



NERDA BETA

NEAR REAL-TIME DATA ACCESS

**Energy Innovation Summit
2024**

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Innovation Project Manger



**Scottish & Southern
Electricity Networks**



WHO WE ARE

We are **Scottish and Southern Electricity Networks Distribution**.

Our electricity distribution network delivers power to over 3.9 million homes and businesses across the diverse and unique geographies of the north of Scotland and central southern England.

OUR NETWORK AT A GLANCE

Over **3.9 million** homes and businesses

More than **978,200** customers on our **Priority Services Register**

Over **128,000km** of overhead lines and underground cables

460km subsea cables powering island communities

Over **4,400** employees across the country

Figures as of September 2024



NeRDA : Agenda

- NeRDA Background
- Portal overview
- API usage
- Future developments
- NeRDA use cases





NeRDA : Background



nerda.opengrid.com

Energy Data Taskforce – NIA Project



Initial trial in Oxford expanded to Green Recovery



Real-time data now available



Via API and Portal Dashboard



NeRDA : Portal Overview

NeRDA users have two options to view data:

- Navigating directly through the Dashboard portal which does not require login.
- Accessing real-time data via APIs which requires registering for a login.

The screenshot shows the NeRDA DASHBOARDS BETA portal interface. At the top, there is a header with the logo and the text "NeRDA DASHBOARDS BETA" and "Scottish & Southern Electricity Networks". Below the header, there is a main content area with the following sections:

- WELCOME TO THE NeRDA PORTAL**: A section with a heading and a paragraph: "The Near Real-time Data Access (NeRDA) Portal is making near real-time data available to our stakeholders and interested parties."
- ACCESS NeRDA**: A section with two buttons: "Dashboard Portal" and "API Access".
- USEFUL LINKS**: A section with four links: "NeRDA Dashboards Overview Guide", "NeRDA APIs User Guide", "NeRDA Data types/Definitions", and "NeRDA Feedback & Contact".
- NeRDA Dashboards Beta**: A section with a paragraph: "This version of NeRDA is a Beta release and therefore the product may present performance instabilities and minor general exceptions. We appreciate your valuable feedback so that we can continue to improve the product. Please send your feedback here."

Callouts point to various elements:

- "View real-time data via the Dashboard Portal" points to the "Dashboard Portal" button.
- "API Login access" points to the "API Access" button.
- "View page explaining API Access" points to the "API Access" button.
- "Links to NeRDA Guides" points to the "NeRDA APIs User Guide" link.

NeRDA : Portal Overview

On accessing the portal users will be presented with a geographic view of our network.

They can then navigate to a particular **GSP** (Grid Supply Point) or **BSP** (Bulk Supply Point) using the map or the drop down panels on the right hand side. The search panel also gives the ability to search directly for a substation.

