Leneda

MARKET RULES

INSTITUT
LUXEMBOURGEOIS
DE REGULATION

Procedural Modalities for Data Exchange via the National Energy Data Platform

Author / Responsible Body: Creos Luxembourg S.A.

Legal Basis: Established in accordance with:

- Article 27ter of the amended Law of 1 August 2007 on the organisation of the electricity market
- Article 33(1)(g) of the amended Law of 1 August 2007 on the organisation of the natural gas market

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1 INTRODUCTION AND CORE CONCEPTS

1.1 PURPOSE AND SCOPE

The national energy data platform Leneda serves as the central data hub for communication in the Luxembourg electricity and gas market. Its primary purpose is to facilitate a standardized, transparent, and efficient exchange of information among all Market Actors. In contrast to previous decentralized point-to-point communication methods between individual *Market Actors* - as described, for example, in the *Code de Distribution du Gaz Naturel* (CDD) or the *Modell der Marktkommunikation Strom* (MdMS) - Leneda is now at the center of all message flows. This means that all interactions are routed centrally through Leneda, primarily via automated API calls.

This document provides a binding definition of the applicable *Market Rules*, *Market Roles*, *Business Scenarios*, and services, as well as the underlying *Data Objects* required for the interaction of all *Market Actors* with Leneda. A key objective in this regard is the harmonization of processes for electricity and gas to create a single, consistent *Market Communication* framework. This centralization and standardization aim to minimize data inconsistencies, simplify and accelerate processes for all Market Actors, and establish a single Source of Truth for data synchronization and for ensuring compliance with the applicable *Market Rules*.

Please note that the current version of the LMR does not yet fully cover all *Market Communication* processes. A detailed list of the specific electricity and gas processes not yet included is maintained in dedicated documents within the *Luxembourg Energy Forum*. Until these processes are incorporated into a future version of the LMR, the existing rules set forth in the MdMS and the CDD remain strictly valid and applicable.

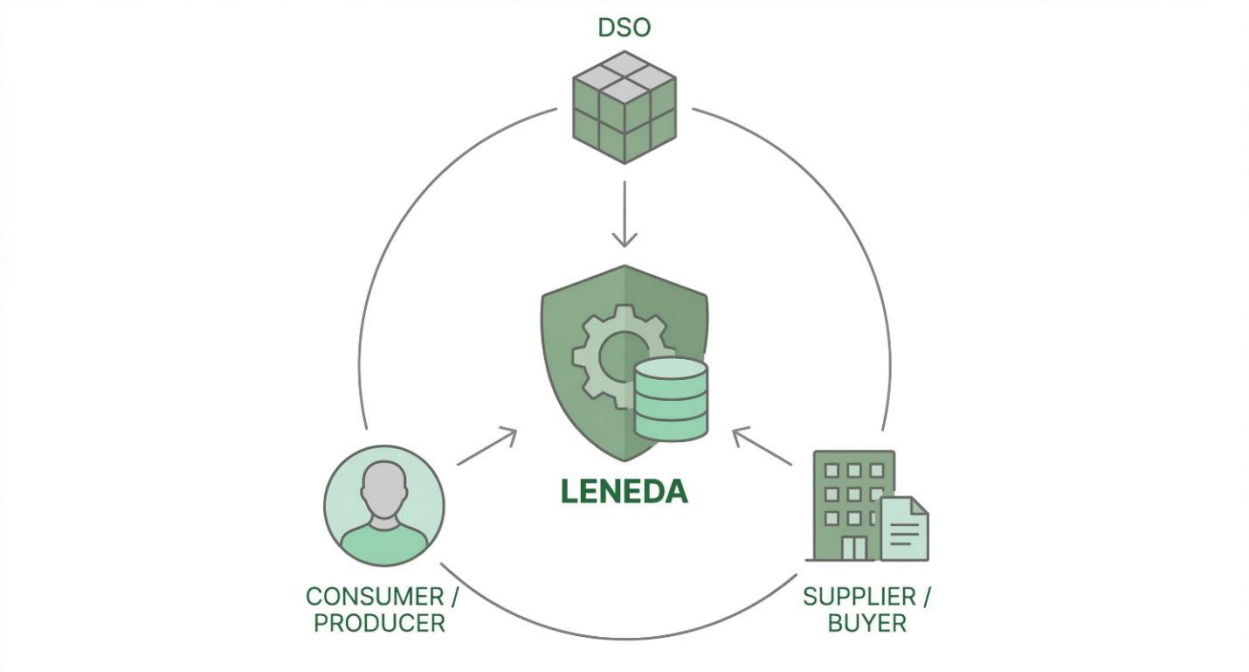


FIGURE 1: THE CENTRAL ROLE OF LENEDA

To present these aspects comprehensively, the document is structured as follows: Following this introduction, which covers the fundamental concepts, abbreviations, and glossary, the detailed Leneda

Data Model is presented. Building on this foundation, a description of the various *Business Scenarios* follows, explaining the covered energy industry business processes. The document concludes with a chapter on the services and technical implementation. Instead of listing individual API specifications, this section outlines the fundamental principles of data exchange via Leneda and establishes the binding reference to the external technical API documentation (e.g., *Swagger*) for concrete service definitions and validation logic.

1.2 Abbreviations and Glossary

To ensure a common understanding of *Market Communication* via Leneda, the most important terms and concepts are explained below. This section also establishes the official abbreviations for these terms, which are then used consistently throughout this document for clarity and brevity.

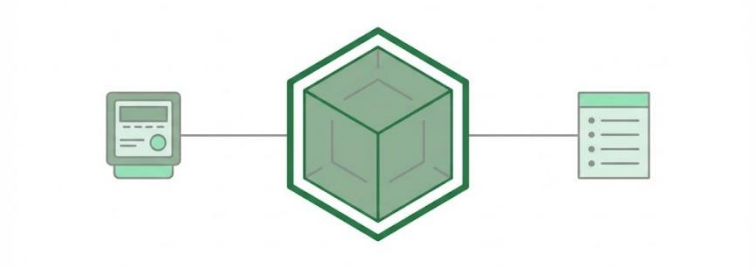
Abbreviations and Definitions

Abbreviation	***Definition***
API	*Application Programming Interface*
BC	*Balance Coordinator*
BRP	*Balance Responsible Party*
BS	*Basic Supply*
CCR	*ComRel linking MP with Customer*
CDD	*Code de Distribution du Gaz Naturel*
CM	*Customer Mandate*
coMP	*Consumption Metering Point*
ComRel	*Commercial Relationship in Leneda*
DaCR	*Commercial Relationship for specific Data Access*
DCR	*ComRel linking MP with DSO*
DSO	*Distribution System Operator*
EIC	*Energy Identification Code*
EID	*National Energy-Identification Number in Leneda*
EoFi	*End of Feed-In (can be extended with Feed-In Variant, e.g. EoRFi)*
EoS	*End of Supply (can be extended with Supply Variant, e.g. EoBS)*
fiMP	*Feed-In Metering Point*
FiR	*Feed-In Responsible*
GUI	*Graphical User Interface*
ILR	*Institut Luxembourgeois de Régulation*
LMR	*Leneda Market Rules*
MA	*Market Actor*
MaCo	*Market Communication*
MCS	*MaCo Services*
MdMS	*Modell der Marktkommunikation Strom*
MFi	*Market Feed-In*
MI	*Move-In*
MO	*Move-Out*
MP	*Metering Point*
MS	*Market Supply*
PPA	*Power Purchase Agreement*
RFi	*Regulated Feed-In*
RRM	*Remote Relay Module*
RS	*Replacement Supply*
SCR	*ComRel linking MP with Supplier / Buyer*
SG	*Energy Sharing Group (commonly: Sharing Group)*
SGR	*Sharing Group Responsible (also: Sharing Group Manager)*
SoFi	*Start of Feed-In (can be extended with Feed-In Variant, e.g. SoRFi)*

Abbreviation	*Definition*
SoS	*Start of Supply (can be extended with Supply Variant, e.g. SoBS)*
SSoT	*Single Source of Truth*
TSO	*Transmission System Operator*
UFi	*Uncompensated Feed-In*
VFi	*Vacancy Feed-In*
VS	*Vacancy Supply*

RELEVANT TERMS IN CONTEXT

The following section explains the most important terms and concepts used in these Leneda Market Rules. The definitions provide a compact explanation in the Leneda context and serve to establish a fundamental understanding. More detailed information can be found in the respective specialized chapters of this document.



TECHNICAL CORE OBJECTS AND METERING CONCEPTS

Active MP: An MP is considered *active* as soon as it is technically equipped for measurement (typically, a meter is installed and operational) and linked to a DSO via a valid DCR. While administrative market processes can be initiated prior to this state, an *active MP* is the prerequisite for the physical energy supply or feed-in and subsequent settlement. Consequently, an *active MP* without a valid SCR or CCR is automatically subject to *Vacancy Management*, as Leneda ensures that every active MP is continuously assigned to a *Balancing Perimeter*.

Auxiliary MP: A specific type of MP used solely for control, statistical, or internal measurement purposes (e.g., intermediate meters, control meters). Unlike regular MPs, an *auxiliary MP* does not require a *Supplier* or *Buyer* and therefore has no SCR. It is linked only to the DSO (via DCR) and the *Customer* (via CCR) who can be the owner of the site or the *Consumer*/*Producer* of the MP.

Balancing Perimeter: A virtual energy account representing the entirety of all supply and feed-in MPs under the responsibility of a specific BRP. This aligns with the legal definition of a “périmètre d'équilibre” pursuant to the amended law of 1 August 2007. Leneda ensures that every active MP is always assigned to a *Balancing Perimeter* to enable the net recording of energy flows.

Business Scenario: End-to-end business use case that includes the complete MaCo process handled via Leneda. Each Business Scenario is broken down into a sequence of individual components, which can represent system-side interactions (such as the execution of *Base Services* or MCS) as well as other business actions like the signing of contracts or *Customer* interactions.

Commercial Relationship (ComRel): A time-limited *Data Object* in Leneda that links a *Business Partner* to an MP. The type of ComRel (e.g., SCR for a *Supplier*, DaCR for specific data access) depends on the

Market Role of the associated *Business Partner*. It is the formal prerequisite for a *Business Partner* to act as an MA in its *Market Role* at the respective MP and defines the associated rights and obligations for the validity period of the relationship. A *Business Partner* can hold multiple ComRels of different types for one MP simultaneously to perform various *Market Roles* (e.g., the DSO in the case of VS being *Customer* and DSO).

Device: A physical or logical unit assigned to one or more MPs that is relevant for measurement (e.g., meter, *Smartmeter*, transformers), control (e.g., RRM), or data communication in the context of energy flows.

Flat-rate System: A specific type of MP without a physical meter, primarily used for historical public infrastructure (e.g., public lighting, sirens). Consumption is billed based on a fixed calculated arrangement. These systems represent legacy configurations intended to be progressively transitioned to metered connections.

Integrated Supply (Fourniture Intégrée): The standard supply and billing model in which the *Supplier* acts as the single point of contact for the *Customer*. Under this model, the *Supplier* pays the grid usage fees to the DSO and subsequently invoices the *Customer* for the combined total of both energy and grid costs.

Metering Concept: The framework and rules defining the logical relationship between physical *Devices* (specifically meters) and one or more MPs (coMP or fiMP). It describes how energy flows are measured at an installation. This concept also defines the technical or logical link between these MPs, which are then managed as *related MPs* (e.g., linking a CoMP to a FiMP in a *One-Meter Model*).

Metering Point (MP): A central, uniquely identified physical or virtual connection point in the energy grid for the supply or feed-in of electricity or gas. It serves as the primary anchor point for all associated data, relationships, and processes in Leneda.

Meter Reading: The cumulative numerical value (index) recorded by a *Register* at a specific point in time. In the Leneda context, these represent the raw data delivered by *Luxmetering*. As they reflect the continuous counter of the meter, *Meter Readings* are monotonously increasing (cumulative index curve), except in the event of a meter rollover.

One-Meter Model: A *Metering Concept* for a *Prosumer* installation where a single physical meter is linked to both a coMP and a fiMP. Leneda does not technically enforce that the coMP and the linked fiMP must be registered to the identical *Customer* (same EID). If an MA evaluates this data via Leneda and considers the mixed constellation to be incorrect or incompatible with their contractual requirements, it is the responsibility of the affected MAs to bilaterally clarify and resolve the situation in coordination with the respective *Customers*.

Pre-registered ComRel: A specific status for a ComRel that indicates it is provisional and can be automatically overwritten by a subsequent market process. This status applies exclusively to ComRels generated for *Vacancy Supply* or to EoS/EoFi notifications that have not yet been billed.

Register: A functional unit within a physical meter specifically used for capturing, counting, and storing measured values, which are processed and provided either as *Timeseries* or as *Meter Readings*.

Related MP: A relationship defined in Leneda that always links exactly one MP to another MP in a specific technical or logical connection. An MP can have multiple, independent relations to various other MPs. Such relationships are relevant, for example, in *Prosumer* installations to associate the fiMP with the coMP, or in more complex plant structures to represent their interconnection. Information about related MPs is typically viewable as *Market Data*.

Separate Grid Usage (Fourniture Simple): An alternative supply and billing model where the *Customer* maintains a separate grid usage contract directly with the DSO. Under this model, the *Customer* pays the grid usage fees directly and independently to the DSO, while the *Supplier* only invoices for the supplied energy.

Smart Meter: A digital *Device* for measurement. In the Luxembourg MaCo context, this refers to both electricity and gas meters. For electricity, *Luxmetering* reads energy values in 15-minute intervals, which are transmitted to Leneda, and supports remote control functions (e.g., *Power Reduction*, *Locking*). For gas, Luxmetering reads energy values in hourly intervals, which are typically transmitted via the paired electricity *Smart Meter*. Gas *Smart Meters* do not support remote control functions.

Timeseries: A chronological sequence of power values that represent measured or calculated values over a specific period at a defined interval and are used for billing, balancing, and analysis. Specifically, measured *Timeseries* are determined based on the delta of consecutive *Meter Readings*, while calculated *Timeseries* (e.g., for *Sharing Groups*) are computed based on these measured *Timeseries*.

Two-Meter Model: A *Metering Concept* for a *Prosumer* installation that uses two separate physical meters, for example one for household consumption and one for the generation unit. The meter for the generation unit is in turn linked to both a coMP (to measure its own consumption) and a fiMP (to measure the feed-in).

Virtual Register: A register logically defined at the MP whose values are not directly sourced from a single physical register but are typically calculated from the values of other registers or data sources.

Market Actors, Roles and Identification

Balance Coordinator (BC): A central role responsible for the administrative management, creation, and maintenance of *Balancing Perimeters* in Leneda.

Balance Responsible Party (BRP): The MA who bears the responsibility for allocating energy feed-in and supply within a virtual *Balancing Perimeter* assigned to them.

Business Partner: The central *Data Object* in Leneda that technically represents a natural or legal person and contains their master data. Each *Business Partner* is identified by its unique EID upon its creation. One or more *Market Roles* are assigned to a *Business Partner*.

Buyer: An MA who purchases and compensates for energy injected by a *Producer*. For this purpose, they hold an SCR with the *Producer's* fiMP. As authorized MA the *Buyer* can access relevant *Market Data* (e.g., for quotation purposes) without requiring a CM.

Consumer: A *Customer* in their role as a *Consumer* for one or more sectors, who withdraws energy from the supply grid at one or more MPs for their own use.

Customer: A business term describing an MA – the final customer - who acts as a *Consumer*, *Producer*, or *Prosumer* based on their assigned *Market Roles*.

Customer Mandate (CM): A time-limited, purpose-specific digital authorization created by Leneda and explicitly granted by a *Customer* to a specific MA. It allows the MA to access defined protected *Customer Data* or to execute processes requiring a mandate (e.g., SoS) on behalf of the *Customer*.

Distribution System Operator (DSO): The legal entity responsible for the secure operation, maintenance, and expansion of the energy distribution grid (electricity and gas) in a defined zone, as well as for meter data acquisition at the MPs, which in Luxembourg is largely carried out in cooperation with *Luxmetering* for the smart metering infrastructure.

Energy Identification Code (EIC): A standardized, cross-border identification code used throughout the European energy market to uniquely identify market participants, grid operators, and other entities. In Leneda, the EIC serves as a specific MaCo ID assigned to professional MAs (such as BRPs or *Suppliers*) to ensure seamless and unambiguous cross-system *Market Communication*.

Energy ID (EID): A unique national identification number assigned by Leneda to *Business Partners* - private individuals or organizations - during the initial onboarding process, used for system-wide identification in MaCo.

Institut Luxembourgeois de Régulation (ILR): The national regulatory authority, which, as an MA, has access to defined statistics and reports in Leneda.

Market Actor (MA): The business term for a *Business Partner* who has been assigned at least one active *Market Role*. The *Market Roles* define the specific rights and obligations of the MA in the energy market.

Market Role: A sector-specific function defined in Leneda (e.g., DSO, *Supplier*, *Producer*) that is assigned to a *Business Partner*. The *Market Role* determines the permissions and obligations that an MA has within the system and its associated market processes.

Leneda Agent: A designated representative of the *Leneda Operator* responsible for executing manual administrative tasks, complex corrections, and verifications on the platform.

Leneda Operator: The neutral, central administrative body responsible for platform-level tasks and manual interventions, acting through dedicated *Leneda Agents*.

Luxembourg Energy Forum: The central platform where modifications, updates, and major revisions to the LMR are published, discussed, and reviewed by the MAs and the ILR.

Luxmetering: A *Groupement d'Intérêt Économique* (GIE) founded by all Luxembourgish electricity and gas DSOs to act as their common operator. Luxmetering is responsible for managing the central system

that collects, processes, and transmits the data from all *Smart Meters* in Luxembourg on behalf of the DSOs. It also serves as the connected system Leneda interacts with for remote *Smart Meter* functions.

Preferred Buyer: A *Buyer* with whom a *Customer* has a prior contractual agreement that authorizes Leneda to automatically assign the feed-in of the MP to them. This automatic assignment to a *Market Feed-In* is carried out in the event of a *Vacancy*, provided the *Customer* is registered as the FiR at the MP. During *Move-In* processes, this setup bypasses the *Selection of a Buyer* and enables a fast lane assignment without an explicit SoFi requested.

Preferred Supplier: A *Supplier* with whom a *Customer* has a prior contractual agreement. As part of this agreement, the *Customer* grants the *Supplier* a standing authorization. This authorizes Leneda to automatically assign the supply of the MP to them in the event of a *Vacancy*. Furthermore, this status serves as a valid authorization for the *Supplier* to initiate an SoS request for the *Customer's* MP without requiring an additional, specific CM.

Producer: A *Customer* in their role as a *Producer* for electricity (e.g., via a PV system) or gas (e.g., biogas), who produces energy. A *Customer* is considered a *Producer* even if the generated energy is fully self-consumed and not injected into the supply grid.

Prosumer: A *Customer* who acts in both the role of a *Consumer* by withdrawing energy from the grid, and in the role of a *Producer* by injecting self-generated energy into the grid. These two energy directions are mapped via separate, *related MPs*, which can be connected to one or more physical meters according to different *Metering Concepts* (e.g. *One-Meter Model* or *Two-Meter Model*).

Supplier: A MA who supplies energy to a *Consumer*. For this supply relationship, they hold a valid SCR with the coMP. As authorized MA the *Supplier* can access relevant *Market Data* (e.g., for quotation purposes) without requiring a CM.

Transmission System Operator (TSO): The legal entity responsible for the operation, maintenance, and expansion of the energy transmission grid. The TSO also assumes the role of the BC.

Vacancy Customer: A *Consumer* who is preventively registered for a CoMP to take responsibility during a *Vacancy*. This registration prevents a *Locking* or VS. Instead, it automatically activates either BS or, if a *Preferred Supplier* is designated, a regular MS.

Data Categories, Types and Data Responsibility

Contract Data: Specific, protected information about the supply or feed-in contract between a *Customer* and a *Supplier*/*Buyer*, such as SoS/EoS, minimum contract periods, or tax and levy categories; it is a component of *Customer Data*.

Customer Data: Sensitive, personal, or contract-relevant information subject to data protection regulations, with *Timeseries* being a primary example. Access generally requires a valid ComRel of the corresponding *Market Role* to the MP for the relevant period or a CM granted by the *Customer*.

Data Object: A fundamental, structured unit of information managed in Leneda, such as an MP, a *Business Partner*, or a ComRel. Each *Data Object* has specific attributes and is assigned a responsible *Data Owner*.

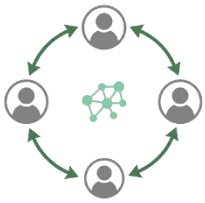
Data Owner: Designates the responsibility and exclusive permission assigned to a specific *Market Role* (e.g., DSO, *Supplier*, *Customer*) to directly create, modify, or delete the value of a *Data Object* or specific fields within it. The *Data Owner* is responsible for ensuring that the *Data Object* they manage is correct and up to date in Leneda.

Data Stakeholder: MAs who have read access to associated *Data Objects* or fields due to an existing ComRel, a CM, or another connection to an MP (e.g., as an SGR). *Data Stakeholders* are actively informed by Leneda when these relevant *Data Objects* are changed (created, updated, or deleted).

Historized Data: Data whose values or relationships can change over time. In Leneda, such data is not overwritten but is stored in the form of consecutive validity periods, known as time slices. Each time slice is defined by a *Process Date* that marks its start of validity, ensuring a complete and traceable history of all changes.

Market Data: Information that primarily describes the technical and structural properties of an MP and is generally accessible to relevant MAs without an explicit CM or an existing ComRel.

Static Data: Data fields or objects managed in Leneda without explicit version history in the form of time slices. When a change occurs, the previous value is directly overwritten. However, for traceability purposes, all value changes are logged in Leneda, with the *Request Date* serving as the timestamp for the modification.



Energy Processes and Sharing Groups

Cession: The formal transfer of a generation facility and its corresponding FiMP from the previous operator to a new *Customer*. This transfer requires the mutual consent of both the outgoing and the incoming operator. This consent must be formally documented and serves as the mandatory prerequisite for the DSO to execute the administrative takeover.

Contractual Binding: A status or set of parameters stored on the SCR representing the *Customer's* contractual commitment (e.g., a fixed term or a rolling notice period). An active *Contractual Binding* defines a blocked period during which a *Supplier Switch* by a new *Supplier* will be rejected by Leneda and involved parties will need to clarify the situation.

Decommissioning: The process for shutting down an MP, which includes the physical removal of the meter and the formal deactivation of the MP in Leneda. This process can be either temporary, where the MP remains to allow for a later *Recommissioning*, or a final *Decommissioning*, where the MP is permanently removed from the system and the DCR as well as any other currently active ComRels are terminated.

End of Supply (EoS): The standardized market process for terminating an existing supply relationship at an MP by delimiting the active CCR and SCR.

End of Feed-In (EoFi): The standardized market process for terminating an existing feed-in relationship at an MP by delimiting the active CCR and SCR.

Energy Sharing Convention: A contractual agreement involving the SGR, the participating *Customers* (acting as *Consumers* or *Producers*), and the relevant DSOs. It regulates the participation of specific MPs within a *Sharing Group* and establishes the repartition key, which determines the rules for the calculation and allocation of *Shared Energy* among the members.

Feed-In (Fi): The physical injection of energy (electricity or gas) by a *Producer* at an MP for the purpose of offtake from the public supply grid by a *Buyer*.

Feed-In Parameters: A set of rules and constraints defined by the DSO for a specific fiMP during the pre-registration of the FiR. These parameters define the binding commercial framework for the MP and restrict the *Customer's* subsequent choice of *Feed-In Variant* (e.g., MFi or RFi) and/or the list of eligible *Buyers*.

Feed-In Responsible (FiR): The natural or legal person linked to a fiMP as the responsible operator, based on a grid usage contract with the DSO. The pre-registration of the FiR is a mandatory prerequisite for any subsequent SoFi by a *Buyer* and defines the entity to which an UFi is assigned in the event of a *Producer Vacancy*. This distinguishes the FiR from the general *Market Role* of a *Producer*, as the FiR status is tied to the specific contractual registration at the MP.

Feed-In Variant: The specific model of energy feed-in and remuneration chosen for a FiMP. This includes the distinction between *Market Feed-In* (MFi) and *Regulated Feed-In* (RFi), as well as the specific regulatory schemes within RFi (e.g., fixed feed-in tariffs or market premium).

Locking: The interruption of the energy supply at an MP, carried out by the DSO. This is the overarching term that can encompass both a remote and a manual *Locking*.

Move-In (MI): A SoS/SoFi process in which a new *Customer* (identifiable by a new EID in the CCR) is registered at an MP, thereby commencing supply/feed-in.

Move-Out (MO): The departure of a *Customer* from an MP, leading to the termination of its supply/feed-in relationship. In Leneda, this is not a separately reported process, but is implicitly triggered by a successor's MI or an EoS/EoFi.

Power Purchase Agreement (PPA): A contract under which a natural or legal person agrees to purchase electricity directly from an electricity producer.

Power Reduction: A measure initiated by the DSO to throttle the maximum available power at an MP, typically as the first escalation step in *Vacancy Management* or in case of non-payment.

Power Restoration: The restoration of full power at an MP after it was previously reduced by a *Power Reduction*.

Recommissioning: The process of reactivating a previously temporarily decommissioned MP (status inactive) by installing a new meter.

Shared Energy: The amount of energy that has been either consumed from or injected into the SG by participating MPs calculated according to the *SG Configuration*.

Sharing Group (SG): A virtual construct in Leneda that links a group of participating MPs. Its primary purpose is to enable the calculation and allocation of *Shared Energy* between these MPs for each quarter-hour, based on the rules defined in the corresponding *SG Configuration*.

Sharing Group Responsible (SGR): A specific *Market Role* – synonymously referred to as *Sharing Group Manager* – responsible for creating, configuring, and managing SGs and their *SG Configurations* in Leneda. The SGR can delegate their tasks to an *SG-Deputy*.

SG Configuration: The specific configuration of a SG for a defined period, which specifies the participating MPs and the rules for energy allocation using a repartition key.

Start of Supply (SoS): The standardized market process for establishing a new supply relationship at an MP, typically by creating a CCR and an SCR.

Start of Feed-In (SoFi): The standardized market process for establishing a new feed-in relationship at an MP, typically by creating a CCR and a SCR.

Supplier Switch: The process at an MP where the *Customer* remains the same, but the commercial partner (*Supplier* or *Buyer*) responsible for the SCR is changed. This is distinct from an MI, where the *Customer* also changes.

Supply: The physical delivery of energy (electricity or gas) by a *Supplier* to an MP for the purpose of withdrawal from the public supply grid by a *Consumer*.

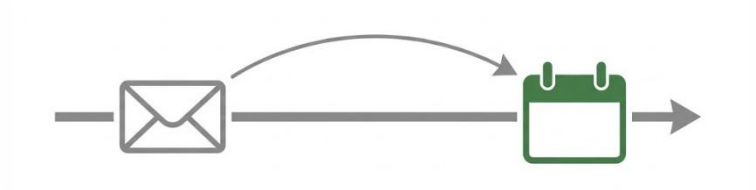
Supply Variant: The overarching term for the different models of energy supply to a coMP, distinguished by their commercial and regulatory basis (e.g., MS, BS).

Unlocking: The restoration of the energy supply at a previously locked MP.

Vacancy: A state of an *active MP* where, at a specific point in time, there is no valid SCR (and possibly no CCR) for supply or feed-in. In this state, the MP is considered *vacant*, meaning it is not assigned to a *Balancing Perimeter*, which automatically triggers the *Vacancy Management* process.

Vacancy Management: The overarching term for all processes handling an *active MP* that is in a state of *Vacancy*. It comprises both the automated, system-side Leneda *Vacancy Management* and the subsequent DSO *Vacancy Management*. Leneda identifies the *Vacancy* and applies a defined logic to assign a fallback supply or feed-in relationship (e.g., VS, BS, VFi), ensuring the MP is always assigned to a *Balancing Perimeter*. The DSO *Vacancy Management* is the business process initiated by the DSO in

cases of VS or VFi, which includes the DSO's actions to clarify the situation, such as identifying the unknown *Customer* or initiating measures like *Power Reduction* or *Locking* of the MP.



Leneda Services and Time Concepts

Base Service: Standardized, API-based services in Leneda that allow direct, object-based read and write access (CRUD operations) to individual *Data Objects* (*Base Data* objects like MP, *Business Partner*, *Device*) and their attributes, subject to permission checks.

Correction: The general process of rectifying any erroneous data or process state in Leneda. The term encompasses a range of actions, from simple data updates via *Base Services* to the reversal of a MCS or complex, coordinated procedures. *Corrections* that affect billing-relevant data, exceed deadlines, or involve multiple *Data Owners* typically require the creation of a *Correction Ticket*.

Correction Ticket: The central instrument in Leneda for managing and tracking *Corrections*. Any MA who identifies an error can create a *Correction Ticket* to formally initiate a *Correction process*, which requires the responsible *Data Owners* and original MCS initiators to take action.

MaCo Service (MCS): More complex, process-oriented services in Leneda that control the execution of energy industry business transactions. They enable coordinated data operations across multiple objects or rule-based changes (including by non-*Data Owners*) in compliance with market rules and deadlines.

MCS Reversal: A specific method of *Correction* used to completely cancel a single, previously executed MCS. A MCS Reversal is only possible if the data state that existed immediately before the original MCS was executed can be fully restored.

Process Date: The point in time to which the business and energy industry effect of a process or data change refers (e.g., SoS). It controls the validity of time slices for *Historized Data*.

Request Date: The exact timestamp of the system-side receipt of a request, notification, or process trigger by Leneda. It is used for logging and is relevant for technical deadline checks.

1.3 Core Principles of Leneda

The functionality and structure of Leneda are based on the following core principles:

Fundamental Role and Architecture

- **Central Data Hub**: Leneda is the sole, central platform for all MaCo between professional MAs in the Luxembourg electricity and gas market, replacing decentralized systems. All market-relevant interactions are routed centrally through Leneda.
- **Standardization and Harmonization**: Leneda establishes consistently standardized processes, *Market Roles*, and *Data Objects* that are harmonized for both electricity and gas. This ensures a consistent, transparent, and efficient exchange of information.

- **Automated API Communication**: Interaction with Leneda occurs primarily through automated API interfaces to promote efficiency and systemic integration.
- **MP-Centric Data Model**: The MP is the centerpiece of the data model. All relevant *Data Objects* and MAs are directly or indirectly linked to the MP via ComRels.

DATA MANAGEMENT AND QUALITY

- **Single Source of Truth (SSoT):** The data managed in Leneda is considered the binding and sole source of truth for all MAs and for data synchronizations.
- **Clear Data Responsibility:** A *Data Owner* is assigned to every *Data Object*. This *Data Owner* is exclusively responsible for the correctness, timeliness, as well as the creation, modification, or deletion of this data.
- **Rule Compliance and Data Integrity:** Leneda actively monitors compliance with the applicable market rules and deadlines within the defined business processes. Furthermore, automated mechanisms, such as *Vacancy Management*, ensure that every active MP is always assigned to a *Balancing Perimeter*.

ACCESS, TRANSPARENCY AND CONTROL

- **Role-Based Access Control:** Access to data and the authorization to execute processes are clearly regulated by *Market Roles* and, where applicable, by CM. A distinction is made between *Market Data* and protected *Customer Data*. Leneda verifies the respective authorizations for every read and write request by strictly enforcing the defined *Data Ownership* and *Data Stakeholder* principles, as well as checking for valid CMs where required.
- **Transparency and Information:** MAs have access to data relevant to them according to their role. *Data Stakeholders* are actively informed about changes to *Data Objects* that concern them (e.g., due to ComRels, CMs, *SG Configurations*, or delegations). *Customers* have insights into who accesses their data or is making changes.
- **Control of Smart Meters:** Leneda acts as the central orchestrator for *Smart Meter* functions. For critical interventions such as *Lockings* or *Power Reductions*, Leneda validates the incoming request and forwards it to the responsible DSO. The DSO assumes full responsibility for assessing the feasibility, executing the measure, and updating the corresponding status in Leneda.

SERVICE LAYERS FOR DATA ACCESS AND PROCESS INTERACTION

Interaction with Leneda is carried out via standardized interfaces that provide different service layers for various use cases.

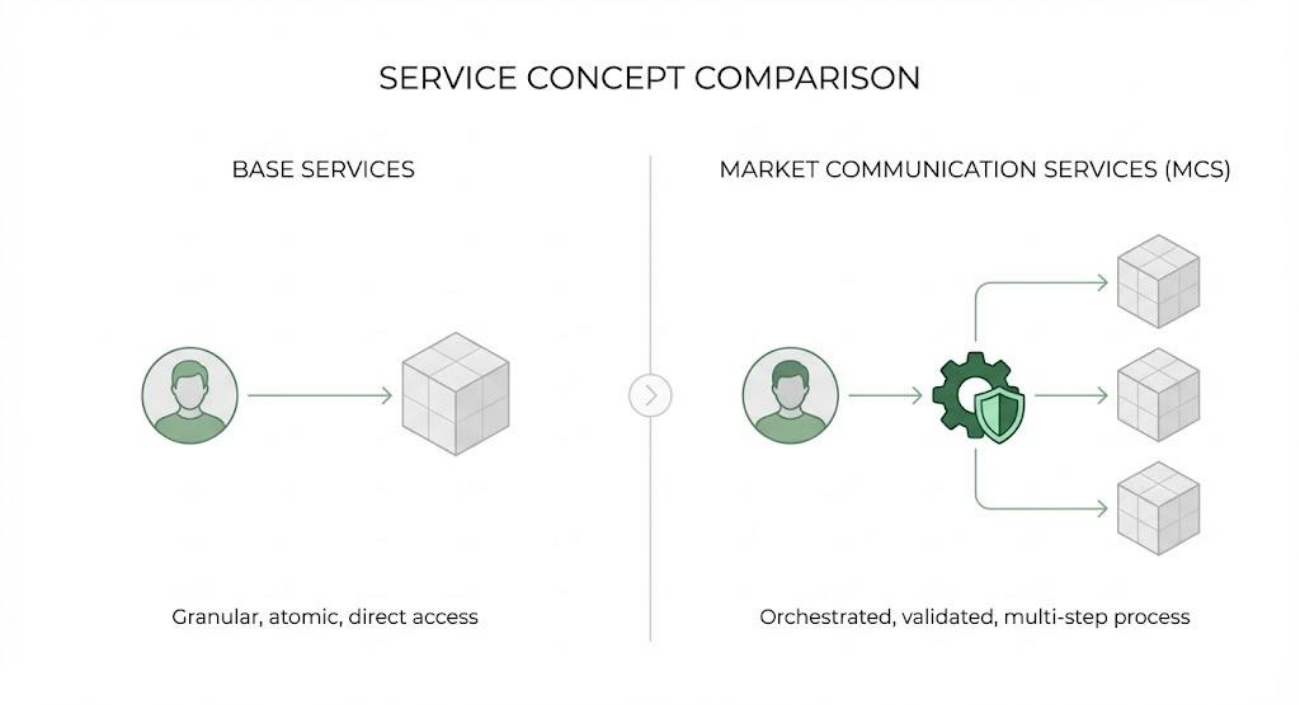


FIGURE 2: SERVICE CONCEPT COMPARISON

Base Services allow for direct, fine-grained access to individual *Data Objects* and their attributes through standard operations like create, read, update, and delete (CRUD). These are primarily used for master data maintenance and simple data queries by authorized MAs, with Leneda always verifying data ownership and access permissions.

Market Communication Services (MCS) are designed to map complete energy industry business processes and more complex data operations. A MCS often encapsulates specific business logic, coordinates access to multiple *Data Objects*, checks for compliance with market rules and deadlines, and can also enable rule-based data changes by authorized, non-primary *Data Owners* (e.g., a request for a meter *Disconnection* by a *Supplier*). MCS are therefore the standard method for handling MaCo in Leneda. For retrieving historical data using an MCS, specifying a *Process Date* is crucial to establish the correct temporal context.

