



Recommended identification schemes for the European energy industry

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1 INTRODUCTION

1.1 About this document

Electronic Data Interchange in the European energy industry needs common identification schemes to be effective. Market participants in a deregulated European energy market have a huge need for an automated and standardised information exchange. In order to do this, a reliable and unique identification scheme for such entities as parties, domains, installations and products are necessary. Among others the following items are important for an identification scheme:

- Identification numbers should not have any other meaning than the unique identification. All semantics (characteristics) should be stored as attributes to the object being identified.
- Identification numbers should not need renumbering when companies merge or split.
- Identification numbers may have a check digit to avoid typing errors.

This document describes two recommended identification schemes, the Energy Identification Code (EIC) and the GS1 coding scheme, which are the identification schemes recommended by ebIX[®] and ENTSO-E. These identification schemes have a format that makes them suitable for general electronic data interchange.

1.2 Change log

Ver.	Rel.	Rev.	Date	Changes
1	2	A	June 12 th 2012	<ul style="list-style-type: none"> • Updated national rules in Appendix D • Renamed ETSO to ENTSO-E • Referencing new options of EIC coding scheme in chapter 2 • Appendix B, description of EIC scheme, is now referencing the EIC web-site • Textual corrections
1	1	F	October 21 st 2011	<ul style="list-style-type: none"> • Addition of Energy, Reactive capacitive and inductive in Appendix C
1	1	E	April 12 th 2011	<ul style="list-style-type: none"> • National code usage in Appendix D is updated
1	1	D	September 7 th 2007	<ul style="list-style-type: none"> • National code usage in Appendix D is updated • EAN is renamed to GS1
1	1	C	June 15 th 2005	Textual corrections.
1	1	B	June 3 rd 2005	Correction of paragraph 1.2, Change log (this paragraph)
1	1	A	December 15 th 2004	Addition of a paragraph recommending only one identification number, used for all roles played in 2, Objects and numbering structures
1	0	A	June 31 st 2004	First approved version

2 OBJECTS AND NUMBERING STRUCTURES

There are a number of objects that need to be identified when exchanging business documents in the European energy domain, such as:

- A. Parties having one or more roles, such as System Operators, Traders, Producers and Consumers, Power Exchanges, Metering Point Administrators, Grid Operators and Balance Suppliers.
- B. Areas, e.g. Metering Grid Areas and Market Balance Areas.
- C. Metering Points, i.e. for the location of production units, consumption units, cross border connections, etc.
- D. Physical equipment, e.g. Meters, Registers and Busbars.
- E. Products.

Both the Energy Identification Code (EIC) and the GS1 coding schemes have different numbering structures for different objects to be identified. The following table shows which numbering structure to use for different objects:

Nature of object	Examples of objects	GS1	EIC
<i>Party</i>			
Party	Parties participating in the energy domain, such as grid companies, energy supply companies and metering companies.	GLN	EIC-X
<i>Domain</i>			
Area	Logical areas, such as Metering Grid Areas and Market Balance Areas.	GSRN	EIC-Y
Metering Point and Accounting Point	Logical entities where energy products are measured or computed.	GSRN	EIC-Z
<i>Installation</i>			
Installation (physical equipment)	Physical objects, such as Meters, Registers and Busbars (field buses).	GIAI	EIC-T EIC-V EIC-W
<i>Product</i>			
Product	Active energy, reactive energy, active power, connection capacity and transport capacity etc.	GTIN	

A successful identification scheme requires that the allocated codes are stable over time. This implies that the significance of a code should always remain constant.

The recommended principle is that a legal company should have one identification number, used for all roles played. However, a company may use different coding schemes (EIC or GS1) in different settings. Note that this only concerns identification of legal parties and not domains, such as balancing groups.

3 AGREEMENTS REGARDING IDENTIFICATION SCHEMES

3.1 ENTSO-E and ebIX[®]

The ETSO Steering Committee (Predecessor of ENTSO-E) and ebIX[®] have agreed that EIC and GS1 coding schemes shall be the preferred schemes for data interchange. All TSOs shall accept both the EIC and GS1 scheme for cross border information exchanges.

An overview of usage of identification schemes can be found in Appendix D.

Appendix A THE STANDARD GS1 NUMBERING STRUCTURES

A.1 Introduction

This appendix is a modified extract from the GS1 general specification, customised to the situation in the energy domain.

The GS1 system provides standard numbering structures for different applications. The application will determine how the number is to be used, but regardless of application each number must be used in its entirety and not broken down into constituent parts. The numbering structure guarantees worldwide uniqueness within the relevant area of application.