NeRDA DASHBOARDS Scottish & Southern Electricity Networks

Substation Map

Our network at a glance

Scotland			
Connected Assets:			
58	302	65	
GSP	Primary	Secondary	

England			
Connected Assets:			
20	76	401	57
GSP	BSP	Primary	Secondary

Search Panel

Search: dund

Scotland

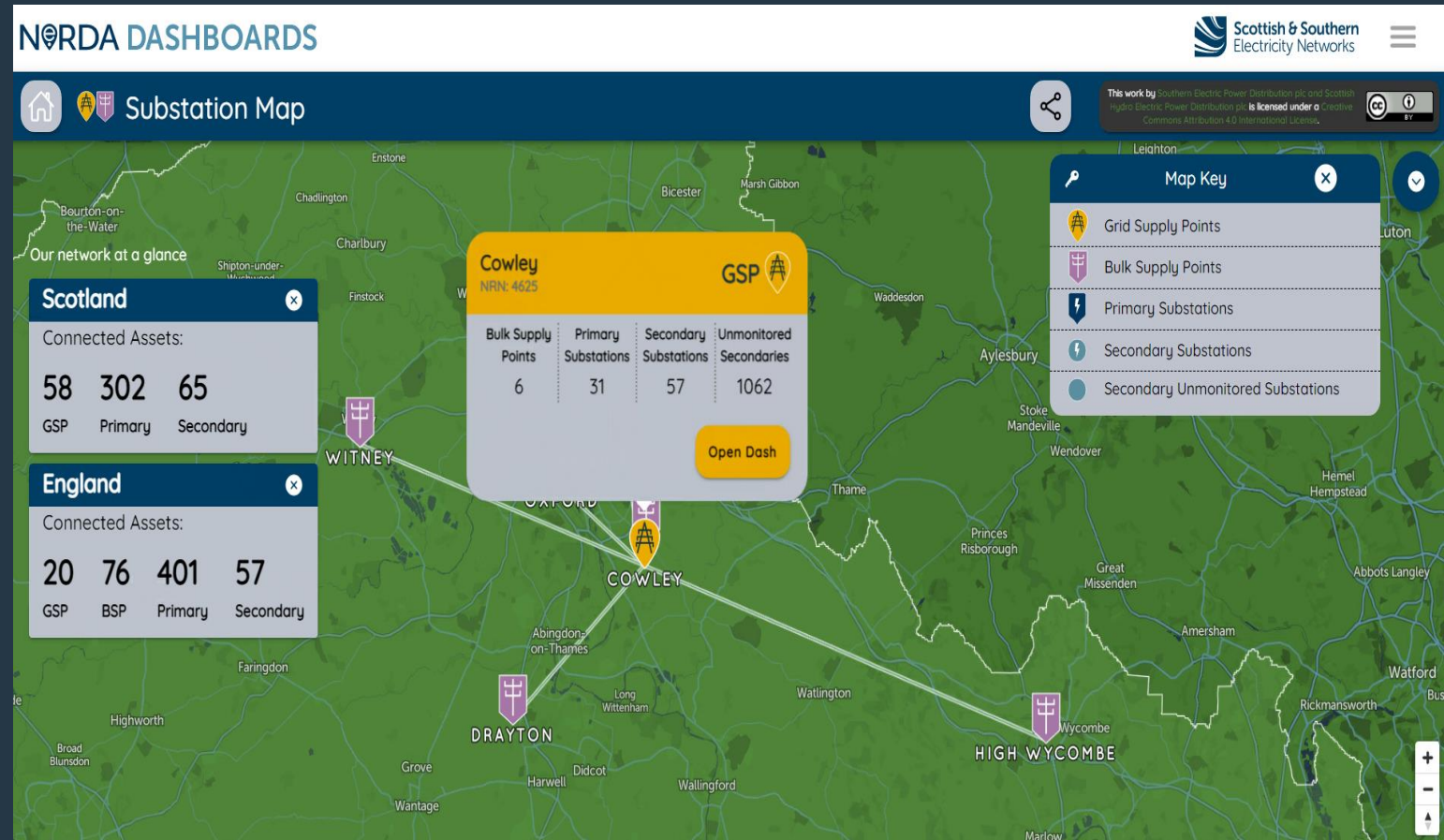
Grid Supply Points

- Dundee Baths [Dash]
- Dundee Csi [Dash]
- Abattoir Dundee [Dash]
- Dundee City Quay [Dash]
- Dundee Rail Station [Dash]
- Dundee House [Dash]
- Dundee Arts Centre [Dash]
- Dundee Private Hire [Dash]
- Douglas Tce Dundee [Dash]

NeRDA: GSP / BSP Overview

Once a GSP has been selected the user will be presented with this visual dashboard which provides;

- Real-time current measurements.
- Geo reference
- Connected primary substations
- Ability to download data as .csv and .xlsx
- API link for site (login required)



NeRDA : GSP / BSP Overview

NeRDA DASHBOARDS BETA

GSP: Cowley

GSP (SEPD): Cowley

Export site data as .xlsx | Share Dashboard | API for site (login required) | 4625 Static API

Dropdown includes all GSP/BSP dashboards

Real-time current measurements

Download readings as .csv

Click to show/hide feeder readings on graph

Individual feeder head readings

Substation Readings

Feeder	Type	Value (unit)	Timestamp
COWLEY A805 AMPS	LineCurrent	216.79688 A	04/05/2023 14:18
COWLEY 680 AMPS	LineCurrent	424.264 A	04/05/2023 14:18
COWLEY A505 AMPS	LineC		04/05/2023
COWLEY A705 AMPS	LineC		