1.4 Temporal References and Deadlines

When days are mentioned in these market rules, unless explicitly stated otherwise, they always refer to calendar days. For the temporal control and traceability of processes and data changes, as described in these market rules and handled via Leneda, Leneda fundamentally distinguishes between two central dates: the *Request Date* and the *Process Date*.

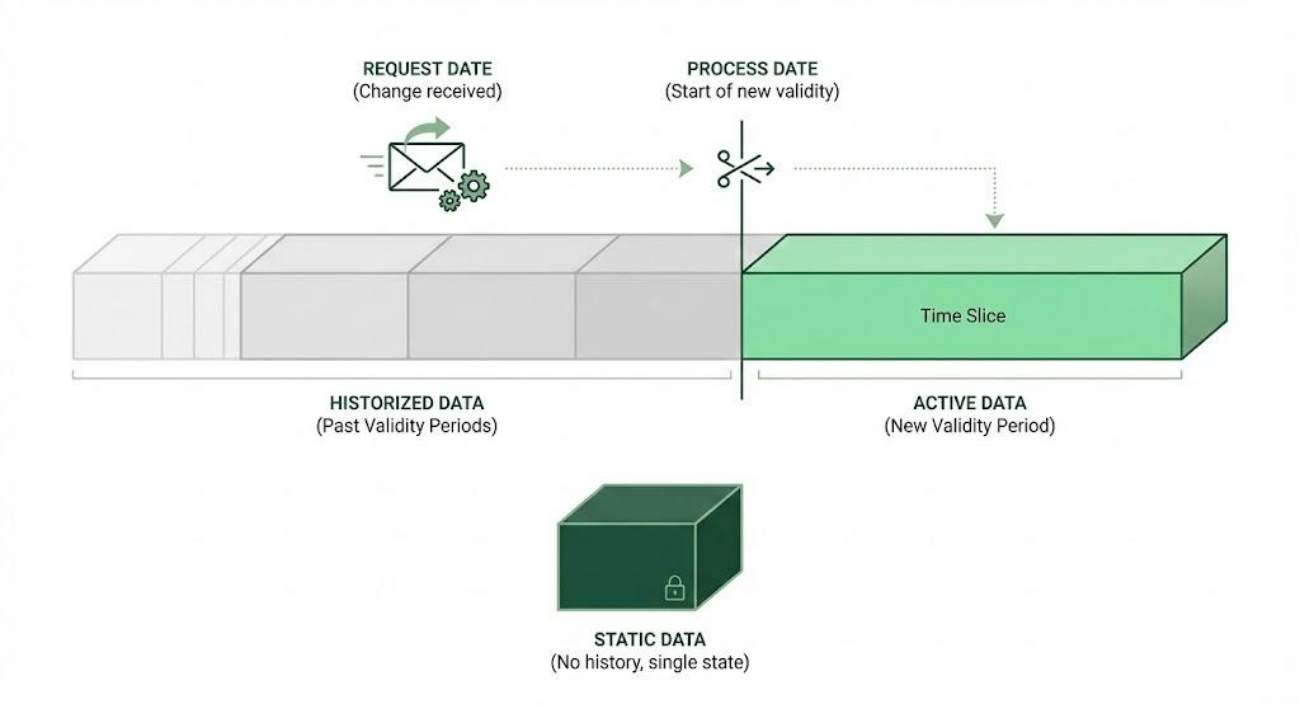


FIGURE 3: TEMPORAL REFERENCES

REQUEST DATE

Designates the exact point in time (timestamp) at which a request, notification, or process is received or triggered system-side by Leneda. It primarily serves for logging, documenting the date of receipt, and is relevant for technical checks, such as adherence to reporting deadlines. For changes to *Static Data*, whose values are directly overwritten, the *Request Date* is used for logging the change; a *Process Date* is not required here.

PROCESS DATE

Defines the point in time from which the substantive and energy industry effect of a process or data change takes place. It is the central date for controlling the energy industry logic in Leneda and for the temporal delimitation of *Historized Data* - i.e., values that can change over time or relationships between *Data Objects* that are valid for a specific period. Specifying a *Process Date* is mandatory for all processes that have a specific temporal validity or effect. This particularly affects the creation or modification of ComRels based on SoS/Fi or EoS/Fi notifications, the assignment of *Devices* to MPs over a period, or changes to historized attributes of MPs or *Devices*.

USING TIME SLICES

For *Historized Data*, the *Process Date* is used to precisely define validity periods. A *Process Date* is always a specific point in time, consisting of a date and time (timestamp), to ensure a future-proof and seamless sequence of processes.

It defines the exact start time at which a new value or relationship becomes valid. The end of the previous validity period is implicitly determined by the start time of the new period. There are no overlaps.

***Example**: A SoS for a new customer is reported with the Process Date 01.01.2026 00:00:00. The implicit EoS of the previous customer thus takes place at the exact same point in time. The previous supply is therefore valid until 01.01.2026 00:00:00, and the new supply begins from 01.01.2026 00:00:00 onwards.*

This timestamp-based logic ensures a seamless and unambiguous assignment of all periods. For commercial market processes, the existing standard times for electricity (00:00:00) and gas (06:00:00) strictly apply.

NOTATION OF DEADLINES

The notation used for deadlines in these market rules defines the permitted period for the *Process Date* in relation to the *Request Date* of a MaCo process. The start and end days of a deadline are always included in the permitted period.

- **Example D-14 ~ M+3:** The *Process Date* may fall within the period from the 14th calendar day before the *Request Date* up to and including the calendar day three months after the *Request Date*.
- **Example D+1:** The *Process Date* must be the exact calendar day following the *Request Date*.
- **Example D+1 ~ D+14:** The *Process Date* may fall within the period from the calendar day after the *Request Date* up to and including the 14th calendar day after the *Request Date*.

1.5 MARKET ACTORS AND THEIR ROLES

The various actors in the energy market are represented in the Leneda Data Model as *Business Partners*. One or more sector-specific *Market Roles* (e.g., DSO, *Supplier*) are assigned to a *Business Partner*, which define its permissions and obligations in the market and make it an MA. The concrete business relationship of an MA to an MP - and thus its authorization to view data or execute processes - is established via a time-defined ComRel.

CUSTOMER (AS CONSUMER & PRODUCER)

The *Customer* acts as a *Consumer* and/or *Producer*. A *Customer* can also represent other *Customers* or assume the role of a SGR.

Connection to the MP: As a *Consumer* or *Producer*, the *Customer* is linked to his MP via a CCR. This allows them to view not only their *Customer Data* but also the *Market Data*, i.e., the technical information belonging to the MP, making them a *Data Stakeholder* for this data. Via the CCR, they are also the party who must pay for their grid supply and is compensated for their feed-in.

Vacancy Customer: As a *Consumer*, the *Customer* has the option to register as a *Vacancy Customer* for an MP to avoid potential *Lockings* in case of a *Vacancy*. For this scenario, they can also find and register a corresponding *Preferred Supplier* or *Buyer*.

Feed-In Responsible (FiR): In their role as a *Producer*, the FiR is the *Customer* who has signed the grid usage contract with the DSO for the fiMP. The DSO's pre-registration of this *Customer* as the FiR is a mandatory prerequisite for any subsequent SoFi by a *Buyer*.

Data Ownership: The *Customer* is the *Data Owner* of their own *Business Partner* object and the associated CCR, i.e., their own data such as their contact details. To ensure high data quality within the

system, Leneda enables MAs with an active ComRel (e.g., the *Supplier*) to initiate proposals for updating this data. However, to strictly preserve the *Customer's* sovereignty as the *Data Owner*, such modifications are not applied directly but require a confirmation or approval action by the *Customer* before becoming effective.

Transparency and Control: The *Customer* can via a *Graphical User Interface* (GUI) access and see the *Customer Data* and *Market Data* of their MPs and is informed about changes. To allow other MAs to access their *Customer Data* or to perform certain services requiring a mandate (e.g., SoS), the *Customer* must grant a corresponding CM.

Obligations: As the *Customer* assumes an active and central role within the Leneda *Market Communication*, they also bear specific responsibilities to enable the smooth execution of market processes. This explicitly includes the obligation to duly and timely inform their contractual partners (e.g., *Supplier*, *Buyer*, or SGR) in advance of any intended changes. This applies particularly to planned *Move-Outs*, contract terminations, or potential contract extensions, ensuring that the respective MAs are able to meet their reporting deadlines in Leneda.

DISTRIBUTION SYSTEM OPERATOR

The DSO is a legal entity responsible for the operation, maintenance, and, if necessary, the expansion of distribution grids in a defined zone. Its main tasks in the context of Leneda include:

MP Management: The DSO creates the MP in Leneda. They are responsible for the maintenance and regular synchronization of MP data, such as address, grid tariffs, and associated devices.

Device Management: The DSO is responsible for the maintenance and regular updating of detailed information about devices (e.g., *Smart Meters*), including their registers.

Meter Data Management: The DSO bears the overarching responsibility for the acquisition, validation, calculation, and timely provision of all metering data and *Timeseries* from the MPs to Leneda. For automated data provision, this mandate can be fulfilled via *Luxmetering* - in the standard process for *Smart Meters* - or through other directly connected remote reading systems (e.g., for RLP meters). For classical, non-communicating meters, the respective DSO remains operationally responsible for collecting and actively providing the required data to Leneda.

Grid Usage Billing: The DSO is responsible for the grid usage billing for all MPs in their grid area, based on the data and rules managed in Leneda.

Data Ownership: The DSO is the *Data Owner* of the technical master data of the MP and the associated *Devices*. When the MP is created, a DCR is initially established, linking the DSO to the MP. This DCR generally remains active for the entire lifecycle of the MP and is only terminated during exceptional activities, such as a grid merger, or as part of the final *Decommissioning* of the MP.

SUPPLIER & BUYER

The *Supplier* is the provider who delivers energy to the *Consumer* in the electricity or gas market. For each supplied MP, the *Supplier* concludes a supply contract with the *Consumer* and takes over the supply to this MP, which is represented in Leneda by a SCR. In the context of feed-in, the *Buyer* assumes

this role; they purchase the injected energy from the *Producer*. Here, too, the relationship is documented via a SCR at the *Producer's* MP.

Initiation of Market Processes: The *Supplier* is responsible for the timely notification of the SoS and EoS processes to Leneda, provided that the *Customer* has fulfilled their obligation to inform the *Supplier/Buyer* within the required timeframes. In the event of a *Supplier Switch*, the new *Supplier/Buyer* manages the entire process, for which they generally require a CM from the *Customer*.

Data Ownership: The *Supplier/Buyer* is the *Data Owner* of their own *Business Partner* object as well as the SCR for which they are responsible. This includes the responsibility for maintaining *Contract Data* on the SCR, specifically the *Contractual Binding* parameters, to prevent inadmissible switches. The *Supplier/Buyer* is responsible for ensuring that these stored rules or dates correctly reflect the active contract status.

Data Access as Data Stakeholder: Through the active SCR, the *Supplier/Buyer* becomes a *Data Stakeholder* at the MP. This entitles them to access *Customer Data* relevant for contract processing, especially the *Timeseries* necessary for billing for the supply period. While this general access right as an active *Data Stakeholder* is limited to the validity period of the SCR, the *Supplier*/*Buyer* inherently retains access to the historical consumption and contract data that falls strictly within their past supply period to fulfill legal obligations (e.g., re-billing or corrections).

Furthermore, to ensure the proper completion of the commercial relationship after an EoS/EoFi, Leneda will foresee a mechanism that grants the former *Supplier/Buyer* temporary, limited access to the *Customer's* current static contact data (e.g., email address). This ensures that essential documents, such as the final invoice, can be successfully delivered even if the *Customer* updates their contact details shortly after the contract ends, without requiring a newly initiated CM. Any access to data outside these specific transitional and historical purposes requires a new, explicit CM.

Balancing Perimeter Management: With the registration of the SCR in Leneda, the MP is assigned to the specific *Balancing Perimeter* explicitly nominated by the *Supplier*/*Buyer* within the SoS or SoFi request. The balance responsibility for the energy consumption or feed-in at this MP then lies with the respective BRP of the nominated *Balancing Perimeter*.

Preferred Supplier or Buyer: A *Customer* and a *Supplier* (or *Buyer*) can conclude a framework agreement. To reflect this contractual relationship in Leneda, the respective party registers as the *Preferred Supplier* or *Buyer*. These framework agreements are registered at a granular level per sector (electricity or gas) and per energy direction (supply or feed-In). Consequently, a *Customer* can have a maximum of one active *Preferred Supplier* or *Buyer* per sector and per direction at any given time. This registered status serves two primary purposes: First, if an MP associated with this *Customer* enters a state of *Vacancy*, Leneda's automated *Vacancy Management* will recognize this status and automatically assign the supply or feed-in to the matching *Preferred Supplier* or *Buyer*. Second, the registered status acts as a standing authorization, allowing the Preferred *Supplier* or *Buyer* to initiate subsequent market processes, such as an SoS or SoFi, for the *Customer's* MPs without the need to request an additional, specific CM. This significantly simplifies administration, particularly for organizations managing a large portfolio of MPs. The registration is defined by specific validity periods using a start and end date. The *Supplier* or *Buyer* actively initiates this registration process, which strictly

requires an initial CM to serve as explicit digital confirmation. The termination or expiration is handled according to the registered end date or can be updated directly without requiring an additional CM.

SHARING GROUP RESPONSIBLE (SHARING GROUP MANAGER)

The *Sharing Group Responsible* (SGR) – also referred to synonymously as the *Sharing Group Manager* – is a *Market Role* that manages *Sharing Groups*. The SGR acts under a delegated mandate from the DSO to manage the composition and configuration of the *Sharing Group*. In the standard process, this self-service capability allows the SGR to independently administer the *Sharing Group* for all forward-looking processes (with a *Process Date* of at least D+1). This digital orchestration replaces manual paper-based processes, as the granting of a CM by the participating members serves as the formal digital signature of the *Energy Sharing Convention*, thereby relieving the DSO of manual administrative tasks. As an exception, any retroactive corrections to the configuration fall under the exclusive authority of the DSO to ensure billing integrity. These historical interventions strictly require a formal *Correction Ticket* to properly document the change and ensure transparency for all potentially affected MAs.

Data Access: The SGR is linked directly to the MPs of their SG in Leneda via a DaCR. This DaCR makes them a *Data Stakeholder* but grants them only limited and clearly defined access to *Customer Data*. Specific attributes on the DaCR control which data the SGR is allowed to view. This explicitly includes the calculated *Timeseries* of the *Shared Energy* (allocated to the member) and the *Customer* contact data (e.g., email, address) to facilitate necessary communication (e.g., in the event of a *Move-Out*). In the standard process, this access strictly excludes the total consumption or production of the *Customer* at the MP. However, should the SGR require access to these *Timeseries*, they can actively request a specific CM. Once the *Customer* approves this CM in Leneda, the SGR is granted the authorized access rights to the requested protected *Customer Data*.

Joining an SG: To add an MP to an SG, the SGR requires a valid CM from the respective *Customer*. By granting this mandate, the *Customer* also approves the SGR's fundamental access to the protected data of the MP necessary for *Sharing Group* administration.

Tasks of the SGR include:

- Creating and dissolving SGs.
- Creating and editing *SG Configurations*, which assign MPs to a SG (a valid CM is always required to add an MP).
- Configuring repartition keys, which determine how the energy generated or consumed within the SG is distributed among the participating MPs. Changes to *SG Configurations* may only be made with a *Process Date* in the range of D+1 to D+14.
- Optionally, delegating their tasks to a SG Deputy.

Delegation to a SG Deputy: The SGR can delegate their operational tasks to a *SG Deputy*. For this, the SGR authorizes another *Business Partner*, who then assumes the role of the deputy for the specific SG. The *SG Deputy* has the same rights and obligations as the SGR - for example, they can edit *SG Configurations* or adjust the repartition key. The only exception is that the *SG Deputy* cannot, in turn, appoint another deputy. The SGR remains responsible overall and can revoke the delegation and remove the deputy at any time.

LENEDA OPERATOR

The *Leneda Operator* is the neutral, central administrative body responsible for overseeing the platform and managing processes that require manual intervention. The dedicated personnel executing these tasks are referred to as *Leneda Agents*. While Leneda automates the vast majority of market communication, the *Leneda Operator* steps in for specific administrative, exceptional, or fallback scenarios. The core responsibilities of the *Leneda Operator* include , but are not limited to:

- **Company Onboarding:** The verification, approval, and formal registration of companies and MAs on the platform. This explicitly includes validating that the acting individual (e.g., CEO or authorized representative) possesses the legal authority to represent the respective company.
- **Complex Data Corrections:** The mediation, technical support, and manual execution of complex corrections (via *Correction Tickets*) that cannot be resolved purely automatically by the involved MAs.
- **Protection Status:** The verification and administration of the specific protection status for non-lockable MPs (such as critical infrastructure or life-sustaining medical equipment) to prevent unlawful or critical supply disconnections.

In all its operations, the *Leneda Operator* acts strictly neutrally to ensure the continuous, reliable, and correct operation of the national energy data platform.

OTHER MARKET ACTORS

Other relevant MAs that interact with Leneda include, for example, aggregators and public authorities. However, their roles in direct, daily MaCo via Leneda are typically more specific or downstream.

POWER PURCHASE AGREEMENTS

Leneda supports the handling of PPAs through two primary mechanisms, which can also be combined. First, a third party managing a PPA can formally assume the *Market Role* of a *Supplier* or *Buyer*. Due to Leneda's strict single-supplier model, each MP can only be assigned to exactly one active *Supplier* or *Buyer* at a time. Second, PPAs can be modelled in a similar way to *Sharing Groups*. In this case, Leneda calculates the *Shared Energy* distributed between participating MPs, while each MP still requires a regular *Supplier* or *Buyer* to cover any residual consumption or to off-take any remaining excess feed-in.

1.6 FUNDAMENTALS OF SUPPLY AND FEED-IN

COMMON CONCEPTS

The concepts of supply and feed-in are fundamental to the processes in the energy market. Leneda ensures that these energy flows are clearly defined, assigned, and processed via standardized processes.

ENERGY DIRECTIONS: SUPPLY AND FEED-IN

- **Supply:** Designates the energy direction in which energy is withdrawn from the grid.
- **Feed-In:** Defines the energy direction in which energy is injected into the grid.

Each MP is uniquely assigned to one of these two energy directions.

Prerequisites for Market Interaction

Upon its creation in Leneda, a MP is immediately linked to the responsible DSO via a DCR. However, it initially receives the status *inactive*, which persists as long as no physical meter is installed. MPs defined as *Flat-rate Systems* (limited to legacy infrastructure such as public lighting) are considered active upon their administrative activation by the DSO, even without a physical meter.

Despite this status, market processes can already be initiated; for example, a *Supplier* can report a SoMS to pre-register a contract before the technical activation. Crucially, since every energy flow must be uniquely allocated to a *Balancing Perimeter*, the initiating MA (e.g., the *Supplier*) must explicitly specify the target *Balancing Perimeter* in such a request. Leneda validates this by checking the permissions stored by the responsible BRP, ensuring that the MA is authorized to use the designated *Balancing Perimeter* before confirming the assignment.

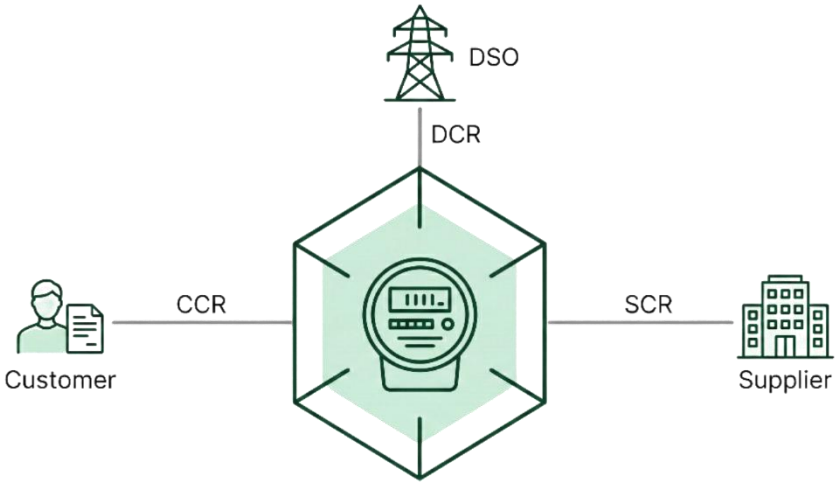


FIGURE 4: ACTIVE METERING POINT WITH CCR AND SCR

The physical energy supply or feed-in can only formally begin once the MP becomes *active*. This status is achieved solely through technical readiness, typically when a meter is installed and operational. At this moment, the presence of ComRels becomes mandatory to ensure proper settlement:

- A CCR links the *Customer* (as a *Consumer* or *Producer*) to the MP, defining who receives the bill for the energy consumed or is compensated for the energy fed in.
- An SCR links the *Supplier* (in case of supply) or the *Buyer* (in case of feed-in) to the MP, defining who provides or off-takes the energy and to which nominated *Balancing Perimeter* the volume is allocated.

For a standard *active MP*, if these required ComRels are missing - for instance, because no *Supplier* was pre-registered - the MP is considered vacant. In this situation, Leneda's *Vacancy Management* automatically applies to establish the necessary links (e.g., with a *Vacancy Customer* and the *Basic Supplier*), guaranteeing that the *active MP* remains assigned to a *Balancing Perimeter*.

A specific exception applies solely to MPs defined as *Auxiliary Meters* used for internal technical purposes (e.g., statistical metering or control measurements without commercial billing relevance). For these specific objects, the requirement for an SCR may not apply, and they are managed solely between the *Customer*/DSO via CCR/DCR.

Integrated Supply and Separate Grid Usage

In the standard process, known as *Integrated Supply*, the *Supplier* acts as the single point of contact for the *Customer* regarding both energy supply and grid usage. The *Supplier* is billed by the DSO for the grid usage fees and subsequently invoices the *Customer* for the total amount, encompassing both energy and grid costs. As an exception, the *Customer* may opt for a separate grid usage contract directly with the respective DSO, operating under the *Separate Grid Usage* model. In this scenario, the *Supplier* only invoices the *Customer* for the supplied energy, while the *Customer* pays the grid usage fees directly and independently to the DSO.

Core Processes: Start and End

The commencement and termination of energy supply or feed-in at an MP occur via clearly defined processes:

- **Start of Supply / Start of Feed-In:** This is the process for creating a new CCR and a new SCR at the MP for a specific period. If an active CCR and/or SCR already exist at the MP on the *Process Date* of the SoS/SoFi, they are automatically terminated on the preceding day to enable the new relationships.
- **End of Supply / End of Feed-In:** This is the process for terminating the active CCR and SCR at the MP on a specific *Process Date*.

Implicit Termination Logic: In Leneda, the registration of a new SoS or SoFi generally triggers an automatic termination (EoS/EoFi) of the incumbent MAs active ComRel. This termination is effective immediately prior to the *Process Date* of the new process, ensuring a seamless transition without requiring a separate EoS/EoFi message.

This automatic delimitation is suspended if the retroactive SoS/SoFi targets a period for which the incumbent *Supplier* or *Buyer* has already received a *Grid Usage Billing*. In such cases, to protect the integrity of billing data, the implicit termination does not apply. The incumbent MA must actively manage the EoS/EoFi via the *Correction Ticket* before the new SoS/SoFi can be processed.

Vacancy and its Handling

A *Vacancy* occurs when an *active MP* does not have a valid SCR at a specific point in time, meaning it is not assigned to any *Balancing Perimeter*. Leneda identifies such vacancies and resolves them at the end of the day through the automated *Vacancy Management*. In this process, the MP is assigned to a predefined *Balancing Perimeter* (e.g., nominated by the corresponding *Basic Supplier* as part of the *Vacancy Supply*).

Move-In vs. Supplier Switch

For the correct application of deadlines and processes, the distinction between a *Move-In*, where the *Customer* changes, and a pure *Supplier Switch*, where the *Customer* remains the same, is crucial.

Move-In (MI)

A MI always occurs when the EID of the *Customer* at the MP changes. This is the classic case of a new *Customer* moving in. A MI also occurs if a supply gap was bridged by *Vacancy Management* by means of *Vacancy Supply* before the new *Customer* starts their supply.

To prevent retroactive gaps in supply and unbilled consumption, Leneda does not feature a separately reportable MO process. Instead, the departure of a previous *Customer* is handled implicitly:

- The MO of the previous *Customer* is automatically executed on the day before a new *Customer's* SoS/SoFi is registered for the MP. This is the standard method for handling a seamless or retroactive (up to D-14) change of occupancy.
- Alternatively, the previous *Customer's Supplier* can proactively end the relationship for a future date by reporting a contract end via an EoS/EoFi, which requires a *Process Date* of at least D+1.

Supplier Switch

A *Supplier Switch* refers to any change in the ComRel for an energy direction at an MP where the *Customer* remains the same. This includes both the change of the commercial partner (*Supplier* or *Buyer*) and a change of the underlying *Supply Variant* or *Feed-In Variant* (e.g., a switch from RFi to MFi), even if the *Customer* remains the same. In any case, the existing CCR and SCR are formally terminated and newly created to ensure a clean process separation.

Deadlines

SoS and SoFi

- In case of a MI, the *Process Date* of the SoS/SoFi can be in the period from 14 days before the *Request Date* to three months after the *Request Date* (D-14 ~ M+3).
- In case of a *Supplier Switch* (*Customer* remains the same), the *Process Date* of the SoS/SoFi can be in the range of D+1 ~ M+3. The D+1 deadline only applies if the process is initiated on a working day and validated metering data is available; the respective DSO is strictly responsible for providing these required *Meter Readings* or *Timeseries* in Leneda to enable the process. If initiated on a non-working day, the *Request Date* is technically treated as the next working day, shifting the earliest possible *Process Date* (D+1) to the second working day after submission.

EoS and EoFi

- An EoS/EoFi initiated by the *Supplier* can be reported with a *Process Date* in the period from the day after the *Request Date* to 3 months after the *Request Date* (D+1 ~ M+3).

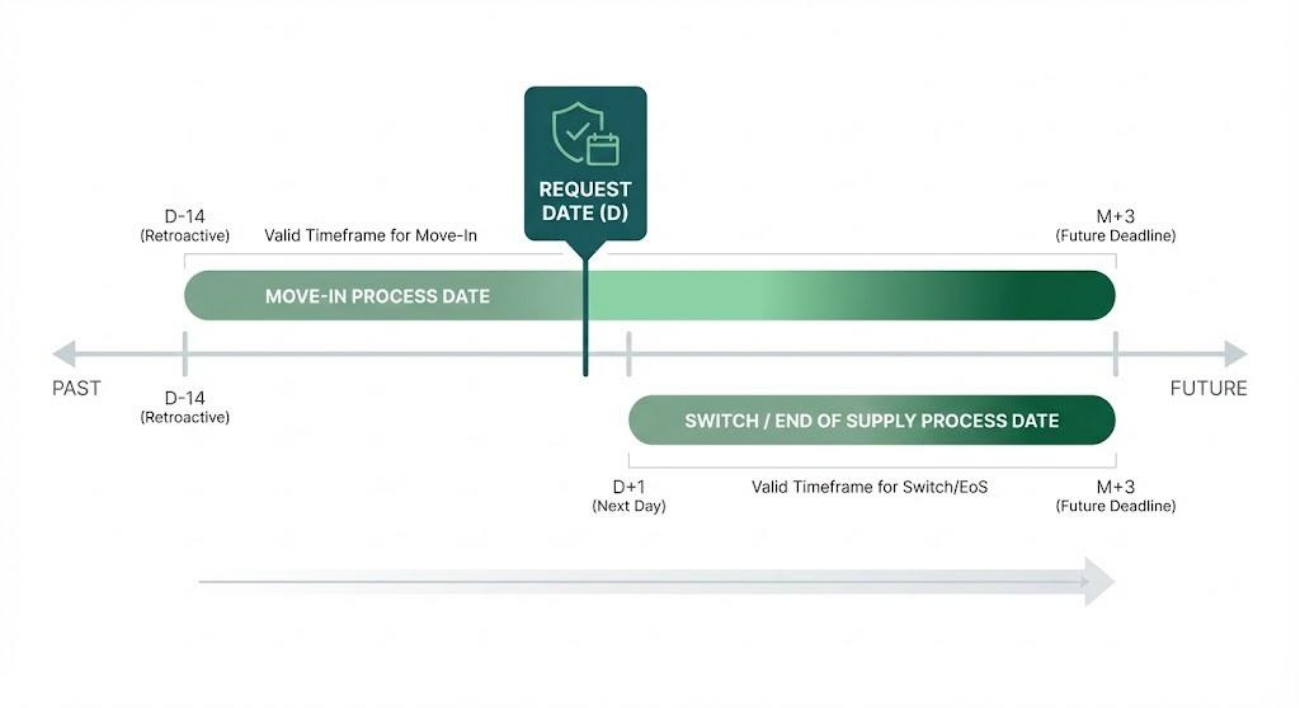


FIGURE 5: VALID DEADLINES FOR MOVE-IN AND SUPPLIER SWITCHES

Conflict Resolution and Registration Logic

First-Come-First-Served (SoS and SoFi)

Leneda applies a strict *First-Come-First-Served* principle for all registrations of an SoS or SoFi.

Binding Status: Once a ComRel is registered for a specific *Process Date* - even if that date is in the future - it is considered binding and blocks any subsequent conflicting registrations.

Rejection of Conflicts: Consequently, an MA cannot register a new SoS or SoFi with a *Process Date* that is older than or equal to the *Process Date* of the latest registered ComRel on the MP. Leneda will strictly reject such requests.

Resolution: To resolve a conflict (e.g., to correct an erroneous future registration), the incumbent MA holding the blocking registration must first reverse their. If the incumbent MA identifies the error themselves, they can execute this directly via a standalone *MCS-Reversal*. Conversely, a blocked MA cannot resolve the issue directly and must instead initiate a formal *Correction Ticket* within Leneda. This ticket serves as the central communication and tracking hub to coordinate the required reversal.

Pre-Registered Status (Exceptions)

Certain processes in Leneda utilize a *pre-registered* status. Processes with this status are considered provisional and can be overwritten or adjusted by subsequent valid SoS/SoFi messages without requiring a manual reversal. This applies to:

- **Vacancy Supply:** ComRels generated by Leneda for *Vacancy Supply* are pre-registered for a fixed period of 14 days. Within this timeframe, they are automatically overwritten by a regular SoS/SoFi request if the *Process Date* matches or precedes the start of the *Vacancy Supply*. Once this period expires, the *Vacancy Supply* is considered binding, and any retroactive adjustment requires a formal *Correction*.

- **End of Supply / End of Feed-In:** A reported termination (EoS/EoFi) with a future *Process Date* remains in a *pre-registered* status. This allows for flexibility; for example, a retroactive *Move-In* reported for a date on or before the planned EoS will automatically supersede the *pre-registered* EoS. This *pre-registered* status applies only as long as the period affected by the EoS/EoFi has not yet been subject to grid usage billing. Once the relevant period has been billed, the EoS/EoFi is considered fixed. Any changes thereafter require a formal *Correction* (including a *Correction Ticket*) to manage the necessary re-billing.

Whenever a *pre-registered* process is overwritten, Leneda triggers a standard notification to the responsible *Data Owner* of the affected ComRel (the process initiator).

Contractual Binding in Supplier Changes

Contractual Binding in Supplier Changes: To prevent a SoS/SoFi from being initiated by a new *Supplier/Buyer* during an active commitment period, the current *Supplier/Buyer* can store a *Contractual Binding* on their SCR.

Storage and Responsibility: The *Contractual Binding* is managed as a specific attribute on the active SCR. As the *Data Owner* of the SCR, the *Supplier/Buyer* is responsible for correctly maintaining this information - whether as a specific end date or as a logic defining the contract term - and keeping it up to date. Regarding the technical execution, the management of this attribute is performed via the standard *Base Services* or specific MCS provided by Leneda. Information about an existing contractual obligation is designed to be transparent and is visible to the affected *Customer* in Leneda.

Customer Override: When a new *Supplier/Buyer* initiates the switch by requesting the mandatory CM, Leneda notifies the *Customer* if the desired switch date conflicts with an active *Contractual Binding*. During the CM approval process in Leneda, the *Customer* has the option to proactively override this binding. By actively selecting this option and acknowledging potential contractual penalties or early termination fees from their current *Supplier/Buyer*, the *Customer* neutralizes the blocking effect of the binding in advance for this specific switch.

Check by Leneda: If Leneda receives a SoS/SoFi from a new *Supplier/Buyer*, the system validates the request against the stored *Contractual Binding*. If the *Process Date* of the requested SoS/SoFi falls within the blocked period defined by the active binding, Leneda will reject the request with a corresponding reason.

Need for Clarification in Case of Rejection: In the event of such a rejection, the involved parties - the *Customer*, the previous *Supplier/Buyer* and the new *Supplier/Buyer* - must clarify the situation. Possible solutions are:

- The incumbent *Supplier/Buyer* adjusts or removes the *Contractual Binding* on the SCR (e.g., in the case of a mutual contract termination).
- The SoS/SoFi by the new *Supplier/Buyer* does not take place or occurs at a later *Process Date* that complies with the stored contractual commitment.

Supply Variants

Once an active MP has a valid CCR and a valid SCR, a formal supply relationship is established. Leneda distinguishes the following variants of energy supply from the grid, depending on the type of *Customer* involved and the contractual or regulatory basis:

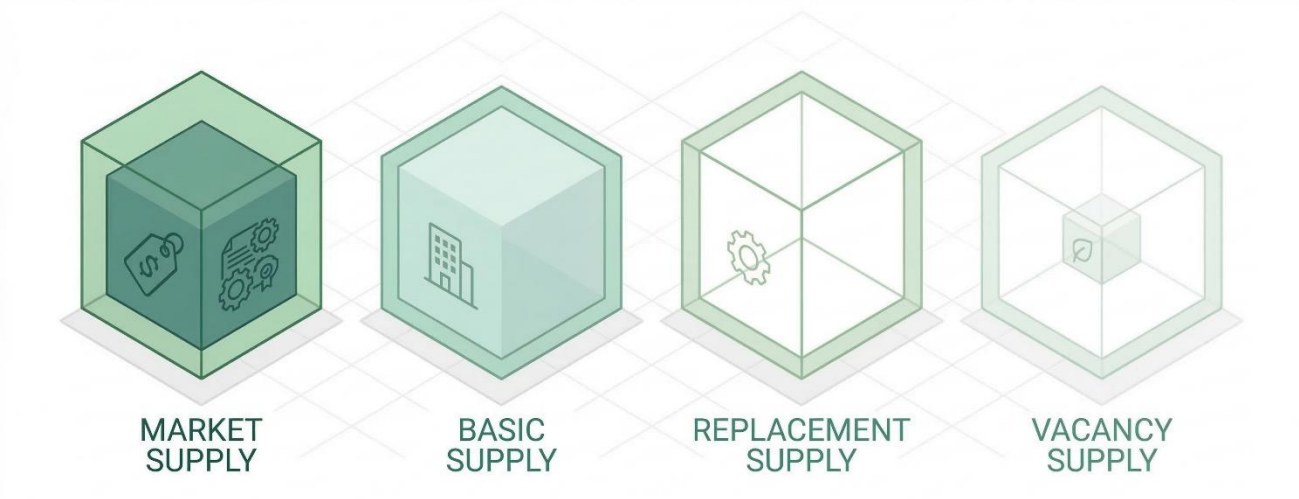


FIGURE 6: SUPPLY VARIANTS

Market Supply

The *Market Supply* is the standard case in the liberalized energy market. The *Customer* has concluded a supply contract with a freely chosen *Supplier*. The Supplier has successfully reported the SoS or SoFi to Leneda, after which the corresponding ComRels (CCR for the *Customer* and SCR for the *Supplier*) were registered at the MP. *Market Supply* can also be applied during *Vacancy Management* if the *Customer* registered as the *Vacancy Customer* for the MP has specified a *Preferred Supplier*. In this case, Leneda registers the *Market Supply* ComRels (CCR for the *Vacancy Customer*, SCR for the *Preferred Supplier*) and informs the involved MAs accordingly.

