
Intelligentni transportni sistemi - Specifikacije za izmenjavo podatkov DATEX II pri upravljanju prometa in informiranju - 10. del: Publikacije o energetske infrastrukturi

Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 10: Energy infrastructure publications

Intelligente Verkehrssysteme - Datex-II-Datenaustauschspezifikationen für Verkehrsmanagement und Verkehrsinformationen - Teil 10: Energieinfrastruktur Publikation

Systèmes de transport intelligents - Spécifications DATEX II d'échange de données pour la gestion du trafic et l'information routière - Partie 10: Publication de infrastructure énergétique

Ta slovenski standard je istoveten z: FprCEN/TS 16157-10

ICS:

35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport
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kSIST-TS FprCEN/TS 16157-10:2026 **en,fr,de**

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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

FINAL DRAFT
FprCEN/TS 16157-10

June 2026

ICS

English Version

**Intelligent transport systems - DATEX II data exchange
specifications for traffic management and information -
Part 10: Energy infrastructure publications**

Systèmes de transport intelligents - Spécifications
DATEX II d'échange de données pour la gestion du
trafic et l'information routière - Partie 10: Publication
de infrastructure énergétique

Intelligente Verkehrssysteme - Datex-II-
Datenaustauschspezifikationen für
Verkehrsmanagement und Verkehrsinformationen -
Teil 10: Energieinfrastruktur Publikation

This draft Technical Specification is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/TC 278.

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Ref. No. FprCEN/TS 16157-10:2026 E

Contents	Page
European foreword	4
Introduction.....	5
1 Scope	6
2 Normative references.....	7
3 Terms and definitions	7
4 Symbols and abbreviations.....	8
5 Conformance.....	8
6 UML notation	9
7 «D2Namespace» EnergyInfrastructure	9
7.1 Overview.....	9
7.2 The Energy infrastructure table model	12
7.2.1 Overview.....	12
7.2.2 Energy infrastructure table publication	12
7.2.3 Energy infrastructure site	13
7.2.4 Energy infrastructure station.....	14
7.2.5 EnergyProduct	15
7.2.6 Refill point.....	16
7.3 The Energy infrastructure status model	21
7.3.1 Overview.....	21
7.3.2 Semantics.....	22
7.4 Electric charging equipment	23
7.5 Associated parking	24
7.6 Data types.....	24
Annex A (normative) Data Dictionary for «D2Namespace» AfirEnergyInfrastructure	26
A.1 Overview.....	26
A.2 Data Dictionary for "AfirEnergyInfrastructure"	27
A.2.1 "Classes" package.....	27
A.2.2 "EnergyInfrastructureStatusPublication" package.....	43
A.2.3 "EnergyInfrastructureTablePublication" package	46
A.3 Data Dictionary of <<D2Datatype>> for "AfirEnergyInfrastructure"	48
A.3.1 Introduction	48
A.3.2 The <<D2Datatype>> "Ampere"	48
A.3.3 The <<D2Datatype>> "Bar"	48
A.3.4 The <<D2Datatype>> "GramsPerKilowattHour"	48
A.3.5 The <<D2Datatype>> "KilogramPerDay"	48
A.3.6 The <<D2Datatype>> "Units"	48

