



em6: API Integration Guide

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Em6 API Integration Guide

Introduction

The APIs available as part of the em6 service are used to power the em6 web application as well as business-to-business APIs.

The APIs are split amongst various features that participants must subscribe to gain access to a service.

Data feeds

The tags under each API relate to our data feed subscriptions. If you want more information about the different data feeds or want to get access to an API, visit ems.co.nz/services/em6 or contact call@ems.co.nz.

Em6 URLs

The base API URL will be referred to as **{EM6_URL}** for the remainder of this guide.

UAT Endpoint:	{EM6_URL} = https://uat-api.em6.co.nz/ords/em6/data_api/
PROD Endpoint:	{EM6_URL} = https://api.em6.co.nz/ords/em6/data_api/

Reference Nodes

There are three reference price nodes referred to in the em6 application. None of these price nodes have load associated to them.

OTA2201	Otahuhu
HAY2201	Haywards
BEN2201	Benmore

Default Price Nodes

There are 15 default price nodes referred to in the em6 application. Some of these price nodes have load associated to them as indicated below:

Grid Zone	NODE ID	Pricing Node?	Load Node?
1	BRB0331	YES	YES
2	OTA2201	YES	
3	HAM2201	YES	
4	WKM2201	YES	YES
5	RDF2201	YES	
5	TUI1101	YES	YES
6	SFD2201	YES	
7	BPE2201	YES	
8	HAY2201	YES	
9	KIK2201	YES	
10	ISL2201	YES	
12	DOB0661	YES	
13	BEN2201	YES	
14	INV2201	YES	
14	HWB2201	YES	

Default Load Nodes

There are 15 default load nodes referred to in the em6 application:

Grid Zone	NODE ID	Pricing Node?	Load Node?
1	MPE1101	YES	YES
2	PEN0331	YES	YES
3	HAM0331	YES	YES
4	EDG0331	YES	YES
5	RDF0331	YES	YES
5	TUI1101	YES	YES
6	SFD0331	YES	YES
7	BPE0331	YES	YES
8	CPK0331	YES	YES
9	STK0331	YES	YES
10	ISL0661	YES	YES
12	GYM0661	YES	YES
13	OAM0331	YES	YES
14	INV0331	YES	YES
15	HWB0331	YES	YES

Authorisation

Authentication overview

Authentication for the EM6 APIs is handled by User Pools configured within AWS Cognito. Each user within Cognito will have groups assigned to them which help to control what data is returned and which APIs they are allowed to access. The API is served by AWS API Gateway, which checks the user provided token is valid, authenticated and was issued by the correct User Pool. Once API Gateway has validated the token with Cognito to make sure it is correct, it then passes the token back to the API Backend.

The Authorisation and filtering logic for the data to be returned is controlled by the backend. The Cognito tokens that are passed back are in a JWT encrypted format, so they include information about what groups the user belongs to and other user specific attributes like email. Once the backend has filtered the returned data based on the information in the token, the request is passed back through the API Gateway and back to the user.

Authentication process

Step one: Authenticate to AWS Cognito

The first step in the authentication flow is for the end user to authenticate to AWS Cognito with a valid username and password to retrieve a token to pass to API Gateway. In order to authenticate to Cognito, you will need:

- A valid Application Client ID from the userpool
- A valid username and password from the userpool
- The User Pool ID that is used for authentication

There are two different broad methods of authentication to Cognito. You can either use one of the AWS SDKs or you can use authenticate based on standard OAuth2 authentication. We recommend wherever possible that the AWS SDK should be used, as this makes the process a lot easier. Cognito tokens, by default, are valid for 60 minutes. There are a number of JWT libraries that can be used to help manage expiry and refresh of tokens as required.

Authenticating via AWS SDK

In order to authenticate with the AWS SDK, you will need to integrate that with your code base. AWS SDKs are developed for the majority of programming languages, and most languages will have sample apps available (i.e. Java and .NET). You will need to call `Initiate_auth` (Name may change depending on SDK language) method which should take a username and password as input and output a JSON payload containing a series of tokens (IdToken, AccessToken and RefreshToken). The method should not require admin, or IAM, credentials (There's normally options for both admin and normal - in this case, we want normal). Authentication flow should be 'USER_PASSWORD_AUTH' unless you are choosing to use 'USER_SRP_AUTH' - we support both.

For example (but not limited to);

```
import com.amazonaws.services.cognitoidp.AWSCognitoIdentityProvider;
import
com.amazonaws.services.cognitoidp.AWSCognitoIdentityProviderClientBuilder;
import com.amazonaws.services.cognitoidp.model.*;
import java.util.HashMap;
import java.util.Map;
public class DemoApplication {
public AWSCognitoIdentityProvider getAmazonCognitoIdentityClient() {
return AWSCognitoIdentityProviderClientBuilder.standard()
.withRegion( "ap-southeast-2" )
.build();
}
public void authenticate() {
final Map<String, String> authParams = new HashMap<>();
authParams.put( "USERNAME" , "UsernameHere" );
authParams.put( "PASSWORD" , "PasswordGoesHere" );
final InitiateAuthRequest authRequest = new InitiateAuthRequest();
authRequest.withAuthFlow(AuthFlowType.USER_PASSWORD_AUTH)
.withClientId( "2psmqhb*****6b2q2" )
.withAuthParameters(authParams);
InitiateAuthResult initiateAuthResult =
getAmazonCognitoIdentityClient().initiateAuth(authRequest);
System.out.println( "Authenticate result: " + initiateAuthResult);
}
public static void main(String[] args) {
DemoApplication demoApplication = new DemoApplication();
demoApplication.authenticate();
}
}
```

Authentication for B2B without SDK

You can authenticate with the Cognito service without using the SDK using the following technique.

Request format and instructions

Endpoint:	https://api.em6.co.nz/auth or in UAT https://uat-api.em6.co.nz/auth
Method:	POST
Example Payload	
<pre>{ "AuthParameters": { "USERNAME": "usernamePlaceholder", "PASSWORD": "passwordPlaceholder", "AuthFlow": "USER_PASSWORD_AUTH", "ClientId": "clientIdPlaceholder" } }</pre>	
usernamePlaceholder = email address used to authenticate to the webapp passwordPlaceholder = password created on account setup clientIdPlaceholder provided by EMS	

Successful response format

HTTP Code: 200

```
{
  "AuthenticationResult": {
    "AccessToken": "xyz",
    "ExpiresIn": 3600,
    "IdToken": "xyz",
    "RefreshToken": "xyz",
    "TokenType": "Bearer"
  },
  "ChallengeParameters": { }
}
```

All 3 tokens (Access, ID and Refresh) are in JWT encoded format. The 'IdToken' is the one you need to supply to API Gateway as below. 'ExpiresIn' is the time, in seconds, that the token is valid for.

Error response format

HTTP Code: 400

```
{
  "__type": "Exception type"
  "message": "Exception message"
}
Example:
{
  "__type": "NotAuthorizedException"
  "message": "Incorrect username or password"
}
```

Curl example

```
curl -X POST --data @auth-data.json https://api.em6.co.nz/auth
```

Where auth-data.json is the following;

```
{
  "AuthParameters" :
  { "USERNAME" : "yourusername@example.com", "PASSWORD" : "yourpassword" },
  "AuthFlow" : "USER_PASSWORD_AUTH",
  "ClientId" : "AFDG....."
}
```

Step two: Authenticate to API Gateway

Using the Identity Token (IdToken), we can now authenticate to API Gateway. Simply append the body of the identity IdToken to 'Authorization' header to all your requests. API Gateway will validate with Cognito that the token is valid, not expired and that the token was issued by the correct User Pool. Once this is done, the request will be passed to the backend and data returned (based on what the authenticated Cognito user has access.

Node API

DATA FEEDS: MARKET DASHBOARD, SCADA LOAD GENERATION AND HVDC, MARKET PRICES

Description: API to return node metadata, including coordinates for plotting on a map.

URL:	{EM6_URL}/nodes/ [node_id] [site_id] [pricing_node] [load_node] [generation_node] [generation_type_id] [grid_zone_id]
Method:	GET
Query parameters:	
Node_id	HAY0111 [CSV] - <i>Optional blank for all</i>
Site_id	HAY – <i>Optional blank for all</i>
Pricing_node	TRUE, FALSE – <i>Optional blank for all</i>
Load_node	TRUE, FALSE – <i>Optional blank for all</i>
Generation_node	TRUE, FALSE – <i>Optional blank for all</i>
Generation_type_id	Hydro HYD , Coal/Gas CG , Gas GAS , Wind WIN , Cogen COG , Battery BAT , Liquid LIQ , Geothermal GEO , Solar SOL – <i>Optional blank for all</i>
Grid_zone_id	8 – <i>Optional blank for all</i>

Examples:

1. {em6_url}/nodes/?generation_node=TRUE
2. {em6_url}/nodes/?load_node=TRUE
3. {em6_url}/nodes/?site_id=HAY
4. {em6_url}/nodes/?grid_zone_id=8&generation_node=TRUE
5. {em6_url}/nodes/OTA2201,BEN2201,HAY2201

Example Node API Response: {em6_url}/nodes/OTA2201,BEN2201

```
{
  "items": [
    {
      "site_id": "BEN",
      "site_name": "Benmore",
      "node_id": "BEN2201",
      "node_name": "Benmore",
      "grid_zone_id": 13,
      "grid_zone_name": "Otago",
      "pricing_node": "TRUE",
      "load_node": "FALSE",
      "conforming_load": "FALSE",
      "network_id": null,
      "network_description": null,
      "generation_node": "FALSE",
      "generation_type_id": null,
      "generation_type_name": null,
      "generation_capacity_mw": null,
      "generator_id": null,
      "generator_description": null,
      "latitude": -44.566414786999985,
      "longitude": 170.19463940900005
    },
    {
      "site_id": "OTA",
      "site_name": "Otahuhu A",
      "node_id": "OTA2201",
      "node_name": "Otahuhu",
      "grid_zone_id": 2,
      "grid_zone_name": "Auckland",
      "pricing_node": "TRUE",
      "load_node": "FALSE",
      "conforming_load": "FALSE",
      "network_id": null,
      "network_description": null,
      "generation_node": "FALSE",
      "generation_type_id": null,
      "generation_type_name": null,
      "generation_capacity_mw": null,
      "generator_id": null,
      "generator_description": null,
      "latitude": -36.955194815999996,
      "longitude": 174.86269900600007
    }
  ]
}
```

Current Price API

DATA FEED: MARKET DASHBOARD, MARKET PRICES

Description: API to return the six most recent dispatch prices for requested nodes

URL:	{EM6_URL}/price/[node_id] [site_id] [grid_zone_id]
Method:	GET
Query parameters:	
Node_id	HAY0111 [CSV] – <i>Optional blank for all</i>
Site_id	HAY – <i>Optional blank for all</i>
Grid_zone_id	8 – <i>Optional blank for all</i>

Examples:

1. {em6_url}/price/WIL0331,HAY2201
2. {em6_url}/price/?site_id=ALB
3. {em6_url}/price/?grid_zone_id=8

Truncated Current Price Example Response: {em6_url}/price/?site_id=GOR

```
{
  "items": [
    {
      "trading_date": "2020-08-13T12:00:00Z",
      "trading_period": 24,
      "time_stamp": "11:50",
      "node_id": "GOR0331",
      "node_name": "Gore",
      "price": 114.31,
      "price_change": null,
      "price_tp_average": 114,
      "max_7_day": 243.47,
      "min_7_day": 48.56
    },
    {
      "trading_date": "2020-08-13T12:00:00Z",
      "trading_period": 24,
      "time_stamp": "11:55",
      "node_id": "GOR0331",
      "node_name": "Gore",
      "price": 113.69,
      "price_change": -0.62,
      "price_tp_average": 114,
      "max_7_day": 243.47,
      "min_7_day": 48.56
    },
    {
      "trading_date": "2020-08-13T12:00:00Z",
      "trading_period": 25,
      "time_stamp": "12:00",
      "node_id": "GOR0331",
      "node_name": "Gore",
      "price": 117.3,
      "price_change": 3.61,
      "price_tp_average": 115.555,
      "max_7_day": 243.47,
      "min_7_day": 48.56
    }
  ],
  "3 MORE TRADING PERIODS"
}
```

Current Regional Price API

DATA FEED: FREE (NO AUTHORISATION REQUIRED)

Description: API to return the average prices for the most recent trading period for each region.

URL:	{EM6_URL}/region/price/[grid_zone_id]
Method:	GET
Query parameters:	
Grid_zone_id	8 [csv]– Optional blank for all

Examples:

1. {em6_url}/region/price/
2. {em6_url}/region/price/?grid_zone_id=2
3. {em6_url}/region/price/?grid_zone_id=4,5,9

Truncated Current Regional Price Example Response:

{em6_url}/region/price/?grid_zone_id=2,4,8

```
{
  "items": [
    {
      "timestamp": "2021-08-01T21:30:00Z",
      "trading_period": 20,
      "grid_zone_id": 2,
      "grid_zone_name": "Auckland",
      "price": 177.41
    },
    {
      "timestamp": "2021-08-01T21:30:00Z",
      "trading_period": 20,
      "grid_zone_id": 4,
      "grid_zone_name": "Edgumbe",
      "price": 164.51
    },
    {
      "timestamp": "2021-08-01T21:30:00Z",
      "trading_period": 20,
      "grid_zone_id": 8,
      "grid_zone_name": "Wellington",
      "price": 158.68
    }
  ]
}
```

Price Last 24hrs API (free version)

DATA FEED: FREE (NO AUTHORISATION REQUIRED)

Description: API to return the price over last 24 hours for six nodes, OTA2201, WKM2201, HAY2201, KIK2201, ISL2201 and BEN2201.

URL:	{EM6_URL}/price/free_24hrs
Method:	GET
Query parameters:	n/a

Examples:

1. {em6_url}/price/free_24hrs

Truncated Price last 24hrs Example Response: {em6_url}/price/free_24hrs

```
{
  "items": [
    {
      "timestamp": "2021-07-31T20:30:00Z",
      "trading_period": 18,
      "node_id": "BEN2201",
      "price": 144.46
    },
    {
      "timestamp": "2021-07-31T20:30:00Z",
      "trading_period": 18,
      "node_id": "OTA2201",
      "price": 160.94
    },
    {
      "timestamp": "2021-07-31T21:00:00Z",
      "trading_period": 19,
      "node_id": "BEN2201",
      "price": 144.48
    },
    {
      "timestamp": "2021-07-31T21:00:00Z",
      "trading_period": 19,
      "node_id": "OTA2201",
      "price": 162.03
    },
    {
      "timestamp": "2021-07-31T21:30:00Z",
      "trading_period": 20,
      "node_id": "BEN2201",
      "price": 144.46
    },
    {
      "timestamp": "2021-07-31T21:30:00Z",
      "trading_period": 20,
      "node_id": "OTA2201",
      "price": 162.02
    }
  ]
}
```

Price Last 24hrs API

DATA FEED: MARKET DASHBOARD, MARKET PRICES, GWAP

Description: API to return the price over last 24 hours by node, based on interim prices which are published at the end of every trading period.

URL:	{EM6_URL}/price/24hrs/[node_id]
Method:	GET
Query parameters:	
Node_id	HAY0111 [CSV] – Required

Examples:

2. {em6_url}/price/24hrs/WIL0331,HAY2201

Truncated Price last 24hrs Example Response: {em6_url}/price/24hrs/OTA2201,BEN2201

```
{
  "items": [
    {
      "timestamp": "2021-07-31T20:30:00Z",
      "trading_period": 18,
      "node_id": "BEN2201",
      "price": 144.46
    },
    {
      "timestamp": "2021-07-31T20:30:00Z",
      "trading_period": 18,
      "node_id": "OTA2201",
      "price": 160.94
    },
    {
      "timestamp": "2021-07-31T21:00:00Z",
      "trading_period": 19,
      "node_id": "BEN2201",
      "price": 144.48
    },
    {
      "timestamp": "2021-07-31T21:00:00Z",
      "trading_period": 19,
      "node_id": "OTA2201",
      "price": 162.03
    },
    {
      "timestamp": "2021-07-31T21:30:00Z",
      "trading_period": 20,
      "node_id": "BEN2201",
      "price": 144.46
    },
    {
      "timestamp": "2021-07-31T21:30:00Z",
      "trading_period": 20,
      "node_id": "OTA2201",
      "price": 162.02
    }
  ]
}
```

RCPD Last 48hrs API

DATA FEED: RCPD LOAD MONITORING AND RCPD API FOR ALL REGIONS

Description: API to return 30 minute RCPD load data for yesterday and today plus existing MAX, MIN AVG peaks by RCPD region.

URL:	{EM6_URL}/rcpd_load/[region]
Method:	GET
Query parameters:	
Region	UNI - Required

Example:

1. {em6_url}/rcpd_load/?region=UNI

Truncated RCPD Load Example Response: {em6_url}/rcpd_load/?region=UNI

```
{
  "region_totals": [
    {
      "rcpd_region_id": "UNI",
      "max_peak": 1920.19,
      "avg_peak": 1803.92,
      "min_peak": 1729.85
    }
  ],
  "today": [
    {
      "timestamp": "2020-11-19T11:51:00Z",
      "trading_period": 1,
      "scada_mw": 947.541,
      "revenue_mw": null
    },
    {
      "timestamp": "2020-11-19T12:21:00Z",
      "trading_period": 2,
      "scada_mw": 913.049,
      "revenue_mw": null
    },
    {
      "timestamp": "2020-11-19T12:51:00Z",
      "trading_period": 3,
      "scada_mw": 877.26,
      "revenue_mw": null
    }
  ],
  "yesterday": [
    {
      "timestamp": "2020-11-18T11:51:00Z",
      "trading_period": 1,
      "scada_mw": 947.541,
      "revenue_mw": null
    },
    {
      "timestamp": "2020-11-18T12:21:00Z",
      "trading_period": 2,
      "scada_mw": 913.049,
      "revenue_mw": null
    },
    {
      "timestamp": "2020-11-18T12:51:00Z",
      "trading_period": 3,
      "scada_mw": 877.26,
      "revenue_mw": null
    }
  ]
}
```

TODAY followed by YESTERDAY's data including revenue_mw

RCPD Last 48hrs API csv

DATA FEED: RCPD LOAD MONITORING AND RCPD API FOR ALL REGIONS

Description: API to return a csv download of the 30min RCPD load data for yesterday and today plus existing MAX, MIN AVG peaks by RCPD region.

