



# ADVAGEN

## DELIVERABLE REPORT



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101069743 (ADVAGEN). Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

**Development of ADVanced next GENeration Solid-State batteries for Electromobility Applications**
**- GA n° 101069743 -**

<b>Start date of project:</b>	01/08/2022
<b>Duration of project:</b>	48 months
<b>Deliverable n° &amp; name:</b>	D7.1. Digital Data Platform - User Manual
<b>Version</b>	1
<b>Work Package n°</b>	7
<b>Due date of D:</b>	M12, 31/07/2023
<b>Actual date of D:</b>	18/07/2023
<b>Participant responsible:</b>	INEGI
<b>Main authors:</b>	Inês Ribeiro, Joana Gouveia, Marco Rodrigues

Nature of the Deliverable		
R	Document, report (excluding the periodic and final reports)	X
DEM	Demonstrator, pilot, prototype, plan designs	
DEC	Websites, patents filing, press & media actions, videos, etc.	

Dissemination Level		
PU	Public, fully open	X
SEN	Sensitive	

Quality procedure			
Date	Version	Reviewers	Comments
06/07/2023	0.1	Anish Patil	General review, and minor revisions
13/07/2023	0.3	Cécile Fligny	General review
18/07/2023	0.4	Takwa Benissa	General review

## Project summary

This report is part of the deliverables from the project "ADVAGEN" (Development of ADVAnced next GENeration Solid-State batteries for Electromobility Applications), which has received funding from the European Union's Horizon Europe research and innovation program under grant agreement No. 101069743.

To date, the battery market is dominated by lithium-ion (Li-ion) chemistries, as the energy density has more than doubled and their costs have dropped by a factor of at least 10. However, conventional Li-ion batteries (LIB) are reaching their performance limits in terms of energy density and facing safety issues, is required the development and production of new battery generations, such as Solid-State Batteries (SSBs), to create a new industry value chain in Europe towards their commercialization. Consequently, high-energy-density EU-made SSBs will ensure the supply of, among others, the automotive sector. To do so, the development and deployment of new manufacturing technologies, enabling the largescale production of SSBs, is crucial. Indeed, among the overarching themes to develop and produce sustainable batteries in the future, the BATTERY 2030+ roadmap<sup>4</sup> considers manufacturability as a cross-cutting key area. Innovative and scalable manufacturing techniques to produce SSBs will accelerate cost reduction, energy savings, and enhanced safety. ADVAGEN will develop a new lithium metal (LiM) battery cell technology based on a safe, reliable, and high performing hybrid solid-state electrolyte (LLZO-LPS based), gaining a competitive advantage over the worldwide (mainly Asian) competition. This will sustainably strengthen the EU as a technological and manufacturing leader in batteries as specified in the ERTRAC electrification roadmap and SET-Plan Action Point-7. ADVAGEN consortium contains key EU actors in the battery sector, from industrial materials producers (SCHT, CPT, ABEE), battery manufacturer (ABEE) to R&D centers (IKE, CEA, IREC, TUB, CICE, POLITO, INEGI, UL, FEV) and the automotive industry (TME), covering the complete knowledge and value chain. By developing high-performance, affordable and safe batteries, ADVAGEN aims to re-establish European competitiveness in battery cell production.

## Objective and Executive summary

This deliverable constitutes as the digital data platform (DPP) User Manual for ADVAGEN project. The report describes the matured DPP, now named SUNDIAL, which was adapted to ADVAGEN project requirements and guidelines for data management (deliverable 1.2), and in line with the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data. The report is meant to be used as a user manual for SUNDIAL, with instructions presented for both types of users. The first section presents, in a descriptive manner, all of the developed features for each user activity, also addressing the accessibility and safety approaches. The second section presents a tutorial for each user type, detailing each step for a seamless experience and facilitating the gathering and organization of life cycle data (environmental and economic) of the developed ADVAGEN SSB technology.

