

## DEMOCRAT

### Deliverable D1.0 - “Documentation Management and Innovation Management Plan”

Activity: A1 - Coordination and Project Management  
(Atividade A1: Coordenação e Gestão de Projeto)

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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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## Document

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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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## Executive Summary

This deliverable describes the documentation management plan and the innovation management, especially designed for the DEMOCRAT project.

Along the document, the reader will be able to learn about the tool used at corporate level for documentation management also adequate for the project purposes, as well as the structure of documentation, the role of users, the overall workflow steps for documentation management and the related lifecycle management.

Moreover, the reader will also learn about the innovation management process implemented within the project, namely regarding the technology radar, innovation risks management, intellectual property management and impact of innovation derived from the project.

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## Glossary

ASE	<i>Automation and Smart Energy - an Efacec business unit</i>
BoD	<i>Board of Directors</i>
CEVE	<i>Cooperativa Eléctrica do Vale d'Este</i>
DEMOCRAT	<i>DEMOstration of a miCrogrid integRAting sTorage</i>
DSO	<i>Distribution System Operator</i>
EDP	<i>Energias de Portugal</i>
HEDNO	<i>Hellenic Electricity Distribution Network Operator</i>
HTTP	<i>Hypertext Transfer Protocol - set of rules for transferring files on the World Wide Web</i>
IPR	<i>Intellectual Property Rights</i>
LV	<i>Low Voltage</i>
PDF	<i>Portable Document Format - a file format for copying and sending electronic documents</i>
QAS	<i>Quality, Environment and Safety - the Portuguese related acronym</i>
R&D	<i>Research and Development</i>
RES	<i>Renewable Energy Sources</i>

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# 1. Introduction

This deliverable describes the documentation management plan and the innovation management plan, especially designed for the DEMOCRAT project.

The document is divided in two main sections:

- The Documentation Management Plan
- The Innovation Management Plan

The two plans, although belonging to the same document, are quite different.

The Documentation Management Plan describes how documentation will be managed within the DEMOCRAT project, addressing specific subjects such as:

- Electronic platform
- Editing, reviewing and approval workflow
- Roles and responsibilities
- Overall directory for all DEMOCRAT documentation-like deliverables

The Innovation Plan describes how innovation is managed along the DEMOCRAT project lifecycle, addressing specific subjects such as:

- Technology radar
- Innovation risks management
- Intellectual property management
- Impact assessment of innovation within DEMOCRAT towards the strategic technology roadmap of the energy storage business

## 2. Documentation Management Plan

### 2.1 Overview

Documents for strategic projects such as DEMOCRAT, are managed in the in-house application named SharePlace.

SharePlace is a web-based application suitable for documentation management. It was developed in Efacec and is widely used by all business units across the Efacec Group. It includes different applications designed to optimize and simplify many user tasks and thus increasing user productivity.

The computational platform beneath Shareplace offers all needed features regarding persistency and backup, data protection against viruses and other threats, as well as cyber-security, as such platform is managed by the Efacec corporate services, namely by the Digital Office.

SharePlace is a set of integrated applications. It covers almost all business functional areas, comprising Production, Engineering, Commercial, Logistics, etc., as well as R&D.

This is an online tool available through the Intranet “Synergynet” folder link, as it can be depicted in Figure 1.



Figure 1 - Link to Synergynet from the Efacec corporate intranet

Once selected, a menu within Synergynet allows the duly user to select the suitable application which, in the scope of documentation is SharePlace, as it can be depicted in Figure 2.