URL:	{EM6_URL}/rcpd_load_csv/[region]
Method:	GET
Query parameters:	
Region	UNI - <i>Required</i>

Example:

1. {em6_url}/rcpd_load_csv/?region=UNI

Truncated RCPD Example csv Response: {em6_url}/rcpd_load/?region=LSI

```

RCPD Region,Max Peak,Average Peak,Min Peak
LSI,1056.62,997.27,974.46
Trading Date,Trading Period,RCPD MW,RCPD Revenue MW
19/11/2020, 1,878.164,877.91
19/11/2020, 2,869.167,869.286
19/11/2020, 3,859.754,859.706
19/11/2020, 4,850.523,850.69
19/11/2020, 5,846.817,846.786
19/11/2020, 6,850.23,850.172
19/11/2020, 7,851.073,851.454
19/11/2020, 8,856.038,856.518
19/11/2020, 9,854.376,854.94
19/11/2020, 10,868.328,868.954
19/11/2020, 11,889.105,889.496
19/11/2020, 12,910.426,910.468
19/11/2020, 13,941.858,941.968
19/11/2020, 14,979.491,979.462
19/11/2020, 15,1013.679,1013.62
19/11/2020, 16,1040.258,1039.852
19/11/2020, 17,1040.011,1039.596
19/11/2020, 18,1029.095,1028.752
19/11/2020, 19,1018.152,1017.63
19/11/2020, 20,1003.235,1002.158
19/11/2020, 21,990.301,989.822
19/11/2020, 22,981.23,980.89
19/11/2020, 23,978.39,978.026
19/11/2020, 24,974.011,973.954
19/11/2020, 25,967.872,967.686
19/11/2020, 26,961.605,961.772
19/11/2020, 27,954.3,954.22
19/11/2020, 28,950.446,950.56
19/11/2020, 29,955.276,955.43
19/11/2020, 30,961.36,961.202
19/11/2020, 31,968.014,967.984
19/11/2020, 32,971.168,971.046
19/11/2020, 33,977.745,977.636
19/11/2020, 34,988.891,988.844
19/11/2020, 35,982.586,982.34
19/11/2020, 36,979.682,979.714
19/11/2020, 37,977.598,977.622
19/11/2020, 38,968,968.124
19/11/2020, 39,964.554,964.706
19/11/2020, 40,967.649,967.766
19/11/2020, 41,959.596,959.812
19/11/2020, 42,958.433,958.748
19/11/2020, 43,961.805,962.338
19/11/2020, 44,958.328,958.49
19/11/2020, 45,942.274,942.39
19/11/2020, 46,914.605,914.498
19/11/2020, 47,897.358,897.308
19/11/2020, 48,874.729,874.76
20/11/2020, 1,864.648,
20/11/2020, 2,848.98,
20/11/2020, 3,844.804,
20/11/2020, 4,842.357,
20/11/2020, 5,840.992,
20/11/2020, 6,839.399,
20/11/2020, 7,833.383,
20/11/2020, 8,829.064,
20/11/2020, 9,834.547,
20/11/2020, 10,848.289,
20/11/2020, 11,871.383,

```

RCPD Last 2hrs API

DATA FEED: RCPD LOAD MONITORING AND RCPD API FOR ALL REGIONS

Description: API to return a rolling two-hour window of near real-time RCPD load by RCPD region.

URL:	{EM6_URL}/rcpd_1min/[region]
Method:	GET
Query parameters:	
Region	UNI - Required

Example:

1. {em6_url}/rcpd_1min/?region=UNI

Truncated RCPD 1min Example Response: {em6_url}/rcpd_1min/?region=UNI

```
{
  "period_data": [
    {
      "timestamp": "2020-08-14T00:42:00Z",
      "trading_period": 26,
      "rcpd_1_mw": 1367.62
    },
    {
      "timestamp": "2020-08-14T00:43:00Z",
      "trading_period": 26,
      "rcpd_1_mw": 1376.94
    },
    {
      "timestamp": "2020-08-14T00:44:00Z",
      "trading_period": 26,
      "rcpd_1_mw": 1377.14
    },
    {
      "timestamp": "2020-08-14T00:46:03Z",
      "trading_period": 26,
      "rcpd_1_mw": 1375.36
    },
    {
      "timestamp": "2020-08-14T00:46:21Z",
      "trading_period": 26,
      "rcpd_1_mw": 1375.18
    }
  ],
  "region_peaks": [
    {
      "rcpd_region_id": "UNI",
      "min_peak": 1845.08,
      "current_tp_avg": 1365.81
    }
  ]
}
```

RCPD Current Peaks API

DATA FEED: RCPD LOAD MONITORING AND RCPD API FOR ALL REGIONS

Description: API to return the current 100 peaks for a requested region and capacity measurement year.

URL:	{EM6_URL}/rcpd_peaks/[region][cm_year]
Method:	GET
Query parameters:	
Region	UNI - Required
CM_year	2019-2020 – Required

Example:

1. {em6_url}/rcpd_peaks/?region=UNI&cm_year=2019-2020

Truncated RCPD Peaks Example Response:

{em6_url}/rcpd_peaks/?region=UNI&cm_year=2019-2020

```
{
  "items": [
    {
      "ranking": 1,
      "source": "M",
      "trading_date": "2020-06-29T12:00:00Z",
      "trading_period": 36,
      "mw": 1990.632
    },
    {
      "ranking": 2,
      "source": "M",
      "trading_date": "2020-06-29T12:00:00Z",
      "trading_period": 37,
      "mw": 1990.104
    },
    {
      "ranking": 3,
      "source": "D",
      "trading_date": "2020-07-21T12:00:00Z",
      "trading_period": 37,
      "mw": 1988.442
    },
    {
      "ranking": 4,
      "source": "M",
      "trading_date": "2020-06-28T12:00:00Z",
      "trading_period": 36,
      "mw": 1987.228
    }
  ]
}
```

RCPD Current Peaks API csv

DATA FEED: RCPD LOAD MONITORING AND RCPD API FOR ALL REGIONS

Description: API to return a csv download of the current 100 peaks for a requested region and capacity measurement year.

URL:	{EM6_URL}/rcpd_peaks_csv/[region][cm_year]
Method:	GET
Query parameters:	
Region	UNI - Required
CM_year	2019-2020 – Required

Example:

1. {em6_url}/rcpd_peaks_csv/?region=UNI&cm_year=2019-2020

Truncated RCPD Peaks Example csv Response:
 {em6_url}/rcpd_peaks_csv/?region=UNI&cm_year=2019-2020

```

Ranking,Source,Trading Date,Trading Period,MW
1,M,30/06/2020,36,1990.632
2,M,30/06/2020,37,1990.104
3,D,22/07/2020,37,1988.442
4,M,29/06/2020,36,1987.228
5,M,29/06/2020,37,1985.49
6,D,22/07/2020,41,1983.604
7,D,22/07/2020,39,1980.498
8,M,30/06/2020,38,1979.43
9,D,22/07/2020,40,1978.16
10,M,29/06/2020,38,1976.874
11,M,30/06/2020,39,1972.106
12,M,29/06/2020,39,1970.686
13,D,22/07/2020,38,1969.052
14,D,22/07/2020,36,1964.114
15,M,29/06/2020,35,1963.286
16,M,29/06/2020,40,1962.138
17,M,30/06/2020,40,1958.372
18,M,15/06/2020,36,1955.984
19,M,15/06/2020,37,1954.106
20,D,17/08/2020,38,1945.498
21,D,27/07/2020,17,1944.066
22,D,17/08/2020,37,1942.932
23,M,16/06/2020,36,1941.948
24,M,16/06/2020,37,1933.66
25,D,27/07/2020,16,1933.65
26,D,27/07/2020,37,1926.268
27,M,16/06/2020,38,1923.076
28,D,27/07/2020,38,1922.876
29,M,15/06/2020,38,1922.396
30,D,30/07/2020,37,1922.08
31,D,27/07/2020,39,1922.068
32,D,30/07/2020,38,1917.086
33,D,22/07/2020,35,1913.638
34,M,08/06/2020,37,1913.224
35,M,08/06/2020,36,1912.052
36,D,27/07/2020,40,1911.212
37,D,30/07/2020,36,1909.614
38,D,27/07/2020,18,1909.394
39,D,17/08/2020,39,1904.224
40,D,27/07/2020,36,1903.676
41,M,24/06/2020,36,1902.718
42,D,27/07/2020,19,1901.962
  
```

Residuals API

DATA FEED: RCPD LOAD MONITORING AND RCPD API FOR ALL REGIONS

Description: API to return residual information for New Zealand and by island, for different schedules. NRS and PRS long and short schedules are combined. RTD displays at least 24 hours of data. HVDC and Island Residual data currently unavailable but included in the response with 'null' values as placeholders.

URL:	{EM6_URL}/residuals
Method:	GET
Query parameters:	
Region	NI, SI, NZ – <i>Optional blank for all</i>
Run_type	NRS, PRS, WDS, RTD – <i>Optional blank for all</i>

Examples:

1. {em6_url}/residuals/?region=NI&run_type=RTD

1. Truncated Residuals Example Response:
 {em6_url}/residuals/?region=NI&run_type=RTD

```
{
  "items": [
    {
      "timestamp": "2024-01-27T11:00:00Z",
      "trading_date": "2024-01-27T11:00:00Z",
      "trading_period": 1,
      "region": "NI",
      "run_type": "RTD",
      "run_time": "2024-01-27T10:59:00Z",
      "residual": 1566.379,
      "hvdc_residual": null,
      "island_residual": null
    },
    {
      "timestamp": "2024-01-27T11:30:00Z",
      "trading_date": "2024-01-27T11:00:00Z",
      "trading_period": 2,
      "region": "NI",
      "run_type": "RTD",
      "run_time": "2024-01-27T11:29:00Z",
      "residual": 1606.041,
      "hvdc_residual": null,
      "island_residual": null
    },
    {
      "timestamp": "2024-01-27T12:00:00Z",
      "trading_date": "2024-01-27T11:00:00Z",
      "trading_period": 3,
      "region": "NI",
      "run_type": "RTD",
      "run_time": "2024-01-27T11:59:00Z",
      "residual": 1645.041,
      "hvdc_residual": null,
      "island_residual": null
    },
    {
      "timestamp": "2024-01-27T12:30:00Z",
      "trading_date": "2024-01-27T11:00:00Z",
      "trading_period": 4,
      "region": "NI",
      "run_type": "RTD",
      "run_time": "2024-01-27T12:29:00Z",
      "residual": 1654.141,
      "hvdc_residual": null,
      "island_residual": null
    }
  ],
}
```

Current Reserve Prices API

DATA FEED: FREE (NO AUTHORISATION REQUIRED)

Description: API to return the fast (6s) and fustained (60s) reserve prices for the most recent trading period for North and South Islands.

URL:	{EM6_URL}/current_reserve_prices/
Method:	GET
Query parameters:	n/a

1. Truncated Current Reserve Prices Example Response:
 {em6_url}/current_reserve_prices/

```
{
  "items": [
    {
      "timestamp": "2025-02-10T01:00:00Z",
      "trading_date": "2025-02-09T11:00:00Z",
      "trading_period": 29,
      "region": "NI",
      "sir price": 3.93,
      "fir price": 6.64
    },
    {
      "timestamp": "2025-02-10T01:00:00Z",
      "trading_date": "2025-02-09T11:00:00Z",
      "trading_period": 29,
      "region": "SI",
      "sir price": 3.69,
      "fir price": 4.99
    }
  ]
}
```

Reserve Prices API

DATA FEED: RESERVES, MARKET DASHBOARD, MARKET PRICES

Description: API to return pricing information for fast (6s) and sustained (60s) reserves, for all run types, date ranges and region (North or South Islands).

URL:	{EM6_URL}/reserve_prices
Method:	GET
Query parameters:	
region	NI, SI, NZ – <i>Optional blank for all</i>
run_type	NRS, PRS, WDS, Interim, Final – <i>Optional blank for most recent according to the following hierarchy: Final > Interim > NRS > WDS. I.e. Final prices will be returned for a selected date range if available. If not, Interim prices will be returned if available, then NRS etc.</i>
from_trading_date, to_trading_date	<i>Optional blank returns past 24 hours Final or Interim plus forecast 36 hours NRS</i>

Examples:

1. {em6_url}/reserve-prices/?region=NI&run_type=NRS
2. {em6_url}/reserve-prices/?run_type=Final&from_trading_date=02/02/2025&to_trading_date=04/02/2025

2. Truncated Reserve Prices Example Response: {em6_url}/reserve_prices

```
{
{
  "items": [
    {
      "timestamp": "2025-02-08T11:00:00Z",
      "trading_date": "2025-02-08T11:00:00Z",
      "trading_period": 1,
      "region": "NI",
      "run_type": "Final",
      "sir_price": 0.11,
      "fir_price": 0.22
    },
    {
      "timestamp": "2025-02-08T11:00:00Z",
      "trading_date": "2025-02-08T11:00:00Z",
      "trading_period": 1,
      "region": "SI",
      "run_type": "Final",
      "sir_price": 0.11,
      "fir_price": 0.18
    },
    {
      "timestamp": "2025-02-08T11:30:00Z",
      "trading_date": "2025-02-08T11:00:00Z",
      "trading_period": 2,
      "region": "NI",
      "run_type": "Final",
      "sir_price": 0.1,
      "fir_price": 0.22
    },
    {
      "timestamp": "2025-02-08T11:30:00Z",
      "trading_date": "2025-02-08T11:00:00Z",
      "trading_period": 2,
      "region": "SI",
      "run_type": "Final",
      "sir_price": 0.1,
      "fir_price": 0.18
    },
    {
      "timestamp": "2025-02-08T12:00:00Z",
      "trading_date": "2025-02-08T11:00:00Z",
      "trading_period": 3,
      "region": "NI",
      "run_type": "Final",
      "sir_price": 0.22,
      "fir_price": 0.5
    }
  ],
}
```

Aggregated Reserves API

DATA FEED: AGGREGATED RESERVES

Description: API to return the aggregated reserves for New Zealand by reserve type/s. This is an unrestricted report of the Non-Response Schedule (NRS) results for total MW cleared and total MW offered by island and type I, T, P, Fast or Slow.

URL:	{EM6_URL}/reserves_agg/[from_trading_date][to_trading_date][island][power_type][reserve_type]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required
Island	NI, SI – Optional blank for all
Power_type	Interruptible I , Partly Loaded Spinning Reserve P , Tail Water Depressed Reserve T – Optional blank for all
Reserve_type	fast F , sustained S - Optional blank for all

Examples:

1. {em6_url}/reserves_agg/?from_trading_date=02/08/2020&to_trading_date=02/08/2020
2. {em6_url}/reserves_agg/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI
3. {em6_url}/reserves_agg/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&power_type=P
4. {em6_url}/reserves_agg/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&reserve_type=S

Truncated Aggregated Reserves Example Response: {em6_url}/reserves_agg/?
from_trading_date=13/08/2020&to_trading_date=13/08/2020&island=NI&power_type=P

```
{
  "items": [
    {
      "trading_date": "2020-08-12T12:00:00Z",
      "trading_period": 1,
      "islandid": "NI",
      "power_type": "P",
      "reserve_type": "F",
      "mwcleared": 153.949,
      "mwoffered": 696.328
    },
    {
      "trading_date": "2020-08-12T12:00:00Z",
      "trading_period": 1,
      "islandid": "NI",
      "power_type": "P",
      "reserve_type": "S",
      "mwcleared": 206.04,
      "mwoffered": 823.028
    },
    {
      "trading_date": "2020-08-12T12:00:00Z",
      "trading_period": 2,
      "islandid": "NI",
      "power_type": "P",
      "reserve_type": "F",
      "mwcleared": 127.571,
      "mwoffered": 676.332
    },
    {
      "trading_date": "2020-08-12T12:00:00Z",
      "trading_period": 2,
      "islandid": "NI",
      "power_type": "P",
      "reserve_type": "S",
      "mwcleared": 159.104,
      "mwoffered": 793.032
    },
    {
      "trading_date": "2020-08-12T12:00:00Z",
      "trading_period": 3,
      "islandid": "NI",
      "power_type": "P",
      "reserve_type": "F",
      "mwcleared": 127.135,
      "mwoffered": 673.332
    }
  ]
}
```

Aggregated Reserves API csv

DATA FEED: AGGREGATED RESERVES

Description: API to return a csv download of the aggregated reserves for New Zealand by reserve type/s.

URL:	{EM6_URL}/reserves_agg_csv/[from_trading_date][to_trading_date][island][power_type][reserve_type]
Method:	GET
Query parameters:	
From_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required
Island	NI, SI – Optional blank for all
Power_type	Interruptible I , Partly Loaded Spinning Reserve P , Tail Water Depressed Reserve T – Optional blank for all
Reserve_type	fast F , sustained S - Optional blank for all

Examples:

1. {em6_url}/reserves_agg_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020
2. {em6_url}/reserves_agg_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI
3. {em6_url}/reserves_agg_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020 &island=NI&power_type=P
4. {em6_url}/reserves_agg_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&reserve_type=S

Truncated Aggregated Reserves Example csv Response:

{em6_url}/reserves_agg_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI

Trading Date	Trading Period	Island	Power Type	Reserve Type	Total MW Cleared	Total MW Offered
02/08/2020,	1,NI,I,F,	239.501,	274.506			
02/08/2020,	1,NI,I,S,	301.975,	312.379			
02/08/2020,	1,NI,P,F,	127.992,	641.133			
02/08/2020,	1,NI,P,S,	132.624,	746.133			
02/08/2020,	1,NI,T,F,	0,98.2				
02/08/2020,	1,NI,T,S,	5.318,	307.4			
02/08/2020,	2,NI,I,F,	245.899,	272.505			
02/08/2020,	2,NI,I,S,	295.687,	306.068			
02/08/2020,	2,NI,P,F,	121.71,	619.133			
02/08/2020,	2,NI,P,S,	131.624,	742.133			
02/08/2020,	2,NI,T,F,	0,98.2				
02/08/2020,	2,NI,T,S,	15.608,	307.4			
02/08/2020,	3,NI,I,F,	250.716,	274.685			
02/08/2020,	3,NI,I,S,	295.248,	304.8			
02/08/2020,	3,NI,P,F,	98.18,	607.133			
02/08/2020,	3,NI,P,S,	108.712,	732.133			
02/08/2020,	3,NI,T,F,	0,98.2				
02/08/2020,	3,NI,T,S,	18.548,	307.4			
02/08/2020,	4,NI,I,F,	207.46,	273.829			
02/08/2020,	4,NI,I,S,	265.86,	300.962			
02/08/2020,	4,NI,P,F,	97.822,	571.133			
02/08/2020,	4,NI,P,S,	105.051,	728.133			
02/08/2020,	4,NI,T,F,	0,98.2				
02/08/2020,	4,NI,T,S,	0,307.4				
02/08/2020,	5,NI,I,F,	212.375,	273.445			
02/08/2020,	5,NI,I,S,	261.152,	294.543			
02/08/2020,	5,NI,P,F,	110.426,	569.133			
02/08/2020,	5,NI,P,S,	115.861,	728.133			
02/08/2020,	5,NI,T,F,	0,98.2				
02/08/2020,	5,NI,T,S,	0,307.4				
02/08/2020,	6,NI,I,F,	206.005,	273.534			
02/08/2020,	6,NI,I,S,	260.96,	292.459			
02/08/2020,	6,NI,P,F,	103.526,	581.133			
02/08/2020,	6,NI,P,S,	114.841,	728.133			
02/08/2020,	6,NI,T,F,	0,98.2				
02/08/2020,	6,NI,T,S,	0,307.4				
02/08/2020,	7,NI,I,F,	197.25,	273.197			
02/08/2020,	7,NI,I,S,	251.25,	290.856			
02/08/2020,	7,NI,P,F,	110.982,	547.133			
02/08/2020,	7,NI,P,S,	115.861,	691.133			
02/08/2020,	7,NI,T,F,	0,98.2				
02/08/2020,	7,NI,T,S,	0,307.4				
02/08/2020,	8,NI,I,F,	123.054,	215.1			
02/08/2020,	8,NI,I,S,	140.08,	232.94			
02/08/2020,	8,NI,P,F,	77.439,	571.133			
02/08/2020,	8,NI,P,S,	102.413,	735.133			
02/08/2020,	8,NI,T,F,	0,98.2				
02/08/2020,	8,NI,T,S,	0,307.4				
02/08/2020,	9,NI,I,F,	157.033,	212.833			
02/08/2020,	9,NI,I,S,	213.052,	231.269			

Restricted Reserves Amount by Source API

DATA FEED: AGGREGATED RESERVES

Description: API to return the restricted reserves amount by source for specific participants by reserve type/s. This is a restricted report that provides quantity and price - amount to be paid to each participant. This report is made available after System Operator processing within 8 business days following month end. As the processing of data requires the availability of other inputs i.e. pricing data, monthly data may occasionally be delayed.

