

SMIP-CR-027: Changes required to SMETS & GBCS to implement the CR titled ‘Tariff and Register Labels in SMETS’

NOTE: some parts of the ZSE specification relating to Price Labels are marked *‘provisional and not certifiable. This feature set may change before reaching certifiable status’*. Further, additional changes may have been made to the Mapping Table & GBCS before implementation. Thus, the specifics in this CR will need review before that implementation.

Background

Request For Change SMIP-CR-027 is to make the following data items available over the HAN: (1) label (or name) for the current tariff and (2) a label (or name) for each of the entries in the Tariff TOU Price Matrix / Tariff TOU Register Matrix, with those labels all having been set in the corresponding Set Tariff and Price Command issued by the Supplier.

Although not explicit in the RFC, this drafting provides the same labelling for Prices in the Secondary Tariff TOU Price Matrix / Secondary Tariff TOU Register Matrix, where the ESME is a twin element ESME. There is a single SMETS Tariff Switching Table on such variants and so a single Tariff and therefore single Tariff Label

There is no requirement in the RFC to display these items on meters, mandated IHDs or PPMIDs..

To align to the ZSE specification (which is the mechanism used to share the Labels over the Consumer’s HAN and that used to send the data to the GSME / GPF from the Supplier), this paper uses the terms:

- Tariff TOU Price Label Matrix (‘Price Labels’), for the names of the entries in the Tariff TOU Price Matrix, and
- Tariff Label, for the name of the overall Tariff.

Note that entries in the Tariff TOU Price Matrix map one-to-one to registers in the Tariff TOU Register Matrix.

Note that ZSE constrains Price Labels to at most 12 octets in length and Tariff Labels to 24 octets in length. Both must contain utf-8 encoded octet strings. The GBCS changes are specified accordingly.

Change Required

The changes required to SMETS are to insert the requirements for additional Configuration Data Items to the GSME, ESME and Twin Element ESME sections. See Annex A.

The change required to CHTS, to oblige the GPF to make this data available over the HAN, is to add ‘Tariff Label’ and ‘Tariff TOU Price Label Matrix’ to the list of GSME Proxy Log data items in section 4.5.3, maintaining alphabetical order in that list.

There are changes to GBCS to allow these additional data items to be sent to / from the ESME and GSME (see Annex B for detailed specification):

- Add 5 rows to the Mapping Table's Use Case Reference tab to create the additional 5 Use Cases, specifically:
 - Set Tariff and Price with labels
 - Set Price on GSME with labels change supported (GSME is required because the ZSE command to set Standing Charge also mandates the Tariff Label parameter)
 - Set Tariff and Price - Second Element with labels
 - Read Tariff Data with labels
 - Read Tariff Data - second element with labels
- Add 3 rows to the Mapping Table's SMETS Required Objects tab for the Tariff Label (Set Tariff and Price is future date-able, so there needs to be (1) a current label; (2) a not yet activated label and (3) an activation date-time)
 - TariffLabel.valueCurrent to the 'Read Tariff Data with labels' Use Case. To this row, add the link to the corresponding attribute 2 of the class 9000 DLMS object for the ESME Messages (so the current label) and to the *Read Attribute* and *Read Attribute Response* ZSE commands to read the *TariffLabel* attribute using the GSME Messages
 - TariffLabel.valueNext to the 'Set Tariff and Price with labels' Use Case. To this row, add the link to the corresponding attribute 4 of the class 9000 DLMS object (so the not-yet-activated label on the ESME) and to the *Tariff Label* parameter of the *PublishTariffInformation* ZSE command, and a *Default Response* ZSE command
 - TariffLabel.activationDateTime to the 'Set Tariff and Price with labels' Use Case. To this row, add the link to the corresponding attribute 6 of the class 9000 DLMS object (so the date-time at which it is to be activated on the ESME) and to the *Start Time* parameter of the *PublishTariffInformation* ZSE command.
- Add six rows to the Mapping Table SMETS Required Objects tab for the Tariff TOU Price Label Matrices (Set Tariff and Price is future date-able, so there needs to be (1) a current set of labels; (2) a not yet activated set of labels and (3) an activation date-time. This set of three needs repeating on a twin element ESME, hence six rows):
 - TariffTOUPriceLabelMatrix[1..n].valueCurrent to the 'Read Tariff and Price with labels' Use Case, where n = 4 for a GSME and 48 for an ESME. To this row, add the link to the corresponding attribute 2 of the class 9000 DLMS object for the ESME Messages (so the current labels) and to the *GetTierLabel* and *PublishTierLabels* ZSE commands for the GSME Messages
 - TariffTOUPriceLabelMatrix[1..n].valueNext to the 'Set Tariff and Price with labels' Use Case, where n = 4 for a GSME and 48 for an ESME.. To this row, add the link to the corresponding attribute 4 of the class 9000 DLMS object (so the not-yet-activated labels) and to the *TierLabel* parameter of the ZSE *PublishTierLabels* command, and a *Default Response* ZSE command

