

Business Service

Supply aggregated volumes for electricity

Service for the supply of an anonymized data set featuring total volumes for allocation points aggregated by grid area, profile category, determined energy consumption and energy direction by suppliers to the distribution system operators.

Name	SD030 - Supply aggregated volumes for electricity	Version	1.0
Code	BSCMF0078	Status	Approved
Date	09-03-2022	Author	EDSN Business Integration

Table of contents

Table of contents	2
Document management.....	3
Distribution history	3
Referenced documents.....	4
1 Introduction	5
1.1 Service description	5
1.2 Reading guide	5
1.3 Starting points	5
1.4 List of abbreviations	6
2 Roles and responsibilities	7
2.1 Consumer.....	7
2.2 Provider	7
2.3 RACI	7
3 BPMN Supply aggregated volumes for electricity	8
3.1 Supply aggregated volumes for electricity	8
3.2 Provider checks.....	9
4 Functional parameters	10
4.1 Notification Supply aggregated volumes for electricity.....	10
4.2 Response to notification Supply aggregated volumes for electricity.....	11
5 Sequence Diagram	12
5.1 Note	12
6 Properties service Supply aggregated volumes for electricity	13
7 Information model	14
7.1 Note	14
7.2 Notification Supply aggregated volumes for electricity (AggregatedVolumes).....	15
7.3 Response to notification Supply aggregated volumes for electricity.....	19

Document management

Version	Version date	Changes	Author
0.1	09-12-2021	Initial version Compiled based on MSP Dynamic Profile fractions and UML class model AggregatedVolumesSeries	EDSN
0.3	04-01-2022	After processing review of working group C1 – RfC273.1 LV variant	EDSN
0.6	10-01-2022	After discussion v0.3 in working group C1	EDSN
0.7	20-01-2022	After processing review of sector and working group C1	EDSN
0.8	27-01-2022	Review market parties and NEDU API working group processed	EDSN
0.9	03-02-2022	Version for the NEDU approval process	EDSN
1.0	09-03-2022	Determined in NEDU General Meeting of Members	EDSN

Distribution history

Version	Distribution date	Receivers
0.1	22/12/2021	Working group C1 – RfC273.1 LV variant
0.3	04-01-2022	Working group C1
0.6	10-01-2022	Market parties (via NEDU) Working group C1 EDSN MDK
0.7	20-01-2022	NEDU API Working group
0.8	27-01-2022	Market parties (via NEDU) Working group C1 EDSN MDK
0.9	03-02-2022	NEDU Design Authority Working group C1
1.0	09-03-2022	NEDU

Referenced documents

Requirements model

No.	Description	Version	Date	Author
1.	Marktsubproces (MSP) Dynamische profielfracties	0.8	20/12/2021	NEDU

Design frameworks and guidelines

No.	Description	Version	Date	Author
2.	NEDU API strategie	1.0	16/12/2020	NEDU TC/WG API
3.	NEDU API ontwerprichtlijnen	2.1	21/12/2021	NEDU TC/WG API
4.	NEDU API URI richtlijnen	1.0	16/12/2020	NEDU TC/WG API

Service descriptions and data model

No.	Description	Version	Date	Author
5.	ebIX® Code list	1.0A	June 2019	ebIX TC
6.	ISO 8601 for date and time stamping	1:2019	2019	ISO
7.	Business Service request profile fractions electricity	1.0	16/12/2021	EDSN

This document is a publication of EDSN. In the interest of completeness and accuracy, we kindly request that you forward any comments, additions and corrections regarding this document to EDSN.

You can also contact EDSN for more information about this document in the following ways.