URL:	{EM6_URL}/res_amount_source/[from_trading_date][to_trading_date][island][reserve_class][power_type]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required
Island	NI, SI – Optional blank for all
Power_type	Interruptible Load I , Reserve R – Optional blank for all
Reserve_class	fast F , sustained S - Optional blank for all

Examples:

1. {em6_url}/res_amount_source/?from_trading_date=02/08/2020&to_trading_date=02/08/2020
2. {em6_url}/res_amount_source/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI
3. {em6_url}/res_amount_source/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&power_type=R
4. {em6_url}/res_amount_source/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&reserve_class=F

Truncated Reserve by Source Example Response:

{{em6_url}}/res_amount_source/?from_trading_date=01/12/2021&to_trading_date=01/12/2021

```
{
  "items": [
    {
      "partyid": "ABCD",
      "price_type": "F",
      "trading_date": "01/12/2021",
      "trading_period": 1,
      "islandid": "NI",
      "blockid": "XY2",
      "marketnodeid": "XY2",
      "power_type": "I",
      "sched_dispatch_type": "D",
      "reserve_class": "F",
      "reserve_qty": 2.3,
      "reserve_price": 0.89,
      "reserve_amount": 0.1035
    },
    {
      "partyid": "ABCD",
      "price_type": "F",
      "trading_date": "01/12/2021",
      "trading_period": 1,
      "islandid": "NI",
      "blockid": "XY2",
      "marketnodeid": "XY2",
      "power_type": "I",
      "sched_dispatch_type": "D",
      "reserve_class": "S",
      "reserve_qty": 5.4,
      "reserve_price": 0.23,
      "reserve_amount": 1.431
    },
    {
      "partyid": "ABCD",
      "price_type": "F",
      "trading_date": "01/12/2021",
      "trading_period": 1,
      "islandid": "SI",
      "blockid": "CLU",
      "marketnodeid": "CLU",
      "power_type": "R",
      "sched_dispatch_type": "D",
      "reserve_class": "S",
      "reserve_qty": 37,
      "reserve_price": 0.9,
      "reserve_amount": 19.25
    },
    {
      "partyid": "ABCD",
      "price_type": "F",
      "trading_date": "01/12/2021",
      "trading_period": 2,
      "islandid": "NI",
      "blockid": "XY2",
      "marketnodeid": "XY2",
      "power_type": "I",
      "sched_dispatch_type": "D",
      "reserve_class": "F",
      "reserve_qty": 1.3,
      "reserve_price": 0.11,
      "reserve_amount": 0.0715
    }
  ],
}
```

Restricted Reserves Amount by Source API csv

DATA FEED: AGGREGATED RESERVES

Description: API to return a csv download of the restricted reserves amount by source for specific participants by reserve type/s.

URL:	{EM6_URL}/res_amount_source_csv/[from_trading_date][to_trading_date][island][reserve_class][power_type]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required
Island	NI, SI – Optional blank for all
Power_type	Interruptible Load I , Reserve R – Optional blank for all
Reserve_class	fast F , sustained S - Optional blank for all

Examples:

1. {em6_url}/res_amount_source_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020
2. {em6_url}/res_amount_source_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI
3. {em6_url}/res_amount_source_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&power_type=R
4. {em6_url}/res_amount_source_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&reserve_class=F

Truncated Reserve by Source Example csv Response:

{{em6_url}}/res_amount_source_csv/?from_trading_date=01/12/2021&to_trading_date=01/12/2021
1

```
Party,Trading Date,Trading Period,Island,Block,Market Node,Power Type,Quantity
Type,Price Type,Reserve Class,Reserve Quantity (MW),Reserve Price
($/MWh),Reserve Amount (MWh*$/MWh)
ABCD,01/12/2021,1,NI,HR2,HR2,I,D,F,F,2.3,.09,.1035
ABCD,01/12/2021,1,NI,HR2,HR2,I,D,F,S,5.4,.53,1.431
ABCD,01/12/2021,1,SI,HRT,HRT,R,D,F,S,37,.5,9.25
ABCD,01/12/2021,10,NI,HR2,HR2,I,D,F,F,4,.09,.18
ABCD,01/12/2021,10,NI,HR2,HR2,I,D,F,S,5.4,.52,1.404
ABCD,01/12/2021,10,SI,HRT,HRT,R,D,F,S,34.2,.5,8.55
ABCD,01/12/2021,11,NI,HR2,HR2,I,D,F,F,3.2,.13,.208
ABCD,01/12/2021,11,NI,HR2,HR2,I,D,F,S,5.4,2.01,5.427
ABCD,01/12/2021,11,SI,HRT,HRT,R,D,F,S,34.5,1.94,33.465
ABCD,01/12/2021,12,NI,HR2,HR2,I,D,F,F,.1,.09,.0045
ABCD,01/12/2021,12,NI,HR2,HR2,I,D,F,S,5.3,.98,2.597
ABCD,01/12/2021,12,SI,HRT,HRT,R,D,F,F,.2,.07,.007
ABCD,01/12/2021,12,SI,HRT,HRT,R,D,F,S,28.9,.95,13.7275
ABCD,01/12/2021,13,NI,HR2,HR2,I,D,F,F,7.4,2.03,7.511
ABCD,01/12/2021,13,NI,HR2,HR2,I,D,F,S,5.3,.52,1.378
ABCD,01/12/2021,13,SI,HRT,HRT,R,D,F,F,26.2,1.57,20.567
ABCD,01/12/2021,13,SI,HRT,HRT,R,D,F,S,29,.5,7.25
ABCD,01/12/2021,14,NI,HR2,HR2,I,D,F,F,7.6,2.03,7.714
ABCD,01/12/2021,14,NI,HR2,HR2,I,D,F,S,5.6,2.01,5.628
ABCD,01/12/2021,14,SI,HRT,HRT,R,D,F,F,41.8,1.53,31.977
ABCD,01/12/2021,14,SI,HRT,HRT,R,D,F,S,44.8,1.89,42.336
ABCD,01/12/2021,15,NI,HR2,HR2,I,D,F,F,8.2,4.5,18.45
ABCD,01/12/2021,15,NI,HR2,HR2,I,D,F,S,6,2.01,6.03
ABCD,01/12/2021,15,SI,HRT,HRT,R,D,F,F,22,3.38,37.18
ABCD,01/12/2021,15,SI,HRT,HRT,R,D,F,S,22,1.89,20.79
ABCD,01/12/2021,16,NI,HR2,HR2,I,D,F,F,8.2,4.5,18.45
ABCD,01/12/2021,16,NI,HR2,HR2,I,D,F,S,5.9,2.01,5.9295
ABCD,01/12/2021,16,SI,HRT,HRT,R,D,F,F,22,3.38,37.18
ABCD,01/12/2021,16,SI,HRT,HRT,R,D,F,S,22,1.89,20.79
ABCD,01/12/2021,17,NI,HR2,HR2,I,D,F,F,8.2,4.5,18.45
ABCD,01/12/2021,17,NI,HR2,HR2,I,D,F,S,6,2.01,6.03
ABCD,01/12/2021,17,SI,HRT,HRT,R,D,F,F,22,3.38,37.18
ABCD,01/12/2021,17,SI,HRT,HRT,R,D,F,S,22,1.89,20.79
ABCD,01/12/2021,18,NI,HR2,HR2,I,D,F,F,11,5.06,27.83
ABCD,01/12/2021,18,NI,HR2,HR2,I,D,F,S,8.2,2.01,8.241
ABCD,01/12/2021,18,SI,HRT,HRT,R,D,F,F,22,3.81,41.91
ABCD,01/12/2021,18,SI,HRT,HRT,R,D,F,S,22,1.89,20.79
ABCD,01/12/2021,19,NI,HR2,HR2,I,D,F,F,11,5.06,27.83
ABCD,01/12/2021,19,NI,HR2,HR2,I,D,F,S,8.2,5.06,20.746
ABCD,01/12/2021,19,SI,HRT,HRT,R,D,F,F,22,3.81,41.91
ABCD,01/12/2021,19,SI,HRT,HRT,R,D,F,S,22,4.76,52.36
ABCD,01/12/2021,2,NI,HR2,HR2,I,D,F,F,1.3,.11,.0715
ABCD,01/12/2021,2,NI,HR2,HR2,I,D,F,S,5.9,1.55,4.5725
ABCD,01/12/2021,2,SI,HRT,HRT,R,D,F,S,37,1.46,27.01
ABCD,01/12/2021,20,NI,HR2,HR2,I,D,F,F,11.2,5.06,28.336
ABCD,01/12/2021,20,NI,HR2,HR2,I,D,F,S,8.3,5.06,20.999
ABCD,01/12/2021,20,SI,HRT,HRT,R,D,F,F,22,3.81,41.91
ABCD,01/12/2021,20,SI,HRT,HRT,R,D,F,S,22,4.76,52.36
ABCD,01/12/2021,21,NI,HR2,HR2,I,D,F,F,11.2,4.5,25.2
ABCD,01/12/2021,21,NI,HR2,HR2,I,D,F,S,8.3,5.06,20.999
```

Restricted Reserves Extract API

DATA FEED: AGGREGATED RESERVES

Description: API to return the restricted reserves extract by source for specific participants by reserve type/s.

URL:	{EM6_URL}/reserves_extract/[from_trading_date][to_trading_date] [island][reserve_class][power_type]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required
Island	NI, SI – Optional blank for all
Power_type	Interruptible Load I , Reserve R – Optional blank for all
Reserve_class	fast F , sustained S - Optional blank for all

Examples:

1. {em6_url}/reserves_extract/?from_trading_date=02/08/2020&to_trading_date=02/08/2020
2. {em6_url}/reserves_extract/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI
3. {em6_url}/reserves_extract/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&power_type=R
4. {em6_url}/reserves_extract/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&reserve_class=F

Truncated Reserve Extract Example Response:

{{em6_url}}/reserves_extract/?from_trading_date=01/12/2021&to_trading_date=01/12/2021&island=NI&power_type=I&reserve_class=S

```
{
  "items": [
    {
      "partyid": "ABCD",
      "blockid": "CE1",
      "price_type": "F",
      "trading_date": "01/12/2021",
      "trading_period": 1,
      "power_type": "I",
      "reserve_class": "S",
      "islandid": "NI",
      "reserve_qty": 5.4,
      "reserve_price": 0.53,
      "reserve_amount": 1.431
    },
    {
      "partyid": "ABCD",
      "blockid": "CE1",
      "price_type": "F",
      "trading_date": "01/12/2021",
      "trading_period": 2,
      "power_type": "I",
      "reserve_class": "S",
      "islandid": "NI",
      "reserve_qty": 5.9,
      "reserve_price": 1.55,
      "reserve_amount": 4.5725
    },
    {
      "partyid": "ABCD",
      "blockid": "CE1",
      "price_type": "F",
      "trading_date": "01/12/2021",
      "trading_period": 3,
      "power_type": "I",
      "reserve_class": "S",
      "islandid": "NI",
      "reserve_qty": 5.9,
      "reserve_price": 2.01,
      "reserve_amount": 5.9295
    }
  ],
}
```

Restricted Reserves Extract API csv

DATA FEED: AGGREGATED RESERVES

Description: API to return a csv download of the restricted reserves extract for specific participants by reserve type/s. This is a restricted report of the quantities and final prices, by reserve type and class. This report is made available after System Operator processing within 8 business days following month end. As the processing of data requires the availability of other inputs i.e. pricing data, monthly data may occasionally be delayed

URL:	{EM6_URL}/reserves_extract_csv/[from_trading_date][to_trading_date][island][reserve_class][power_type]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required
Island	NI, SI – Optional blank for all
Power_type	Interruptible Load I , Reserve R – Optional blank for all
Reserve_class	fast F , sustained S - Optional blank for all

Examples:

1. {em6_url}/reserves_extract_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020
2. {em6_url}/reserves_extract_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI
3. {em6_url}/reserves_extract_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&power_type=R
4. {em6_url}/reserves_extract_csv/?from_trading_date=02/08/2020&to_trading_date=02/08/2020&island=NI&reserve_class=F

Truncated Reserve Extract Example csv Response: {{em6_url}}/reserves_extract
_csv/?from_trading_date=01/12/2021&to_trading_date=01/12/2021&island=NI&power_type=I&reserve_class=F

Party	Block	Pricing Run Type	Trading Date	Trading Period	Power Type	Reserve Class	Island	Averaged Quantity (MW)	Price (\$/MWh)	Amount (\$)
ABCD	CE1	F	01/12/2021	1	I	F	NI	2.3	0.09	0.1035
ABCD	CE1	F	01/12/2021	10	I	F	NI	4	0.09	0.1800
ABCD	CE1	F	01/12/2021	11	I	F	NI	3.2	0.13	0.2080
ABCD	CE1	F	01/12/2021	12	I	F	NI	.1	0.09	0.0045
ABCD	CE1	F	01/12/2021	13	I	F	NI	7.4	2.03	7.5110
ABCD	CE1	F	01/12/2021	14	I	F	NI	7.6	2.03	7.7140
ABCD	CE1	F	01/12/2021	15	I	F	NI	8.2	4.50	18.4500
ABCD	CE1	F	01/12/2021	16	I	F	NI	8.2	4.50	18.4500
ABCD	CE1	F	01/12/2021	17	I	F	NI	8.2	4.50	18.4500
ABCD	CE1	F	01/12/2021	18	I	F	NI	11	5.06	27.8300
ABCD	CE1	F	01/12/2021	19	I	F	NI	11	5.06	27.8300
ABCD	CE1	F	01/12/2021	2	I	F	NI	1.3	0.11	0.0715
ABCD	CE1	F	01/12/2021	20	I	F	NI	11.2	5.06	28.3360
ABCD	CE1	F	01/12/2021	21	I	F	NI	11.2	4.50	25.2000
ABCD	CE1	F	01/12/2021	22	I	F	NI	11.2	4.50	25.2000
ABCD	CE1	F	01/12/2021	23	I	F	NI	11.1	4.50	24.9750
ABCD	CE1	F	01/12/2021	24	I	F	NI	11.1	4.50	24.9750
ABCD	CE1	F	01/12/2021	25	I	F	NI	11.6	4.50	26.1000
ABCD	CE1	F	01/12/2021	26	I	F	NI	11.6	4.50	26.1000
ABCD	CE1	F	01/12/2021	27	I	F	NI	10.8	4.50	24.3000
ABCD	CE1	F	01/12/2021	28	I	F	NI	10.8	10.06	54.3240
ABCD	CE1	F	01/12/2021	29	I	F	NI	10.8	4.50	24.3000
ABCD	CE1	F	01/12/2021	3	I	F	NI	7	0.11	0.3850
ABCD	CE1	F	01/12/2021	30	I	F	NI	11.2	4.50	25.2000
ABCD	CE1	F	01/12/2021	31	I	F	NI	11.2	4.50	25.2000
ABCD	CE1	F	01/12/2021	32	I	F	NI	11.2	4.50	25.2000
ABCD	CE1	F	01/12/2021	33	I	F	NI	11	10.06	55.3300
ABCD	CE1	F	01/12/2021	34	I	F	NI	11	11.00	60.5000
ABCD	CE1	F	01/12/2021	35	I	F	NI	11	11.00	60.5000
ABCD	CE1	F	01/12/2021	36	I	F	NI	11.1	4.50	24.9750
ABCD	CE1	F	01/12/2021	37	I	F	NI	11.1	4.50	24.9750
ABCD	CE1	F	01/12/2021	38	I	F	NI	11.1	4.50	24.9750
ABCD	CE1	F	01/12/2021	39	I	F	NI	11.1	4.50	24.9750
ABCD	CE1	F	01/12/2021	4	I	F	NI	8.2	0.13	0.5330
ABCD	CE1	F	01/12/2021	40	I	F	NI	11.1	4.50	24.9750
ABCD	CE1	F	01/12/2021	41	I	F	NI	11	4.50	24.7500
ABCD	CE1	F	01/12/2021	42	I	F	NI	11	4.50	24.7500
ABCD	CE1	F	01/12/2021	43	I	F	NI	11	5.06	27.8300
ABCD	CE1	F	01/12/2021	44	I	F	NI	11.3	4.50	25.4250
ABCD	CE1	F	01/12/2021	45	I	F	NI	11.2	4.50	25.2000
ABCD	CE1	F	01/12/2021	46	I	F	NI	11.2	4.50	25.2000
ABCD	CE1	F	01/12/2021	47	I	F	NI	10.9	6.65	36.2425
ABCD	CE1	F	01/12/2021	48	I	F	NI	10.9	4.50	24.5250
ABCD	CE1	F	01/12/2021	5	I	F	NI	8.2	0.65	2.6650
ABCD	CE1	F	01/12/2021	6	I	F	NI	7.8	0.65	2.5350
ABCD	CE1	F	01/12/2021	7	I	F	NI	7.3	0.65	2.3725
ABCD	CE1	F	01/12/2021	8	I	F	NI	7.3	0.65	2.3725
ABCD	CE1	F	01/12/2021	9	I	F	NI	7.2	0.65	2.3400

Arc Flows API

DATA FEED: ARC FLOWS

Description: API to return the MW flows scheduled along an arc in the transmission network created by the Transpower SPD application for a single trading date.

Note: data for the Provisional 'V' run type will only be available for date ranges prior to 1 November 2022.

URL:	{EM6_URL}/arc_flows/[trading_date] [run_type] [arc_id]
Method:	GET
Query parameters:	
Trading_date	21/07/2020 - <i>Required</i>
Run_type	Provisional V , Interim T , Final F – <i>Optional blank for most recent run type</i>
Arc_id	Text search for ARC_ID: ALB_HEN1.1 or ALB_HEN or ALB – <i>Optional blank for all</i>

Examples:

1. {em6_url}/arc_flows/?trading_date=02/03/2020
2. {em6_url}/arc_flows/?trading_date=02/03/2020&run_type=T
3. {em6_url}/arc_flows/?trading_date=02/03/2020&run_type=F
4. {em6_url}/arc_flows/?trading_date=02/03/2020&run_type=F&arc_id=ALB

Truncated Arc Flow Example Response:

{em6_url}/arc_flows/?trading_date=02/03/2018&run_type=F&arc_id=ALB

```
{
  "items": [
    {
      "arc_id": "ALB_HEN1.1",
      "trading_date": "2018-03-01T11:00:00Z",
      "trading_period": 1,
      "run_type": "F",
      "flow_into_arc": 2.677,
      "flow_out_of_arc": 2.669,
      "shadow_price": 0,
      "run_time": "2018-03-02T18:37:24Z",
      "mwmax": 105.08
    },
    {
      "arc_id": "ALB_HEN1.1",
      "trading_date": "2018-03-01T11:00:00Z",
      "trading_period": 2,
      "run_type": "F",
      "flow_into_arc": 2.269,
      "flow_out_of_arc": 2.263,
      "shadow_price": 0,
      "run_time": "2018-03-02T18:37:24Z",
      "mwmax": 105.08
    },
    {
      "arc_id": "ALB_HEN1.1",
      "trading_date": "2018-03-01T11:00:00Z",
      "trading_period": 3,
      "run_type": "F",
      "flow_into_arc": 2.33,
      "flow_out_of_arc": 2.324,
      "shadow_price": 0,
      "run_time": "2018-03-02T18:37:24Z",
      "mwmax": 105.08
    },
    {
      "arc_id": "ALB_HEN1.1",
      "trading_date": "2018-03-01T11:00:00Z",
      "trading_period": 4,
      "run_type": "F",
      "flow_into_arc": 2.18,
      "flow_out_of_arc": 2.175,
      "shadow_price": 0,
      "run_time": "2018-03-02T18:37:24Z",
      "mwmax": 105.08
    }
  ],
}
```

Arc Flows API csv

DATA FEED: ARC FLOWS

Description: API to return a csv download of the MW flows scheduled along an arc in the transmission network created by the Transpower SPD application for a single trading date. This service describes the MW flow scheduled along an arc in the transmission network.