A.3.7	The <<D2Datatype>> "Volt"	48
A.3.8	The <<D2Datatype>> "Watt"	48
A.4	Data Dictionary of <<D2Enumeration>> for "AfirEnergyInfrastructure"	48
A.4.1	Introduction	48
A.4.2	The <<D2Enumeration>> "AuthenticationAndIdentificationEnum"	48
A.4.3	The <<D2Enumeration>> "BioethanolTypeEnum"	49
A.4.4	The <<D2Enumeration>> "ChargingModeEnum"	50
A.4.5	The <<D2Enumeration>> "ChargingPointUsageTypeEnum"	50
A.4.6	The <<D2Enumeration>> "ConnectorFormatTypeEnum"	51
A.4.7	The <<D2Enumeration>> "ConnectorTypeEnum"	51
A.4.8	The <<D2Enumeration>> "CurrentTypeEnum"	54
A.4.9	The <<D2Enumeration>> "DeliveryUnitEnum"	54
A.4.10	The <<D2Enumeration>> "DieselVehicleTypeEnum"	54
A.4.11	The <<D2Enumeration>> "ElectricEnergySourceTypeEnum"	54
A.4.12	The <<D2Enumeration>> "EnergyInfrastructureSiteTypeEnum"	55
A.4.13	The <<D2Enumeration>> "GasConnectorTypeEnum"	55
A.4.14	The <<D2Enumeration>> "HydrogenFuellingProcessProtocolEnum"	56
A.4.15	The <<D2Enumeration>> "HydrogenRefuellingModeEnum"	56
A.4.16	The <<D2Enumeration>> "OctaneTypeEnum"	57
A.4.17	The <<D2Enumeration>> "PetrolTypeEnum"	57
A.4.18	The <<D2Enumeration>> "PriceTypeEnum"	57
A.4.19	The <<D2Enumeration>> "RatePolicyEnum"	58
A.4.20	The <<D2Enumeration>> "RefillPointStatusEnum"	58
A.4.21	The <<D2Enumeration>> "ReservationTypeEnum"	59
A.4.22	The <<D2Enumeration>> "ServiceTypeEnum"	59
A.4.23	The <<D2Enumeration>> "SmartRechargingServicesEnum"	60
A.4.24	The <<D2Enumeration>> "UserTypeEnum"	60
A.4.25	The <<D2Enumeration>> "VehicleToGridCommunicationTypeEnum"	61
	Bibliography	63

FprCEN/TS 16157-10:2026 (E)**European foreword**

This document (FprCEN/TS 16157-10:2026) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

This document will supersede CEN/TS 16157-10:2022.

FprCEN/TS 16157-10:2026 includes the following significant technical changes with respect to CEN/TS 16157-10:2022:

- adding elements to provide support for COMMISSION IMPLEMENTING REGULATION (EU) 2025/655 - Rules for the application of Regulation (EU) 2023/1804 of the European Parliament and of the Council as regards specifications and procedures relating to the availability and accessibility of data on alternative fuels infrastructure
- introducing the new namespace AfirEnergyInfrastructure (aegi) because of non-backwards compatible model changes
- further model improvements
- correction of different bugs.

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Introduction

This document defines a common set of data exchange specifications to support the vision of a seamless interoperable exchange of road traffic and travel information across boundaries, including national, urban, interurban, road administrations, infrastructure providers and service providers. Standardisation in this context is a vital constituent to ensure interoperability, reduction of risk, reduction of the cost base, promotion of open marketplaces and many social, economic and community benefits to be gained from more informed travellers, network managers and transport operators.

Deploying intelligent transport systems in line with European Sustainable and Smart Mobility Strategy as issued by the European Commission requires co-ordination of traffic management operation and development of seamless pan-European information services. These jointly aim at contributing to the transformation of the European transport system for the objectives of efficient, safe, sustainable, smart and resilient mobility.

In this context the European Commission has been supporting the development of information exchange between the actors of road traffic management and related services for several years. In the road sector, DATEX II has been long in fruition, with the European Commission being fundamental to its development through an initial contract and subsequent co-funding of the further evolution of the standard and user support ecosystem. With this standardisation of DATEX II, there is a real basis for common exchange between the actors of the traffic and travel information sector both in the collaboration between traffic management organisations and their systems, as well as in coherent information provision to service providers. DATEX II supports the requirements of the stakeholder organisations involved in the road traffic and travel domain in compliance with the EU policy and legal frameworks aimed at the sector.