EDSN B.V.	Telephone 033 - 422 46 20
Barchman Wuytierslaan 8	E-mail servicedesk@edsn.nl
3818 LH Amersfoort	Internet www.edsn.nl

1 Introduction

1.1 Service description

The service description describes the arrangements for the daily supply of an anonymized data set featuring total volumes of allocation points aggregated per grid area, profile category, determined energy consumption and energy direction over a calendar day by suppliers to distribution system operators. The transmission system operators use this anonymized data set to calculate the dynamic profile fraction series per grid area, profile category, determined energy consumption and energy direction and make these dynamic profile fraction series available (see *Business Service Request profile fractions electricity*[7]).

To give the reader a good idea of the exchange, a detailed process description is included as well as an indication of the messages to be used. For a functional description of the process, refer to *Market Sub-Process (MSP) Dynamic Profile fractions*[1].

1.2 Reading guide

This document describes the following aspects, including:

- Process *Supply aggregated volumes for electricity*;
- Checks on the request;
- Approval/rejection of the request;
- JSON data models.

1.3 Starting points

The following principles were used when designing the *service Supply aggregated volumes for electricity*:

- The date/time creation message is in UTC and in accordance with ISO 8601[6] stamp: YYYY-MM-DDThh:mm:ssZ;
- The date of the measurement day is in accordance with ISO 8601[6] stamp: YYYY-MM-DD;
- All volumes in the messages are greater than or equal to zero;
- A time series with aggregated volumes will only be offered to the DSO if the relevant LV for that measurement day has been active at a predetermined minimum number or more operational allocation points in the relevant grid area and concerned profile category and determined energy consumption;
- Three time series with aggregated volumes are always offered per measurement day, grid area and profile category:
 1. A time series with aggregated volumes for energy direction Off-take and established off-take type AMI;
 2. A time series with aggregated volumes for energy direction Off-take and established off-take type AZI;
 3. A time series with aggregated volumes for energy direction Feed-in and established off-take type AMI.

A time series with aggregated volumes for energy direction Feed-in and established off-take type AZI is not relevant and is therefore not offered;
- If an LV has offered the message with aggregated volumes for one measurement day more than once before 24:00 hrs local NL time, then the latest version (most recent creation date/time) of the message used to calculate the dynamic profile fractions provided that the date/time creation (time stamp) of the message is no later than D+1 (the day after the measurement day) 22:59:59Z (winter time) or 21:59:59Z (summer time);
- Should an LV offer one or more messages with aggregated volumes due to an emergency after 24:00 local NL time, the latest version (most recent creation date/time) of the message is used to calculate the dynamic profile fractions provided that the calculation of the dynamic profile fractions has not yet been started;
- The data model for this service is based on the IEC CIM reference model.

1.4 List of abbreviations

Abbreviation	Description
AMI	Off-take with feed-in
ASIA	Off-take without feed-in
BRS	Business Requirements Specification
EDSN	Energy Data Services Nederland B.V.
LV	Supplier
MSP	Market Sub-Process
SJA	Standard annual volumes for acquisition
SJI	Standard annual volumes for input
SLA	Service Level Agreement
REST API	Presentational State Transfer Application Programming Interface
DSO	Distribution system operator

1.5 Disclaimer

The terms of this disclaimer apply to this English service description.

In the event of any conflict between this English service description and the Dutch version of this service description, the Dutch service description will prevail.

2 Roles and responsibilities

2.1 Consumer

This service description describes how consumers of the service (the suppliers¹) offer the anonymized dataset with aggregated volumes.

2.2 Provider

This service description describes how the service providers (the distribution system operators²) receive and monitor the anonymized data set with aggregated volumes.

