# **Document History**

#### **Revision History**

Revision Number	Revision Date	Revision/ Reviewed By	Summary of Changes	Changes marked

# Approvals

This document requires the following approvals.

Name	Title

# 1.1 Use Case Title

L2 – Vehicle Use Case

Customer connects PEV at Another Home (premise) and within the customer's home territory.

#### 1.2 Use Case Summary

This use case details the Connection Location (VIN Authentication, Basic Charging per enrolled program) for the customer to transfer energy. This is precluded by specific enrollment process by one or more of the connection architectures as described in Use Cases S1-3. This sequence of Use cases is followed by Use cases PR1 series that summarize the previous Use Cases.

#### **1.3 Use Case Detailed Narrative**

# 3. Step by Step Analysis of Each Scenario

Use Case L2: Custom Customer connects PEV at Another Home (premise) within the customer's territory.

#### 3.1 Scenario Description

# Primary Scenario (L2-A): Customer connects PEV to energy portal at another premise and premise customer pays for energy use

This scenario describes what happens if a Customer plugs PEV into another premise (not his own, but one serviced by the same utility), where the premise owner is responsible for the cost of energy delivered to the PEV charged at the premise.

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
The customer plugs in the PEV	PEV	Customer has enrolled PEV with	The utility has a record of the
using either EVSE cordset or		home utility. Enrollment and Initial	energy purchased transactions
Premise EVSE for charging		Setup steps	related to the customer premise
			and the associated PEV ID.

## 3.1.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
1	PEV	PEV connects another customer's premise within the Utility service territory, and the customer at this location is willing to pay for PEV charging energy. Customer can plug in his PEV using either EVSE cordset or Premise EVSE for charging	PEV may display message communicating charging/billing options or information to the Customer
1a	Customer	Customer connects EVSE <b>cordset</b> to Energy Portal at Premise.	Startup steps are provided in S1
1b	EVSE	Customer connects <b>Premise Mounted</b> EVSE to PEV.	Startup steps are provided in S2

Step #	Actor	Description of the Step	Additional Notes
2	PEV/Energy Services Communications Interface (ESCI)	PEV and Energy Services Communications Interface (ESCI) perform PEV binding and authentication process.	Implementation could have PEV or ESCI as initiator of session.
3	PEV	PEV is able to provide indicator to customer that binding has been successful (and that the PEV will receive incentive rate upon charging, if applicable).	
4	PEV	PEV sends Energy Request (amount and rate) and Schedule (according to enrolled PEV program)	
5	Utility	Utility compares request with available and confirms or adjusts for message back to PEV Utility sends Energy Available (amount and rate) and Schedule (according to enrolled PEV program)	
6	PEV	PEV prepares for charging	
7	PEV	PEV begins charging based on Customer-selected preferences. Charging may be delayed based upon Customer preferences or grid reliability criteria (e.g., off- peak economy charging, demand response event underway, short, randomized charging delay to promote grid stability, etc.)	The vehicle needs to record the energy delivered as a running total for the event. This would be a reference to be compared with the EUMD total. The EUMD has logged the actual energy flow accumulation for the utility
8	End Use Measurement Device	EUMD records charging information and energy supplied to PEV for each charging session. Charging information includes PEV ID, Premise ID, energy usage, and time stamp for each metering interval.	
9	End Use Measurement Device	EUMD communicates to Energy Services Communication Interface the energy supplied to PEV for each charging session.	This communication could be on a periodic basis during charging, upon vehicle unplug from energy portal, or a combination of the two.

Step #	Actor	Description of the Step	Additional Notes
10	Energy Services Communication Interface	<ul> <li>Energy Services Communication Interface communicates to Utility the energy supplied to PEV for each charging session.</li> <li>ESCI transmits Date, time, duration and energy delivered to Utility and Vehicle.</li> </ul>	This is the status of the cycle for the Utility, PEV and Customer information. J2836 identifies the periodicity of these messages. It may be desired to have this summed on a regular interval (every minute) in case the charge cycle is interrupted prior to the end so the current information (running summation) is not lost
11	Utility	Utility records each PEV charging session for bill generation and reporting to customer account associated with this premise and PEV ID.	