This information is created by the market system and transferred to em6, once a Final or Provisional schedule has resolved the day after each market day. This data will be available at end of every final and provisional pricing schedule.

Note: data for the Provisional 'V' run type will only be available for date ranges prior to 1 November 2022.

URL:	{EM6_URL}/arc_flows_csv/[trading_date] [run_type] [arc_id]
Method:	GET
Query parameters:	
Trading_date	21/07/2020 - Required
Run_type	Provisional V , Interim T , Final F – Optional blank for most recent run type
Arc_id	Text search for ARC_ID: ALB_HEN1.1 or ALB_HEN or ALB – Optional blank for all

Examples:

1. {em6_url}/arc_flows_csv/?trading_date=02/03/2020
2. {em6_url}/ arc_flows_csv/?trading_date=02/03/2020&run_type=T
3. {em6_url}/ arc_flows_csv/?trading_date=02/03/2020&run_type=F
4. {em6_url}/ arc_flows_csv/?trading_date=02/03/2020&run_type=F&arc_id=ALB

Truncated Arc Flow Example csv Response:

{em6_url}/arc_flows_csv/?trading_date=29/03/2018&run_type=T

Arc ID,Trading Date,Trading Period,Run Type,Flow In,Flow Out,Shadow Price,Run Time,MW Max

```

ABY_MXT1.MXT1,22/06/2020, 1,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 2,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 3,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 4,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 5,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 6,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 7,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 8,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 9,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 10,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 11,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 12,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 13,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 14,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 15,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 16,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 17,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 18,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 19,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 20,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 21,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 22,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 23,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 24,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 25,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 26,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 27,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 28,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 29,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 30,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 31,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 32,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 33,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 34,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 35,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 36,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 37,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 38,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 39,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 40,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 41,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 42,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 43,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 44,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 45,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 46,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 47,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_MXT1.MXT1,22/06/2020, 48,F,0,0,0,26/06/2020 11:35:42,17.61
ABY_T2.T2,22/06/2020, 1,F,2.56,2.554,0,26/06/2020 11:35:42,11.29
ABY_T2.T2,22/06/2020, 2,F,2.383,2.377,0,26/06/2020 11:35:42,11.29
ABY_T2.T2,22/06/2020, 3,F,2.311,2.305,0,26/06/2020 11:35:42,11.29

```

SCADA Load API

DATA FEED: SCADA LOAD GENERATION AND HVDC

Description: API to return the 30 minute SCADA load by node. The MW load of SCADA data at each node in the transmission network as captured by the Remote Terminal Units and transmitted to the em6 application.

The 10 min is the most recent of the three SCADA readings taken each half hour. The SCADA load data is the average of these three 10 min readings.

URL:	{EM6_URL}/scada_load/[node_id][from_trading_date] [to_trading_date] [site_id] [grid_zone_id]
Method:	GET
Query parameters:	
Node_id	HAY0111 [CSV] - <i>Optional blank for all load nodes</i>
From_trading_date	21/07/2020 - <i>Required</i>
To_trading_date	21/07/2020 - <i>Required</i>
Site_id	HAY – <i>Optional blank for all</i>
Grid_zone_id	7 – <i>Optional blank for all</i>

Examples:

1. {em6_url}/scada_load/?from_trading_date=30/07/2020&to_trading_date=30/07/2020
2. {em6_url}/scada_load/HAY0111?from_trading_date=30/07/2020&to_trading_date=30/07/2020
3. {em6_url}/scada_load/HAY0111,CPK0331,ALB0331?from_trading_date=30/07/2020&to_trading_date=30/07/2020
4. {em6_url}/scada_load/?grid_zone=7&from_trading_date=30/07/2020&to_trading_date=30/07/2020
5. {em6_url}/scada_load/?site_id=PEN&from_trading_date=30/07/2020&to_trading_date=30/07/2020

Truncated SCADA Load Example Response:

{em6_url}/scada_load/HAY0111?from_trading_date=30/07/2020&to_trading_date=30/07/2020

```
{
  "items": [
    {
      "country": "NZ",
      "island": "NI",
      "node_id": "HAY0111",
      "node_name": "Haywards",
      "trading_date": "30/07/2020",
      "mean_energy_mw": 11.1458,
      "daily_energy_mw": 267.499,
      "tp1_mw": 8.401,
      "tp2_mw": 8.016,
      "tp3_mw": 7.711,
      "tp4_mw": 7.489,
      "tp5_mw": 7.426,
      "tp6_mw": 7.382,
      "tp7_mw": 7.447,
      "tp8_mw": 7.62,
      "tp9_mw": 7.642,
      "tp10_mw": 7.92,
      "tp11_mw": 8.474,
      "tp12_mw": 9.477,
      "tp13_mw": 11.139,
      "tp14_mw": 12.921,
      "tp15_mw": 14.278,
      "tp16_mw": 15.212,
      "tp17_mw": 15.257,
      "tp18_mw": 14.287,
      "tp19_mw": 13.33,
      "tp20_mw": 12.669,
      "tp21_mw": 11.71,
      "tp22_mw": 11.428,
      "tp23_mw": 10.943,
      "tp24_mw": 10.397,
      "tp25_mw": 9.881,
      "tp26_mw": 9.538,
      "tp27_mw": 8.953,
      "tp28_mw": 8.537,
      "tp29_mw": 8.459,
      "tp30_mw": 8.756,
      "tp31_mw": 9.462,
      "tp32_mw": 9.902,
      "tp33_mw": 10.678,
      "tp34_mw": 11.762,
      "tp35_mw": 13.411,
      "tp36_mw": 15.591,
      "tp37_mw": 16.037,
      "tp38_mw": 16.122,
      "tp39_mw": 15.912,
      "tp40_mw": 15.668,
      "tp41_mw": 15.319,
      "tp42_mw": 14.377,
      "tp43_mw": 13.802,
      "tp44_mw": 12.728,
      "tp45_mw": 11.681,
      "tp46_mw": 10.648,
      "tp47_mw": 10.02,
      "tp48_mw": 9.178,
      "tp49_mw": null,
      "tp50_mw": null
    }
  ],
}
```

SCADA Load API csv

DATA FEED: SCADA LOAD GENERATION AND HVDC

Description: API to return a csv download of the 30 minute SCADA load by node.

URL:	{EM6_URL}/scada_load_csv/[node_id][from_trading_date] [to_trading_date] [site_id] [grid_zone_id]
Method:	GET
Query parameters:	
Node_id	HAY0111 [CSV] - <i>Optional blank for all load nodes</i>
From_trading_date	21/07/2020 - <i>Required</i>
To_trading_date	21/07/2020 - <i>Required</i>
Site_id	HAY – <i>Optional blank for all</i>
Grid_zone_id	7 – <i>Optional blank for all</i>

Examples:

1. {em6_url}/scada_load_csv/?from_trading_date=30/07/2020&to_trading_date=30/07/2020
2. {em6_url}/scada_load_csv/HAY0111?from_trading_date=30/07/2020&to_trading_date=30/07/2020
3. {em6_url}/scada_load_csv/HAY0111,CPK0331,ALB0331?from_trading_date=30/07/2020&to_trading_date=30/07/2020
4. {em6_url}/scada_load_csv/?grid_zone=7&from_trading_date=30/07/2020&to_trading_date=30/07/2020
5. {em6_url}/scada_load_csv/?site_id=PEN&from_trading_date=30/07/2020&to_trading_date=30/07/2020

Truncated SCADA Load Example csv Response:

{em6_url}/scada_load_csv/HAY0111,GOR0331?from_trading_date=30/07/2020&to_trading_date=30/07/2020

```
Country,Island,Node Id,Node Name,Trading Date,MEAN Energy,Daily
ENERGY,TP1,TP2,TP3,TP4,TP5,TP6,TP7,TP8,TP9,TP10,TP11,TP12,TP13,TP14,TP15,TP
16,TP17,TP18,TP19,TP20,TP21,TP22,TP23,TP24,TP25,TP26,TP27,TP28,TP29,TP30,TP
31,TP32,TP33,TP34,TP35,TP36,TP37,TP38,TP39,TP40,TP41,TP42,TP43,TP44,TP45,TP
46,TP47,TP48,TP49,TP50
NZ,NI,HAY0111,Haywards,30/07/2020,11.1458,267.499,8.401,8.016,7.711,7.489,7
.426,7.382,7.447,7.62,7.642,7.92,8.474,9.477,11.139,12.921,14.278,15.212,15
.257,14.287,13.33,12.669,11.71,11.428,10.943,10.397,9.881,9.538,8.953,8.537
,8.459,8.756,9.462,9.902,10.678,11.762,13.411,15.591,16.037,16.122,15.912,1
5.668,15.319,14.377,13.802,12.728,11.681,10.648,10.02,9.178,,
NZ,SI,GOR0331,Gore,30/07/2020,19.6041,470.4995,16.838,16.287,15.589,14.91,1
4.338,13.747,13.542,13.34,13.507,13.398,14.1,15.132,16.569,18.612,20.777,22
.787,24.18,23.911,23.064,22.593,22.12,22.133,21.673,21.88,21.858,21.418,21.
917,21.452,21.069,20.16,20.218,20.756,20.809,21.787,22.603,24.192,24.487,23
.937,23.482,22.853,21.9,21.218,19.947,18.956,17.922,16.351,18.838,17.842,,
```

SCADA Generation API

DATA FEED: SCADA LOAD GENERATION AND HVDC

Description: API to return the 30 minute SCADA generation by node. This API does not contain restricted MANAWA ENERGY LIMITED (previously TRUSTPOWER LIMITED) generation nodes.

The MW generation of SCADA data at each node in the transmission network as captured by the Remote Terminal Units and transmitted to the em6 application.

The 10 min is the most recent of the three SCADA readings taken each half hour. The SCADA generation data is the average of these three 10 min readings.

URL:	{EM6_URL}/scada_generation/[node_id][from_trading_date][to_trading_date] [site_id] [grid_zone_id] [generation_type_id]
Method:	GET
Query parameters:	
Node_id	WIL0331 MCK0 [CSV] - <i>Optional blank for all generation nodes</i>
From_trading_date	21/07/2020 - <i>Required</i>
To_trading_date	21/07/2020 - <i>Required</i>
Site_id	WIL – <i>Optional blank for all</i>
Grid_zone_id	7 – <i>Optional blank for all</i>
Generation_type_id	Hydro HYD , Coal/Gas CG , Gas GAS , Wind WIN , Cogen COG , Battery BAT , Liquid LIQ , Geothermal GEO , Solar SOL – <i>Optional blank for all</i>

Examples:

1. {em6_url}/scada_generation/?from_trading_date=30/07/2020&to_trading_date=30/07/2020
2. {em6_url}/scada_generation/HAY0111?from_trading_date=30/07/2020&to_trading_date=30/07/2020
3. {em6_url}/scada_generation/WIL0331 MCK0?from_trading_date=30/07/2020&to_trading_date=30/07/2020
4. {em6_url}/scada_generation/?grid_zone=7&from_trading_date=30/07/2020&to_trading_date=30/07/2020
5. {em6_url}/scada_generation/?site_id=BEN&from_trading_date=30/07/2020&to_trading_date=30/07/2020
6. {em6_url}/scada_generation/?generation_type_id=HYD&from_trading_date=30/07/2020&to_trading_date=30/07/2020

Truncated SCADA Generation Example Response: {em6_url}/scada_generation/WIL0331 MCK0?from_trading_date=4/08/2020&to_trading_date=4/08/2020

```
{
  "items": [
    {
      "country": "NZ",
      "island": "NI",
      "node_id": "WIL0331 MCK0",
      "node_name": "Mill Creek",
      "trading_date": "04/08/2020",
      "mean_energy_mw": 42.6991,
      "daily_energy_mw": 1024.7775,
      "tp1_mw": 33.174,
      "tp2_mw": 34.515,
      "tp3_mw": 34.535,
      "tp4_mw": 38.817,
      "tp5_mw": 41.827,
      "tp6_mw": 41.34,
      "tp7_mw": 44.101,
      "tp8_mw": 44.646,
      "tp9_mw": 42.413,
      "tp10_mw": 39.998,
      "tp11_mw": 39.741,
      "tp12_mw": 46.742,
      "tp13_mw": 50.866,
      "tp14_mw": 45.629,
      "tp15_mw": 47.042,
      "tp16_mw": 44.139,
      "tp17_mw": 41.419,
      "tp18_mw": 40.498,
      "tp19_mw": 42.058,
      "tp20_mw": 46.199,
      "tp21_mw": 40.208,
      "tp22_mw": 41.911,
      "tp23_mw": 42.629,
      "tp24_mw": 35.94,
      "tp25_mw": 37.807,
      "tp26_mw": 45.753,
      "tp27_mw": 47.172,
      "tp28_mw": 45.864,
      "tp29_mw": 45.24,
      "tp30_mw": 45.154,
      "tp31_mw": 47.603,
      "tp32_mw": 50.729,
      "tp33_mw": 50.618,
      "tp34_mw": 45.927,
      "tp35_mw": 46.974,
      "tp36_mw": 45.576,
      "tp37_mw": 46.858,
      "tp38_mw": 46.997,
      "tp39_mw": 41.41,
      "tp40_mw": 41.569,
      "tp41_mw": 46.372,
      "tp42_mw": 43.59,
      "tp43_mw": 35.071,
      "tp44_mw": 31.806,
      "tp45_mw": 34.466,
      "tp46_mw": 37.507,
      "tp47_mw": 42.265,
      "tp48_mw": 46.84,
      "tp49_mw": null,
      "tp50_mw": null
    }
  ],
}
```

Restricted SCADA Generation API

DATA FEED: SCADA LOAD GENERATION AND HVDC

Description: API to return the 30 minute SCADA generation by node that includes restricted MANAWA ENERGY LIMITED (previously TRUSTPOWER LIMITED) generation nodes.

URL:	{EM6_URL}/scada_generation/[node_id][from_trading_date][to_trading_date] [site_id] [grid_zone_id] [generation_type_id][party_id]
Method:	GET
Query parameters:	
Node_id	WIL0331 MCKO [CSV] – <i>Optional blank for all generation nodes</i>
From_trading_date	21/07/2020 - <i>Required</i>
To_trading_date	21/07/2020 - <i>Required</i>
Site_id	WIL – <i>Optional blank for all</i>
Grid_zone_id	7 – <i>Optional blank for all</i>
Generation_type_id	Hydro HYD , Coal/Gas CG , Gas GAS , Wind WIN , Cogen COG , Battery BAT , Liquid LIQ , Geothermal GEO , Solar SOL – <i>Optional blank for all</i>
Party_id	TRUS – <i>Optional only Manawa Energy can request this. If other generators became restricted, the same method would apply</i>

Examples:

1. {em6_url}/scada_generation/?from_trading_date=30/07/2020&to_trading_date=30/07/2020&party_id=TRUS
2. {em6_url}/scada_generation/?generation_type_id=WIN&from_trading_date=30/07/2020&to_trading_date=30/07/2020&party_id=TRUS

Restricted MANAWA ENERGY LIMITED (previously TRUSTPOWER LIMITED) generation nodes:

HWB0331 MAHO	Waipori B	Wind
KUM0661 KUM0	Kumara	Hydro
NSY0331 PAEO	Paerau	Hydro
TGA0331 KMIO	Kaimai 5	Hydro

Truncated **Restricted** SCADA Generation Example Response: {em6_url}/scada_generation/KUM0661 KUM0?from_trading_date=30/07/2020&to_trading_date=30/07/2020&party_id=TRUS

```
{
  "items": [
    {
      "country": "NZ",
      "island": "NI",
      "node_id": "KUM0661 KUM0",
      "node_name": "Kumara",
      "trading_date": "13/08/2020",
      "mean_energy_mw": 0.8139,
      "daily_energy_mw": 19.5345,
      "tp1_mw": 0.573,
      "tp2_mw": 0.216,
      "tp3_mw": 0.03,
      "tp4_mw": 0,
      "tp5_mw": 0,
      "tp6_mw": 0,
      "tp7_mw": 0,
      "tp8_mw": 0,
      "tp9_mw": 0,
      "tp10_mw": 0,
      "tp11_mw": 0.005,
      "tp12_mw": 0.021,
      "tp13_mw": 0.139,
      "tp14_mw": 0.063,
      "tp15_mw": 1.086,
      "tp16_mw": 2.035,
      "tp17_mw": 2.438,
      "tp18_mw": 1.699,
      "tp19_mw": 2.596,
      "tp20_mw": 0.584,
      "tp21_mw": 0.013,
      "tp22_mw": 0.138,
      "tp23_mw": 0.68,
      "tp24_mw": 2.136,
      "tp25_mw": 3.509,
      "tp26_mw": 1.775,
      "tp27_mw": 1.923,
      "tp28_mw": 2.002,
      "tp29_mw": 2.307,
      "tp30_mw": 1.952,
      "tp31_mw": 1.74,
      "tp32_mw": 0.78,
      "tp33_mw": 0.731,
      "tp34_mw": 0.03,
      "tp35_mw": 0.022,
      "tp36_mw": 0.008,
      "tp37_mw": 0.01,
      "tp38_mw": 0.01,
      "tp39_mw": 0.01,
      "tp40_mw": 0.01,
      "tp41_mw": 0.01,
      "tp42_mw": 0.01,
      "tp43_mw": 0.025,
      "tp44_mw": 0.405,
      "tp45_mw": 1.696,
      "tp46_mw": 1.651,
      "tp47_mw": 2.085,
      "tp48_mw": 1.916,
      "tp49_mw": null,
      "tp50_mw": null
    }
  ],
}
```

SCADA Generation API csv

DATA FEED: SCADA LOAD GENERATION AND HVDC

Description: API to return a csv download of the 30 minute SCADA generation by node. This API does not contain restricted MANAWA ENERGY LIMITED (previously TRUSTPOWER LIMITED) generation nodes.