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1 Scope

This document specifies two publication sub-models within the DATEX II framework that support the publication of information on infrastructure for vehicle energy supply. The provided data model is separated into two publications for static and dynamic information. The static information regarding the infrastructure is not subject to frequent changes, whereas the dynamic part offers the ability to provide highly up-to-date information. The static part covers all relevant information on vehicle energy infrastructure, e.g. sites, stations and refill points for electric vehicles as well as petrol, gasoline or gas-based refuelling for vehicles. In terms of dynamic information, the availability of the infrastructure, possible faults and a price indication are covered.

In normative Annex A, the data dictionary for the «D2Namespace» AfirEnergyInfrastructure is specified.

These publications are intended to support the exchange of informational content from road traffic authorities issuing traffic regulation orders and organisations implementing these orders to other organisations providing ITS services or onward information exchange.

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2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16157-1:2018, *Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 1: Context and framework*

EN 16157-2:2019, *Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 2: Location referencing*

EN 16157-7:2018, *Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 7: Common data elements*

CEN/TS 16157-12,¹ *Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 12: Facility related publications*

ISO/IEC 19505-1:2012, *Information technology - Object Management Group Unified Modeling Language (OMG UML) - Part 1: Infrastructure*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16157-1, EN 16157-2 and EN 16157-7 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1

connector

type and form of the piece that is used to connect a charging point to a vehicle or vice versa

Note 1 to entry: It requires a matching socket.

3.2

electric charging point

technical infrastructure at a specific location that facilitates electric charging of one vehicle at a time

3.3

energy infrastructure site

location and corresponding constructions where vehicles can be refilled and other services (parking, shopping, etc.) may be offered

3.4

energy infrastructure station

part of an energy infrastructure site that offers at least one refilling option (e.g. fuel, gas, electricity, ...)

¹ Under preparation. Stage at the time of publication: FprCEN/TS 16157-12.

FprCEN/TS 16157-10:2026 (E)

3.5

fault

information about a malfunction relating to a specific piece of equipment or process

3.6

refilling

process of transferring energy from a refill point to a vehicle, regardless of the type of energy; replaces the terms "fuelling" and "charging"

3.7

refill point

technical infrastructure at a specific location that facilitates an energy refilling process being connected to max. one vehicle at a time

4 Symbols and abbreviations

AC	Alternating Current
DC	Direct Current
CEE	Commission on the Rules for the Approval of the Electrical Equipment
CCS	Combined Charging Solution
CNG	Compressed Natural Gas
EV	Electric Vehicle
IEC	International Electrotechnical Commission
kWh	Kilo Watt Hours
LPG	Liquefied Petroleum Gas
MCS	Megawatt Charging System
NFC	Near Field Communication
PLC	Powerline Communication
RFID	Radio-Frequency Identification
SAE	Society of Automotive Engineers
UML	Unified Modeling Language
URL	Uniform Resource Locator
XML	eXtensible Markup Language

5 Conformance

This document specifies DATEX II infrastructure for vehicle energy supply, except for the elements that relate to location information which are specified in EN 16157-2:2019, the common elements (i.e., shared between several publications) which are defined in EN 16157-7:2018 and facility information which is specified in CEN/TS 16157-12²

² Revision in preparation

The DATEX II platform independent data model, of which this publication sub-model is a part, corresponds to the level A model as defined in EN 16157-1.

Conformance with this Part shall require platform independent models from which platform specific models are generated to comply with the UML modelling rules defined in EN 16157-1 and with the following requirements of the models which are expressed in this part.

6 UML notation

The UML notation used in these Technical Specifications shall be as described in ISO/IEC 19505-1.

NOTE Some introductory guides to UML 2 are provided in the Bibliography of EN 16157-1:2018

7 «D2Namespace» EnergyInfrastructure

7.1 Overview

The namespace "EnergyInfrastructure" shall specify a data model with details of infrastructure for vehicle energy supply. The approach is to provide all necessary details for all kinds of energy types (fuels, gases, hydrogen and electricity). The core concept (see Figure 2) was derived from ISO/TS 21219-25 [7].