2.3 RACI

The RACI below shows *the* roles and responsibilities for the service description *Supply aggregate volumes for electricity*:

R (Responsible, NL: Verantwoordelijk)	EDSN Business Integration
A (Accountable, NL: Eindverantwoordelijk)	To be determined!
C (Consulted, NL: Raadplegen)	NEDU-ICWE, ebIX Technical Committee, NEDU API working group
I (Informed, NL: Informeren)	NEDU General Meeting of Members, EDSN, NEDU DA

1. Is the LV as supplier of time series with aggregated volumes.
 2. The RNB's offer this service to the LV's.

3 BPMN Supply aggregated volumes for electricity

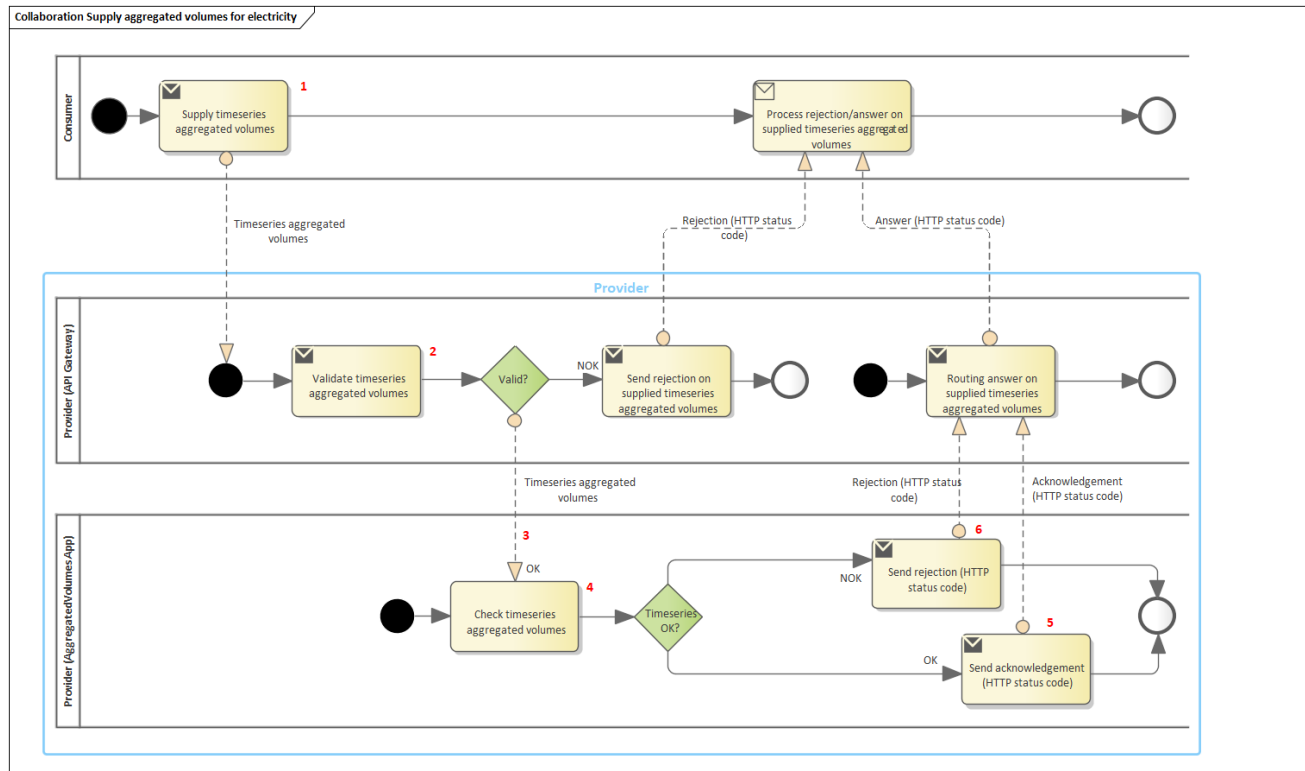


Figure 1 for detailed information on this process, see Market Sub-Process (MSP) Dynamic Profile Fractions[1]

3.1 Supply aggregated volumes for electricity

The process for supply aggregated volumes for electricity is based on the following scenario:

1. The consumer³ submits a notification "Supply aggregated volumes for electricity" via POST AggregatedVolumes;
2. The provider⁴ verifies that the concerned consumer is authenticated and authorized for this service and validates the received notification (message) syntactically. In the event of errors, the message is immediately rejected and submitting party is expected to correct the errors and to resubmit the message;
3. If the concerned consumer is authenticated and authorized for this service, and the received notification (message) is syntactically valid, it will be processed;
4. The provider will check the functional contents of the received notification, as described in the section "Checks";
5. If the notification (message) is approved, it is processed by the provider and the provider sends a confirmation to the consumer;
6. If the notification (message) is functionally rejected, the provider sends a rejection to the consumer.