URL:	{EM6_URL}/scada_generation_csv/[node_id][from_trading_date][to_trading_date] [site_id] [grid_zone_id] [generation_type_id]
Method:	GET
Query parameters:	
Node_id	WIL0331 MCK0 [CSV] - <i>Optional blank for all generation nodes</i>
From_trading_date	21/07/2020 - <i>Required</i>
To_trading_date	21/07/2020 - <i>Required</i>
Site_id	WIL – <i>Optional blank for all</i>
Grid_zone_id	7 – <i>Optional blank for all</i>
Generation_type_id	Hydro HYD , Coal/Gas CG , Gas GAS , Wind WIN , Cogen COG , Battery BAT , Liquid LIQ , Geothermal GEO , Solar SOL – <i>Optional blank for all</i>

Examples:

1. {em6_url}/scada_generation_csv/?from_trading_date=30/07/2020&to_trading_date=30/07/2020
2. {em6_url}/scada_generation_csv/HAY0111?from_trading_date=30/07/2020&to_trading_date=30/07/2020
3. {em6_url}/scada_generation_csv/WIL0331MCK0?from_trading_date=30/07/2020&to_trading_date=30/07/2020
4. {em6_url}/scada_generation_csv/?grid_zone=7&from_trading_date=30/07/2020&to_trading_date=30/07/2020
5. {em6_url}/scada_generation_csv/?site_id=BEN&from_trading_date=30/07/2020&to_trading_date=30/07/2020
6. {em6_url}/scada_generation_csv/?generation_type_id=HYD&from_trading_date=30/07/2020&to_trading_date=30/07/2020

Truncated SCADA Generation Example csv Response: {em6_url}/scada_generation/WIL0331
MCK0?from_trading_date=4/08/2020&to_trading_date=4/08/2020

```
Country,Island,Node Id,Node Name,Trading Date,MEAN Energy,Daily
ENERGY,TP1,TP2,TP3,TP4,TP5,TP6,TP7,TP8,TP9,TP10,TP11,TP12,TP13,TP14,TP15,TP16,T
P17,TP18,TP19,TP20,TP21,TP22,TP23,TP24,TP25,TP26,TP27,TP28,TP29,TP30,TP31,TP32,
TP33,TP34,TP35,TP36,TP37,TP38,TP39,TP40,TP41,TP42,TP43,TP44,TP45,TP46,TP47,TP48
,TP49,TP50
NZ,NI,WIL0331 MCK0,Mill
Creek,04/08/2020,42.6991,1024.7775,33.174,34.515,34.535,38.817,41.827,41.34,44.
101,44.646,42.413,39.998,39.741,46.742,50.866,45.629,47.042,44.139,41.419,40.49
8,42.058,46.199,40.208,41.911,42.629,35.94,37.807,45.753,47.172,45.864,45.24,45
.154,47.603,50.729,50.618,45.927,46.974,45.576,46.858,46.997,41.41,41.569,46.37
2,43.59,35.071,31.806,34.466,37.507,42.265,46.84,,
```

SCADA HVDC API

DATA FEED: SCADA LOAD GENERATION AND HVDC

Description: API to return the 30 minute SCADA HVDC flows. The MW HVDC of SCADA data at each HVDC node in the transmission network as captured by the Remote Terminal Units and transmitted to the em6 application.

The 10 min is the most recent of the three SCADA readings taken each half hour. The SCADA HVDC data is the average of these three 10 min readings.

URL:	<code>{EM6_URL}/scada_hvdc/[from_trading_date][to_trading_date][net_flow_nodes]</code>
Method:	GET
Query parameters:	
From_trading_date	21/07/2020 - Required
To_trading_date	21/07/2020 - Required
Net_flow_nodes	DCN3501, DCS3501 – Optional nodes used to request net flow only

Examples:

1. `{em6_url}/scada_hvdc/?from_trading_date=30/07/2020&to_trading_date=30/07/2020`
2. `{em6_url}/scada_hvdc/?from_trading_date=25/07/2020&to_trading_date=30/07/2020`
3. `{em6_url}/scada_hvdc/DCN3501,DCS3501?from_trading_date=25/07/2020&to_trading_date=30/07/2020`

Truncated SCADA HVDC Example Response:

{em6_url}/scada_hvdc/?from_trading_date=23/07/2020&to_trading_date=23/07/2020

```
{
  "items": [
    {
      "country": "NZ",
      "island": "NI",
      "node_id": "DCN3502",
      "node_name": "Haywards Pole 2",
      "trading_date": "23/07/2020",
      "mean_energy_mw": -36.774,
      "daily_energy_mw": -882.576,
      "tp1_mw": 157.84,
    },
    {
      "country": "NZ",
      "island": "NI",
      "node_id": "DCN3503",
      "node_name": "Haywards Pole 3",
      "trading_date": "23/07/2020",
      "mean_energy_mw": -65.5103,
      "daily_energy_mw": -1572.2475,
      "tp1_mw": 32.894,
      "tp2_mw": 131.847,
    },
    {
      "country": "NZ",
      "island": "NI",
      "node_id": "HVDCN",
      "node_name": "Haywards Net Flow",
      "trading_date": "23/07/2020",
      "mean_energy_mw": 102.2843,
      "daily_energy_mw": 2454.822,
      "tp1_mw": -190.734,
      "tp2_mw": -259.642,
    },
    {
      "country": "NZ",
      "island": "SI",
      "node_id": "DCS3502",
      "node_name": "Benmore Pole 2",
      "trading_date": "23/07/2020",
      "mean_energy_mw": 38.3263,
      "daily_energy_mw": 919.831,
      "tp1_mw": -155.069,
      "tp2_mw": -125.982,
    },
    {
      "country": "NZ",
      "island": "SI",
      "node_id": "DCS3503",
      "node_name": "Benmore Pole 3",
      "trading_date": "23/07/2020",
      "mean_energy_mw": 67.536,
      "daily_energy_mw": 1620.8645,
      "tp1_mw": -32.638,
      "tp2_mw": -131.069,
    },
    {
      "country": "NZ",
      "island": "SI",
      "node_id": "HVDCS",
      "node_name": "Benmore Net Flow",
      "trading_date": "23/07/2020",
      "mean_energy_mw": -105.8623,
      "daily_energy_mw": -2540.6945,
      "tp1_mw": 187.707,
      "tp2_mw": 257.051,
    }
  ]
}
```

SCADA HVDC API csv

DATA FEED: SCADA LOAD GENERATION AND HVDC

Description: API to return a csv download of the 30 minute SCADA HVDC flows.

URL:	{EM6_URL}/scada_hvdc_csv/[from_trading_date][to_trading_date][net_flow_nodes]
Method:	GET
Query parameters:	
From_trading_date	21/07/2020 - <i>Required</i>
To_trading_date	21/07/2020 - <i>Required</i>
Net_flow_nodes	DCN3501, DCS3501 – <i>Optional nodes used to request net flow only</i>

Examples:

1. {em6_url}/scada_hvdc_csv
/?from_trading_date=30/07/2020&to_trading_date=30/07/2020
2. {em6_url}/scada_hvdc_csv
/?from_trading_date=25/07/2020&to_trading_date=30/07/2020
3. {em6_url}/scada_hvdc_csv
/DCN3501,DCS3501?from_trading_date=25/07/2020&to_trading_date=30/07/2020

Truncated SCADA HVDC Example csv Response:

{em6_url}/scada_hvdc_csv/?from_trading_date=23/07/2020&to_trading_date=23/07/2020

```
Country,Island,Node Id,Node Name,Trading Date,MEAN Energy,Daily
ENERGY,TP1,TP2,TP3,TP4,TP5,TP6,TP7,TP8,TP9,TP10,TP11,TP12,TP13,TP14,TP15,TP16,T
P17,TP18,TP19,TP20,TP21,TP22,TP23,TP24,TP25,TP26,TP27,TP28,TP29,TP30,TP31,TP32,
TP33,TP34,TP35,TP36,TP37,TP38,TP39,TP40,TP41,TP42,TP43,TP44,TP45,TP46,TP47,TP48
,TP49,TP50
NZ,NI,DCN3502,Haywards Pole 2,23/07/2020,-36.774,-
882.576,157.84,127.794,156.038,147.459,156.236,149.99,150.097,162.892,146.863,1
31.441,132.891,144.432,65.922,10.047,-76.729,-149.353,-187.968,-187.551,-
155.646,-145.831,-146.836,-158.938,-153.185,-154.794,-159.287,-156.247,-
130.671,-123.049,-119.504,-115.913,-112.386,-123.643,-57.6,-.002,-54.574,-
159.777,-158.91,-145.097,-133.28,-125.57,-130.055,-117.536,-99.024,-.015,-
.015,10.809,58.168,64.915,,
NZ,NI,DCN3503,Haywards Pole 3,23/07/2020,-65.5103,-
1572.2475,32.894,131.847,160.685,151.808,160.688,154.379,154.62,167.539,151.086
,135.492,80.075,.045,-18.923,-77.448,-136.252,-147.724,-185.941,-185.66,-
153.774,-143.882,-144.702,-156.893,-151.454,-152.935,-157.357,-154.405,-
128.999,-121.478,-117.859,-114.398,-110.81,-121.97,-149.17,-175.131,-156.624,-
158.012,-157.153,-143.24,-131.583,-123.866,-128.208,-115.926,-121.254,-
165.424,-117.008,-61.3,-35.805,-3.085,,
NZ,NI,HVDCN,Haywards Net Flow,23/07/2020,102.2843,2454.822,-190.734,-259.642,-
316.723,-299.268,-316.924,-304.369,-304.717,-330.431,-297.949,-266.933,-
212.966,-144.478,-
46.999,67.401,212.981,297.078,373.909,373.21,309.42,289.713,291.538,315.832,304
.638,307.729,316.644,310.652,259.67,244.528,237.363,230.311,223.197,245.613,206
.77,175.132,211.198,317.789,316.063,288.337,264.863,249.436,258.263,233.462,220
.277,165.439,117.023,50.491,-22.363,-61.83,,
NZ,SI,DCS3502,Benmore Pole 2,23/07/2020,38.3263,919.831,-155.069,-125.982,-
153.581,-145.231,-153.758,-147.698,-147.753,-160.211,-144.432,-129.406,-
130.672,-142.117,-65.03,-
9.907,77.493,151.393,191.131,190.553,157.666,147.627,148.669,161.066,155.242,15
6.847,161.547,158.364,132.217,124.216,120.702,116.984,113.252,124.83,58.033,.05
6,54.26,161.856,160.993,146.621,134.586,126.676,131.397,118.516,99.762,.018,.01
8,-10.593,-57.438,-64.051,,
NZ,SI,DCS3503,Benmore Pole 3,23/07/2020,67.536,1620.8645,-32.638,-131.069,-
159.308,-150.499,-159.18,-153.071,-153.23,-165.984,-149.76,-134.464,-79.659,-
.099,19.017,78.411,138.829,150.508,190.078,189.643,156.604,146.515,147.333,160.
174,154.329,155.888,160.689,157.476,131.417,123.538,119.945,116.308,112.484,123
.999,152.192,179.126,160.651,161.049,160.124,145.811,133.695,125.589,130.332,11
7.61,123.061,168.674,118.812,61.625,36.085,3.069,,
NZ,SI,HVDCS,Benmore Net Flow,23/07/2020,-105.8623,-
2540.6945,187.707,257.051,312.89,295.73,312.939,300.769,300.983,326.196,294.192
,263.87,210.332,142.216,46.013,-68.503,-216.323,-301.901,-381.209,-380.196,-
314.27,-294.142,-296.003,-321.24,-309.57,-312.735,-322.236,-315.84,-263.635,-
247.754,-240.647,-233.291,-225.736,-248.829,-210.225,-179.182,-214.91,-
322.905,-321.117,-292.432,-268.282,-252.265,-261.729,-236.126,-222.824,-
168.692,-118.831,-51.032,21.353,60.982,,
```

Battery Mode API

DATA FEED: SCADA LOAD GENERATION AND HVDC

Description: API to return last seven days of aggregated battery charge and dispatch data.

URL:	{EM6_URL}/battery_charging_dispatching
Method:	GET
Query parameters:	n/a

Truncated Market Price Example Response: {em6_url}/battery_charging_dispatching

```
"items": [
  {
    "timestamp": "2026-07-14T12:00:00Z",
    "trading_date": "2026-07-14T12:00:00Z",
    "trading_period": 1,
    "region": "NZ",
    "total_dispatch_mw": 0,
    "total_charging_mw": 45.694
  },
  {
    "timestamp": "2026-07-14T12:30:00Z",
    "trading_date": "2026-07-14T12:00:00Z",
    "trading_period": 2,
    "region": "NZ",
    "total_dispatch_mw": 0,
    "total_charging_mw": 9.357
  },
  {
    "timestamp": "2026-07-14T13:00:00Z",
    "trading_date": "2026-07-14T12:00:00Z",
    "trading_period": 3,
    "region": "NZ",
    "total_dispatch_mw": 0.016,
    "total_charging_mw": 13.281
  },
  {
    "timestamp": "2026-07-14T13:30:00Z",
    "trading_date": "2026-07-14T12:00:00Z",
    "trading_period": 4,
    "region": "NZ",
    "total_dispatch_mw": 0,
    "total_charging_mw": 23.662
  },
  {
    "timestamp": "2026-07-14T14:00:00Z",
    "trading_date": "2026-07-14T12:00:00Z",
    "trading_period": 5,
    "region": "NZ",
    "total_dispatch_mw": 0,
    "total_charging_mw": 20.322
  },
  {
    "timestamp": "2026-07-14T14:30:00Z",
    "trading_date": "2026-07-14T12:00:00Z",
    "trading_period": 6,
    "region": "NZ",
    "total_dispatch_mw": 0,
    "total_charging_mw": 20.14
  },
]
```

Market Price API

DATA FEED: MARKET PRICES

Description: API to return market prices by run type and pricing node.

Note: data for the Provisional 'V' run type will only be available for date ranges prior to 1 November 2022.

URL:	{EM6_URL}/market_price/[run_type][trading_date] [from_trading_period] [to_trading_period][node_id]
Method:	GET
Query parameters:	
Run_type	Provisional – V , Interim – T , Final – F , Price Responsive - PR (most recent PRSS or PRSL), Non Response - NR (most recent NRSS or NRSL)
Trading_date	21/07/2020 - Required
from_trading_period	1 – Optional blank returns a full trading date
to_trading_period	48 - Optional blank returns a full trading date
Node_id	OTA2201 – Optional blank for all price nodes

Examples:

1. {em6_url}/market_price/BEN2201?run_type=PR&trading_date=05/08/2020
2. {em6_url}/market_price/BEN2201?run_type=F&trading_date=05/08/2020
3. {em6_url}/market_price/BEN2201,OTA2201?run_type=F&trading_date=05/08/2020&from_trading_period=20&to_trading_period=25

Truncated Market Price Example Response:

{em6_url}/market_price/BEN2201?run_type=PR&trading_date=05/08/2020

```
{
  "items": [
    {
      "trading_date": "2020-08-04T12:00:00Z",
      "trading_period": 1,
      "node_id": "BEN2201",
      "run_time": "05/08/2020 00:03:02",
      "run_type": "A",
      "price": 174.31
    },
    {
      "trading_date": "2020-08-04T12:00:00Z",
      "trading_period": 2,
      "node_id": "BEN2201",
      "run_time": "05/08/2020 00:33:02",
      "run_type": "A",
      "price": 133.5
    },
    {
      "trading_date": "2020-08-04T12:00:00Z",
      "trading_period": 3,
      "node_id": "BEN2201",
      "run_time": "05/08/2020 01:03:02",
      "run_type": "A",
      "price": 126.91
    },
    {
      "trading_date": "2020-08-04T12:00:00Z",
      "trading_period": 4,
      "node_id": "BEN2201",
      "run_time": "05/08/2020 01:33:03",
      "run_type": "A",
      "price": 128.24
    },
    {
      "trading_date": "2020-08-04T12:00:00Z",
      "trading_period": 5,
      "node_id": "BEN2201",
      "run_time": "05/08/2020 02:03:02",
      "run_type": "A",
      "price": 126.37
    },
    {
      "trading_date": "2020-08-04T12:00:00Z",
      "trading_period": 6,
      "node_id": "BEN2201",
      "run_time": "05/08/2020 02:33:02",
      "run_type": "A",
      "price": 126.48
    },
    {
      "trading_date": "2020-08-04T12:00:00Z",
      "trading_period": 7,
      "node_id": "BEN2201",
      "run_time": "05/08/2020 03:03:03",
      "run_type": "A",
      "price": 109.82
    }
  ]
}
```

Market Price API csv

DATA FEED: MARKET PRICES

Description: API to return market prices by run type and pricing node.

Market prices are calculated for every commercial node (i.e. grid injection or grid exit point) for every trading period. They are produced for the NRS, PRS, Provisional and Final Price schedule types. Final and Provisional prices are created daily.

Note: data for the Provisional 'V' run type will only be available for date ranges prior to 1 November 2022.

URL:	{EM6_URL}/market_price_csv/[run_type][trading_date] [from_trading_period] [to_trading_period][node_id]
Method:	GET
Query parameters:	
Run_type	Provisional – V , Interim – T , Final – F , Price Responsive - PR (most recent PRSS or PRSL), Non Response - NR (most recent NRSS or NRSL)
Trading_date	21/07/2020 - <i>Required</i>
from_trading_period	1 – <i>Optional blank returns a full trading date</i>
to_trading_period	48 - <i>Optional blank returns a full trading date</i>
Node_id	OTA2201 – <i>Optional blank for all price nodes</i>

Examples:

1. {em6_url}/market_price_csv/BEN2201?run_type=PR&trading_date=05/08/2020
2. {em6_url}/market_price_csv/BEN2201?run_type=F&trading_date=05/08/2020
3. {em6_url}/market_price_csv/BEN2201,OTA2201?run_type=F&trading_date=05/08/2020
&from_trading_period=20&to_trading_period=25

Truncated Market Price Example csv Response:

{em6_url}/market_price_csv/BEN2201?run_type=F&trading_date=14/08/2020

Trading Date	Trading Period	Node	Run Time	Run Type	Price
14/08/2020,	1,	BEN2201,	15/08/2020 07:35:56,	F,	93.22
14/08/2020,	2,	BEN2201,	15/08/2020 07:35:56,	F,	96.06
14/08/2020,	3,	BEN2201,	15/08/2020 07:35:56,	F,	89.76
14/08/2020,	4,	BEN2201,	15/08/2020 07:35:56,	F,	88.28
14/08/2020,	5,	BEN2201,	15/08/2020 07:35:56,	F,	88.32
14/08/2020,	6,	BEN2201,	15/08/2020 07:35:56,	F,	88.49
14/08/2020,	7,	BEN2201,	15/08/2020 07:35:56,	F,	85.59
14/08/2020,	8,	BEN2201,	15/08/2020 07:35:56,	F,	84.7
14/08/2020,	9,	BEN2201,	15/08/2020 07:35:56,	F,	78.21
14/08/2020,	10,	BEN2201,	15/08/2020 07:35:56,	F,	77.99
14/08/2020,	11,	BEN2201,	15/08/2020 07:35:56,	F,	84.42
14/08/2020,	12,	BEN2201,	15/08/2020 07:35:56,	F,	85.32
14/08/2020,	13,	BEN2201,	15/08/2020 07:35:56,	F,	85
14/08/2020,	14,	BEN2201,	15/08/2020 07:35:56,	F,	112.57
14/08/2020,	15,	BEN2201,	15/08/2020 07:35:56,	F,	109.88
14/08/2020,	16,	BEN2201,	15/08/2020 07:35:56,	F,	118.54
14/08/2020,	17,	BEN2201,	15/08/2020 07:35:56,	F,	119.97
14/08/2020,	18,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	19,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	20,	BEN2201,	15/08/2020 07:35:56,	F,	141.42
14/08/2020,	21,	BEN2201,	15/08/2020 07:35:56,	F,	144.14
14/08/2020,	22,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	23,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	24,	BEN2201,	15/08/2020 07:35:56,	F,	114.55
14/08/2020,	25,	BEN2201,	15/08/2020 07:35:56,	F,	115.39
14/08/2020,	26,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	27,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	28,	BEN2201,	15/08/2020 07:35:56,	F,	129.79
14/08/2020,	29,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	30,	BEN2201,	15/08/2020 07:35:56,	F,	116.44
14/08/2020,	31,	BEN2201,	15/08/2020 07:35:56,	F,	117.43
14/08/2020,	32,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	33,	BEN2201,	15/08/2020 07:35:56,	F,	118.05
14/08/2020,	34,	BEN2201,	15/08/2020 07:35:56,	F,	120.3
14/08/2020,	35,	BEN2201,	15/08/2020 07:35:56,	F,	120
14/08/2020,	36,	BEN2201,	15/08/2020 07:35:56,	F,	94.71
14/08/2020,	37,	BEN2201,	15/08/2020 07:35:56,	F,	120.42
14/08/2020,	38,	BEN2201,	15/08/2020 07:35:56,	F,	173.71

Average Price API

DATA FEED: MARKET PRICES

Description: API to return average prices by most recent available run type and pricing node.

