

Interface Specification Document

# NET2GRID EnergyAI™ Input File Interface Specification

Document Version: 2026-1



**NET2GRID**

Prins Hendriklaan 7  
3701 CK Zeist  
The Netherlands

+31 30 304 00 86  
sales@net2grid.com  
www.net2grid.com

## REVISION HISTORY

|        |  |            |
|--------|--|------------|
| 2022-1 | The initial version contains measurement interface specifications, data exchange, and import process definitions.  | 2022-11-03 |
| 2023-1 | Renamed solution offering to NET2GRID EnergyAI™ and added Data Requirements sections differentiating on High and Low-Resolution input data requirements.<br>Refined versioning of the document.  | 2023-06-16 |
| 2023-2 | Removed High-Resolution data specifications entirely until they are fully supported in NET2GRID EnergyAI™  | 2023-06-19 |
| 2023-3 | Updated the expected units of measurements with what is supported in NET2GRID EnergyAI™. Removed the timestamp on the input interface filename. Re-organized content to clarify the additional requirements in case of a B2C NET2GRID EnergyAI™ solution. Included also minor phrasing changes.  | 2023-11-10 |
| 2024-1 | Minor update of the description of the timestamp field in the interface specification to remove the reference of the UTC format since the UNIX timestamps definition is sufficient   | 2024-01-10 |
| 2024-2 | Update to include specifications for secondary meter measurement files   | 2024-11-29 |
| 2025-1 | Measurements Files Upload Strategy   | 2025-01-13 |
| 2025-2 | Historical Measurements Upload Details<br>Added section "Meter Types"<br>Added installation profile requirements   | 2025-05-05 |
| 2025-3 | New profile attributes added. More specifically: <ul style="list-style-type: none"> <li>- Added spaceCoolingType in metadata</li> <li>- Added hot Tub and dehumidifier in appliances</li> <li>- Added appliance metadata attribute fuel type that applies for tumble dryer and hot tub and appliance metadata attribute hotFill that applies for dishwasher and washing machine</li> </ul> | 2025-09-09 |
| 2026-1 | Added section for DER Measurements Upload Details  | 2026-01-02 |



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Prins Hendriklaan 7  
3701 CK Zeist  
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www.net2grid.com

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## Summary

This document describes how data exchange can be accomplished between NET2GRID EnergyAI™ and CUSTOMER systems and specifies the measurements' directory and file format.

## Data requirements

The data requirements depend on the agreement between NET2GRID and the CUSTOMER on the services that EnergyAI™ will provide.

Some limitations should be considered:

- The Cumulative Energy Metrics represent meter readings and are expected to increase over time. NET2GRID does not handle deltas of energy over a period provided as a metric.
- The Cumulative Energy Metrics represent the installation's total energy consumed or produced (mains).
- Currently, only Low-Resolution metric imports are supported.

## Meter Types

To provide better context for how this interface applies across different use cases, it's important to clarify the distinction between mains meters and secondary meters.

- **Mains meters** measure the total energy consumed and injected by the entire household. They are typically installed at the main power entry point and represent the overall energy flow to and from the grid.
- **Secondary meters** monitor the energy usage of a specific appliance or circuit within the household. These offer more detailed insights into the performance of individual devices rather than the household as a whole.

## Metrics supported

The table below lists the metrics supported as measurement input for NET2GRID EnergyAI™. The required metrics are specified in bold.

- The required metrics for EnergyAI™ are CSD and CSR with 15-60 minute granularity.
  - Energy injection (CSR) can be omitted if no energy is produced in the household.
- Gas consumption (GAS) is also required when gas disaggregation is in scope for the services provided to the customer.

