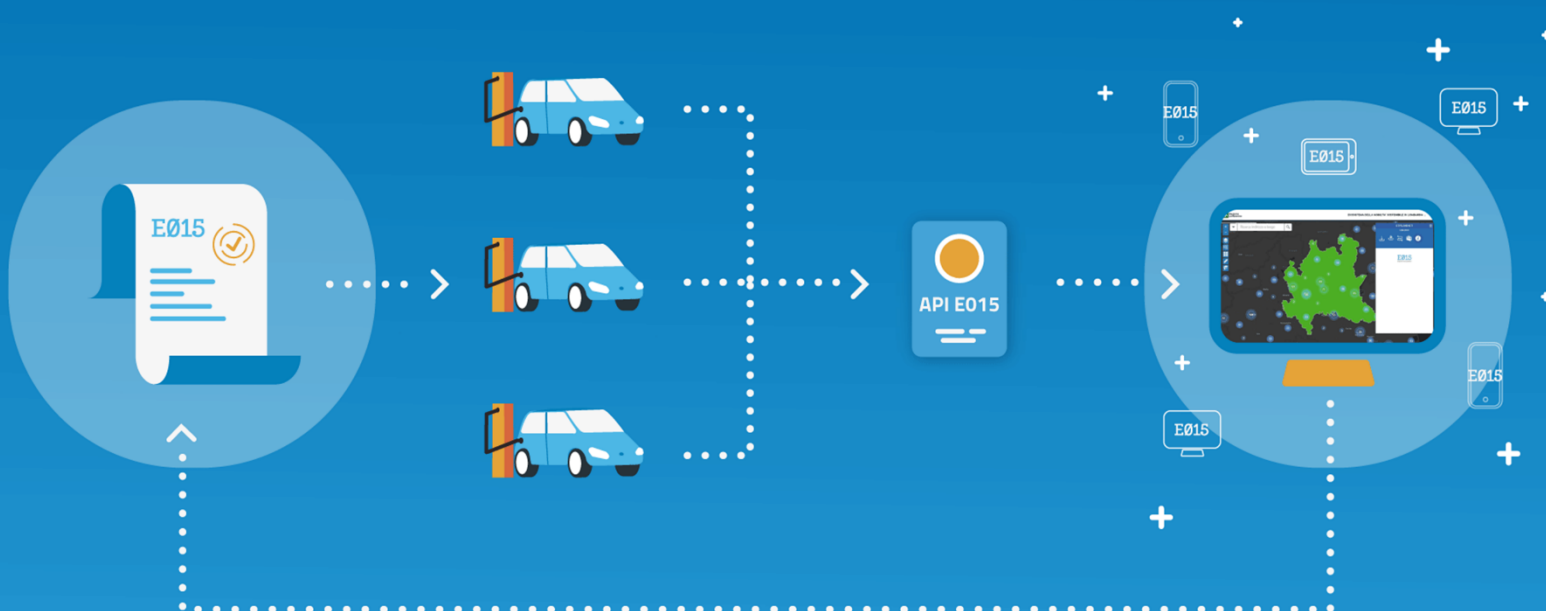


# API E015 guidelines for e-mobility in ECOMOBS



## Introduction

The purpose of this document is to provide the Guidelines for the development of an API E015 to support the **ECOMOBS - Ecosystem of Sustainable Mobility** initiative of Lombardy Region, thanks to which the Public Administration is given access to quality data to foster the sustainable mobility programming, planning and incentive activities. The ECOMOBS portal can be accessed at the following web address: <https://www.ecomobs.servizirl.it>.

The release of an API E015 that complies with the Guidelines set out in this document is of interest not only to join the ECOMOBS initiative, but also to promote the development of a valuable, reusable and scalable interchange tool for quality data, which also enables the effective fulfillment of formal obligations for application to regional tenders and fundings.