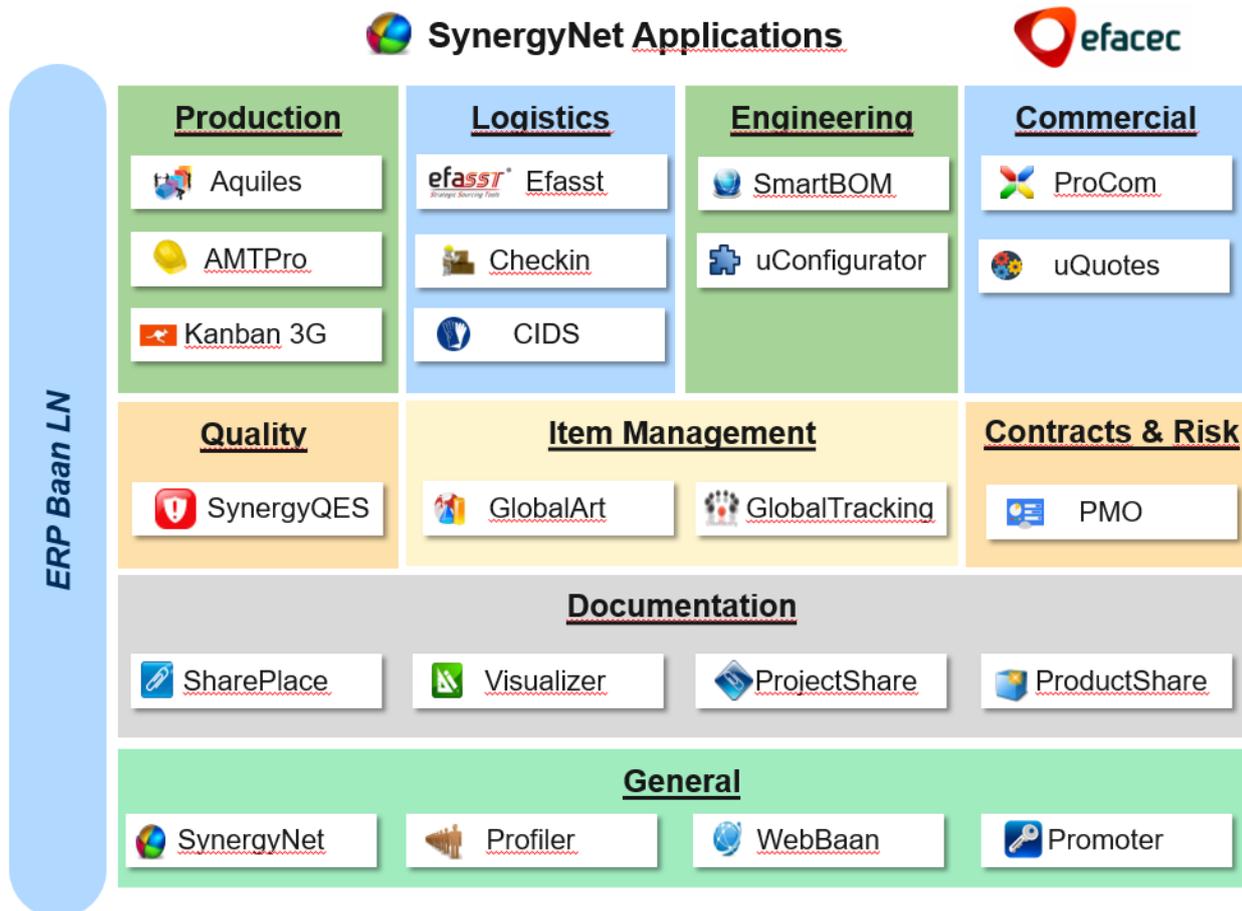


Figure 2 - Synergynet options, comprising SharePlace

The application for project document management is ProjectShare, where all users can visualize documents associated to projects.

Key users are primarily defined so they are in charge of the assignment of write and read permissions. In addition, for each project, the project manager can add or remove users' access of the projects.

## 2.2 Folder Structure

The selected folder structure to manage the project DEMOCRAT is common to other R&D and demonstration projects and it is as follows:

01. Requirements and Specifications
02. Architecture and Design
03. Plans and Test Results
04. Meetings
05. Financial Management
06. Supplementary Documents
07. Communications

The previous structure addresses all required documentation needs for DEMOCRAT, as it allows managing, comprising the creation, editing and reading of important documents achieved along the project lifecycle. Such folder structure is used in the project for the following purposes:

01. Requirements and Specifications - project deliverables regarding technical aspects of the project, comprising use cases and pilot definitions