Vacancy Supply

The *Vacancy Supply* is always initiated by Leneda as part of *Consumer Vacancy Management*. It applies when there is neither a regular SoS nor a *Vacancy Customer* registered for an active coMP (e.g., after an EoS or with a new installation without a direct SoS). To cover the vacant MP, Leneda then creates the necessary ComRels: the DSO is registered in the role of the *Customer* (via a CCR). By default, the responsible *Basic Supplier* is assigned the role of the *Supplier* (via an SCR), and the applicable *Basic Supply* tariffs apply to the DSO. However, just like any other *Customer*, the DSO has the option to designate a *Preferred Supplier* for their portfolio of vacant MPs based on a framework agreement. If such a status is registered in Leneda, the system will automatically assign the DSO's *Preferred Supplier* instead of the *Basic Supplier* to handle the *Vacancy Supply*.

Basic Supply

Basic Supply is typically initiated by Leneda as part of the *Consumer Vacancy Management*. Within this automated process, *Basic Supply* is triggered specifically when a *Customer* has registered as a *Vacancy Customer* for the affected MP but has not designated a *Preferred Supplier* for *Market Supply*. In this case, Leneda creates the necessary ComRels (CCR for the *Vacancy Customer*, SCR for the *Basic Supplier* responsible for the grid area) and informs the *Customer* and the *Basic Supplier*. Alternatively, the DSO can submit an explicit SoBS request to Leneda. This is possible if the MP is in *Vacancy Supply* and the

DSO has identified the responsible *Customer*. A valid CM from the identified *Customer* is required for the registration of *Basic Supply* ComRels based on such a DSO request.

Replacement Supply

The *Replacement Supply* is used when an active *Supplier* unexpectedly stops operating. This can happen, for example, due to insolvency or the revocation of the *Supplier's* license. All MPs affected by the outage are then automatically assigned to a predefined *Replacement Supplier*. There is an automatic switch of the SCR to the *Replacement Supplier*. In this special case, no CM is required for the termination of the original supply by the failed *Supplier* and the transfer of the MP to *Replacement Supply*.

Feed-In Variants

For the feed-in of energy into the grid by a *Producer*, Leneda distinguishes between different variants. These are based on different remuneration models and responsibilities for the offtake and balance of the injected energy. Only one *Feed-In Variant* or remuneration model can be active for each MP at any given time. A switch between models is subject to the processes, deadlines, and conditions defined in this document. The variants described here primarily relate to the electricity market; specific regulations for gas feed-in, if different, would be treated separately.

FIGURE 7: FEED-IN VARIANTS

Market Feed-In

Market Feed-In represents the fully market-based variant of energy feed-in. The *Producer* concludes an individual contract with a freely chosen *Buyer* for the offtake and remuneration of their injected energy quantities. All commercial aspects, such as prices and contract terms, are negotiated directly between the *Producer* and the *Buyer*. The *Buyer* chosen by the *Producer* is responsible for the timely notification of the SoFi to Leneda. With the SoFi, the fiMP is assigned to the *Buyer's Balancing Perimeter*. A CCR for the *Producer* and a SCR for the *Buyer* are registered at the MP.

Regulated Feed-In

Regulated Feed-In covers feed-in remuneration models that are state-subsidized or otherwise regulated (e.g., follow-up support agreements) to achieve specific energy policy goals, particularly the expansion of renewable energies or high-efficiency combined heat and power plants. The defining characteristic of all *Regulated Feed-In* models is that, unlike standard *Market Feed-In*, they require a specific contractual

basis with the DSO. This contractual requirement dictates that the initial setup and any subsequent modifications of the *Feed-In Variant* must involve the DSO to validate the conditions and update the binding *Feed-In Parameters* in Leneda.

These regulated models offer various forms of guaranteed remuneration or support for qualified generation facilities. This typically includes:

- Legally fixed feed-in tariffs (depending on plant type, capacity, commissioning year).
- Special residual payments after initial support periods expire, where the injected energy is often remunerated at a price based on the determined wholesale market price.
- Market premiums paid in addition to the market price.

For fixed feed-in tariffs and residual payment models, the handling (offtake of energy, remuneration payment, *Balancing Perimeter* assignment) is generally carried out by the DSO or a *Buyer* designated by the DSO. These are processed strictly as *Regulated Feed-In* in Leneda. However, the market premium model represents a hybrid. While the premium contract itself is concluded with the DSO (fulfilling the RFi definition), the actual offtake of energy and the *Balancing Perimeter* assignment are handled via the free market. Therefore, within Leneda, MPs operating under a market premium are routed as *Market Feed-In* and follow the standard MFi processes for *Buyer* selection and switching.

Uncompensated Feed-In

Uncompensated Feed-In describes the feed-in of energy without direct remuneration to the *Producer*. This scenario is managed via *Producer Vacancy Management* in Leneda.

Use Cases:

- A known *Producer* (e.g., registered as a FiR at the MP) injects energy without an active offtake agreement (SCR) with a *Buyer*.
- In a *One-Meter Model*, the DSO creates a new, separate fiMP for a retrofitted production unit. Because the physical meter is already installed and operational, the DSO logically activates the new fiMP. If no SoFi by a *Buyer* has been reported for this fiMP at the time of its activation, it immediately falls into *Producer Vacancy Management* and is treated as *Uncompensated Feed-In*.

Leneda initiates an SoUFi. The *Producer* is informed of this situation and requested to find a *Buyer* for their feed-in. The injected energy is allocated for balance purposes to the DSO (or a *Balancing Perimeter* designated by them). A CCR with the known *Producer* and a SCR with the DSO as the formal off-taker are registered.

Vacancy Feed-In

Vacancy Feed-In is a *Feed-In Variant* initiated by *Producer Vacancy Management*. It applies when an active fiMP has no valid SCR, and no FiR is registered for it in Leneda. To ensure an uninterrupted *Balancing Perimeter* assignment even when the responsible *Producer* is not (or no longer) known, the MP is transferred to *Vacancy Feed-In* status. In this process, Leneda automatically creates a CCR and a SCR with the DSO as the responsible actor in both roles (*Customer* and *Buyer*). The injected energy is thus

assigned to the DSO's *Balancing Perimeter* without remuneration, avoiding unallocated feed-in and maintaining system stability. The DSO is required to clarify the situation at the MP (e.g., by identifying the *Producer* or, if necessary, deactivating the MP after a certain period).

1.7 PROVISION OF TIMESERIES

Fundamentals and Responsibility: The timely and accurate provision of measurement data is a critical foundation for billing, balancing, and energy management in the Luxembourg energy market. The DSO acts as the designated *Data Owner* and bears the overarching legal and procedural responsibility for the acquisition, validation, and timely provision of metering data to Leneda. Operationally, the transmission of these *Timeseries* to Leneda is carried out either via the central *Luxmetering* system acting on behalf of the DSOs, or directly by the respective DSO. Regardless of the technical routing or the installed metering technology, the DSO retains ultimate accountability for the accuracy and timeliness of the provided data.

Leneda serves as the central hub for the distribution of this data to the relevant MAs. This encompasses both *Timeseries* (continuous load profiles) and, where applicable, the underlying *Meter Readings* (cumulative indexes).

Distribution Mechanism: Leneda facilitates the automated distribution of measurement data to authorized *Data Stakeholders*. A distinction is made regarding the delivery configuration:

- **Suppliers and Buyers:** For these MAs, the daily transmission of data to their specific message queue in Leneda is the default standard.
- **Other authorized MAs:** Other *Data Stakeholders* (e.g., SGRs) with a valid authorization can optionally subscribe to this daily push service to receive the data automatically based on their operational needs.

Data Attributes and Quality: To ensure traceability and correct processing, every data transmission includes specific meta-information:

- **Timestamp:** Defines the precise temporal reference of the value. For *Timeseries*, this timestamp represents the start of interval. For *Meter Readings*, it represents the exact time of data generation.
- **Version:** A version identifier to track updates or corrections to previously delivered data.
- **Status:** A summary indicator describing the quality and nature of the data. The detailed logic and specific tags defining this status are described in the following section.

Data Quality Status Principles: The status attribute defines the quality status of the values provided. While the primary objective is to provide validated actual measurement data, estimations are calculated and provided to bridge gaps where physical measurement data is temporarily unavailable or missing. These estimated values are explicitly marked to distinguish them from actual readings.

Beyond this fundamental distinction between **measured** and **estimated**, the status in Leneda is defined as a modular set of tags that can be combined to precisely describe the lifecycle of the data:

- **Calculated:** Distinguishes whether data originates directly from a physical device (measured) or is derived via logic (calculated), such as the application of repartition keys for *Shared Energy*. For calculated *Timeseries*, the quality status is derived from the source data. If a calculation is based - wholly or partially - on estimated input values, the resulting *Timeseries* is explicitly flagged with a combined status of calculated and estimated.
- **Provisional:** This specific flag indicates that the provided values (based on estimations) are provisional. These values are used for immediate *Grid Usage Billing* to ensure timely processing but are subject to being overwritten by actual measurement data in the future, which will automatically trigger a re-billing process.

Obligation for Timeliness: The DSO, *Luxmetering*, and Leneda are obligated to ensure the timely provision of data. The primary objective is to make *Timeseries* and *Meter Readings* available to authorized MAs as early as possible depending on the data provisioning rate. To support efficient downstream market processes, the DSO must make its best effort to provide this measurement data before 8:00 AM for electricity and before 12:00 PM (noon) for gas on the day following the measurement (D+1). In cases where this target cannot be met due to technical reasons, the data must be provided immediately as soon as it becomes available.

On-Demand Meter Reading Requests: In addition to the regular, automated provision of measurement data, an authorized *Supplier* has the capability to request a discrete *Meter Reading* for any specific timestamp in the past, provided they hold the active SCR for that requested timeframe. For MPs equipped with continuous *Timeseries* recording (e.g., *Smart Meters*), Leneda will automatically calculate and provide the requested *Meter Reading* directly based on the underlying *Timeseries* data.

Exception classical SLP Meters: While the Luxembourgish energy market benefits from a near-nationwide rollout of *Smart Meters* - enabling automated and highly frequent data provision for the vast majority of MPs - a very small number of classical, non-communicating meters remain. For these exceptional MPs (typically billed via SLP), the automated data provision SLAs described in this chapter cannot technically apply. Instead, traditional fallback mechanisms (such as manual or periodic meter readings and synthetic profile estimations) continue to apply as defined by the DSO.

1.8 RULES FOR LOCKING

This chapter defines the regulatory and technical framework for executing a *Locking* or a *Power Reduction* at an MP. These measures, whether requested by a *Supplier* or initiated by the DSO, are executed based on the technical capabilities of the installed metering device.

When a *Supplier* initiates a *Locking* or *Power Reduction*, Leneda validates the request and creates a formal locking request. The responsible DSO is notified and assumes full responsibility for the entire execution process. Initially, the DSO assesses the feasibility of the request against legal and technical constraints. Throughout this phase, the DSO continuously updates the status of the request in Leneda to provide transparency.

In the standard process for electricity *Smart Meters* equipped with an integrated breaker, the DSO executes the measure remotely. The technical execution relies on the connected *Luxmetering* infrastructure, whereby the necessary remote commands and status updates can be routed centrally through Leneda. For meters lacking remote capabilities, including traditional electricity meters and all

gas meters, the DSO executes the measure manually on-site. Upon successful completion, the final status is updated in Leneda to conclude the process.

Regardless of the execution method (remote or manual), all measures are subject to the strict protective provisions defined in this chapter to safeguard residential and vulnerable *Customers*. Where technically feasible, a *Power Reduction* should be carried out as a preceding measure before a full *Locking*.

Any financial claims, fees, or cost allocations associated with the physical locking or unlocking of a MP are handled entirely outside of Leneda. These are strictly subject to the applicable legal framework and the official, published tariffs and terms and conditions of the respective DSO.

Protective Provisions

For the application of these protective provisions, a distinction is made based on the type of the *Business Partner* linked to the MP via the active CCR. This classification serves to implement the statutory protection mechanisms for household customers (clients résidentiels) as defined in the applicable amended Laws of 1 August 2007, by mapping them to the *Business Partner* type *Person* in Leneda.

Provisions for Business Partners of the type Person

For MPs where the responsible *Customer* is a *Business Partner* of the type *Person*, *Lockings* and *Power Reductions* may only be carried out under the following conditions:

- They are restricted to working days, between 08:00 and 16:00.
- The measure must be postponed to the next working day if the planned day is immediately followed by a weekend or a public holiday.

General Provisions for all Business Partner types

The following provision applies to all MPs, regardless of the *Business Partner* type (*Person* or *Organisation*):

- A planned *Locking* or *Power Reduction* will be postponed to the next working day if the outside temperature at 08:00 on the planned day is below 0°C according to the readings of the meteorological station at Luxembourg Airport (Findel).

Protection of Critical and Vulnerable Connections

While standard protective provisions apply to all residential *Customers*, specific MPs require absolute protection against *Locking* due to their vital importance. This includes residential connections with vital medical dependencies (e.g., residents relying on life-support equipment) as well as critical infrastructure (e.g., hospitals, public safety services). In Leneda, these specific MPs are designated as *non-lockable*. For these MPs, any *Locking* or *Power Reduction* request is technically blocked by the system.

Application and Approval Process: This protected status is not applied automatically. To obtain the status *non-lockable*, the *Customer* must submit a formal request via Leneda. This request requires the upload of valid supporting documents (e.g., official medical certificates or designation as critical infrastructure) proving the vital need for continuous supply. Leneda reviews the submitted evidence and approves the status upon successful verification.

Scope and Validity: The protection is assigned to the specific MPs designated in the request. The *Customer* can choose to apply for protection for all their MPs or restrict it to specific MPs. The status is valid for a fixed period of one year. To maintain protection, the *Customer* must submit a renewal request with updated evidence before the current status expires. For permanently critical facilities, the status may be granted without an expiration date, subject to periodic review.

REASONS FOR A LOCKING

A *Locking* or *Power Reduction* can be initiated for the following reasons:

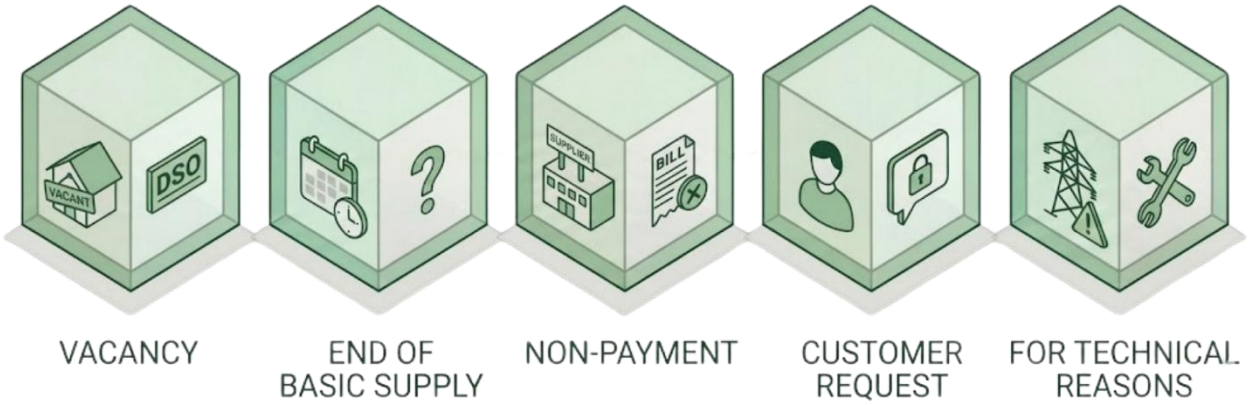


FIGURE 8: REASONS FOR A LOCKING

- **Vacancy**: If Leneda's automated *Vacancy Management* results in a *Vacancy Supply*, the DSO is informed. The decision on if, when, and which measures to take lies within the sole discretion of the DSO. Even though the DSO is technically registered as the *Customer* (via CCR) during a *Vacancy Supply*, the specific protective provisions for *Business Partners* of the type *Person* apply analogously to ensure the protection of any unknown residential *Customers* at the MP.
- **End of Basic Supply**: If the maximum supply period for *Basic Supply*, or in the exceptional case of *Replacement Supply*, expires without a new Supplier being registered, the DSO will initiate the *Locking* of the MP after prior notification of the *Customer*.
- **Non-Payment**: The current *Supplier* of an MP can request a *Locking* via MaCo, for example, due to non-payment by the *Customer*.
- **Customer Request**: The *Customer* can request a planned *Locking* directly from their responsible DSO.
- **For Technical Reasons**: A *Locking* can be carried out at any time to avert danger or to perform necessary work on the grid. In this case, the protective provisions listed above do not apply. For severe technical reasons (e.g., imminent danger), the *Locking* of a protected *Customer* or MP may also occur after careful consideration and, if possible, in prior coordination with the *Customer*.

2 LENEDA DATA MODEL

2.1 DATA MODEL AS THE FOUNDATION

The Leneda data model forms the structured basis for the organization, storage, and exchange of all energy industry relevant information managed via the central platform Leneda in the Luxembourg energy market. The aim of this chapter is to provide business users from the energy industry and MaCo with a clear and practical understanding of the core concepts, the most important *Data Objects*, and their relationships within this model.

The Leneda data model diagram serves as the central visual guide for the explanations in this chapter. This diagram illustrates at a glance the essential entities of the model and how they relate to one another.

A fundamental principle that runs as a common thread through the entire Leneda data model is the prominent central role of the MP. As is clear from the diagram, the MP is the linchpin: Nearly all other *Data Objects* are either directly or indirectly linked to an MP and refer to it. Semantic coloring distinguishes data categories: Green elements (e.g., DSO, *Device*, MP) represent technical *Market Data*. Orange elements (e.g., *Customer*, *Protected Attributes*, *Timeseries*) indicate protected *Customer Data*, where access strictly requires a valid ComRel or CM.

The following sub-chapters will explain the individual components and principles of this data model - from the core building blocks and data organization to responsibilities and access rules - step by step and in detail.

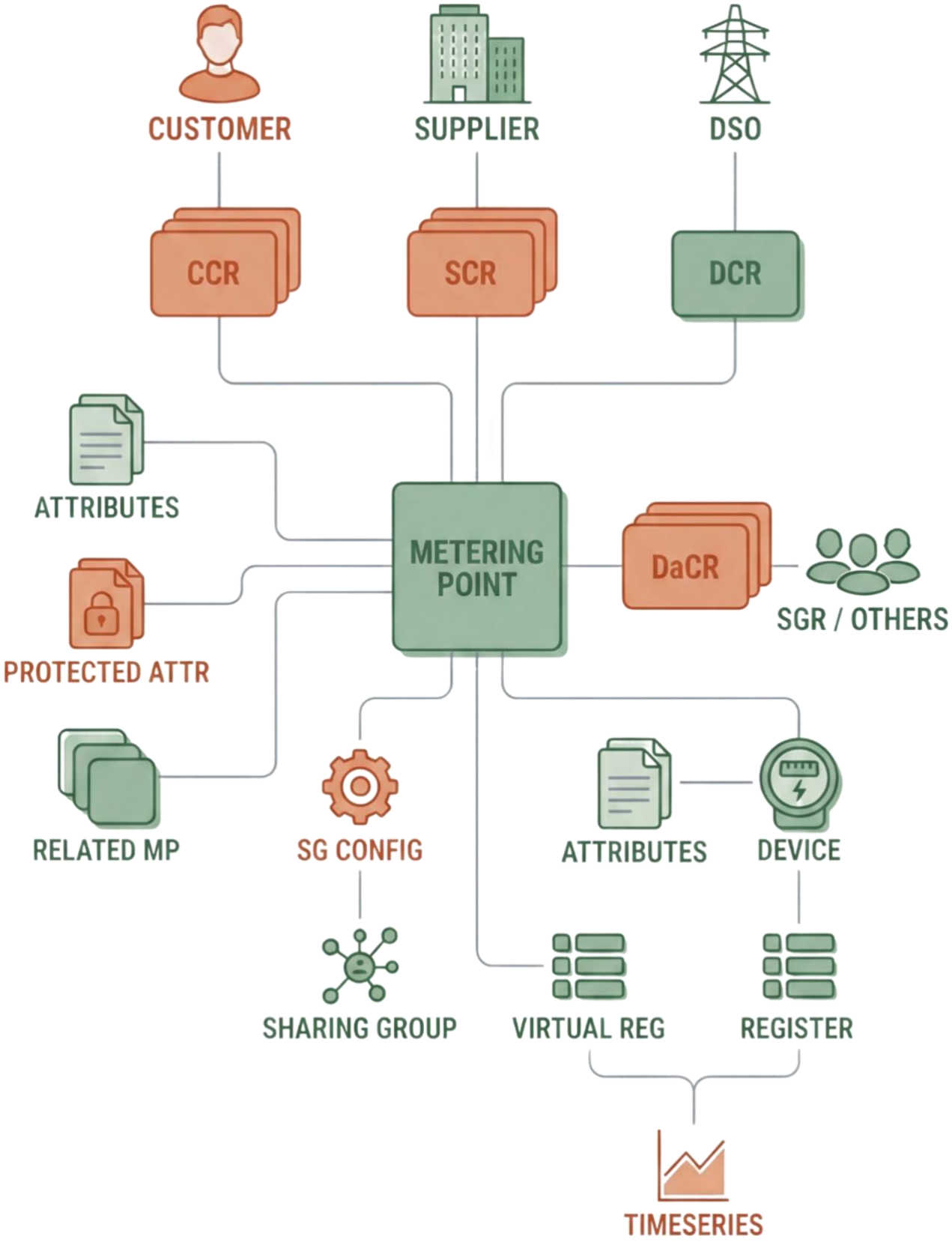


FIGURE 9: LENEDA DATA MODEL

2.2 CENTRAL DATA OBJECTS AND THEIR LINKS

The Leneda data model is composed of various *Data Objects* that are interconnected in specific ways to represent the complex relationships and processes of the energy market. This sub-chapter introduces the fundamental building blocks: the central MP, the acting *Business Partners*, and the ComRels that link them, as well as an initial overview of other important entities connected to the MP.

METERING POINT – CENTER OF THE MODEL

The MP is the linchpin of the entire data model in Leneda. It represents the uniquely identified physical or virtual connection point in the energy supply grid where energy - electricity or gas - is either withdrawn or injected. Every MP has the following characteristic properties:

Unique Identification: Each MP is identified by a unique *Metering Point Code*, which makes it unmistakable.

Sector Specificity: A separate, distinct MP exists for each energy sector (electricity, gas) and each energy direction (supply or feed-in). For example, a *Prosumer* installation requires at least two separate MPs to map the consumption and the feed-in of electricity.

Metering Concept: A fundamental principle of the Luxembourg market model is that every physical meter must be linked to a CoMP to ensure that all energy withdrawal from the grid, including a unit's self-consumption, is accounted for. This principle is applied across all types of installations, from simple connections to more complex sites with multiple meters. The common *One-Meter Model* and *Two-Meter Model* for *Prosumers* are typical applications of this rule: even a meter dedicated solely to a production unit is linked to both a FiMP for measuring its feed-in and its own CoMP for measuring the unit's self-consumption. This consistent structure is essential to separately map and balance all energy flows, regardless of the installation's complexity.

Central Linkage: All other relevant *Data Objects* and market relationships in the Leneda system are directly or indirectly connected to an MP. It thus forms the anchor point for all energy industry processes and data.

BUSINESS PARTNERS – ACTORS IN THE MARKET

The various MAs operating in the Luxembourg energy market are represented in Leneda as *Business Partners*. A *Business Partner* is the central *Data Object* that represents a specific MA, such as *Customer* (as *Consumer* and/or *Producer*), DSO, *Supplier*/*Buyer or Sharing Group Responsible*.

However, the specific function of an MA in the market is not derived from the type of *Business Partner* (natural person or organisation), but from one or more explicitly assigned *Market Roles*. Every *Business Partner*, regardless of its role, is identified by a unique *Energy ID*. This EID is assigned by Leneda during the initial onboarding process of the respective MA and serves for its unique identification within the platform.

For professional MAs such as DSOs, *Suppliers*, *Buyers*, or BRPs, this internal identification is complemented by sector-specific standard codes required for cross-system market communication and the management of *Balancing Perimeters*. These codes are collectively referred to as MaCo IDs. Depending on the sector and the specific role, a MaCo ID can be an *Energy Identification Code* (EIC), a *Gas Code Luxembourg* (GLU), or another designated national identifier. Consequently, a single *Business*

Partner identified by one EID typically holds multiple MaCo IDs, each explicitly assigned to a specific *Market Role* they perform, such as a distinct MaCo ID for their DSO role and a separate one for their BC role.

A *Business Partner* represents either a natural person or an organisation (e.g., a company, a public authority). For direct interaction with the Leneda platform, for example via a GUI, logging in is typically done by natural persons, who then act, where applicable, on behalf of and with the permissions of an associated company or another organisation.

COMMERCIAL RELATIONSHIPS – CONNECTIONS TO THE MP

To connect a *Business Partner* with an MP and thus establish a formal relationship between an MA and a connection point over a defined period, ComRels are used. This relationship is often commercial in nature, as with a supply contract, but it can also represent a purely functional authorization, such as granting data access rights via an DaCR.

KEY ASPECTS OF COMRELS

Temporal Validity: Every ComRel is valid for a specified period, defined by a start and end date. This concept is closely linked to the principle of *Historized Data*, which will be explained later.

Typing by BP Role: The type of ComRel depends on the type of *Business Partner* being connected to the MP. The primary types are:

- **Customer ComRel (CCR):** Links the *Customer* (*Consumer* or *Producer*) to the MP.
- **Supplier ComRel (SCR):** Links the *Supplier* or the *Buyer* to the MP.
- **DSO ComRel (DCR):** Links the responsible DSO to the MP.
- **Data-Access ComRel (DaCR):** Links a *Business Partner* to an MP to grant it specific, limited read access to selected data.

  ***Example**: For an SGR, the DaCR specifically grants access to the contact data (e.g., email, address) of the Customer currently assigned to the participating MP, as well as to the calculated Timeseries of the Shared Energy allocated to that MP.*

Significance for Data Access and Stakeholdership: The creation of a ComRel makes the participating MAs *Data Stakeholders* for the corresponding MP. This affects their permissions to view the MP's data and to be informed about relevant changes.

OVERVIEW OF OTHER ENTITIES CONNECTED TO THE MP

Besides MPs, *Business Partners* and ComRels, the data model diagram shows other important *Data Objects* that are directly or indirectly related to the MP and are relevant for specific processes and information. These include, among others:

- **MP Attribute:** Technical, historized properties of the MP that describe its physical or grid-technical characteristics (e.g., the voltage level of the measurement or the Z-factor).
- **MP Billing Attribute:** Billing-relevant, historized properties of the MP used for grid usage billing (e.g., the reference power or the assigned grid usage tariffs).

- **Device:** Physical devices, especially meters, but also other equipment such as RRMs, that are assigned to an MP.
- **Device Attribute:** Specific properties of the device.
- **Register:** Measurement registers of a device that record measured values.
- **Virtual Register:** Logical registers that can be calculated at the MP, for example, from values of physical registers or other sources.
- **Meter Readings:** The cumulative index values received automatically from *Luxmetering* (for *Smart Meters*) or collected through conventional reading methods by the DSO or the *Customer* (for classical, non-communicating meters).
- **Timeseries:** Chronological sequences of power values. Leneda distinguishes between measured *Timeseries* and calculated *Timeseries*.
- **Sharing Group & Configuration:** Entities for mapping and managing SGs (e.g., for energy communities).
- **Related MP:** References to other MPs that have a technical or logical relationship with the MP in question (e.g., in *Prosumer* installations with separate coMP and fiMP).

2.3 Data Organization Over Time

To adequately represent the different requirements for data management - from stable master data to frequently changing values or time-limited relationships - the Leneda Data Model fundamentally distinguishes between two types of data organization: *Static Data* and *Historized Data*. This distinction is fundamental to understanding how information is managed, versioned, and provided for market processes in Leneda.

Static Data

Static Data refers to information that typically remains constant over the lifecycle of a *Data Object*, or where only the most current value is relevant, without needing to track a detailed history of value changes.

- **Characteristics:** Values are stored directly in the respective *Data Object* and always have only a single, current valid value throughout the object's entire lifecycle. If a change or *Correction* occurs, the previous value is directly overwritten. An explicit history of the individual values over time is not maintained in the form of separate time slices on the object itself. It is important to note that corrections to *Static Data* thus have a retroactive effect on the entire validity period of the object, i.e., from the time the object was created.
- **Date Reference:** For logging changes to *Static Data*, the *Request Date* (the time of the request or change in the system) is relevant. A *Process Date* is not required for the applied modification of *Static Data*, as there is no temporal delimitation of validity periods. Of course, all value changes are logged in Leneda for traceability purposes.

- **Examples:** The phone number of a *Customer*, the name of a tariff, or certain fundamental, typically unchangeable properties of a *Data Object*.

HISTORIZED DATA

Historized Data is used whenever values can change over time, or when relationships between different *Data Objects* must be defined, traceable, and analyzable for specific periods. This is the case for most energy industry data and processes.

- **Characteristics:** Values or relationships that can change over the lifecycle of an MP or other objects are not overwritten but are stored in the form of individual, consecutive validity periods, known as time slices. Each time slice has a clearly defined start time (*Process Date*) for its validity. The end of the previous time slice is implicitly defined by the start of the new one, ensuring a seamless history without overlaps. This concept enables the mapping of 1:n relationships over time, for example, when an MP has various *Suppliers* over its lifecycle, which is represented by a chain of consecutive SCRs. Likewise, attributes such as the billing-relevant reference power of an MP can change; each change is stored as a new time slice valid from a specific *Process Date*. In principle, only one value or instance can be valid for a historized attribute or relationship at any given time. *Historized Data* is thus the mechanism that precisely maps and manages such time-delimited assignments and value progressions.

- **Date Reference:** The *Process Date* is the decisive timestamp for *Historized Data*. It defines the exact point in time (date and time) of validity for a new time slice and thereby delimits the validity of the previous time slice for the same attribute or relationship. Changes therefore always take effect from the specified *Process Date* onwards and not retroactively for the object's entire history, as is the case with *Static Data*.

- **Examples:** A meter change at an MP, changes to the billing-relevant reference power of an MP on a specific date or the validity period of a ComRel between a *Customer* and an MP.

- **Significance:** The historization of data ensures complete traceability of changes over time. This is essential for correct historical analysis, meeting regulatory requirements, and, not least, for period-specific billing, as access to *Customer Data* (like *Timeseries*) is always considered in the context of the valid time slices of the relevant ComRels.

2.4 DATA CATEGORIES, VISIBILITY AND ACCESS

All data organized around the MP in Leneda can be fundamentally divided into two main categories: *Market Data* and *Customer Data*. These categories significantly control the access to and visibility of information for the various MAs. As previously introduced, this distinction is also visualized in the data model diagram through the color coding of the objects (generally green for *Market Data*, orange for *Customer Data*).

MARKET DATA

Market Data comprises information that primarily describes the technical and structural characteristics of an MP. This explicitly encompasses *Historized Data*, ensuring that the complete history of attribute values and their past validity periods is available. It serves to promote general market transparency and enables the efficient handling of technical and fundamental market processes.

Accessibility: Access to *Market Data* is restricted to specific authorized *Market Roles*, specifically *Suppliers* and *Buyers*, who require this information for pre-contractual processes (e.g., quotation). This access is granted without an explicit CM or a pre-existing ComRel to the respective MP. Other MAs generally do not have access to *Market Data* without a valid CM. However, the exact scope of viewable *Market Data* can be configured at the field level, allowing Leneda to grant specific *Market Roles* access to selected data fields if required by future regulatory changes or specific business needs.

Examples of Market Data:

- Information on the MP's address, the logical voltage level, or references to *related MPs*. The DSO is typically the *Data Owner* of these properties.
- Detailed information about meters linked to an MP, including their registers and technical attributes. The DSO is also responsible for maintaining and updating this data.
- The basic information on whether an MP is part of a *Sharing Group* to enable correct market processes. The detailed *SG Configuration*, such as the repartition key, is excluded from *Market Data* and treated as protected *Customer Data*.
- In the event that an MP is currently in a state of *Vacancy* (e.g., in *Vacancy Supply* or *Feed-In*), the specific start date of this *Vacancy* is visible. This transparency allows a potential new *Supplier/Buyer* to proactively set the *Process Date* of their SoS/Fi to match this date, thereby enabling a seamless restoration of a regular market contract and preventing coverage gaps.

CUSTOMER DATA

Customer Data is sensitive information subject to special data protection because it directly relates to the *Customer*, their consumption behavior, or their contractual relationships.

Access Conditions: Access to *Customer Data* is strictly regulated and generally requires one of the following authorizations:

- A valid CM issued by the *Customer*, which grants a specific MA access for a defined purpose and period.
- An existing, active ComRel (e.g., a CCR or SCR) of the corresponding *Market Role* to the respective MP. In this case, access is typically limited to the validity period of this ComRel.

Examples of Customer Data:

- **Customer Master Data:** Personal information of the *Customer* such as name, contact details, and the EID.
- **Timeseries:** Detailed measurement data that depicts load profiles and meter readings over time. This is essential for billing and energy management. The DSO is responsible for the correct collection and regular provision of this data. Access to *Timeseries* by an MA (e.g., a *Supplier*) is limited to the period in which a valid ComRel from that MA to the *Customer's* MP existed or a corresponding CM is in place.

- **Contract Data:** Information about the supply contract between the *Customer* and *Supplier*, such as the SoS/EoS date, specific contract conditions like a fixed minimum contract term, or the *Customer's* tax and levy categories. Generally, information stored on the CCR and SCR is referred to as *Contract Data*.
- **SG Configuration:** Specific details regarding the internal rules of a *Sharing Group*, in particular the defined repartition key used for the calculation of *Shared Energy*.

CUSTOMER MANDATE AS CONTROL INSTRUMENT

The CM is a central instrument in Leneda that gives the *Customer* authority and control over access to their protected data and simultaneously authorizes the execution of certain market processes by other MAs on their behalf.

Definition and Purpose: A CM is a time-limited and clearly purpose-bound authorization that the *Customer* grants to a specific MA. It may be mandatory to grant an MA access to protected *Customer Data* or to trigger MaCo processes that require a mandate (such as an SoS) on behalf of the *Customer*.

Characteristics of a CM:

- **Customer-Controlled:** The *Customer* grants and manages their CMs. They retain full control and have the right to revoke a CM at any time. Furthermore, they have transparency at all times about which CMs are active and for what purposes they were granted.
- **Time-Limited:** Every CM has a defined validity period.
- **Purpose- and MA-specific:** A CM is always issued for a concrete, predefined purpose (e.g., executing a *Supplier Switch*, viewing data for quote preparation) and for a single, specific MA.

Typical Use Cases:

- A *Supplier* needs a valid CM from the *Customer* to be able to perform a SoS on a specific MP.
- A SGR needs a CM from the *Customer* to access the MP data and add the MP to a SG.

This clear structuring of data categories and the access mechanisms based on them, especially the CM, are crucial for the trust of all MAs in the Leneda platform and for strict compliance with data protection and regulatory requirements.

While this document outlines the fundamental business principles and use cases of the CM, the exact technical specifications regarding its implementation and usage - including the comprehensive list of available mandate purposes, the precise definitions of their validity periods, and the exact data structures required - are maintained in the official API documentation.