Map displays the GSP/BSPs within the area – click to access the dashboards

Substations

Connected BSPs/Primary Substations

Name	Type	NRN	Dash
Witney	BSP	4630	✓
Cowley Local	BSP	4600	✓
Drayton	BSP	4601	✓
Yarnton	BSP	4602	✓
Oxford	BSP	4902	✓

Open Dashboards

NeRDA : Primary Substation Overview

The Primary Substation dashboards present the same data and features as the GSP/BSP dashboards – however, users will also be able to view any secondary substations where LV monitoring is installed. Wherever LV monitoring is not available, this is supplemented with Load Model data (accessed via the blue dots on the map).

Additionally, our Long Term Development Statement (LTDS) for each primary substation is also available here.



Back up a level to BSP/GSP

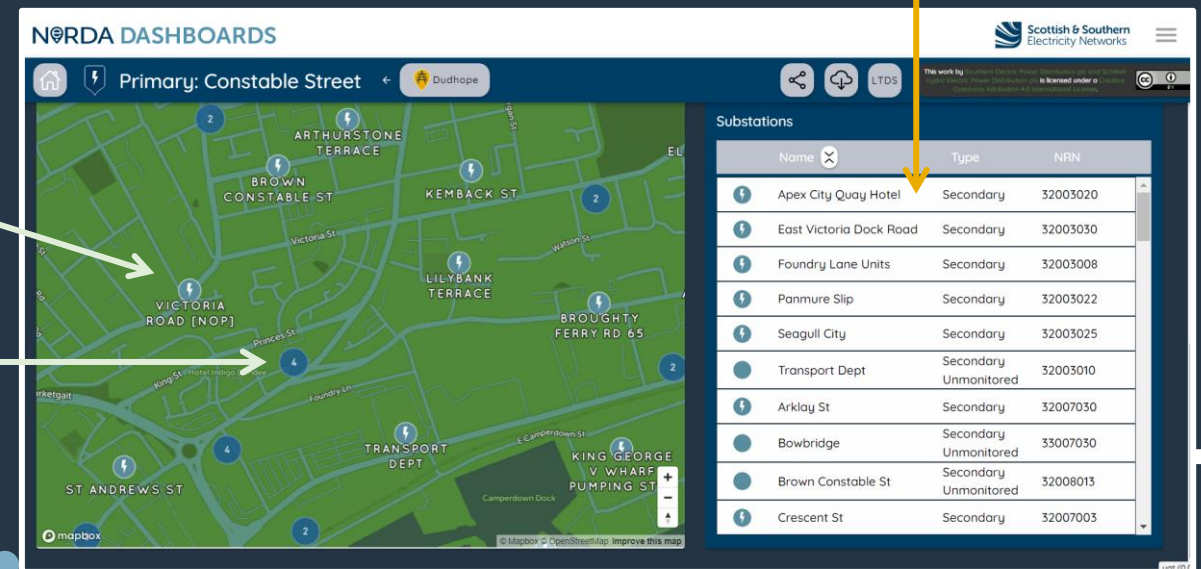
Download readings as .csv
LTDS data

Real-time current measurements

Open Secondary Substation Dashboards

Icons link to Secondary Substation dashboards with real-time LV Monitoring

Blue dots are secondary substations without LV monitoring. Click to view Load forecast model data



NeRDA : Secondary Substation Overview

Secondary Substation data is viewed via LV monitoring. Apparent Power (kVA), Voltage (V) and Current (A) are on the screen. The user will also see displayed the phase measurements for each feeder.

