

## 1 Description of the use case

### 1.1 Name of use case

<i>Use case identification</i>		
<i>ID</i>	<i>Area Domain(s)/ Zone(s)</i>	<i>Name of use case</i>
BC01		Contracting Flexibility Representation - between Customer, Aggregator and BRP

### 1.2 Version management

<i>Version management</i>				
<i>Version No.</i>	<i>Date</i>	<i>Name of author(s)</i>	<i>Changes</i>	<i>Approval status</i>
0.1	2016-09-23	Kai Heussen	Annotation of required fields	draft
0.2	2016-09-28	D. Esteban M. Bondy	Importing the BC1 Use Case into the template	draft
1.0	2016-10-01	D.Esteban M. Bondy – Mads L. Petersen	Full description, including feedback and corrections from Insero.	
1.1	2016-10-24	Troels Lund Rasmussen	Added changes made on the WP4/5 workshop (2016-10-07)	
1.1	2016-11-11	Troels Lund Rasmussen	Added comments from Uptime and WP45 team 0 meeting	
1.1a	2016-11-17	Philip Douglass	Comment/suggestions connected to final review	
1.2	2016-11-29	Daniel Frederiksen	Implemented changes to sequence diagrams, added descriptions and corrections where needed.	
1.3	2016-12-13	Philip Douglass	Final Approval	Approved

### 1.3 Scope and objectives of use case

<i>Scope and objectives of use case</i>	
<i>Scope</i>	The scope of this use case encompasses the relationship between DER owners, aggregators and BRPs at the planning stage of contracting flexibility.
<i>Objective(s)</i>	The objective is to have the DER owners who want to provide flexibility to acquire an aggregator that represents them towards TSOs and DSOs. The aggregator should have an agreement with the BRP in order to provide services to the TSO.
<i>Related business case(s)</i>	

### 1.4 Narrative of use case

<i>Narrative of use case</i>
<i>Short description</i>

The DER owner requests representation from an aggregator. The aggregator prepares an offer, which the DER owner accepts. The aggregator then contacts the corresponding BRP for TSO services in order to represent the customer. For DSO services BRP's are not involved.

**Complete description**

A DER owner chooses to make their DER-flexibility available to the power system, and contacts an aggregator so they can be represented. The aggregator then requests access to probe the DER Capabilities and access to the customer meter data on the Data Hub. Based upon this data, the aggregator will prepare the terms and conditions for representation and send it to the customer. The customer accepts the offer by signing up with the aggregator. In the case where the customer was already attached to an aggregator, the new aggregator will request customer transfer from the old aggregator. The (new) aggregator contacts the BRP of the customer in order to inform it of the new representation. As a consequence of this procedure, the contracts CTR01 and CTR02 are established.

### 1.5 Key performance indicators (KPI)

<i>Key performance indicators</i>			
<i>ID</i>	<i>Name</i>	<i>Description</i>	<i>Reference to mentioned use case objectives</i>
1	Aggregator Changes	Number of DERs switching Aggregator during the demonstration.	

### 1.6 Use case conditions

<i>Use case conditions</i>
<b>Assumptions</b>
<ul style="list-style-type: none"> <li>- Assumes the existence of Data Hub (i.e. a Danish scenario)</li> <li>- Assumes a setup where aggregator must inform the corresponding BRPs of new customer representation (this might not be the case for DSO-services or in all countries)</li> </ul>
<b>Prerequisites</b>
<ul style="list-style-type: none"> <li>- The existence of a generic flexibility interface to the DER.</li> </ul>

### 1.7 Further information to the use case for classification / mapping

<i>Classification Information</i>
<b>Relation to other use cases</b>
IOP02; As a consequence of this procedure, the contracts CTR01 and CTR02 are established
<b>Level of depth</b>
High-level
<b>Prioritisation</b>
HS2
<b>Generic, regional or national relation</b>
National

<b><i>Nature of the use case</i></b>
Business
<b><i>Further keywords for classification</i></b>

