Perseus - Gas methodology and technical specification

Author(s):
Chris Pointon

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Contents

Gas methodology

Definition

The sum of the products of the half-hourly consumption in cubic meters with the most recent published greenhouse gas conversion factor from the UK Government for Natural Gas covering the time of consumption.

Discussion

Data availability

Gas smart meters have similar capabilities to electricity ones. If data for one is available at a location, data for the other is likely to be equally available. Gas data takes slightly longer to propagate through Data Communications Company (DCC) systems than electricity data due to the way the meters operate, but not to an extent that affects any Perseus measures.

The always-on virtual device that holds gas meter data at DCC is required to store 13 months of 30-minute gas consumption data. This means, like electricity data, the preceding 12 months of data should be available if the meter has been in operation for more than that time.

Users prove gas meter ownership to Smart Energy Code (SEC) Other Users using the same evidence and process as they do electricity meter ownership.

Annual conversion factor

DEFRA publishes greenhouse gas conversion factors for a variety of fuels on an annual basis, usually around June of the following year. The factors include the emissions due to burning the fuel and the emissions in the supply chain, which lead to variance over time. The full methodology is provided on the UK Government website. The factor for Natural Gas converts from m^3 gas to tCO_2e. The data is available in a flat file for download, but not via an API.

Disregarded options for conversion factor

It is noted that the government factor is an average of all natural gas supplied and can be up to 18 months out-of-date. Although the carbon emission factor for gas per kWh is fixed, the calorific value of gas (the energy per volume) can vary over time and by location, affecting the emissions per cubic metre. Data is available on daily calorific value per location, and this value is also updated periodically on the meter.

In practice, the variance in calorific value is quite low, especially compared to other unmeasurable factors like the efficiency of the equipment burning the gas. This means that gas emissions factors have much lower differences based on place and time-of-day than electricity ones. The calorific value approach also misses supply chain emissions captured in the annual figures, which would need to be factored in separately. There is

not sufficient benefit to factoring in calorific value to justify the additional complexity of using it.

Gas consumption other than Natural Gas

Biomethane, hydrogen mix-in and other approaches to lower the carbon intensity of the gas supply are not considered to be deployed on a scale that is worth accounting for at present. As and when a geography or SME sector uses a large enough proportion of non-natural gas, it may become necessary to update this methodology.

Licence/policy updates

Licence

Update the permission text for processing consumption data from the EDP (update highlighted):

> [Carbon accounting provider] ("we") need your consent to access the following data provided by [insert source of data]:
> - Your electricity **and gas** consumption (taken every 30 minutes)
> - Electricity **and gas** tariff data

Similarly update the permission text for reporting emissions data to the FSP (update highlighted):

> As a reminder, ([Carbon accounting provider]) (“we”) need to have your consent to access the following data provided by [insert source of data]:
>
> - Your electricity **and gas** consumption (taken every 30 minutes)
> - Electricity **and gas** tariff data

Policy

Update the Information provision policy guidance paragraph (update highlighted):

> Energy Data Provider Perseus members will need to comply with additional SEC requirements if they draw smart meter data (electricity **or gas**) from the DCC network. These requirements should be known to all existing DCC Other Users as compliant SEC Party members. Perseus will not provide further guidance on such matters.

Technical specification

Registry changes

Changes are based on the current energy consumption data API defined in the sandbox registry: https://registry.core.sandbox.trust.ib1.org/scheme/perseus

- Rename The Perseus Emissions Calculation Algorithm to “The Perseus Electricity Consumption Emissions Calculation Algorithm”. Change its URL to `/process/electricity-emissions-calculation`

- Add “The Perseus Gas Consumption Emissions Calculation Algorithm” at `/process/gas-emissions-calculation` with `processDescription` “the sum of the products of the half-hourly consumption in cubic meters and the most recent published greenhouse gas conversion factor for natural gas covering the time of consumption”
- Add a SourceType “Data source is greenhouse gas emissions factors from DEFRA: at `/source-type/GasGreenhouseGasFactor`