2.5 RESPONSIBILITIES AND INFORMATION FLOW

To establish clarity about the responsibilities for data maintenance and controlled access to information in Leneda, a specific data role is assigned to each *Data Object*. These roles define who is responsible for the creation, modification, and correctness of the data (*Data Owner*) and who is authorized to view this data and be informed about changes (*Data Stakeholder*).

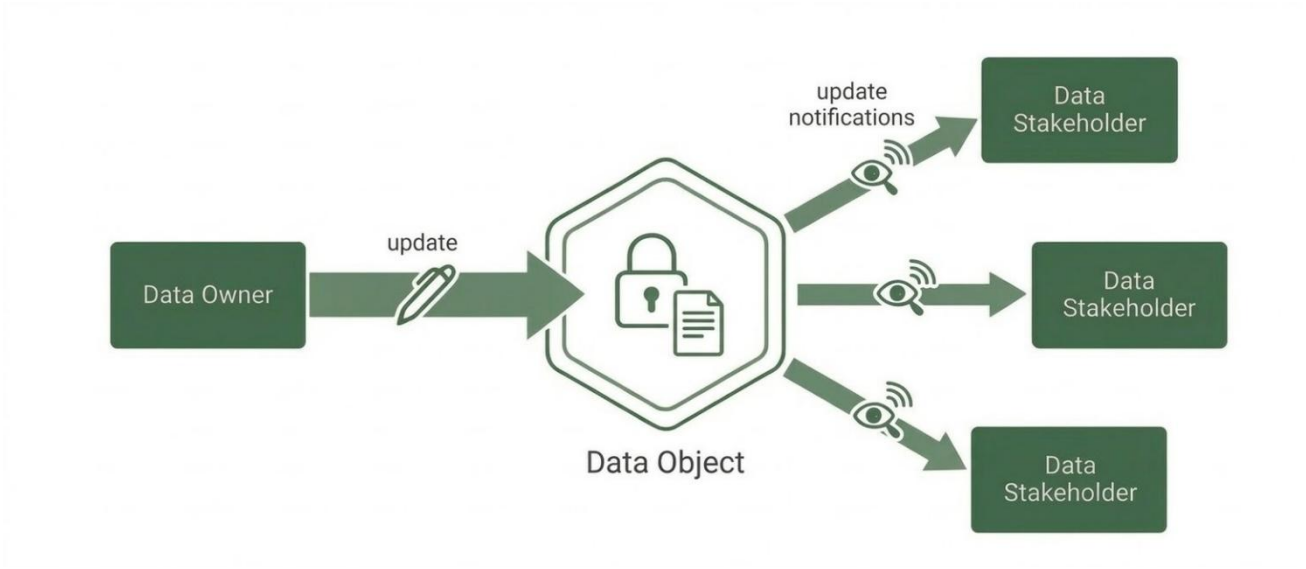


FIGURE 10: DATA OWNER & DATA STAKEHOLDER

DATA OWNER

The *Data Owner* is the *Market Role* that is exclusively authorized to directly create, modify, or delete the value of a *Data Object* or specific fields within it.

Responsibility: The *Data Owner* bears the primary responsibility for ensuring that the *Data Objects* and their values they manage are correct, complete, and always up-to-date in Leneda. Data ownership in Leneda is fundamentally defined at the level of *Data Objects* and assigned to the corresponding *Market Role*.

- The **Customer** is the *Data Owner* of their own *Business Partner* object and the related CCR.
- The **Supplier** or **Buyer** is the *Data Owner* of their own *Business Partner* object and the SCR for which they are responsible.
- The **Sharing Group Responsible** is the *Data Owner* of their own *Business Partner* object. Regarding the *Sharing Group* and the associated *SG Configuration*, the SGR holds a restricted *Data Ownership* defined by a temporal scope. This authorizes the SGR to independently manage and update the configuration for all future periods (D+1). Conversely, the DSO retains the exclusive authority for all historical periods to safeguard the integrity of already calculated or billed *Shared Energy*.
- The **DSO** is the *Data Owner* of the central MP and its specific properties, covering *MP Attributes*, *Protected Attributes*, and the definitions of *related MPs*. Regarding the metering infrastructure, the DSO owns the *Devices* and *Device Attributes*, as well as the associated *Registers* and *Virtual Registers*. Furthermore, the DSO is responsible for the *Timeseries* and the DCR linking their organization to the MP. Finally, the DSO holds the ultimate sovereignty over *Sharing Groups* and *SG Configurations* to ensure billing integrity within their specific grid. However, for national *Sharing Groups* that span across multiple DSOs, the TSO assumes the role of *Data Owner* and responsible entity. In both cases, the operational management is delegated to the SGR.

Exceptions for data changes via MCS: In certain, clearly defined cases, individual data fields can also be changed by MAs who are not the primary *Data Owner* of the entire object. Such changes are typically made via specific MCS and are subject to strict market rules and checks by Leneda. An example of this is the process for a meter *Locking* due to payment arrears: The *Supplier* can request the *Locking* via a specific MCS, but it is the DSO, as the *Data Owner*, who ultimately executes the change on the status field of the MP or *Device*.

DATA STAKEHOLDER

Data Stakeholders are all MAs or parties who are authorized to access specific *Data Objects* in Leneda based on their role, an existing ComRel, or an explicitly granted CM.

Access Authorization and Creation of Stakeholdership: An MA typically becomes a *Data Stakeholder* for an MP's data as soon as they are connected to that MP via an active ComRel (CCR, SCR, DCR, or DaCR). A MA can also become a *Data Stakeholder* for specific data through a CM or a specific role (e.g., as a SGR for the members of their SG regarding SG-relevant data). The *Customer* is always a *Data Stakeholder* of their own data and can track all changes to it in Leneda.

Information about Data Changes: A key feature of the *Data Stakeholder* concept is the active notification about relevant data changes. *Data Stakeholders* are automatically notified by Leneda immediately upon the successful booking of changes (creation, updates, deletion) to the *Data Objects* for which they are registered as a stakeholder and have read permission. These notifications are triggered by the system-side processing of the request (*Request Date*), regardless of whether the change refers to a current or a future *Process Date*. They are generally delivered via a personal update info in the respective MA's message queue in Leneda. This ensures that all involved parties have timely access to the current status of the information relevant to them as soon as it is known to the system. When notifying about changes, especially for *Historized Data* or future contractual relationships (e.g., an upcoming MI), Leneda considers the applicable access rights and the relevant periods of validity to determine the eligible recipients.

The clear definition of *Data Owners* and *Data Stakeholders*, along with the associated regulated data access and information flow, are therefore cornerstones for data quality, transparency, and compliant data exchange in Leneda.

3 BUSINESS SCENARIOS

In this document, *Business Scenarios* refer to all energy industry business processes and interactions that require communication between one or more MAs and the central data platform Leneda. Leneda serves as a data hub and process coordinator to ensure the standardized, transparent, and efficient execution of these operations.

This chapter provides a detailed description of the relevant *Business Scenarios*, grouped into overarching categories where appropriate. The level of detail in the descriptions varies:

- Some *Business Scenarios* describe fundamental data interactions with Leneda, such as reading information or creating and updating master data by the respective responsible *Data Owner*. These interactions are often based on direct calls to *Base Services* or specific MCS and represent single, clearly defined actions.

- Other *Business Scenarios*, such as an MI of a new *Customer*, represent complex end-to-end processes that involve multiple steps, the participation of various MAs, and specific process logic with deadlines and checks. These are typically presented with detailed process flows and component descriptions.

All *Business Scenario* are based on the Leneda data model described in the previous chapter and use the interfaces and services referenced in the *Services and Technical Implementation* chapter for communication with Leneda.

3.1 FUNDAMENTAL DATA INTERACTIONS WITH LENEDA

This category describes the basic interactions of MAs with the data stored in Leneda. It covers both reading information and creating and modifying data by the respectively responsible *Data Owners*. These operations are often fundamental to many subsequent, more complex business processes. Access to and modification of data are always subject to the permission rules defined in Leneda, particularly the distinction between *Market Data* and protected *Customer Data*, as well as the principle of data ownership.

The technical foundation for these interactions is provided by the *Base Services* (which enable direct object manipulation via standard *Create*, *Read*, *Update*, and *Delete* operations, abbreviated as CRUD) and specific MCS (often for context-related data aggregations or rule-based changes). Their fundamental principles are outlined in the *Services and Technical Implementation* chapter, while the specific service definitions are maintained in the technical API documentation.

READ MARKET DATA

Market Data refers to all data managed in Leneda that is accessible to relevant MAs without an explicit CM from the *Customer* or a pre-existing specific ComRel to the corresponding MP. This data primarily includes technical and structural information about MPs and devices.

Purpose and Use Cases: The main use cases for reading *Market Data* include the reconciliation of master data for data synchronization between the systems of MAs and Leneda. It is also essential for gathering the necessary information to prepare for market processes, for example, when a *Supplier* queries the technical details of an MP to create a contract for a potential new *Customer*. Additionally, it serves general information purposes within the scope of the respective *Market Role*.

Execution: Reading *Market Data* is performed by calling the relevant *Base Data Services*. These services allow authorized MAs to query the Leneda database for specific *Data Objects*, such as retrieving the master data of an MP, the list of devices assigned to it, or the registers associated with a specific device. Subject to role-based permissions, these services enable the retrieval of all relevant properties and attributes of a *Data Object*, including its complete history.

Key Data Categories:

- **Metering Point Data:** Properties and attributes directly assigned to the MP, as well as its relationships to other MPs.
- **Device Data:** Properties and attributes directly assigned to the device, as well as information on which devices are or were assigned to an MP.

- **Register Data:** Properties of virtual and physical device registers.
- **Sharing Group Data:** Information indicating solely whether an MP is currently part of a *Sharing Group,* including the provision of the respective SG ID. However, this explicitly excludes any access to the detailed *SG Configuration* data.
- **Vacancy Status:** Information on whether the MP is currently in a state of *Vacancy* and, if applicable, the start date of this period. This enables the *Supplier* to offer a seamless retroactive *Move-In* that closes the supply gap.

Conditions and Checks: Access to *Market Data* is checked by Leneda based on the *Market Role* of the requesting MA. Technical specifications for these services are defined in the external API documentation.

READ CUSTOMER DATA

Customer Data refers to all energy data and personal information managed in Leneda for which access requires either a CM issued by the *Customer* or an active ComRel of the corresponding *Market Role* to the respective MP for the relevant period must exist.

Purpose and Use Cases: The main purpose is to allow authorized MAs, such as the current *Supplier*, to retrieve *Customer* details, contract information, or consumption data. This data is essential for core business activities, including its acquisition for billing processes or for creating offers - which requires an appropriate CM of course. Furthermore, it enables the reconciliation of customer-related data between the systems of MAs and Leneda.

Execution: Reading *Customer Data* is performed by calling either *Base Data Services* for master data queries or more complex MCS to retrieve process-related data like *Timeseries* or contract information. A key function of these services is to enforce all access conditions by verifying the validity of a ComRel or a CM for the requested period.

Key Data Categories:

- **Customer Data:** Master data of the *Customer*.
- **Measurement Data:** *Timeseries* and *Meter Readings*.
- **Contract Data:** Details of supply contracts.
- **SG Configuration:** Detailed configuration parameters, including the repartition key.

Conditions and Checks: Leneda strictly checks for the existence and validity of a ComRel or a CM, as well as the role of the requesting MA. Access to historized *Customer Data* (e.g., *Timeseries*) is often limited to the validity period of the underlying ComRel or CM. Technical details regarding specific validation logic and parameters are defined in the external API documentation (e.g., *Swagger*), as referenced in the *Services* chapter.

CREATE AND MODIFY DATA

This *Business Scenario* describes the fundamental processes by which MAs, in their role as *Data Owners*, ensure the creation, update, and maintenance of the *Data Objects* and attributes for which they

are responsible in Leneda. Correct and up-to-date data maintenance by the respective *Data Owners* is a core requirement for the functionality of all market processes.

Basic Principle of Data Ownership: As explained in the Leneda data model chapter, a *Data Owner* is defined for each *Data Object* and its fields, who is exclusively responsible for its creation, modification, and deletion, as well as for its correctness and timeliness.

Execution via Base Services: The primary method for creating and modifying master data (*Data Objects* such as MP, *Business Partner*, device and their attributes) by the responsible *Data Owner* is through the *Base Services*. These services typically include CRUD (Create, Read, Update, Delete) operations.

- **Create:** *Data Owners* use "Create" services to establish new instances of *Data Objects* (e.g., to create a new MP or a device or to attach a device to an MP).
- **Update:** Existing *Data Objects* and their attributes can be modified by the *Data Owner* using "Update" services (e.g., to update a MO with its attributes).
- **Delete:** In defined cases, *Data Owners* can remove objects or attributes via "Delete" services, provided the market rules permit it.

Modification via MCS: Certain data changes are carried out via dedicated MCS, especially when they require complex business logic, such as the creation or termination of relationships between *Data Objects*. A MCS is also the required method for specific market processes that are initiated by a non-Data Owner. An example of this is a *Supplier* requesting a meter *Locking* due to payment arrears; this process must be handled by a MCS because the DSO is the *Data Owner* of the Locking status. These services encapsulate all necessary checks and process steps. For instance, the SoS process is a MCS that automatically creates the required ComRels after successful validation.

Responsibility and Checks: Every data-modifying operation is validated by Leneda for the authorization of the executing MA (data ownership) and for compliance with applicable market rules (e.g., deadlines, dependencies, format checks). Additionally, during these data-modifying operations by the *Data Owner*, Leneda ensures that all relevant *Data Stakeholders* are informed about the changes made (creation, update, deletion) to the *Data Objects* for which they have read permission. This notification about data changes is generally delivered automatically via an update info in the respective MA's message queue in Leneda, ensuring that the involved parties have immediate access to the current status of the information relevant to them.

The services chapter provides a high-level business description of the key *Base Services* and MCS, focusing on their purpose and important business checks. The complete technical details for all services, including all parameters and specific validation checks, are defined in the corresponding API interface description in Swagger.

MASTER DATA SYNCHRONISATION

This *Business Scenario* describes the standardized process by which an MA can ensure the consistency of their local master data with Leneda as the central *Single Source of Truth*. The process is always initiated by the MA, who can thus flexibly decide when to reconcile their data with Leneda. To ensure operational precision, the MA defines the specific temporal scope of this check. They can choose to validate the data state for a specific key date or validate the comprehensive history of time slices over a

defined period. The goal of this *Business Scenario* is to provide MAs with a flexible tool to maintain high data quality in their systems and to proactively identify and resolve data misalignments with Leneda.

A central feature of this process is its temporal flexibility, the MA can perform the reconciliation either for a specific point in time to check the status on a particular key date, or for a defined period to validate all historized changes within that period.

Technically, the synchronization is executed as a *blind check*. The MA uploads their local data, and Leneda validates it against the central records. In this process, strict data privacy is maintained. Leneda reports back discrepancies but never reveals protected data (such as the actual EID of a *Customer*) to an MA not authorized to view it. Instead, such conflicts are flagged simply as *mismatches* to prevent illegitimate data harvesting.

The reconciliation follows a logical, multi-step procedure:

Portfolio Reconciliation

First, the MA's portfolio - defined as the entirety of their ComRels to MPs - is reconciled. The MA initiates this by submitting a list of their MPs and the EIDs of the associated *Business Partners* linked to each MP via key ComRels (CCR, SCR and DCR) for a specific time or period.

Leneda compares this list with its own data and returns a delta report that identifies all discrepancies. To ensure data privacy, this report is subject to strict information limitations. To act as the *Single Source of Truth*, the level of detail provided in the report depends on the MA's authorization:

- **Valid ComRel:** If the MA holds a valid ComRel (e.g., an active SCR, DCR, or CCR) for the respective MP during the specified period, Leneda will return the correct EID of the actual *Customer* to allow the MA to resolve their local data error.
- **No valid ComRel:** If the MA does not hold a valid ComRel for the respective MP (e.g., due to a typo in the MP or listing an MP outside their portfolio), Leneda will solely flag the entry as invalid or a mismatch. In this case, Leneda will explicitly not reveal the EID of the actual *Customer* currently registered at the MP to prevent illegitimate data harvesting.

Portfolio Cleanup

Based on this report, the MA cleans up their portfolio in their local system. If the error lies with Leneda, the MA initiates the correction process described in the *Data Corrections and Process Reversals Business Scenario*.

Master Data Synchronisation Service

For a selection of MPs from their validated list, the MA submits their local master data to a dedicated Leneda service for synchronization. The MA can flexibly define the scope of this check, choosing to submit data for their entire portfolio or just a subset, and can specify which *Data Objects* (i.e., data groups) to validate for each MP. Leneda then compares the submitted data against its own reference data and returns a list identifying all MPs where a data misalignment was found.

Master Data Analysis and Correction

To analyze the identified discrepancies in detail, the MA can optionally request a field-level delta report from Leneda. Subsequently, the MA either corrects their own system or, if the error lies with Leneda, initiates the *Correction* process described in the *Data Corrections and Process Reversals Business Scenario*.

3.2 START AND END OF SUPPLY

This chapter describes the central processes for the *Start of Supply* (SoS) and *End of Supply* (EoS) at a CoMP. It covers the typical workflows for a *Consumer*, from the initial creation of an MP and the first supply, through the handling of *Vacancies* (*Vacancy Management*) and switches between *Supply Variants* (e.g., *Basic Supply* to *Market Supply*), to a regular *Supplier Switch*. These scenarios illustrate the interaction between the *Customer*, DSO, *Supplier*, and Leneda to ensure a continuous and correctly administered energy supply.

CONSUMER MOVE-IN AT NEW MP

SCENARIO INTRODUCTION

This *Business Scenario* describes the end-to-end process for a new *Customer* at an MP that is yet to be created. It covers the full workflow from the initial grid connection request to the DSO to the start of the commercial *Market Supply*. A key aspect of this process is that all administrative prerequisites are established in Leneda, allowing the *Supplier* chosen by the *Customer* to report the SoMS even before the physical meter has been installed. If no SoMS is registered by the time the DSO activates the MP via the meter installation, Leneda automatically triggers the *Vacancy Management* to prevent unbalanced consumption.

SCENARIO PROCESS FLOW

The following graphical process flow visualizes the individual steps and interactions between the involved MAs. The process is typically initiated by an external grid connection request to the DSO, often from the building owner or a mandated third party (who may not be the future *Customer*). The flow then proceeds through the administrative creation of the MP in Leneda by the DSO and the subsequent conclusion of a supply contract by the future *Customer* with a Supplier. It culminates in the physical installation of the meter and the seamless activation of the supply at the desired time.

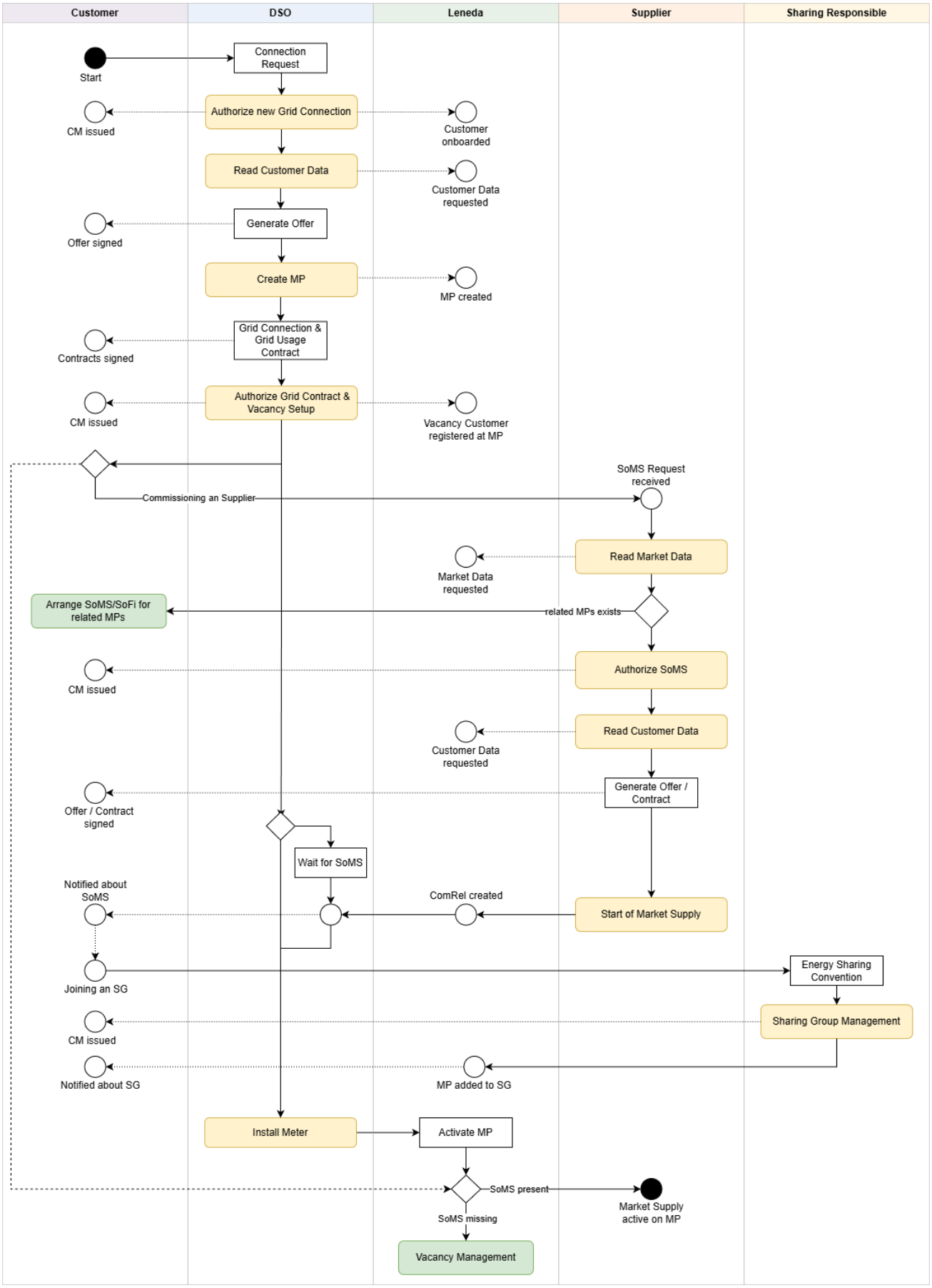


FIGURE 11: CONSUMER MOVE-IN AT NEW MP

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Authorize new Grid Connection

To initiate a new grid connection process, the DSO requires a formal authorization from the Customer. This authorization is provided via a CM. This CM is mandatory for every new grid connection and serves as the *Customer's* official request for the DSO to start the process, which includes creating the new MP in Leneda. This requirement applies even if the DSO already has an active DCR for another MP belonging to that *Customer*, as this CM authorizes a new, specific service.

As part of this mandated process, the CM also authorizes the DSO to retrieve the necessary *Customer Data* such as name and EID required for processing the contract. This step provides an opportunity for the *Customer* to review and update their data if necessary. A prerequisite for granting the CM is that the *Customer* has already completed the onboarding process with Leneda.

Read Customer Data

This component describes how an authorized MA, such as a DSO processing a grid connection request or a *Supplier* initiating a contract, gains read access to protected *Customer Data*. Leneda verifies every access request. Authorization must be based on one of two prerequisites: either a valid CM granted by the *Customer* for a defined purpose, or an existing, active ComRel that links the requesting MA to the relevant MP.

The scope of accessible data includes *Customer* master data (such as name and EID), contract information, or measurement data in the form of *Timeseries*. The exact scope and duration of this access right, particularly for *Timeseries*, are strictly defined by the specific authorization (the CM or the ComRel's validity period) and the MA's role.

Create MP

This component describes the process step in which the DSO creates a new MP in Leneda. For this, the DSO transmits all required master data of the future MP, such as the exact address and technical connection details, to Leneda. Upon the successful creation of the MP in the system, Leneda automatically generates a DCR, which documents the permanent technical and administrative assignment of the MP to the responsible DSO for the respective grid area. Since no physical meter is usually installed at the MP in this initial phase of the process, the newly created MP in Leneda is first given the status *inactive*.

During the MP creation, the DSO may also have the option to define relationships to other existing or newly created MPs, so-called *related MPs*. This is relevant, for example, to correctly map the connection between a coMP and a fiMP in a *Prosumer* installation. The technical implementation of this component is handled via dedicated *Base Data Services*. The DSO uses these services to create the new MP, define its specific attributes, and establish any relationships to other *related MPs*. The complete technical specifications for these services are defined in the corresponding API interface description.

Authorize Grid Contract & Vacancy Setup

This component describes the final, binding authorization from the *Customer* to the DSO. After the grid connection and usage contract is formally prepared, the DSO requests a specific CM.

This CM serves two primary purposes:

- **Contract Confirmation:** It acts as the *Customer's* formal confirmation and digital signature of the grid connection and usage contract in Leneda.
- **Vacancy Setup:** As part of this same authorization process, the *Customer* is asked to nominate a *Vacancy Customer* for the MP.

This registration is optional but highly recommended. The primary purpose is to avoid a potential *Locking* of the MP in the event of a future *Vacancy*. Instead of Leneda initiating a *Vacancy Supply*, the system automatically activates a supply relationship for the registered *Vacancy Customer*. This will either be a regular *Market Supply*, if the *Customer* has designated a *Preferred Supplier* or a *Basic Supply*.

Another advantage of this early linkage is that the *Customer* can view the newly created MP and its status in Leneda even before the SoS has been booked. They can provide this information to a *Supplier* of their choice to initiate a regular *Market Supply*. It is important for data protection that the role of *Vacancy Customer* only grants access to the *Market Data* of the MP, not to the protected *Customer Data* of a potentially different, later energy user. The registration can be revoked at any time.

Sharing Group Management

This component describes the process for adding an MP to an SG. A key prerequisite, as indicated by the process diagram, is that this step can only be initiated after an SoMS has been registered for the MP. This is necessary because the *Customer* must be formally linked to the MP before they can grant the required authorization.

The process typically begins outside Leneda, with the Customer contacting the SGR and signing the necessary contractual agreement such as a sharing convention. The SGR then initiates the process in Leneda by adding the *Customer's* MP to the SG *Configuration*. Leneda validates this new configuration first to ensure it complies with all regulatory and technical market rules. If the configuration is valid, Leneda triggers a request to the *Customer* for an explicit CM. This request may display the contractual details of the sharing convention for the *Customer's* review, making the act of granting the CM the equivalent of a digital signature for the agreement.

Once the Customer grants the CM, the SG *Configuration* becomes active and the MP is officially part of the SG. Leneda automatically creates a DaCR for the SGR. This DaCR grants the SGR access to the specific *Customer Data* required for managing the SG, such as the *Customer's* name, contact details, and the *Timeseries* of the calculated *Shared Energy*.

Read Market Data

This component describes the read access of an MA, typically the *Supplier* in this scenario, to the technical and structural master data of an MP. This *Market Data* is accessible by authorized *Market Roles* even without an explicit CM or a pre-existing ComRel. The data includes, among other things, the voltage level, information on installed devices and registers, and any references to *related MPs*, such as an associated fiMP. In the context of a *Move-In*, the *Supplier* uses this information to create a suitable offer, prepare their supply contract, and technically set up the MP correctly in their internal systems.

Arrange SoMS/SoMFi for related MPs

If the *Supplier* discovers during the reading of the *Market Data* that the new MP is linked to other MPs, so called *related MPs* - for example, with a fiMP of a *Prosumer* installation - this process step becomes relevant. The *Supplier* informs the *Customer* of this situation and advises them that valid supply or feed-in contracts are also required for these *related MPs*. Depending on the configuration of the installation, the *Customer* must then arrange for an additional SoS or a SoFi with an appropriate provider. The goal of this step is to ensure complete and correct contractual coverage for the entire customer installation. This ensures that all energy flows are registered and allocated in Leneda without gaps from the very beginning.

AUTHORIZE SOMS

Before a *Supplier* can perform a SoMS for a *Customer*, they must obtain explicit authorization via a CM. This CM serves as the *Customer's* formal instruction, authorizing the *Supplier* to initiate the SoMS process with Leneda on their behalf. Granting this CM also authorizes the *Supplier* to access the protected *Customer Data* necessary for offer preparation and contract processing. This CM is a mandatory prerequisite checked by Leneda; a SoMS request without a valid CM will be rejected. The CM is requested using the relevant Leneda service.

If the requesting *Supplier* is currently registered as the *Preferred Supplier* for the *Customer* involved in the process, the requirement for a separate CM is waived. Leneda recognizes the existing *Preferred Supplier* status as valid authorization for the SoS request.

START OF MARKET SUPPLY

After the CM is in place, the *Supplier* carries out the actual SoMS by initiating the process in Leneda via the dedicated MCS. In this request, the *Supplier* must explicitly specify the target *Balancing Perimeter* to which the MP shall be assigned. Leneda validates the request, including a check of the *Supplier's* authorization to use the specified *Balancing Perimeter*. Upon successful validation, Leneda creates the necessary ComRels (a CCR and an SCR) and assigns the MP to the *Supplier's Balancing Perimeter*. This action formally establishes the new *Supplier's* responsibility for the energy supply, while transferring the balance responsibility for the MP to the respective BRP, effective from the specified *Process Date*.

INSTALL METER

This component describes the physical act of installing the meter at the MP by the DSO. This step bridges the crucial gap between the physical world and the Leneda system. As soon as the DSO has installed the meter and connected it to be operational, they report this to Leneda via the dedicated *Base Service*. Leneda then changes the status of the MP from *inactive* to *active*. Immediately after activation, Leneda automatically checks whether an SoMS has already been registered for this MP. If this is the case, and a ComRel for a *Supplier* already exists, this *Supplier* is proactively informed by Leneda about the activation of the MP. For the *Supplier*, this is the signal that the supply can now begin and that their responsibilities are in effect.

VACANCY MANAGEMENT

This component describes the automated fallback process that occurs if, at the time of meter installation and MP activation, no SoMS is registered for the MP. To prevent an unallocated state, Leneda initiates the *Vacancy Management* at the end of the activation day.

VACANCY MANAGEMENT FOR CONSUMER

Scenario Introduction

This *Business Scenario* describes the automated Leneda *Vacancy Management* process, which handles any *Vacancy* at a CoMP. Leneda runs this check periodically in a daily cycle to identify all supply gaps, including new *Vacancies* (e.g., after an EoS or new MP) as well as historical gaps that may arise from a *Correction*. To prevent unallocated consumption, Leneda automatically closes these gaps by applying a clear, multi-stage logic. Leneda first verifies if a *Vacancy Customer* is registered for the MP.

If no *Vacancy Customer* is registered, Leneda immediately initiates an SoVS. In this specific case, Leneda assigns the CCR to the DSO and the SCR to the DSO's registered *Preferred Supplier*, or, if none is designated, to the responsible *Basic Supplier* for the grid area. The initiation of an SoVS by Leneda automatically triggers the *DSO Vacancy Management*. As part of this process, the DSO may attempt to identify the responsible *Customer*. If this identification is not successful, or if the DSO opts to proceed with protective measures, the DSO is authorized to initiate escalating measures, such as *Power Reduction* or *Locking*, according to the rules defined in this document.

If, on the other hand, a *Vacancy Customer* is registered, Leneda checks whether this *Customer* has designated a *Preferred Supplier*. In that case Leneda initiates a regular SoMS. If no *Preferred Supplier* is nominated, Leneda initiates an SoBS.

Scenario Process Flow

The following graphical process flow visualizes the interactions of the involved MAs. The process is triggered when Leneda identifies an active CoMP in a state of *Vacancy*, meaning it lacks a valid SCR. This state typically arises after a new MP is activated or an EoS is processed, but can also be the result of a *Correction*.

The diagram illustrates Leneda's multi-stage decision logic, which checks for a *Vacancy Customer* and a *Preferred Supplier*. It shows the path initiated by an SoVS, which triggers the *DSO Vacancy Management*, including the DSO's optional attempts at *Customer* identification and subsequent *Locking* measures. In parallel, it shows the automated paths for *Basic Supply* and *Market Supply*, and the *Customer's* final option to resolve the situation by initiating a new SoMS.

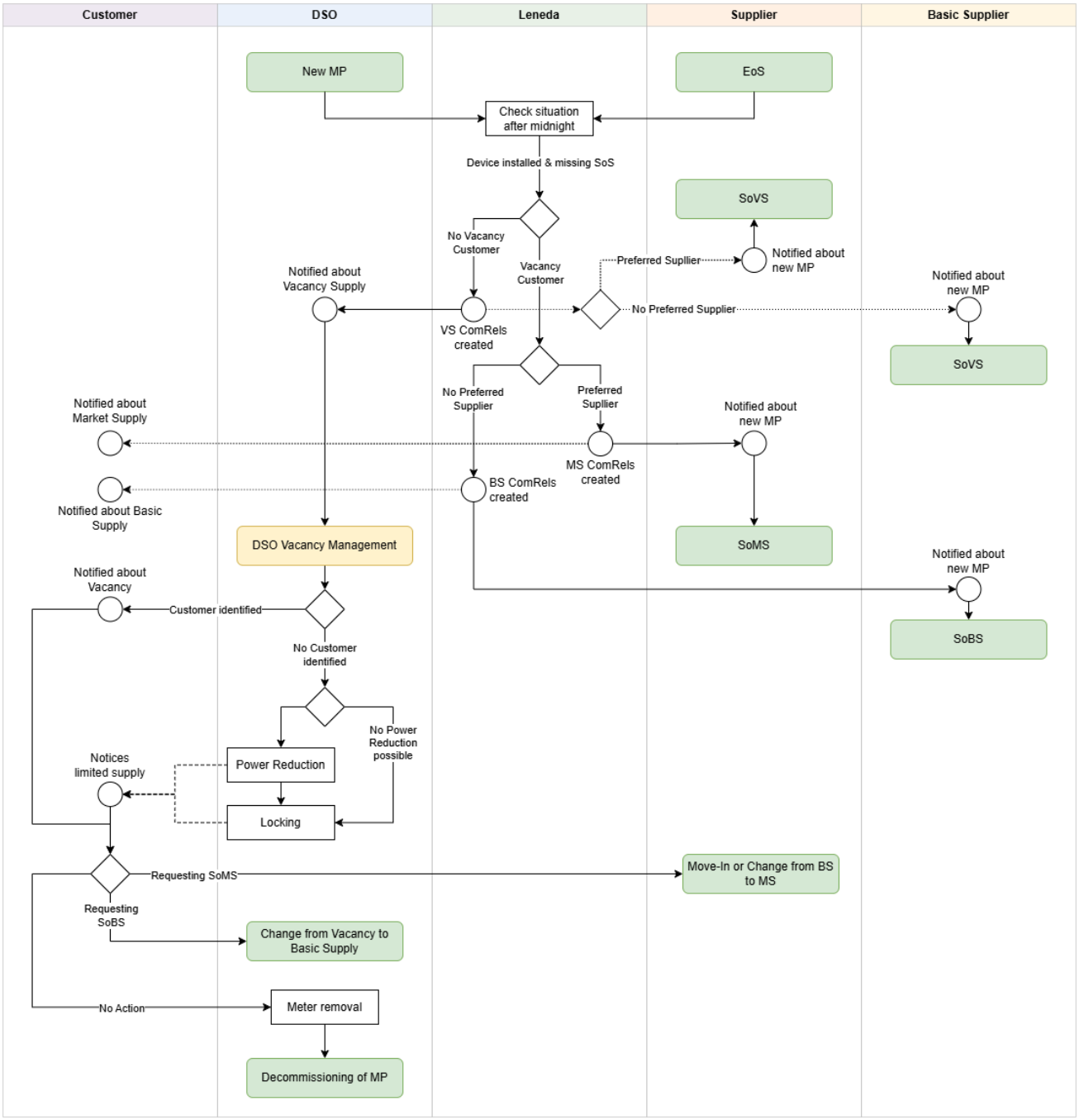


FIGURE 12: VACANCY MANAGEMENT FOR CONSUMER

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Triggering Events

This *Business Scenario* is triggered whenever Leneda's periodic *Vacancy Management* check identifies an active CoMP in a state of, meaning it lacks a valid SCR. This situation typically arises from three main events:

- The activation of a new MP via meter installation, for which no SoS has been registered.

