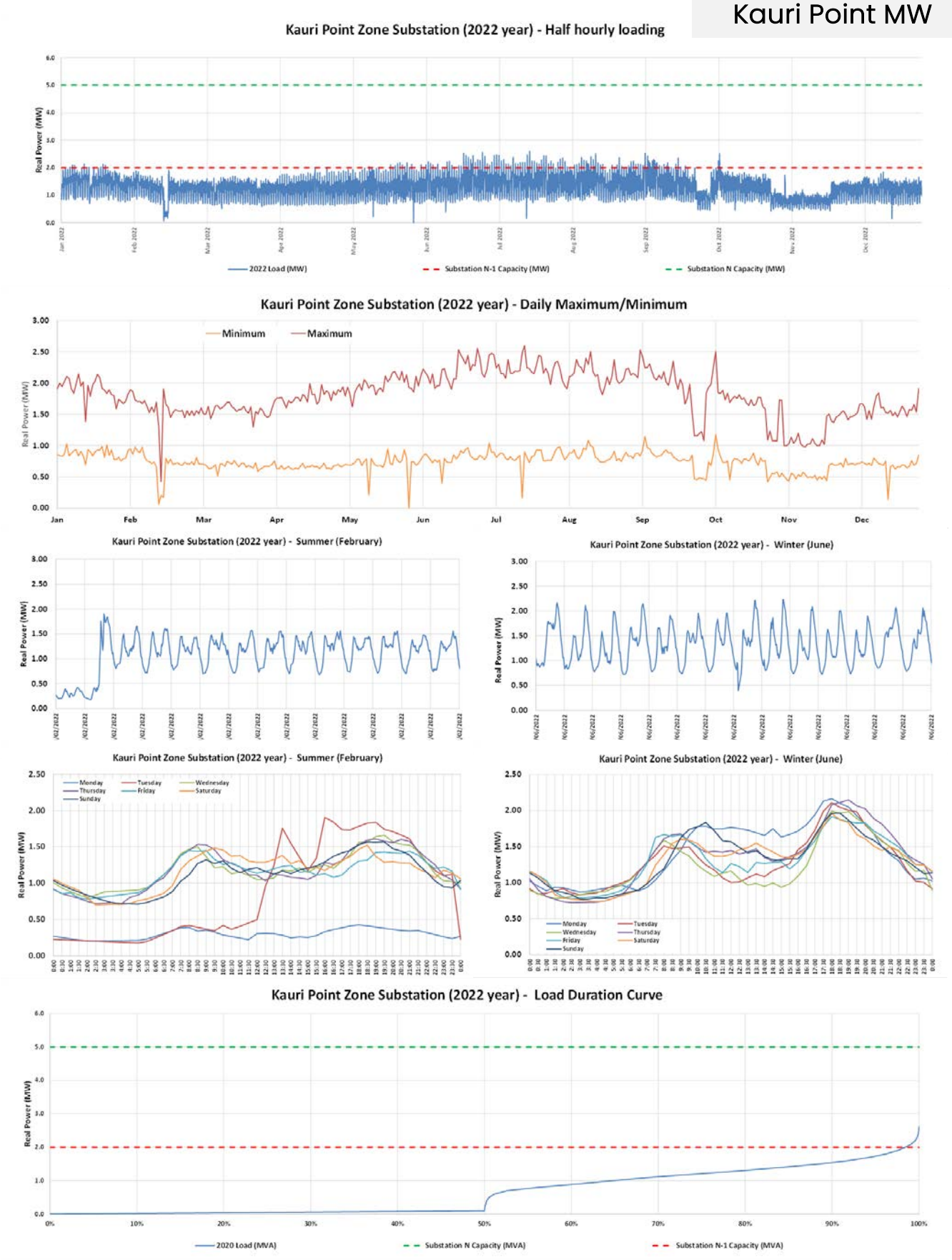

Figure 44. Kauri Point 33/11kV zone substation: Real power (MW) load characteristics.

Welcome Bay MW

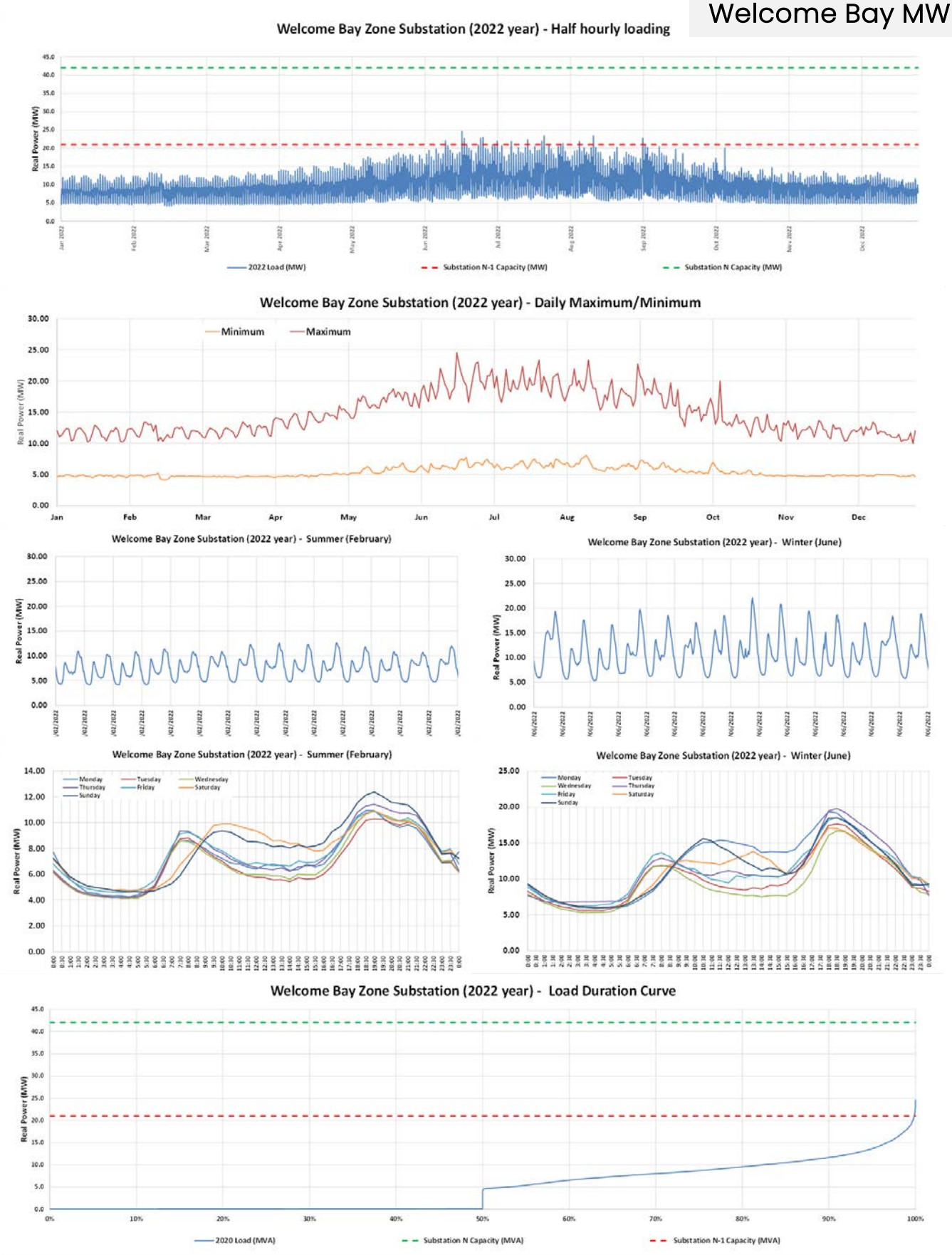

Figure 45. Welcome Bay 33/11kV zone substation: Real power (MW) load characteristics.