With regard to technological requirements, one can refer to the interoperability standards adopted for the E015 Digital Ecosystem, described by the [API E015 Publication Guidelines](#).

## Required information for the integration of an API E015 within ECOMOBS

The table in the following pages shows all the information considered mandatory or of interest by Lombardy Region to ensure effective electric mobility programming, planning and incentive activities.

The sample API response presented at the end of the document adopts the schema provided by the OCPI protocol, which standardizes the exposure of data on charging points and is considered compliant to the information required for the integration of API E015 within ECOMOBS.

The adoption of the OCPI protocol is recommended, but remains at the discretion of the adherent: in fact, there is no requirement to adopt a specific protocol or data schema, as long as all the information considered mandatory is exposed through the API E015, as shown in the table below.

ATTRIBUTE	DESCRIPTION	FORMAT	ALLOWED VALUES	MANDATORY	EXAMPLE
<b>OPERATOR</b>					
Operator Name	Name of the station operator	Text	Free text	Yes	Azienda Mario Rossi
Operator URL	Website of the station operator	Text	Free text	No	
<b>CHARGING STATION</b>					
Station ID	Unique charging station ID (you can choose any ID as long as it is unique for each charging station).	Text	Free text	Yes	12X3S
Station name	Name of the charging station (you can choose any name as long as it is unique for each charging station).	Text	Free text	Yes	Supermarket
Latitude	Latitude of the charging station	Number (Decimal)	Geographic coordinates expressed in decimal degrees (WGS84 reference system)	Yes	9.348738
Longitude	Longitude of the charging station	Number (Decimal)	Geographic coordinates expressed in decimal degrees (WGS84 reference system)	Yes	45.343847
Station address – Typology	Address type of the charging station (street, square...)	Text	Free text	Yes	Piazza
Station address – Address and house number	Charging station address and house number (if available)	Text	Free text	Yes	Piazza Città di Lombardia, 1
Station Address – Zip code	Zip code	Text	Free text	Yes	20124
Municipality	Municipality of the charging station	Text	Free text	Yes	Milano
Province	Province of the charging station	Text	Free text	No	MI
Region	Region of the charging station	Text	Free text	Yes	Lombardia
Localization type	Type of charging station location	Text	<ul style="list-style-type: none"> <li>On street</li> <li>Multi-storey car park</li> <li>Underground multi-storey car park</li> <li>Parking area</li> <li>Other</li> <li>Undefined</li> </ul>	No	Multi-storey car park
Station context type	Indicates the context in which the charging station is located	Text	<ul style="list-style-type: none"> <li>Refueling station</li> <li>Fueling stations</li> <li>Hotels</li> <li>Catering</li> <li>Commercial activities</li> <li>Recreational activities</li> </ul>	No	Commercial activities

ATTRIBUTE	DESCRIPTION	FORMAT	ALLOWED VALUES	MANDATORY	EXAMPLE
Station status	Charging station status	Text	<ul style="list-style-type: none"> <li>Available</li> <li>Busy</li> <li>Under maintenance</li> <li>Out of service</li> <li>Inactive (not yet or no longer available)</li> <li>Planned (soon to be operational)</li> <li>Removed</li> <li>Unavailable</li> </ul>	No	Available
Station accessibility	Indicates whether access to charging stations is allowed to all users indiscriminately or not	Text	<ul style="list-style-type: none"> <li>Public</li> <li>Private</li> <li>Private with public access (the column is on private land but accessible to anyone)</li> </ul>	Yes	Private with public access
Station availability	Indicates whether charging stations are always available (24/7 corresponds to the value "True") or whether they are accessible only during certain time slots and/or specific days ("False")	Text	<ul style="list-style-type: none"> <li>True</li> <li>False</li> </ul>	Yes	True
Station opening days	In case the charging station is not available 24/7, it indicates the specific days when the charging station is available	Text	Free text	No	Saturday, Sunday
Station opening time	In case the charging station is not available 24/7, it indicates the start time from which the charging station is available	Text	Free text	No	09:00
Station closing time	In case the charging station is not available 24/7, it indicates the end time until which the charging station is available	Text	Free text	No	18:00
Special closings	Indicates whether there are any extraordinary closing days	Text	Free text	No	1 May, Holiday
Station activation mode	Indicates the charging station activation mode	Text	RFID Card Other (app, card, ...)	No	RFID Card
Station sustainability	Indicates whether the energy comes from 100% renewable energy sources (i.e., ensures zero CO2 or radioactive emissions)	Text	<ul style="list-style-type: none"> <li>True</li> <li>False</li> </ul>	Yes	True
ENERGY ACCESS POINT					
Energy Access Point ID	Identifier of the access point from which energy can be drawn to charge an electric vehicle	Text	Free text	Yes	IT01A041270-1
Energy Access Point Format	Indicates the format of the access point from which energy for charging an electric vehicle can be drawn (i.e., whether the access point is a socket or a cable)	Text	<ul style="list-style-type: none"> <li>Socket</li> <li>Cable</li> </ul>	No	Socket