The main idea is that the identification of parties and locations are unique and as stable as possible over time. This is not only important for the issuer of the identifications, but also for his relations (trading partners).

Issuing bodies and other information related to the GS1 codes can be found at <http://www.gs1.org/>.

Definitions:

- Company prefix:** is assigned to each system user by a numbering organisation or UCC. The number of digits representing the company prefix may vary.
- Item reference:** is assigned by the system user. Rules for its allocation depend on the particular application.
- Check digit:** is used to check that the number is correctly composed.
- Application identifier 8018:** indicates that the data field contains a Global Service Relation Number.
- Service reference:** is assigned by the service provider (the body issuing the actual identification number). The structure and content of the service reference number is at the discretion of the particular service provider.

Note: These standard numbering structures guarantee unique identification within a particular area of application. Please note, for example, that trade items may have the same identification numbers as locations, and each system user must be able to control how data is used.

A.2 Global Location Number (GLN) in the energy domain

In the energy domain the GLN will be used to identify the parties (organisations).

The GS1 Global Location Number (GLN) makes possible the unique and unambiguous identification of physical or functional or legal entities. The GS1-13 standard numbering structure is used for this purpose and the represented numbers are non-significant. There is no restriction for the allocation of the same GS1-13 identification number to a trade item and a location.

Each party holding an GS1 company prefix may assign GS1 Global Location Numbers to its own locations. It is the responsibility of a company using GLNs to keep business partners informed of all numbers issued and its name and address details. Special care is needed if the ownership of the company changes.

The use of location numbers is a prerequisite for efficient Electronic Data Interchange. Special procedures may be applied to provide GS1 Global Location Numbers for small companies or businesses that have not been assigned a GS1 company prefix.

GS1 company prefix and Location reference	Check digit
N ₁ N ₂ N ₃ N ₄ N ₅ N ₆ N ₇ N ₈ N ₉ N ₁₀ N ₁₁ N ₁₂	N ₁₃

Note: The GLN uses the same structure as GS1-13 numbers for Global Trade Item Number (GTIN), but must be treated as a separate series of numbers.

A.3 Global Service Relation Number (GSRN) in the energy domain

In the energy domain the GSRN will be used to identify Metering Points.

The Global Service Relation Number (GSRN) may be used to identify the recipient of services in the context of a service relationship. It provides a unique and unambiguous identification number for the service provider to store data relevant to service(s) provided to the recipient. The GSRN is the key to access information stored on computer systems or reference information transferred via EDI.

The GSRN is a non-significant number used to identify a data base entry for recording recurring services. These services are considered activities carried out by a service provider for a service user, based upon a bilateral agreement. Consequently, the GSRN identifies a particular service arrangement with reference to a particular service provider and to a particular user. It may in some instances identify the user as a participant (member) in a programme or scheme. However, it never constitutes a person's personal identification number because it is always related to a given service arrangement.

It should be noted that the GSRN is not meant to identify a single service as a trade item. Neither is it used to identify a physical unit as a trade item but it may identify a physical unit for service purposes (for example a computer with a service agreement).

The GSRN is used to identify the recipient of services in the context of a service relationship.

GS1 company prefix and Service reference	Check digit
N ₁ N ₂ N ₃ N ₄ N ₅ N ₆ N ₇ N ₈ N ₉ N ₁₀ N ₁₁ N ₁₂ N ₁₃ N ₁₄ N ₁₅ N ₁₆ N ₁₇	N ₁₈

A.4 Global Trade Item Number (GTIN) in the energy domain

In the energy domain the GTIN will be used to identify product codes.

The GTIN is used for the unique identification of trade items worldwide. A trade item is any item (product or service) upon which there is a need to retrieve predefined information and that may be priced or ordered or invoiced at any point in any supply chain. This includes individual items as well as all their different configurations in different types of packaging. The GTIN is defined as a 13-digit number to accommodate all the different structures.

The following numbering structures provide unique number:

GS1-13 structure

GS1 company prefix and Item reference	Check digit
N ₁ N ₂ N ₃ N ₄ N ₅ N ₆ N ₇ N ₈ N ₉ N ₁₀ N ₁₁ N ₁₂	N ₁₃

Note: This is the file format for the GTIN that is used in all business transactions, especially electronic data interchange, e.g. orders, invoices, price catalogues. All numbers must be right justified in this 13-digit field.

A.5 Global Individual Asset Identifier (GIAI) in the energy domain

In the energy domain the GIAI will be used to identify Meters (serial number) and other components in the net.