Energy Consumption API

Changes are based on the current energy consumption data API defined in the sandbox registry: https://registry.core.sandbox.trust.ib1.org/scheme/perseus/standard/energy-consumption-data/2024-12-05

Datasources

```
GET /datasources

Example Response:
{
  "data": [
    {
      "id": "S90/r2+mSV2",
      "type": "electricity",
      "location": {
        "ukPostcodeOutcode": "CF99"
      },
      "availableMeasures": [
        "import",
        "export"
      ]
    }
  ]
}
```

Changes

- Add `"gas"` as a valid `type`
- Only the `"import"` measure is supported for gas. `"export"` must be ignored if present

Consumption

```
GET /datasources/{id}/{measure}
{
  "data": [
    {
      "cumulative": {
```

```
        "unitCode": "WHR",
        "value": 1234.5
      },
      "energy": {
        "unitCode": "WHR",
        "value": 123.45
      },
      "from": "2023-10-18T00:00:00Z",
      "takenAt": "2023-10-19T00:00:00Z",
      "to": "2023-10-18T00:30:00Z",
      "type": "electricity"
    }
  ],
  "location": {
    "ukPostcodeOutcode": "CF99"
  },
  "provenance": {
    "ib1:provenance":
"https://registry.example.trust.ib1.org/trust-framework",
    "origins": [
      "Esfjwwyjh2iMa-LEHO1N"
    ],
    "steps": [

"eyJpZCI6IlVSZDB3Z3MiLCJ0eXBlIjoidHJhbnNmZXIiLCJmcm9tIjoiaHR0cHM6...MyOj
U2WiJ9",

"eyJpZCI6Iml0SU5zR3RVIiwidHlwZSI6InJlY2VpcHQiLCJmcm9tIjoiaHR0cH...jE2OjM
xWiJ9",
      [
        0,
        "123456",
        "2024-10-17T12:16:31Z",

"MEUCIQDNk3nS64bmGvMJwfdVWfyGuheGDEbB8-b5Ur2H9Iat9gIgc...eGO3GvzH2EJut70
7lA="
      ]
    ]
  }
}
```


Changes

- For gas data sources, allow unitCode `"MTQ"` (UNECE code for cubic meters) in the `"cumulative"` and `"energy"` segments of the response
- Add `"gas"` as a valid `type`

Emissions Report API

```
GET /emissions?from=2023-06Z&to=2023-08Z

"data": [
  {
    "type":"electricity",
    "from":"2023-06-05T00:00:00Z",
    "to":"2023-07-01T00:00:00Z",
    "takenAt":"2024-07-01T00:00:00Z",
    "emissions": {
      "value": 123.45,
      "unitCode": "KGM"
    }
  },
  {
    "type":"electricity",
    "from":"2023-07-01T00:00:00Z",
    "to":"2023-08-01T00:00:00Z",
    "takenAt":"2024-08-01T00:00:00Z",
    "emissions": {
      "value": 123.45,
      "unitCode": "KGM"
    }
  }
],
"provenance" : {
  ...
}
```

Changes

- Add `"gas"` as a valid `type`
- Note that emissions can be provided in date order (gas then electricity emissions for each month), or type order (all the gas emissions for the period followed by all the electricity ones). Consumers should not assume any order for the records
- Provenance must include `origin` steps for the GHG emissions factors using a `sourceType` of `https://registry.core.trust.ib1.org/scheme/perseus/source-type/GasGreenhouseGasFactor` and an `origin` with the URL of the page where the UK Government published the factors e.g. https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024 for 2024 factors
- Provenance must include `process` step(s) for the gas calculation, with a `process` value of `https://registry.core.trust.ib1.org/scheme/perseus/process/gas-emissions-calculation`

Downloadable Emissions Report

See updated sample report. The changes are:

- Add details of gas processing to the header
- Add a column for monthly emissions due to gas consumption
- Update provenance chain to include the origin of the gas emissions factor calculation as described in the API spec above