Pyes Pa MW

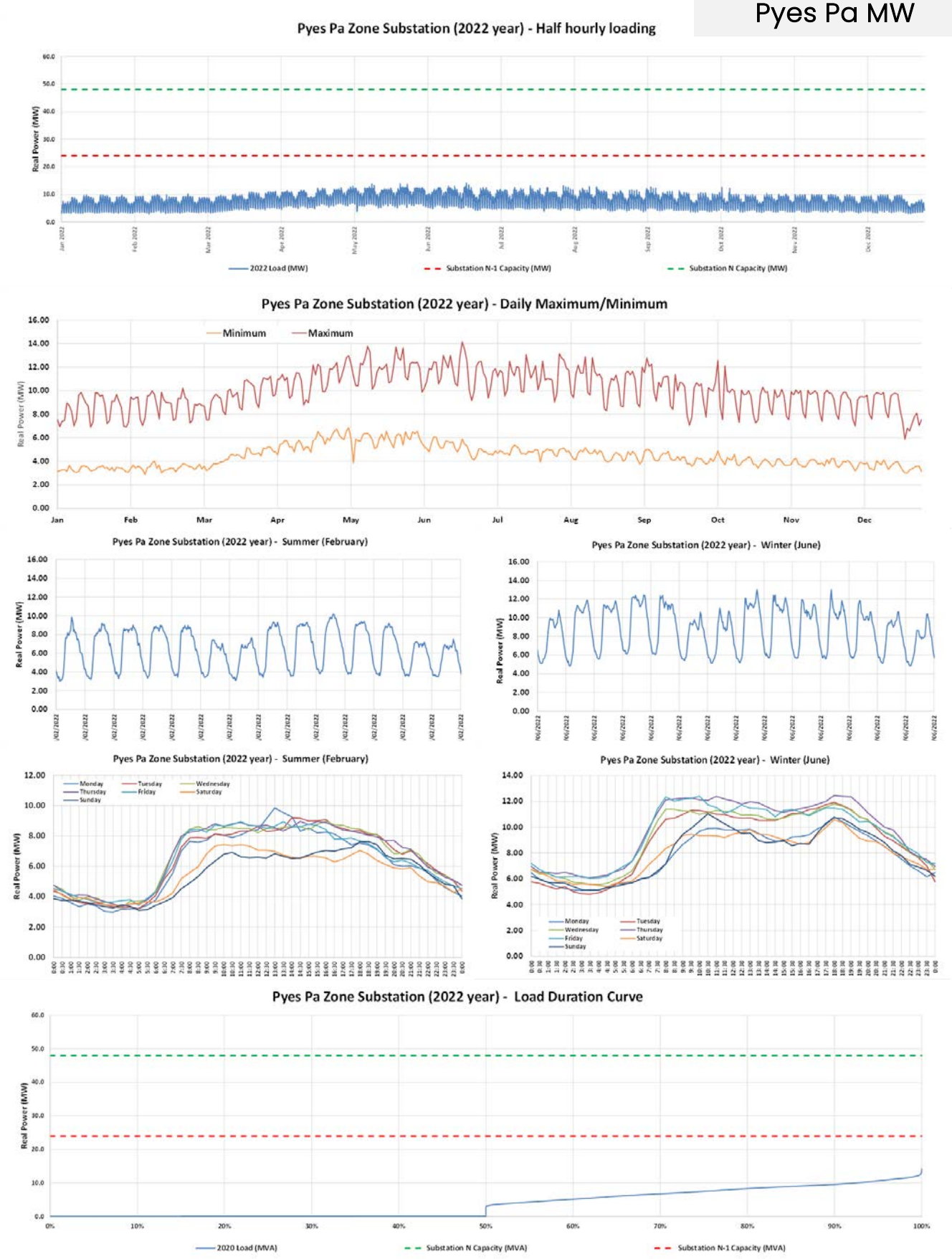

Figure 46. Pyes Pa 33/11kV zone substation: Real power (MW) load characteristics.

Papamoa MW

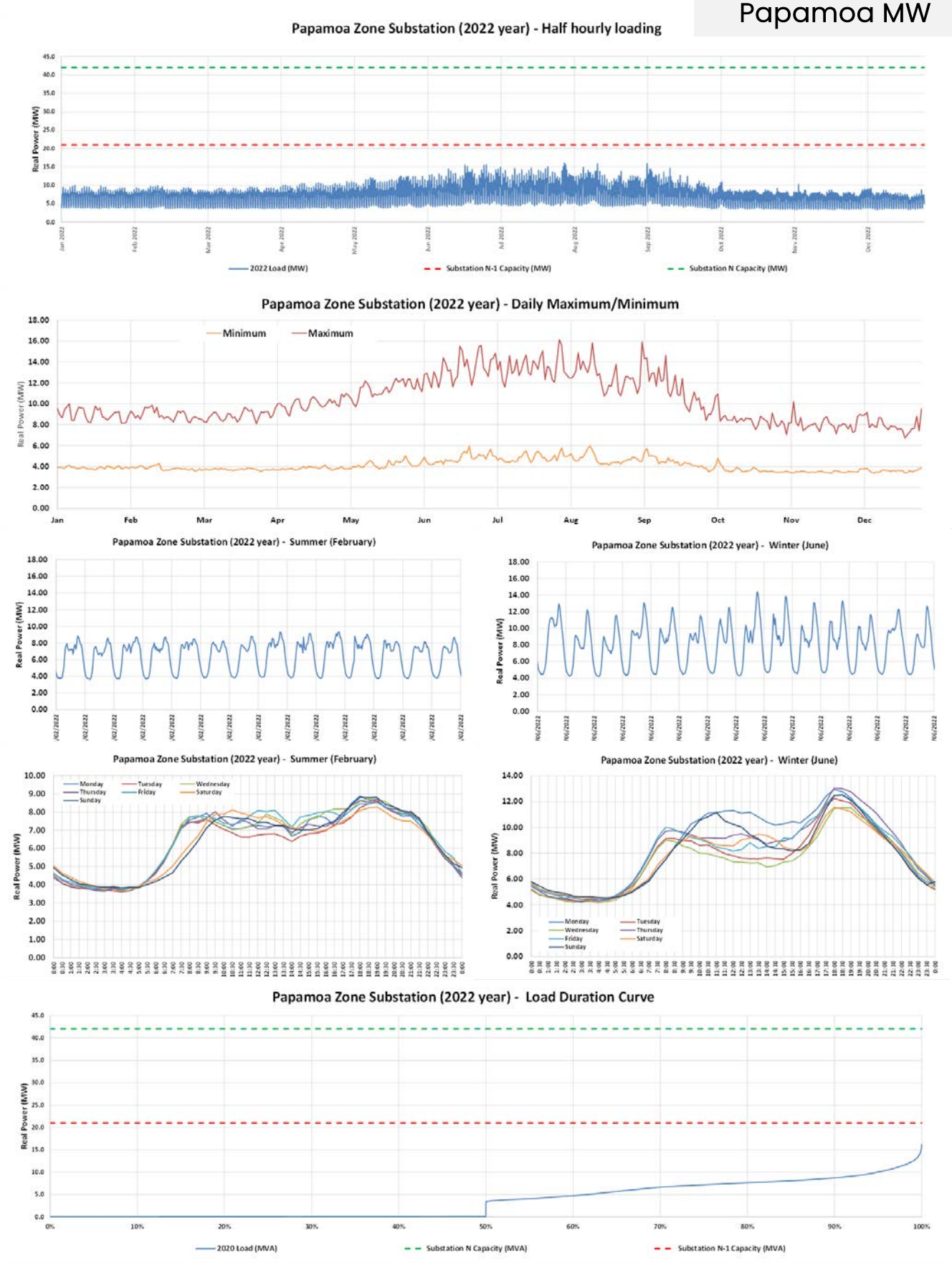

Figure 47. Papamoa 33/11kV zone substation: Real power (MW) load characteristics.

Matapihi MW

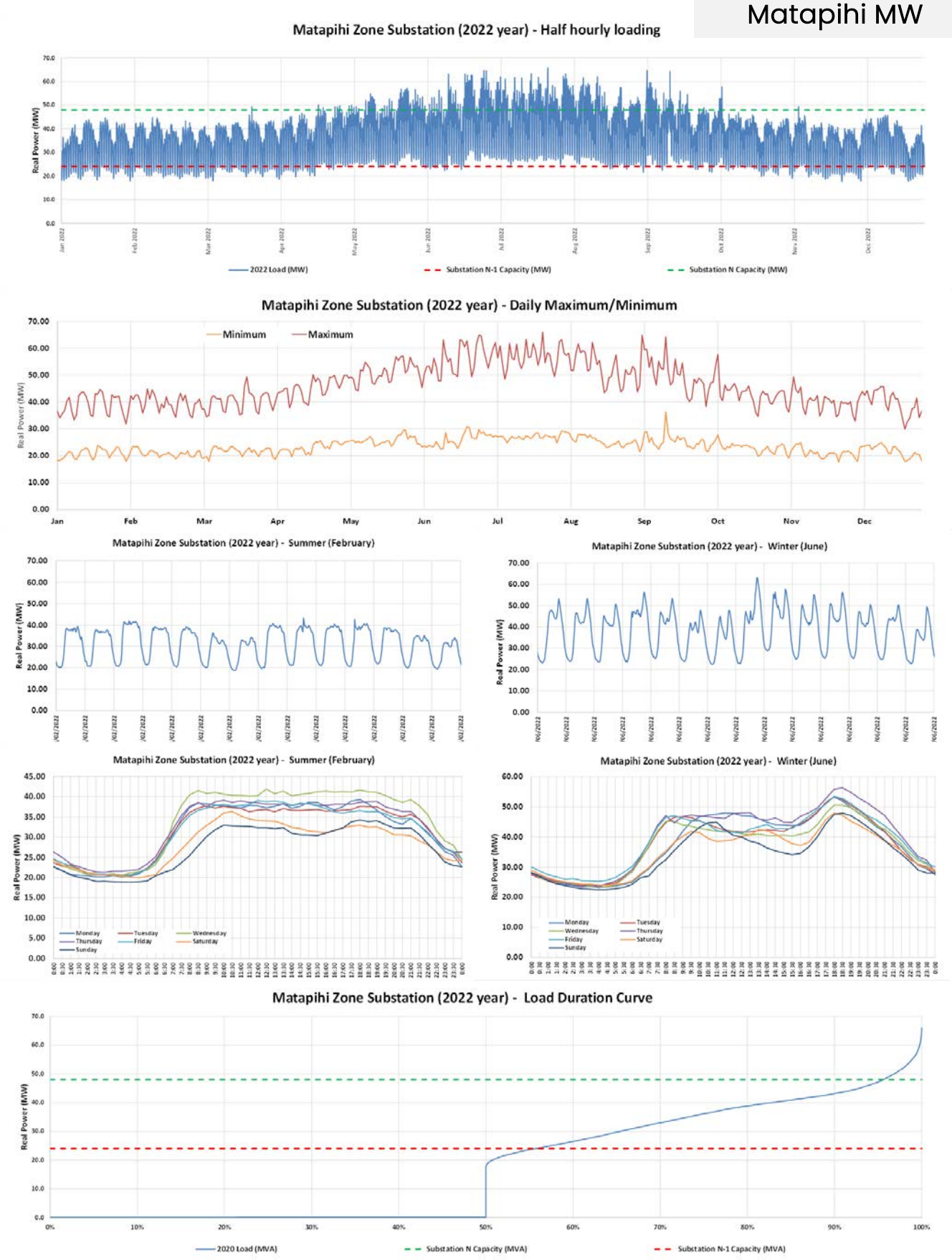

Figure 48. Matapihi 33/11kV zone substation: Real power (MW) load characteristics.