- The processing of an EoS, which is not seamlessly followed by a new SoS from a subsequent *Supplier*.
- A *Correction* that retroactively results in a supply gap for a past period.

DSO Vacancy Management

This component describes the DSO's internal business process. It is initiated by the DSO as soon as Leneda notifies them that a CCR has been assigned to them as part of an SoVS. During the SoVS, Leneda automatically creates two ComRels with a *pre-registered* status: the CCR is assigned to the DSO, and an SCR is assigned to the responsible *Basic Supplier*. This *pre-registered* status is time-limited and allows a regular SoMS to retroactively overwrite the SoVS.

As the holder of the CCR, the DSO is now the formal *Customer* and financially responsible for the energy consumed. The primary goal of the *DSO Vacancy Management* is to resolve this situation to avoid these costs (which would otherwise be socialized via grid fees) and ensure they are allocated to the responsible party (cost allocation by cause).

The subsequent actions are at the DSO's discretion and typically include:

- **Customer Identification:** The DSO may attempt to identify the responsible *Customer*. If successful, the DSO can contact them to end the *Vacancy*, for example by agreeing on an SoBS or prompting the *Customer* to find a *Supplier* for an SoMS.
- **Protective Measures:** The DSO is authorized to initiate measures, such as a *Power Reduction* or a *Locking* of the MP, to avoid the accumulation of these costs, according to the rules defined in this document.

SoVS (Start of Vacancy Supply)

This component describes the automated process initiated by the Leneda *Vacancy Management*. It is triggered when Leneda identifies an active CoMP that is in a state of *Vacancy* and for which no *Vacancy Customer* is registered.

To close the supply gap, Leneda automatically initiates the SoVS. As part of this process, Leneda creates two new ComRels with a *pre-registered* status:

- A **CCR** is created and assigned to the responsible DSO.
- An **SCR** is created and assigned to the *Basic Supplier* for the grid area, unless the DSO has designated a *Preferred Supplier* for *Vacancy Supply*, in which case this *Preferred Supplier* is assigned.

Leneda then informs both parties. With the creation of the SCR, the MP is assigned to the pre-defined *Balancing Perimeter* of the *Basic Supplier*. This formally establishes the *Basic Supplier's* responsibility for the energy supply, while transferring the balance responsibility to the respective BRP, and the DSO assumes the financial responsibility.

SoMS (Start of Market Supply)

This variant of the SoMS represents the proactive case in *Consumer Vacancy Management*. It is the result of a *Preferred Supplier* relationship that has been established contractually in advance between a *Customer* and a *Supplier*.

When Leneda's *Vacancy Management* identifies a *Vacancy* at an MP for which this *Customer* is registered as the *Vacancy Customer* and has designated a *Preferred Supplier*, the system automatically activates the prearranged *Market Supply*. Leneda creates the CCR and SCR for this MP, seamlessly linking the *Vacancy Customer* and their *Preferred Supplier*. This action establishes a regular *Market Supply* from the first moment of the *Vacancy* and makes the fallback scenarios *Vacancy Supply* or *Basic Supply* unnecessary. Leneda then notifies the *Preferred Supplier* about the new SCR, which enables them to retrieve the relevant *Market Data* and *Customer Data* to update their internal systems.

SoBS (Start of Basic Supply)

The SoBS is an automated process triggered by Leneda as a result of the *Vacancy Management* check. It occurs precisely when a *Vacancy Customer* is registered for a coMP, but they have not named a *Preferred* Supplier. Leneda initiates this process by directly creating a *Basic Supply* that links the *Vacancy Customer* and the responsible *Basic Supplier* with the concerned MP. Subsequently, the relevant *Data Stakeholders* are informed about the new supply situation. For the *Basic Supplier*, the notification is the signal to administratively onboard the *Customer* into the basic supply and to inform them via a welcome letter. For the *Customer*, the basic supply represents a stable transitional solution and gives them time to initiate the subsequent *Move-in or Change from BS to MS process* to switch to a *Supplier* of their choice.

Move-In or Change from BS to MS

This component describes the active step by the *Customer* to end an existing *Vacancy Supply* or *Basic Supply* and switch to a regular *Market Supply* with a *Supplier* of their choice. The process is initiated by an SoMS from the new *Supplier* and can result from two main scenarios:

- **Change from BS to MS:** The *Customer* is in *Basic Supply*. Based on the information received (e.g., from the *Basic Supplier's* welcome letter or a *Locking* warning due to the maximum period in BS) or on their own initiative, the *Customer* chooses a *Supplier* whose SoMS notification terminates the *Basic Supply*.
- **Move-in from VS:** The MP is in *Vacancy Supply* under the responsibility of the DSO. After the *Customer* has been contacted by the DSO or has noticed a *Power Reduction* or *Locking* themselves, they choose a *Supplier*. Technically, this is a *Move-In*, as the CCR switches from the DSO to the new *Customer*.

In both cases, if the MP was locked due to the previous situation, the successful SoMS notification automatically triggers the *Unlocking* and *Power Restoration* by the DSO.

Change from Vacancy to Basic Supply

This component describes the process of transitioning a CoMP from *Vacancy Supply* to *Basic Supply*. This is initiated by the DSO after the responsible *Customer* has been identified and has granted the DSO a CM for the SoBS.

The DSO then reports the SoBS to Leneda. Leneda processes this request, which automatically terminates the existing *Vacancy Supply* ComRels. Leneda then creates the new *Basic Supply* ComRels (a CCR for the *Customer* and an SCR for the *Basic Supplier*), and informs both parties. If the MP was previously subject to a *Power Reductio*n or a non-technical *Locking*, Leneda automatically triggers the *Power Restoration* and *Unlocking*.

DECOMMISSIONING OF MP

This component represents the final escalation stage in *Vacancy Management*. It is at the discretion of the DSO and is taken if a coMP remains in *Vacancy Supply* for an extended period and has already been locked, without a responsible *Customer* having come forward or another market process having resolved the situation. In this case, the DSO can arrange for the decommissioning of the MP. This includes the physical removal of the meter on-site and the subsequent formal decommissioning of the MP in Leneda. In the event of a final decommissioning, this step automatically terminates the DCR as well as any other currently active ComRels (such as an existing CCR or SCR) linked to the MP, thereby definitively ending its lifecycle in the system.

CHANGE FROM VACANCY TO BASIC SUPPLY

SCENARIO INTRODUCTION

This scenario describes the transition of an MP from *Vacancy Supply* to *Basic Supply*. The change can be initiated either by the DSO, after they have identified the *Customer* and received the corresponding CM, or automatically by Leneda if the *Customer* registers themselves as the *Vacancy Customer* for this MP. In the first case, the DSO submits an SoBS to Leneda. In the second case, the SoBS is triggered automatically by Leneda.

The targeted *Process Date* is typically the start date of the existing *Vacancy Supply*. Depending on the selected date and applicable deadlines (standard retroactive limit of D-14), the provisional *Vacancy Supply* is either fully annulled (if the dates coincide), remains valid for the remaining interim period, or requires a formal *Correction* process for periods extending further into the past.

Leneda then creates the required ComRels between the *Customer*, the *Basic Supplier* and the MP and assigns the MP to the *Balancing Perimeter* of the *Basic Supplier*. Upon successful registration, the *Basic Supplier* assumes responsibility for the energy supply at the MP from the specified *Process Date*. If the MP was previously locked or its power reduced, full power is restored by the DSO as part of this process.

SCENARIO PROCESS FLOW

The following graphical process flow visualizes the interactions of the involved actors. Starting from an MP in *Vacancy Supply*, the diagram shows the two main paths to switch to *Basic Supply*: Either the DSO initiates the process after the *Customer* has been identified and has granted their CM, or the *Customer* registers themselves directly in Leneda, which automatically triggers the process. Both paths culminate in the creation of the new ComRels by Leneda, the notification of the *Basic Supplier*, and the automatic initiation of any necessary *Power Restoration* at the MP and its *Unlocking*. Additionally, the alternative path is shown where the *Customer* opts for a regular *Market Supply* directly, which leads to the *Consumer Move-In at existing MP Business Scenario*.

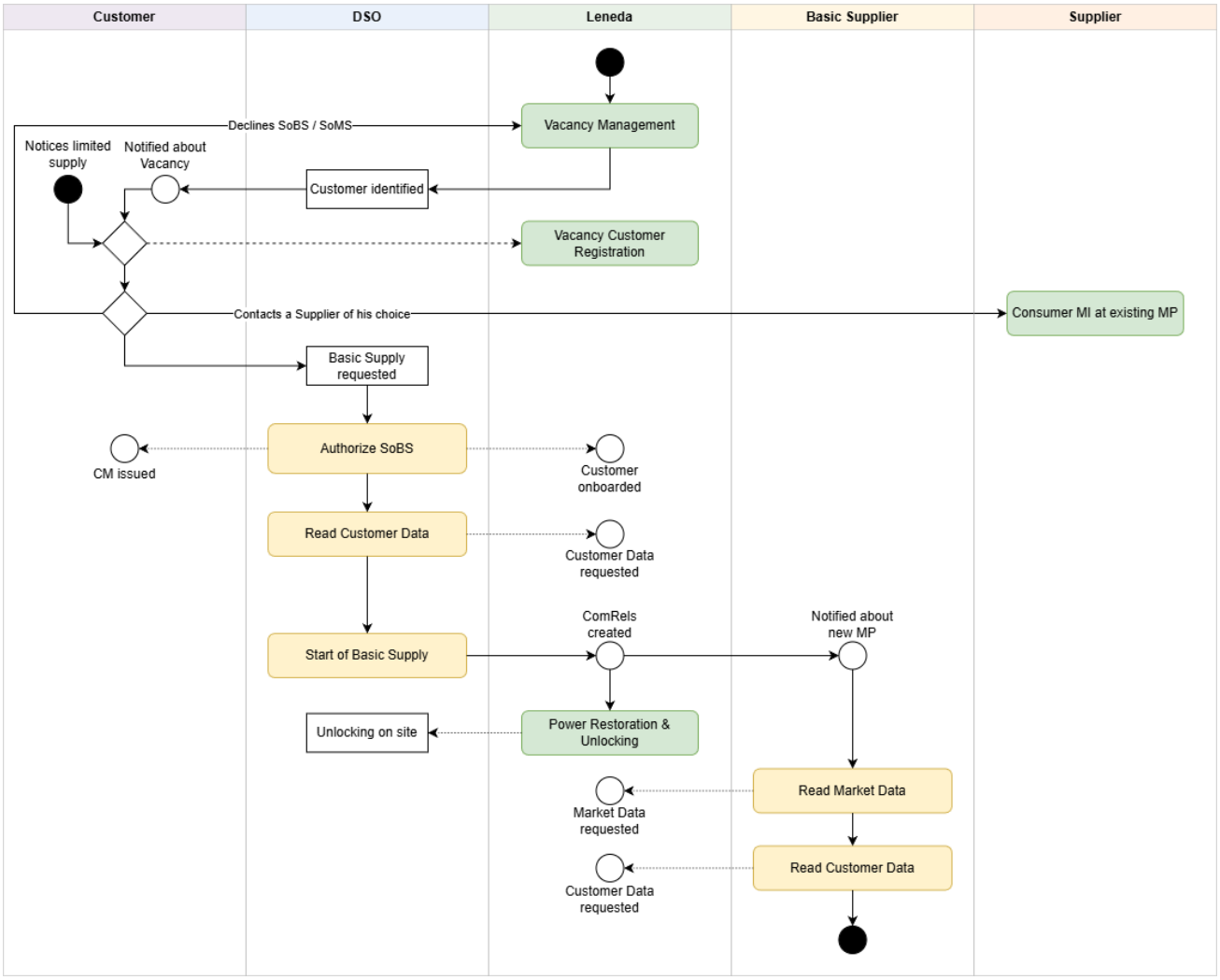


FIGURE 13: CHANGE FROM VACANCY TO BASIC SUPPLY

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Vacancy Management

This component describes the initial state from which the *Business Scenario* starts. The MP is in *Vacancy Supply*, assigned to the DSO as the formal *Customer*, and the DSO may have already initiated a *Power Reduction* or a physical *Locking*. The resolution of this *Vacancy* state can occur through several paths, as shown in the diagram. Ideally, the *Customer* takes the initiative after noticing the *Vacancy* by either registering directly as a *Vacancy Customer* in Leneda, or by commissioning a regular *Supplier* for a *Move-In*. Alternatively, the *Customer* may contact the DSO to explicitly request the transition to *Basic Supply*. However, if the *Customer* takes no action but the DSO successfully identifies them through internal investigations, the DSO is authorized to directly initiate the transition to *Basic Supply*. This unilateral action ensures correct cost allocation, without requiring prior mutual contact or a proactive decision from the *Customer*.

Vacancy Customer Registration

This component describes an alternative path, initiated directly by the *Customer*, to activate *Basic Supply*. The trigger for this occurs after the *Customer* has either been informed of the *Vacancy* by the DSO or has noticed a *Power Reduction* or *Locking* at the MP themselves. In this case, instead of going through the DSO, the *Customer* independently registers in Leneda as the *Vacancy Customer* for the respective MP. This action automatically triggers a SoBS in Leneda, with its *Process Date* set to the current day (D+0) to ensure the *Customer* is unlocked as quickly as possible.

Consumer Move-In at existing MP

After the *Customer* becomes aware of the *Vacancy* (e.g., through a notification from the DSO or by noticing a *Power Reduction*), they actively decide against *Basic Supply*. Instead, they conclude a regular supply contract with a *Supplier* of their choice. This initiates the standard process for a *Move-In* at the MP. A successful SoMS by the new *Supplier* terminates and replaces the existing *Vacancy Supply*. This entire procedure, including the acquisition of the CM and the data query by the new *Supplier*, is described in detail in the separate *Business Scenario Consumer Move-In at existing MP*.

Authorize SoBS

This component becomes relevant immediately after the DSO has identified the responsible *Customer*. To process the SoBS through the standard automated workflow, the DSO directly requests an explicit CM via Leneda to legally act on the *Customer's* behalf. If the *Customer* successfully completes the Leneda onboarding (if not already done) and grants the CM, the DSO proceeds with the standard SoBS. However, if the *Customer* cannot be reached, refuses to grant the CM, or fails to onboard, the DSO directly registers the SoBS using the formal *Correction* process via a *Correction Ticket*, which allows bypassing the CM requirement. Furthermore, if the identified *Customer* does not yet have an EID in Leneda or the EID is unknown to the DSO, the DSO is authorized to manually create a provisional *Business Partner* record to complete the registration.

Read Customer Data

This component describes the read access to protected *Customer Data* in Leneda by an authorized MA. Access is authorized either by a previously granted CM (in the case of the DSO) or by a newly created, valid ComRel to the MP (in the case of the *Basic Supplier*). The authorized MA retrieves the data to obtain the verified contact details and the EID of the *Customer*. This information is needed to administratively prepare the supply and to establish communication with the *Customer*. For the DSO, this is the final step before submitting the SoBS. For the *Basic Supplier*, the data retrieval serves to create the *Customer* in their own systems after the SoBS has been registered by Leneda.

Start of Basic Supply

After the DSO has received the CM from the *Customer* and verified their data, this component is triggered. The DSO now submits the SoBS request to Leneda via the dedicated MCS.

After a successful check, Leneda creates the new ComRels for the *Customer* and the *Basic Supplier* and assigns the MP to the *Balancing Perimeter* of the *Basic Supplier*. The existing *Vacancy Supply* is thereby automatically terminated or delimited to the day before the *Process Date*. The successful registration also triggers the *Unlocking* and *Power Restoration* at the MP and informs all relevant *Data Stakeholders*. For the *Basic Supplier*, this notification is the signal to administratively onboard the *Customer* into the *Basic Supply*. For the *Customer*, the *Basic Supply* represents a stable transitional solution, giving them time to switch to a *Supplier* of their choice.

The standard process allows the *Process Date* for the SoBS to be up to 14 calendar days in the past. If the *Process Date* must be set further in the past, or if a CM cannot be obtained - for instance, when a responsible *Customer* has been identified but fails or refuses to complete the onboarding process and grant the CM - the standard process cannot be used. In such situations, the DSO must register the SoBS using the formal *Correction* process, which requires a *Correction Ticket*. To facilitate this, the DSO is authorized to create a provisional *Business Partner* record for the identified *Customer*. This mechanism ensures that the SoBS can still be processed and the necessary ComRels established as a fallback measure to ensure proper cost allocation, even without a fully onboarded *Customer*.

Additionally, if it is subsequently discovered that an incorrect *Customer* was registered for the *Basic Supply* - for instance, when the *Basic Supplier* contacts the *Customer* with a welcome letter or an invoice and the error becomes apparent - a formal *Correction* is mandatory. In such cases, either the DSO or the *Basic Supplier* can initiate the process by creating a *Correction Ticket*. This ticket is used to reverse the erroneous ComRels and to register the actual responsible *Customer* for the *Basic Supply* via a new SoBS.

Power Restoration & Unlocking

This component is automatically initiated by Leneda immediately following a successful SoBS registration. This process only applies if the MP was previously locked or its power was reduced as part of the *Vacancy Management* process.

To restore the full energy supply, Leneda first attempts a remote *Unlocking* for *Smart Meters* by interfacing with the connected *Luxmetering* system. If this remote attempt fails, or if the MP is equipped with a conventional meter, Leneda automatically notifies the DSO. The DSO must then perform the physical *Unlocking* on-site. The result is the full restoration of power, allowing the *Customer* to use the connection without restrictions.

Read Market Data

This component is triggered after the SoBS has been processed and the *Basic Supplier* has been informed of the new supply situation. The *Basic Supplier* now accesses the technical master data of the MP in Leneda. This *Market Data* includes information such as the voltage level respectively pressure, the installed devices, and the available registers. No explicit CM from the *Customer* is required to access this technical data. The retrieved data is used to correctly set up the MP in the *Basic Supplier's* internal systems and to administratively support the supply.

Change from Basic or Replacement to Market Supply

Scenario Introduction

This *Business Scenario* describes the switch from an existing *Basic Supply* or *Replacement Supply* to a regular *Market Supply*. The *Customer* has been informed about their current supply status and can now commission a *Supplier* of their choice to perform the switch. The new *Supplier* then reports an SoMS to Leneda to process the *Supplier Switch*. However, if the *Customer* does not choose a new *Supplier* within the maximum period set by the ILR, the DSO will initiate the *Locking* of the MP after a prior written notification, or, if required by the applicable legal framework, transfer the MP to a subsequent *Supply Variant*.

Scenario Process Flow

The starting point is the state in which the *Customer* is in *Basic Supply* or *Replacement Supply*. The primary process path is initiated by the *Customer* commissioning a new *Supplier*. This action initiates the *Consumer switches Supplier Business Scenario*, transitioning the *Customer* to a new *Market Supply*.

The alternative path occurs if the *Customer* fails to act within the maximum permitted period. In this case, the DSO is authorized to initiate escalating measures, starting with a *Power Reduction* where technically feasible, followed by a Locking. If the Customer continues to take no action, this can lead to the removal of the meter and the *Decommissioning* of the MP.

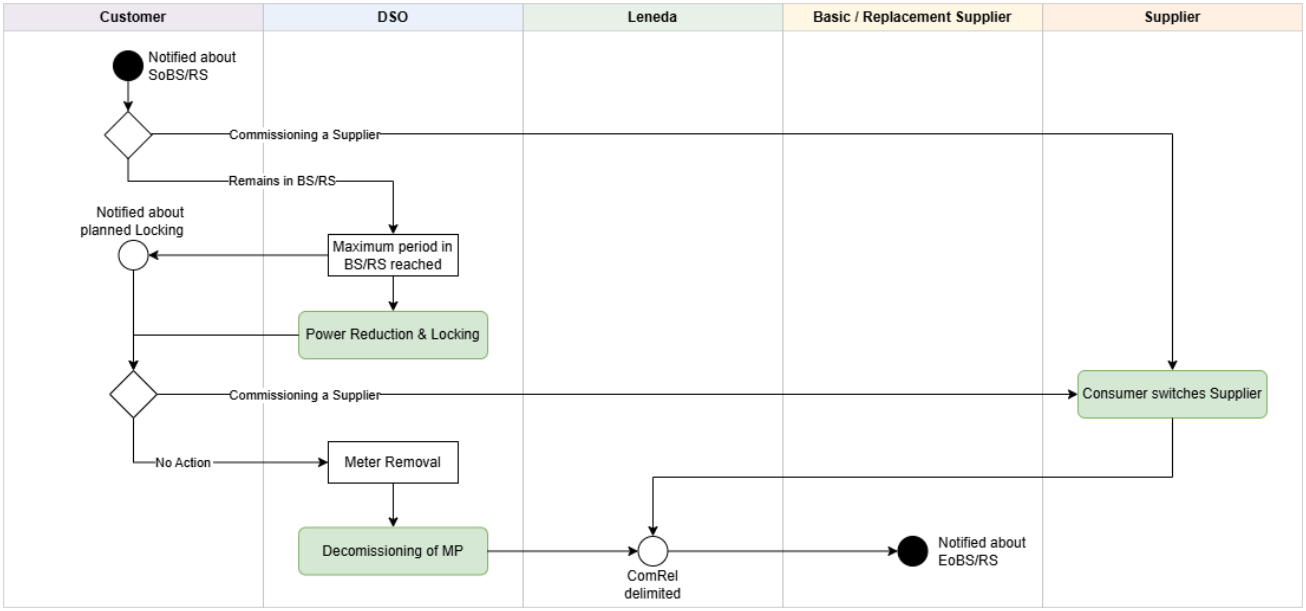


FIGURE 14: CHANGE FROM BASIC OR REPLACEMENT TO MARKET SUPPLY

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Power Reduction & Locking

This sub-process is initiated by the DSO if the *Customer* has exceeded the maximum permitted period in *Basic Supply* or *Replacement Supply* without switching to a regular *Supplier*. A prerequisite is that the DSO has previously sent the *Customer* a written notification of the planned *Locking*. The DSO then initiates the *Locking* process. If technically possible, a *Power Reduction* is first carried out at the MP as a final warning before the complete *Locking* occurs. If the *Customer* continues to take no action, the next step in the process is the removal of the meter by the DSO, as shown in the diagram. Alternatively, if required by the applicable legal framework, the MP is instead transferred to a subsequent *Supply Variant*.

Consumer switches Supplier

This sub-process describes the *Customer's* active switch to a regular *Market Supply*. The process is triggered after the *Customer* has selected a new *Supplier*, signed a supply contract with them, and granted the necessary CM for the SoMS. The new *Supplier* then reports the SoMS to Leneda. Leneda checks the request, particularly for compliance with the switching deadline - the supply can begin at the earliest on the following calendar day. After a successful check, Leneda creates the new ComRels, terminates the existing *Basic Supply* or *Replacement Supply*, and informs the *Customer* about the start

of the new supply. The detailed procedures for this switch are described in the separate *Business Scenario* of the same name.

Decommissioning of MP

After the MP has already been locked and the *Customer* has still not reacted, the DSO can arrange for the physical removal of the meter. After the removal, the DSO reports the *Decommissioning* to Leneda. Depending on the DSO's assessment, this can be a temporary or a final *Decommissioning*.

Consumer Move-In at existing MP

Scenario Introduction

This *Business Scenario* describes the *Move-In* of a new *Customer* at an existing MP at which, on the *Move-In* date, either no *Customer* or a different *Customer* is assigned, or which is in a state of *Vacancy Supply* with the DSO being linked via CCR with the MP. To perform the *Move-In*, the new *Supplier* must obtain a valid CM from the *Customer* and report an SoMS to Leneda. Leneda then creates the new ComRels, terminates any existing old relationships, and, if necessary, initiates the *Unlocking and Power Restoration* at the MP if it was locked.

Scenario Process Flow

The following graphical process flow visualizes the interactions of the involved actors. The process is initiated by the new *Supplier*. If necessary, the *Supplier* identifies the MP, reads the *Market Data*, and obtains the necessary CM from the *Customer* to gain access to their protected *Customer Data*. After clarifying any existing *related MPs* and signing the contract, the *Supplier* launches the SoMS. Leneda processes the SoMS, creates the new ComRels, and triggers subsequent processes such as notifying a *Sharing Group Responsible*, informing the *Customer* about any related fiMPs or restoring the power supply.

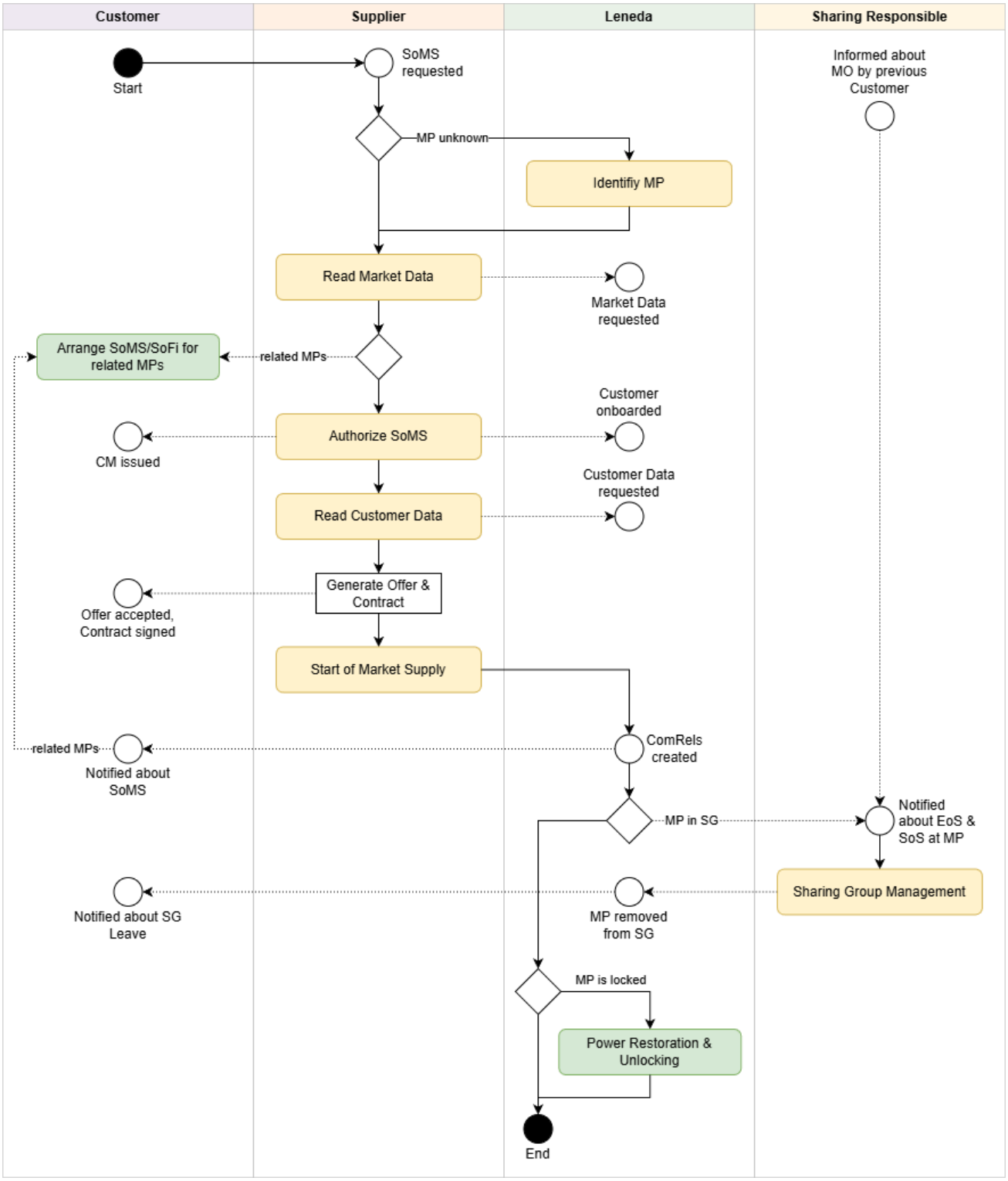


FIGURE 15: CONSUMER MOVE-IN AT EXISTING MP

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Identify MP

If the MP is not known, the *Supplier* can identify it using a dedicated Leneda service. This mandate-free service allows the *Supplier* to query the Leneda database using known details, such as the meter number or the MP's address. Upon a successful match, Leneda returns the correct MP, allowing the *Supplier* to continue the process.

READ MARKET DATA

As soon as the MP is known, the *Supplier* retrieves the corresponding *Market Data* from Leneda. This includes information such as the voltage level, installed devices, registers, and any references to other, associated *related MPs*. No CM is required to access this data. The *Supplier* uses this information to prepare the offer and to set up the MP correctly in their internal systems.

Additionally, if the MP is currently in a state of *Vacancy* (e.g., *Vacancy Supply*), the start date of this period is provided. This allows the *Supplier* to align the SoMS *Process Date* with the start of the *Vacancy* to ensure a seamless transition and retroactive coverage.

If the MP is identified as a member of a *Sharing Group*, the *Supplier* informs the *Customer* of this status and point out that a valid *Energy Sharing Convention* with the SGR is required to maintain membership.

ARRANGE SOMS/SOFI FOR RELATED MPS

The goal of this component is to ensure complete contractual coverage for the entire *Customer* installation, including all *related MPs*. This process can be initiated in two different ways:

- **Initiated by the Supplier before the SoMS:** If the *Supplier* discovers, while reading the *Market Data*, that *related MPs* exist (e.g., a FiMP in a *Prosumer* installation), they proactively inform the *Customer* of this situation and advise them that valid contracts are also required for these MPs.
- **Initiated by Leneda after the SoMS:** Once the ComRels for the CoMP have been created, Leneda informs the *Customer* in a notification about any existing *related MPs*. The *Customer* is then prompted to clarify the contractual situation. For instance, if a FiMP exists, the *Customer* can initiate the takeover (*Cession*) in Leneda (see *Business Scenario Producer MI at existing MP*); if there are other CoMPs, the *Customer* must arrange a *Move-In* with a *Supplier* of their choice.

AUTHORIZE SOMS

After the technical details of the MP have been clarified, the *Supplier* must obtain formal authorization from the *Customer* to carry out the *Move-In*. For this, they request a CM which is a mandatory prerequisite to be able to perform an SoMS. It authorizes the *Supplier* both to access the protected *Customer Data* and to report the SoMS on behalf of the *Customer*. If the *Customer* does not yet have an EID, they must first complete the onboarding process in Leneda. Once the CM is granted, the *Supplier* can execute the next step, reading the *Customer Data*.

If the requesting *Supplier* is currently registered as the *Preferred Supplier* for the *Customer* involved in the process, the requirement for a separate CM is waived. Leneda recognizes the existing *Preferred Supplier* status as valid authorization for the SoS request.

READ CUSTOMER DATA

After the CM has been granted, the *Supplier* is authorized by Leneda to access the protected *Customer Data*. They can now view the *Customer's* master data such as name and EID, as well as relevant

commercial information like the grid tariff or the reference power. With this information, the *Supplier* can finalize their offer and prepare the subsequent SoMS.

START OF MARKET SUPPLY

Once all prerequisites are met (the CM is in place and the supply contract is signed), the *Supplier* initiates the SoMS by reporting it to Leneda.

For a *Move-In*, the standard process allows the *Process Date* to be up to 14 calendar days in the past. If the *Process Date* must be set further in the past (outside this deadline), the *Supplier* must report the SoMS using the formal *Correction* process, which requires a *Correction Ticket*.

Leneda validates the request, creates the new ComRels (a CCR for the *Customer* and an SCR for the *Supplier*), and assigns the MP to the *Supplier's Balancing Perimeter*. In contrast to a pure *Supplier Switch*, a check for any contractual binding of a previous *Customer* is not performed. Upon successful registration, the *Supplier* assumes the responsibility for the energy supply, while the respective BRP assumes the balance responsibility for the MP.

Leneda also informs the *Customer* about the successful *Move-In* and notifies them of any existing *related MPs*. This notification prompts the *Customer* to clarify the contractual situation for these other MPs, such as initiating the takeover (*Cession*) for a FiMP or arranging a *Move-In* for other CoMPs. If the MP was in a state of *Locking* at the time of the SoMS, the downstream *Power Restoration & Unlocking* process is automatically initiated.

SHARING GROUP MANAGEMENT

This component describes the necessary actions for the SGR when the *Customer* at an MP that is a member of a SG changes. Since the *SG Configuration* defines the relationship between the SG and the MP (independent of the *Customer*), the SGR must decide whether this relationship should continue. To do so, the SGR must clarify the contractual basis with the new *Customer*. If the contractual basis for the MP's continued membership in the SG is not met, the SGR is obligated to remove the MP from the SG by adjusting the *SG Configuration*. The trigger for managing the SG can occur in two ways:

- **Proactive notification by the old Customer:** The departing *Customer* is contractually obligated to inform the SGR in advance about the sale or *Move-Out*. The SGR must then adjust the *SG Configuration* and remove the MP from the SG in a timely manner (at the latest D-1 before the takeover). This prevents the new *Customer* from illegitimately benefiting from the *Shared Energy*, unless a seamless entry has already been contractually clarified.

- **Reactive notification by Leneda:** If no proactive notification was made, the SGR, as a *Data Stakeholder*, is automatically informed by Leneda about the change of *Customer* during the ComRel creation. Since the *Move-In* of the *Customer* can be reported retroactively, but the SGR can only adjust the *SG Configuration* for the future (from D+1 onwards), the MP formally remains in the SG for the period between the change and the adjustment. *Shared Energy* that has already been calculated for this period will not be recalculated. The SGR may request a retroactive correction and recalculation from the DSO via a *Correction Ticket*. When the SGR subsequently removes the MP from the SG, the new *Customer* is informed accordingly. If interested, they can now contact the SGR to arrange for re-admission to the SG.

Power Restoration & Unlocking

If the *Move-In* is reported for an MP that is locked or has its power reduced at the time of the SoMS, Leneda automatically initiates this process. This occurs directly after the SoMS is processed and generally applies regardless of the original reason for the *Locking* - be it due to a previous *Vacancy Supply* or non-payment by the previous *Customer*. Full power is then restored. An important exception exists if the *Locking* was for technical reasons; in this case, the decision to restore service is at the discretion of the DSO.

Consumer switches Supplier

Scenario Introduction

This *Business Scenario* describes how a *Customer* at an existing MP switches from their current *Supplier* to a new one. The process is initiated by the *Customer* commissioning the new *Supplier* to handle the switch.

A key prerequisite is the validation of an existing *Contractual Binding*, which is performed by the new *Supplier* and enforced by Leneda. If a binding conflicts with the desired switch date, the *Customer* can proactively override it when granting the necessary CM to the new *Supplier*. By explicitly selecting to ignore the binding and acknowledging potential early termination fees, Leneda automatically neutralizes the block in advance. If the *Customer* does not use this override, the subsequent SoMS will be rejected by Leneda. In that case, the process can only continue if the incumbent *Supplier* manually removes the binding or the switch is postponed.

After the successful reporting of the SoMS by the new *Supplier*, Leneda creates the new ComRels, terminates the old ones, and assigns the MP to the *Balancing Perimeter* designated by the new *Supplier*. The switch can take effect at the earliest on the following calendar day.

Scenario Process Flow

The following graphical process flow visualizes the interactions between the *Customer* and the new and incumbent *Suppliers*. The DSO is not depicted as an active participant in this diagram, as they do not perform any validation or action within this specific process. However, as a permanent *Data Stakeholder* linked via the DCR, the DSO is automatically informed by Leneda about all resulting changes, such as the ComRel updates.