- EnergyAI™ can import tier metrics but will not affect the quality of disaggregation provided.

| <i>Low-Resolution supported metrics</i> |                           |  |                |
|---|---------------------------|--|----------------|
| Metric Id                               | Data Granularity Expected | Description  | Unit           |
| CSD                                     | 15-60 minutes             | <u>Cumulative Energy Consumption on Electricity</u> : The meter reading of the total electricity consumed for the provided timestamp.  | Wh             |
| CSR                                     | 15-60 minutes             | <u>Cumulative Energy fed back to the grid</u> : The meter reading of the total electricity fed back to the grid for the provided timestamp.                                    | Wh             |
| GAS                                     | 15-60 minutes             | <u>Cumulative Energy Consumption on Gas</u> : The meter reading of the total gas consumed for the provided timestamp.  | m <sup>3</sup> |
| CSD_T1                                  | daily                     | <u>Cumulative Energy consumption on Electricity, summation for Tier 1</u> : The meter reading of the total electricity consumed for the provided timestamp for the first Tier. | Wh             |
| CSD_T2                                  | daily                     | <u>Cumulative Energy consumption on Electricity, summation for Tier 2</u> : The meter reading of the total electricity consumed for the provided for the second Tier.          | Wh             |
| CSR_T1                                  | daily                     | <u>Cumulative Energy fed back to the grid for Tier 1</u> : The meter reading of the total electricity is fed back to the grid for the provided timestamp for the first tier.   | Wh             |
| CSR_T2                                  | daily                     | <u>Cumulative Energy fed back to the grid for Tier 2</u> : The meter reading of the total electricity is fed back to the grid for the provided timestamp for the second tier.  | Wh             |

## Secondary Meter Supported Metrics

When measurements are uploaded for a secondary meter, the metric is in an XXXX-PTnHnMnS format, where XXXX is the type of measurement, and PTnHnMnS is the interval in which the data are available. The metrics supported for secondary meters are:

- 0000-PTnHnMnS for the total electricity consumed by the appliance with data granularity of nH nM nS between the given timestamp and the timestamp of the next interval (CSD).
- 0001-PTnHnMnS for the total electricity produced by the appliance with data granularity of nH nM nS the given timestamp and the timestamp of the next interval (CSR).

The data granularity of the files may not be more than 1 hour or less than 15 minutes.

## Data Exchange

AWS [S3](#) will exchange the data files between CUSTOMER and NET2GRID. CUSTOMER is responsible for uploading the measurement data in a specific S3 bucket that will be agreed upon. Once received, the EnergyAI™ platform will process and load the files. Error handling and communication will be agreed upon with CUSTOMER later.

## File Structure

The data files should be stored in plain CSV format using *Unix UTF-8 without BOM* character encoding. The comma character (,) should be used as the field separator, the full stop character (.) will be used as a decimal point separator, and a header line is allowed but not mandatory.

Each file consists of two fields:

1. Timestamp: the timestamp in UNIX timestamp format, in milliseconds.
2. Value: The actual measured value as a number.

The pairs should be sorted based on the timestamp in ascending order.

Example:

```
Timestamp,Value
1562284806000,166001
1562284906000,166003
1562284956000,166009
```

## Directory Structure

### Mains Meter

The data files for regular meters will be stored using the following directory structure:

**Path:**

s3://{bucket\_name}/{labelpartner}/{measurements-type}/{external-installation-id}/{external-meter-id}/

**Filename:** {external-installation-id}\_{start-date}\_{stop-date}\_{metric}.csv

## Where:

- **labelpartner** is the name of the (sub)brand the installation belongs to. NET2GRID will provide this information during CUSTOMER onboarding.
- **measurements-type** should be one of the following options:
  - **measurements:** for daily measurement files uploads
  - **historical-measurements:** for initial historical measurement files uploads. This folder should be used only once, before uploading any daily files. After the historical measurements have been processed, then all subsequent uploads must be done in the **measurements** folder.
  - **der-measurements:** for DER measurements file uploads. In this folder all the measurements files for the DER processes should be uploaded.
- **external-installation-id** is the ID of the installation/house where the meter is located and the measurement data refers to.
- **external-meter-id** is the ID of the metering equipment where the measurements originate.
- **start-date** is the date corresponding to the first available measurement in the end user's local time zone, in YYYYMMDD format.
- **stop-date** is the date corresponding to the last available measurement in the end user's local time zone, in YYYYMMDD format. If the file contains data from a single day, it can be the same as the start date.
- **metric-id** is the data type of the measurement. The applicable values are described in the [Data requirements](#) section tables.