3. Is the LV as supplier of time series with aggregated volumes.

4. Are the RNB's as recipients of time series with aggregated volumes.

3.2 Provider checks

Following the message “Supply aggregated volumes for electricity”, the provider has the following checks and notifications at its disposal and carries out these checks:

Control	HTTP status message	HTTP status code
The consumer is authenticated and authorized for this service.	Unauthorized	401
The syntax of the message is valid.	Bad Request	400
The EAN codes for grid areas are part of the active grid areas electricity from the transmission system operators on the relevant measurement day.	Unprocessable Entity	422
Any combination of grid area, profile category, determined energy consumption and energy direction occurs a maximum of once.	Unprocessable Entity	422
The number of allocation points per grid area, profile category, determined energy consumption and energy direction is greater than 0.	Forbidden	403
The number of allocation points per grid area, profile category, determined energy consumption and energy direction is greater than determined by the Consumer Profile Platform.	Forbidden	403
The measurement day is older than the date/time that the message was created.	Forbidden	403
The profile category is E1B, E1C or E2B.	Forbidden	403
The established offtake type is AMI or AZI.	Forbidden	403
The number of positions of all time series matches the period and the resolution.	Unprocessable Entity	422
The first position in a time series is ‘1’ and then increases by 1 per position.	Unprocessable Entity	422
The positions within a time series are delivered in order from low to high.	Unprocessable Entity	422
Each position in a time series occurs exactly once in the respective time series.	Unprocessable Entity	422
Exactly 96 (100 or 92 in case of transition summer/winter time) volumes have been delivered per combination of grid area, profile category, determined energy consumption and energy direction.	Unprocessable Entity	422
The calculated Total volume offtake (per imbalance period) is greater than or equal to 0.	Unprocessable Entity	422
The calculated Total volume feed-in (per imbalance period) is greater than or equal to 0.	Unprocessable Entity	422
The calculated Total volume off-take (per imbalance period) divided by the number of allocation points is less than: - E1B/E1C: 5 kWh per imbalance settlement period (parameterizable); - E2B: 20 kWh per imbalance settlement period (parameterizable).	Unprocessable Entity	422
The calculated Total volume feed-in (per imbalance period) divided by the number of allocation points is less than: - E1B/E1C: 5 kWh per imbalance settlement period (parameterizable); - E2B: 20 kWh per imbalance settlement period (parameterizable).	Unprocessable Entity	422
The Total SJA Normal plus the Total SJA Low divided by the number of allocation points is less than or equal to an adjustable parameter (for the time being 411,019: maximum SJA value in C-AR based on a physical capacity of 3*80).	Unprocessable Entity	422
The Total SJI Normal plus the Total SJI Low divided by the number of allocation points is less than or equal to an adjustable parameter (for the time being 411,019: maximum SJI value in C-AR based on a physical capacity of 3*80).	Unprocessable Entity	422
For energy direction offtake, both the Total SJA Normal and the Total SJA Low are greater than or equal to 0.	Unprocessable Entity	422
For energy direction Feed-in, the Total SJI Normal and/or the Total SJI Low is greater than 0.	Unprocessable Entity	422
For energy direction offtake, Total SJA Normal and Total SJA Low are supplied and no Total SJI Normal and Total SJI Low.	Unprocessable Entity	422
For energy direction feed-in, Total SJI Normal and Total SJI Low are supplied and no Total SJA Normal and Total SJA Low.	Unprocessable Entity	422
For energy direction feed-in, the determined offtake type is equal to AMI.	Unprocessable Entity	422
The service for supplying aggregated volumes is able to handle the notification.	Internal Server Error	500
The service for supplying aggregated volumes is operational.	Service Unavailable	503