Similar to the *Move-In* process, the new *Supplier* first identifies the MP and obtains the CM to read their data. A crucial step is checking for an existing *Contractual Binding*. If one is active, it must be clarified and, if necessary, removed by the incumbent *Supplier* before the new *Supplier* can report the SoMS. Leneda processes the notification, updates the ComRels, and notifies the involved parties about the successful switch.

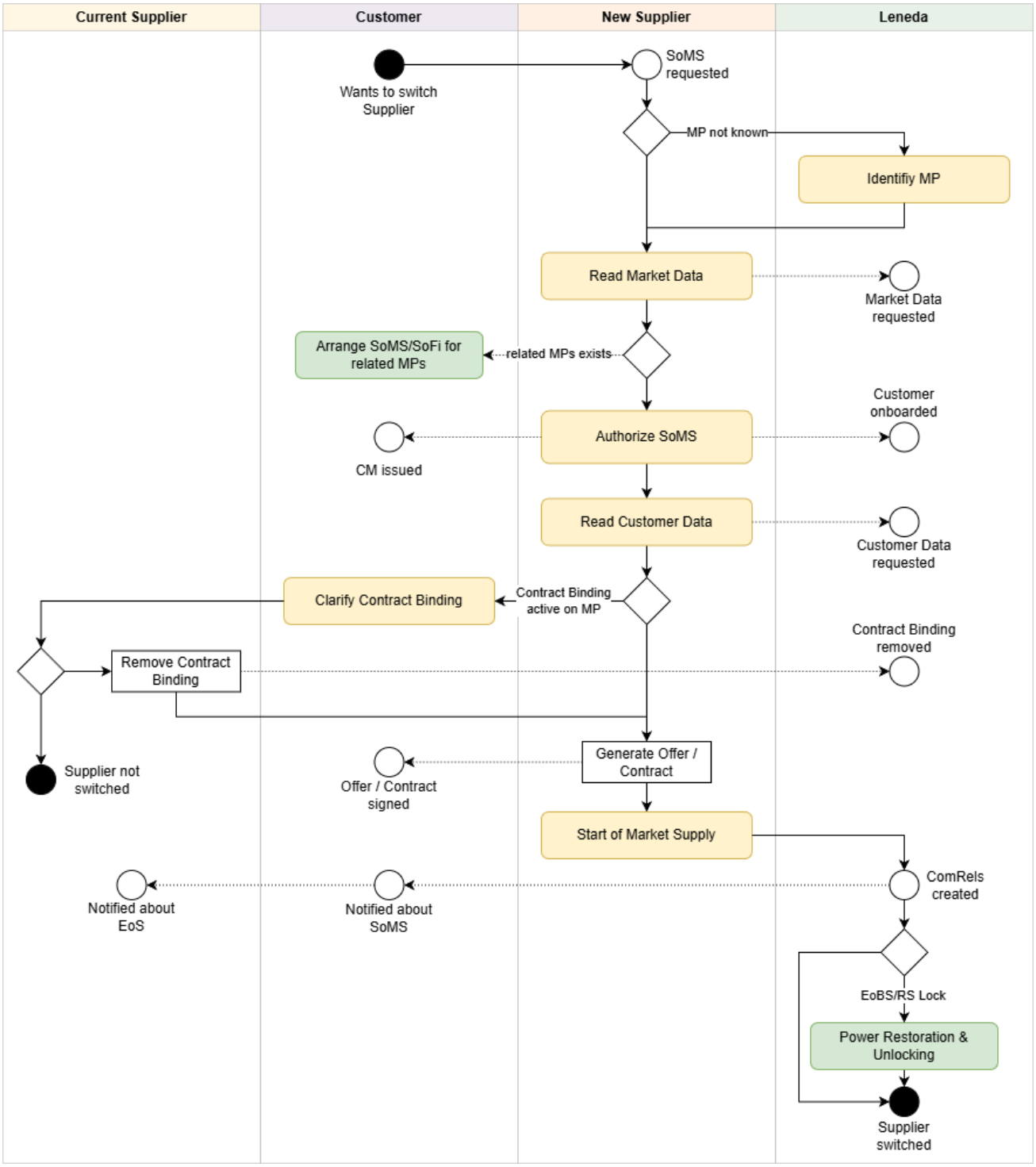


FIGURE 16: CONSUMER SWITCHES SUPPLIER

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Identify MP

If the *Supplier* does not know the MP, they can query it using the meter number and address details. For this mandate-free service, Leneda returns the MP upon success, allowing the *Supplier* to continue the process.

Read Market Data

After the MP has been identified, the *Supplier* retrieves the corresponding *Market Data* from Leneda. This includes information such as the voltage level, installed devices, registers, and any references to other, associated *related MPs*. No CM is required to access this data. The *Supplier* uses this information to prepare the offer and to set up the MP correctly in their internal systems.

Arrange SoMS/SoFi for related MPs

If it is determined while reading the *Market Data* that other *related MPs* belong to the MP, this process step becomes relevant. This is the case, for example, with *Prosumer* installations that have a separate MP for feed-in. The *Supplier* informs the *Customer* of this situation and points out that a valid SoMS or SoMFi is also required for these *related MPs*. The goal is to ensure the complete contractual coverage of the entire *Customer* installation so that all energy flows are correctly registered and allocated in Leneda from the very beginning.

Authorize SoMS

After the technical details of the MP have been clarified, the *Supplier* must obtain formal authorization from the *Customer* to carry out the *Supplier Switch*. For this, they request a CM. This CM is a mandatory prerequisite to be able to perform an SoMS. It authorizes the *Supplier* both to access the protected *Customer Data* and to report the SoMS on behalf of the *Customer*. If the *Customer* does not yet have an EID, they must first complete the onboarding process in Leneda. Once the CM is granted, the *Supplier* can execute the next step, reading the *Customer Data*.

If the requesting *Supplier* is currently registered as the *Preferred Supplier* for the *Customer* involved in the process, the requirement for a separate CM is waived. Leneda recognizes the existing *Preferred Supplier* status as valid authorization for the SoS request.

Read Customer Data

Once the CM is granted, the new *Supplier* is authorized to access the protected *Customer Data*. In contrast to a *Move-In*, this access is more comprehensive, as it is essential for assessing an existing supply situation. It allows the *Supplier* to retrieve not only the *Customer's* master data but also the *Timeseries* for the MP and, crucially, the status of any active *Contractual Binding*. This information allows the new *Supplier* to verify the feasibility of the switch and to create a tailored offer based on the *Customer's* actual consumption behavior.

Clarify Contract Binding

If the new *Supplier* discovers while reading the *Customer Data* that an active *Contract Binding* from the incumbent *Supplier* is stored for the MP, this process step is triggered. The *Customer* or the new *Supplier* must then contact the incumbent *Supplier* to clarify the validity of this contractual obligation. If the incumbent *Supplier* confirms that the *Contract Binding* is valid, the switch cannot take place and must be postponed to a later date. If the *Contract Binding* is incorrect or no longer valid, the incumbent *Supplier* removes the entry in Leneda, allowing the new *Supplier* to continue the switching process.

Start of Market Supply

As soon as all prerequisites are met - in particular, the CM is in place and any *Contract Binding* has been clarified - the new *Supplier* reports the SoMS to Leneda. Leneda checks the request, ensuring that the *Process Date* of the switch is at the earliest on the following calendar day and that the MP is not locked due to non-payment. Upon successful validation, Leneda creates the new ComRels, terminates those of the incumbent *Supplier*, and assigns the MP to the *Balancing Perimeter* designated by the new *Supplier*. The D+1 deadline applies if the switch is initiated on a working day (requests on non-working days shift to the next working day). The DSO is strictly responsible for providing the required metering data in Leneda for the switch date, applying estimations if physical data cannot be retrieved.

Power Restoration & Unlocking

This process applies if an MP was locked for exceeding the maximum period in *Basic Supply* or *Replacement Supply*, and the *Customer* resolves this situation by switching to a new *Supplier*. After the SoMS of the new *Supplier* has been successfully processed, Leneda automatically initiates the *Power Restoration & Unlocking*.

To restore the full energy supply, Leneda first attempts a remote *Unlocking* for *Smart Meters* by interfacing with the connected *Luxmetering* system. If this remote attempt fails, or if the MP is equipped with a conventional meter, Leneda automatically notifies the DSO. The DSO must then perform the physical *Unlocking* on-site. The result is the full restoration of power, allowing the *Customer* to be supplied by their new *Supplier*.

End of Market Supply

Scenario Introduction

This *Business Scenario* describes the process for terminating an active supply relationship (e.g., *Market Supply* or *Basic Supply*), known as an EoS.

The trigger for this process can originate from various real-world events, such as a *Customer's* actual *Move-Out* or a pure contract termination. Within Leneda, no technical distinction is made between these triggers when reporting the termination. This unified approach is necessary because the incumbent *Supplier* often cannot reliably know the *Customer's* true intention (i.e., whether they are leaving the premises or merely switching to a new *Supplier*). Therefore, regardless of the underlying reason, the *Supplier's* sole responsibility is to formally report the EoS to Leneda. This notification must have a *Process Date* in the future (at the earliest D+1). Leneda subsequently determines the exact business context implicitly: for example, if a new *Supplier* registers an SoMS for the same *Customer*, the system handles it as a *Supplier Switch*, whereas an SoMS for a different *Customer* is processed as a *Move-In*. If no seamless SoMS is registered at all, *Vacancy Management* applies. Any retroactive EoS required due to delayed *Customer* notification must be handled via a *Correction Ticket*

Leneda treats a reported EoS with a future *Process Date* as *pre-registered*. This status allows a subsequent SoMS - such as a *Move-In* reported retroactively - to automatically overwrite and cancel the pending EoS if its *Process Date* is on or before the EoS date. If no new SoMS is registered to override it, the EoS will take effect on its *Process Date*, and Leneda will automatically initiate the *Vacancy Management*, which may lead to a *Locking*.

Scenario Process Flow

As illustrated in the process diagram, the *Supplier* manages the expiring contract (triggered by a *Move-Out*, contract expiry, etc.). During this process, the *Supplier* must also check if the *Customer* has *related MPs* and, if necessary, arrange the EoS/EoFi for them as well.

Following this, the *Supplier* formally reports the EoS to Leneda. Leneda processes the termination, which is set to become effective on the *Process Date*. The system then checks if a seamless transition will occur via a new SoMS. If no new SoMS is registered to follow the EoS, Leneda initiates the *Vacancy Management*.

The diagram also shows that if the MP is part of a *Sharing Group*, the SGR is notified and must manage the *Customer's* potential exit from the SG.

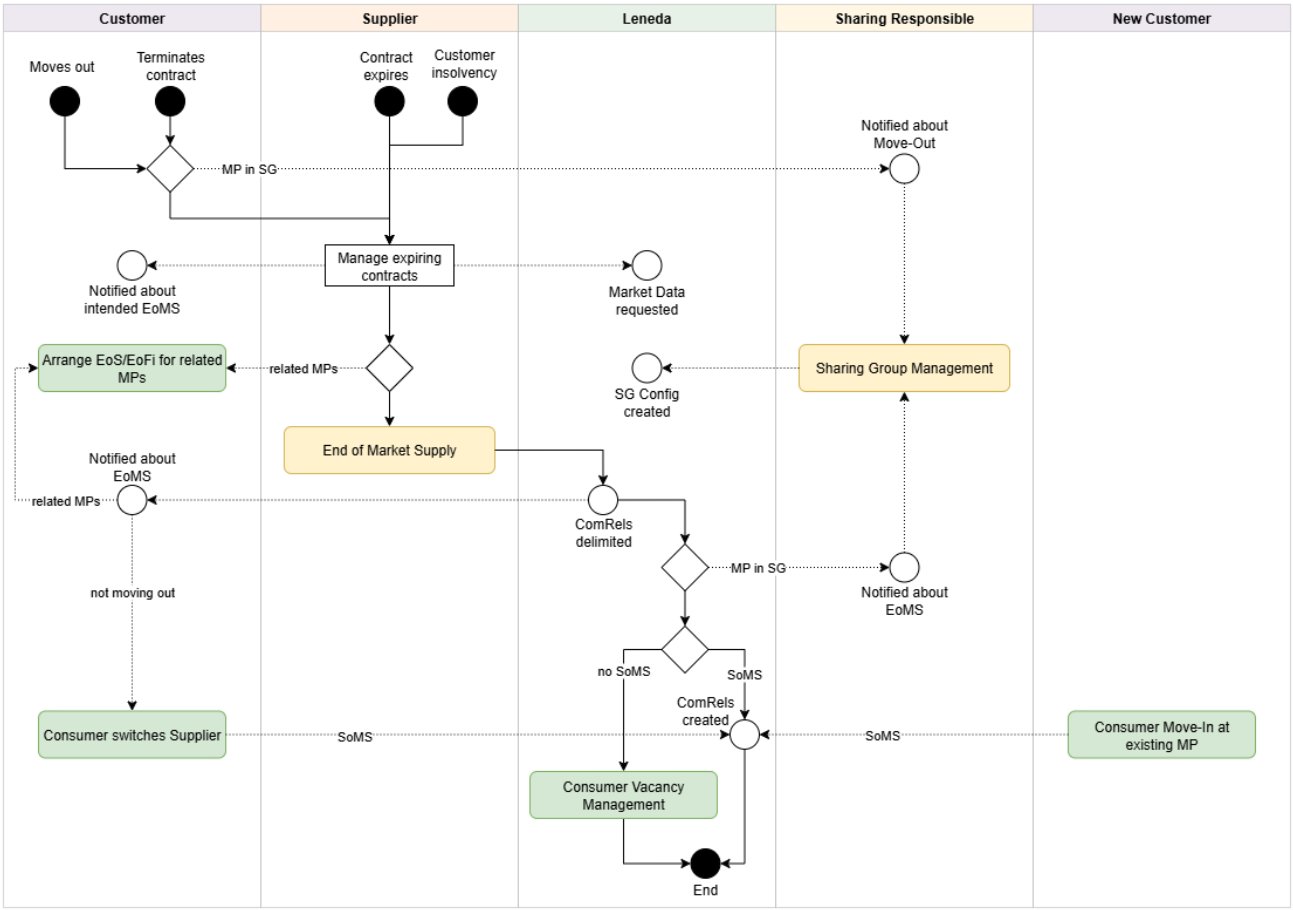


FIGURE 17: END OF MARKET SUPPLY

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Sharing Group Management

This component is initiated if the MP involved in the EoS process is a member of a *Sharing Group*. The management of this situation lies with the SGR, who may be informed of the *Customer's* departure through two channels: either proactively by the *Customer*, who is obligated to notify the SGR in advance of their *Move-Out* or contract termination, or reactively via an automated notification from Leneda as soon as the EoS is processed and the *Customer's* CCR is terminated.

Following either notification, the SGR must review the situation. It is the SGR's responsibility to decide if the MP must be removed from the *Sharing Group* (e.g., in the case of a *Move-Out* with no direct successor). If removal is required, the SGR must update the *SG Configuration* in Leneda accordingly.

It is important to note that changes to an *SG Configuration* can only be made with a *Process Date* in the future (e.g., D+1 to D+14). If the SGR is only notified reactively about an EoS that is already effective, the MP will formally remain in the SG until the SGR's future-dated update takes effect. *Shared Energy* that has already been calculated for this interim period will not be recalculated. The SGR may request a retroactive correction and recalculation from the DSO via a *Correction Ticket*.

Arrange EoS/EoFi for related MPs

If an EoS is planned for an MP that has *related MPs*, this process step becomes relevant. In this case, the *Supplier* and *Customer* must coordinate regarding the upcoming EoS and clarify whether the supply or feed-in contracts of the *related MPs* should also be terminated. The goal is to terminate the contractual situation of the entire *Customer* installation comprehensively and to ensure that no MPs remain unintentionally active.

End of Supply

This component is the central action where the *Supplier* formally reports the EoS to Leneda. This is triggered either by the *Customer* (e.g., due to a *Move-Out* or contract termination , which the *Customer* is obligated to report to the *Supplier* in a timely manner) or by the *Supplier* themselves (e.g., at the end of a fixed-term contract). The *Process Date* must be in the future (at the earliest D+1). If a delayed *Customer* notification necessitates a retroactive EoS, it must be processed via a formal *Correction Ticket*.

Upon successful validation, Leneda immediately books the request and the notifications to authorized *Data Stakeholders* are sent, ensuring timely information. Specifically, the notification sent to the *Customer* explicitly informs them of the pending termination and the urgent need to conclude a new supply contract or register as a *Vacancy Customer*. It also includes a clear warning that failure to take action may result in the *Locking* of the MP.

Although booked immediately, the EoS is technically treated as *pre-registered* until the period affected by the termination has been subject to *Grid Usage Billing*. This status means the termination is pending and can still be overritten. For example, a subsequently reported SoMS (like a retroactive *Move-In*) with an equal or earlier *Process Date* will automatically cancel the pending EoS. If no overwriting SoMS is received, the EoS becomes formally effective on its *Process Date* and the MP falls into *Vacancy Management*.

Consumer switches Supplier

This component describes one of the solutions to prevent the initiation of *Vacancy Management* after a reported EoS. This is the case when the *Customer* is not moving out, but their contract with the incumbent *Supplier* is ending. The *Customer* then commissions a new *Supplier* for their supply, which triggers the standard process for a *Supplier Switch*. A successful SoMS by the new *Supplier* leads to a seamless continuation of the supply under the new contractual partner. The detailed procedures for this switch are described in the separate *Business Scenario* of the same name.

Consumer Move-In at existing MP

This component describes the solution for a supply gap when a new *Customer* takes over an MP after a *Move-Out*. The new *Customer* commissions a *Supplier*, who then initiates the standard *Consumer Move-In at existing MP Business Scenario*.

After obtaining a CM from the new *Customer*, the *Supplier* can read the MP's data and identify the *Process Date* of the previous EoS. This allows them to report their SoMS to align perfectly, ensuring a seamless supply. A successful SoMS from the new *Supplier* will automatically overwrite any *pre-registered* ComRels from a *Vacancy Supply* that Leneda may have initiated. The detailed procedures for this are described in the separate *Business Scenario* of the same name.

Consumer Vacancy Management

This component describes the automated fallback process. If an EoS becomes effective and no new SoMS is registered to seamlessly follow it, the MP enters a state of *Vacancy*.

Leneda's periodic check identifies this unassigned MP and automatically initiates the *Vacancy Management*. This ensures the MP is always assigned to a *Balancing Perimeter* to prevent unallocated consumption, although it may ultimately lead to a *Locking* of the MP.

3.3 Start and End of Feed-In

Producer Move-In at new MP

Scenario Introduction

This *Business Scenario* describes the complete end-to-end process for commissioning a new generation unit at an MP that is yet to be created. It covers the full workflow from the initial grid connection request to the commercial SoFi.

A mandatory prerequisite for the entire process is the *Customer's* registration as the *Feed-In Responsible* (FiR). This step is managed by the DSO, who configures the binding *Feed-In Parameters* such as allowed *Feed-In Variants* and selectable *Buyers* for the MP and requests a CM for the registration and contract confirmation.

Once the FiR is registered, the *Customer* typically selects their *Buyer* manually to establish a feed-in contract. If no valid SCR is present by the time the DSO installs the meter, the automated *Vacancy Management* takes effect to initiate an *Uncompensated Feed-In*. This also applies to retrofitted installations (e.g., *One-Meter Model*) upon activation of the MP.

In the case of *Regulated Feed-In,* the corresponding contract is finalized only after the physical meter installation by the DSO, who then enters the commissioning date.

Scenario Process Flow

The following graphical process flow visualizes the individual steps and interactions.

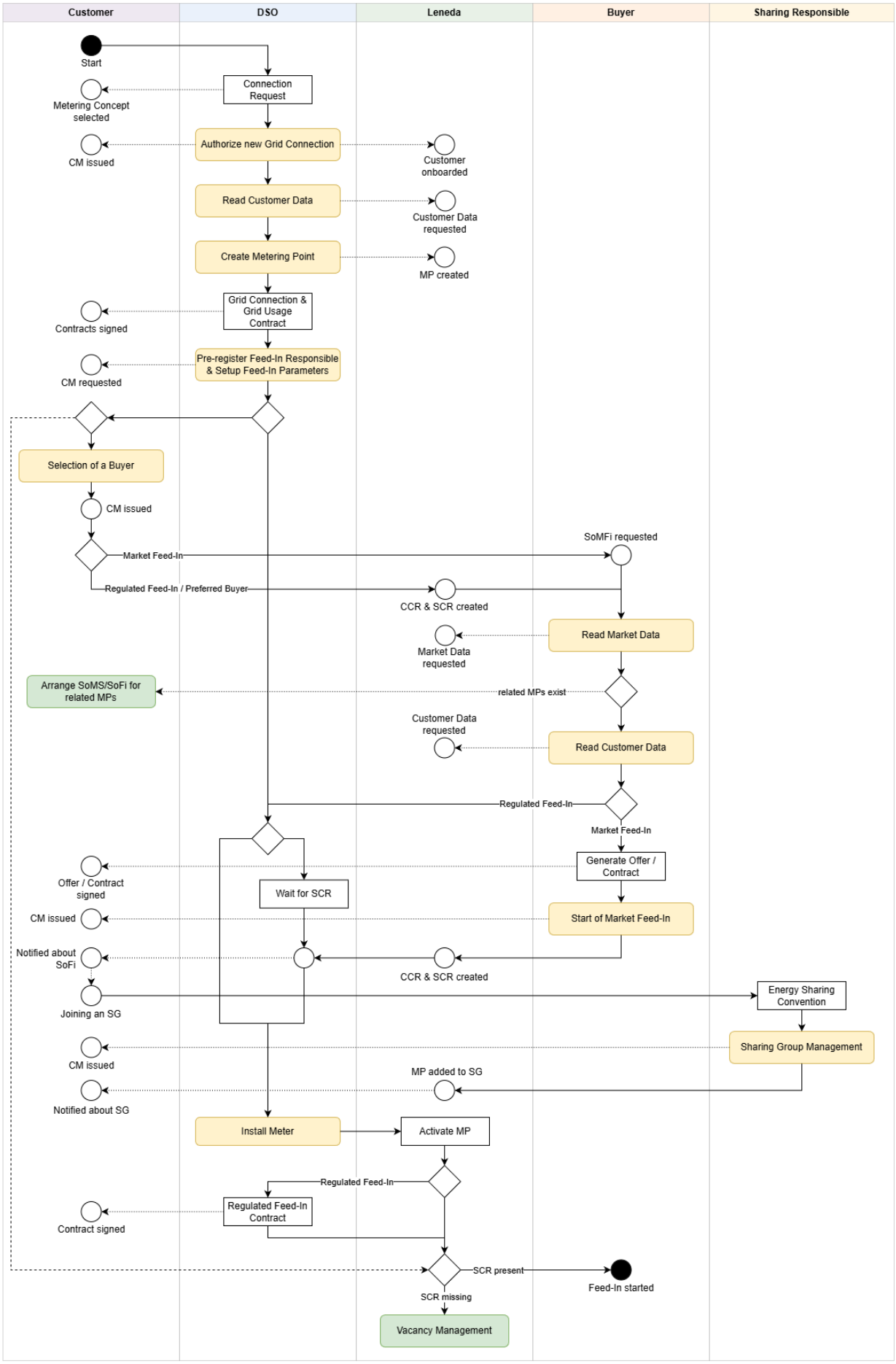

Customer
DSO
Leneda
Buyer
Sharing Responsible
Start
Connection Request
Metering Concept selected
Authorize new Grid Connection
CM issued
Customer onboarded
Read Customer Data
Customer Data requested
Create Metering Point
MP created
Grid Connection & Grid Usage Contract
Contracts signed
Pre-register Feed-In Responsible & Setup Feed-In Parameters
CM requested
Selection of a Buyer
CM issued
Market Feed-In
SoMFi requested
Regulated Feed-In / Preferred Buyer
CCR & SCR created
Read Market Data
Market Data requested
Arrange SoMS/SoFi for related MPs
related MPs exist
Customer Data requested
Read Customer Data
Regulated Feed-In
Market Feed-In
Generate Offer / Contract
Offer / Contract signed
Wait for SCR
CM issued
Start of Market Feed-In
Notified about SoFi
CCR & SCR created
Joining an SG
Energy Sharing Convention
Sharing Group Management
CM issued
MP added to SG
Notified about SG
Install Meter
Activate MP
Regulated Feed-In
Regulated Feed-In Contract
Contract signed
SCR present
Feed-In started
SCR missing
Vacancy Management

FIGURE 18: PRODUCER MOVE-IN AT NEW MP

The process is initiated by the DSO following an external connection request. The DSO creates the MP, defines the *Feed-In Parameters*, and then requests the CM for the FiR registration and contract confirmation.

Once the *Customer* grants this CM and is registered as the FiR, they proceed to select the *Feed-In Variant* and *Buyer* from the options made available by the DSO's *Feed-In Parameters*. This selection determines which of the following two distinct process paths is executed:

- **Fast Lane:** If the *Customer* selects a *Regulated Feed-In* option, Leneda automatically creates the necessary ComRels.
- **Offer & Confirmation:** By selecting a *Market Feed-In* option, the *Customer* can request offers from one or more *Buyers*. After the *Customer* has contractually agreed with their chosen *Buyer*, that *Buyer* submits the SoMFi request to Leneda.

If a *Preferred Buyer* was registered in advance, the selection of a *Buyer* is skipped entirely, provided this *Buyer* is permitted by the DSO's *Feed-In Parameters*. In this case, Leneda automatically creates the ComRels, similar to the *Fast Lane* RFi path.

Once these commercial steps are completed, the DSO typically proceeds with the physical meter installation, which will activate the MP in Leneda. However, as shown in the diagram, the installation or activation can also occur prior to any commercial agreement. In such cases (e.g., no *Preferred Buyer* registered), the active MP initially enters *Vacancy Management*.

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Authorize new Grid Connection

After receiving the external connection request for a new generation facility, the administrative process begins for the DSO. As part of this request, the technical details are clarified first. This includes defining the *Metering Concept* (e.g., *One-Meter Model* or *Two-Meter Model*), which also covers the case where a new FiMP is created and linked to the household's existing meter for a retrofitted PV system.

To correctly assign the *Customer* to the contract and start the formal process in Leneda, the DSO then requests an explicit CM. A prerequisite for this is that the *Customer* is already onboarded and has an EID. This CM serves as the *Customer's* formal authorization for the DSO to start the grid connection process. It also authorizes the DSO to retrieve the protected *Customer Data* required to verify the *Customer's* identity and to generate the grid connection offer. Once this CM is granted, the DSO is authorized to proceed with the next steps.

Read Customer Data

This component describes the authorized read-access to protected *Customer Data* stored in Leneda. This access occurs at different points in the process and by different MAs but always based on a clearly defined authorization. In the initial process step, the DSO uses an explicit CM granted by the *Customer*

to retrieve their *Customer Data*. This verified data serves as the basis for creating the *Customer* in the DSO's system and for drafting the contract with the correct details.

Later in the process, the Buyer accesses the data In the *Market Feed-In* path, the *Customer's* selection of the *Buyer* serves as an implicit CM, authorizing the *Buyer* to retrieve the *Customer Data* needed to prepare an offer and finalize the contract. In the *Regulated Feed-In* path, the already created SCR legitimizes the *Buyer's* access to the data to update their internal systems. Regardless of the trigger, the retrieval of *Customer Data* always serves to ensure a verified and high-quality data foundation for the subsequent contractual and system-side process steps.

Create Metering Point

This component describes the process step in which the DSO creates the new MP in Leneda. Based on the technical details and the *Metering Concept* clarified previously, the DSO transmits all required master data of the future MP, such as the exact address and technical connection details, to Leneda.

Upon successful creation, Leneda automatically generates a DCR, which documents the permanent administrative assignment of the MP to the DSO. Since no physical meter is installed at this time, the newly created MP is initially given the *inactive* status. During this creation, the DSO also defines any relationships to other MPs (such as linking the new FiMP to an existing CoMP) to correctly map them as *related MPs*.

The technical implementation of this component is handled via dedicated *Base Data Services* that allow the DSO to create the MP and define its specific attributes and relationships.

Pre-register Feed-In Responsible & Setup Feed-In Parameters

This component begins after the DSO has received the signed grid connection and grid usage contract. The DSO accesses the previously created MP in Leneda and configures the binding *Feed-In Parameters*, which define the commercial framework for the feed-in. The DSO defines the allowed *Feed-In Variants* (e.g., MFi or specific RFi models). The DSO may also restrict the list of eligible *Buyers*, which can be based on the selected *Feed-In Variant*, and may set a predefined *Process Date*, particularly for RFi.

Via a CM request, the *Customer* is then asked to digitally confirm the grid connection and grid usage contract and to agree to be pre-registered as the FiR for the MP. This FiR registration is a mandatory prerequisite for any subsequent SoFi, as Leneda will validate the EID match between the *Customer* in the SoFi request and the registered FiR. The *Customer* is then prompted to proceed to the next step, the selection of a *Buyer*. If the *Customer* has registered a *Preferred Buyer* (and this *Buyer* is permitted by the *Feed-In Parameters*), this step is bypassed and Leneda automatically creates the corresponding ComRels.

Selection of a Buyer

After being successfully registered as the FiR, the *Customer* selects their desired *Buyer* for the respective MP in their Leneda portal. The available choices are based on the *Feed-In Parameters* previously defined by the DSO. In case there is only one applicable *Buyer* available or a *Preferred Buyer* has been chosen by the *Customer* this selection will simply be skipped.

This selection forks the process based on the chosen *Feed-In Variant*:

- **Fast Lane:** If the *Customer* selects an *Regulated Feed-In*, Leneda immediately creates the necessary ComRels. The selected *Buyer* is notified about the newly created SCR and subsequently retrieves the relevant *Market Data* and Customer Data to update their internal systems.
- **Offer & Confirmation:** When the *Customer* selects *Market Feed-In*, they may request offers from one or more *Buyers*. Each such request serves as an implicit CM, authorizing the respective *Buyer* to access *Customer Data* solely for the purpose of preparing an offer and contract. Once the *Customer* has chosen their final *Buyer*, that *Buyer* must then obtain a separate, explicit CM to perform the final SoMFi.

If the MP is activated (e.g., via meter installation) before a valid SCR is registered, *Vacancy Management* will automatically apply *Uncompensated Feed-In* for the registered FiR.

Read Market Data

This component is initiated by the *Buyer* after they have been selected by the *Customer* in the previous step. The purpose of reading the *Market Data* differs slightly depending on the *Feed-In Variant*:

- **In the MFi path:** The *Buyer* reads the technical master data (e.g., MP details, *related MPs*) to prepare a commercial offer and finalize the contract.
- **In the RFi path:** The *Buyer* (who has already been assigned the SCR by Leneda) reads the *Market Data* to correctly set up the MP and the new *Customer* in their internal systems.

In both cases, access to *Market Data* is possible for the Buyer without a CM.

Arrange SoMS/SoFi for Related MPs

This component describes the process for ensuring complete contractual coverage for the entire installation, which is crucial as the new FiMP is always linked to a CoMP. This process can be initiated in two ways:

- **Proactive Path (by the Buyer):** This path is triggered if the *Buyer*, during the *Read Market Data* step, discovers that the new FiMP is linked to a *related MP* that currently lacks a valid supply contract for this *Customer* (i.e., no CCR exists or it is registered to a different *Customer*). The *Buyer* must then inform the *Customer* that a separate SoS contract with a *Supplier* is required for that CoMP.
- **Reactive Path (by Leneda):** Alternatively, Leneda initiates this notification. After the SoFi is finalized and the ComRels for the FiMP are created, Leneda automatically informs the *Customer* about any existing *related MPs*.

In both cases, the *Customer* is formally prompted to arrange the necessary SoS for their CoMP by commissioning a *Supplier* of their choice.

Start of Market Feed-In

This component describes the final action by the *Buyer* to complete the SoMFi, which is initiated after a commercial agreement with the *Customer* has been reached. This step is authorized by the separate, explicit CM the *Buyer* obtained from the *Customer*.

The *Buyer* then submits the SoMFi to Leneda via the dedicated MCS, indicating the desired *Process Date*. Before processing, Leneda checks that the EID of the *Customer* in the SoMFi request matches the EID of the FiR registered at the MP. If this validation fails, the SoMFi request is rejected.

Upon successful validation, Leneda creates the necessary ComRels and assigns the MP to their *Balancing Perimeter*. This action formally establishes the new *Buyer's* responsibility for the energy off-take, while transferring the balance responsibility for the MP to the respective BRP, effective from the specified *Process Date*.

Sharing Group Management

This component describes the process for adding the new FiMP to a *Sharing Group*. As indicated by the process diagram, this step can only be initiated after the SoFi process is complete. This is necessary because the *Customer* must be formally linked to the MP via CCR before they can grant the required authorization.

The process typically begins outside Leneda, with the *Customer* contacting the SGR and signing the necessary contractual agreement such as a sharing convention. The SGR then initiates the process in Leneda by adding the *Customer's* MP to the *SG Configuration*. Leneda validates this new configuration first to ensure it complies with all regulatory and technical market rules. If the configuration is valid, Leneda triggers a request to the *Customer* for an explicit CM. This request may display the contractual details of the sharing convention for the *Customer's* review, making the act of granting the CM the equivalent of a digital signature for the agreement.

Once the Customer grants the CM, two actions are finalized: the *SG Configuration* becomes active, and Leneda automatically creates a DaCR for the SGR. This DaCR grants the SGR access to the specific *Customer Data* required for managing the SG, such as the *Customer's* name, contact details, and the *Timeseries* of the calculated *Shared Energy*.

Install Meter

This component describes the physical installation of the meter at the MP by the DSO. After the DSO installs the meter to be operational, they report this action to Leneda, which then changes the MP's status from *inactive* to *active*. In cases where the meter is already physically installed (e.g., *One-Meter Model* retrofits), the DSO links the existing meter to the new fiMP, which similarly triggers the activation of the MP in Leneda.

Immediately after activation, Leneda checks which ComRels are registered for this MP:

- **SCR is present:** Leneda proactively informs the responsible *Buyer* about the MP activation. This notification signals the start of the *Buyer's* commercial responsibility for the feed-in and the balance responsibility of the respective BRP. In the specific case of a *Regulated Feed-In*, this step also prompts the DSO to finalize the corresponding contract, enter the commissioning date, and present it to the *Customer* for signature.
- **No SCR:** The MP is now in a state of *Vacancy*. Leneda's next periodic *Vacancy Management* check will identify this MP and automatically initiate the *Uncompensated Feed-In*. A typical use case for this scenario is the MP activation of a new FiMP for a retrofitted PV system in a *One-Meter Model*, where the *Customer* has not yet contracted a *Buyer*.

VACANCY MANAGEMENT

This component describes the automated fallback process that occurs if the MP is activated by the DSO without a valid SCR in place. Leneda's periodic *Vacancy Management* will identify this active MP in a state of *Vacancy*. To prevent unallocated feed-in, the process then uses the FiR to automatically initiate an *Uncompensated Feed-In* at this MP.

VACANCY MANAGEMENT FOR PRODUCER

SCENARIO INTRODUCTION

This *Business Scenario* describes the automated Leneda *Vacancy Management*, which handles any *Vacancy* at a FiMP. A *Vacancy* occurs when an active FiMP lacks a valid SCR. Leneda's periodic check identifies this state and initiates the *Producer Vacancy Management* to ensure a seamless *Balancing Perimeter* assignment.

This automated process results in one of two distinct fallback states: *Vacancy Feed-In* or *Uncompensated Feed-In*. In both cases, the feed-in is uncompensated, as either the *Producer* is unknown (VFi) or no active *Buyer* contract exists (UFi). It is therefore in the interest of all MAs to avoid these states and to ensure that every active FiMP is covered by a regular *Market Feed-In or Regulated Feed-In* contract.

SCENARIO PROCESS FLOW

The following graphical process flow visualizes the interactions of the involved MAs. The process is triggered when Leneda's periodic check identifies an active FiMP without a valid SCR.