## List of partners

N°	Name	Short name	Country
1	AVESTA BATTERY & ENERGY ENGINEERING	ABEE	BE
2	INEGI - INSTITUTO DE CIENCIA E INOVACAO EM ENGENHARIA MECANICA E ENGENHARIA INDUSTRIAL	INEGI	PT
3	POLITECNICO DI TORINO	POLITO	IT
4	FEV EUROPE GMBH	FEV	DE
5	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVE	CEA	FR
6	TECHNISCHE UNIVERSITAET BRAUNSCHWEIG	TUBS	DE
7	CENTRO DE INVESTIGACION COOPERATIVA DE ENERGIAS ALTERNATIVAS FUNDACION, CIC ENERGIGUNE FUNDAZIOA	CICE	ES
8	FUNDACIO INSTITUT DE RECERCA DE L'ENERGIA DE CATALUNYA	IREC-CERCA	ES
9	TOYOTA MOTOR EUROPE NV	TME	BE
10	UNIVERZA V LJUBLJAN	UL	SI
11	EUROQUALITY SARL	EQY	FR
12	TECHCONCEPTS BV	TC	NL
13	CERAMIC POWDER TECHNOLOGY AS	CERPOTECH	NO
14	IKERLAN S. COOP	IKERLAN	ES

## Table of Contents

Deliverable report .....	1
Project summary .....	3
Objective and Executive summary .....	3
List of partners .....	4
Table of Contents .....	4
List of Figures .....	5
List of abbreviations .....	6
1. Introduction .....	7
1.1. SUNDIAL main objective and technical structure.....	7
1.2. Safety & Accessibility.....	8
2. Access profiles within SUNDIAL .....	15
2.1. Administrator (INEGI team).....	15
2.2. User (ADVAGEN partner data provider).....	15
3. SUNDIAL features .....	15
3.1. Work Packages – specific to admins.....	16

3.2.	Tasks – specific to admins .....	16
3.3.	LCA Models – specific to admins .....	17
3.4.	Model flowchart – specific to admins .....	18
3.5.	Life Cycle Inventory tables.....	19
3.6.	Change or reset of password.....	20
4.	Tutorial.....	23
4.1.	Admin Profile.....	23
4.2.	User (data provider) Profile.....	29
5.	Final remarks .....	31

## List of Figures

Figure 1:	SUNDIAL Platform Architecture. ....	8
Figure 2:	Window of action 4. ....	9
Figure 3:	Action 5 of VPN configuration.....	10
Figure 4:	FortiClient front page. ....	10
Figure 5:	VPN configuration in FortiClient.....	11
Figure 6:	Sign-in page of FortiClient. ....	12
Figure 7:	VPN connected. ....	13
Figure 8:	Login front-end.....	14
Figure 9:	Authentication request through email.....	14
Figure 10:	SUNDIAL front page for an admin profile.....	15
Figure 11:	Admin view - Information requested for the creation and status of a work package.....	16
Figure 12:	Creation of Tasks. ....	17
Figure 13:	Creation of LCA Models.....	17
Figure 14:	Flowchart design of the LCA Model (Admin view, with tools to create or edit the flowchart). ....	18
Figure 15:	Life cycle inventory table - inputs of a process step. ....	19
Figure 16:	Life cycle inventory table: outputs of a process step with the reference flow in orange.....	20
Figure 17:	Accessing user profile information.....	21
Figure 18:	User profile menu.....	21
Figure 19:	Admin view - creation of Work Package (dashboard).....	23
Figure 20:	Admin view - creation of a Work Package. ....	24
Figure 21:	Admin view - creation of task (dashboard). ....	24

Figure 22: Admin view - information requested for the creation of task. .... 25

Figure 23: Admin view - creation of model (dashboard). .... 25

Figure 24: Admin view - information requested for the creation of a model..... 26

Figure 25: Admin view - accessing a model to create a flowchart..... 27

Figure 26: Admin view - flowchart creation..... 27

Figure 27: Admin view - data table of a process. .... 28

Figure 28: User view - dashboard..... 29

Figure 29: User view - model flowchart. .... 29

Figure 30: User view - data table..... 30

### List of abbreviations

API	Application Programming Interface
CRUD	Create, Read, Update, Delete
CSS	Cascading Style Sheets
DDP	Digital Data Platform
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory
SSB	Solid-State Battery
SUNDIAL	Sustainability Data Digital Platform
VPN	Virtual Private Network



## 1. Introduction

This document aims to describe the activities related to the maturation of the Digital Data Platform (DPP) – now called SUNDIAL – within ADVAGEN project to provide a digital interface for the gathering of life cycle data on environmental and economic information of the developed Solid-State Battery (SSB) technology.