02. Architecture and Design - project deliverables regarding the demonstrator architecture for the demonstrator and also for the IT system managing it, as well as the algorithms design and their implementation
03. Plans and Test Results - project deliverables regarding unitary, integration and site testing, comprising their planning and test results
04. Meetings - minutes of all meetings
05. Financial Management - project deliverables regarding financial management of DEMOCRAT, as well as their supporting files
06. Supplementary Documents - project deliverables, addressing other scopes, namely this specific D1.0 deliverable - Documentation Management and Innovation Management Plan - or any other deliverable related to dissemination and exploitation
07. Communications - this folder is used to keep all important e-mails and related attachments associated to the lifecycle management of DEMOCRAT

## 2.3 Users' Access

Not all users have reading access, as it is limited to R&D group that reflects the organization structure. In fact, all groups defined are mirroring the company hierarchical chart granting adaptability and avoiding the need to be constantly managing users by the Project Manager.

The SynergyNet allows the definition of roles that fit exclusive responsibilities, such as the **Project Manager** and the **Project Team**.

In case of one-off situations - those where users belong to external groups not related to the project - specifically when other user requires the access, the project manager is in charge of assigning him the reading or writing access.

The Project Manager is set at first when creating the project. Moreover, it can be defined one or more users. This role means that the project manager and any other duly user may approve documents, reject drafts, insert or remover users, etc.

## 2.4 Documentation Workflow Management

The ProjectShare tool is targeted for documents management.

New documents are sequentially and automatically numbered. The main features are:

- Create new documents (the numbering is automatic)
- Select the type of document (generic, manual, datasheet, roadmap, report...), most suitable for DEMOCRAT
- Set different levels of confidentiality (low, medium or high)
- Define lifecycle (1 step approval or No Approval at all)
- Define a creator team (equals the same writing permissions as the document owner)
- Define revision schemes (0.0; 1.A, or no revision at all)
- Add new step to approval process

In the SharePlace context, a document is a *container* that may include more than one file, typically, an editable file format and a PDF file that is readable for the remaining users.

Besides these, one can save on the same container other files in different languages, or a zipped folder.

There's no limit of files to be saved in SharePlace.

In this stage, the new document is created under a Draft status; it's when the owner and his team work in the same file or files.

There is a check-in and check-out feature to prevent parallel edition so, a message appears to warn when someone is editing the files.

## 2.5 Documentation Lifecycle Management

After the contributions of one or more members, the owner changes the document status from Draft to Under Approval. The Project Manager instantaneously receives a notification to visualize it and then approve it. He can also reject the file, returning it to the owner who will start the process from the beginning.

If the document is approved, all participants of the project are notified with an automatic email. This happens only if the project owner (Project Manager) forces that subscription. But, the users can subscribe themselves the documents or folders that they want to be notified of.

When a new revision is required, the document owner or someone of the project team can create a new revision. The status returns to Draft and the process starts again.

Figure 3 briefly describes the workflow associated to documentation verification, validation, revision and approval.