The GS1 Global Individual Asset Identifier is used as an identification number of an individual asset (GIAI).

This element string may be used for the unique identification of assets to provide a means to store relevant data.

Note: This element string must never be used to identify the entity as a trade item or logistic unit. If an asset is transferred between parties the GIAI cannot be used for ordering the asset. However, the asset identification may be exchanged between parties for the purpose of tractability.

The GIAI may be up to 30 characters long. It may be alphanumeric.

Format of the element string				
Individual asset number				
GS1 company prefix		Individual asset reference		
$N_1 \dots$	N_i	$X_{i+1} \dots$	variable length	$X_{j (j \leq 30)}$

A.6 Allocating Global Location Numbers in the energy domain

General rule

GS1 Global Location Numbers can be used to identify anything that can be addressed. Some examples of this would include companies, departments, functions, rooms, factories, shelves, delivery points, EDI network addresses, etc. A separate unique number is required to identify each different location. Once assigned at source, i.e. in general by the party owning the location, the GS1 Global Location Number becomes a unique and universal reference that can be used by all.

Location changes

From time to time the details related to a GS1 Global Location Number may change. The location identified by the GS1 Global Location Number may change ownership or the address may close and the business carried out at that address may be transferred to a new address. The following are general cases on the use (re-use) of location numbers due to a change in the circumstances in which the number was originally set up.

If a function identified by a GS1 Global Location Number changes, the party responsible for the location number on the related computer file record should change the details associated with the GS1 Global Location Number.

A location number that has stopped being used should remain so for at least three years before being reallocated. The delay must allow time for all references of the old location number to be removed from trading partners' files. When the location number is re-used, the details relating to the new party and/or location must be retransmitted.

Recommendation on allocating Global Location Numbers

The exact method used to allocate the GS1 Global Location Number is at the discretion of the issuing organisation. The GLN must be unique for each individual location being identified.

For ease of administration, GS1 recommend that Global Location Numbers are allocated sequentially and do not contain ‘classifying’ elements.

Information associated with a Global Location Number

The characteristics of a party or location should be established on a computer file using the GS1 Global Location Numbers as the key to the information.

An example of the type of information held would be the full name and address of the party, bank details and account number, sales department dealing with the party, profile of a company, etc.

A.7 Allocating Global Service Relation Number (GSRN) in the energy domain

General rule

The Global Service Relation Number can be used to identify any service relationship. A separate unique number can be issued, normally by the service provider, to identify any given service relationship. Once assigned the GSRN becomes a unique and universal reference that can be used by all.

Changes in a service relationship

From time to time the details related to a GSRN may change. The following are general cases, which may occur if the circumstances under which the GSRN was originally set up change:

- If the activity covered by the GSRN is transferred, the new service provider may continue to use the existing GSRN, but should allocate further GSRNs from their own number bank.
- If the range of services identified by a GSRN changes, the service provider should change the details associated with the GSRN on the related computer file record. The assignment of a new GSRN is not required in this case.
- A GSRN used to identify a particular service relationship that has terminated should not be reallocated for a period well beyond the lifetime of the relevant records.

Recommendation on allocating Global Service Relation Numbers

The exact method used to allocate the GSRN is left to the discretion of the issuing organisation. However, the GSRN must be unique for each individual service recipient and remain unique for a period well beyond the lifetime of the records relevant to the service relationship.

For ease of administration, GS1 recommend that GSRNs be allocated sequentially and do not contain ‘classifying’ elements.

Information associated with a Global Service Relation Number

The GSRN is a standalone element string. All information required by the service provider should be established on a computer file using the GSRN as the key to access the information. The type of information stored will be determined by the nature of the service relationship. Typical information would include the service recipients: full name and address, details on services rendered, etc.

A.8 Check Digit Calculations

The standard Check Digit Calculations of GS1 Numbering Structures is described below (see also http://www.gs1.org/barcodes/support/check_digit_calculator#how):

Digit positions																		
GSI-13						N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	N ₇	N ₈	N ₉	N ₁₀	N ₁₁	N ₁₂	N ₁₃
18 digits	N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	N ₇	N ₈	N ₉	N ₁₀	N ₁₁	N ₁₂	N ₁₃	N ₁₄	N ₁₅	N ₁₆	N ₁₇	N ₁₈
Multiply value of each position by																		
	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	
Accumulated results = Sum																		
Subtract the sum from nearest equal or higher multiple of ten = Check Digit →																	N ₁₃ or N ₁₈	