The Average Price report contains an average of available prices per node and trading period. To differentiate between final, interim and provisional price types the Run Type field contains V (for provisional), T (for Interim) and F (for final).

In addition to the price data, the report also contains:

- Periods requested - trading periods from date and trading period selection criteria;
- Periods returned - trading periods returned in report;
- Periods provisional - trading periods with provisional (V) run type in report;
- Periods provisional - trading periods with interim (T) run type in report;
- Periods provisional - trading periods with final (F) run type in report; and
- Node average (for each requested node) - the average for all prices for selected nodes for periods returned

Note: data for the Provisional 'V' run type will only be available for date ranges prior to 1 November 2022.

URL:	{EM6_URL}/average_price/[node_id][from_trading_date] [to_trading_date]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required
Node_id	OTA2201 – Optional blank for all price nodes

Examples:

1. {em6_url}/average_price/OTA2201?from_trading_date=05/08/2020&to_trading_date=05/08/2020

Truncated Average Price Example Response:

{em6_url}/average_price/BEN2201?from_trading_date=01/10/2020&to_trading_date=01/10/2020

```
{
  "all_totals": [
    {
      "periods requested": "96",
      "periods returned": "96",
      "periods provisional": "0",
      "periods interim": "0",
      "periods final": "96"
    }
  ],
  "node_prices": [
    {
      "node_id": "BEN2201",
      "run_type": "F",
      "trading_date": "01/10/2020",
      "trading_period": " 1",
      "run_time": "02/10/2020 07:31:12",
      "price": " 148.79"
    },
    {
      "node_id": "BEN2201",
      "run_type": "F",
      "trading_date": "01/10/2020",
      "trading_period": " 2",
      "run_time": "02/10/2020 07:31:12",
      "price": " 149.06"
    },
    {
      "node_id": "BEN2201",
      "run_type": "F",
      "trading_date": "01/10/2020",
      "trading_period": " 3",
      "run_time": "02/10/2020 07:31:12",
      "price": " 126.72"
    },
    {
      "node_id": "BEN2201",
      "run_type": "F",
      "trading_date": "01/10/2020",
      "trading_period": " 4",
      "run_time": "02/10/2020 07:31:12",
      "price": " 148.79"
    },
    {
      "node_id": "BEN2201",
      "run_type": "F",
      "trading_date": "01/10/2020",
      "trading_period": " 5",
      "run_time": "02/10/2020 07:31:12",
      "price": " 127.07"
    }
  ]
}
```

Average Price API csv

DATA FEED: MARKET PRICES

Description: API to return average prices by most recent available run type and pricing node.

Note: data for the Provisional 'V' run type will only be available for date ranges prior to 1 November 2022.

URL:	{EM6_URL}/average_price_csv/[from_trading_date][to_trading_date][node_id]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required
Node_id	OTA2201 – Optional blank for all price nodes

Examples:

1. {em6_url}/average_price_csv/OTA2201?from_trading_date=05/08/2020&to_trading_date=05/08/2020

Truncated Average Price Example csv Response:

{em6_url}/average_price_csv/HAY2201,BEN2201?from_trading_date=01/10/2020&to_trading_date=01/10/2020

```

Periods Requested,48,,,,
Periods Returned,48,,,,
Periods Provisional,0,,,,
Periods Interim,0,,,,
Periods Final,48,,,,
BEN2201,average,179.44,,,
HAY2201,average,190.69,,,
''''''
Node Id,Run Type,Trading Day,Trading Period,Run Time,Price
BEN2201,F,01/10/2020, 1,02/10/2020 07:31:12, 148.79
BEN2201,F,01/10/2020, 2,02/10/2020 07:31:12, 149.06
BEN2201,F,01/10/2020, 3,02/10/2020 07:31:12, 126.72
BEN2201,F,01/10/2020, 4,02/10/2020 07:31:12, 148.79
BEN2201,F,01/10/2020, 5,02/10/2020 07:31:12, 127.07
BEN2201,F,01/10/2020, 6,02/10/2020 07:31:12, 130.00
BEN2201,F,01/10/2020, 7,02/10/2020 07:31:12, 116.47
BEN2201,F,01/10/2020, 8,02/10/2020 07:31:12, 134.97
BEN2201,F,01/10/2020, 9,02/10/2020 07:31:12, 265.64
BEN2201,F,01/10/2020, 10,02/10/2020 07:31:12, 144.46
BEN2201,F,01/10/2020, 11,02/10/2020 07:31:12, 259.15
BEN2201,F,01/10/2020, 12,02/10/2020 07:31:12, 260.04
BEN2201,F,01/10/2020, 13,02/10/2020 07:31:12, 398.67
BEN2201,F,01/10/2020, 14,02/10/2020 07:31:12, 378.37
BEN2201,F,01/10/2020, 15,02/10/2020 07:31:12, 389.86
BEN2201,F,01/10/2020, 16,02/10/2020 07:31:12, 369.60
BEN2201,F,01/10/2020, 17,02/10/2020 07:31:12, 417.83
BEN2201,F,01/10/2020, 18,02/10/2020 07:31:12, 416.75
BEN2201,F,01/10/2020, 19,02/10/2020 07:31:12, 205.75
BEN2201,F,01/10/2020, 20,02/10/2020 07:31:12, 130.29
BEN2201,F,01/10/2020, 21,02/10/2020 07:31:12, 130.25
BEN2201,F,01/10/2020, 22,02/10/2020 07:31:12, 130.23
BEN2201,F,01/10/2020, 23,02/10/2020 07:31:12, 130.19
BEN2201,F,01/10/2020, 24,02/10/2020 07:31:12, 130.22
BEN2201,F,01/10/2020, 25,02/10/2020 07:31:12, 130.80
BEN2201,F,01/10/2020, 26,02/10/2020 07:31:12, 130.50
BEN2201,F,01/10/2020, 27,02/10/2020 07:31:12, 133.36
BEN2201,F,01/10/2020, 28,02/10/2020 07:31:12, 130.80
BEN2201,F,01/10/2020, 29,02/10/2020 07:31:12, 130.64
BEN2201,F,01/10/2020, 30,02/10/2020 07:31:12, 130.39
BEN2201,F,01/10/2020, 31,02/10/2020 07:31:12, 130.00
BEN2201,F,01/10/2020, 32,02/10/2020 07:31:12, 130.66
BEN2201,F,01/10/2020, 33,02/10/2020 07:31:12, 130.80
BEN2201,F,01/10/2020, 34,02/10/2020 07:31:12, 146.46
BEN2201,F,01/10/2020, 35,02/10/2020 07:31:12, 130.68
BEN2201,F,01/10/2020, 36,02/10/2020 07:31:12, 130.00
BEN2201,F,01/10/2020, 37,02/10/2020 07:31:12, 124.41
BEN2201,F,01/10/2020, 38,02/10/2020 07:31:12, 102.27
BEN2201,F,01/10/2020, 39,02/10/2020 07:31:12, 109.23
BEN2201,F,01/10/2020, 40,02/10/2020 07:31:12, 130.00
BEN2201,F,01/10/2020, 41,02/10/2020 07:31:12, 130.49
BEN2201,F,01/10/2020, 42,02/10/2020 07:31:12, 138.39
BEN2201,F,01/10/2020, 43,02/10/2020 07:31:12, 184.66
BEN2201,F,01/10/2020, 44,02/10/2020 07:31:12, 182.22
BEN2201,F,01/10/2020, 45,02/10/2020 07:31:12, 195.45
BEN2201,F,01/10/2020, 46,02/10/2020 07:31:12, 160.11
BEN2201,F,01/10/2020, 47,02/10/2020 07:31:12, 174.48
BEN2201,F,01/10/2020, 48,02/10/2020 07:31:12, 157.05
HAY2201,F,01/10/2020, 1,02/10/2020 07:31:12, 154.42
HAY2201,F,01/10/2020, 2,02/10/2020 07:31:12, 154.70
HAY2201,F,01/10/2020, 3,02/10/2020 07:31:12, 131.52

```

Generation Type API

DATA FEED: MARKET DASHBOARD

Description: API to return the last 24 hours of NZ generation information aggregated by generation type. Eg: Hydro and the associated carbon output for each generation type and all of NZ in tonnes.

URL:	{EM6_URL}/generation_type/24hrs/[generation_type_id]
Method:	GET
Query parameters:	
Generation_type_id	Hydro HYD , Coal/Gas CG , Gas GAS , Wind WIN , Cogen COG , Battery BAT , Liquid LIQ , Geothermal GEO , Solar SOL – <i>Optional blank for all</i>

Examples:

1. {em6_url}/generation_type/24hrs/
2. {em6_url}/generation_type/24hrs/?generation_type_id=WIN

Truncated Generation Type Example Response: {em6_url}/generation_type/24hrs/

```
{
  "items": [
    {
      "timestamp": "2023-10-19T01:30:00Z",
      "trading_period": 30,
      "generation_type": [
        {
          "generation_type_name": "Co-Gen",
          "generation_mw": 97.208,
          "generation_capacity_mw": 168,
          "generation_carbon_t": 15.29
        },
        {
          "generation_type_name": "Coal",
          "generation_mw": 56.564,
          "generation_capacity_mw": 340,
          "generation_carbon_t": 28.56
        },
        {
          "generation_type_name": "Gas",
          "generation_mw": 107.111,
          "generation_capacity_mw": 1690,
          "generation_carbon_t": 31.54
        },
        {
          "generation_type_name": "Geothermal",
          "generation_mw": 874.588,
          "generation_capacity_mw": 1061.5,
          "generation_carbon_t": 23.91
        },
        {
          "generation_type_name": "Hydro",
          "generation_mw": 3177.41,
          "generation_capacity_mw": 5414.5,
          "generation_carbon_t": null
        },
        {
          "generation_type_name": "Liquid",
          "generation_mw": 0,
          "generation_capacity_mw": 156,
          "generation_carbon_t": 0
        },
        {
          "generation_type_name": "Solar",
          "generation_mw": 0,
          "generation_capacity_mw": 39,
          "generation_carbon_t": null
        },
        {
          "generation_type_name": "Wind",
          "generation_mw": 509.963,
          "generation_capacity_mw": 1259,
          "generation_carbon_t": null
        },
        {
          "generation_type_name": "NZ",
          "generation_mw": 4822.844,
          "generation_capacity_mw": 10128,
          "generation_carbon_t": 99.31
        }
      ]
    }
  ],
}
```

Historic Generation Type API

DATA FEED: CURRENT AND HISTORIC CARBON INTENSITY, GWAP

Description: API to return historic generation information aggregated by generation type. Eg: Hydro and the associated carbon output for each generation type and all of NZ in tonnes

URL:	{EM6_URL}/historic_generation_type/[generation_type_id][From_trading_date][to_trading_date][interval]
Method:	GET
Query parameters:	
Generation_type_id	Hydro HYD , Coal/Gas CG , Gas GAS , Wind WIN , Cogen COG , Battery BAT , Liquid LIQ , Geothermal GEO , Solar SOL – <i>Optional blank for all</i>
From_trading_date	21/07/2020 - <i>Required</i>
To_trading_date	21/07/2020 - <i>Required</i>
Interval	30minute, daily or monthly (required)

Examples:

1. {em6_url}/historic_generation_type/?from_trading_date=05/08/2020&to_trading_date=05/08/2020&interval=30minute
2. {em6_url}/historic_generation_type/?from_trading_date=05/01/2020&to_trading_date=05/08/2020&generation_type_id=WIN&interval=30minute
3. {em6_url}/historic_generation_type/?from_trading_date=01/01/2020&to_trading_date=01/08/2020&generation_type_id=WIN&interval=monthly
4. {em6_url}/historic_generation_type/?from_trading_date=01/01/2020&to_trading_date=01/02/2020&generation_type_id=WIN&interval=daily

Truncated Historic Gen Type Example Response:

historic_generation_type/?from_trading_date=01/01/2022&to_trading_date=02/01/2022&interval=daily

```
{
  "daily_gen": [
    {
      "trading_date": "2021-12-31T11:00:00Z",
      "generation_type": [
        {
          "generation_type_name": "Battery",
          "generation_mw": -7.487,
          "generation_carbon_t": 0
        },
        {
          "generation_type_name": "Co-Gen",
          "generation_mw": 3075.108,
          "generation_carbon_t": 1176.62
        },
        {
          "generation_type_name": "Coal",
          "generation_mw": 0,
          "generation_carbon_t": 0
        },
        {
          "generation_type_name": "Gas",
          "generation_mw": 10611.143,
          "generation_carbon_t": 2148.39
        },
        {
          "generation_type_name": "Geothermal",
          "generation_mw": 42272.75,
          "generation_carbon_t": 1678.67
        },
        {
          "generation_type_name": "Hydro",
          "generation_mw": 118313.918,
          "generation_carbon_t": 0
        },
        {
          "generation_type_name": "Liquid",
          "generation_mw": 0,
          "generation_carbon_t": 0
        },
        {
          "generation_type_name": "Wind",
          "generation_mw": 11907.021,
          "generation_carbon_t": 0
        },
        {
          "generation_type_name": "NZ",
          "generation_mw": 186172.453,
          "generation_carbon_t": 5003.68
        }
      ]
    },
    {
      "trading_date": "2022-01-01T11:00:00Z",
      "generation_type": [
        {
          "generation_type_name": "Battery",
          "generation_mw": -9.149,
          "generation_carbon_t": 0
        },
        {
          "generation_type_name": "Co-Gen",
          "generation_mw": 5587.508,
          "generation_carbon_t": 1339.1
        },
        {
          "generation_type_name": "Coal",
          "generation_mw": 0,
          "generation_carbon_t": 0
        },
        {
          "generation_type_name": "Gas",
          "generation_mw": 10863.658,
          "generation_carbon_t": 2199.57
        },
        {
          "generation_type_name": "Geothermal",
          "generation_mw": 42311.027,
          "generation_carbon_t": 1673.69
        }
      ]
    }
  ]
}
```

Historic Generation Type API csv

DATA FEED: CURRENT AND HISTORIC CARBON INTENSITY, GWAP

Description: API to return historic NZ generation information aggregated by generation type. Eg: Hydro and the associated carbon output for each generation type and all of NZ in tonnes in csv format

URL:	{EM6_URL}/historic_generation_type_csv/[generation_type_id] [From_trading_date][to_trading_date]
Method:	GET
Query parameters:	
Generation_type_id	Hydro HYD , Coal/Gas CG , Gas GAS , Wind WIN , Cogen COG , Battery BAT , Liquid LIQ , Geothermal GEO , Solar SOL – <i>Optional blank for all</i>
From_trading_date	21/07/2020 - <i>Required</i>
To_trading_date	21/07/2020 - <i>Required</i>

Examples:

1. {em6_url}/historic_generation_type_csv/?from_trading_date=05/08/2020&to_trading_date=05/08/2020
2. {em6_url}/historic_generation_type_csv/?from_trading_date=05/01/2020&to_trading_date=05/08/2020&generation_type_id=WIN

Truncated Historic Gen Type Example csv Response:

historic_generation_type_csv/?from_trading_date=01/07/2021&to_trading_date=01/07/2021

Trading Date,Trading Period,Generation Type,MW,Carbon Tonnes

```
01/07/2021,1,Battery,-1.2,0
01/07/2021,1,Co-Gen,88.075,9.89
01/07/2021,1,Coal,463.451,230.68
01/07/2021,1,Gas,516.048,108.34
01/07/2021,1,Geothermal,854.359,31
01/07/2021,1,Hydro,2344.753,0
01/07/2021,1,Liquid,0,0
01/07/2021,1,Wind,245.194,0
01/07/2021,1,NZ,4510.68,379.92
01/07/2021,2,Battery,-1.21,0
01/07/2021,2,Co-Gen,88.529,9.96
01/07/2021,2,Coal,445.791,221.89
01/07/2021,2,Gas,477.31,100.13
01/07/2021,2,Geothermal,855.082,31.06
01/07/2021,2,Hydro,2261.635,0
01/07/2021,2,Liquid,0,0
01/07/2021,2,Wind,229.424,0
01/07/2021,2,NZ,4356.561,363.04
01/07/2021,3,Battery,-1.212,0
01/07/2021,3,Co-Gen,88.041,9.74
01/07/2021,3,Coal,416.136,207.13
01/07/2021,3,Gas,441.285,89.22
01/07/2021,3,Geothermal,856.076,31.1
01/07/2021,3,Hydro,2199.045,0
01/07/2021,3,Liquid,0,0
01/07/2021,3,Wind,233.559,0
01/07/2021,3,NZ,4232.93,337.19
01/07/2021,4,Battery,-.811,0
01/07/2021,4,Co-Gen,88.817,9.8
01/07/2021,4,Coal,376.116,187.21
01/07/2021,4,Gas,435.752,87.7
01/07/2021,4,Geothermal,855.52,31.09
01/07/2021,4,Hydro,2150.404,0
01/07/2021,4,Liquid,0,0
01/07/2021,4,Wind,230.42,0
01/07/2021,4,NZ,4136.218,315.79
01/07/2021,5,Battery,-.268,0
01/07/2021,5,Co-Gen,80.077,10.11
01/07/2021,5,Coal,378.071,188.18
01/07/2021,5,Gas,435.297,87.6
01/07/2021,5,Geothermal,856.216,31.19
01/07/2021,5,Hydro,2101.673,0
01/07/2021,5,Liquid,0,0
01/07/2021,5,Wind,215.773,0
01/07/2021,5,NZ,4066.839,317.09
01/07/2021,6,Battery,-.226,0
01/07/2021,6,Co-Gen,74.8,10.38
01/07/2021,6,Coal,369.276,183.81
01/07/2021,6,Gas,434.411,87.43
01/07/2021,6,Geothermal,855.187,31.07
01/07/2021,6,Hydro,2074.427,0
01/07/2021,6,Liquid,0,0
01/07/2021,6,Wind,211.062,0
01/07/2021,6,NZ,4018.937,312.68
01/07/2021,7,Battery,-.236,0
01/07/2021,7,Co-Gen,73.877,9.92
01/07/2021,7,Coal,353.064,175.74
01/07/2021,7,Gas,440.027,88.56
```

HVDC Last 24hrs API

DATA FEED: MARKET DASHBOARD

Description: API to return the last 24 hours of HVDC flow information.

URL:	<code>{EM6_URL}/hvdc/24hrs/</code>
Method:	GET
Query parameters:	<i>None</i>

Examples:

1. `{em6_url}/hvdc/24hrs/`

Truncated HVDC 24hr Example Response: {em6_url}/hvdc/24hrs/

```
{
  "items": [
    {
      "timestamp": "2020-11-04T02:21:00Z",
      "trading_period": 30,
      "dcn_flow": 463.911,
      "dcs_flow": 0,
      "direction": "NORTH",
      "north_limit_mw": 1200,
      "south_limit_mw": -750
    },
    {
      "timestamp": "2020-11-04T02:51:00Z",
      "trading_period": 31,
      "dcn_flow": 491.419,
      "dcs_flow": 0,
      "direction": "NORTH",
      "north_limit_mw": 1200,
      "south_limit_mw": -750
    },
    {
      "timestamp": "2020-11-04T03:21:00Z",
      "trading_period": 32,
      "dcn_flow": 521.525,
      "dcs_flow": 0,
      "direction": "NORTH",
      "north_limit_mw": 1200,
      "south_limit_mw": -750
    },
    {
      "timestamp": "2020-11-04T03:51:00Z",
      "trading_period": 33,
      "dcn_flow": 504.943,
      "dcs_flow": 0,
      "direction": "NORTH",
      "north_limit_mw": 1200,
      "south_limit_mw": -750
    },
    {
      "timestamp": "2020-11-04T04:21:00Z",
      "trading_period": 34,
      "dcn_flow": 523.794,
      "dcs_flow": 0,
      "direction": "NORTH",
      "north_limit_mw": 1200,
      "south_limit_mw": -750
    },
    {
      "timestamp": "2020-11-04T04:51:00Z",
      "trading_period": 35,
      "dcn_flow": 589.203,
      "dcs_flow": 0,
      "direction": "NORTH",
      "north_limit_mw": 1200,
      "south_limit_mw": -750
    }
  ],
}
```

Reserves Last 24hrs API

DATA FEED: MARKET DASHBOARD

Description: API to return the last 24 hours of aggregated NZ reserve information.