In the SUNDIAL platform, life cycle models will be created by INEGI and structured according to the instructions provided by the partners responsible for the development of each specific process step, and within the scope defined by INEGI, to organize the life cycle data into inventories. The main objective of this platform is to build Life Cycle Inventories (LCI) for the environmental and cost assessment (WP7, specifically tasks 7.2 and 7.3), where a comprehensive strategy is applied to gather the necessary information related to the developed SSB cell and module, from materials to production and end-of-life (recycling).

To access SUNDIAL in a safe manner, a VPN is provided to the ADVAGEN consortium. All necessary steps for the VPN installation are provided in this document. Based on the established Data Management Plan (DMP) in deliverable 1.2, the platform was developed within a specific structure, ensuring the proper handling of information.

The deliverable details the features developed according to the type of users and their role in the environmental and cost assessment: either responsible for the assessment (exclusive to INEGI) or for the technology development and corresponding data conveyance (remaining ADVAGEN consortium). Finally, a tutorial is provided for an easier understanding of SUNDIAL's features and operational mechanisms.

### 1.1. SUNDIAL main objective and technical structure

SUNDIAL platform is a software tool created as part of ADVAGEN to facilitate the development of a reliable and suitable framework for collecting sustainability data for later environmental impact and cost analysis. The platform enables the creation of a reference structure in tree form, allowing the management and storage of work package data, tasks information, established case studies, and historical mapping, where, at a more detailed level, it is possible to manage data pertaining to processes in cell development. This reference structure is created through administrator profiles.

#### 1.1.1. Technological approach

The development strategy of SUNDIAL, as a digital data platform (visible in Figure 1), is considered an architecture mainly focused on safe and confidential data collection and storage related to the LCI for the environmental and cost assessment in tasks 7.2 and 7.3, respectively. Strategically, crucial points such as FAIR (Findable, accessible, interoperable and re-usable) principles were taken into account for the development to guarantee traceability and compliance with the DMP (deliverable 1.2), being also relevant to mention that INEGI is not responsible for the control of what data will be inserted, nor will change the provided data.

The frontend technology stack, consists of React, a Javascript-based library for user interface development, HTML, CSS and Javascript. These, all together, provided the needed features for the development of component-based views, and are compliant with most modern browsers.

For version management, git version control system was used, and each module of SUNDIAL is deployed on a docker container allowing communication in between them.

SUNDIAL’s database was built using MySQL, and, therefore, relies on a relational (SQL-based) scheme to establish the needed entities to structure and store organized data. SUNDIAL also provides an API (Application Programming Interface) to allow communication between the database and the frontend module, ending up as an isolated layer between them. API represents also the server part of the software, since it contains the business logic for the implemented requirements, and it was developed using NodeJS Framework. Regarding the development pattern, the API consists of Models, Controllers and Routes. Models represent the structure of database tables and allow the controllers to acknowledge it. Controllers create functions to implement the logic and rules defined. Routes allow for external communication, providing the necessary routing for each HTTP request.

This is a CRUD API, meaning that it is able to handle Create, Read, Update and Delete operation requests. Security measures such as encryption and decryption of data, and two-factor authentication, are also managed at API level. Metadata is created automatically upon new rows in the database, and all inserted information will be preserved for a minimum of 5 years after the end of ADVAGEN project in a specific infrastructure, and then kept in archive for controlled partner access for another 5 years, aligned with the indicated data storage handling for the ADVAGEN sharepoint in the DMP.