4 Functional parameters

4.1 Notification Supply aggregated volumes for electricity

The following functional parameters apply to a notification with aggregated volumes for electricity:

Given	Elec	1/n	Note	Enumeration
Message creation date/time	V	1	The date/time when the message was created	
Measurement day	V	1	The calendar day to which the data relates.	
Aggregate volumes		n		
EAN code grid area	V	1	The identifying EAN18 code of the grid area.	
Profile category	V	1	Profile category identifier. Allowed values: E1B, E1C, or E2B.	E1B E1C E2B
Determined energy consumption	V	1	Indicates whether there is offtake with feed-in or off-take without feed-in. Allowed values: Off-take with feed-in Off-take without feed-in	AMI ASIA
Energy direction	V	1	Allowed values (from ebIX Code list[5]): Decrease Feed	E17 E18
Imbalance settlement period (electricity)	V	1	Resolution is in accordance with ISO 8601 notation[6] for <i>Duration</i> . Permissible values electricity: 15 minutes	PT15M
Number of allocation points	V	1	Number of allocation points per grid area, profile category, determined energy consumption and energy direction included in aggregation	
Totals SJA/SJI		n		
Total SJA Normal	A	1	Sum of the SJA normal from allocation points within this grid area with the same profile category and determined energy consumption (in kWh, without decimals). Only applicable for a time series with energy direction Offtake (E17).	
Total SJA Low	A	1	Sum of the SJA layer of the allocation points within this network area with the same profile category and defined take-off type (in kWh, without decimals). Only applicable for a time series with energy direction Offtake (E17).	
Total SJI normal	A	1	Sum of the SJI normal for allocation points within this grid area with the same profile category and determined energy consumption (in kWh, without decimals). Only applicable for a time series with energy direction Feed-in (E18).	
Total SJI Low	A	1	Sum of the SJI low for allocation points within this grid area with the same profile category and determined energy consumption (in kWh, without decimals). Only applicable for a time series with energy direction Feed-in (E18).	
Volume per position		n		
Position	V	1	Position in a sequential and contiguous series of whole numbers. The first position in a series is "1".	
Volume	V	1	Sum of volumes (in kWh) from allocation points within the grid area with the same profile category, established offtake and energy direction. Volume as a decimal number, always to 3 decimal points.	

Mandatory fields (V) are always filled; optional fields (O) or dependent fields (A) if required for the context of the concerned message.

4.2 Response to notification *Supply aggregated volumes for electricity*

The response to *the notification Supply aggregated volumes for electricity* is an approval or rejection:

Approval:

HTTP status message	HTTP status code
Created ⁵	201

Rejection:

HTTP status message	HTTP status code
See paragraph 3.2	See paragraph 3.2

5. Status code/status notification '201 Created' indicates that the server has successfully met the request and that the supply of volumes by the LV was successful.

5 Sequence Diagram

5.1 Note

The sequence diagram shows the parties and services as an object with a so-called "lifeline". The interaction between these objects is shown by arrows if one or more messages between objects. The messages in the sequence diagram are explained in more detail in the chapter Information Model.