- TariffTOUPriceLabelMatrix[1..n].activationDateTime to the 'Set Tariff and Price with labels' Use Case, where n = 4 for a GSME and 48 for an ESME.. To this row, add the link to the corresponding attribute 6 of the class 9000 DLMS object (so the date-time at which it is to be activated) and add a note that this needs to use the GBZ Extended Header 'From Date Time' field (as per table 7.2.10d of GBCS). Note that the ZSE command has no activation date-time, hence the additional requirements for 'From Date Time' and the associated GBCS Section 10 requirement below. This is to ensure that tariff price labels change at the same time as the tariff changes, and so do not overwrite part of the existing tariff with incorrect details.
- SecondaryTariffTOUPriceLabelMatrix[1..4].valueCurrent to the 'Read Tariff and Price - Second Element with labels' Use Case (so an extra row in the SMETS Required Object tab of the Mapping Table). To this row, add the link to the corresponding attribute 2 of the class 9000 DLMS object (so the current labels)
- SecondaryTariffTOUPriceLabelMatrix[1..4].valueNext to the 'Set Tariff and Price - Second Element' Use Case. To this row, add the link to the corresponding attribute 4 of the class 9000 DLMS object (so the so the not-yet-activated labels)
- SecondaryTariffTOUPriceLabelMatrix[1..4].activationDateTime to the 'Set Tariff and Price - Second Element' Use Case. To this row, add the link to the corresponding attribute 6 of the class 9000 DLMS object (so the date-time at which it is to be activated).
- Update existing current Set Tariff and Price / Set Price / Read Tariff rows in the SMETS required objects tab of the Mapping Table to link to the additional Use Cases.

There are changes to the ZigBee Commands tab of the Mapping Table to reflect these additional data items in the GSME / GPF Message Templates (see Annex B). These are to create the 321 additional rows required for the additional GBZ Message Templates.

The preceding changes will create additional GSME and ESME Message Templates and Use Cases for the following Use Cases:

- Set Tariff and Price with labels
- Set Price on GSME with labels change supported (GSME is required because the ZSE command to set Standing Charge also mandates the Tariff Label parameter)
- Set Tariff and Price - Second Element with labels
- Read Tariff Data with labels
- Read Tariff Data - second element with labels

The additional Use Cases and Message Templates are at Annex C.

There are changes to section 10.4.2.11 of the GBCS (see Annex D for specific drafting):

- that GSME and GPF shall be able to store at least two instances of the PublishTierLabels command, current and next instance to be activated in the future [this is because Set Tariff and Price is future date-able and so the GPF needs to be able to hold a current and future version. Note the GSME is not required to display this data and but does need to store it since it is SMETS Configuration Data and can be read by the Supplier]
- that Price Labels shall only be changed by the GSME at the 'From Date Time' specified in the GBZ Extended Header for the ZSE PublishTierLabels command.
- in common with all other instructions in TOM Commands, changes to Tariff & Price Labels shall only be made by the GPF if and when it has confirmation from the GSME that the labels have been changed
- on receipt of a GetTierLabels command in a GBZ Command, the GSME / GPF shall respond with the currently active Tier Labels
- where a GSME or GPF is applying a PublishTariffInformation ZSE command from a GBZ payload, it shall not change the Tariff Label if the Tariff Label parameter in the command contains a single null character (0x00), so the ZSE octet string is 0x0100 (meaning a string of length one containing a single null character).

There are also changes to GBCS to allow the additional data to be shared over the HAN from GPF and ESME. These changes are additional rows in the embedded table at Section 7.4 of GBCS as detailed at Annex E.

Annex A: changes to SMETS

Insert the following sections in to SMETS:

4.6.4.34 Tariff Label

A label for the Tariff.

4.6.4.35 Tariff TOU Price Label Matrix

A 1 x 4 matrix containing labels corresponding to the entries in the Tariff TOU Price Matrix.

5.7.4.51 Tariff Label [INFO]

A label for the Tariff.

5.7.4.52 Tariff TOU Price Label Matrix [INFO]

A 1 x 48 matrix containing labels corresponding to the entries in the Tariff TOU Price Matrix.