Omanu MW

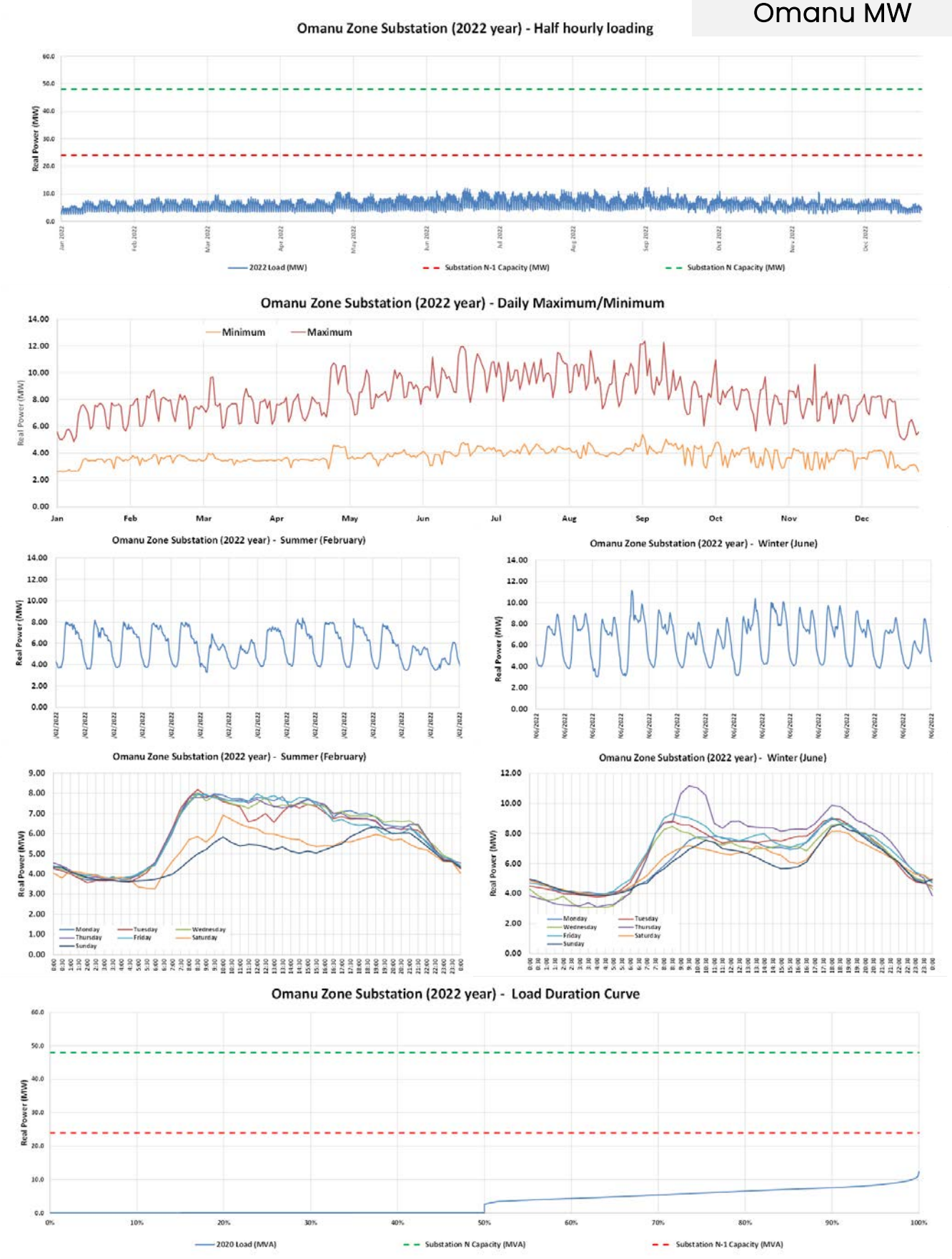

Figure 49. Omanu 33/11kV zone substation: Real power (MW) load characteristics.

Te Maunga MW

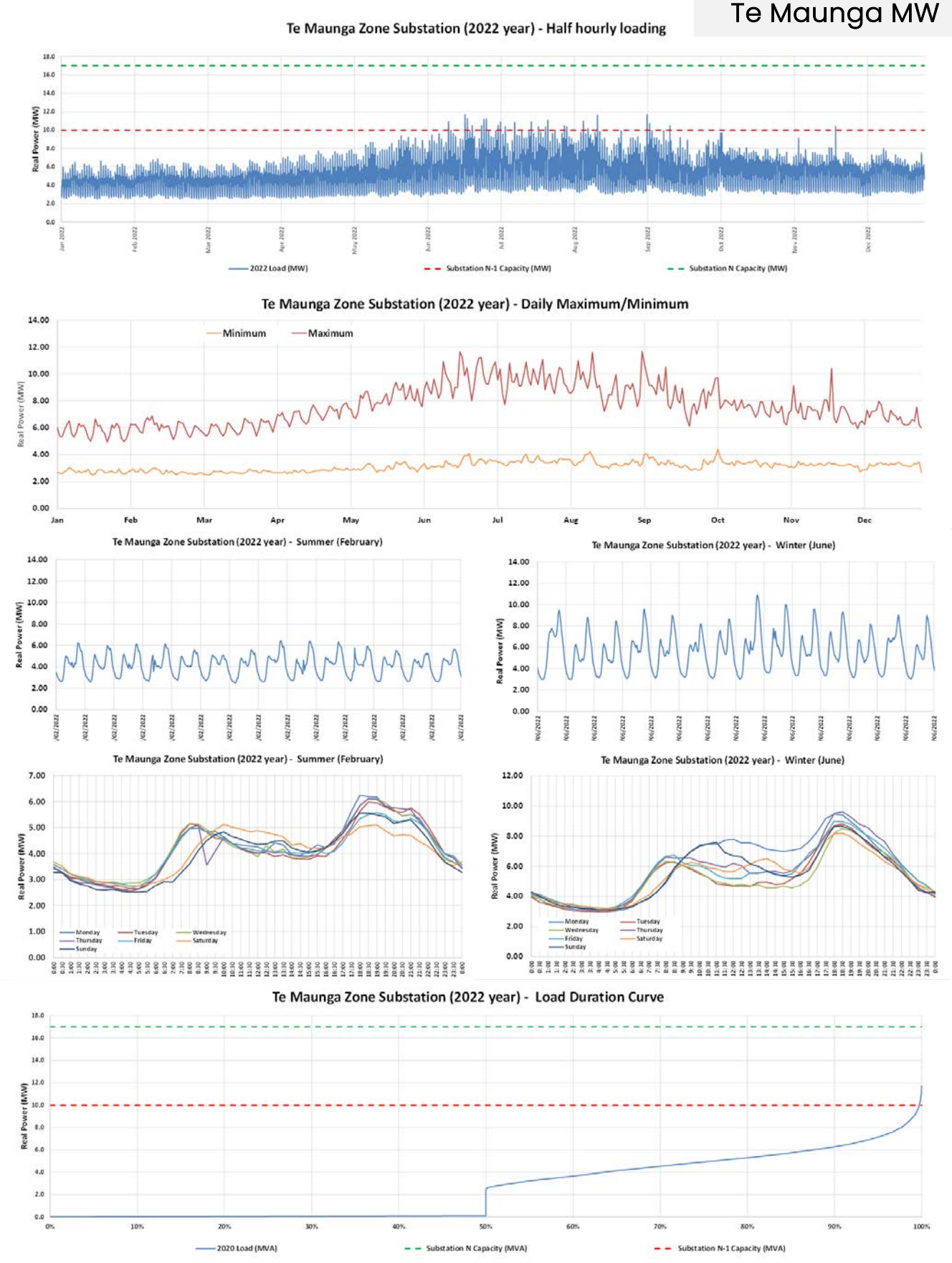

Figure 50. Te Maunga 33/11kV zone substation: Real power (MW) load characteristics.