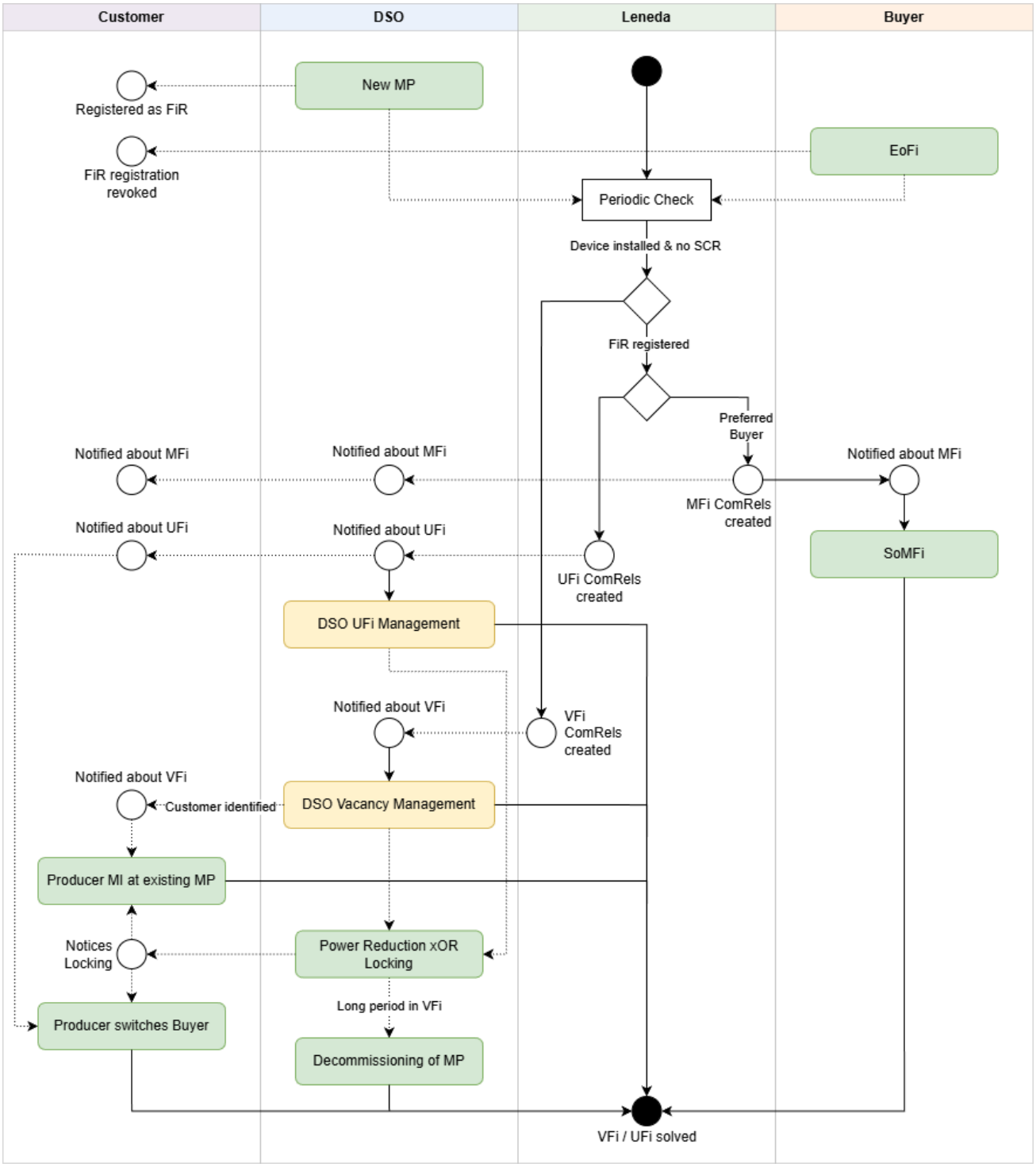


FIGURE 19: VACANCY MANAGEMENT FOR PRODUCER

The central decision point in the process is Leneda's check to determine if an FiR is registered for the MP. If no FiR is registered (e.g., after a *Customer* revokes their FiR status when moving out), the VFi path is triggered. In this case, the *Producer* is unknown, so Leneda assigns both the CCR and the SCR to the DSO. This leads to the *DSO Vacancy Management*. The DSO may attempt to identify the unknown *Producer*. While this uncompensated energy might be used by the DSO (e.g., to cover grid losses), large or un-forecasted feed-in volumes can negatively impact the DSO's *Balancing Perimeter*. Therefore, the DSO is authorized to initiate a *Locking* or, as a final measure, a *Decommissioning*.

If an FiR is registered, Leneda checks for a *Preferred Buyer*. If a valid *Preferred Buyer* is found, Leneda assigns the SoMFi directly to this *Buyer*, and the *Vacancy* is resolved. If no *Preferred Buyer* is found, the UFi path is triggered. The establishment of this UFi state, where the FiR holds the CCR and the DSO assumes the SCR, initiates the *DSO UFi Management*. In this situation, the FiR is feeding in energy without compensation. It is therefore in their interest to end this state in a timely manner by commissioning a new *Buyer*. If the FiR does not act, the DSO may initiate escalating measures (e.g., *Power Reduction* or *Locking*).

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Triggering Events

This *Business Scenario* is triggered whenever Leneda's periodic *Vacancy Management* identifies an active FiMP in a state of *Vacancy*, meaning it lacks a valid SCR. This situation typically arises from three main events:

- **New MP:** A new FiMP is activated in Leneda through the physical installation of the meter by the DSO, without a SoFi being registered for this time.
- **EoFi:** An existing feed-in is terminated by a *Buyer* via an EoFi, without a SoFi from a new *Buyer* seamlessly taking over.
- **Correction:** A *Correction* retroactively results in a feed-in gap for a past period.

SoMFi (Start of Market Feed-In)

This variant of the SoMFi represents the proactive, automated resolution within *Producer Vacancy Management*. It is the result of a *Preferred Buyer* relationship that has been established contractually in advance between a *Customer* (as FiR) and a *Buyer*.

When Leneda's *Vacancy Management* identifies a *Vacancy* at an FiMP for which this *Customer* is registered as the FiR, the system automatically activates this prearranged *Market Feed-In*. Leneda creates the CCR for the FiR and the SCR for this MP, seamlessly linking the FiR and their *Preferred Buyer*.

With the creation of the SCR, the *Buyer* formally assumes the commercial responsibility for the feed-in, while the respective BRP assumes the energy balance responsibility for this MP. This action establishes a regular *Market Feed-In* from the first moment of the *Vacancy* and makes the fallback scenario *Uncompensated Feed-In* unnecessary. Leneda then notifies the *Preferred Buyer* about the new SCR, which enables them to retrieve the relevant *Market Data* and *Customer Data* to update their internal systems.

DSO UFi Management

This component is triggered when Leneda's *Vacancy Management* finds a registered FiR but no *Preferred Buyer*, and therefore initiates the *Uncompensated Feed-In*. A typical use case for this scenario is a retrofitted PV system in a *One-Meter Model*: the DSO creates a new FiMP linked to the existing, active meter, but the *Customer* has not yet contracted a *Buyer*. As part of the SoUFi, Leneda creates two ComRels: a CCR for the FiR and an SCR for the DSO who acts as the formal off-taker.

In this situation, the FiR is feeding in energy without compensation. It is therefore in their interest to end this state in a timely manner by commissioning a new *Buyer*. To manage the *Uncompensated Feed-In*, the DSO is authorized to initiate escalating measures. This can include an immediate *Power Reduction* or a *Locking*.

DSO Vacancy Management

This component is triggered when Leneda's *Vacancy Management* check finds an active FiMP for which no FiR is registered.

To ensure a seamless *Balancing Perimeter* assignment, Leneda automatically initiates the *Vacancy Feed-In*. In this case, the *Producer* is unknown, so Leneda assigns both the CCR and the SCR to the DSO. This action triggers the *DSO Vacancy Management*.

The DSO is now responsible for this MP, and the *Uncompensated Feed-In* is assigned to their *Balancing Perimeter*. The DSO's subsequent actions are at their discretion and may include:

- **Customer Identification:** The DSO may attempt to identify the unknown *Producer* to resolve the situation, for example by initiating the *Producer MI at existing MP Business Scenario*.
- **Protective Measures:** The DSO is authorized to initiate a *Power Reduction* or a *Locking* to manage the un-forecasted feed-in volumes or, as a final measure, a *Decommissioning* of the MP.

Power Reduction xOR Locking

This component describes the protective measures the DSO can initiate within both the *DSO UFi Management* and the *DSO Vacancy Management*. The goal is to limit (via *Power Reduction*) or completely stop (via *Locking*) the uncompensated feed-in. When executing a *Power Reduction* at a vacant FiMP, the injected capacity is typically restricted to a minimal technical threshold (e.g., 5A).

In both cases, these measures serve to help the DSO manage the negative impacts of un-forecasted feed-in on their *Balancing Perimeter*. Depending on the use case, this action can be taken immediately or may serve as an escalation measure (e.g., if the FiR does not resolve the situation). These measures must be carried out in accordance with the general Rules for *Locking* defined in this document.

Producer MI at existing MP

This component describes the formal resolution path for a *Vacancy Feed-In*. This process can be initiated either by the DSO after successfully identifying the previously unknown *Producer*, or by the *Producer* themselves after noticing the consequences of the VFi state (e.g., a *Locking*) and contacting the DSO.

In both cases, the DSO then triggers the dedicated *Business Scenario Producer MI at existing MP*. The purpose of this process is to formalize the administrative relationship by registering the identified *Customer* as the new FiR, which transitions the MP from *Vacancy Feed-In* to a regular *Market Feed-In* or *Regulated Feed-In*. The detailed procedures for this are described in the separate *Business Scenario* of the same name.

Producer switches Buyer

This component describes the formal resolution path for an *Uncompensated Feed-In*. This process is initiated by the *Customer*, either after being notified by Leneda as FiR of the MP about the

Uncompensated Feed-In and the resulting lack of compensation, or after noticing the consequences of the UFi state (e.g., a *Power Reduction* or *Locking* initiated by the DSO). In either case, the FiR resolves the situation by initiating the dedicated *Business Scenario Producer switches Buyer*. A successful SoFi from a new *Buyer* terminates the UFi state and ensures the feed-in is compensated again. The detailed procedures for this are described in the separate *Business Scenario* of the same name.

DECOMMISSIONING OF MP

This component represents the final escalation stage for both the *DSO UFi Management* and the *DSO Vacancy Management*. It is initiated by the DSO if the MP has remained in a state of *Vacancy* for an extended period, has already been subject to a *Locking*, and the situation has not been resolved. The DSO has a particular interest in this step, especially in the VFi case. In this scenario, the *Producer* is unknown, and the DSO holds the CCR, meaning no *Customer* is paying the metering fees. In both cases, the DSO arranges for the physical removal of the meter on-site.

PRODUCER MOVE-IN AT EXISTING MP

SCENARIO INTRODUCTION

This *Business Scenario* describes the process by which a new *Customer* takes over an existing generation facility and its corresponding FiMP from the previous operator.

The process can be initiated in two ways:

- **Direct Report to DSO**: The new *Customer* reports the takeover directly to the DSO outside of Leneda. In this case, the DSO starts the process by requesting an explicit CM via Leneda.
- **Via Leneda:** The new *Customer* initiates the takeover via a dedicated function in Leneda. This action already includes the granting of the necessary CM.

The core of the process is the formal transfer of the facility (*Cession*), which is managed by the DSO and requires the written consent of both the old and new operators. Because obtaining these signatures often causes delays, *Cessions* are frequently reported retroactively. If this retroactive takeover exceeds the standard process deadline, it must be handled via a dedicated category within the *Correction Ticket* framework. This ensures the delayed registration is processed smoothly as a standard administrative exception rather than a data error. Based on the granted CM, the DSO performs the mandatory registration of the new Customer as the FiR and defines the binding Feed-In Parameters.

Following this configuration, the process determines the commercial assignment. If a permitted *Preferred Buyer* is registered, Leneda automatically assigns the contract. Otherwise, the *Customer* selects their *Buyer* manually, which triggers different process chains depending on the *Feed-In Variant*.

SCENARIO PROCESS FLOW

The following graphical representation visualizes the individual steps and interactions of the involved MAs.

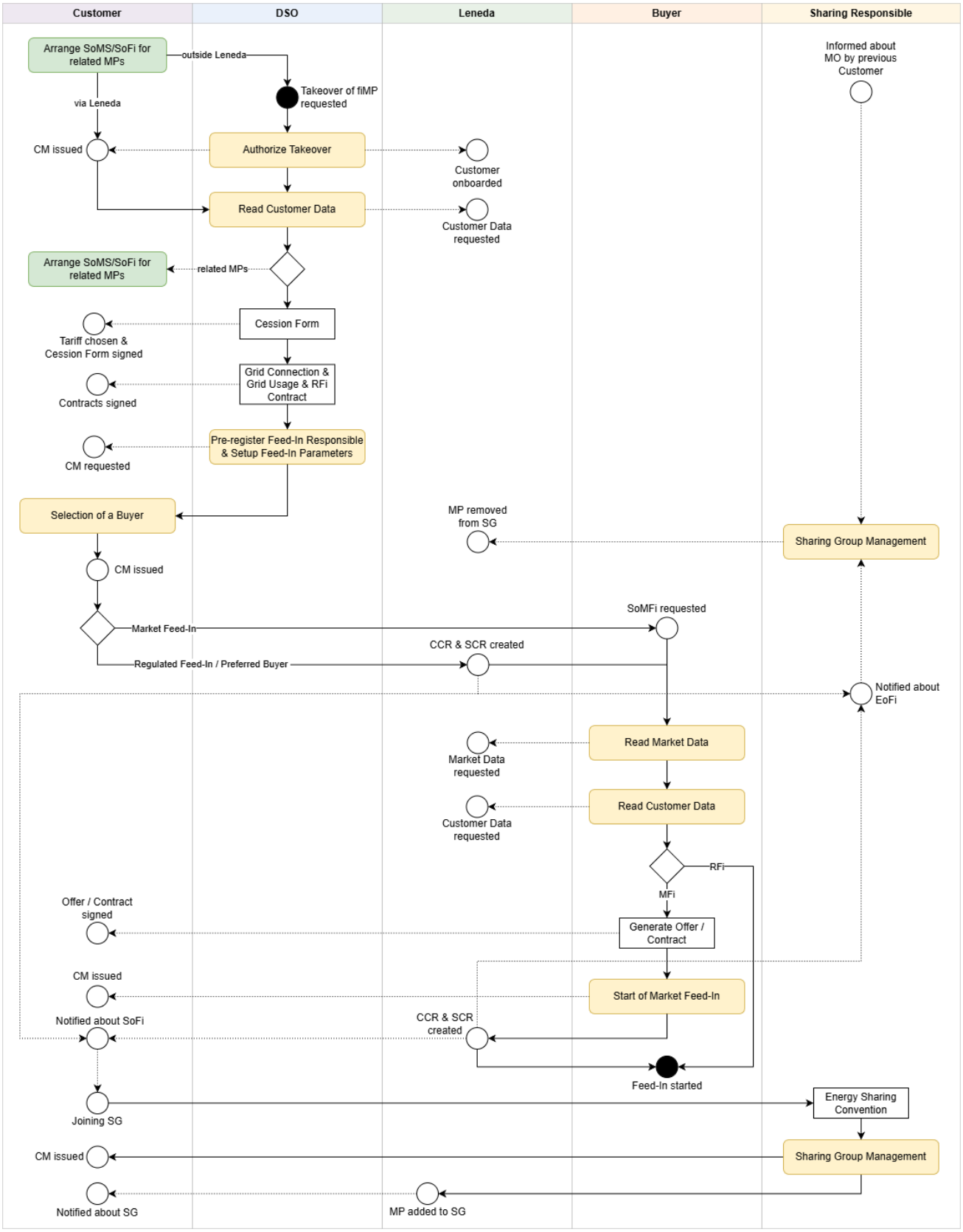


FIGURE 20: PRODUCER MOVE-IN AT EXISTING MP

The process flow can be divided into three main phases:

Administrative Takeover: As shown in the diagram, the process begins with the administrative transfer managed by the DSO. Based on a CM (*Authorize Takeover*) and the formal *Cession*, the DSO registers the new FiR in Leneda and defines the binding *Feed-In Parameters*. During this phase, the SGR should also be informed by the leaving *Customer* about the *Move-Out*.

Commercial Assignment: Once the FiR is registered, Leneda checks for a *Preferred Buyer*.

- If a valid *Preferred Buyer* exists or the *Customer* selects a *Regulated Feed-In* option, Leneda creates the CCR & SCR directly.
- If the *Customer* selects a *Market Feed-In* option, this serves as a request for an offer. The chosen *Buyer* must then submit a SoMFi request, which requires an explicit CM from the *Customer* before the ComRels are created.

Conclusion: The successful creation of a new SCR and CCR for the new *Customer* completes the takeover. This action implicitly triggers an EoFi for the previous operator and generates a notification to the SGR. Additionally, the SoFi notification informs the new *Customer* if the MP is currently part of a *Sharing Group*. If so, the *Customer* is prompted to contact the SGR to either formalize their participation (e.g., by signing an *Energy Sharing Convention*) or to arrange their exit from the *Sharing Group*.

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Arrange SoMS/SoFi for related MPs

This sub-process ensures the complete and seamless contractual coverage of *Customer* installations that consist of multiple, technically *related MPs* (e.g., *Prosumer* installations). within this *Business Scenario*, this process serves two primary functions:

As a Trigger for the Takeover: The takeover process itself can be initiated via this step in two ways:

- During a *Consumer Move-In* at a CoMP, the *Supplier* informs the *Customer* about a related FiMP. The *Customer* subsequently contacts the DSO directly to clarify the takeover of this FiMP.
- The *Customer* actively initiates the clarification of the contractual situation for their *related MPs* directly via a dedicated function in Leneda.

As a Validation Check by the DSO: This occurs after the DSO has read the new *Customer's* data. The DSO checks if any other *related MPs* belong to the FiMP being taken over. If the DSO determines that a valid SoMS has not been reported for such a *related MP*, they inform the *Customer*, who is then required to clarify the situation.

Authorize Takeover

This component initiates the formal, administrative takeover process in Leneda. As a preparatory step, the DSO checks the *Market Data* of the MP, primarily to identify any *related MPs* and ensure that the takeover encompasses the entire installation. The core of this component is the establishment of the CM for the new *Customer*. If the process was initiated via Leneda, the *Customer* grants this CM implicitly by starting the takeover process in the portal; if initiated externally, the DSO must request an explicit CM.

This mandatory CM authorizes the DSO to retrieve protected *Customer Data* to verify the *Customer's* identity and grants permission to prepare the grid connection and grid usage contract. Please note that this does not automatically execute the transfer; the formal and documented consent (*Cession*) of both the previous and new owner remains a mandatory prerequisite.

Read Customer Data

This component describes the authorized read-access to protected *Customer Data* in Leneda, which occurs at different stages of the process to verify data for administrative and commercial steps. Initially, the DSO utilizes the explicit CM granted in the *Authorize Takeover* step to retrieve the new *Customer's* master data. This verification is the prerequisite for preparing the formal *Cession* and the grid connection and grid usage contract. If the MP is identified as a member of a *Sharing Group*, the DSO informs the *Customer* of this status and point out that a valid *Energy Sharing Convention* with the SGR is required to maintain membership.

Subsequently, once the *Customer* has selected a *Buyer*, that *Buyer* also gains access to the data, though the authorization basis differs. In the *Regulated Feed-In* path, access is legitimized by the SCR that Leneda has already created. In the *Market Feed-In* path, the *Customer's* selection serves as a request for an offer, implicitly authorizing the *Buyer* to access the data necessary to prepare that offer and finalize the feed-in contract.

Pre-register FiR & Setup Feed-In Parameters

This component is executed by the DSO after the administrative steps of the takeover (signing of the *Cession* and grid contracts) are completed. The DSO accesses the MP in Leneda to configure the binding *Feed-In Parameters*. This configuration defines the commercial framework and constrains the *Customer's* subsequent choices: the DSO specifies the allowed *Feed-In Variants* (e.g., MFi or RFi) and can restrict the list of eligible *Buyers* - a feature often relevant in a *Cession* within *Regulated Feed-In* if the *Buyer* must remain unchanged. Additionally, a predefined *Process Date* may be set, particularly for *Regulated Feed-In*.

The DSO finalizes this step by initiating a CM request. This request includes the defined parameters and is sent to the new *Customer*. It serves as the formal invitation to confirm their registration as the new FiR - thereby replacing the previous FiR - and to proceed to the *Selection of a Buyer*. The finalization of this FiR registration is a mandatory prerequisite for any subsequent SoFi, as Leneda validates the EID match between the *Customer* in the SoFi request and the registered FiR.

Selection of a Buyer

After being successfully registered as the FiR, the *Customer* selects their desired *Buyer* for the respective MP in their Leneda portal. The available choices are based on the *Feed-In Parameters* previously defined by the DSO. In case a valid *Preferred Buyer* has been registered by the *Customer* (and is permitted for this MP) or if only one applicable *Buyer* is available, this manual selection step is skipped.

Otherwise, the selection forks the process based on the chosen *Feed-In Variant*:

- **Fast Lane:** If the *Customer* selects a *Regulated Feed-In* option, Leneda immediately creates the necessary ComRels. The selected *Buyer* is notified about the newly created SCR and subsequently retrieves the relevant *Market Data* and *Customer Data* to update their internal systems.

- **Offer & Confirmation:** When the *Customer* selects *Market Feed-In*, they may request offers from one or more *Buyers*. Each such request serves as an implicit CM, authorizing the respective *Buyer* to access *Customer Data* solely for the purpose of preparing an offer and contract. Once the *Customer* has chosen their final *Buyer*, that *Buyer* must then obtain a separate, explicit CM to perform the final SoMFi.

Read Market Data

This component describes the read-access to the technical and structural master data of an MP that is classified as *Market Data*. Access to this data is possible for authorized MAs without an explicit CM.

In this *Business Scenario*, this action is performed by the *Buyer* after they have been selected by the *Customer* (either through direct assignment in the RFi path or by selection in the MFi path). The retrieved information, such as technical connection details or details on installed devices, is needed to correctly set up the MP in their internal systems and, in the MFi path, to create a suitable commercial offer.

If the MP is currently in a state of *Vacancy* (e.g., *Vacancy Feed-In*), the *Buyer* also sees the start date of this status, enabling them to offer a seamless retroactive contract start , provided it falls within the permitted retroactive timeframe.

Start of Market Feed-In

This component describes the final action by the *Buyer* to complete the *Market Feed-In* registration. It is initiated by the specific *Buyer* who has successfully concluded a commercial agreement with the *Customer*, potentially following a phase where the *Customer* requested offers from multiple parties.

To perform this step, the *Buyer* requires explicit authorization. They must initiate a separate process to request a CM from the *Customer*. Only after this CM is granted can the *Buyer* submit the SoMFi request to Leneda, indicating the desired *Process Date*.

Before processing, Leneda performs a critical validation: it checks that the EID of the *Customer* in the SoMFi request matches the EID of the FiR registered at the MP. If this check fails, the notification is rejected.

Upon successful validation, Leneda creates the necessary ComRels. This action formally establishes the new *Buyer's* responsibility for the energy off-take, while transferring the balance responsibility for the MP to the respective BRP, effective from the specified *Process Date*.

Sharing Group Management

This component describes the necessary actions for the SGR when the *Customer* at a FiMP changes. Since the *SG Configuration* links the MP to the *Sharing Group* regardless of the *Customer*, the SGR must validate if this relationship should continue with the new owner.

The process involves interactions with both parties. The departing *Customer* is obligated to proactively inform the SGR about the *Move-Out*. Simultaneously, upon completion of the takeover, Leneda notifies the new *Customer* if the MP is currently part of an SG. This prompts the new *Customer* to contact the SGR to either formalize their participation (e.g., by signing the *Energy Sharing Convention*) or to arrange their exit.

Leneda also automatically notifies the SGR as a *Data Stakeholder* once the takeover is processed. Based on this information, the SGR must decide whether to update the *SG Configuration* to remove the MP or to maintain it with the new *Customer*. It is important to note that adjustments to the *SG Configuration* can only be made for the future (e.g., D+1). Consequently, if the SGR acts reactively, the MP formally remains in the SG for the interim period between the takeover and the adjustment. *Shared Energy* calculated for this period will not be recalculated. The SGR may request a retroactive correction and recalculation from the DSO via a *Correction Ticket*.

PRODUCER SWITCHES BUYER OR FEED-IN VARIANT

SCENARIO INTRODUCTION

This *Business Scenario* describes the process by which a *Customer*, who is already registered as the FiR for a FiMP, changes their commercial feed-in relationship. This can involve a change of the *Buyer*, a change of the *Feed-In Variant* (e.g., switching from RFi to MFi, or changing the specific RFi model), or both.

The process varies depending on the nature of the change:

- Any change involving a *Regulated Feed-In* contract (including switching between different RFi models) requires the DSO's involvement. The DSO validates the contractual feasibility of the request against the existing contract conditions before modifying the contractual basis and updating the *Feed-In Parameters* in Leneda. This also applies if a *Customer* wishes to newly apply for a market premium, or to terminate an existing market premium to return to a standard *Market Feed-In*, as this constitutes a change to the underlying support contract.
- A switch between *Market Feed-In Buyers*, or a switch *from Uncompensated Feed-In* to MFi, is initiated by the *Customer* contacting a new *Buyer* of their choice. The new Buyer then manages the switch by obtaining the necessary CM and reporting the SoMFi. This explicitly includes *Customers* who retain an active market premium contract with the DSO but only wish to change their commercial *Buyer*. Because the energy offtake is technically handled as an MFi in Leneda, they can freely switch their *Buyer* without requiring a contract modification process with the DSO in Leneda.

A key prerequisite for any switch is checking for an existing *Contractual Binding*. If such a binding is stored by the current *Buyer* and conflicts with the desired switch date, the *Customer* has the option to proactively override it while granting the CM for the new SoMFi. By actively choosing this option and acknowledging potential contractual penalties, the blocking effect is neutralized in advance. Without this proactive override, a switch for a date within the commitment period will be rejected by Leneda, requiring manual clarification (e.g., the current *Buyer* removing the binding) or a postponement of the switch.

SCENARIO PROCESS FLOW

This graphical representation visualizes the individual steps and interactions. The entry point depends on the type of switch.

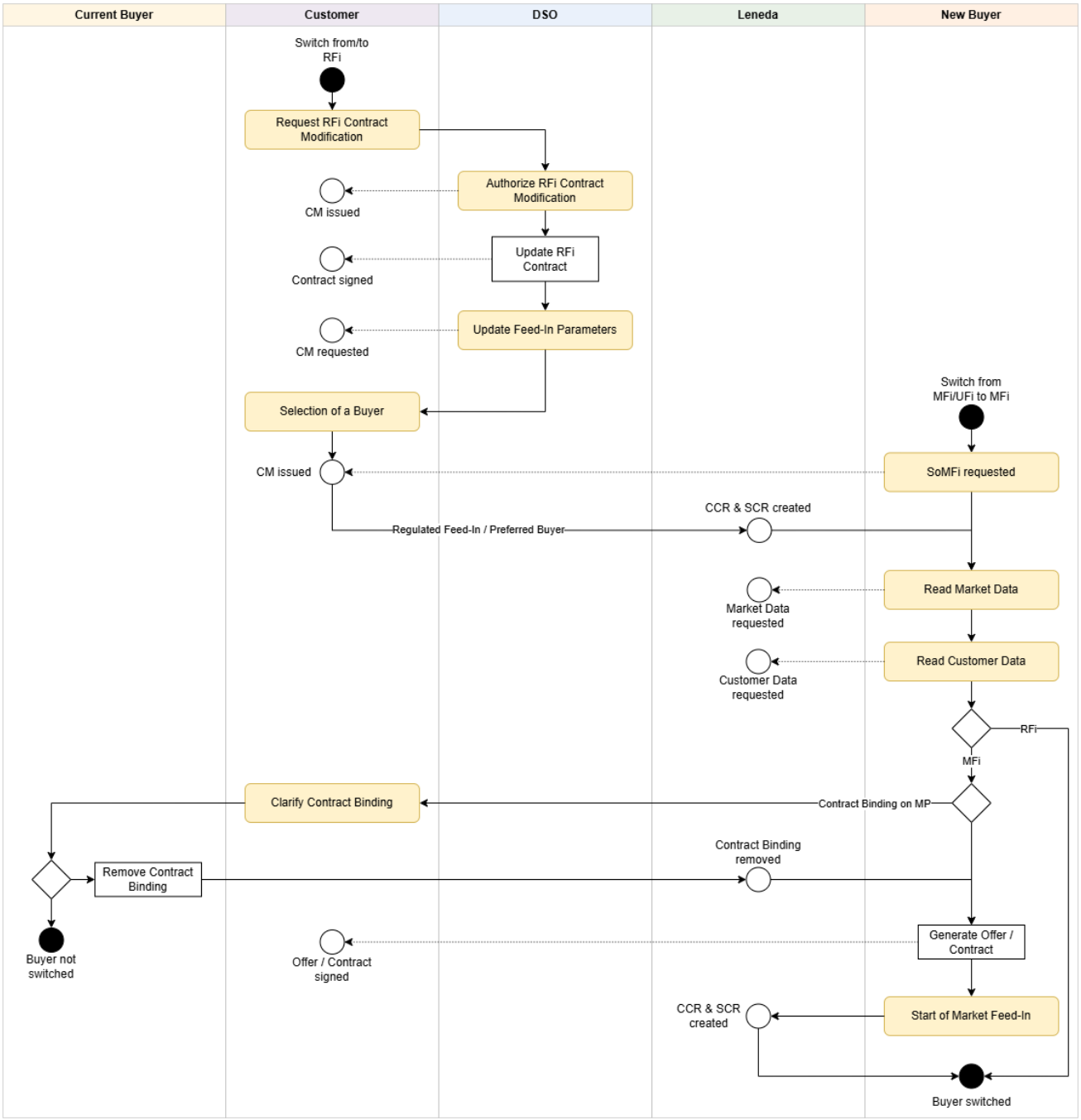


FIGURE 21: PRODUCER SWITCHES BUYER OR FEED-IN VARIANT

For any switch involving a *Regulated Feed-In* contract (e.g., switching to, from, or within an *Regulated Feed-In Variant*), the process begins with an administrative phase managed by the DSO. The *Customer* must first formally request a modification of the underlying feed-in contract. The DSO validates this request and, upon authorization, prepares the contract amendment and updates the binding *Feed-In Parameters*. This phase concludes with the DSO requesting a new CM, prompting the *Customer* to digitally confirm the amended contract terms. Once confirmed, Leneda directly creates the corresponding ComRels.

In contrast, a switch between *Market Feed-In Buyers* - or a switch from *Uncompensated Feed-In* to *Market Feed-In* - bypasses this DSO administrative phase entirely and is handled analogous to an SoMS.

The *Customer* initiates the change by directly contacting a new *Buyer* of their choice outside of Leneda. The new *Buyer* then takes the lead: they request a CM to access the relevant *Market Data*, clarify the commercial terms with the *Customer*, and subsequently submit the formal SoMFi request to Leneda.

A critical validation step before executing any switch is the check for an active *Contractual Binding* on the existing SCR. If such a binding conflicts with the desired switch date, Leneda's standard protective mechanism will block the request. However, the *Customer* can proactively utilize a customer override when granting the CM to the new *Buyer*, explicitly instructing Leneda to ignore the binding (while acknowledging potential contractual penalties). If this proactive override is not used, the SoMFi request will be rejected by Leneda and the process can only continue once the current *Buyer* manually clarifies and removes the block.

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Request RFi Contract Modification

This component describes the initial action taken by the *Customer* to change an existing *Regulated Feed-In* relationship. Since RFi models are governed by specific contracts with the DSO, the *Customer* cannot simply switch via a direct selection. Instead, they must formally request a modification (e.g., to change the remuneration model or terminate the contract) either directly via a function in Leneda or by contacting the DSO externally.

Authorize RFi Contract Modification

This component describes the DSO's validation and authorization step. Upon receiving the *Customer's* request, the DSO reviews it against the existing contract terms and technical prerequisites. The DSO has the authority to approve or reject the request (e.g., if the prerequisites for a *Regulated Feed-In* are not met). If the request is rejected, the process is terminated, and the *Customer* is informed.

To proceed with an approved request, the DSO requires a CM to prepare the necessary contract amendment. This CM is granted implicitly if the request was made via Leneda, whereas external requests require the DSO to obtain an explicit CM.

Update Feed-In Parameters

Based on the CM, the DSO administratively prepares the amendment to the RFi contract. Subsequently, the DSO updates the binding *Feed-In Parameters* in Leneda to reflect the agreed changes (e.g., updating the allowed *Feed-In Variants* or *Buyers*).

The DSO finalizes this phase by triggering a new CM request. This request serves as the formal invitation for the *Customer* to digitally confirm the amended contract terms and leads directly to the *Selection of a Buyer* component.

Selection of a Buyer

This component describes the *Customer's* commercial decision specifically within the *Regulated Feed-In* path. Normally, the *Customer* selects their desired option manually in the Leneda portal. By doing so, the *Customer* formally grants the CM, which serves as the digital signature for the contract amendment prepared by the DSO, allowing Leneda to immediately create the necessary ComRels. However, this

manual step is skipped entirely if a valid *Preferred Buyer* is already registered and permitted, or if only a single applicable option is defined in the *Feed-In Parameters* (e.g., in a fixed *Regulated Feed-In* context), in which case the system proceeds automatically.

SoMFi Requested

This component marks the starting point of the *Market Feed-In* switch process. After the *Customer* contacts a prospective new *Buyer*, the *Buyer* requests an CM via Leneda. By digitally granting this CM, the *Customer* explicitly authorizes the new *Buyer* to retrieve their protected *Customer Data*, verify and potentially override existing *Contractual Bindings*, prepare a commercial offer, and ultimately submit the formal SoMFi request.

Alternatively, the *Customer* can request an offer from a *Buyer* directly via Leneda. This request inherently acts as an implicit CM, authorizing the *Buyer* to access the necessary *Customer Data* to prepare the offer. However, the execution of the final SoMFi still requires a separate, explicit CM from the *Customer*.

Read Market Data

This component describes the read-access to the technical and structural master data of an MP that is classified as *Market Data*. Access is possible for authorized MAs without an explicit CM. In this *Business Scenario*, this action is performed by the new *Buyer* after being selected by the *Customer*. The retrieved information is needed to correctly set up the MP in their internal systems and, in the MFi path, to create a suitable commercial offer.

Read Customer Data

This component describes the authorized read-access to protected *Customer Data* in Leneda. In this *Business Scenario*, the new *Buyer* accesses the data after being selected by the *Customer*. The authorization and purpose differ depending on the path:

- **In the MFi path:** Based on the explicit CM granted, the new *Buyer* accesses the relevant *Customer Data*. The Buyer uses this data to check for any active *Contractual Bindings*, prepare the commercial offer, and finalize the feed-in contract with the *Customer*.
- **In the RFi path:** The already created SCR legitimizes access. The *Buyer* needs the data to correctly set up the *Customer* and the MP in their internal systems.

Clarify Contract Binding

This component is triggered if the new *Buyer* identifies an active *Contractual Binding* stored by the current *Buyer* for the FiMP. Upon being notified, the *Customer* must clarify the validity of this obligation directly with the current *Buyer* outside of Leneda.

If the *Contractual Binding* is valid, the switch cannot proceed at the requested date. However, if the binding is incorrect or expired, the *Customer* must instruct the current *Buyer* to remove the entry in Leneda. This removal by the current *Buyer* is the mandatory technical prerequisite for the process to continue.