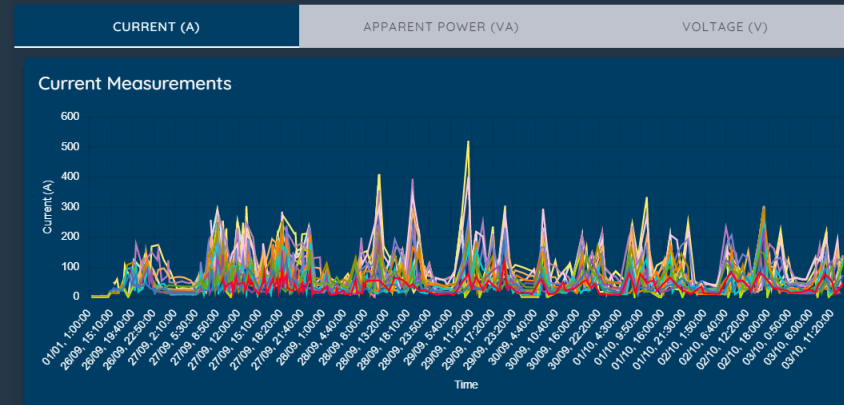
All the dashboard readings can be downloaded as Excel workbook (.xlsx). Other measurements are available via the API (login required).

NeRDA DASHBOARDS

Secondary: East Victoria Dock Road

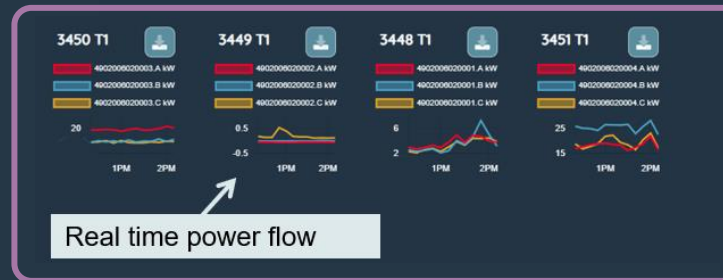
Constable Street Dudhope LTDS

Scottish & Southern Electricity Networks



Substation Readings

Feeder	Type	Value (Unit)	Timestamp
EAST VICTORIA DOCK ROAD 001	Line Current	46.60A	05/10/2024 13:50
EAST VICTORIA DOCK ROAD 001	Line Current	27.30A	05/10/2024 13:50
EAST VICTORIA DOCK ROAD 001	Line Current	35.00A	05/10/2024 13:50
EAST VICTORIA DOCK ROAD 001	Line Current	13.50A	05/10/2024 13:20
EAST VICTORIA DOCK ROAD	Line Current	12.00A	05/10/2024 13:50



Three-Phase measurements for each feeder

NeRDA : Secondary Substation API View

Secondary Substation data as viewed in the API presented with a list of JSON of the measurements available; 26 data points like, current, frequency, active power, reactive power, phase angle, voltage angle etc. Max, min and RMS are available for each 10 min period.