Triton MW

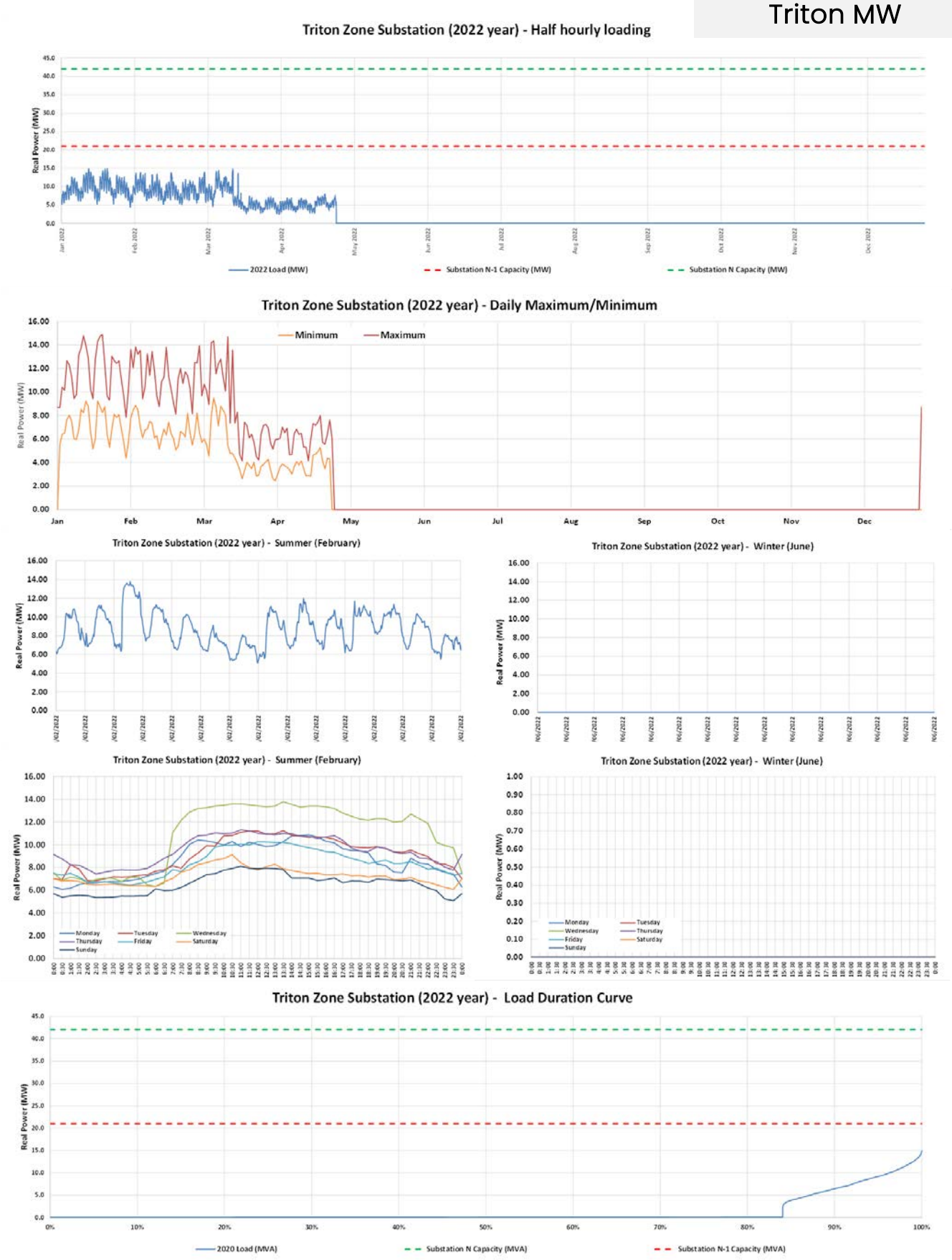

Figure 51. Triton 33/11kV zone substation: Real power (MW) load characteristics.

Wairakei MW

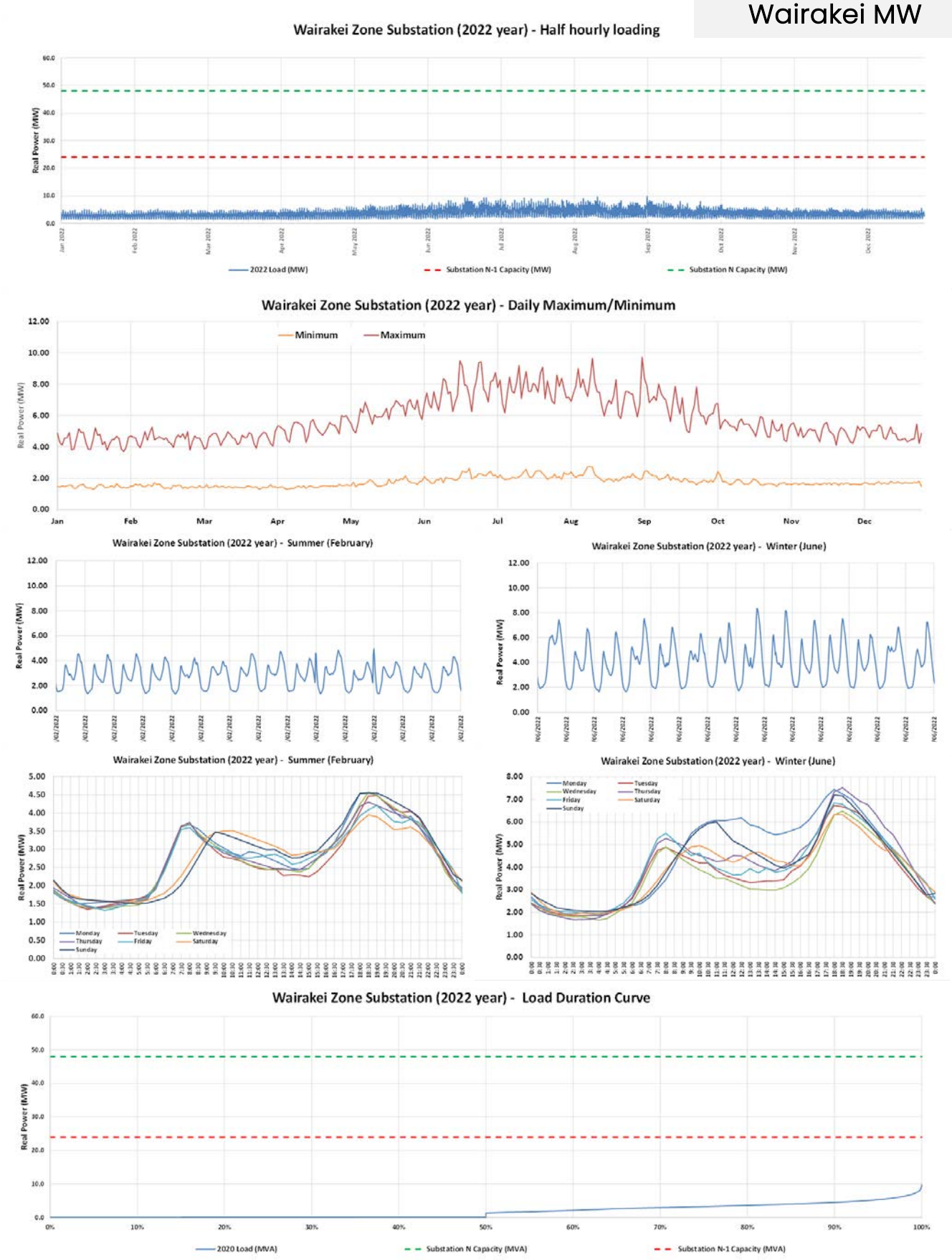

Figure 52. Wairakei 33/11kV zone substation: Real power (MW) load characteristics.

Te Puke MW

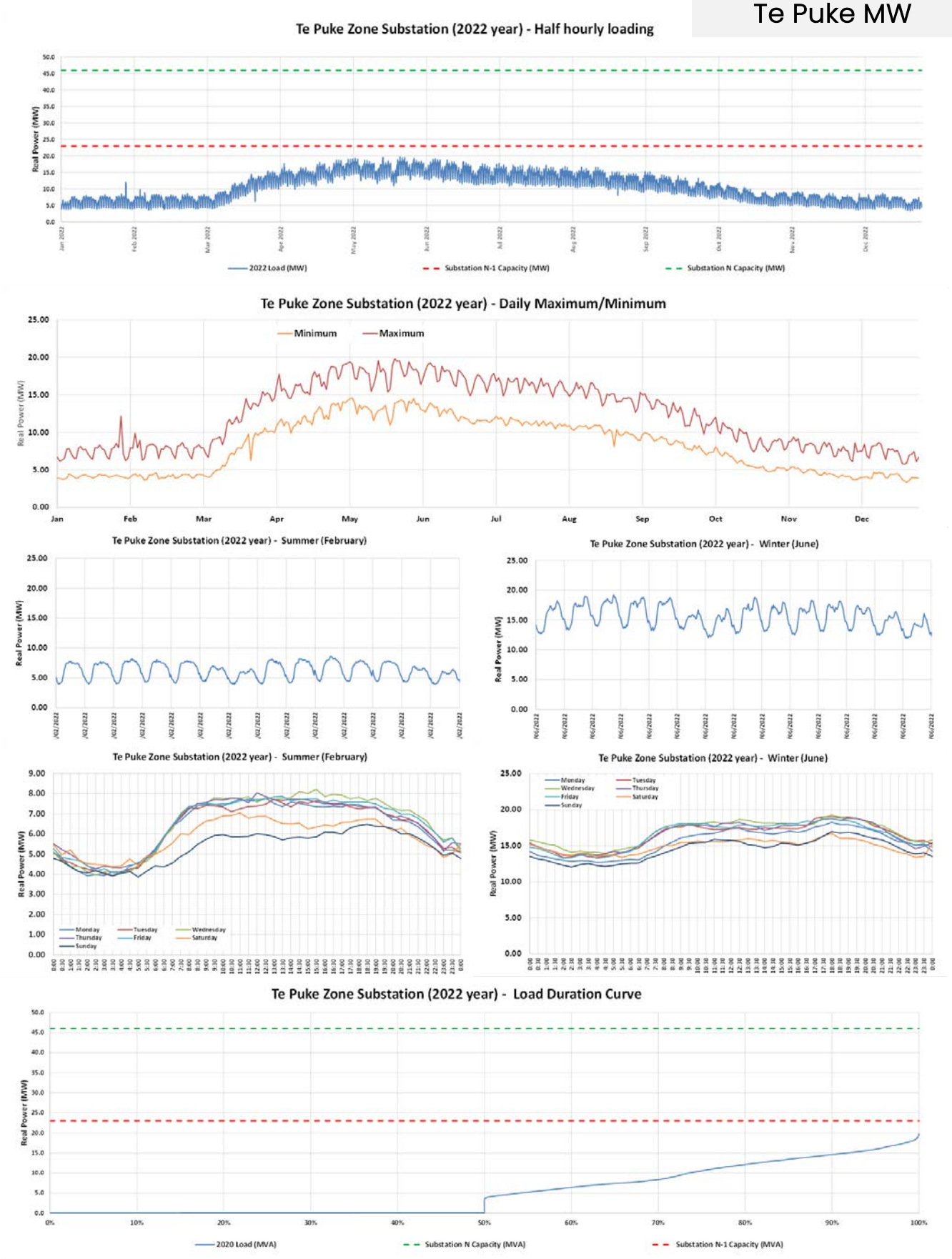

Figure 53. Te Puke 33/11kV zone substation: Real power (MW) load characteristics.