## Secondary Meter

The data files for secondary meters will be stored using the following directory structure:

**Path:**

s3://{bucket\_name}/{labelpartner}/{measurements-type}/{external-installation-id}/{external-meter-id}/

**Filename:**

{external-installation-id}\_{start-date}\_{stop-date}\_{metric-id}\_{appliance}\_{source}\_{unit}.csv

Where:

- **labelpartner** is the name of the (sub)brand the installation belongs to. NET2GRID will provide this information during CUSTOMER onboarding.
- **measurements-type** should be one of the following options:
  - **measurements**: for daily measurement files uploads
  - **historical-measurements**: for initial historical measurement files uploads. This folder should be used only once, before uploading any daily files. After the historical measurements have been processed, then all subsequent uploads must be done in the **measurements** folder.
- **external-installation-id** is the ID of the installation/house where the meter is located and the measurement data refers to.
- **external-meter-id** is the ID of the metering equipment where the measurements originate.
- **start-date** is the date corresponding to the first available measurement in the end user's local time zone, in YYYYMMDD format.
- **stop-date** is the date corresponding to the last available measurement in the end user's local time zone, in YYYYMMDD format. If the file contains data from a single day, it can be the same as the start date.
- **metric-id** shows the data type of the measurement as described in the [Secondary Meter Supported Metrics section](#).
- **appliance** is the type of appliance for which the measurement data are provided. The allowed values will be all [appliance identifiers](#) supported by EnergyAI™ formatted in **kebab-case** (e.g., heatPump -> heat-pump).

- The **photovoltaic-panels** appliance is also supported as a secondary meter appliance (although it is not part of the above list).
- The appliance options that contribute to the disaggregation reports are:
  - air-condition
  - electric-vehicle
  - battery-energy-storage-system
  - heat-pump
  - photovoltaic-panels
- **source** can be either of the two:
  - "D" - for dedicated metering, meaning that the ground truth data provided are measured by a dedicated meter and are not included in the mains measurements provided for the installation.
  - "S" - for submetering, meaning that the ground truth data provided are included in the mains measurements provided for the installation.
- **unit** is the unit in which the measurements are provided. The supported units will be only **Wh**.

## Permissions

NET2GRID will create the bucket, and the following permissions will be granted to the CUSTOMER:

- List objects under {bucket\_name}/{labelpartner}
- Put objects {bucket\_name}/{labelpartner}
- Get objects from {bucket\_name}/{labelpartner}
- Delete objects from {bucket\_name}/{labelpartner}

NET2GRID will create an IAM role with these permissions and share the credentials with CUSTOMER in a secure way during CUSTOMER onboarding.

## Import process

NET2GRID EnergyAI™ imports measurement files in a way that overwrites data for the same period. If there are more than one file for the same date:

- Both files contain measurements with different timestamps, so the values appearing in both files are expected to be loaded in NET2GRID EnergyAI™.
- The measurements for the identical timestamps are expected to be the values available in NET2GRID EnergyAI™, which will contain the last file uploaded.

## Ingestion Frequency

EnergyAI™ expects to receive input measurements once per day. If the customer's business needs require a more frequent ingestion pattern, NET2GRID should be consulted.

## Order of imports

The files will be processed, and the measurements will be imported as uploaded in the S3 bucket.

A file will be scheduled to be imported as soon as it is uploaded. However, it may be imported later. Thus, the upload time may differ from the processing time.

## Restrictions

1. The file's contents will be validated against the provided startDate and endDate in the file's filename. Timestamps not belonging to the date period provided in the file will be ignored.
  - a. The start and end dates in the filename are expected to be in the installation's time zone. NET2GRID EnergyAI™ will validate the timestamps provided in UTC inside the file against this period.
  - b. If no specific timezone has been provided for the installation, NET2GRID EnergyAI™ will use the timezone of the Label Partner that has been agreed with the CUSTOMER.

2. NET2GRID EnergyAI™ supports files with measurements restricted to one month of data for metrics with a resolution of 15-minutes data or lower.
3. The measurement values should be positive.