ATTRIBUTE	DESCRIPTION	FORMAT	ALLOWED VALUES	MANDATORY	EXAMPLE
Energy Access Point Type	Indicates the type of the Energy Access Point	Text	<ul style="list-style-type: none"> <li>Type 2 (for AC charging)</li> <li>Scame (for charging in AC alternating current)</li> <li>CHAdemo (for charging in DC direct current)</li> <li>CCS COMBO 2 (for charging in DC direct current)</li> <li>Other (Tesla_R, Tesla_S, ...)</li> </ul>	<b>Yes</b>	CHAdemo
Energy Access Point Power Type	Indicates the power type of the Energy Access Point (as per Article 2, Paragraph 1, Letter d of Legislative Decree 257/16)	Text	<ul style="list-style-type: none"> <li>Slow (less than or equal to 7.4 kW)</li> <li>Accelerated (between 7.4 kW and 22 kW)</li> <li>Fast (between 22 kW and 50 kW)</li> <li>Ultra-fast (greater than 50 kW)</li> </ul>	No	Accelerated
Energy Access Point Power	Indicates the power of each Energy Access Point	Number (Decimal with two digits)	Power output in kW	<b>Yes</b>	22, 7.4
Energy Access Point Status	Indicates the status of each Energy Access Point	Text	<ul style="list-style-type: none"> <li>Available</li> <li>Busy</li> <li>Under maintenance</li> <li>Out of service</li> <li>Inactive (not yet or no longer available)</li> <li>Planned (soon to be operational)</li> <li>Removed</li> <li>Booked</li> <li>Data not available</li> </ul>	No	Available
<b>TARIFFS</b>					
Cost	Indicates the total cost (excluding VAT) of the charge in the specified currency; if the total cost is 0.00, it means that the energy withdrawal is free. If the information is not provided, it does not necessarily mean that the withdrawal is free.	Number (Integer or Decimal with two digits)	Cost expressed in €/kWh	No	0.46
Payment Method	Indicates the payment method	Text	<ul style="list-style-type: none"> <li>Credit card</li> <li>Prepaid card</li> <li>Other</li> </ul>	No	Credit card
<b>MORE INFORMATION</b>					
Photo - Image URL	Link to the image	Text	Free text	No	
Photo - Image thumbnail	Link to the image thumbnail	Text	Free text	No	