Atauroa MW

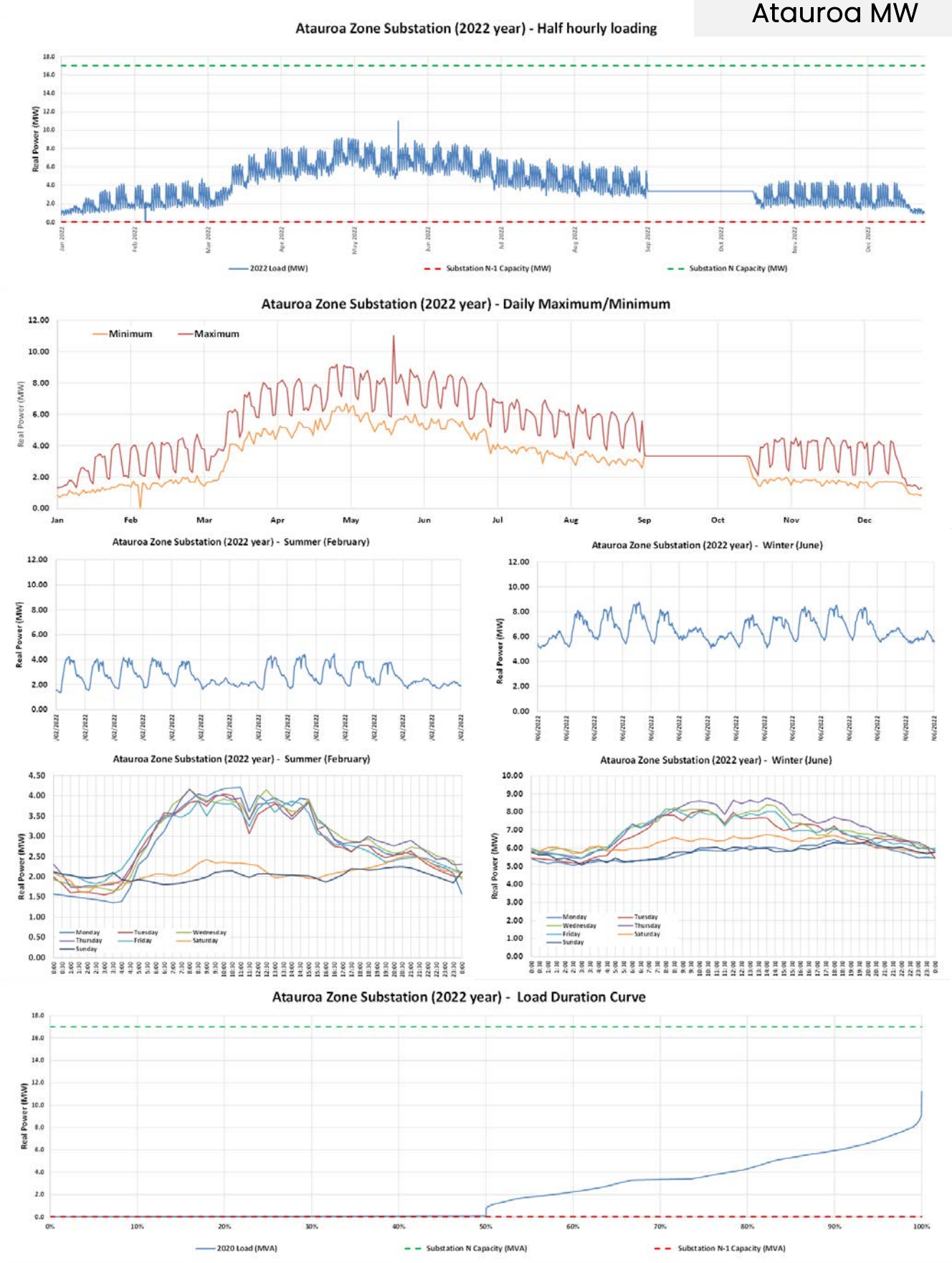

Figure 54. Atauroa 33/11kV zone substation: Real power (MW) load characteristics.

Paengaroa MW

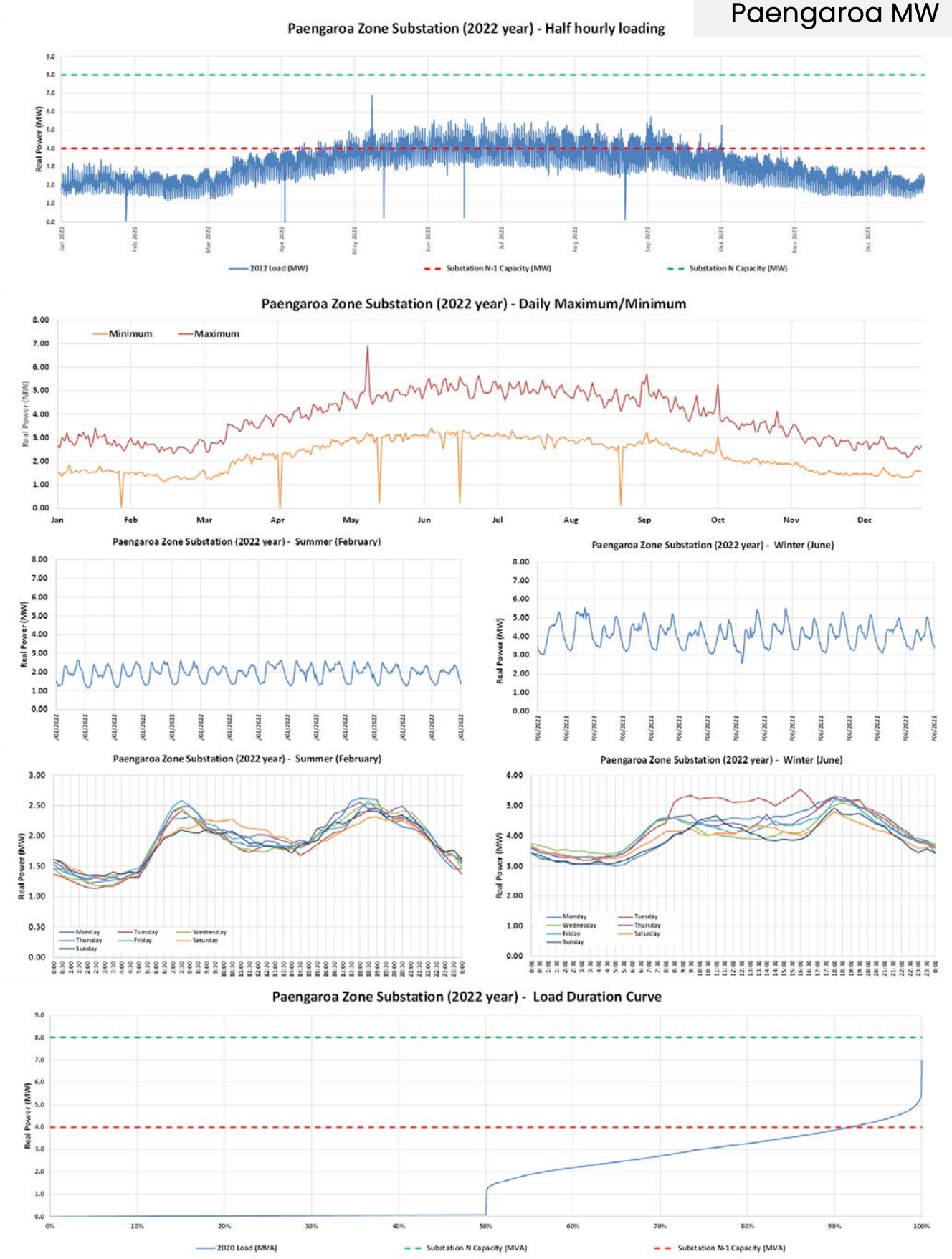

Figure 55. Paengaroa 33/11kV zone substation: Real power (MW) load characteristics.