Three core elements define the model:

- «D2Class» "EnergyInfrastructureSite" represents an energy infrastructure site, i.e. a site where vehicles can refill energy. It is described by a number of properties and parameters like for example its included energy infrastructure stations, operation hours or its location.
- «D2Class» "EnergyInfrastructureStation" represents an energy infrastructure station that is located on an energy infrastructure site. The station is the location on the site where the refilling can be carried out. For fuels, it usually offers different kinds of petrol (super, regular) and diesel. For electro mobility, it may offer different kind of connectors. Furthermore, it may offer options for the client to pay for the product (energy) they refilled.
- «D2Class» "RefillPoint" represents a refill point that is part of an energy infrastructure station. A refill point is defined by its ability to charge one vehicle at a time by establishing a connection between the station and the vehicle. In most cases, a refill point is specialised to only be able to provide one kind of energy.

These three classes shall all be a specialization of the «D2Class» "Facility" from «D2Namespace» Facilities defined in CEN/TS 16157-12. This implies, that these classes inherit a number of facility properties, like being versioned identifiable, operating hours, rates, URLs, information about operator and owner and more.

EXAMPLE: Figure 1 shows the core elements of an energy infrastructure site at the example of electric charging. Note that ElectricChargingPoint is a specialisation of RefillPoint, and connectors are only available for electric charging points, not for other types of refill points.