The following sequence diagram concerns the supply of aggregated volumes for electricity:

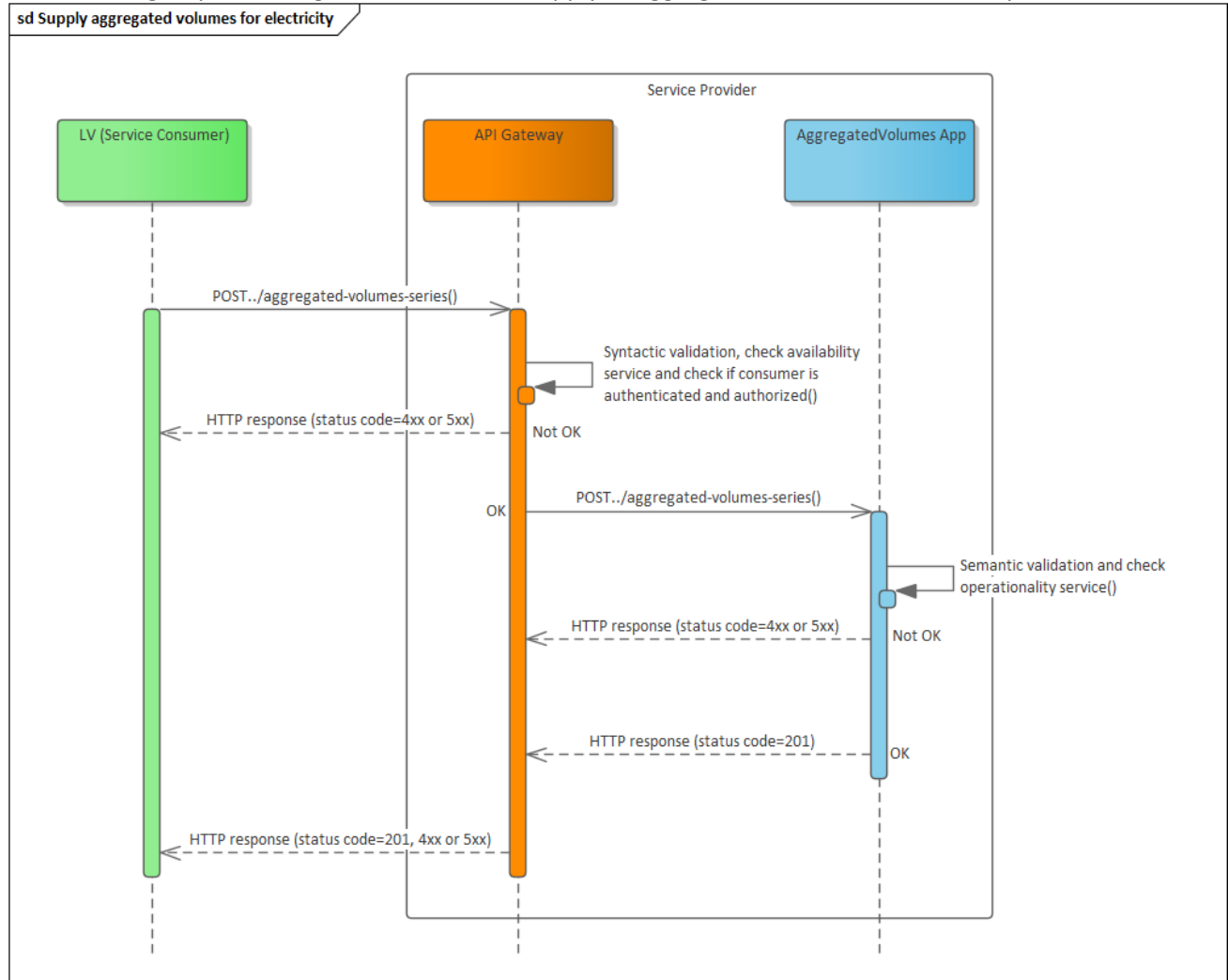


Figure 2The sequence diagram for Supplying aggregated volumes for electricity

6 Properties service *Supply aggregated volumes for electricity*

Supply aggregated volumes for electricity	
Service	AggregatedVolumes
Service ID	BSCMF0078
Description	Supply aggregated volumes for electricity
Service transaction pattern	Notification/Acknowledgement (REST operation POST ⁶)
Precondition(s)	Notification is submitted by a consumer who is authenticated and authorized to do so.
Trigger	Notification Supply aggregated volumes for electricity
Post condition(s)	- Notification results in an approval (HTTP status code 201); - or - Notification results in a rejection (see HTTP status codes).
AggregatedVolumes	
REST API	aggregated-volumes-series
Version	1.0.0 draft
Date	03-02-2022
Availability (within SLA)	Calendar days from 6:00 pm – 10:00 am next calendar day (local time resp CET or CEST)