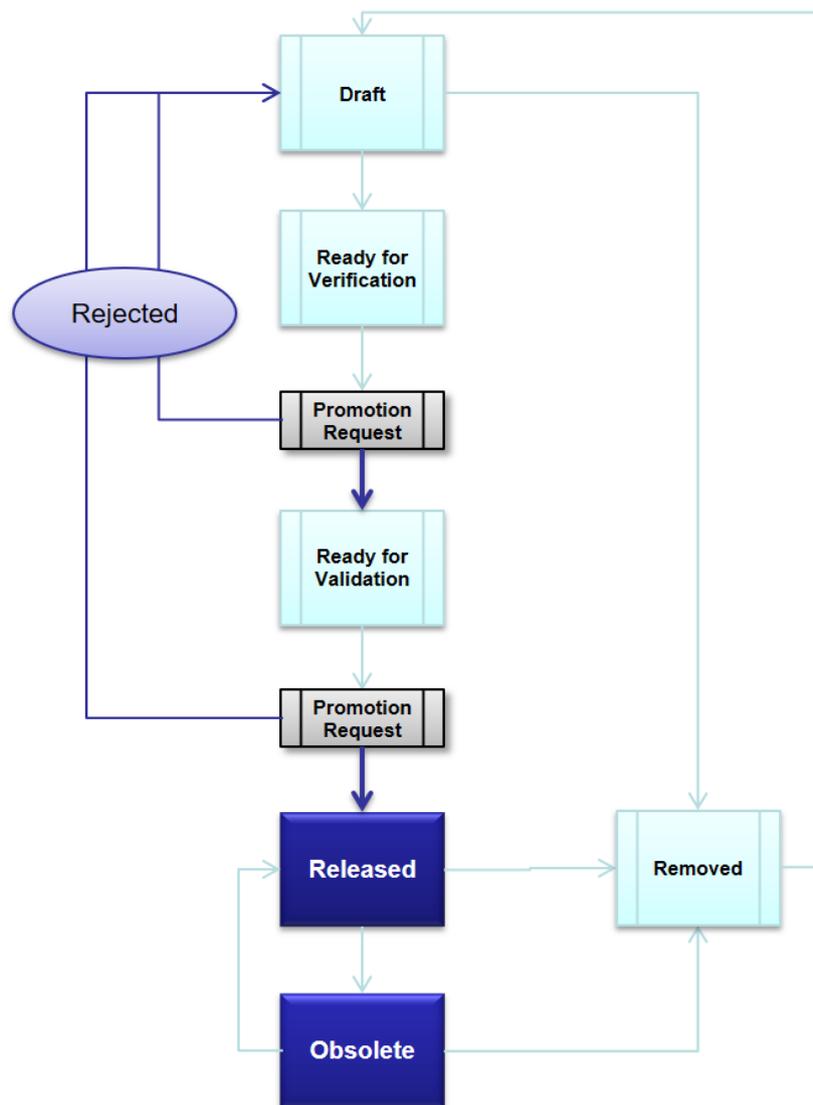


Figure 3 - Lifecycle workflow

SharePlace maintains older revisions. For instance, a document with a third approved revision keeps revisions 1 and 2. The interface of the application only shows the last one, however, previous revisions are displayed under the Revision Log option of the Document as it can be observed in Figure 4, highlighted by the red rectangle.

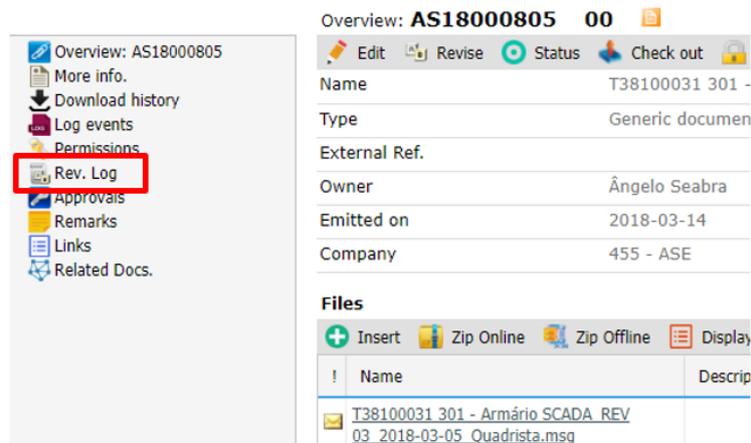


Figure 4 - Example of document revision tracking

A log is kept with all the revisions, so, the information is never lost, and the user can compare different revisions and see the reasons for revision throughout time.

There is a great advantage of using SharePlace: the user can bind the same document to different references. That is, a specific document can be visualized in the DEMOCRAT project and at the same time, if applicable, in a Product or even in another project; basically, there is an interaction with different documents, and the user can always unbind them.

This binding is quite flexible, as the user can bind the last revision of a document to the first revision of the second document bound.

The access is dependent on the permissions assigned in each reference, addressing both projects or products.

Apart from the document characteristics as stated above, the application allows to give different attributes that help to distinguish the documents. This is a totally optional feature. Attributes as event date, HTTP link, related documents or event dates, are some of those examples.

## 2.6 Simplicity of Use

The upload of files can be made by drag-and-drop, where the user can select a package of files and drag it to SharePlace, thus, simplicity and speed is assured.

It is possible to drag more than one file and the tool is able to differentiate, whether one container is created for lots of files, or a container per file; it depends on the user will.