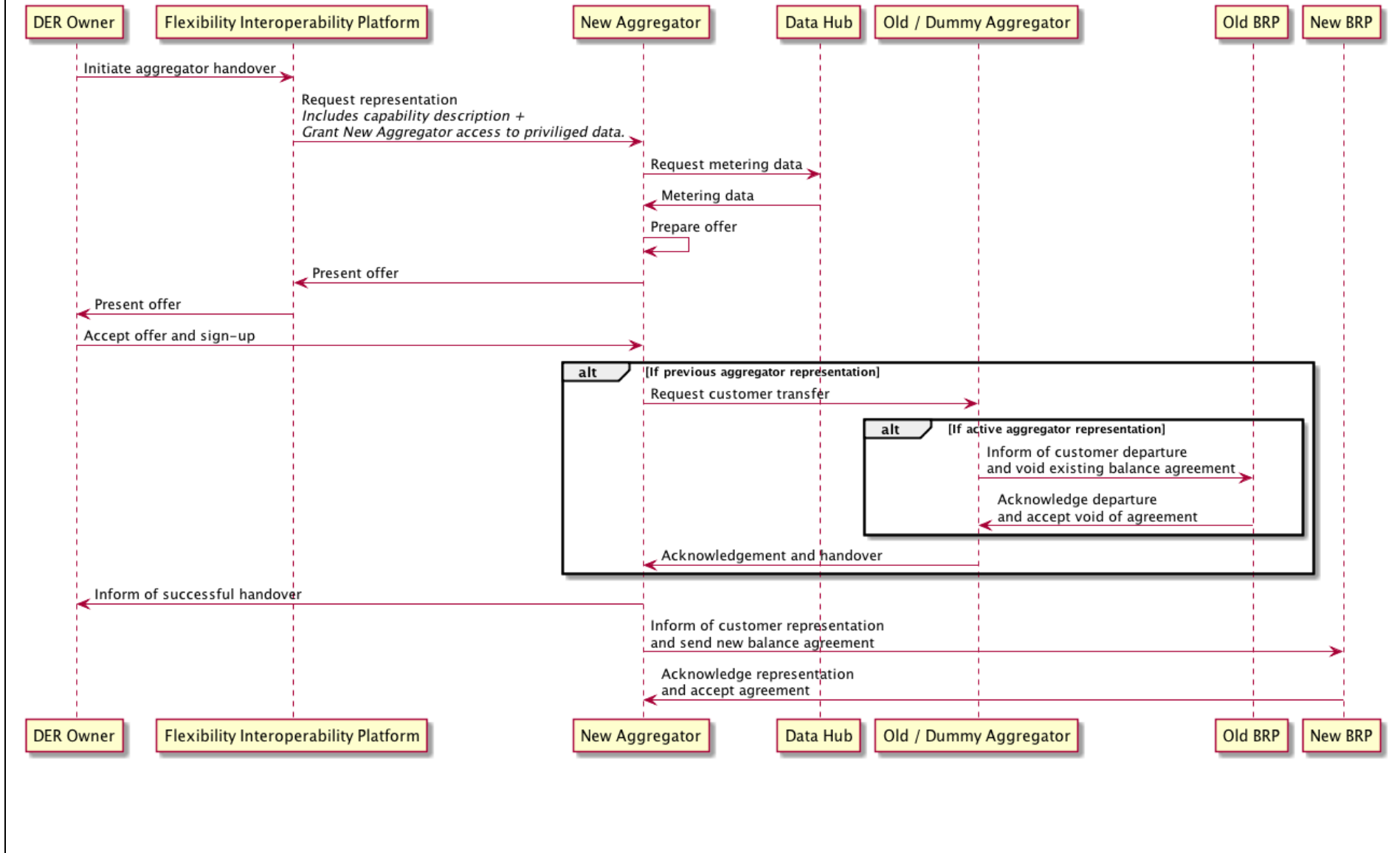
## 1.8 General remarks

<b><i>General remarks</i></b>
If the customer no longer wishes to participate in the flexibility market, the Flexibility Interoperability Platform (FIP) will offer a passive, dummy Aggregator that does no active flexibility trading or control. This dummy Aggregator will be the initial setting for all new customers. The dummy Aggregator will give the customer a choice of being represented by any BRP. The proposed dummy aggregator might be introduced as a role that the DER equipment manufacturers introduce, to facilitate an easy introduction to the FIP and FTP.