Pongakawa MW

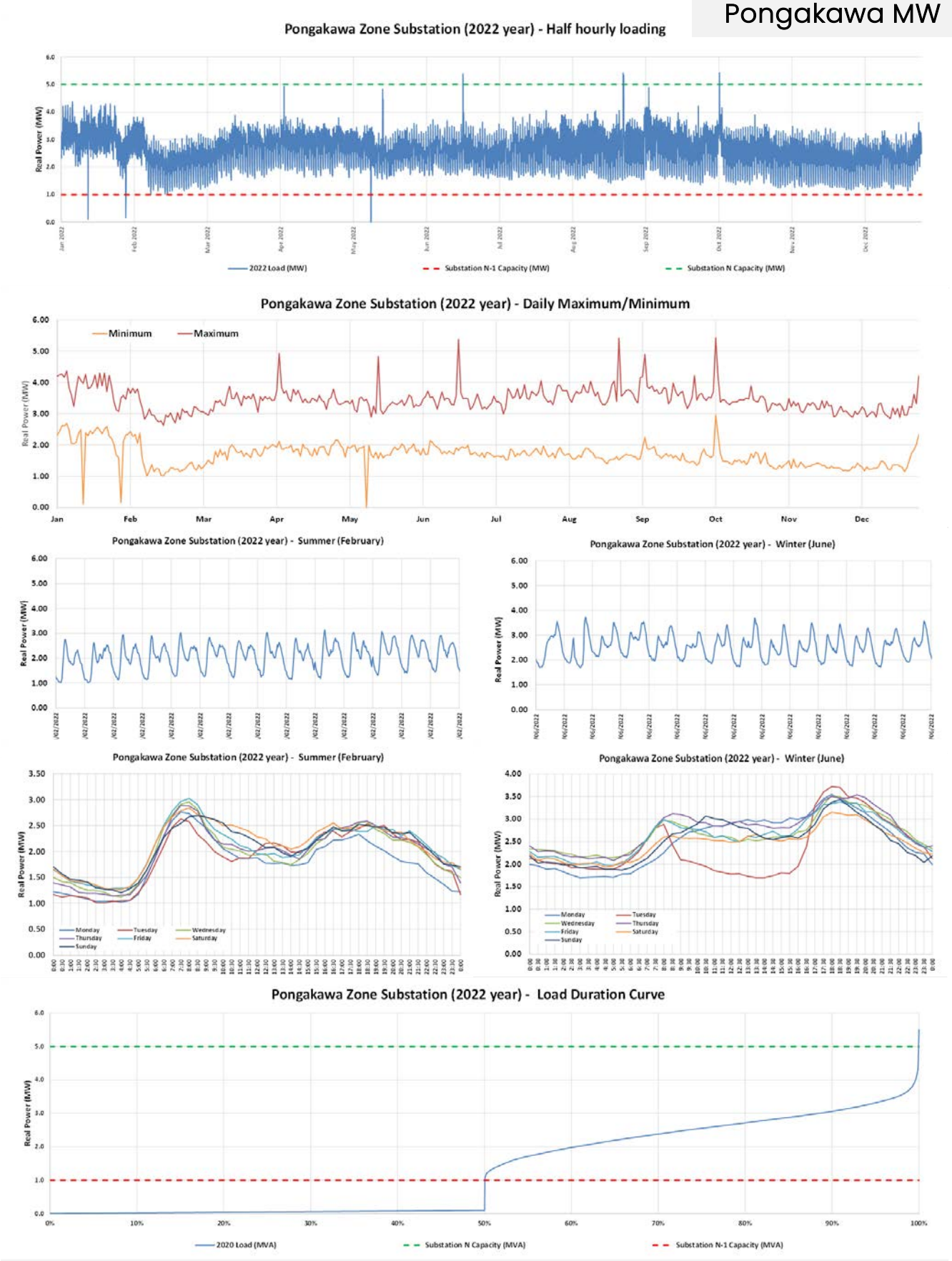

Figure 56. Pongakawa 33/11kV zone substation: Real power (MW) load characteristics.

1.3 Unison (Rotorua Region)

The characteristics of the zone substation **real power loadings** within Unison's network are shown in the following:

- Figure 57. Arawa 33/11kV zone substation: Real power (MW) load characteristics.
- Figure 58. Atiamuri 33/11kV zone substation: Real power (MW) load characteristics.
- Figure 59. Biak Street 33/11kV zone substation: Real power (MW) load characteristics.
- Figure 60. Fernleaf 33/11kV zone substation: Real power (MW) load characteristic.
- Figure 61. Rainbow 33/11kV zone substation: Real power (MW) load characteristics.
- Figure 62. Waipa 33/11kV zone substation: Real power (MW) load characteristics.

Arawa MW

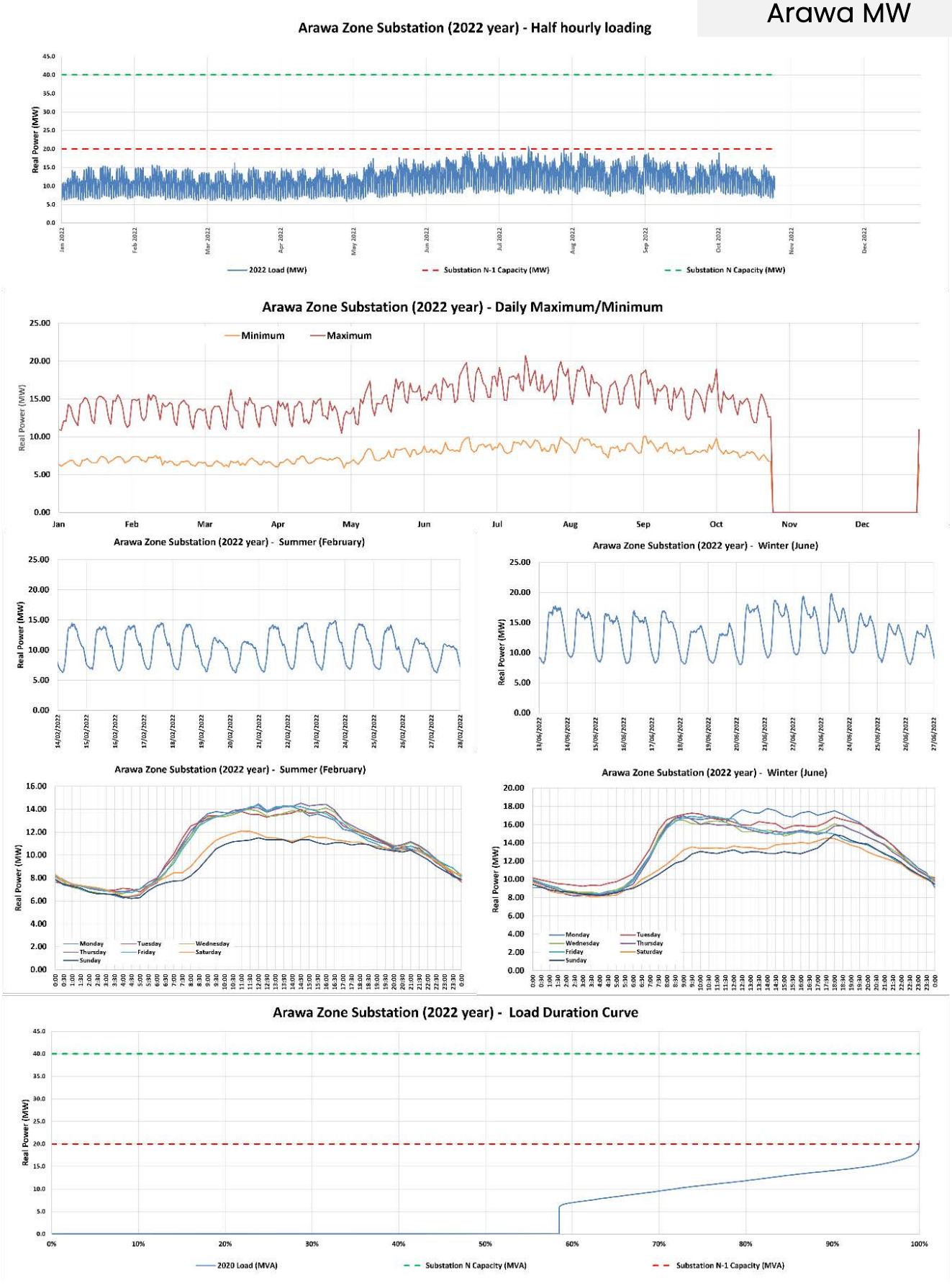

Figure 57. Arawa 33/11kV zone substation: Real power (MW) load characteristics.