## Secondary Meter Measurements

Some additional restrictions that apply to measurement files for secondary meters are:

- According to the data granularity specified, the valid measurements should not fall below 75% of the expected measurement entries. (e.g., for given metric 0000-PT30M for 1-day measurements, we should have at least 36 valid measurements in the file)

## Additional specifications for solutions with B2C service support

For NET2GRID EnergyAI™ solutions that support B2C access through CE-API, additional processes are in place to not impact the end-user experience.

1. Account registration must be completed for data to be imported into NET2GRID EnergyAI™.
2. Reporting on the processing of files is in place to allow the CUSTOMER to act on potential errors in file uploads.

## Measurements Files Upload Strategy

To optimize resource usage, the following measurement upload strategy is recommended. Adoption of this strategy by the Customer is entirely optional.

- When uploading meter measurements for a large time interval, it is recommended to consolidate the data into the smallest number of files possible.  
For example, If you are uploading meter measurements for a one-month period, it is preferable to use a single file containing all the measurements rather than splitting the data into multiple files for each week.
- When uploading large batches of measurement files to S3, it is recommended to group and upload files based on the same time period.  
For example, suppose you have 200 measurement files to upload, with 100 files covering the period from 01/01/2024 to 04/01/2024 and another 100 files for the period from

06/01/2024 to 09/01/2024. Start by uploading the 100 files for one time period (e.g., 01/01/2024 to 04/01/2024). Once that batch is successfully uploaded, proceed with the files for the remaining time period (06/01/2024 to 09/01/2024).

- Once the process of uploading historical measurements for new meters has been completed, it is expected that every day new daily measurement files will be uploaded for each meter, containing the measurements for that day. If the upload process deviates from this plan, it is recommended to follow the previously mentioned strategy of consolidating data into the smallest number of files possible for each time period.

## Account registration prerequisite

This requirement ensures that the state of the account is adequately depicted through the relevant CE-API endpoints, allowing app builders to create the appropriate customer journey.

For this reason, it is a prerequisite that before placing the files:

1. the account needs to be [created through Account Management API](#) by the CUSTOMER and
2. the end user needs to have [registered an account](#) via CE-API.

The files will only be processed if the account with the provided installation and meter identifiers is registered in NET2GRID EnergyAI™. Otherwise, the file will be ignored, and a relative error message will be mentioned in the report message.

If a file is uploaded with measurements for a secondary meter, the meter does not need to be provisioned before. Still, the user account needs to be registered, as mentioned above.

## Reporting on the processing of files

Every time a file gets processed by NET2GRID EnergyAI™, a message will be published to the SQS queue that NET2GRID will create for the Label Partner containing the state of file processing. This allows the CUSTOMER to act upon received errors so that the end-user journey is not impacted.

### Message format



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Prins Hendriklaan 7  
3701 CK Zeist  
The Netherlands

+31 30 304 00 86  
sales@net2grid.com  
www.net2grid.com

The message will contain the following information in JSON format:

- filename: The name of the file which NET2GRID EnergyAI™ platform has processed.
- timestamp: The UNIX timestamp when the file was processed, in milliseconds.
- error\_code: The error code that represents the output of the file processing, as described in the table below.
- error\_description: The description of the error containing additional information from the error\_code. It will be empty if no error is reported.

| error_code                 | Description   |
|----------------------------|---|
| Successful file processing |   |
| 000                        | The file was processed successfully and met all validations.<br>error_description will be empty.  |
| 010                        | The file was processed and loaded partially due to validation exceptions (e.g., timestamps that don't belong to the provided period).<br>error_description will contain the validation exceptions |
| File Processing Failed     |   |
| 300                        | Account not found or inactive for the provided file.<br>error_description will contain the exact reason for the failure.  |
| 400                        | The file could not be loaded due to validation exceptions<br>error_description will contain the validation exceptions.  |
| 500                        | An unexpected error on the NET2GRID EnergyAI™ platform occurred.<br>error_description will contain more information about this error.   |

Messages will be kept in the SQS queue for 4 days, a configurable period that cannot exceed 14 days.