## 2 Diagrams of use case

<b><i>Diagram(s) of use case</i></b>
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### Change/Handover of flexibility representation



```
@startuml
title Change/Handover of flexibility representation
participant "DER Owner" as DEROWNR
participant "Flexibility Interoperability Platform" as FLEXIOP
participant "New Aggregator" as NEWAGGR
participant "Data Hub" as DATAHUB
participant "Old Aggregator" as OLDAGGR
participant "Old BRP" as OLDBRP
participant "New BRP" as NEWBRP
DEROWNR -> FLEXIOP : Initiate aggregator handover
FLEXIOP -> NEWAGGR : Request representation \n//Includes capability description + // \n//Grant New
Aggregator access to privileged data.//
alt If new trading aggregator
    NEWAGGR -> DATAHUB : Request metering data
    DATAHUB -> NEWAGGR : Metering data
    NEWAGGR -> NEWAGGR : Prepare offer
end
NEWAGGR -> FLEXIOP : Present offer
FLEXIOP -> DEROWNR : Present offer
DEROWNR -> NEWAGGR : Accept offer and sign-up
NEWAGGR -> OLDAGGR : Request customer transfer
alt If existing trading aggregator
    OLDAGGR -> OLDBRP : Inform of customer departure \nand void existing balance agreement
    OLDBRP -> OLDAGGR : Acknowledge departure \nand accept void of agreement
end
OLDAGGR -> NEWAGGR : Acknowledgement and handover
NEWAGGR -> DEROWNR : Inform of successful handover
alt If new trading aggregator
    NEWAGGR -> NEWBRP : Inform of customer representation \nand send new balance agreement
    NEWBRP -> NEWAGGR : Acknowledge representation \nand accept agreement
end
@enduml
```

### 3 Technical details

#### 3.1 Actors

<b>Actors</b>			
<b>Grouping</b>		<b>Group description</b>	
System		ICT System; exchanges between systems are "Messages"	
Role		Legal role or business actor	
<b>Actor name</b>	<b>Actor type</b>	<b>Actor description</b>	<b>Further information specific to this use case</b>
Aggregator	Role	Actor who manages pools of flexibility from DER to provide services to the grid operators.	
DER Owner (Customer)	Role	Owner of DER who offers flexibility to the system.	
BRP	Role	Balance responsible for the customer/DER.	
Data Hub (TSO)	System	System that collects all metering data. Managed by the TSO.	
Flexibility Interoperability Platform (FIP)	System	System that unifies different setups and handles communication between DER, Aggregator and customer. It allows the Aggregator to understand what are the capabilities of the DER unit	

#### 3.2 References

<b>References</b>						
<b>No.</b>	<b>References type</b>	<b>Reference</b>	<b>Status</b>	<b>Impact on use case</b>	<b>Originator / organisation</b>	<b>Link</b>

### 4 Step by step analysis of use case

#### 4.1 Overview of scenarios

<b>Scenario conditions</b>						
<b>No.</b>	<b>Scenario name</b>	<b>Scenario description</b>	<b>Primary actor</b>	<b>Triggering event</b>	<b>Pre-condition</b>	<b>Post-condition</b>
1	Change of flexibility representation	The process of the DER owner changing active	Aggregator	Customer requests representation to a new aggregator.	Customer already owns DER with flexibility interface and an existing	Existing contracts (CTR01 + CTR02) are void and new

		aggregator.			representation contract with an active trading aggregator.	contracts (CTR01 + CTR02) are established.
2	Acquisition of flexibility representation.	The process of the DER owner acquiring an active aggregator for being represented in the market as a flexibility provider.	Aggregator	Customer requests representation.	Same as in scenario 1 with the exception of the absence of an existing representation contract with an active trading aggregator.	The contracts CTR01 and CTR02 are established
3	Exit from flexibility representation	The process of the DER owner exiting the market as flexibility provider.	Aggregator	Customer requests to no longer be represented by any active aggregator, falling back to a passive dummy aggregator.	Same as scenario 1 except that the new aggregator is a passive dummy.	Existing contracts CTR01 and CTR02 are void.