Atiamuri MW

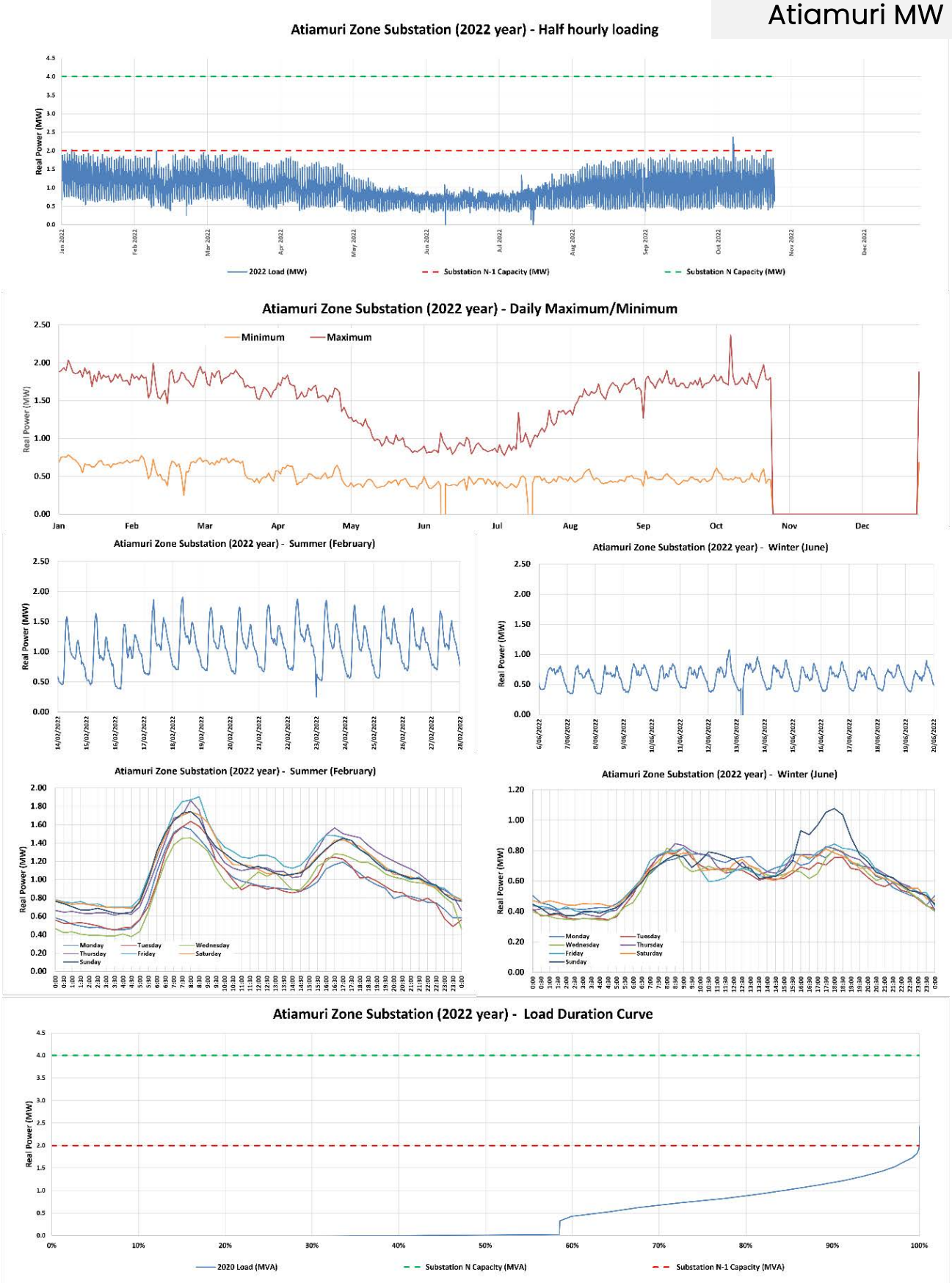

Figure 58. Atiamuri 33/11kV zone substation: Real power (MW) load characteristics.

Biak St MW

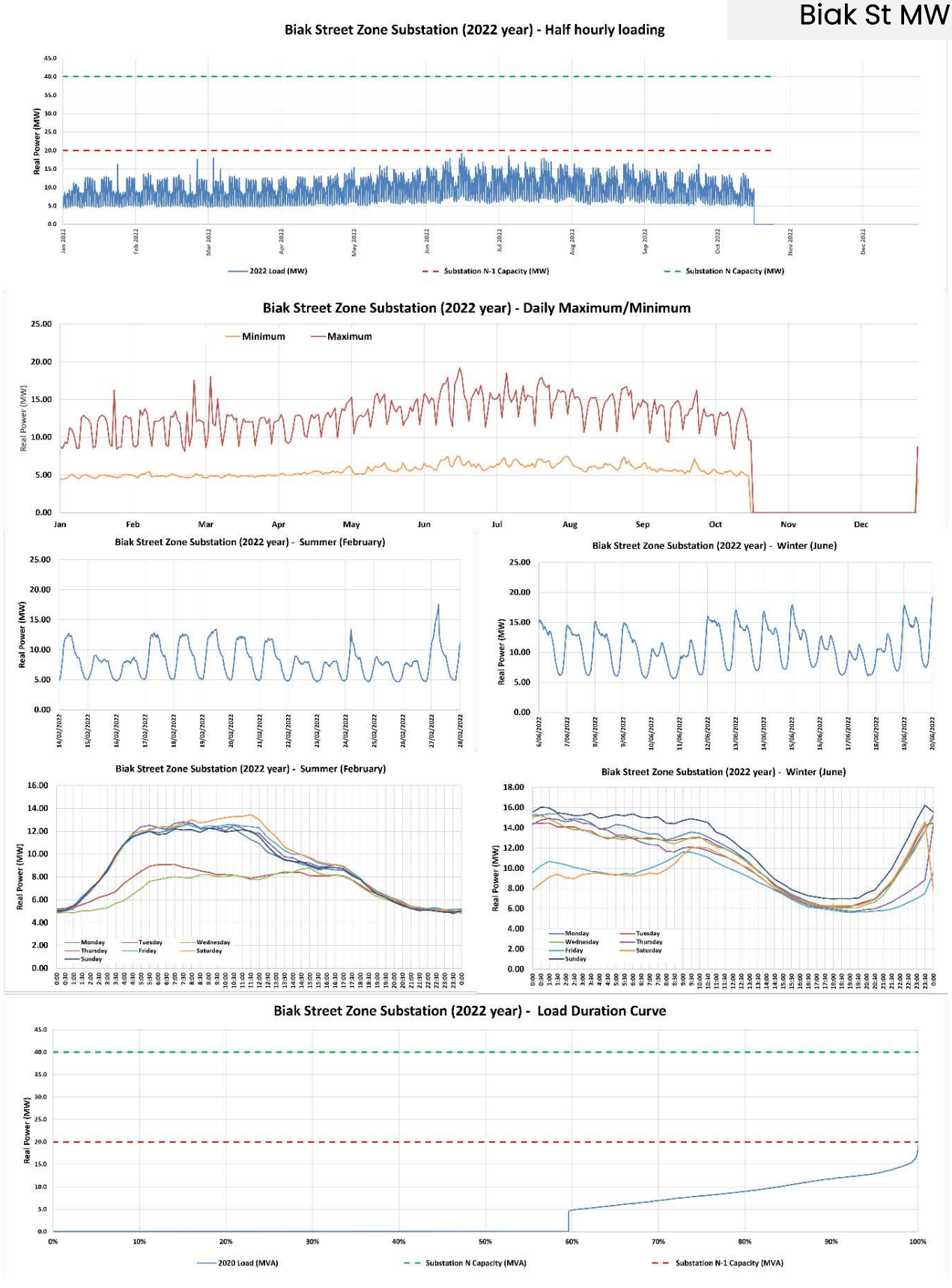

Figure 59. Biak Street 33/11kV zone substation: Real power (MW) load characteristics.