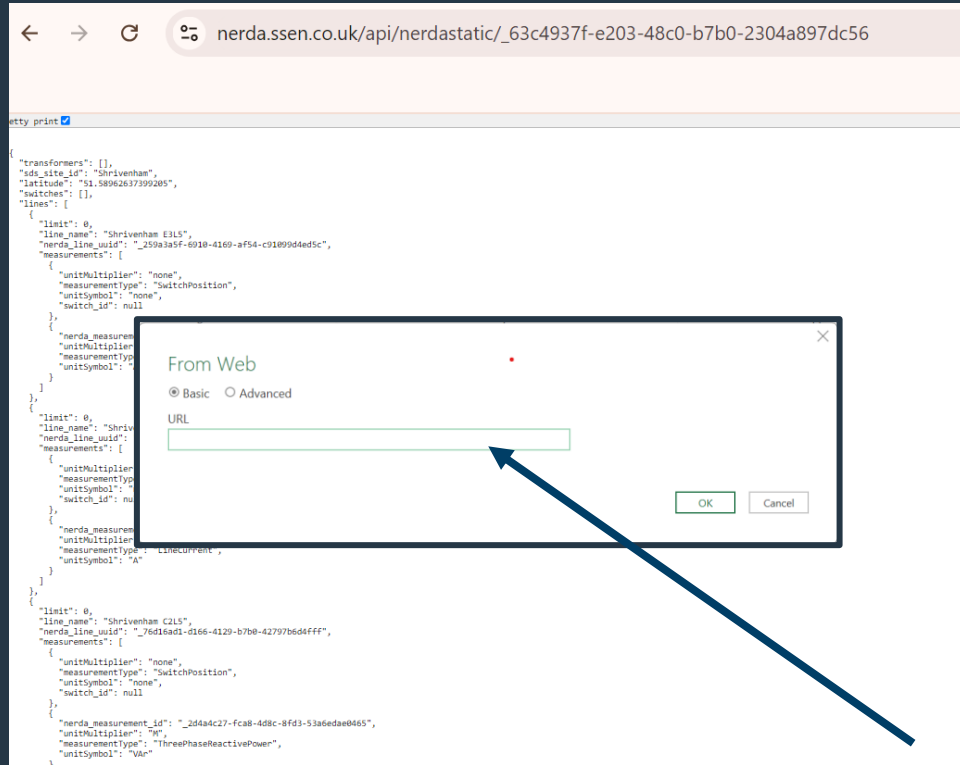
```
nerda.ssen.co.uk/api/nerdastatic/_fe7dce33-d209-4f67-a34f-2b6e36c935b2

pretty print ✓

{
  "transformers": [],
  "sds_site_id": "Victoria Road [nop]",
  "latitude": "56.46666748",
  "switches": [],
  "lines": [
    {
      "limit": 0,
      "line_name": "VICTORIA ROAD [NOP] 003",
      "nerda_line_uuid": "_6409a060-dbf6-44e2-ad67-cb2281c3cdfa",
      "measurements": [
        {
          "nerda_measurement_id": "_d5c136d5-1539-402b-af29-7cf5b793a334",
          "unitMultiplier": "k",
          "measurementType": "PhaseVoltage",
          "unitSymbol": "V"
        },
        {
          "nerda_measurement_id": "_699e5bb6-4d18-42a8-ba76-fc4b0ce44c91",
          "unitMultiplier": "none",
          "measurementType": "LineCurrent",
          "unitSymbol": "A"
        },
        {
          "nerda_measurement_id": "_df8fc118-bcf0-475d-8ba4-7c2ba49ff544",
          "unitMultiplier": "k",
          "measurementType": "PhaseVoltage",
          "unitSymbol": "V"
        },
        {
          "nerda_measurement_id": "_87e18012-425b-4309-a0cf-c4c1f722ed3d",
          "unitMultiplier": "k",
          "measurementType": "SinglePhaseReactivePower",
          "unitSymbol": "VAr"
        }
      ]
    }
  ]
}
```