EnergyInfrastructureSite

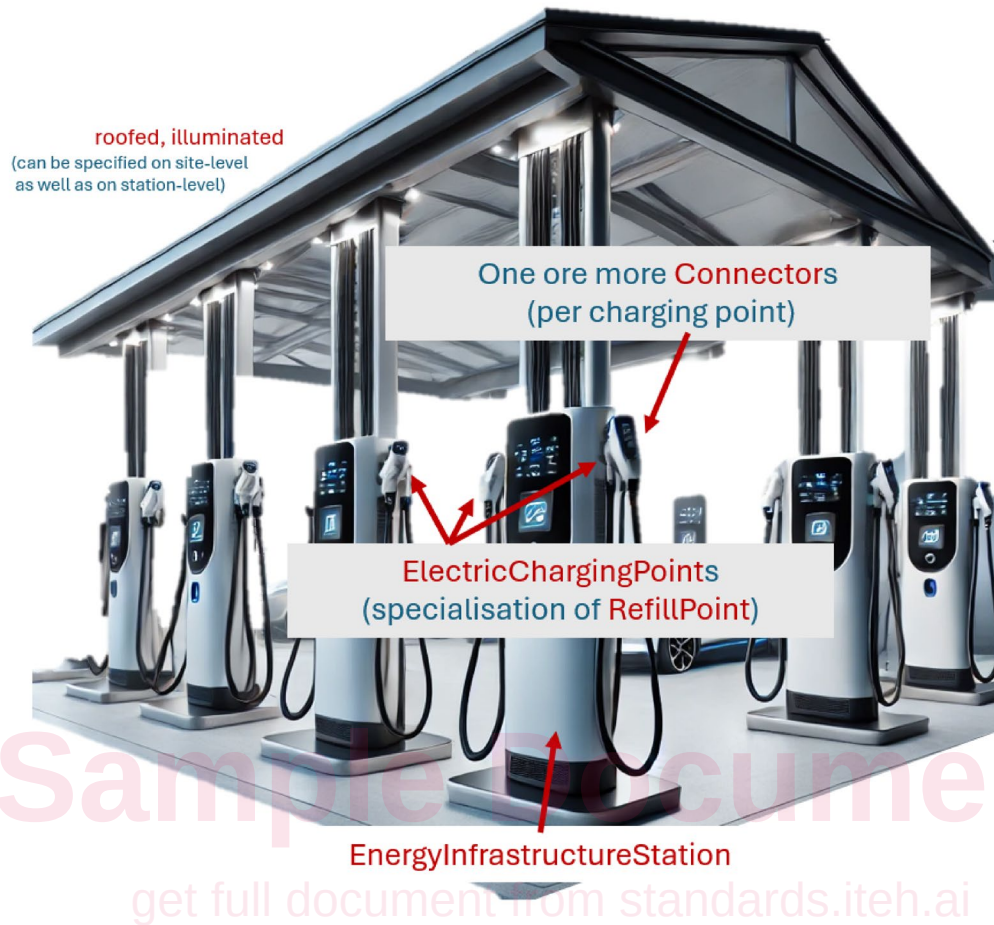


Figure 1 — Core elements of an energy infrastructure site on the example of electric charging