#### 4.1 Steps – Scenarios

Scenario								
Scenario name :		Change of flexibility representation.						
Step No.	Event	Name of process/ activity	Description of process/ activity	Service	Information producer (actor)	Information receiver (actor)	Information exchanged (IDs)	Requirements R-ID
10		Initiate aggregator handover.	The DER owner initiates a request towards the FIP to facilitate an aggregator handover session.		DER owner	FIP	BC01-01	
11		Request representation	The FIP contacts the requested new active aggregator.	x	FIP	Aggregator	BC01-02	

			Included in the request is the DER capabilities and consent to access privileged data requested by the new aggregator.					
12		Request meter data.	The aggregator requests meter data from the DataHub, providing the consent delivered by the DER owner.	x	Aggregator	DataHub	BC01-03	
13		Meter Data	Meter Data is supplied by the DataHub for use by Aggregator.		DataHub	Aggregator	BC01-04	
14		Prepare offer	The aggregator evaluates DER capabilities and sourced privileged data to prepare an offer to the DER owner.		Aggregator	Aggregator		
15		Present offer	The aggregator replies the representation	x	Aggregator	FIP	BC01-05 (CTR02)	



			request session towards the FIP.					
16		Present offer	The FIP facilitates the presentation of the offer provided by the aggregator.		FIP	DER owner	BC01-06 (CTR02)	
17		Accept offer and sign-up	The customer accepts the offer and acknowledges the contract establishment.		DER owner	Aggregator	BC01-07 (CTR02)	
18		Request customer transfer	The new aggregator requests the old aggregator to acknowledge a customer transfer.		Aggregator	Aggregator (Old)	BC01-08	
19		Customer departure and void existing balance agreement	The old aggregator, if active trader, voids existing balance agreement with old BRP.		Aggregator (Old)	BRP (Old)	BC01-09 (CTR01)	
20		Customer departure accept and void of existing agreement	The old BRP acknowledge departure and void of contractual agreement.		BRP (Old)	Aggregator (Old)	BC01-10 (CTR01)	



## 5 Information exchanged

<i>Information Exchanged</i>			
<i>Information exchanged ID</i>	<i>Name of information exchanged</i>	<i>Description of information exchanged</i>	<i>Requirements IDs</i>
BC01-01	Handover request.	A query from the DER-owner to the FIP to initiate a handover to a new aggregator. Includes any necessary information to allow the Aggregator to facilitate the request for representation.	R01
BC01-02	Representation request	Standardized request from the DER-owner, facilitated through the FIP, for the Aggregator to initiate the gathering of information to prepare an offer for representation. Includes any necessary acceptance to gather related information in offer preparation.	
BC01-03	Meter Data Request	Supplying the previously acknowledged acceptance of access, the aggregator requests historical meter data from the DataHub, for use in representation and offer preparation.	
BC01-04	Meter Data	Meter Data, if available, is supplied based on valid request.	
BC01-05	Representation response	The aggregator replies the session request initiated in BC01-02, with either an acceptance or rejection, including additional related information, e.g. link to aggregator specific terms of agreement, etc. If accepted representation, the contractual agreement (CTR02), is to be established based in this response.	
BC01-06	Offer presentation	Through the standardized FIP the offer is presented to the DER-owner from where the formalities of the contractual foundation can be handed over in accordance to the DER-owner and aggregator established communication.	
BC01-07	Offer accept/reject	The DER-owner either accepts or rejects the offer presented. The communication is handed over directly between DER-owner and aggregator.	
BC01-08	Customer transfer request	The new aggregator requests the previous aggregator to handover customer representation, including reference to DER-owner consent.	

BC01-09	Old handover notification	BRP	Old aggregator informs BRP about DER-owner representation change and requests void of contractual agreement (CRT01).	
BC01-10	Old handover acknowledgement	BRP	The old BRP acknowledges contractual changes and void of old contract (CRT01).	
BC01-11	Customer transfer acknowledgement		The old Aggregator acknowledges handover request to new Aggregator.	
BC01-12	Offer acknowledgement		The new aggregator acknowledges the stages of handover and informs DER-owner of the final completion.	
BC01-13	New handover notification	BRP	New aggregator informs BRP about DER-owner representation change and requests negotiation of contractual agreement (CRT01).	
BC01-14	New handover acknowledgement	BRP	The new BRP acknowledges new DER-owner contractual agreement and new contract (CRT01).	

## 6 Requirements (optional)

<i>Requirements (optional)</i>		
<i>Categories ID</i>	<i>Category name for requirements</i>	<i>Category description</i>
<i>Requirement ID</i>	<i>Requirement name</i>	<i>Requirement description</i>
R01	Existing FIP interface	The customer must have a DER with a flexibility interface.

## 7 Common Terms and Definitions

<i>Common terms and definitions</i>	
<i>Term</i>	<i>Definition</i>

## 8 Custom information (optional)

<i>Custom information (optional)</i>		
<i>Key</i>	<i>Value</i>	<i>Refers to section</i>