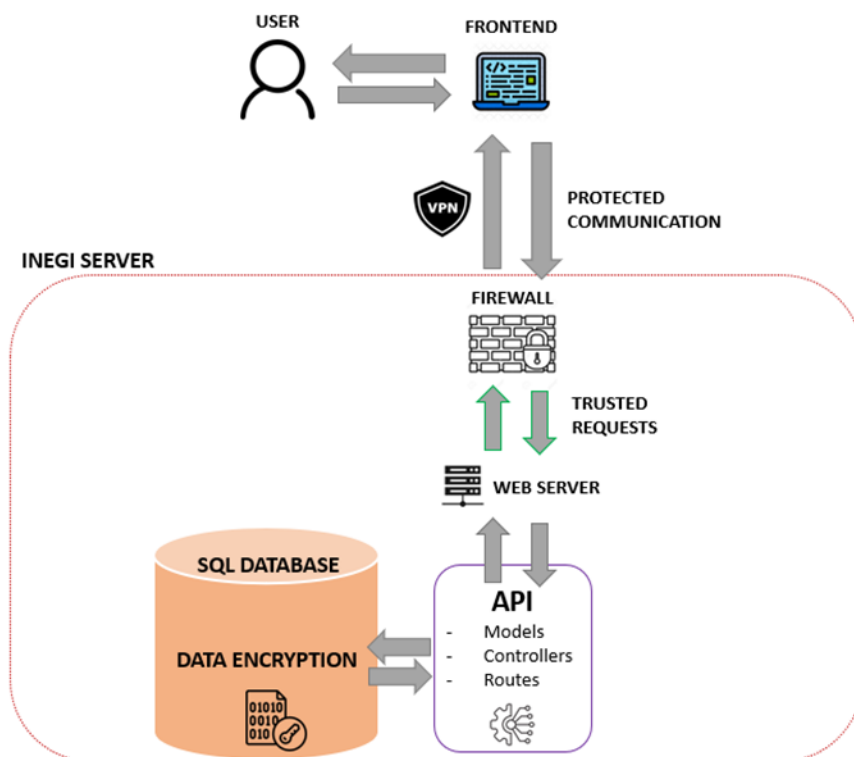


Figure 1: SUNDIAL Platform Architecture.

## 1.2. Safety & Accessibility

The following section presents the main safety features regarding online access to the SUNDIAL platform. To connect to the VPN, it is **mandatory** that the software client must be “FortiClient VPN”.



### 1.2.1. VPN Installation and Configuration

The configuration of a specific VPN (Virtual Private Network) is mandatory to enable the user to access a specific server located at INEGI's premises using HTTP protocol, and for the platform to be accessible. No other INEGI server or service will be accessible through this VPN, other than the HTTP access to the SUNDIAL platform through the URL "http://sundial.inegi.up.pt/advagen".

Installing and setting up the VPN access requires the subsequent actions:

**1<sup>st</sup> action:** In the browser, go to <https://www.fortinet.com/support/product-downloads>

**2<sup>nd</sup> action:** Download "FortiClient VPN";

**3<sup>d</sup> action:** Open the obtained file;

**4<sup>th</sup> action:** Select "Yes" when asked "Do you want to allow the following program to make changes to this computer?" (Figure 2);

The software will download the updates and verify the system before starting the installation;



Figure 2: Window of action 4.

**5<sup>th</sup> action:** Check in the box for "Yes, I have read and accept the License Agreement" and click "Next" and "Install" (see Figure 3);



Figure 3: Action 5 of VPN configuration.

**6<sup>th</sup> action:** Once installation is complete, open “FortiClient” (Figure 4);

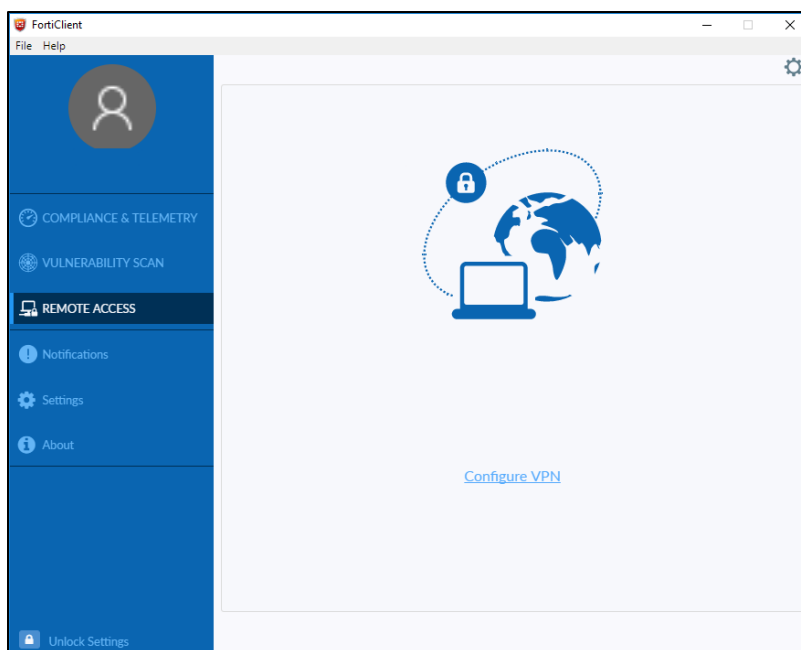


Figure 4: FortiClient front page.