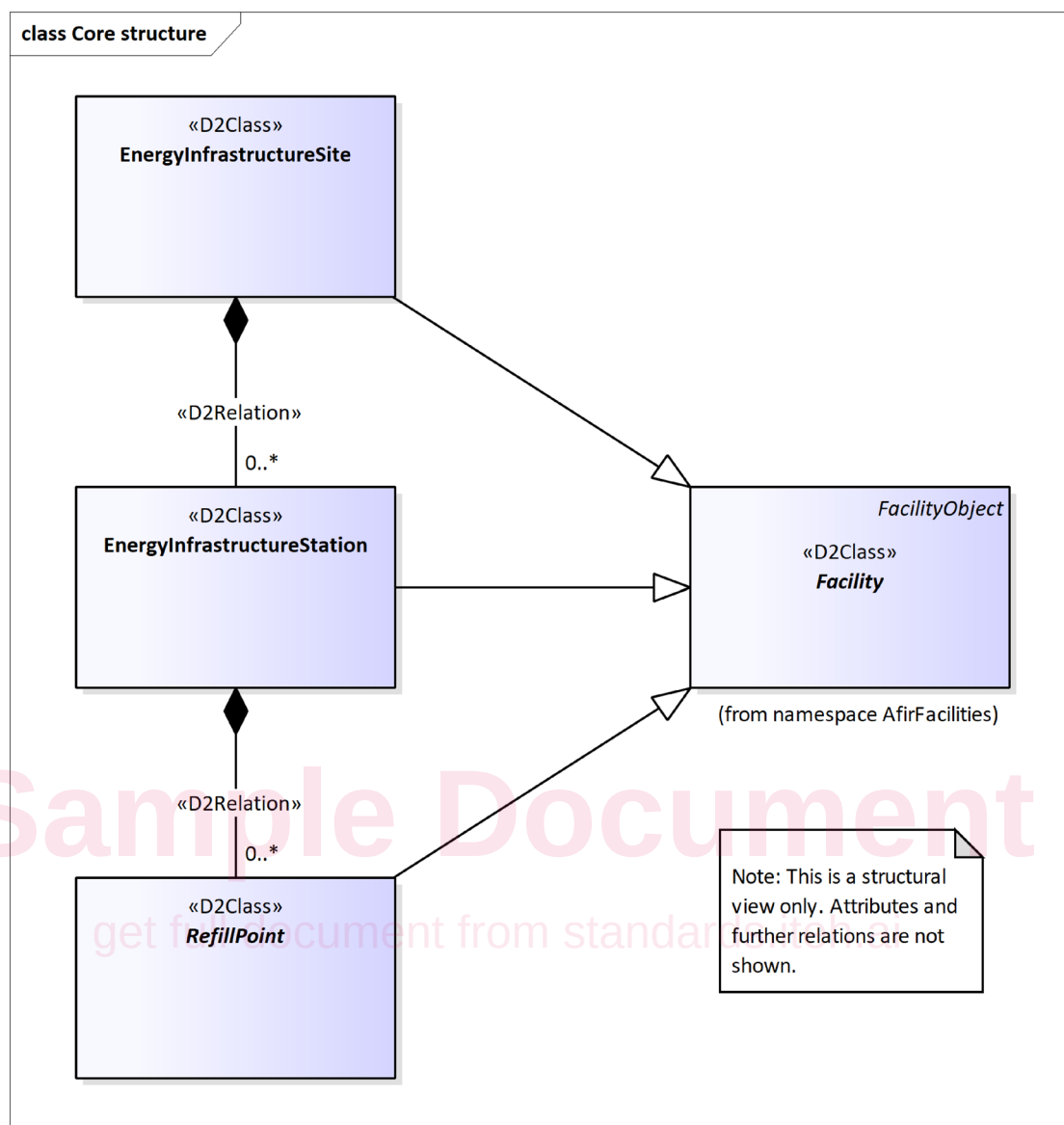


Figure 2 — The core structure of the Energy Infrastructure Publication

The «D2Namespace» "AfirEnergyInfrastructure" shall be immediately subordinate to the "PayloadPublication" package defined in EN 16157-7 and shall comprise:

- the «D2Package» "EnergyInfrastructureTablePublication" (see 7.2);
- the «D2Package» "EnergyInfrastructureStatusPublication" (see 7.3);
- and, in addition, the classes, data types and enumerations specific for these payload publications.

The prefix of the namespace shall be "aegi".

Some of the packages and individual classes used within the "AfirEnergyInfrastructure" namespace reside in the namespaces "Common" and "LocationReferencing" defined in EN 16157-7 and EN 16157-2. Some other elements reside in the «D2Namespace» "AfirFacilities" that is specified in CEN/TS 16157-12.

The classes, attributes, data types and enumerations that are specific to the namespace "AfirEnergyPublication" are defined in the normative Annex A. The XML schema corresponding to this document is provided in the normative Annex B.

FprCEN/TS 16157-10:2026 (E)

7.2 The Energy infrastructure table model

7.2.1 Overview

The Energy infrastructure table model shall be located in the «D2Package» "EnergyInfrastructureTable Publication" and define a model for publishable information on sites where vehicles can be refilled with energy. The corresponding publication contains information designated for low exchange-rate communication.

7.2.2 Energy infrastructure table publication

7.2.2.1 Overview

The «D2Class» "EnergyInfrastructureTablePublication" class shall be a specialization of the "PayloadPublication" class defined in EN 16157-7 (see Figure 3). It shall comprise one or more instances of «D2VersionedIdentifiable» "EnergyInfrastructureTable".