Example of a check digit calculation for the 18 digit field																		
Positions	N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	N ₇	N ₈	N ₉	N ₁₀	N ₁₁	N ₁₂	N ₁₃	N ₁₄	N ₁₅	N ₁₆	N ₁₇	N ₁₈
Number <i>without</i> check digit	3	7	6	1	0	4	2	5	0	0	2	1	2	3	4	5	6	
Step 1: Multiply by	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	
	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	
Step 2: Add up results to sum	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	
	9	7	18	1	0	4	6	5	0	0	6	1	6	3	12	5	18	= 101
Step 3: Subtract sum from nearest equal or higher multiple of ten (110) = Check digit (9)																		
Number <i>with</i> check digit	3	7	6	1	0	4	2	5	0	0	2	1	2	3	4	5	6	9

Appendix B ENERGY IDENTIFICATION CODING SCHEME - EIC

The Energy Identification Coding scheme, EIC, is documented at <http://www.eiccodes.eu/>.

Appendix C EBIX[®] PRODUCT CODES

8716867000030	Energy, Active	Energy, Active, kWh
8716867000047	Energy, Reactive	Energy, Reactive, kvarh
8716867000016	Power, Active	Power, Active, kW
8716867000023	Power, Reactive	Power, Reactive, kvar
8716867000054	Connection, Capacity	Connection, Capacity, A or kVA
8716867000061	Connection, Use	Connection, Use, kWh
8716867000078	Transport, Capacity	Transport, Capacity, kV
8716867000085	Transport, Use	Transport, Use, kWh
5410000100016	Natural gas	Natural gas
8716867000139	Energy, Reactive capacitive	Energy, Reactive capacitive, kvarh
8716867000146	Energy, Reactive inductive	Energy, Reactive inductive, kvarh

Measurement unit is only shown as an example, i.e. both kWh and MWh are allowed

For commercial use (bilaterally agreed) parties may define their own codes for products and services in addition to the generic product codes shown above.

For information exchange within the energy domain the generic codes shown above shall be the only codes used.

Appendix D OVERVIEW OF NATIONAL USAGE OF CODING SCHEMES

Country	Party	Domain	Installation
Austria	EIC	Derivative of the MeteringCode of VDE	N/A
Belgium	GS1 (on role level)	GS1 for the national downstream market for both electricity and gas.	N/A
Denmark	GS1 and EIC	GS1, EIC and national numbers for the national downstream market for both electricity and gas.	N/A
Estonia			
Finland	National code, GS1 and EIC	National code	N/A
Germany	GS1 (on role level) EIC (in gas only for allocation processes) National codes compatible with GS1 coding scheme (on role level)	<i>Metering point for electricity:</i> VDE-AR-N 4400 Messwesen Strom (Metering Code) <i>Metering point for gas:</i> DVGW (A) G2000 <i>Metered products:</i> OBIS-System (Power: DIN EN 62056-61:2007-06 OBIS - Object Identification System, Gas: DIN EN 13757-1:2003-03 EDI and Blue Book of DLMS UA) ¹ <i>Areas and Balance Groups:</i> EIC and national Codes (Gas) <i>Invoiced products:</i> national codes compatible with GTIN coding scheme	N/A
Netherlands	GS1	GS1 for the national downstream market for both electricity and gas. EIC is used where required by ENTSO-E.	N/A
Norway	GS1	GS1 (for all consumption Metering Points) and a national identification scheme combining Metering Grid Area and Supplier (when identifying Metering Grid Areas).	N/A
Poland ²	EIC	EIC	N/A
Slovenia	EIC (transmission level, market operator, energy exchange)	<i>Metering point:</i> <ul style="list-style-type: none"> • Distribution: proprietary coding scheme³ • Transmission: EIC <i>Metered products:</i> OBIS-System (DIN EN 62056-61:2002 OBIS - Object Identification System) – used internally by DSO/distribution utilities	GS1 - type 128 and proprietary coding schemes
Sweden	National code (Ediel-id)	GS1 is used for almost all Metering Points where a supply switch can occur. National codes are used for areas.	GS1 may be used for Meter no.
Switzerland	EIC	EIC for areas and for Metering Points a derivative of the MeteringCode of VDN	

¹ OBIS codes used can be found at <http://www.edi-energy.de/> in the document “OBIS-Kennzahlen-System”

² In Poland there is also national coding scheme existing for Parties, Domains and Assets used for local market purpose”

³ On-going migration project at distribution level for implementation of GS1 (GSRN) Metering Point identification