ATTRIBUTE	DESCRIPTION	FORMAT	ALLOWED VALUES	MANDATORY	EXAMPLE
Photo - Image category	Description of the object to which the image refers	Text	<ul style="list-style-type: none"> <li>• Energy access point</li> <li>• Charging station entrance</li> <li>• Charging station location</li> <li>• Operator</li> <li>• Other</li> </ul>	No	
Photo - Image format	Indicates the format of the image (gif, jpeg, png, svg)	Text	Free text	No	jpeg
Photo - Image width	Indicates the width of the image (in pixels)	Number (Integer)	Value in pixels	No	300
Photo - Image height	Indicates the height of the image (in pixels)	Number (Integer)	Value in pixels	No	300
Facilities	List of services that may be available nearby the charging station	Text	<ul style="list-style-type: none"> <li>• Hotels</li> <li>• Bars/Restaurants</li> <li>• Shopping malls</li> <li>• Supermarkets</li> <li>• Commercial activities</li> <li>• Recreational activities</li> <li>• Public transport stops</li> <li>• Subway/rail stations</li> <li>• Cab stops</li> <li>• Airports</li> <li>• Car Sharing</li> <li>• Car Pooling</li> <li>• Interchange parking lots</li> <li>• Fueling stations</li> <li>• Wi-Fi</li> </ul>	No	Shopping malls

## Example of API response in OCPI 2.2.1

Example of APIs developed by operators adopting the OCPI protocol, in its version 2.2.1.

The following example shows a subset of the attributes required by the OCPI 2.2.1 specification, which find a correspondence with the attributes listed in table given in the previous section. **Only those parameters that are considered mandatory for ECOMOBS are highlighted**, representing the minimum set of attributes that must be fulfilled to adhere to the initiative.

```
{
  "operator": {
    "name": "operator name",
    "website": "link to the operator website"
  },
  "suboperator": {           // can share attributes and values of the field operator
    ...
  },
  "owner": {                 // can share attributes and values of the field operator
    ...
  },
  "id": "station id",
  "name": "station name",
  "coordinates": {
    "latitude": "51.562787",
    "longitude": "4.638975"
  },
  "address": "address",
  "postal_code": "zip code",
  "city": "municipality",
  "state": "region",
  "charging_when_closed": true,
  "charging_station_use": true, // "Station accessibility", indicates whether
a station is public or private
  "energy_mix": {
    "is_green_energy": true    // "Station sustainability", of great interest
  },
  "evses": [
    {
      "uid": "station uid",
      "evse_id": "evse id compliant with eMI3 standard version V1.0",
      "status": "station status", // optional, but of great interest
      "connectors": [
        {
          "id": "id of the energy access point",
          "standard": "CHADEMO", // "Energy Access Point Type"
          "format": "cable",
          "power_type": "AC_3_PHASE"
          "max_electric_power": 200,
        }
      ]
    }
  ]
}
```

```

        "max_voltage": 220,
        "max_amperage": 16,
        "tariff_ids": [
            "elements of cost and payments"
        ],
        "last_updated": "2024-05-16T10:10:02Z"
    },
    ],
    "capabilities": [
        "station's functionalities and capabilities",
    ],
    "physical_reference": "number printed on the evse",
    "parking_restrictions": [
        "*****"
    ],
    ],
    "last_updated": "2024-05-28T08:12:01Z"
}
],
"parking_type": "location type",
"opening_times": {
    "twentyfourseven": true,           // "Station availability", indicates whether
the station is always available (24/7)
    "regular_hours": [
        {
            "weekday": 1,           // Monday
            "period_begin": "starting time in 24-hour format convention",
            "period_end": "closing time in 24-hour format convention "
        },
        {
            "weekday": 2,           // Tuesday
            ...
        }
    ],
    "exceptional_closings": [
        {
            "period_begin": "2024-06-02T00:00:00Z",
            "period_end": "2024-06-02T23:59:59Z"
        }
    ]
},
"images": [
    {
        "url": "image url",
        "thumbnail": "thumbnail url",
        "category": "image category",
        "type": "image format (file extension)",
    }
]

```



```
        "width": 1920,  
        "height": 1080  
    },  
    ],  
    "facilities": [  
        "facilities to which the charging station belongs"  
    ],  
    "time_zone": "IANA tzdata's TZ timezone value",  
    "last_updated": "2015-06-29T20:39:09Z"  
}
```