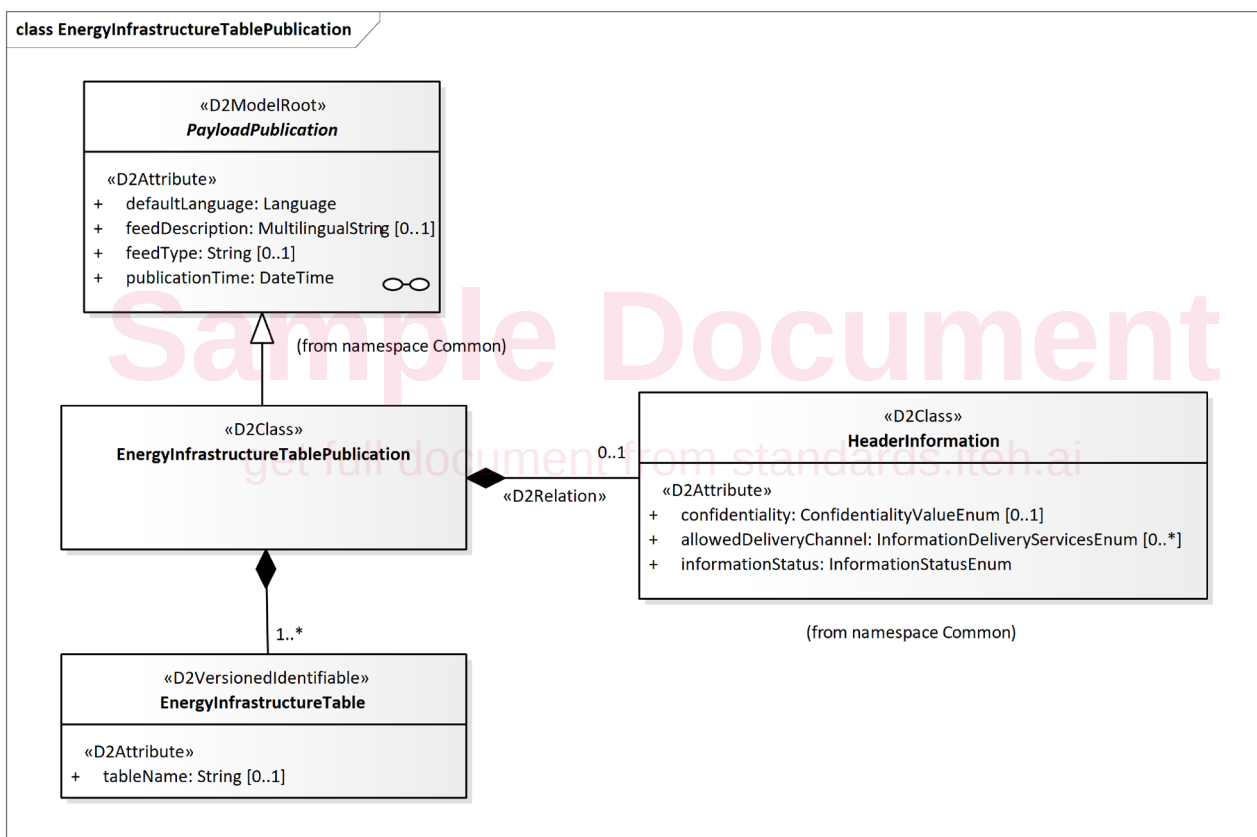


Figure 3 — EnergyInfrastructureTablePublication class and associated classes

7.2.2.2 Semantics

7.2.2.2.1 «D2Class» EnergyInfrastructureTablePublication

The "EnergyInfrastructureTablePublication" class is a specific realisable case of a "PayloadPublication" (defined in EN 16157-7). The "EnergyInfrastructureTablePublication" class is the base class for containing the published "EnergyInfrastructureTable".

7.2.2.2.2 «D2Class» HeaderInformation

The "HeaderInformation" class and its components is defined in EN 16157-7.

7.2.2.2.3 «D2VersionedIdentifiable» EnergyInfrastructureTable

Each instance of a “EnergyInfrastructureTable” comprises one or more instances of the “EnergyInfrastructureSite” class and may have associated metadata contained in an instance of the “HeaderInformation” class (defined in EN 16157-7), which allows the supplier of the “EnergyInfrastructureTable” to specify how the recipient should treat the information contained in it.

7.2.3 Energy infrastructure site

7.2.3.1 Overview

The «D2Class» “EnergyInfrastructureSite” is aggregated to the “EnergyInfrastructureTable” class (see Figure 4) and a specialization of the «D2Class» “Facility” from «D2Namespace» AfirFacilities defined in CEN/TS 16157-12. It shall comprise any number of instances of «D2Class» “EnergyInfrastructureStation” and shall have further aggregations to the «D2Class» Location as depicted in Figure 4.