Average load	N/a.
Peak load	N/a.
Period peak load	N/a.
Availability (outside SLA)	Calendar days from 10:00 am – 18:00 pm (local time resp CET of CEST): submitted notification <i>Supply aggregated volumes for electricity</i> is handled based on "best effort".
Max. response time	N/a.
Time-out	N/a.

6. Is used as create for resources and adds a new resource to the collection.

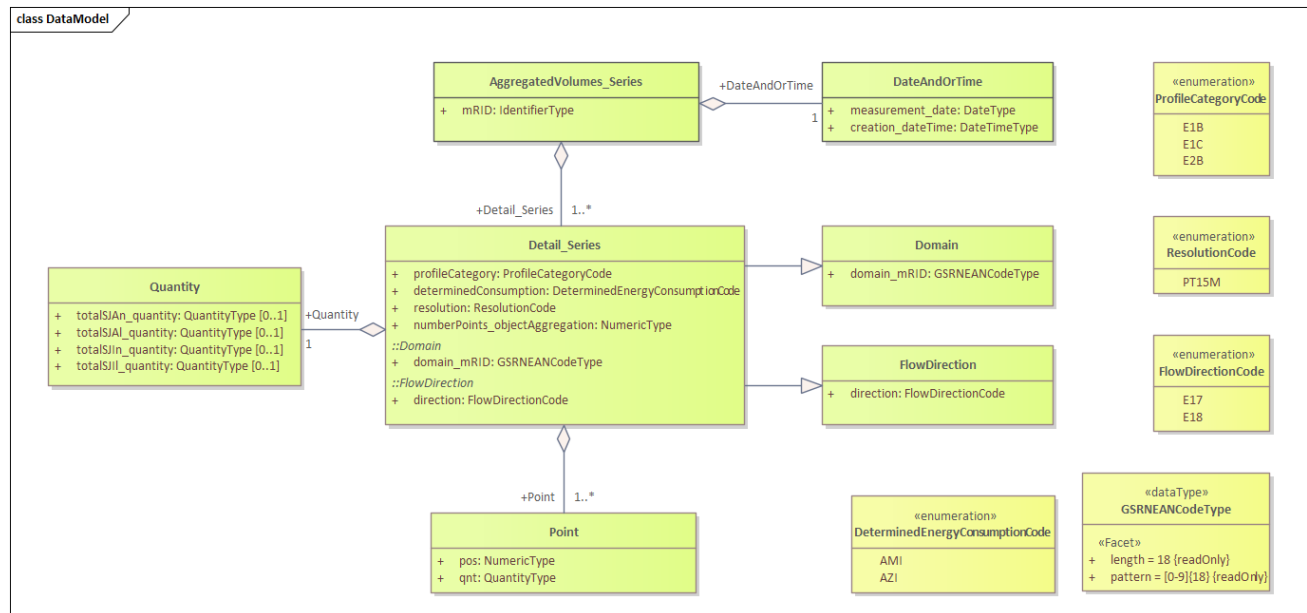
7 Information model

7.1 Note

The information model is shown as a class diagram. Each class diagram is followed by a table with the description of the elements, except for the class diagrams of "empty" messages exchanged for acknowledgement.

Multiplicity is indicated for the elements. Notation 0..1 means that the element optionally occurs once, 1..1 means that the element occurs once (mandatory). Notation 0...* means that the element may optionally occur more than once. Notation 1...* means that the element may occur 1 or more times (mandatory).