URL:	<code>{EM6_URL}/resrves_nz/24hrs/</code>
Method:	GET
Query parameters:	<i>None</i>

Examples:

1. `{em6_url}/reserves_nz/24hrs/`

Truncated Reserves 24hr Example Response: {em6_url}/reserves_nz/24hrs/

```
{
  "items": [
    {
      "timestamp": "2020-11-18T21:00:00Z",
      "trading_period": 20,
      "islandid": "NI",
      "mwcleared": 673.975,
      "mwoffered": 1450.151
    },
    {
      "timestamp": "2020-11-18T21:00:00Z",
      "trading_period": 20,
      "islandid": "SI",
      "mwcleared": 199.973,
      "mwoffered": 431.995
    },
    {
      "timestamp": "2020-11-18T21:30:00Z",
      "trading_period": 21,
      "islandid": "NI",
      "mwcleared": 653.888,
      "mwoffered": 1646.59
    },
    {
      "timestamp": "2020-11-18T21:30:00Z",
      "trading_period": 21,
      "islandid": "SI",
      "mwcleared": 216.167,
      "mwoffered": 431.995
    },
    {
      "timestamp": "2020-11-18T22:00:00Z",
      "trading_period": 22,
      "islandid": "NI",
      "mwcleared": 660.645,
      "mwoffered": 1624.333
    },
    {
      "timestamp": "2020-11-18T22:00:00Z",
      "trading_period": 22,
      "islandid": "SI",
      "mwcleared": 189.019,
      "mwoffered": 424.995
    },
    {
      "timestamp": "2020-11-18T22:30:00Z",
      "trading_period": 23,
      "islandid": "NI",
      "mwcleared": 645.186,
      "mwoffered": 1643.288
    }
  ]
}
```

NZ Island Load Last 24hrs API

DATA FEED: MARKET DASHBOARD

Description: API to return the last 24 hours of aggregated North and South Island load information.

URL:	<code>{EM6_URL}/nz/24hrs/</code>
Method:	GET
Query parameters:	<i>None</i>

Examples:

1. `{em6_url}/nz/24hrs/`

Truncated NZ 24hr Example Response: {em6_url}/nz/24hrs/

```
{
  "items": [
    {
      "timestamp": "2020-11-04T02:51:00Z",
      "trading_period": 31,
      "ni_mw": 3149.9,
      "si_mw": 1834.3,
      "ni_7_day_max": 3171.7,
      "si_7_day_max": 1898.7,
      "ni_7_day_min": 2550.4,
      "si_7_day_min": 1591.4,
      "ni_mw_lwk": 3164.1,
      "si_mw_lwk": 1722
    },
    {
      "timestamp": "2020-11-04T03:21:00Z",
      "trading_period": 32,
      "ni_mw": 3203.2,
      "si_mw": 1851.2,
      "ni_7_day_max": 3233.1,
      "si_7_day_max": 1913.2,
      "ni_7_day_min": 2583.9,
      "si_7_day_min": 1603.1,
      "ni_mw_lwk": 3208,
      "si_mw_lwk": 1735.2
    },
    {
      "timestamp": "2020-11-04T03:51:00Z",
      "trading_period": 33,
      "ni_mw": 3225.1,
      "si_mw": 1857.7,
      "ni_7_day_max": 3269.5,
      "si_7_day_max": 1932.7,
      "ni_7_day_min": 2619.4,
      "si_7_day_min": 1635.9,
      "ni_mw_lwk": 3250.2,
      "si_mw_lwk": 1740.5
    },
    {
      "timestamp": "2020-11-04T04:21:00Z",
      "trading_period": 34,
      "ni_mw": 3242,
      "si_mw": 1862.9,
      "ni_7_day_max": 3313.2,
      "si_7_day_max": 1955.4,
      "ni_7_day_min": 2673.9,
      "si_7_day_min": 1664.1,
      "ni_mw_lwk": 3289.1,
      "si_mw_lwk": 1742.2
    },
    {
      "timestamp": "2020-11-04T04:51:00Z",
      "trading_period": 35,
      "ni_mw": 3254.5,
      "si_mw": 1859.3,
      "ni_7_day_max": 3336.2,
      "si_7_day_max": 1955.9,
      "ni_7_day_min": 2727.6,
      "si_7_day_min": 1692.8,
      "ni_mw_lwk": 3316.7,
      "si_mw_lwk": 1759.9
    }
  ]
}
```

Recent Load API

DATA FEED: MARKET DASHBOARD

Description: API to return the recent load by node id.

	Info	Example
Max_7_day:	Maximum half hourly load in the previous 7 days	97.848
Scada_mw_current:	The latest SCADA load value	80.272
Mw_change:	The MW difference between the scada_mw_current and the previous value. Is the load increasing or decreasing?	-0.329
Pct_7_day	The current load relative to the 7-day rolling peak, expressed as a percentage	82.04

URL:	{EM6_URL}/recent_load/[node_id]
Method:	GET
Query parameters:	
Node_id	HAY0111 [CSV] – <i>Optional blank for all</i>

Examples:

1. {em6_url}/recent_load/
2. {em6_url}/recent_load/HAY0111
3. {em6_url}/recent_load/HAY0111,CPK0331

Recent Load Example Response:

{em6_url}/recent_load/CPK0331,WIL0331,ALB0331,PEN0331,ISL0661

```

{
  "items": [
    {
      "node_id": "ALB0331",
      "max_7_day": 97.848,
      "scada_mw_current": 80.272,
      "mw_change": -0.329,
      "pct_7_day": 82.04,
      "timestamp": "2022-04-20T01:21:00Z",
      "trading_period": 26,
      "trading_date": "20/04/2022"
    },
    {
      "node_id": "CPK0331",
      "max_7_day": 84.823,
      "scada_mw_current": 81.36,
      "mw_change": -0.852,
      "pct_7_day": 95.92,
      "timestamp": "2022-04-20T01:21:00Z",
      "trading_period": 26,
      "trading_date": "20/04/2022"
    },
    {
      "node_id": "ISL0661",
      "max_7_day": 253.818,
      "scada_mw_current": 253.818,
      "mw_change": 0.19,
      "pct_7_day": 100,
      "timestamp": "2022-04-20T01:21:00Z",
      "trading_period": 26,
      "trading_date": "20/04/2022"
    },
    {
      "node_id": "PEN0331",
      "max_7_day": 183.124,
      "scada_mw_current": 182.683,
      "mw_change": 0.396,
      "pct_7_day": 99.76,
      "timestamp": "2022-04-20T01:21:00Z",
      "trading_period": 26,
      "trading_date": "20/04/2022"
    },
    {
      "node_id": "WIL0331",
      "max_7_day": 28.507,
      "scada_mw_current": 26.908,
      "mw_change": 0.07,
      "pct_7_day": 94.39,
      "timestamp": "2022-04-20T01:21:00Z",
      "trading_period": 26,
      "trading_date": "20/04/2022"
    }
  ]
}

```

Recent Generation API

DATA FEED: MARKET DASHBOARD

Description: API to return the recent generation by node id.

	Info	Example
Max_7_day:	Maximum half hourly generation in the previous 7 days	443.128
Scada_mw_current:	The latest SCADA generation value	382.565
Mw_change:	The MW difference between the scada_mw_current and the previous value. Is the generator increasing or decreasing?	-15.361
Pct_7_day	The current generation relative to the 7-day rolling peak generation output expressed as a percentage.	86.33
Pct_capacity	The current generation output relative to the unit nameplate capacity expressed as a percentage.	70.85

URL:	{EM6_URL}/recent_generation/[node_id]
Method:	GET
Query parameters:	
Node_id	WIL0331 MCK0 [CSV] – <i>Optional blank for all</i>

Examples:

1. {em6_url}/recent_generation/
2. {em6_url}/recent_generation/WIL0331 MCK0
3. {em6_url}/recent_generation/WIL0331 MCK0,HLY2201 HLY5

Recent Generation Example Response: {em6_url}/recent_generation/BEN2202 BEN0,HLY2201 HLY5,WIL0331 MCK0,WWD1103 WWD0

```
{
  "items": [
    {
      "node_id": "BEN2202 BEN0",
      "max_7_day": 443.128,
      "scada_mw_current": 382.565,
      "mw_change": -15.361,
      "pct_7_day": 86.33,
      "pct_capacity": 70.85,
      "timestamp": "2022-04-20T01:31:00Z",
      "trading_period": 27,
      "trading_date": "20/04/2022"
    },
    {
      "node_id": "HLY2201 HLY5",
      "max_7_day": 385.389,
      "scada_mw_current": 375.777,
      "mw_change": -1.787,
      "pct_7_day": 97.51,
      "pct_capacity": 93.24,
      "timestamp": "2022-04-20T01:31:00Z",
      "trading_period": 27,
      "trading_date": "20/04/2022"
    },
    {
      "node_id": "WIL0331 MCK0",
      "max_7_day": 56.836,
      "scada_mw_current": 17.225,
      "mw_change": -1.302,
      "pct_7_day": 30.31,
      "pct_capacity": 28.71,
      "timestamp": "2022-04-20T01:31:00Z",
      "trading_period": 27,
      "trading_date": "20/04/2022"
    },
    {
      "node_id": "WWD1103 WWD0",
      "max_7_day": 62.572,
      "scada_mw_current": 25.834,
      "mw_change": -0.299,
      "pct_7_day": 41.29,
      "pct_capacity": 32.29,
      "timestamp": "2022-04-20T01:31:00Z",
      "trading_period": 27,
      "trading_date": "20/04/2022"
    }
  ],
}
```

Real Time Load API

DATA FEED: REAL-TIME LOAD GENERATION AND HVDC (1MIN)

Description: API to return the latest 1min load value by node.

URL:	{EM6_URL}/current_load/[node_id]
Method:	GET
Query parameters:	
Node_id	HAY0111 [CSV] – <i>Optional blank for all</i>

Examples:

1. {em6_url}/current_load/
2. {em6_url}/current_load/HAY0111
3. {em6_url}/current_load/HAY0111,CPK0331

Real Time Load Example Response:

{em6_url}/current_load/CPK0331,WIL0331,ALB0331,PEN0331

```
{
  "items": [
    {
      "node_id": "ALB0331",
      "scada_mw_current": 85.5,
      "current_tp_avg": 60.7,
      "timestamp": "2020-11-18T23:53:10Z",
      "trading_period": 26
    },
    {
      "node_id": "CPK0331",
      "scada_mw_current": 86.1,
      "current_tp_avg": 83.3,
      "timestamp": "2020-11-18T23:53:10Z",
      "trading_period": 26
    },
    {
      "node_id": "PEN0331",
      "scada_mw_current": 176.201,
      "current_tp_avg": 167.8,
      "timestamp": "2020-11-18T23:53:10Z",
      "trading_period": 26
    },
    {
      "node_id": "WIL0331",
      "scada_mw_current": 27.76,
      "current_tp_avg": 26.5,
      "timestamp": "2020-11-18T23:53:10Z",
      "trading_period": 26
    }
  ]
}
```

Real Time Generation API

DATA FEED: REAL-TIME LOAD GENERATION AND HVDC (1MIN)

Description: API to return the latest 1min generation value by node.

URL:	{EM6_URL}/current_generation/[node_id]
Method:	GET
Query parameters:	
Node_id	WIL0331 MCK0 [CSV] – <i>Optional blank for all</i>

Examples:

4. {em6_url}/current_generation/
5. {em6_url}/current_generation/WIL0331 MCK0
6. {em6_url}/current_generation/WIL0331 MCK0,HLY2201 HLY5

Real Time Generation Example Response: {em6_url}/current_generation/WIL0331 MCK0,HLY2201 HLY5,ARA2201 ARA0

```
{
  "items": [
    {
      "node_id": "ARA2201 ARA0",
      "scada_mw_current": 46.48,
      "current_tp_avg": 30.6,
      "timestamp": "2020-11-19T00:01:10Z",
      "trading_period": 27
    },
    {
      "node_id": "HLY2201 HLY5",
      "scada_mw_current": 346.431,
      "current_tp_avg": 292.4,
      "timestamp": "2020-11-19T00:01:10Z",
      "trading_period": 27
    },
    {
      "node_id": "WIL0331 MCK0",
      "scada_mw_current": 55.94,
      "current_tp_avg": 47.6,
      "timestamp": "2020-11-19T00:01:10Z",
      "trading_period": 27
    }
  ]
}
```

Real Time HVDC API

DATA FEED: REAL-TIME LOAD GENERATION AND HVDC (1MIN)

Description: API to return the latest 1min HVDC load value by pole and net flow.

URL:	{EM6_URL}/current_hvdc/[node_id]
Method:	GET
Query parameters:	
Node_id – HVDC pole values	DCN3502, DCS3502, DCN3503, DCS3503 [CSV] – <i>Optional blank for all including net flow</i>

Examples:

1. {em6_url}/current_hvdc/
2. {em6_url}/current_hvdc/DCN3503
3. {em6_url}/current_hvdc/DCN3502,DCS3502

Real Time HVDC Example Response: {em6_url}/current_hvdc/

```
{
  "hvdc_flow": [
    {
      "timestamp": "2021-08-19T00:05:45Z",
      "trading_period": 25,
      "dcn_flow": 390.129,
      "dcs_flow": 0,
      "direction": "NORTH"
    }
  ],
  "hvdc_nodes": [
    {
      "islandid": "NI",
      "node_id": "DCN3502",
      "node_name": "Haywards Pole 2",
      "scada_mw_current": -0.039,
      "current_tp_avg": 0,
      "timestamp": "2021-08-19T00:05:45Z",
      "trading_period": 25
    },
    {
      "islandid": "NI",
      "node_id": "DCN3503",
      "node_name": "Haywards Pole 3",
      "scada_mw_current": -390.09,
      "current_tp_avg": -394,
      "timestamp": "2021-08-19T00:05:45Z",
      "trading_period": 25
    },
    {
      "islandid": "SI",
      "node_id": "DCS3502",
      "node_name": "Benmore Pole 2",
      "scada_mw_current": 0.046,
      "current_tp_avg": 0,
      "timestamp": "2021-08-19T00:05:45Z",
      "trading_period": 25
    },
    {
      "islandid": "SI",
      "node_id": "DCS3503",
      "node_name": "Benmore Pole 3",
      "scada_mw_current": 407.929,
      "current_tp_avg": 411.8,
      "timestamp": "2021-08-19T00:05:45Z",
      "trading_period": 25
    }
  ]
}
```

Current Carbon Intensity API

DATA FEED: CURRENT AND HISTORIC CARBON INTENSITY, FREE (NO AUTHORISATION REQUIRED)

Description: API to return the aggregated recent carbon intensity for NZ in the last three trading periods, including the following:

	Info	Example
nz_carbon_t:	Total Tonnes of CO2 produced in the trading period	459.95
nz_carbon_gkwh:	Grams of CO2 produced per kWh generated	171.34
nz_carbon_change_gkwh:	Change in grams of CO2 produced per kWh generated from the previous trading period	5.23
nz_renewable:	Percentage of NZ generation that is 'renewable'	76.52
max_24hrs_gkwh:	The max Grams of CO2 produced per kWh in the last 24hrs	205.74
min_24hrs_gkwh:	The min Grams of CO2 produced per kWh in the last 24hrs	163.89
current_month_avg_gkwh:	The average Grams of CO2 produced per kWh generated in the current month	78.38
current_year_avg_gkwh:	The average Grams of CO2 produced per kWh generated in the current year	71.17
Pct_current_year_gkwh:	The current Carbon output as a percentage of the rolling 12 month max output	83.28

URL:	{EM6_URL}/current_carbon_intensity/
Method:	GET
Query parameters:	none

Examples:

1. {em6_url}/current_carbon_intensity

Current Carbon Intensity Example Response: {em6_url}/current_carbon_intensity

```
{
  "items": [
    {
      "trading_date": "2022-01-09T11:00:00Z",
      "trading_period": 27,
      "timestamp": "2022-01-10T00:00:00Z",
      "nz_carbon_t": 246.12,
      "nz_carbon_gkwh": 93.49,
      "nz_carbon_gkwh_prev": 92.14,
      "nz_carbon_change_gkwh": 1.35,
      "nz_renewable": 84.73,
      "max_24hrs_gkwh": 103.36,
      "min_24hrs_gkwh": 59.06,
      "current_month_avg_gkwh": 54.57,
      "current_year_avg_gkwh": 122.25,
      "pct_current_year_gkwh": 33.44
    },
    {
      "trading_date": "2022-01-09T11:00:00Z",
      "trading_period": 26,
      "timestamp": "2022-01-09T23:30:00Z",
      "nz_carbon_t": 242.58,
      "nz_carbon_gkwh": 92.14,
      "nz_carbon_gkwh_prev": 95.3,
      "nz_carbon_change_gkwh": -3.16,
      "nz_renewable": 85.08,
      "max_24hrs_gkwh": 103.36,
      "min_24hrs_gkwh": 59.06,
      "current_month_avg_gkwh": 54.57,
      "current_year_avg_gkwh": 122.25,
      "pct_current_year_gkwh": 32.96
    },
    {
      "trading_date": "2022-01-09T11:00:00Z",
      "trading_period": 25,
      "timestamp": "2022-01-09T23:00:00Z",
      "nz_carbon_t": 252.85,
      "nz_carbon_gkwh": 95.3,
      "nz_carbon_gkwh_prev": 95.94,
      "nz_carbon_change_gkwh": -0.64,
      "nz_renewable": 85.03,
      "max_24hrs_gkwh": 103.36,
      "min_24hrs_gkwh": 59.06,
      "current_month_avg_gkwh": 54.57,
      "current_year_avg_gkwh": 122.25,
      "pct_current_year_gkwh": 34.09
    }
  ]
}
```

Historic Carbon Intensity API

DATA FEED: CURRENT AND HISTORIC CARBON INTENSITY

Description: API to return the aggregated carbon intensity for NZ by trading date:

	Info	Example
nz_carbon_t:	Total Tonnes of CO2 produced in the trading period	184.03
nz_carbon_gkwh:	Grams of CO2 produced per kWh generated	22.95
nz_renewable:	Percentage of NZ generation that is 'renewable'	81.23

URL:	{EM6_URL}/carbon_intensity/[from_trading_date] [to_trading_date]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required

Examples:

1. {em6_url}/carbon_intensity/?from_trading_date=30/07/2020&to_trading_date=30/07/2020
2. {em6_url}/carbon_intensity/?from_trading_date=01/07/2020&to_trading_date=30/08/2020

