

DEMOCRAT

Deliverable D5.1 - Demonstrator Installation Plan

Activity: Integration of the solution components and installation in the demonstrator's grid

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DEMOCRAT ABSTRACT

The DEMOCRAT project aims at demonstrating an integrated and innovative micro-grid concept applied to LV and MV networks, as a suitable solution for efficiently managing their distributed energy resources (DER), working simultaneously as a flexible asset of the distribution networks.

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Language Requirements (for non-native English speakers)

In order to fully understand the content of this document, it is therefore recommended that the reader possesses a language proficiency equivalent to B1 level, according to European Language Levels

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Revisions

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Executive Summary

This deliverable presents the installation plan for the demonstrator deployment.

The activities performed and described in this deliverable comprise:

- Main safety procedures
- Initial installation site - definitive location
- Final installation site - temporary site
- Installation plan

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Glossary

DER	Distributed Energy Resources
LV	Low Voltage
MV	Medium Voltage
SEQ	Safety, Environment and Quality department of Efacec

1. Introduction

1.1 Scope and Purpose

This aim of this deliverable is to present the installation plan for the demonstrator deployment.

The activities performed and described in this deliverable comprise:

- Main safety procedures
- Initial installation site - definitive location
- Final installation site - temporary site
- Installation plan

The present deliverable uses as reference a previous one performed in Activity 2, which is Deliverable D2.1 - Pilot Microgrid Definition.

Moreover, deliverable D1.2 - Identification of Project Risks and Related Mitigation Plan - was also used as reference, as the project faced deployment constraints due to the ongoing infrastructure refurbishment that took place at the Efacec facilities in Maia, Portugal.

2. Main Safety and Logistics Procedures

2.1 Aim and Scope

Safety rules apply to all Efacec staff or external third parties providing services inside the industrial facilities of Efacec.

Those rules are briefly described below:

- Applied to Efacec staff participating in the DEMOCRAT project
 - Use of individual protection equipment, such as helmet, safety boots, glasses, vest
 - Training about electrical risks and training on how performing live-wire electrical works
- Applied to external third parties
 - The same of Efacec staff
 - Participation in a welcome session provided by the Safety, Environment and Quality department - SEQ -, meant to mitigate safety and health risks while performing the assigned work
 - Use of appropriate tools and equipment to perform the assigned work
 - Evidence of commitment to all national social security rules in force
 - Evidence of commitment to all national tributary rules in force
 - Evidence of insurance policy to support all third party's staff
 - Evidence of insurance policy to support the third party's civil responsibilities

The list of candidate services is described in sections 2.2 and 2.3.

Any transportation and logistics - such as crane use - must be communicated to the Safety, Environment and Quality department, as well as to the Patrimony and Services department. The latter must be involved whenever internal facilities car traffic may be affected or may affect any ongoing logistics service.

2.2 Service Provision by Efacec Staff

The list of services to be provided by Efacec staff is the following:

- Installation of power, ancillary service and communication cables
- Installation of batteries in their destination racks, as well as the external air conditioning system
- Authorization of logistics and transports inside the Efacec facilities and of installation works, by SEQ

2.3 Service Provision by Third Parties

The list of services to be provided by third parties is the following:

- Provision of transportation and logistics services
- Manufacturing of containerised solutions
- Installation of firefighting suppressor agents
- Installation of vinyl decorative images and logotypes over the metallic surface of PCA Block and Battery Block

2.4 Components to be Installed

The list of components to be installed is the following:

- PCS Block - the containerised solution by Efacec, housing the power conversion system
- Battery Block - the containerised solution by Efacec, housing the battery system
- Load bank - a third party equipment providing loads to the micro grid
- QC 45 - the EV fast charger by Efacec, acting as a load of the micro grid
- New public lighting circuit, acting as a load of the micro grid

3. Initial Installation Site - Definitive Location

The initial installation site chosen for the project demonstrator came up to become not possible to implement, during the project. Figure 1 depicts the initial installation site meant to receive the demonstrator. This site will provide a LV and a MV (15 kV) grid connection, both providing 250 kVA.