#### **3.2 Alternative Scenario Description**

# Alternative Scenario (L2-B): Customer connects PEV to energy portal at another premise and PEV customer pays for energy use.

This scenario describes what happens if customer plugs PEV into another premise (not his own, but serviced by the same utility), where the PEV operator is responsible for the cost of energy delivered to the PEV charged at the premise.

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
The customer plugs in the PEV	PEV	Customer has enrolled PEV with	The utility has a record of the
using either EVSE cordset or		home utility. Enrollment and	energy purchased transactions
Premise EVSE for charging		Initial Setup steps	related to the customer premise
			and the associated PEV ID.

Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
1	PEV	PEV connects at another customer premise within the Utility service territory. PEV owner will pay for charging. Customer can plug in his PEV using either EVSE cordset or Premise EVSE for charging	PEV may display message communicating charging/billing options or information to the Customer.
1a	Customer	Customer connects EVSE cordset to Energy Portal at Premise.	Startup steps are provided in S1
1b	EVSE	Customer connects Premise Mounted EVSE to PEV.	Startup steps are provided in S2
2	PEV/Energy Services Communications Interface (ESCI)	PEV and Energy Services Communications Interface (ESCI) perform PEV binding and authentication process	Implementation could have PEV or ESCI as initiator of session.
3	PEV	PEV is able to provide indicator to customer that binding has been successful (and that the PEV will receive incentive rate upon charging, if applicable).	
4	PEV	PEV sends Energy Request (amount and rate) and Schedule (according to enrolled PEV program)	
5	Utility	Utility compares request with available and confirms or adjusts for message back to PEV Utility sends Energy Available (amount and rate) and Schedule (according to enrolled PEV program)	
6	PEV	PEV prepares for charging	
7	PEV	PEV begins charging based on Customer-selected preferences. Charging may be delayed based upon Customer preferences or grid reliability criteria (e.g., off-peak economy charging, demand response event underway, short, randomized charging delay to promote grid stability, etc.)	The vehicle needs to record the energy delivered as a running total for the event. This would be a reference to be compared with the EUMD total. The EUMD has logged the actual energy flow accumulation for the utility

Step #	Actor	Description of the Step	Additional Notes
8	End Use Measurement Device	EUMD records charging information and energy supplied to PEV for each charging session. Charging information includes PEV ID, Premise ID, energy usage, and time stamp for each metering interval.	
9	End Use Measurement Device	EUMD communicates to Energy Services Communication Interface the energy supplied to PEV for each charging session.	This communication could be on a periodic basis during charging, upon vehicle unplug from energy portal, or a combination of the two.
10	Energy Services Communication Interface	Energy Services Communication Interface communicates to Utility the energy supplied to PEV for each charging session. ESCI transmits Date, time, duration and energy delivered to Utility and Vehicle.	This is the status of the cycle for the Utility, PEV and Customer information. J2836 identifies the periodicity of these messages. It may be desired to have this summed on a regular interval (every minute) in case the charge cycle is interrupted prior to the end so the current information (running summation) is not lost
11	Utility	Utility records each PEV charging session for bill generation and reporting to customer account associated with this premise and PEV ID.	

# 4. Requirements

This use case is the 4<sup>th</sup> in a series that follows Use Cases S1-3 for connection architectures. This use case defines the steps for the customer connecting at another home within the customer's territory.



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#### **4.1 Functional Requirements**

Func. Req. ID	Functional Requirement	Associated Scenario # (if applicable)	Associated Step # (if applicable)

#### 4.2 Non-Functional Requirements

Non- func. Req. ID	Non-Functional Requirement	Associated Scenario # (if applicable)	Associated Step # (if applicable)

#### **4.3 Business Requirements**

Bus. Req. ID	Business Requirement	Associated Scenario # (if applicable)	Associated Step # (if applicable)

## 5. Use Case Models

## 5.1 Sequence Diagram using EVSE Cordset



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## 5.2 Sequence diagram using premise EVSE



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5.3