## 3. Innovation Management Plan

### 3.1 Overview

The present plan for innovation management is focused on the following main topics:

- Technology radar
- Innovation risks management
- Intellectual property management
- Impact assessment of innovation within DEMOCRAT towards the strategic technology roadmap of the energy storage business

### 3.2 Technology Radar

The DEMOCRAT project addresses several business aspects of smart grids, addressing the scope of energy storage within microgrids enabled by renewable energies, with a significant presence of electric vehicle charging. As part of its business role, Efacec has determined that the team involved in the DEMOCRAT project, as any other involved in other R&D or demonstration projects, should follow up technology and market trends, namely by establishing a technology radar.

Such technology radar will be defined considering internal perspectives of technology, internal processes and business commitment, as well as external perspectives regarding business awareness, namely comprising customers, competitors and market fit.

A preliminary study was already performed, resulting in the technology/business radar diagram depicted in Figure 5.

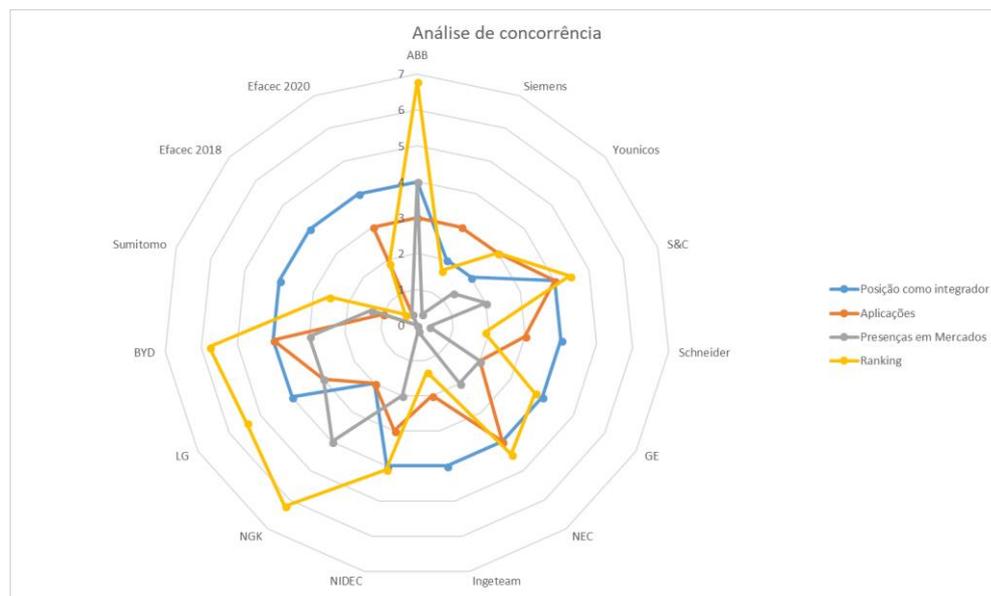


Figure 5 - Preliminary technology/business radar

The preliminary study addressed five business segments, comparing the Efacec expectation for 2020 against its competitors:

- Grid storage
- RES integration
- Islanded / off grid systems
- Micro-grids
- Industrial/EV integration

The same study comprised an assessment of market potential for Efacec and the current presence of its competitors in Europe, Africa, USA and Canada, Latin America, Asia and Australia.

### 3.3 Innovation Risks Management

Innovation risks comprise all related contingencies that may put the project at risk. The risks that may arise are presented in Table 1, which also comprise the related mitigation measure.

It is worth mentioning that as DEMOCRAT is mainly an innovative demonstration project involving the installation of an electrical infrastructure and related smart grid and energy storage components in the Efacec premises located in Maia, Portugal, not only research and development risk aspects may affect the overall progress of the project, but also other aspects regarding multiple participation of Efacec internal stakeholders may affect the project as well. The internal stakeholders of Efacec are the following:

- Board of Directors
- Automation and Smart Energy business unit (ASE), comprising the General Manager and three business divisions:
  - Smart Grids
  - Energy Storage
  - Inverters
- Quality, Environment and Safety corporate department (QAS)
- Infrastructures department, also comprising the Electrical Infrastructure Responsible Consultant