Fernleaf MW

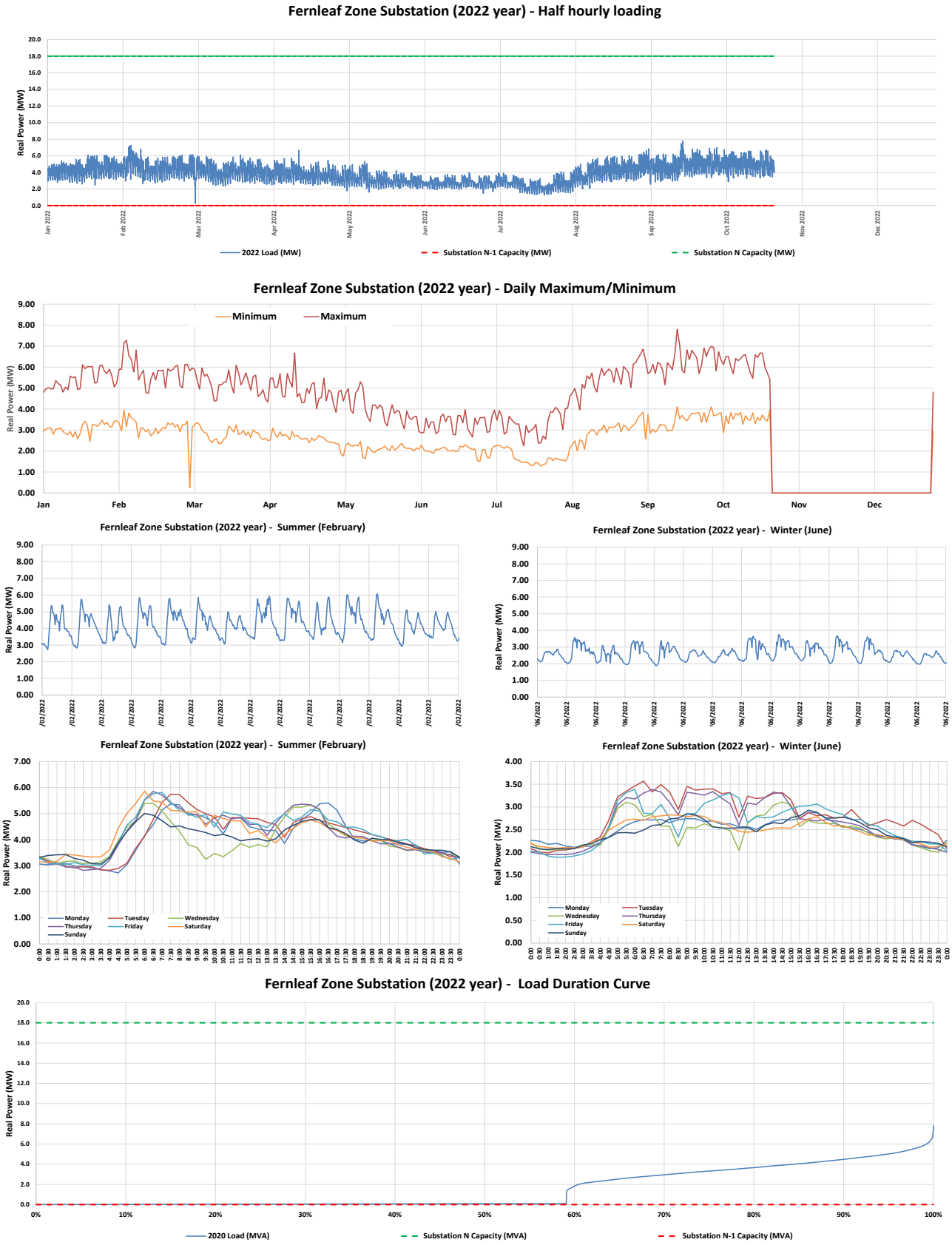

Figure 60. Fernleaf 33/11kV zone substation: Real power (MW) load characteristic.

Rainbow MW

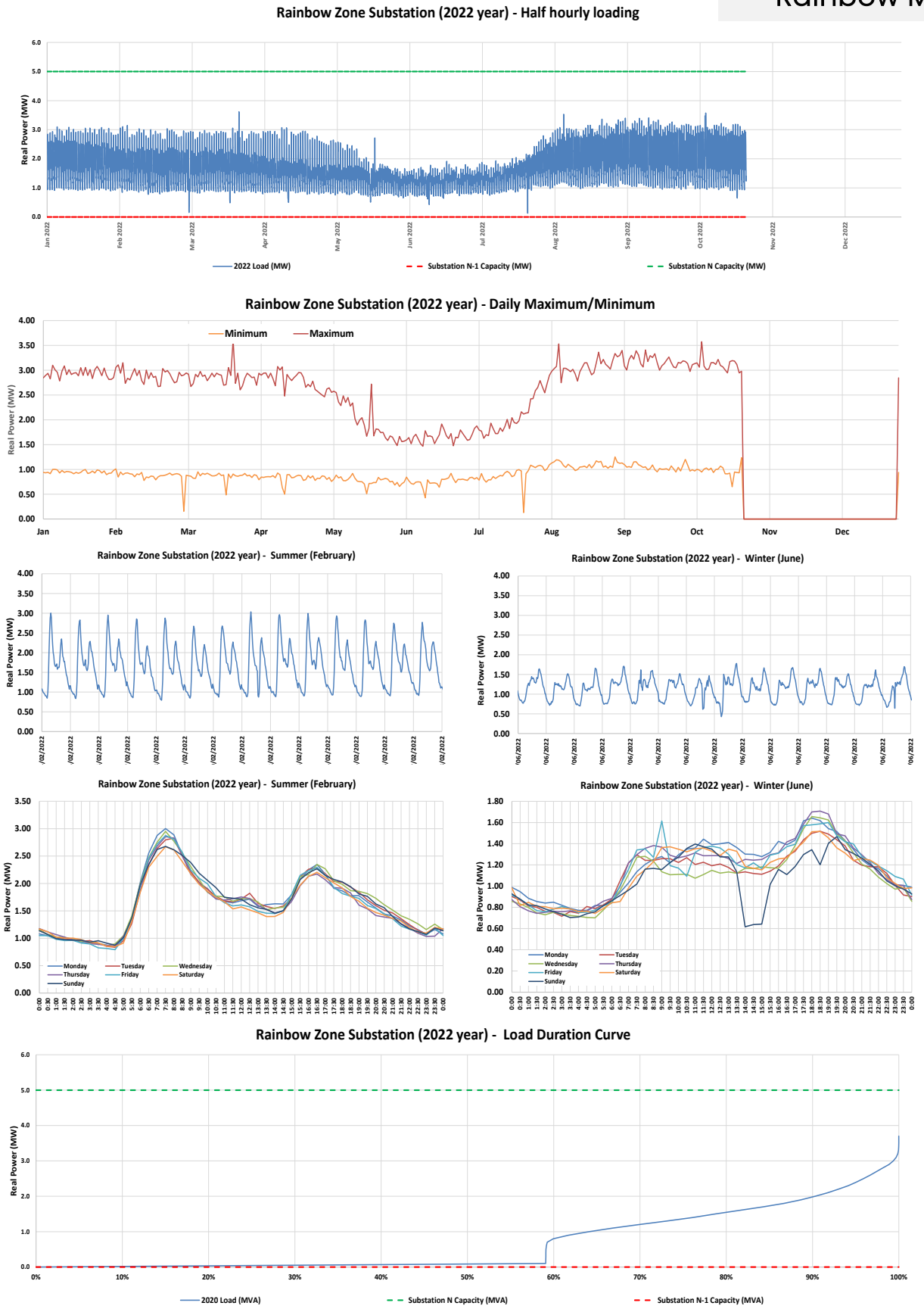

Figure 61. Rainbow 33/11kV zone substation: Real power (MW) load characteristics.

Waipa MW

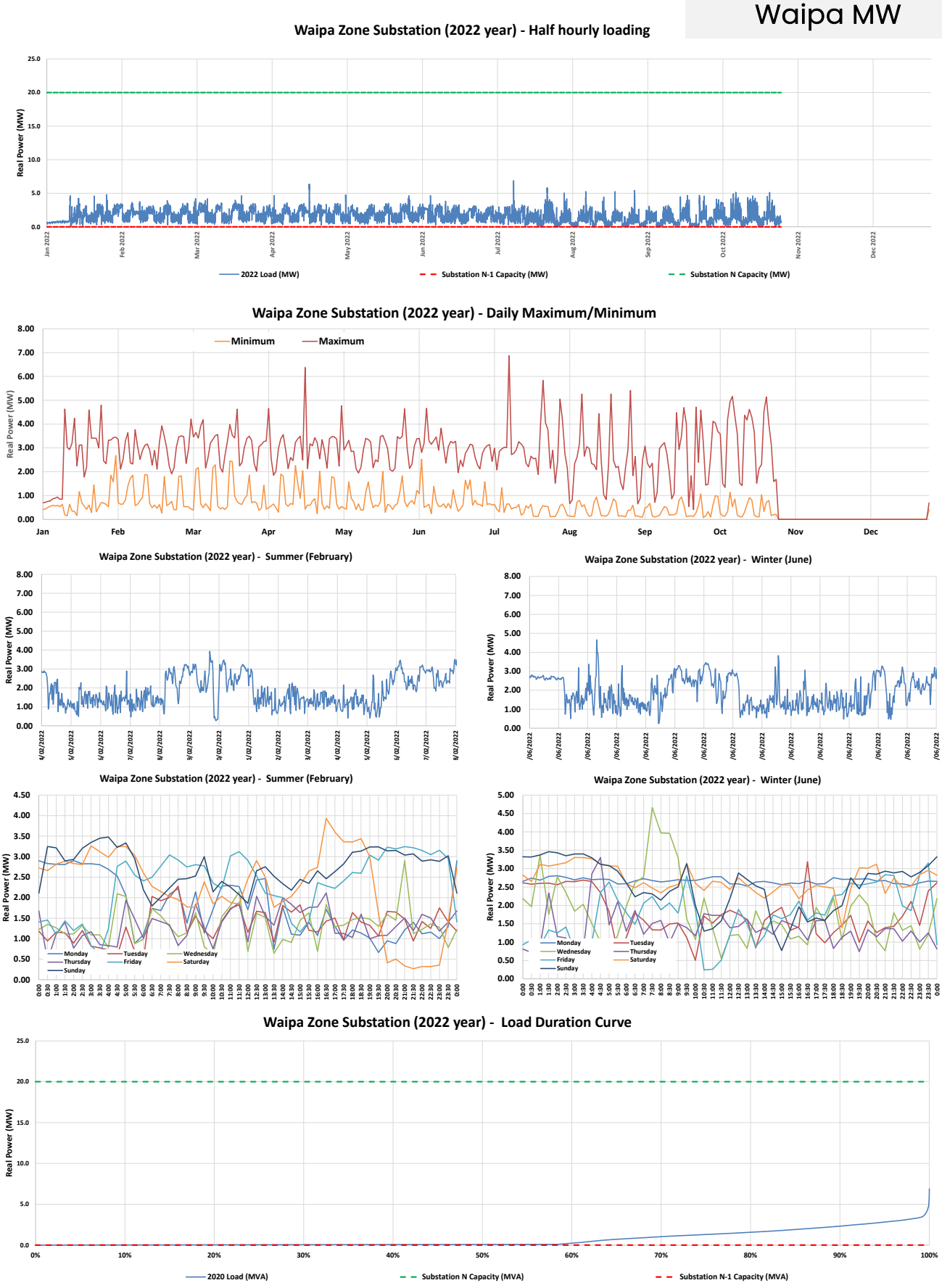

Figure 62. Waipa 33/11kV zone substation: Real power (MW) load characteristics.