7.2 Notification Supply aggregated volumes for electricity (AggregatedVolumes)



AggregatedVolumes_Series

JSON element	Data type	Multiplicity	Description	Functional parameter
mRID	IdentifierType	1..1	A unique identification of the aggregated volume time series. Example: e3d5ced9-3b0a-4e46-ba55-4cad6cdf2e56	Unique Message ID

DateAndOrTime

JSON element	Data type	Multiplicity	Description	Functional parameter
measurement_date	DateType	1..1	Measurement date as per ISO 8601 YYYY-MM-DD. Example: 2022-06-18	Date measurement day
creation_dateTime	DateTimeType	1..1	Date/time of the creation of the aggregated volume time series as per ISO 8601 YYYY-MM-DDThh:mm:ssZ. Example: 2022-06-19T08:21:56Z	Message creation date/time

Detail_Series

JSON element	Data type	Multiplicity	Description	Functional parameter
profileCategory	ProfileCategoryCode	1..1	The identification of the profile category that is the common denominator used to aggregate a time series. The full attribute name "profileCategory_objectAggregation" is because of efficiency changed into "profileCategory". Example: E1B	Profile category
determinedConsumption	DeterminedEnergyConsumptionCode	1..1	The identification of the determined energy consumption that is the common denominator used to aggregate a time series. The full attribute name "determinedEnergyConsumption_objectAggregation" is because of efficiency changed into "determinedConsumption". Example: AMI	Determined energy consumption
resolution	ResolutionCode	1..1	The definition of the number of units of time that compose an individual step within a period. Example: PT15M	Imbalance settlement period
numberPoints_objectAggregation	NumericType	1..1	The number of allocation points being provided. Example: 953	Number of allocation points

Domain

JSON element	Data type	Multiplicity	Description	Functional parameter
domain_mRID	GSRNEANCodeType	1..1	The unique identification of the domain. Example: 874567894561234543	EAN18 grid area

FlowDirection

JSON element	Data type	Multiplicity	Description	Functional parameter
direction	FlowDirectionCode	1..1	The coded identification of the direction of energy flow. Example: E17	Energy direction (offtake/feed-in)

Point

JSON element	Data type	Multiplicity	Description	Functional parameter
pos	NumericType	1..1	A sequential value representing the relative position within a given time interval. The full attribute name "position" is because of efficiency changed into "pos". Example: 1	Position
qnt	QuantityType	1..1	The principal quantity or the accepted offer quantity identified for a point. The full attribute name "quantity" is because of efficiency changed into "qnt". Example: 2456.100	Volume

Quantity

JSON element	Data type	Multiplicity	Description	Functional parameter
totalSJAN_quantity	QuantityType	0..1	The quantity value. Sum SJA normal of the allocation points within this grid area with the same profile category and determined energy consumption (in kWh, without decimals). Example: 468	Total SJA Normal
totalSJAL_quantity	QuantityType	0..1	The quantity value. Sum SJA low of the allocation points within this grid area with the same profile category and determined energy consumption (in kWh, without decimals). Example: 238	Total SJA Low

JSON element	Data type	Multiplicity	Description	Functional parameter
totalSJIN_quantity	QuantityType	0..1	The quantity value. Sum SJI normal of the allocation points within this grid area with the same profile category and determined energy consumption (in kWh, without decimals). Example: 310	Total SJI normal
totalSJIL_quantity	QuantityType	0..1	The quantity value. Sum SJI low of the allocation points within this grid area with the same profile category and determined energy consumption (in kWh, without decimals). Example: 128	Total SJI Low

7.3 Response to notification Supply aggregated volumes for electricity

The response to the offered data set with total volumes for allocation points aggregated by grid area, profile category, determined energy consumption, and energy direction is an HTTP status code, see paragraph 4.2.