5.13.1.4 Secondary Tariff TOU Price Label Matrix [INFO]

A 1 x 4 matrix containing labels corresponding to the entries in the Secondary Tariff TOU Price Matrix.

Annex B: changes to the Mapping Table

Add the nine yellow highlighted rows at the bottom of the SRO tab in the embedded file to the bottom of the SRO tab in the Mapping Table,

Add the five yellow highlighted rows at the bottom of the Use Case reference tab in the embedded file to the bottom of the Use Case reference tab in the Mapping Table.

Add the 321 yellow highlighted rows at the bottom of the ZigBee Commands tab in the embedded file to the bottom of the ZigBee Commands tab in the Mapping Table.

To update existing current Set Tariff and Price / Set Price / Read Tariff rows in the SMETS required objects tab of the Mapping Table to link to the additional Use Cases:

In column	For all cells containing	Append alt+enter plus
AJ	ECS01a Set Tariff and Price on ESME	ECS01e Set Tariff and Price on ESME with labels
AJ	ECS01c Set Tariff and Price on ESME secondary	ECS01f Set Tariff and Price on ESME secondary with labels
AH	ECS24 Read ESME Tariff Data	ECS24c Read ESME Tariff Data with labels
AH	ECS24b Read ESME Tariff Data - second element	ECS24d Read ESME Tariff Data - second element with labels
AM	GCS01a Set Tariff and Price on GSME	GCS01c Set Tariff and Price on GSME with labels
AM	GCS01b Set Price on GSME	GCS01d Set Price on GSME with labels change supported
AL	GCS21f Read GSME Tariff Data	GCS21k Read GSME Tariff Data with labels



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Annex C: resulting revised Use Cases and Message Templates

For the following Use Cases to reflect the Mapping Table changes

- Set Tariff and Price
- Set Tariff and Price - Second Element
- Set Price (GSME part is affected because the ZSE command to set Standing Charge also mandate the Tariff Label parameter)
- Read Tariff Data
- Read Tariff Data - second element

[DN: need to be generated when updated mapping table available]

Annex D – additional section 10.2.4.11 requirements

Add the following text at the end of Section 10.2.4.11 of the GBCS:

'GSME and GPF shall be able to store at least two instances of the *PublishTierLabels* command, the current and the next instance (to be activated in the future).

GSME shall only execute a *PublishTierLabels* command from a GBZ payload at the 'From Date Time' specified in the GBZ Extended Header for that command.

In common with all other instructions in TOM Commands, a GPF shall only process a *PublishTierLabels* command in a Command with GBZ Payload if and when it has confirmation from the GSME that the labels have been changed.

A GSME and a GPF shall respond to a *GetTierLabels* command from a GBZ payload with the labels it is currently making available over the SMHAN.

Where a GSME or a GPF is processing a *PublishTariffInformation* command from a GBZ payload, it shall not change the Tariff Label if the *Tariff Label* parameter in the command contains a single null character (0x00), so where the ZSE octet string is 0x0100 (meaning a string of length one containing a single null character).'

Annex E: additional rows required in the Section 7.4 embedded table

SMETS Device : ZigBee Smart Energy Device (Label)	Cluster	Client / Server	Command	Attribute Set	Attribute(s)	ZigBee Mandatory / Optional - informative	Notes - informative	GBCS /SMETS /CHTS ref - informative (SMETS reference if not explicitly stated)
ESME : Energy Services Interface (Electricity ESI Endpoint)	Price	Server	GetTierLabels			Optional	Tariff TOU Price Label Matrix	5.7.4.52
ESME : Energy Services Interface (Electricity ESI Endpoint)	Price	Server	PublishTierLabels			Optional	Tariff TOU Price Label Matrix	5.7.4.52
ESME : Energy Services Interface (Twin ESME primary/secondary ESI Endpoint)	Price	Server	GetTierLabels			Optional	Secondary Tariff TOU Price Label Matrix	5.13.1.4
ESME : Energy Services Interface (Twin ESME primary/secondary ESI Endpoint)	Price	Server	PublishTierLabels			Optional	Secondary Tariff TOU Price Label Matrix	5.13.1.4
GPF : Energy Services Interface (Gas ESI Endpoint)	Price	Server	GetTierLabels			Optional	Tariff TOU Price Label Matrix	4.6.4.35
GPF : Energy Services Interface (Gas ESI Endpoint)	Price	Server	PublishTierLabels			Optional	Tariff TOU Price Label Matrix	4.6.4.35