### SQS Queue

The SQS Queue that will be used to publish the report messages will be created by NET2GRID, and the IAM user that can access the S3 bucket as specified in the [Permissions](#) section will also have permission to

- ReceiveMessage
- DeleteMessage

- DeleteMessageBatch

## Installation Profiles

The NILM services of NET2GRID EnergyAI™ can be improved if provided with additional information regarding the installation properties and app preferences of the end-user. A personalized profile can be provided for each installation, containing information regarding the household (e.g. number of occupants, electric space heating) and the appliances that the user owns (e.g. electric vehicle).

This interface is necessary only for EnergyAI™ Core, where there is no B2B2C API available. On EnergyAI™ Active, the Installation Profiles will be provided directly by the end user.

### Filename

The client should provide a single JSON file for each installation id with the following name convention:

{external-installation-id}\_profile.json

where:

external-installation-id = the ID of the installation/house where the meter is located and the data refers to

Example for external-installation-id = 123456789

123456789\_profile.json

### File Structure

There are three types of profile information that should be provided in the same JSON file. These are the installation metadata, the appliances and the appliances metadata.

The installation metadata contains demographic and general premises information about the installation under examination and should be provided under the "home" key. The appliances attribute contains the number of appliances per each type of appliance that can be found in the

installation under examination and should be provided under the “appliances” key. Last, the appliances metadata attribute contains metadata information regarding specific appliances that can be found in the installation under examination and should be provided under the “applianceMetadata” key.

For attributes consisting of multiple options (e.g., spaceHeatingType, waterHeatingType), these options are supported as comma-separated string values.

The following table specifies the format of each part of the document profile.

| Installation Attribute | JSON Format  |
|------------------------|--|
| home                   | <pre>{   "\$home_attribute_1": "\$value",   ...   "\$home_attribute_n": "\$value" }</pre> <p>where the <i>\$home_attribute</i> corresponds to an installation metadata attribute and the <i>\$value</i> to its value</p> |
| appliances             | <pre>{   "\$appliance_1": \$value,   ...   "\$appliance_n": \$value }</pre> <p>where the <i>\$appliance_1</i> corresponds to an appliance and the <i>\$value</i> to the number of appliances that are available</p>      |
| applianceMetadata      | <pre>{   "\$appliance_1": {     "\$id_1": {       "\$appliance_metadata_attribute_1": "\$value"       ...     },     ...   },   ...   "\$id_n": {     "\$appliance_metadata_attribute_1": "\$value"   } }</pre>          |

|  |  |
|--|--|
|  | <pre> ... } }, ... "<b>\$appliance_n</b>":{   "<b>\$id_1</b>":{     "<b>\$appliance_metadata_attribute_n</b>": "<b>\$value</b>"   } } } } </pre> <p>where <i>\$appliance</i> corresponds to an appliance, the <i>\$id</i> to the id of the appliance, the <i>\$appliance_metadata_attribute</i> to the appliance metadata attribute of the appliance under examination and the <i>\$value</i> to the value of the attribute.</p> |
|--|--|

## Installation Profile Attributes

The following table lists all the attributes of the installation profile.

| <i>Installation Profile Attributes</i> |             |   |  |
|--|-------------|---|--|
| Attribute                              | JSON Parent | Description                                   | Acceptable Values  |
| postalCode                             | home        | the postal code of the premises               | Any valid postal code  |
| timezone                               | home        | the timezone of the premises                  | Any valid timezone   |
| country                                | home        | the country in which the premises are located | The value should be formatted according to the ISO 3166 alpha-2 country code standard. |