**7<sup>th</sup> action:** Select “Remote Access” if applicable (Figure 5);

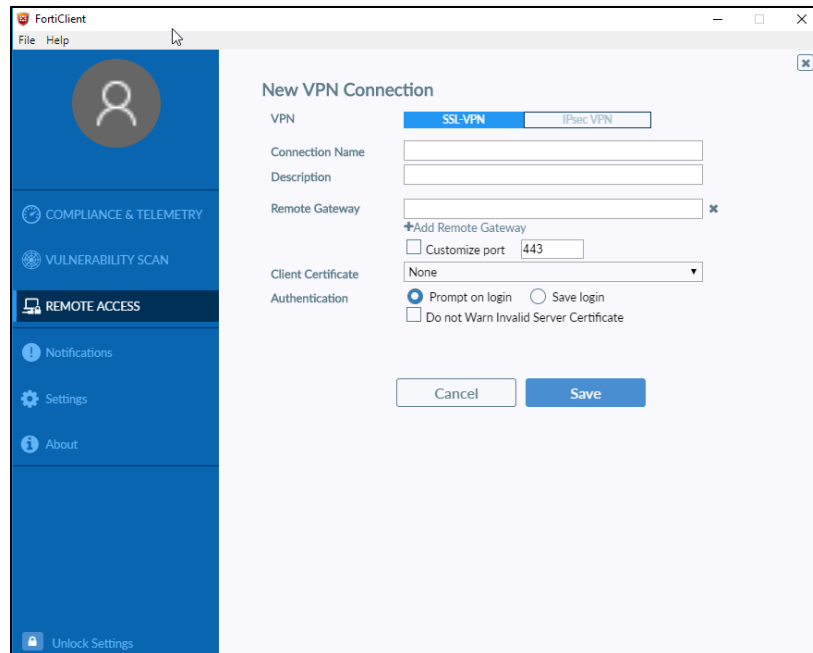


Figure 5: VPN configuration in FortiClient.

**8<sup>th</sup> action:** Select “SSL-VPN”.

Insert a name for the connection in “Connection Name” (e.g., “SUNDIAL VPN”);

**9<sup>th</sup> action:** In “Remote Gateway” put “vpn.inegi.up.pt” and keep Port 443.

Click in “Save” and “Close” to end the configuration. A sign-in page will appear for the configured VPN (Figure 6);

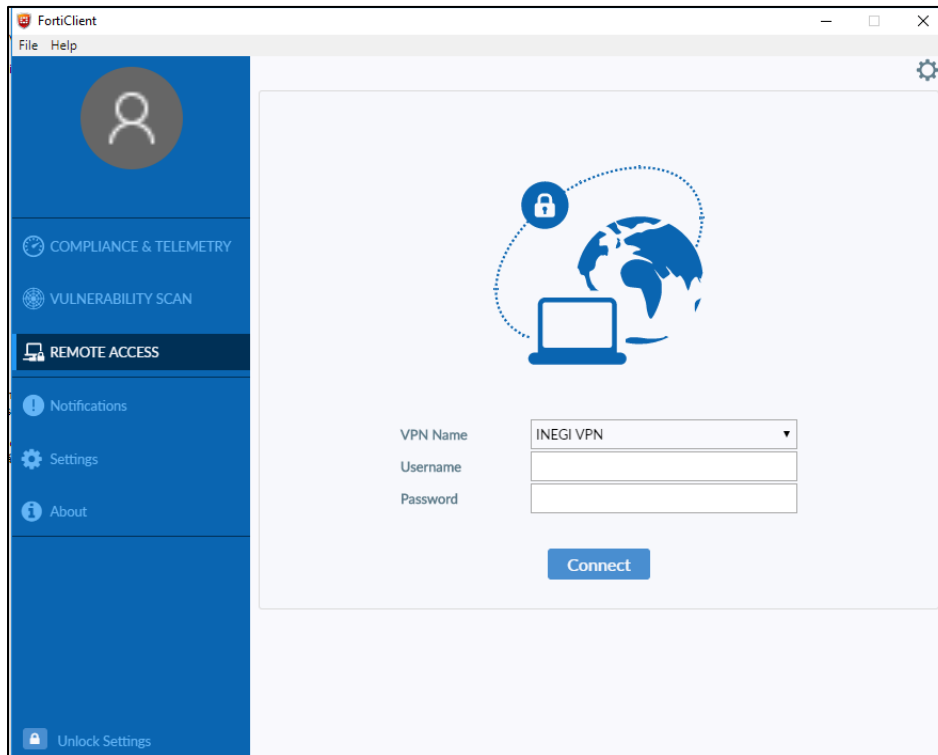


Figure 6: Sign-in page of FortiClient.