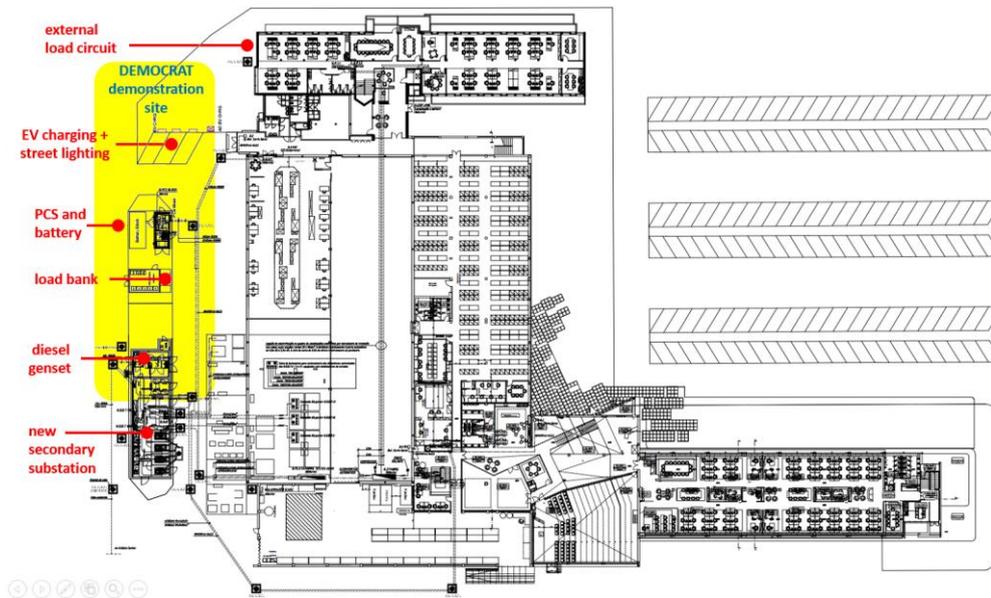


Figure 1 - Initial installation site

4. Final Installation Site - Temporary Location

The final installation site chosen for the project demonstrator is depicted in Figure 2. This site is temporary and can not comprise a MV grid connect, as there is no MV infrastructure nearby.

The LV connection which was provided is limited to 70 kVA, instead of the 250 kVA that were initially requested.

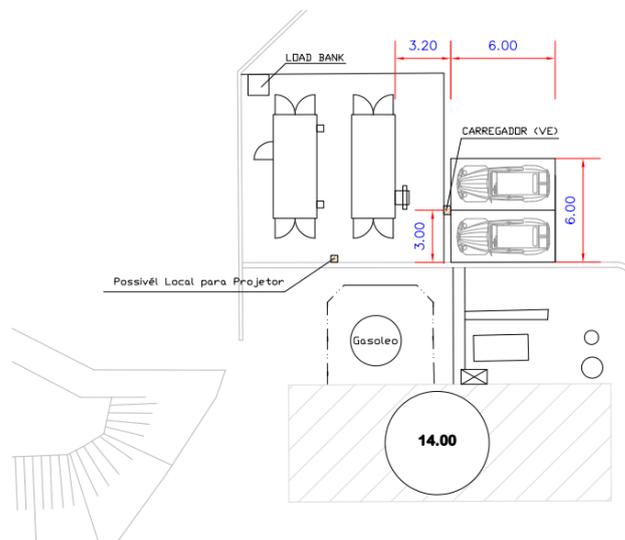


Figure 2 - Final installation site

5. Installation Plan

The demonstrator’s installation plan is as follows:

- Assign roles to Efacec staff participating in DEMOCRAT project, as stated in sections 2.1 and 2.2.
- Assign roles to third parties, as stated in sections 2.1 and 2.3.
- Install the PCS Block (the power conversion system) in January 2019 and perform all electrical connections, namely the interconnection to the Efacec facilities LV grid
- Install the Battery Block (the battery system) in March 2019 and perform all electrical connections, namely the DC link between the inverter and the battery system, as well as the ancillary services of the battery system provided through a specific circuit from the PCS Block
- Install the Load Bank, the EV Charger and the Public Lighting in September 2019 and perform all electrical connections, namely the mentioned loads to their specific feeder at the LV switchboard 2, inside the PCS Block

Figure 3 depicts the Gantt map of the installation plan.

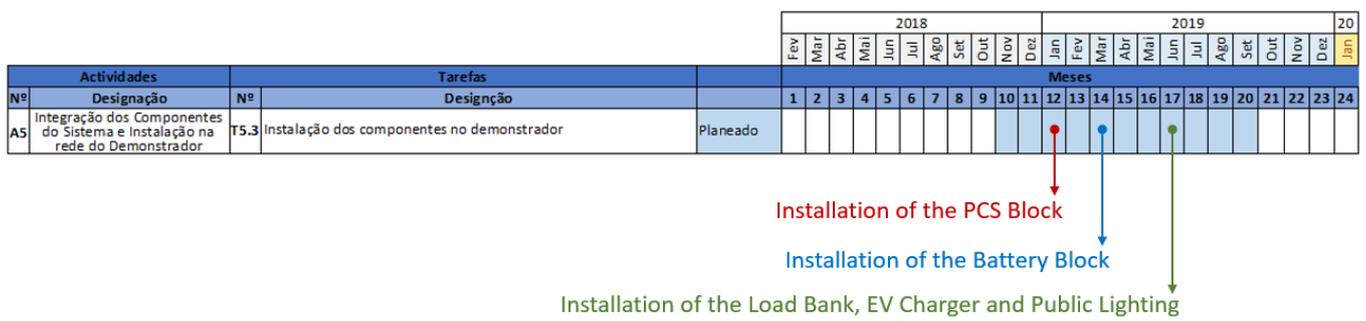


Figure 3 - Gantt map of the installation plan