Risks (impact, probability)	Proposed mitigation measure
<b>Agreement risks</b>	
Smart Grids division, Storage division and Inverters division (the project teams) cannot agree (Medium impact, Low probability)	<p>The project management foresees clear conflict resolution and decision procedures to mitigate and resolve any related impact;</p> <p>As the mentioned teams belong all to the same business unit (ASE) and have a long track record working together in R&amp;D and other demonstration projects, the current collaboration framework is considered as suitable to overcome any conflicting situation.</p> <p>The role of each division manager as well as the role of the business unit General Manager are crucial to enable risk management, thus mitigating any risk impact;</p>
The project team and the infrastructures team cannot agree (High impact, Low probability)	<p>The role of the Infrastructures management and senior staff, of the involved division managers as well as the role of the business unit General Manager are crucial to enable risk management, thus mitigating any risk impact;</p>
The project team and the QAS team cannot agree (Low impact, Low probability)	<p>The role of the QAS management and senior staff, of the involved division managers as well as the role of the business unit General Manager are crucial to enable risk management, thus mitigating any risk impact;</p> <p>Quality, Environment and Safety procedures are core competencies of any Efacec business or project, therefore the overall approach does not leave space for ambiguities or lack of compromise between involved teams.</p>
<b>Expertise Risks</b>	
Departure of key experts (Medium impact, Medium probability)	<p>Any departing key expert will be replaced by a different expert. Presently, Efacec owns a comfortable overlap of key experts regarding the project related technological and management skills.</p>
<b>Technological risks</b>	
Under estimation of project effort (High impact, low probability)	<p>The project implements an Agile methodology with short work cycles, giving detailed planning and early working versions of components. These mitigate the risk of delaying or not achieving project outcomes.</p> <p>The project has also received internal funding approved by the BoD as part of the investment effort Efacec is doing for the new “energy storage” business. Therefore, the project team may be reinforced, provided it is justified and framed within the approved investment plan.</p>

<p><b>Consensus on technical interoperability issues is not achieved (High impact, Low probability)</b></p>	<p>Efacec is used to provide integrated solutions, aligned with the “open systems” paradigm. The internal teams are used to work together and know already the interoperability aspects that need to be considered, when defining, developing and integrating system components.</p> <p>The integration of third parties’ components will always be considered in full respect of the above-mentioned paradigm.</p>
<p><b>Implementation risks</b></p>	
<p><b>Ongoing Efacec site refurbishing agenda does not match the DEMOCRAT project construction needs (High impact, High probability)</b></p>	<p>The BoD is supervising the ongoing Efacec site refurbishing civil and electrical works. Any conflicting aspect of the agenda or any delay contingencies will be framed along with the DEMOCRAT project as well.</p> <p>There is a joint task force to supervise some of the major ongoing infrastructures refurbishing civil and electrical works. The joint task force comprises the Infrastructures corporate department senior staff, the Electrical Infrastructure Responsible Consultant, as well as members from the three involved divisions (Smart Grids, Storage and Inverters). Their role is to supervise the ongoing works and to find mitigation plans to jointly address any constraints derived from the refurbishing civil and electrical works.</p> <p>Further considerations are made in “Deliverable D1.2 - Identification of Risks and respective Mitigation Plan”, section 3.1.</p>
<p><b>Take up risks</b></p>	
<p><b>The technology is not accepted by industry (High impact, low probability)</b></p>	<p>The project team is aware of how important stakeholder take up is for the impact of the DEMOCRAT results. Therefore, the project has considered the participation of relevant stakeholders in its Steering Committee, through the invitation of personalities from the Portuguese and Greek DSO (respectively EDP Distribuição and HEDNO), from a LV distribution cooperative (CEVE), from the Portuguese Scientific and Technological system (University of Coimbra and INESC TEC) and from the Innovation sector (EDP Inovação).</p> <p>The comprehensive and dedicated communication plan of the project will also contribute for a wide dissemination of results, which will also contribute to demonstrate the project outcomes.</p>

**Table 1 - Critical risks and mitigation measures**

Risk management for the DEMOCRAT project is based on an iterative risk management process:

- *Planning* - definition of risk management procedures and responsibilities
- *Identification* - identification of risks before they turn into threats
- *Analysis* - assessment of risks and their impact, ranking of risks
- *Response* - definition of mitigation procedures to address any risky contingency
- *Monitoring* - tracking of risks and evaluation of the effectiveness of the response procedures

### 3.4 Intellectual Property Management

Efacec owns all intellectual property rights (IPR) derived from the outcome of DEMOCRAT project. Special care will be considered when disseminating specific project outcomes resulting from any of the scheduled R&D tasks.