**10<sup>th</sup> action:** Select the VPN, insert username and password (provided by INEGI separately), then click “Connect”.

The VPN will connect shortly. To disconnect click, “Disconnect” (Figure 7).

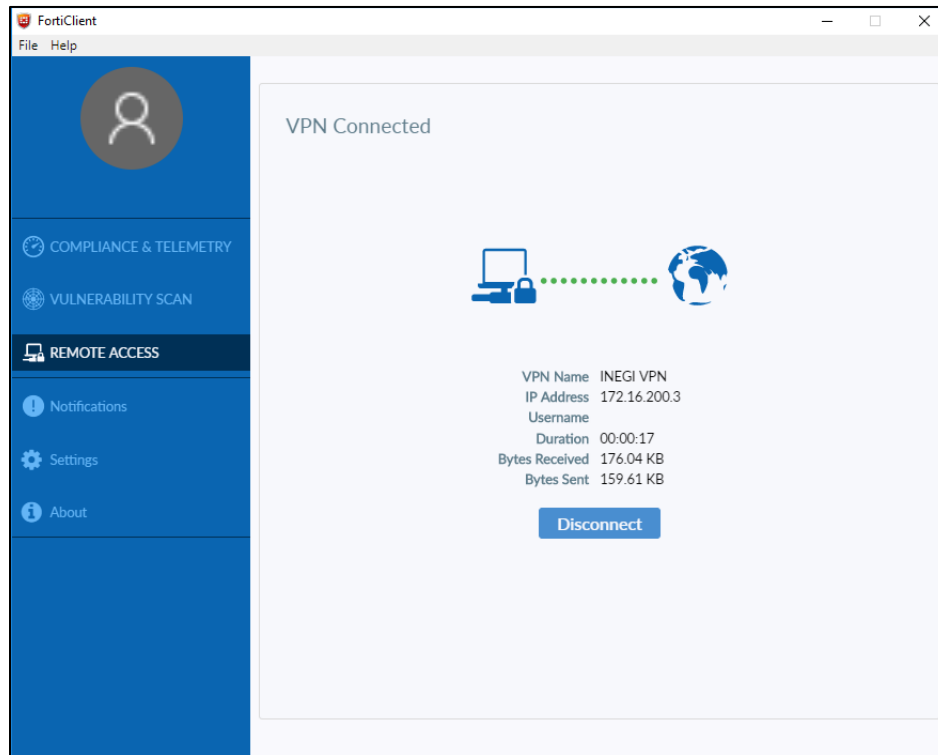


Figure 7: VPN connected.

With the VPN activated, it is now possible to access SUNDIAL Platform through the URL <http://sundial.inegi.up.pt/advagen>

#### 1.2.1. Safety authentication and local resources

To create a first security layer, SUNDIAL is first served through VPN to ADVAGEN partners before being served over HTTP.

Each user must successfully complete the two-factor authentication process in order to access the platform. To do this, they must enter their login information in the front-end illustrated in Figure 8.