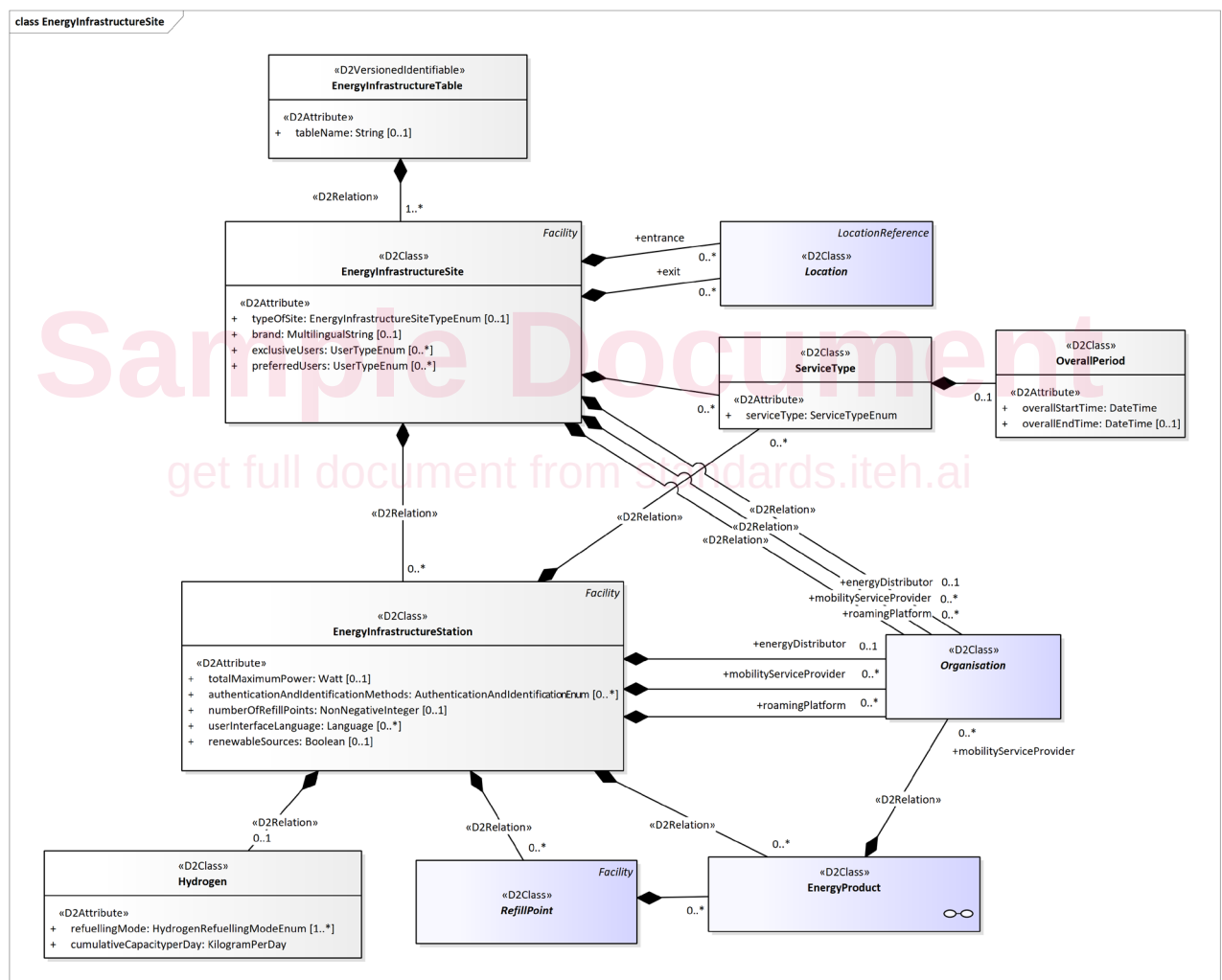


Figure 4 — EnergyInfrastructureSite and -Station and associated classes

7.2.3.2 Semantics

7.2.3.2.1 «D2Class» EnergyInfrastructureSite

The “EnergyInfrastructureSite” class shall provide information about a site which offers refilling of vehicles. By inheritance of the Facility class, a name or its location (including a physical address) may be