|                  |      |  |   |
|------------------|------|--|---|
| propertyType     | home | describes the layout of the premises   | detached<br>semi-detached<br>bungalow<br>terraced<br>end-terrace<br>flat                    |
| numBedrooms      | home | the number of bedrooms on the premises   | 1<br>2<br>3<br>4  |
| numOccupants     | home | indicates the number of people living on the premises  | 1<br>2<br>3<br>4<br>5   |
| propertyAge      | home | represents the period during which the premise was built   | pre-1919<br>1920-1975<br>1976-1999<br>post-2000   |
| ownership        | home | defines whether the installation is owned or rent  | own<br>rent   |
| occupantType     | home | the type of people living on the premises  | students<br>working-adults<br>home-adults<br>young-family<br>older-family<br>retirees       |
| spaceHeatingType | home | The type of space heating installed on the premises.<br>Supports multiple options, which are provided comma-separated. | gas<br>gas-furnace<br>electric-furnace<br>electric-storage<br>electric-heaters<br>heat-pump |

|                           |      |  |   |
|---------------------------|------|--|---|
|                           |      |  | hybrid-heat-pump<br>air-condition<br>district-heating<br>wood-pellet<br>oil<br>solar<br>other |
| spaceCoolingType          | home | The type of space cooling installed on the premises.<br>Supports multiple options, which are provided comma-separated. | heat-pump<br>air-condition<br>ceiling-fan<br>other  |
| spaceHeatingExchangerType | home | the space heating exchanger type   | radiators<br>floor  |
| waterHeatingType          | home | the type of water heating installed on the premises. Supports multiple options, which are provided comma-separated.    | gas<br>electric<br>oil<br>solar<br>other<br>heat-pump<br>hybrid-heat-pump                     |
| stoveHeatingType          | home | the type of stove appliances installed on the premises   | gas<br>electric<br>oil<br>other   |
| grillHeatingType          | home | the type of grill appliances installed on the premises   | gas<br>electric<br>oil<br>other   |
| ovenHeatingType           | home | the type of oven appliances installed on the premises  | gas<br>electric<br>oil<br>other   |

|              |            |   |   |
|--------------|------------|---|---|
| photovoltaic | home       | indicates the presence of Photovoltaic (solar) panels on the premises | true<br>false   |
| fridgeCombo  | appliances | the number of fridge combo appliances on the premises                 | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| refrigerator | appliances | the number of refrigerator appliances on the premises                 | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| freezer      | appliances | the number of freezer appliances on the premises                      | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| hob          | appliances | the number of hob appliances on the premises                          | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not                     |

|           |            |  |   |
|-----------|------------|--|---|
|           |            |  | be provided at all.   |
| oven      | appliances | the number of oven appliances on the premises      | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| grill     | appliances | the number of grill appliances on the premises     | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| microwave | appliances | the number of microwave appliances on the premises | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| kettle    | appliances | the number of kettle appliances on the premises    | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |

|                |            |  |   |
|----------------|------------|--|---|
| toaster        | appliances | the number of toaster appliances on the premises         | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| dishWasher     | appliances | the number of dishwasher appliances on the premises      | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| washingMachine | appliances | the number of washing machine appliances on the premises | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| tumbleDryer    | appliances | the number of tumble dryer appliances on the premises    | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| iron           | appliances | the number of iron appliances on the premises            | A number defining the number of   |

|             |            |   |   |
|-------------|------------|---|---|
|             |            |   | appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all.                                 |
| TV          | appliances | the number of TV appliances on the premises           | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| dvd         | appliances | the number of dvd appliances on the premises          | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| cableBox    | appliances | the number of cablebox appliances on the premises     | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| gameConsole | appliances | the number of game console appliances on the premises | A number defining the number of appliances. 0 = the appliance is not  |

|                 |            |   |   |
|-----------------|------------|---|---|
|                 |            |   | present. If unknown, then the attribute should not be provided at all.  |
| computer        | appliances | the number of computer appliances on the premises         | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| tablet          | appliances | the number of tablet appliances on the premises           | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| electricVehicle | appliances | the number of electric vehicle appliances on the premises | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| electricShower  | appliances | the number of electric shower appliances on the premises  | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the  |

|                 |            |   |   |
|-----------------|------------|---|---|
|                 |            |   | attribute should not be provided at all.  |
| immersionHeater | appliances | the number of immersion heater appliances on the premises | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| airCondition    | appliances | the number of air conditioner appliances on the premises  | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| poolPump        | appliances | the number of pool pump appliances on the premises        | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| sauna           | appliances | the number of sauna appliances on the premises            | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |

|                            |            |  |   |
|----------------------------|------------|--|---|
| infraredPanels             | appliances | the number of infrared panels appliances on the premises               | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| closeInBoiler              | appliances | the number of close in boiler appliances on the premises               | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| instantBoilingWaterTap     | appliances | the number of instant boiling water tap appliances on the premises     | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| batteryEnergyStorageSystem | appliances | the number of battery energy storage system appliances on the premises | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| heatPump                   | appliances | the number of heat pumps appliances on the premises                    | A number defining the number of   |

|              |                    |  |   |
|--------------|--------------------|--|---|
|              |                    |  | appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all.                                 |
| dehumidifier | appliances         | the number of dehumidifier appliances on the premises                      | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| hotTub       | appliances         | the number of hotTub appliances on the premises                            | A number defining the number of appliances. 0 = the appliance is not present. If unknown, then the attribute should not be provided at all. |
| fuelType     | appliance Metadata | the fuel type of an appliance. It applies to tumbleDryer and hotTub.       | gas<br>electric<br><br>The default fuel type value is electric.   |
| hotFill      | appliance Metadata | the hot fill of an appliance. It applies to washingMachine and dishWasher. | true<br>false<br><br>The default hot fill value is false.   |

## Installation Profile Example

An example for the Installation Profile JSON file is presented below:

```
{  
  "home": {  
    "postalCode": "12345",  
    "country": "UK",  
    "propertyType": "bungalow",  
    "numBedrooms": 4,  
    "numOccupants": 2,  
    "propertyAge": "1976-1999",  
    "ownership": "own",  
    "occupantType": "retirees",  
    "spaceHeatingType": "gas,electric-heaters",  
    "spaceCoolingType": "air-condition,ceiling-fan",  
    "spaceHeatingExchangerType": "radiators",  
    "waterHeatingType": "electric,other",  
    "stoveHeatingType": "gas",  
    "grillHeatingType": "gas",  
    "ovenHeatingType": "gas",  
    "photovoltaic": true  
  },  
  "appliances": {  
    "fridgeCombo": 1,  
    "refrigerator": 1,  
    "freezer": 2,  
    "hob": 4,  
    "oven": 1,  
  }  
}
```

```
"grill": 1,  
"microwave": 1,  
"kettle": 1,  
"toaster": 0,  
"dishWasher": 2,  
"washingMachine": 1,  
"tumbleDryer": 2,  
"iron": 1,  
"TV": 0,  
"dvd": 1,  
"cableBox": 1,  
"gameConsole": 0,  
"computer": 1,  
"tablet": 1,  
"electricVehicle": 1,  
"electricShower": 0,  
"immersionHeater": 1,  
"airCondition": 1,  
"poolPump": 1,  
"sauna": 0,  
"infraredPanels": 0,  
"closeInBoiler": 0,  
"instantBoilingWaterTap": 0,  
"batteryEnergyStorageSystem": 0,  
"heatPump": 0,  
"hotTub": 1,  
"dehumidifier": 0  
},
```

```

"applianceMetadata": {
  "tumbleDryer": {
    "id2": {
      "fuelType": "gas"
    }
  },
  "hotTub": {
    "id1": {
      "fuelType": "electric"
    }
  },
  "dishWasher": {
    "id4": {
      "hotFill": true
    },
    "id5": {
      "hotFill": true
    }
  },
  "washingMachine": {
    "id3": {
      "hotFill": true
    }
  }
}

```

## Default Profile

In many cases, the client may not have complete information for a user's installation or any information at all. To accommodate this, NET2GRID EnergyAI™ uses a **Default Profile** as a fallback.

Default Profile Behaviour:

- If no user-specific profile is available, the default profile is used in its entirety.
- If the user has a partial profile, the system automatically inherits missing values from the default profile.
- If the user has a complete profile, the system uses the user's profile exclusively, with no fallback.

This hybrid inheritance model ensures that NET2GRID EnergyAI™ always has a complete and coherent profile for every installation, while still honoring any available personalized data.

**Note:** The default profile functionality is optional and should be enabled after client request.