Historic Carbon Intensity Example Response: {em6_url}/carbon_intensity
?from_trading_date=01/01/2022&to_trading_date=10/01/2022

```
{
  "items": [
    {
      "trading_date": "2021-12-31T11:00:00Z",
      "trading_period": 1,
      "timestamp": "00:00",
      "nz_carbon_t": 101.74,
      "nz_carbon_gkwh": 56.77,
      "nz_renewable": 92.42
    },
    {
      "trading_date": "2021-12-31T11:00:00Z",
      "trading_period": 2,
      "timestamp": "00:30",
      "nz_carbon_t": 102.95,
      "nz_carbon_gkwh": 58.92,
      "nz_renewable": 92.04
    },
    {
      "trading_date": "2021-12-31T11:00:00Z",
      "trading_period": 3,
      "timestamp": "01:00",
      "nz_carbon_t": 101.61,
      "nz_carbon_gkwh": 59.88,
      "nz_renewable": 91.98
    },
    {
      "trading_date": "2021-12-31T11:00:00Z",
      "trading_period": 4,
      "timestamp": "01:30",
      "nz_carbon_t": 101.55,
      "nz_carbon_gkwh": 61.59,
      "nz_renewable": 91.8
    },
    {
      "trading_date": "2021-12-31T11:00:00Z",
      "trading_period": 5,
      "timestamp": "02:00",
      "nz_carbon_t": 102.43,
      "nz_carbon_gkwh": 63.33,
      "nz_renewable": 91.52
    }
  ]
}
```

Historic Carbon Intensity API csv

DATA FEED: CURRENT AND HISTORIC CARBON INTENSITY

Description: API to return the aggregated carbon intensity for NZ by trading date in a csv file:

	Info	Example
nz_carbon_t:	Total Tonnes of CO2 produced in the trading period	184.03
nz_carbon_gkwh:	Grams of CO2 produced per kWh generated	22.95
nz_renewable:	Percentage of NZ generation that is 'renewable'	81.23

URL:	{EM6_URL}/carbon_intensity_csv/[from_trading_date] [to_trading_date]
Method:	GET
Query parameters:	
from_trading_date	21/07/2020 - Required
to_trading_date	21/07/2020 - Required

Examples:

1. {em6_url}/carbon_intensity_csv/?from_trading_date=30/07/2020&to_trading_date=30/07/2020
2. {em6_url}/carbon_intensity_csv/?from_trading_date=01/07/2020&to_trading_date=30/08/2020

Historic Carbon Intensity Example csv Response: {em6_url}/carbon_intensity_csv ?from_trading_date=01/01/2022&to_trading_date=10/01/2022

Trading Date,Trading Period,Time Stamp,NZ Carbon Tonnes,NZ Carbon gkWh,NZ Renewable

```
01/01/2022,1,00:00,101.74,56.77,92.42
01/01/2022,2,00:30,102.95,58.92,92.04
01/01/2022,3,01:00,101.61,59.88,91.98
01/01/2022,4,01:30,101.55,61.59,91.80
01/01/2022,5,02:00,102.43,63.33,91.52
01/01/2022,6,02:30,104.35,65.56,91.11
01/01/2022,7,03:00,101.87,64.55,91.37
01/01/2022,8,03:30,102.78,65.58,91.15
01/01/2022,9,04:00,104.11,66.58,90.87
01/01/2022,10,04:30,104.49,66.55,90.82
01/01/2022,11,05:00,102.43,63.53,91.46
01/01/2022,12,05:30,100.21,60.76,91.99
01/01/2022,13,06:00,101.03,60.11,91.98
01/01/2022,14,06:30,102.25,59.65,91.98
01/01/2022,15,07:00,103.23,58.26,92.09
01/01/2022,16,07:30,101.47,55.84,92.56
01/01/2022,17,08:00,103.22,54.67,92.55
01/01/2022,18,08:30,101.89,51.93,93.02
01/01/2022,19,09:00,101.01,49.66,93.29
01/01/2022,20,09:30,100.79,48.71,93.46
01/01/2022,21,10:00,103.21,49.37,93.36
01/01/2022,22,10:30,103.01,49.08,93.42
01/01/2022,23,11:00,102.14,48.69,93.47
01/01/2022,24,11:30,102.08,48.79,93.47
01/01/2022,25,12:00,102.13,48.90,93.42
01/01/2022,26,12:30,100.74,48.86,93.45
01/01/2022,27,13:00,101.19,49.49,93.39
01/01/2022,28,13:30,108.46,53.43,92.35
01/01/2022,29,14:00,108.92,53.59,92.32
01/01/2022,30,14:30,102.53,50.04,93.13
01/01/2022,31,15:00,102.80,49.77,93.11
01/01/2022,32,15:30,102.61,49.12,93.24
01/01/2022,33,16:00,102.40,48.49,93.30
01/01/2022,34,16:30,108.11,50.38,92.74
01/01/2022,35,17:00,107.28,49.00,92.91
01/01/2022,36,17:30,107.16,48.10,93.04
01/01/2022,37,18:00,106.31,47.56,93.24
01/01/2022,38,18:30,108.51,48.56,93.00
01/01/2022,39,19:00,109.89,49.89,92.84
01/01/2022,40,19:30,107.33,49.64,93.12
01/01/2022,41,20:00,105.54,50.17,93.12
01/01/2022,42,20:30,109.03,51.87,92.76
01/01/2022,43,21:00,109.76,51.65,92.79
01/01/2022,44,21:30,111.70,52.77,92.61
01/01/2022,45,22:00,110.38,53.68,92.58
01/01/2022,46,22:30,105.43,53.42,92.98
01/01/2022,47,23:00,106.64,55.41,92.62
01/01/2022,48,23:30,104.24,56.45,92.51
02/01/2022,1,00:00,103.60,58.33,92.26
02/01/2022,2,00:30,104.94,61.27,91.86
02/01/2022,3,01:00,105.97,63.63,91.57
02/01/2022,4,01:30,105.82,64.75,91.43
02/01/2022,5,02:00,106.61,66.46,91.18
02/01/2022,6,02:30,106.19,66.82,90.91
02/01/2022,7,03:00,106.33,67.64,90.43
02/01/2022,8,03:30,106.27,67.63,89.95
02/01/2022,9,04:00,106.04,67.07,89.51
```

Carbon Intensity and Renewables Daily Average API

DATA FEED: CURRENT AND HISTORIC CARBON INTENSITY

Description: API to return the daily average carbon intensity and renewables percentage for NZ by trading date.

	Info	Example
nz_carbon_gkwh:	Grams of CO2 produced per kWh generated	22.95
nz_renewable:	Percentage of NZ generation that is 'renewable'	81.23

URL:	{EM6_URL}/ carbon_intensity_daily_average/[trading_date_from] [trading_date_to]
Method:	GET
Query parameters:	Without parameters, API returns previous 14 days' daily averages.
trading_date_from	21/02/2024 - <i>optional</i>
trading_date_to	21/03/2024 - <i>optional</i>

Examples:

1. {em6_url}/carbon_intensity_daily_average/
2. {em6_url}/carbon_intensity_daily_average/?trading_date_from=21/02/2024&trading_date_to=21/03/2024

Carbon Intensity and Renewables Daily Average Example Response:

{em6_url}/carbon_intensity_daily_average/?trading_date_from=15/03/2024&trading_date_to=17/03/2024

```
{
  "items": [
    {
      "trading_date": "2024-03-16T11:00:00Z",
      "timestamp": "2024-03-17T10:30:00Z",
      "nz_carbon_gkwh": 92.59,
      "nz_renewable": 83.07
    },
    {
      "trading_date": "2024-03-15T11:00:00Z",
      "timestamp": "2024-03-16T10:30:00Z",
      "nz_carbon_gkwh": 109.22,
      "nz_renewable": 80.9
    },
    {
      "trading_date": "2024-03-14T11:00:00Z",
      "timestamp": "2024-03-15T10:30:00Z",
      "nz_carbon_gkwh": 104.36,
      "nz_renewable": 82.33
    }
  ]
}
```

Generation Weighted Average Price API

DATA FEED: GWAP

Description: API to return the generation weighted average price (GWAP) by region and generation type. Values will be calculated using the final prices (or interim if unavailable):

URL:	{EM6_URL}/gen_region_price/[interval][grid_zone_id][generation_type_id][from_trading_date][to_trading_date]
Method:	GET
Query parameters:	
interval	30minute, daily, monthly - <i>Required</i>
Grid_zone_id	1-14 – 14 Grid Zones in NZ
Generation_type_id	Hydro HYD , Coal/Gas CG , Gas GAS , Wind WIN , Cogen COG , Battery BAT , Liquid LIQ , Geothermal GEO , Solar SOL – <i>Optional blank for all</i>
from_trading_date	21/02/2021 - <i>Required</i>
to_trading_date	21/02/2021 - <i>Required</i>

Examples:

1. {em6_url}/gen_region_price/?interval=30minute&generation_type_id=HYD&from_trading_date=28/04/2021&to_trading_date=28/04/2021
2. {em6_url}/gen_region_price/?interval=daily&from_trading_date=01/04/2021&to_trading_date=28/04/2021
3. {em6_url}/gen_region_price/?interval=monthly&generation_type_id=HYD&from_trading_date=01/01/2021&to_trading_date=30/04/2021
4. {em6_url}/gen_region_price/?interval=30minute&grid_zone_id=7&from_trading_date=28/04/2021&to_trading_date=28/04/2021

GWAP 30min Example Response:

{em6_url}/gen_region_price/?interval=30minute&generation_type_id=HYD&from_trading_date=28/04/2021&to_trading_date=28/04/2021

```
{
  "TP_gwap": [
    {
      "trading_date": "2021-04-27T12:00:00Z",
      "totals": [
        [
          {
            "unit": "WAP",
            "generation_type": "HYD",
            "value": 266.73
          },
          {
            "unit": "MW",
            "generation_type": "HYD",
            "value": 1712.28
          }
        ]
      ],
      "locations": [
        [
          {
            "location_name": "NZ",
            "generation_type": [
              {
                "unit": "WAP",
                "generation_type": "HYD",
                "value": 266.73
              },
              {
                "unit": "MW",
                "generation_type": "HYD",
                "value": 1712.28
              }
            ]
          }
        ]
      ]
    },
    {
      "trading_date": "2021-04-27T12:30:00Z",
      "totals": [
        [
          {
            "unit": "WAP",
            "generation_type": "HYD",
            "value": 268.65
          },
          {
            "unit": "MW",
            "generation_type": "HYD",
            "value": 1638.35
          }
        ]
      ],
      "locations": [
        [
          {
            "location_name": "NZ",
            "generation_type": [
              {
                "unit": "WAP",
                "generation_type": "HYD",
                "value": 268.65
              },
              {
                "unit": "MW",
                "generation_type": "HYD",
                "value": 1638.35
              }
            ]
          }
        ]
      ]
    }
  ]
}
```

GWAP Daily Example Response:

{em6_url}/gen_region_price/?interval=daily&generation_type_id=HYD&from_trading_date=01/04/2021&to_trading_date=03/04/2021

```
{
  "daily_gwap": [
    {
      "trading_date": "2021-03-31T11:00:00Z",
      "totals": [
        {
          "unit": "WAP",
          "generation_type": "HYD",
          "value": 238.15
        },
        {
          "unit": "MW",
          "generation_type": "HYD",
          "value": 110139.89
        }
      ]
    },
    {
      "trading_date": "2021-04-01T11:00:00Z",
      "totals": [
        {
          "unit": "WAP",
          "generation_type": "HYD",
          "value": 230.99
        },
        {
          "unit": "MW",
          "generation_type": "HYD",
          "value": 95098.94
        }
      ]
    }
  ],
  "locations": [
    {
      "location_name": "NZ",
      "generation_type": [
        {
          "unit": "WAP",
          "generation_type": "HYD",
          "value": 238.15
        },
        {
          "unit": "MW",
          "generation_type": "HYD",
          "value": 110139.89
        }
      ]
    }
  ]
}
```

GWAP Monthly Example Response:

{em6_url}/gen_region_price/?grid_zone_id=7&from_trading_date=01/03/2021&to_trading_date=30/04/2021&interval=monthly

```
{
  "monthly_gwap": [
    {
      "trading_date": "2021-02-28T11:00:00Z",
      "totals": [
        {
          "unit": "WAP",
          "generation_type": "HYD",
          "value": 256.05
        },
        {
          "unit": "MW",
          "generation_type": "HYD",
          "value": 69091.72
        }
      ],
      [
        {
          "unit": "WAP",
          "generation_type": "WIN",
          "value": 197.55
        },
        {
          "unit": "MW",
          "generation_type": "WIN",
          "value": 92282.78
        }
      ]
    ],
    "locations": [
      {
        "location_name": "Bunnythorpe",
        "generation_type": [
          {
            "unit": "WAP",
            "generation_type": "HYD",
            "value": 256.05
          },
          {
            "unit": "MW",
            "generation_type": "HYD",
            "value": 69091.72
          }
        ],
        [
          {
            "unit": "WAP",
            "generation_type": "WIN",
            "value": 197.55
          },
          {
            "unit": "MW",
            "generation_type": "WIN",
            "value": 92282.78
          }
        ]
      ]
    ]
  ]
}
```

Generation Weighted Average Price and Energy Summary API

DATA FEED: GWAP

Description: API to return the average generation weighted average price (GWAP) and energy generated in Gwh summary by date range and generation type. Values will be calculated using final prices (or interim or interim if unavailable):

URL:	{EM6_URL}/gen_region_price/summary/[from_trading_date][to_trading_date]
Method:	GET
Query parameters:	
from_trading_date	21/02/2021 - Required
to_trading_date	21/02/2021 - Required

Examples:

1. {em6_url}/gen_region_price/summary/?from_trading_date=28/04/2021&to_trading_date=28/04/2021
2. {em6_url}/gen_region_price/summary/?from_trading_date=01/04/2021&to_trading_date=28/04/2021

GWAP Energy Summary Example Response:

{em6_url}/gen_region_price/summary/?from_trading_date=15/10/2023&to_trading_date=15/10/2023

```
{
  "items": [
    {
      "start_date": "15/10/2023",
      "end_date": "15/10/2023",
      "generation_type": [
        {
          "cg_gwap": 157.28,
          "cg_gwh": 0.01,
          "cg_pct": 0.01
        },
        {
          "cog_gwap": 121.96,
          "cog_gwh": 2.82,
          "cog_pct": 2.68
        },
        {
          "gas_gwap": 135.44,
          "gas_gwh": 3.99,
          "gas_pct": 3.8
        },
        {
          "geo_gwap": 119.26,
          "geo_gwh": 21.17,
          "geo_pct": 20.17
        },
        {
          "hyd_gwap": 113.49,
          "hyd_gwh": 58.31,
          "hyd_pct": 55.57
        },
        {
          "sol_gwap": 126.86,
          "sol_gwh": 0.63,
          "sol_pct": 0.6
        },
        {
          "win_gwap": 111.97,
          "win_gwh": 18.01,
          "win_pct": 17.16
        }
      ]
    }
  ]
}
```

Intermittent Generation Aggregated Forecast API

DATA FEED: FREE (NO AUTHORISATION REQUIRED)

Description: API to return wind and solar forecast generation information for up to 72 trading periods into the future. Wind data can be broken into North and South Island, however solar data is nationwide only.

URL:	{EM6_URL}/ig_aggregated
Method:	GET
Query parameters:	
generation_type	WIN wind, SOL solar - <i>optional, leave blank for all</i>
region	NI North Island, SI South Island, NZ Nationwide – <i>optional, leave blank for all</i>

Examples:

1. {em6_url}/ig_aggregated
2. {em6_url}/ig_aggregated?generation_type=WIN®ion=NI

Intermittent Generation Aggregated Forecast Example Response:

{em6_url}/ig_aggregated?generation_type=WIN®ion=NI

```
{
  "items": [
    {
      "trading_period": 31,
      "timestamp": "2025-11-06T02:00:00Z",
      "region": "NI",
      "generation_type": "WIN",
      "forecast_generation": 523.82,
      "potential_forecast_generation": 535.385,
      "cleared": 536.468,
      "shortfall": -12.648
    },
    {
      "trading_period": 32,
      "timestamp": "2025-11-06T02:30:00Z",
      "region": "NI",
      "generation_type": "WIN",
      "forecast_generation": 530.42,
      "potential_forecast_generation": 545.751,
      "cleared": 526.819,
      "shortfall": 3.601
    },
    {
      "trading_period": 33,
      "timestamp": "2025-11-06T03:00:00Z",
      "region": "NI",
      "generation_type": "WIN",
      "forecast_generation": 538.376,
      "potential_forecast_generation": 558.148,
      "cleared": 529.451,
      "shortfall": 8.925
    },
    {
      "trading_period": 34,
      "timestamp": "2025-11-06T03:30:00Z",
      "region": "NI",
      "generation_type": "WIN",
      "forecast_generation": 537.856,
      "potential_forecast_generation": 561.993,
      "cleared": 548.172,
      "shortfall": -10.316
    },
    {
      "trading_period": 35,
      "timestamp": "2025-11-06T04:00:00Z",
      "region": "NI",
      "generation_type": "WIN",
      "forecast_generation": 534.378,
      "potential_forecast_generation": 562.932,
      "cleared": 545.965,
      "shortfall": -11.587
    }
  ]
}
```

Document History

Version	Date	Status	Edited By	Revision Description
0.1	01 July 2020	Draft	EMS	Initial Draft of APIs built to date and em6 permissions design
0.3	14 August 2020	Draft	E Oosterbaan	API documentation
0.4	19 August 2020	Draft	E Oosterbaan	Additional csv APIs and dashboard 24 hours APIs
0.5	19 September 2020	Draft	E Oosterbaan	Em6 permissions update
0.6	19 October 2020	Draft	E Oosterbaan	To/from for Reserves
0.7	22 October 2020	Draft	E Oosterbaan	Dashboard Timestamps
0.9	28 October 2020	Draft	E Oosterbaan	Permissions and API updates – ISO date format, updated csv headers, generation type by NZ
1.0	13 November 2020	Draft	E Oosterbaan	Add MW change to recent load and RT APIs
1.1	14 November 2020	Final	E Oosterbaan	Authorisation
1.2	8 December 2020	Final	E Oosterbaan	Change non-responsive schedule to non-response and Recent Generation API
1.3	18 February 2021	Final	E Oosterbaan	New Carbon Intensity APIs and update to generation_type API Update to auth flow for UAT auth URL and clarification on username and password
1.4	8 March 2021	Final	E Oosterbaan	Small correction to TRUS restricted node type
1.5	8 July 2021	Final	E Oosterbaan	Update for new carbon APIs
1.6	2 August 2021	Final	E Oosterbaan	Update for new carbon APIs, and free dashboard [regional price, price 24rs]
1.7	2 December 2021	Final	E Oosterbaan	Price API corrections, carbon emissions and generation weighted average prices, update restricted datasets to Manawa Energy
1.8	20 February 2022	Final	E Oosterbaan	New Reserve amount and source report APIs. Update API descriptions for reserves, SCADA, price and Arc Flows
1.9	19 April 2022	Final	E Oosterbaan	Change to recent load / 10 min SCADA APIs. Remove 12 months stats, and add trading_date
1.10	1 November 2022	Final	N Warren	Updates to reflect RTP industry change
1.11	14 June 2023	Final	N Warren	Data feed tags added to API details
1.12	7 July 2023	Final	N Warren	Typo fixed for Nodes API
1.13	20 October 2023	Final	N Warren	Solar as a generation type added

1.14	30 January 2024	Final	N Warren	New Residuals API
1.15	3 April 2024	Final	N Warren	New Carbon Intensity Daily Average API
1.16	15 April 2024	Final	N Warren	Minor correction to Current Regional Price description
1.17	22 July 2024	Final	N Warren	Updates to Restricted Scada Generation API
1.18	10 February 2025	Final	N Warren	Current Reserve Prices and Reserve Prices APIs added
1.19	10 November 2025	Final	N Warren	Intermittent Generation Forecast API added
1.20	26 January 2026	Final	N Warren	Price last 24hrs (free version) API added
1.21	22 July 2026	Final	N Warren	Battery Mode API added