Measurement ID

NeRDA : API to Excel



https://nerda.ssen.co.uk/api/nerdastatic/_63c4937f-e203-48c0-b7b0-2304a897dc56

Column1.switch_name	Column1.nerda_switch_uid	Column1.measurements.nerda_measurement_id	Column1.measurements.unitMultiplier	Column1.measurements
Shrivenham C1L5	_0f6014d9-c8fe-4af3-a93e-dd74ed3b3415	_6a16160c-c9c7-49c2-8869-54f4eb3d44a6	M	ThreePhaseActivePower
Shrivenham C1L5	_0f6014d9-c8fe-4af3-a93e-dd74ed3b3415	_fcf9162d-1c28-40a7-9de8-647373625fb0	none	LineCurrent
Shrivenham C2L5	_c068b69a-3a68-4f34-b760-55392bcaac04	_eaaa91f8-9207-46bc-b2d9-1357b6553d60	M	ThreePhaseActivePower
Shrivenham C2L5	_c068b69a-3a68-4f34-b760-55392bcaac04	_1b54695b-4943-462b-a260-a0c10ffd18d1	none	LineCurrent
Shrivenham E4L5_PMCB11495	_3610a164-11ab-4187-9650-2dedb3a3b86e	_10fb05e4-02d6-4ab3-bdc5-f248ced39c39	M	ThreePhaseActivePower
Shrivenham E4L5_PMCB11495	_3610a164-11ab-4187-9650-2dedb3a3b86e	_2f1f8582-a7d2-448f-b338-ea8de20af3ab	none	LineCurrent
Shrivenham E4L5	_b0b7a76a-c28d-40b4-92a5-bff220f86b02	_25d46e8f-7de4-41d0-b6ef-d00457267a3c	none	LineCurrent
Shrivenham E1L5	_94f843bd-5494-48e0-b991-2415b170fd50	_6f71138c-b807-4fb7-8732-a1d935a2036f	none	LineCurrent
Shrivenham E2L5	_b10998ac-a4b0-44fc-8241-903e9b1d1e04	_4d34bd69-f1f4-4eda-8384-5161a24b9ef0	none	LineCurrent
Shrivenham E5L5	_9a69c6ca-756b-46a1-856e-d8d3e8d26d6f	_c6e4f62f-0e23-4559-b105-c21c86319c74	none	LineCurrent
Shrivenham E2T0	_b21f4b00-4d4c-4129-ba6f-7ed759c1d22f	_9733d05b-bbd1-4330-be59-e2213d1518e0	none	LineCurrent
Shrivenham E2T0	_b21f4b00-4d4c-4129-ba6f-7ed759c1d22f	_4502067d-1a03-4963-95da-06b35ca7858	M	ThreePhaseActivePower
Shrivenham E1T0	_1fdd67af-928d-4d5a-bd33-0f1c9c7a4327	_5df6026a-d643-469d-822f-ff64d4089b58	M	ThreePhaseActivePower
Shrivenham E1T0	_1fdd67af-928d-4d5a-bd33-0f1c9c7a4327	_66e55efd-96de-49bc-acd8-0bb462b29306	none	LineCurrent
Shrivenham E3L5	_c71b23fe-d2b8-492d-a167-a63bfc67d8a2	_b620d7bc-0476-4cbe-8b74-f8bc75c50a87	none	LineCurrent

https://nerda.opengrid.com/api/nerdart_after?measurement=_6978304c-93b2-4ffa-847e-342f936f436c&after=2024-01-01T08:00:00Z

Measurement ID

Date and time after which you want to pull data



NeRDA : BETA to Release 1

Through stakeholder feedback we will be further developing NeRDA to provide **enhanced functionality and user experience**. Here are some of the planned improvements.

- Incorporating transformer ratings, **demand and capacity** so users can better visualise transformer utilisation
- Including near real-time data from all our **LV monitoring** devices in our secondary transformers
- Including our **load model data** for all secondary transformers that do not have LV monitors installed
- Ability search and navigate our electrical assets through an improved **connectivity model**, from GSP/BSP through to secondary transformers.
- Improved labelling of assets, and **user display messages** i.e. where data is loading or is not currently available.




NeRDA : Use Cases

transition
Moving to a smart future




Flexibility providers / Data consultants / Energy sector /
Local authorities / Academia


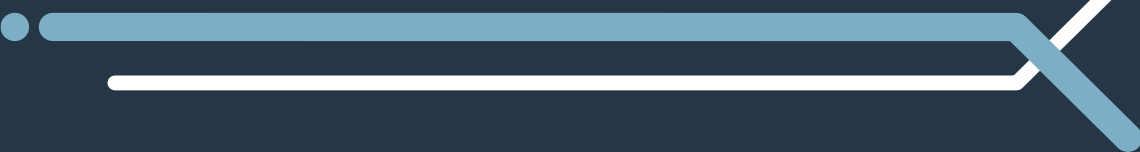
FEEDBACK RECEIVED



I've been using the NeRDA data for day-ahead and half-hourly-ahead grid load forecasting, and then calculating a dynamic grid tariff. This enables the control of flexibilities within the distribution network (such as EVs, heat storages, and heat pumps) to mitigate distribution grid congestion. The NeRDA API operates seamlessly, and the team's responsiveness and assistance have been exemplary."



Omid Mousavi,
Lead Data Scientist, KrakenFlex

ANY QUESTIONS PLEASE?



NeRDA Portal:
nerda.opengrid.com



For general enquiries and API access please contact:
SSENSmart@sse.com



NeRDA page on SSEN website:
ssen.co.uk/our-services/tools-and-maps/nerda-portal



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