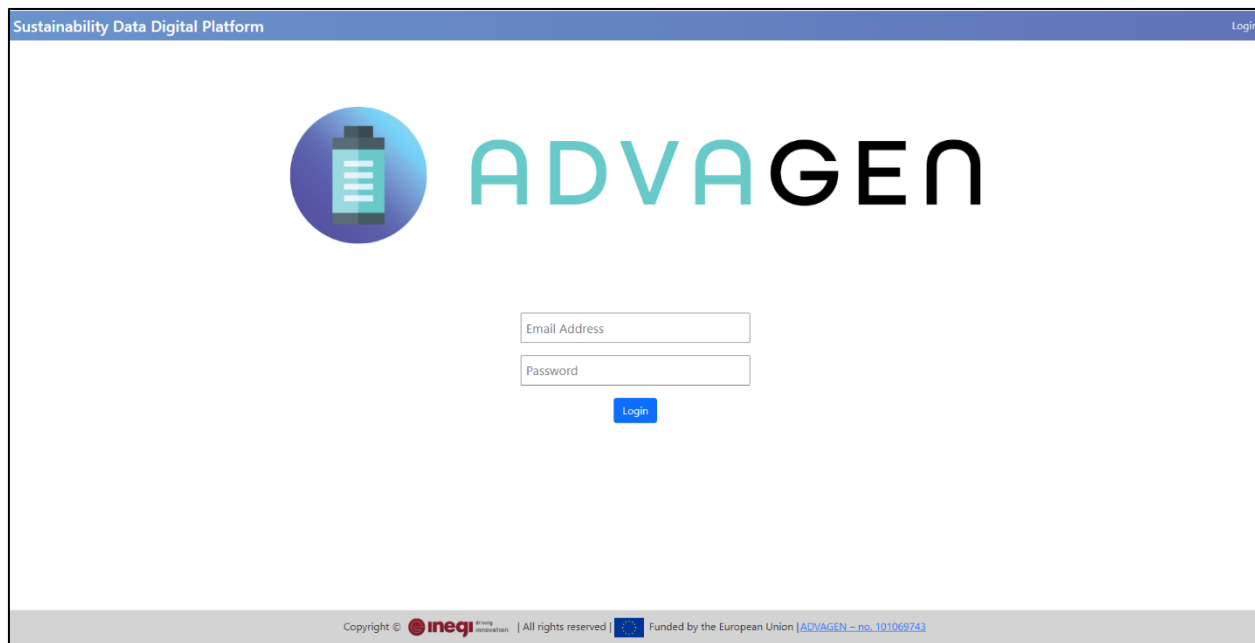


Figure 8: Login front-end.

After this action, the user will receive an e-mail with a message and a link to access the platform, as presented in Figure 9.

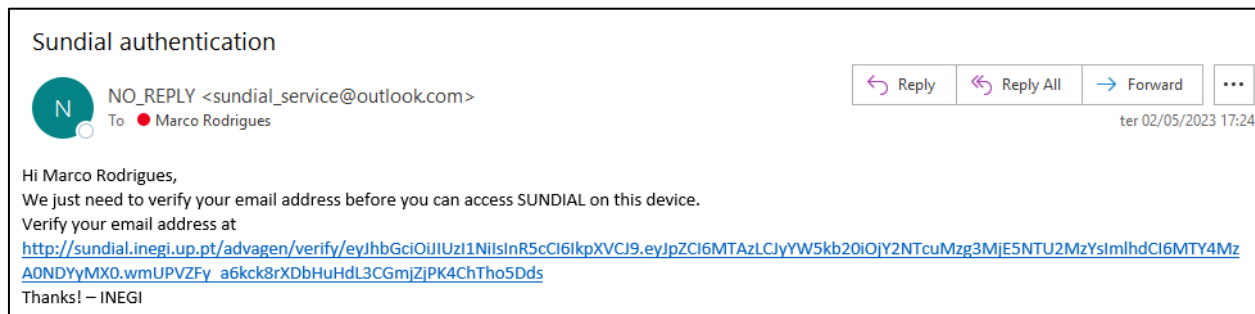


Figure 9: Authentication request through email.

To improve the user experience, the tool stores one token in the browser's local storage during the login process. This token enables the user to maintain his session even after quitting the browser. In the absence of a user-initiated "Log out" click, this token is valid for 15 days.

## 2. Access profiles within SUNDIAL

SUNDIAL platform considers "Admin" (exclusive to INEGI team) and "User" (data provider) profiles. The admin main activities are to manage the BackOffice of the tool by categorization of activities, creating life cycle assessment (LCA) models for each process development, and handling the connection between each segment. On the other hand, the User's primary activity is to provide data for the LCI, in accordance to their respective segment in the technological development of ADVAGEN's SSB cell. SUNDIAL is organized as Work Package>Task>LCA Model, following the same work structure of ADVAGEN.

### 2.1. Administrator (INEGI team)

INEGI team members are the admins of the SUNDIAL platform. The admins control the platform's BackOffice and are responsible for the relational data structure. The admin profile has the ability to create Work Packages, Tasks, LCA Models, and control the information included in the processes, inputs, and outputs (Figure 10). This gives the admin profile a more complete perspective of the platform.