Start of Market Feed-In

This component is initiated by the new *Buyer* after successfully reaching a commercial agreement with the *Customer*. Since the required CM was already granted upfront, the new *Buyer* directly submits the formal SoMFi request to Leneda, specifying the desired *Process Date*.

Before processing, Leneda performs critical validations:

- **FiR Match:** It verifies that the EID of the *Customer* in the request matches the EID of the registered *Feed-In Responsible* (FiR) at the MP.
- **Contractual Binding:** It checks for any active *Contractual Binding* on the existing SCR. If a binding exists and the *Process Date* falls within the blocked period, Leneda verifies whether the *Customer* proactively utilized the override option during the initial CM process. If no override was granted, the request is rejected.

Upon successful validation, Leneda creates the new SCR for the new *Buyer* and terminates the previous one. This action formally establishes the new *Buyer's* responsibility for the energy off-take, while transferring the balance responsibility for the MP to the respective BRP, effective from the specified *Process Date*.

End of Feed-In

Scenario Introduction

This *Business Scenario* describes the various processes leading to the termination of a feed-in relationship at a FiMP, known as EoFi. The trigger for this process is typically a *Move-Out* by the *Customer* or the expiration of a *Market-Feed-In* or *Regulated Feed-In* contract. A notable difference to the setup processes (e.g., SoFi) is that the termination of a relationship - whether via EoFi or by revoking the FiR registration - does not require a specific CM in Leneda.

A key distinction in this *Business Scenario* is the impact on the subsequent *Vacancy Management*. If the FiR registration is actively revoked (e.g., during a *Move-Out*), the operator becomes unknown, and the MP falls into *Vacancy Feed-In*. If a contract ends but the FiR registration remains active, the *Producer Vacancy Management* detects this contractual gap and automatically transitions the MP into *Uncompensated Feed-In*.

Scenario Process Flow

The following graphical representation visualizes the interactions of the involved MAs.

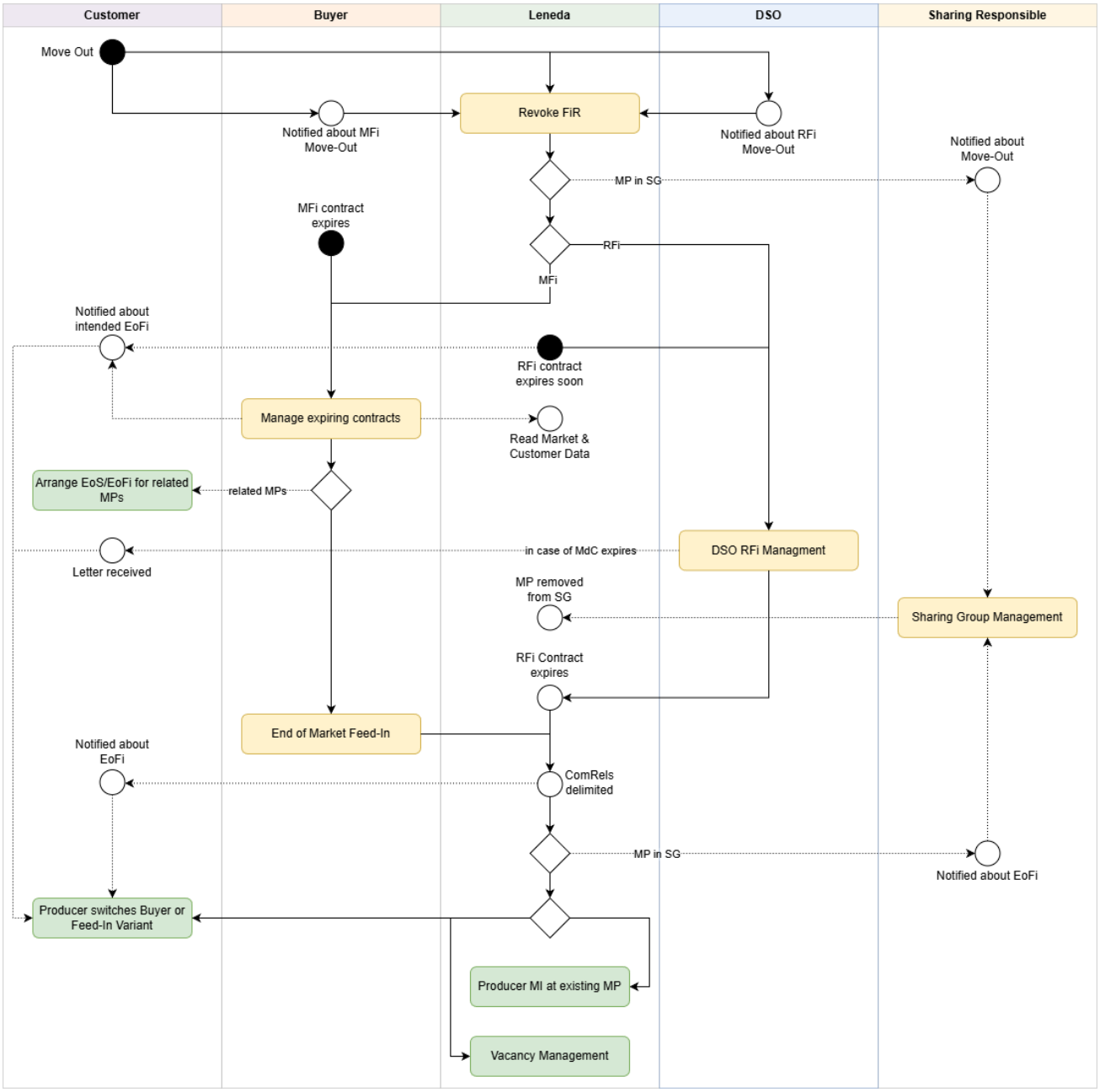


FIGURE 22: END OF FEED-IN

The process flow is structured according to the three main triggering events:

- **Move-Out (Customer-Initiated):** This path applies to both *Market Feed-In* and *Regulated Feed-In* and is triggered when a *Customer* leaves the premises. The core outcome is the revocation of the FiR registration, which can be executed in two ways. The *Customer* may choose to revoke their FiR status directly via a dedicated function in Leneda, an action that immediately terminates the ComRels and triggers the *Vacancy Feed-In* path. Alternatively, the *Customer* can inform their contractual partner (the *Buyer* for MFi or the DSO for RFi) about the *Move-Out* outside of Leneda. The partner then triggers the termination process in the system: in the MFi path, the *Buyer* submits the EoMFi, while in the RFi path, the DSO sets the end date for the SCR and CCR. In both partner-initiated cases, these actions delimit the ComRels and effectively revoke the FiR status as of the specified end date.

- **MFi Contract Expiry (Buyer-Initiated):** This path is triggered by the upcoming expiration of a fixed-term *Market Feed-In* contract. The *Buyer* manages this process proactively. They clarify the situation with the *Customer* including a check for any *related MPs*. If no contract extension is agreed upon, the *Buyer* reports the EoMFi to Leneda.
- **RFi Support Expiry (DSO-Initiated):** This path is triggered when a *Regulated Feed-In* support period is about to expire. The DSO proactively informs the *Customer* via a formal letter about the upcoming end date and the available options. Subsequently, the DSO manages the termination by setting the end date for the SCR and CCR in Leneda.

In all three cases, if no seamless transition occurs (e.g., via a *Producer MI at existing MP* or a *Producer switches Buyer* process) by the time the termination takes effect, Leneda automatically initiates the *Vacancy Management*.

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Revoke FiR

To report an upcoming *Move-Out*, the *Customer* must revoke their status as the FiR. The *Customer* can perform this action directly in Leneda, or they can inform their responsible contractual partner - the *Buyer* in the case of *Market Feed-In* or the DSO for *Regulated Feed-In* - who will then execute it on their behalf.

As this revocation effectively triggers the standard *Move-Out*, which is inherently exempt from consent management validation in Leneda, no specific CM is required. However, this change can only be reported with a future *Process Date* at least D+1. Through this revocation, the link between the *Customer* and the MP is removed at the specified *Process Date*. Leneda then informs all relevant *Data Stakeholders* (such as the DSO and the *Buyer*) about the upcoming *Move-Out*.

Manage expiring contracts

This component is managed by the *Buyer* and can be triggered in two ways: proactively through internal contract management when a contract end date approaches, or reactively upon receiving a Leneda notification that the *Customer* has reported their *Move-Out* and revoked their FiR status. In either case, the *Buyer* contacts the *Customer* to clarify the situation, for instance, to discuss a potential contract extension or to confirm the termination. As part of this clarification, the *Buyer* also coordinates with the *Customer* regarding any *related MPs* to ensure the contractual situation of the entire installation is handled consistently. If no contract extension is agreed upon, the *Buyer* proceeds to the next step to formally terminate the relationship.

Arrange EoS/EoFi for related MPs

This sub-process is initiated by the *Buyer* during the *Manage expiring contracts* step if they determine that the fiMP has *related MPs*. The goal is to coordinate with the *Customer* to ensure that the termination of the feed-in contract is handled in consideration of the entire installation, preventing unintended contractual gaps for other MPs.

End of Market Feed-In

This component is initiated by the *Buyer* after determining that the ComRel will not be extended. The *Buyer* formally reports the EoMFi to Leneda with a future *Process Date* (at least D+1). Upon receipt, Leneda processes the termination of the CCR and SCR effective on the specified date. This action does not affect the Customer's registration as the FiR. Consequently, if no new ComRel is established (e.g., via a *Producer switches Buyer or Feed-In Variant Business Scenario*) by the time the EoMFi takes effect, the MP will fall into *Vacancy Management*. Since the FiR remains known to Leneda, this results in an *Uncompensated Feed-In*.

DSO RFi Management

This component is initiated by the DSO to manage the termination of a *Regulated Feed-In* relationship. The process can be triggered in two contexts: proactively, when a subsidized feed-in model is approaching its expiration, or reactively, upon receiving a Leneda notification that a *Customer* with an RFi contract has revoked their FiR status.

In the case of an expiring support contract, the DSO is obligated to send a formal letter to the *Customer*, informing them of the upcoming contract end and outlining the available options for a subsequent feed-in model. The primary goal is to ensure the *Customer* makes a timely decision by initiating the *Producer switches Buyer or Feed-In Variant Business Scenario*. If the *Customer* fails to act and the RFi contract expires, the MP will automatically fall into *Vacancy Management*, resulting in an *Uncompensated Feed-in*.

Sharing Group Management

This component becomes relevant if the MP affected by the EoFi is a member of a *Sharing Group*. In this case, the responsibility for managing the *Sharing Group* membership lies entirely with the SGR.

The SGR is informed about the *Customer's* departure - either proactively by the *Customer* themselves or reactively through an automated system notification from Leneda (e.g., following the execution of *Revoke FiR* or the termination of the ComRels).

Based on this information, the SGR must clarify the situation with the member and decide whether the MP must be removed from the SG. If removal is required, the SGR updates the *SG Configuration* in Leneda accordingly. For this specific step (removing an MP), the SGR does not require a CM. However, it should be noted that this adjustment can only become effective in the system with a *Process Date* in the future (at the earliest D+1). If the SGR reacts only after the EoFi has taken effect, the MP formally remains in the *Sharing Group* for the interim period.

Producer switches Buyer or Feed-In Variant

This *Business Scenario* represents the proactive path for the *Customer*. Instead of letting their contract expire, the *Customer* can initiate this process to seamlessly transition to a new *Buyer* or a different *Feed-In Variant*. The successful completion of this *Business Scenario* prevents the fiMP from entering a vacant state.

Producer MI at existing MP

This component describes the process for registering a new *Customer* at an existing FiMP. It serves as a primary mechanism to ensure a seamless transition between operators or to resolve a *Vacancy*. The process can be used to report a SoFi that immediately follows the previous *Customer's* EoFi, or to overwrite a planned termination via a retroactive *Move-In*. Furthermore, if the MP has already fallen into

a state of *Vacancy* - for instance, after a *Move-Out* without a direct successor - this process is used to formalize the relationship once the new operator is identified. The detailed procedures for this takeover are described in the separate *Business Scenario* of the same name.

VACANCY MANAGEMENT

This *Business Scenario* is the default outcome if, after an EoFi becomes effective, no seamless takeover by a new *Customer* or a new ComRel for the existing *Customer* is in place. It manages the vacant fiMP by assigning it to either *Uncompensated Feed-In* or *Vacancy Feed-In*, depending on the context of the termination.

3.4 DATA CORRECTIONS AND PROCESS REVERSALS

Although Leneda is designed to handle all energy industry processes in a standardized and error-free manner, market reality requires mechanisms to react to unavoidable errors or exceptional situations. This chapter describes the standardized Leneda framework - the principles, processes, and tools - for performing data *Corrections* and process *Reversals*.

FUNDAMENTAL PRINCIPLES

Two fundamental principles apply to all *Correction* and *Reversal* processes to ensure data consistency and traceability in Leneda:

DATA OWNERSHIP

The principle of data ownership applies without restriction: Only the *Data Owner* of a *Data Object* is authorized to perform a *Correction* on that object. Similarly, a MCS can generally only be reversed by the MA who originally initiated it.

A *Correction Ticket* enables the respective *Data Owners* to perform *Corrections* that would normally be blocked by system rules (e.g., deadlines). While any MA can create and coordinate a ticket, the actual data changes must still be executed by the responsible *Data Owners*.

CORRECTION OF HISTORIZED DATA

Data whose values or relationships change over time are stored in Leneda as *Historized Data* in a chronological chain of consecutive validity periods, known as time slices. This includes time-limited relationships - such as the assignment of a device to an MP or a ComRel - as well as historized properties of objects, like *MP Attributes*.

To ensure the consistency and complete traceability of this data history, any *Correction* of past time slices must follow a strict procedure. This procedure is referred to as the *New-to-Old* principle and is defined as follows:

- **Structural changes to Time Slices**: The structure of the time slice chain is protected to guarantee a seamless history. Therefore, a structural change - such as modifying the start or end date of a past time slice for specific historized data (e.g., the installed meter), or deleting it entirely - is only possible if all more recent time slices for that particular historized data are removed first. The *Correction* must proceed chronologically from the newest entry back to the point of change, before the correct history of this data can be rebuilt.

- **Changes to attributes within a Time Slice**: An important distinction is made for changes to data fields within an existing time slice. As long as its validity period and core relationship remain unchanged, designated attributes can be adjusted directly in a past time slice without affecting newer ones.
- **Exceptions via guided MCS**: For specific, recurring use cases, Leneda may offer a dedicated MCS that provides a guided process for complex structural changes. Such an MCS would manage the necessary removal and recreation of time slices automatically, simplifying the *Correction* for the MA.

Temporal Scope of Corrections

Leneda acts as the *Single Source of Truth* for the physical and contractual reality of the energy market. Therefore, corrections to *Historized Data* or past processes are generally possible and technically supported up to the statutory limitation periods (typically up to 10 years in the past).

It is strictly necessary to distinguish between the correction of data in Leneda and the subsequent commercial energy settlement processes. While specific balancing or settlement processes may have shorter operational deadlines (e.g., 15 months) after which they are considered closed, this does not restrict the obligation to correct the underlying data in Leneda to reflect the true historical state. The commercial or financial resolution of corrections that exceed such sector-specific settlement deadlines is subject to the applicable legal framework or bilateral clarification between the involved parties and is managed outside of Leneda's automated processes.

Standard Procedure via Ticket

The standard procedure for performing a *Correction* in Leneda is managed via a *Correction Ticket*. This process is mandatory for regulated, complex, or financially relevant changes and ensures that they are performed in a traceable, transparent, and controlled manner.

The Concept of a Correction

A *Correction* is the overarching, formal process for rectifying an erroneous data or process state. It is initiated by creating a *Correction Ticket* and may consist of one or more coordinated steps performed by the responsible MAs. Depending on the error, a *Correction* can involve a combination of different tools, such as reversing an MCS, updating master data via *Base Services*, or initiating new, correct market processes.

The Correction Ticket

The *Correction Ticket* is the central governance instrument for managing and authorizing corrections within Leneda. While any authorized MA can open a *Correction Ticket* to request a change, the authority to actively execute a correction fundamentally resides with the respective *Data Owner* of the affected data (e.g., the DSO for *Time Series* or the respective *Supplier* for their ComRel).

A *Correction Ticket* is mandatory when a planned *Correction* meets one or more of the following criteria:

A. It requires a recalculation of grid usage fees because it affects billing-relevant data in a period that has already been billed. As Leneda acts as the calculation engine for grid usage fees, the system automatically detects if a data change invalidates an existing invoice, in which case a *Correction Ticket* is required to proceed. Upon execution of the *Correction*, Leneda triggers a

recalculation of the fees. The DSO is then notified and must align their back-end systems by cancelling the original invoice and finalising the newly generated billing document.

B. A MCS is to be reported with a *Process Date* outside the regularly permitted deadline. The *Correction Ticket* serves as the request channel for the *Data Owner* to evaluate the legitimacy of the retroactive change. The *Data Owner* must verify that the request is legally permissible (e.g., adhering to regulatory limits). If the request violates these rules without valid justification, the *Data Owner* is entitled to reject and close the *Correction Ticket*.

C. A *MCS-Reversal* is required, but the original data state cannot be restored directly because subsequent processes have occurred at the MP.

Categorization for Market Analysis: To facilitate structured error analysis and identify systemic issues in the market, Leneda provides distinct *Correction Ticket* categories. When creating a ticket, the initiating MA is required to select the category that best describes the underlying error. This categorization aids process steering by helping involved parties quickly understand the context and required actions, and simultaneously supports market quality monitoring by allowing for reporting on the frequency of specific error types, enabling MA's such as DSOs or the ILR to identify areas where market processes or data quality need improvement.

Lifecycle of a Ticket

The process follows a simple, three-step lifecycle:

Create: To ensure the process is as streamlined and efficient as possible, an MA can easily initiate a *Correction Ticket* (e.g., via API or a GUI) by providing only the essential information needed to identify the issue. Conceptually, this includes the scope (such as the affected MPs and the correction period) and a clear reason (e.g., by selecting a standardized error category). While this document outlines these business requirements, the exact mandatory data fields and technical structures required to successfully trigger a *Correction Ticket* are specified in the official API documentation. Upon creation, Leneda returns a unique *Correction Ticket* ID. As long as the *Correction Ticket* is open, all affected MPs are flagged in Leneda to signal the ongoing *Correction* to all *Data Stakeholders*.

1. **Use & Track:** After a *Correction Ticket* is created, the primary *Data Owner* responsible for the erroneous data typically takes on the role of coordinator. The coordinator shares the *Correction Ticket* ID with any other involved *Data Owners* and original MCS initiators. These MAs then use this ID in their respective service calls to execute the necessary corrective actions, which are now enabled by the *Correction Ticket*.

2. **Close:** After all coordinated actions have been completed and the issue is resolved, the original creator of the *Correction Ticket* is obligated to close it, effectively confirming the successful resolution. For simple, single-action *Corrections*, Leneda may close the ticket automatically upon successful execution. The visual markers are then removed, and all relevant *Data Stakeholders* receive a final notification from Leneda about the completion of the *Correction*.

Executing a Coordinated Correction

Once a *Correction Ticket* is open, the coordinator and the involved MAs (such as *Data Owners* and original MCS initiators) use a combination of Leneda services to resolve the error. A complex *Correction* is not a single action, but a sequence of steps that utilize different tools from the *Correction* toolkit

The primary tools available within a ticket-based *Correction* are:

- **Reversing a MCS**: This is used to completely undo a specific, erroneous market process that has been executed (e.g., an incorrect SoS).
- **Updating data via Base Services**: This is used to correct specific attributes on a Data Object (e.g., correcting a technical parameter on an MP).
- **Initiating new MCS**: This is used to establish the correct business state after the erroneous data has been cleaned up (e.g., reporting a new SoS for the correct MP).

Special Case: Correction by a Leneda Agent

For exceptional or highly complex errors that cannot be resolved by the MAs through the standard, automated correction processes, a *Correction* can be requested to be performed manually by an authorized Leneda Agent.

Process Flow

1. **Ticket Creation**: The MA creates a *Correction Ticket* and selects the type "Leneda Agent Correction". It is crucial that the creator provides a complete and precise documentation of the error in the ticket. This must include all affected objects (e.g., MPs, Devices), a clear description of the incorrect state, and the exact, desired outcome.
2. **Processing by Leneda**: The ticket is placed in an internal processing queue. A Leneda Agent reviews the case, performs the required corrections manually in the system, acting in close coordination with the respective *Data Owners* to ensure the validity of the changes, and documents the steps taken.
3. **Closing and Notification**: After completing the *Correction*, the Leneda Agent closes the ticket. The ticket creator, as well as all other relevant *Data Stakeholders*, are then automatically informed about the resolution and the data changes that were made.

Corrections without a Ticket

While the standard procedure for a *Correction* requires a *Correction Ticket*, Leneda provides direct, ticket-free methods for simple, recent, and non-critical errors. These exceptions are subject to strict, automatically enforced system checks. If any of the conditions listed below are not met, the request will be rejected, and the MA must follow the standard procedure by creating a *Correction Ticket*.

Conditions for a MCS-Reversal without a Ticket

A recent MCS, such as a SoS/Fi, can be reversed directly without a *Correction Ticket* only if all of the following conditions are met:

- The request for the *MCS-Reversal* is received by Leneda within 14 calendar days of the *Process Date* of the faulty MCS.

- The relevant data state of the MP has not been altered in the meantime by another, subsequent and interdependent process (e.g., a *Locking* or a device change). Subsequent processes that are completely independent and do not affect the structural integrity of the initial process, such as simple updates to *Customer* contact data, explicitly do not block a reversal.
- The *MCS-Reversal* can fully and automatically restore the data state that existed immediately before the original MCS was executed.

Conditions for Data Updates without a Ticket

A *Data Owner* can correct master data via a standard *Base Service* (CRUD operation) without a *Correction Ticket* only if the following conditions are met:

- The data update does not affect any previously invoiced periods, ensuring that no recalculation of grid usage billing is required. Leneda automatically performs a rebilling relevance check on every data-modifying request and will reject it if this condition is violated without a valid *Correction Ticket*.
- The change complies with the *New-to-Old* principle for any modifications to the structure of *Historized Data* time slices.

3.5 Locking and Decommissioning

Locking on Supplier Request due to non-payment

Scenario Introduction

This *Business Scenario* describes the process initiated by a *Supplier* to request the *Locking* or *Power Reduction* of an MP due to non-payment by the *Customer*. This measure is considered a last resort and must be carried out in strict compliance with the applicable legal framework.

The process supports two types of measures: a complete *Locking* of the supply or, primarily for *Smart Meters*, a *Power Reduction*. The *Supplier* specifies the desired measure in the request. Leneda validates the request against defined business rules and routes it directly to the responsible DSO.

The DSO assumes full responsibility for managing the execution and continuously updating the request status in Leneda. For electricity *Smart Meters*, the DSO executes the measure remotely via the central *Luxmetering* system. Since gas *Smart Meters* do not support remote control functions, and for electricity meters lacking remote capabilities, or in case a remote attempt fails, the DSO executes the measure manually on-site.

Once the *Customer* has settled their outstanding debts, the *Supplier* initiates the *Unlocking* or *Power Restoration* process to restore the supply.

Scenario Process Flow

The process flow visualizes the interactions between the Supplier, Leneda, the DSO and Luxmetering.

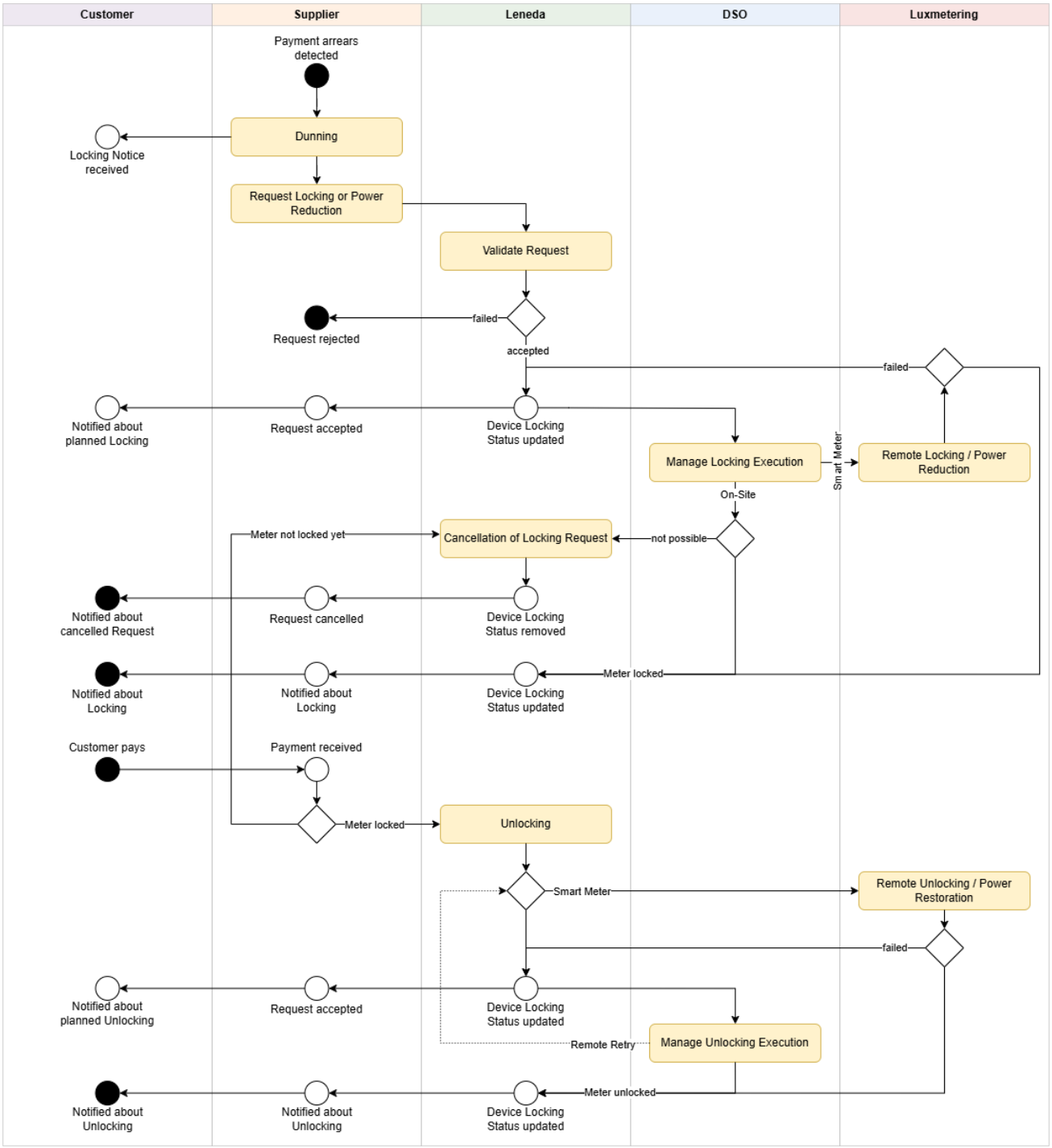


FIGURE 23: LOCKING ON SUPPLIER REQUEST DUE TO NON-PAYMENT

The process flow for this scenario is structured into three main phases. During the initial phase, the *Supplier* ensures that all legal pre-conditions are met and submits the request, which is subsequently validated by Leneda. Once validated, the execution phase begins. Leneda forwards the validated request directly to the responsible DSO, who then assumes full responsibility for assessing the feasibility, continuously updating the request status in Leneda, and executing the measure. For electricity *Smart Meters*, the DSO executes the *Locking* remotely via the central Luxmetering system. If the meter lacks remote capabilities, or if a remote attempt fails, the DSO executes the measure manually on-site. Finally,

in the resolution phase, once the *Customer* has settled their outstanding debts, the *Supplier* triggers the *Unlocking* process, which follows the exact same DSO-managed execution logic to restore the supply.

Scenario Components

The following sections explain the individual process components (shown in yellow) and sub-processes (shown in green) of the flow visualized in the diagram.

Dunning

This component takes place outside of Leneda but is the mandatory prerequisite for the entire process. The *Supplier* executes their internal dunning process to collect outstanding payments. Before a *Locking* can be requested in Leneda, the *Supplier* must ensure compliance with all legal requirements. For residential *Customers* - defined as customers purchasing energy for their own household consumption excluding commercial or professional activities - this specifically includes sending the required payment reminders and the formal notification of the planned *Locking* including the statutory notice period to both the *Customer* and the competent social office. The *Supplier* is responsible for verifying that these conditions are met before proceeding.

Request Locking or Power Reduction

Once the dunning process is completed and the deadline has expired without payment, the *Supplier* submits the request to Leneda. In this request, the *Supplier* must specify the MP and the EID of the defaulting *Customer*. This combination is mandatory to ensure that the measure targets the correct *Customer* and prevents the accidental locking of another *Customer* who may have moved in recently. Furthermore, the *Supplier* defines the scope of the measure - either a full *Locking* or a *Power Reduction* (only applicable for electricity) - and provides a standardized *Locking* reason to classify the case for the DSO. By submitting the request, the *Supplier* implicitly confirms that all legal pre-conditions have been met.

Validate Request

Upon receipt, Leneda performs an automated validation to ensure the request complies with the market rules defined. The system verifies that the requesting *Supplier* holds a valid SCR for the MP and that the EID provided matches the *Customer* currently linked via the CCR. Additionally, Leneda checks the status of the MP and the Customer to ensure that neither is marked as protected (e.g., critical infrastructure or vulnerable status) and that the request respects general constraints. If any of these checks fail, the system rejects the request immediately and notifies the *Supplier* of the specific rejection reason.

Remote Locking / Power Reduction

If the device is an electricity *Smart Meter* equipped with a breaker, this component is triggered by the DSO to execute the measure remotely via *Luxmetering*. In the event of an error or failure, the DSO can retry the remote locking attempt. Consequently, the *Supplier* and the *Customer*, in their capacity as *Data Stakeholders*, are automatically notified about this status change.

Manage Locking Execution

This component assigns the responsibility for execution to the DSO immediately after Leneda has successfully validated the locking request through its initial automated checks. As the *Data Owner* of the device, the DSO is notified of the pending request and assumes full responsibility for executing the measure as promptly as possible within the defined timeframe of 10 working days. The DSO

independently evaluates whether the execution can proceed immediately or must be delayed due to external constraints such as weather conditions, weekends, or public holidays. In any case, the DSO continuously updates the status of the locking request in Leneda.

The DSO manages the further workflow based on the specific technical situation: if the device is an electricity *Smart Meter*, the DSO can execute the *Locking* remotely via *Luxmetering*. For all gas meters, traditional electricity meters without remote capabilities, or in cases where a remote locking attempt fails, the DSO schedules a field service technician to perform the physically on-site.

Upon successful completion, the DSO updates the locking request status to successfully executed in Leneda. Consequently, the *Supplier* and the *Customer*, as *Data Stakeholders*, are automatically notified about the executed measure. If the locking cannot be performed for technical reasons, the DSO initiates the cancellation of the *Locking* request.

Cancellation of the Locking Request

If the *Customer* settles the outstanding debt after the request was sent but before the measure is executed, the *Supplier* cancels the *Locking* request to stop the process. Similarly, the DSO initiates this cancellation if the measure proves technically or organizationally unfeasible (e.g., due to persistent lack of access to the meter). In both scenarios, Leneda updates the device status to reflect that no *Locking* request is pending and notifies the *Supplier* and the *Customer* as *Data Stakeholders*.

Unlocking

Upon receipt of payment, the *Supplier* is legally obligated to initiate the *Unlocking* process immediately. The *Supplier* submits the corresponding request to Leneda to reverse the measure. Leneda validates the request and processes it with high priority to ensure the prompt restoration of supply.

Remote Unlocking / Power Restoration

For eligible electricity *Smart Meters*, Leneda automatically attempts to execute the *Remote Unlocking or Power Restoration* via *Luxmetering*. In the case of a *Power Restoration*, the system removes the power limit, instantly restoring full capacity. For a full *Unlocking*, the breaker is enabled; however, for safety reasons, the physical re-closing of the breaker usually requires a manual confirmation by the *Customer* at the device itself. Upon successful execution, Leneda removes the *Locking* status from the device. Consequently, the *Supplier* and the *Customer*, in their capacity as *Data Stakeholders*, are automatically notified about the restoration of supply.

Manage Unlocking Execution

In cases where remote *Unlocking* is not possible (e.g., for gas meters) or fails, the DSO assumes responsibility for the *Manage Unlocking Execution*. The DSO ensures that the *Unlocking* or *Power Restoration* is performed promptly, legally mandated within three working days, either by triggering a new remote command via Leneda to *Luxmetering* or by dispatching a field service technician for an on-site intervention. Once the supply is restored, the DSO updates the status in Leneda, which triggers the final notification to all *Data Stakeholders*.

4 Services and Technical Implementation

This chapter outlines the fundamental principles of the technical interaction between MAs and Leneda. While the previous chapters defined the regulatory framework, the logical *Business Scenario*, and the

associated rights and obligations, this section describes how these processes are operationalized via Leneda.

To ensure the stability of the *Market Rules* and to allow for agile technical evolution, specific interface definitions are not listed within this document. Instead, this chapter establishes the reference to the technical specifications provided separately.

4.1 Principles of Data Exchange via Leneda

Leneda operates as a central data hub designed to facilitate a standardized, automated, and efficient exchange of information. The interaction with the system is primarily based on the following principles:

API-First Approach: The primary method for MaCo is the use of automated *Application Programming Interfaces* (APIs). MAs integrate their local IT systems with Leneda to exchange data in near real-time.

Standardization: All data exchange is governed by strict technical standards regarding format, structure, and validation logic. This ensures interoperability between all participants in the Luxembourg energy market.

Security and Authentication: Access to Leneda services is secured through robust authentication mechanisms. Every API call is validated against the specific permissions of the requesting MA, ensuring data security and compliance with the rules of *Data Ownership* and *Data Stakeholder* access defined in this document.

4.2 Classification of Services

The services provided by Leneda to support the *Business Scenario* generally fall into two categories:

- **Base Services:** These services allow for granular interactions with individual *Data Objects* (e.g., reading master data of a MP or updating specific attributes). They are typically used for master data maintenance and information retrieval.
- **MCS:** These are process-oriented services designed to execute complex business transactions (e.g., SoS, *Supplier Switch*, or *Correction* processes). An MCS encapsulates the business logic, deadline checks, and validation rules required to transition a *Data Object* from one state to another.

4.3 Reference to Technical Documentation

While these *Leneda Market Rules* define the binding business logic, deadlines, and process flows, the detailed technical specifications are maintained in the official API Documentation (e.g., Swagger).

Scope of the Technical Documentation: The technical documentation serves as the binding reference for the implementation of interfaces by MAs. It includes, but is not limited to:

- **Endpoint Definitions:** The specific URLs and methods (GET, POST, PUT, etc.) for calling *Base Services* and MCS.
- **Data Structures:** Detailed descriptions of input and output parameters, mandatory and optional fields, and data formats.

- **Validation Logic:** Technical descriptions of field-level validations that complement the high-level business rules.
- **Response Codes:** A comprehensive list of success and error messages (including rejection reasons) returned by the API to indicate the outcome of a request.

MAs are required to consult the latest version of the technical API documentation to ensure their systems are compliant with the current Leneda interface specifications.

Purely technical updates and the detailed specification of the system implementation - such as specific endpoint behavior, validation logic, internal data processing rules, and Leneda's system responses - are handled exclusively within the technical documentation. Provided these technical details do not alter the underlying market rules or business processes described in this document, they may be updated or refined to reflect operational optimizations without requiring a revision of the Leneda Market Rules.

Should a modification of the LMR become necessary, the updated document will be published in the *Luxembourg Energy Forum*, giving MAs the opportunity to review and object. Major revisions or periodic reviews (e.g., annually) will be subject to a formal public consultation by the ILR.

5 LIST OF FIGURES