The project team activities are always under the scrutiny of the Efacec corporate Technology and Innovation Board of Efacec, which supervises the IPR terms, namely patents that could result from the project. It is the role of the Technology Board to advise the DEMOCRAT team to establish the bridge with identified external consulting companies offering IPR services. Should that be the case, the Legal Department will also be involved.

### 3.5 Impact assessment of Innovation

The impact assessment of innovation resulting from DEMOCRAT project will be performed. There is a roadmap of R&D and demonstration projects where Efacec regularly shares relevant information with major internal stakeholders, namely the Technology and Innovation Board, towards the validation of its strategic technology roadmap for the Energy Storage business, as well as for the Inverters and Smart Grids businesses.

Figure 6 shows a Gantt Map where the main milestones are depicted, also with mention to relevant projects as it is the case of DEMOCRAT.

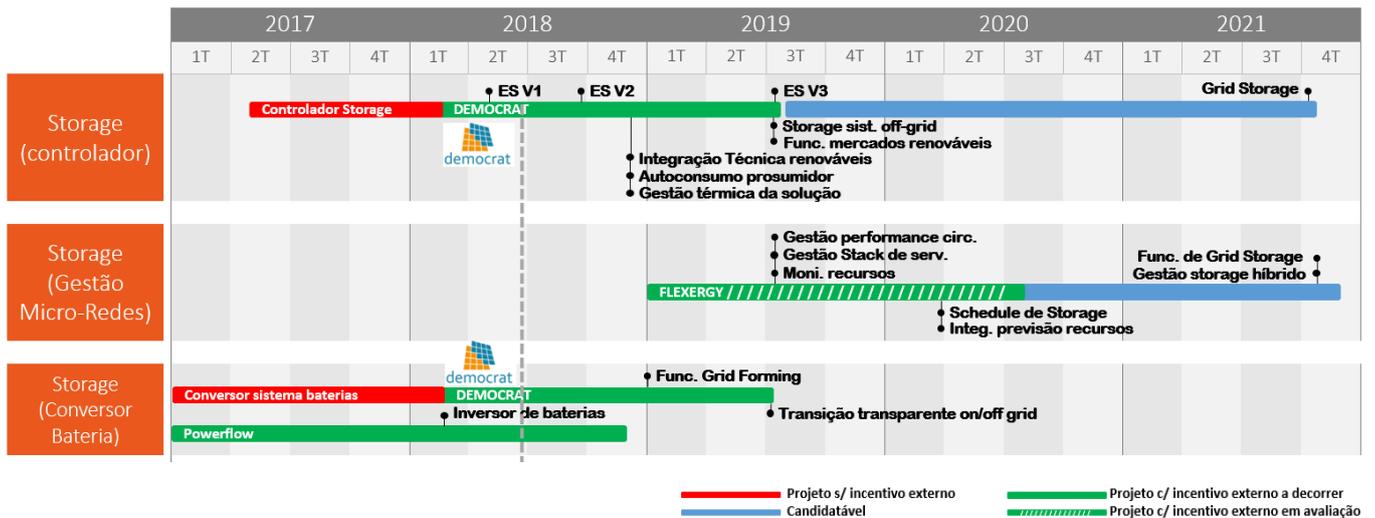


Figure 6 - Example of a roadmap presentation to the Technology and Innovation Board

Regularly, the Technology and Innovation Board organises internal conferences to follow-up projects' progression, namely to highlight their outcome and how they have contributed to enhance each business' solution portfolio. Those conferences are also open for strategic stakeholders of Efacec, namely those among which Efacec has made the invitation to participate in the DEMOCRAT Steering Committee.