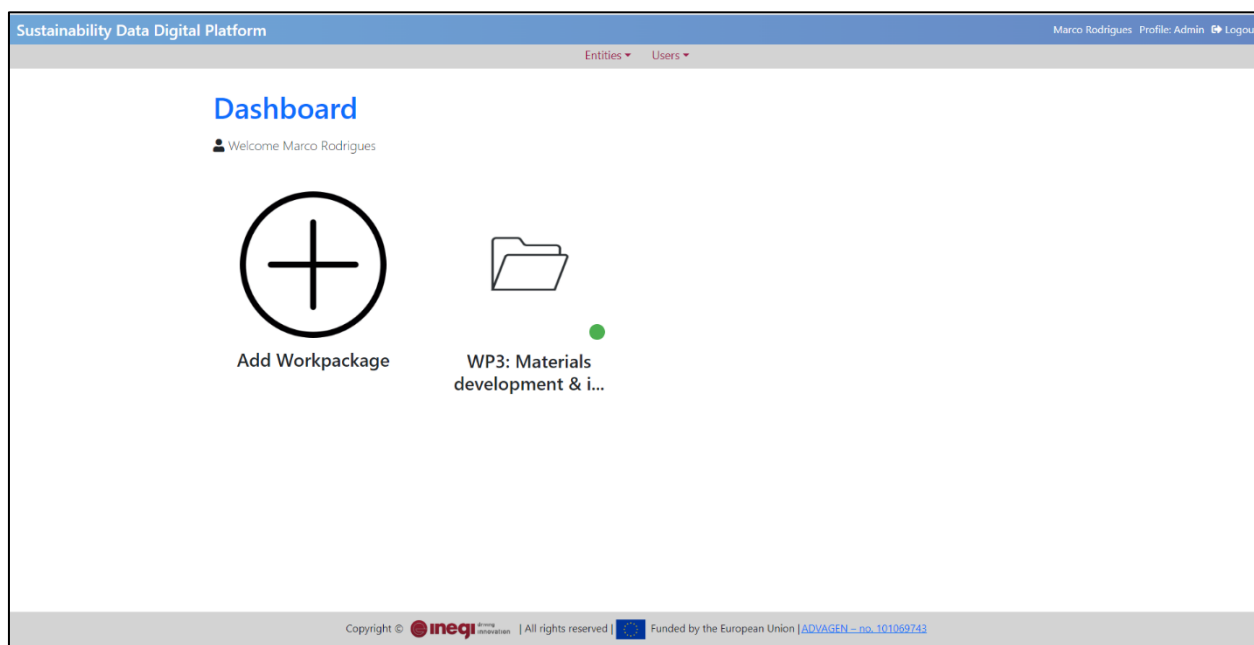


Figure 10: SUNDIAL front page for an admin profile.

### 2.2. User (ADVAGEN partner data provider)

The user profile is given to specific ADVAGEN partners developing the ADVAGEN technological activities and accessing the process-related data. Users can only insert data and view the Work Packages, Tasks, and LCA Models they are working on. Unlike admins, the platform's view for users is constrained to their specific work and to the activity of inserting information in the LCA Models, which can be classified as private or public to other users (admins can see all of the data provided).

## 3. SUNDIAL features

SUNDIAL has several functionalities developed for the admin and user profiles, according to their respective main activities. The functionalities given to the admin allow to create the structure of information and the association of Tasks to a Work Package, and several LCA Models to one Task, as well as create and store different versions of the same Model.

### 3.1. Work Packages – specific to admins

Within the SUNDIAL platform, admins can create and manage multiple "Work Package" activities. The Work Package is the highest level on the platform's data structure's hierarchy. When clicking to create a new Work Package, a new page opens, requesting the following information:

- Work package name – name of that work package;
- Start date –start end of that work package;
- End date – end date of that work package;
- Select Work Package status – selection of status of that work package: ongoing, concluded or inactive.

For the Work Package to be successfully created, the input fields "name" and "status" must be filled out (Figure 11). The Work Package status can be categorized by the admin as "ongoing," "concluded," or "inactive." This status is visually represented by a green (ongoing), blue (concluded) and red (inactive) signal, that is shown when visualizing the Work Package list in the admin view. The status defines the availability of the Work Package to the users and their capability to access and alter the Work Package, where the status of "ongoing" allows users to access the tasks, view the LCA models and add or edit their data. On the other hand, in the concluded status, users can view the tasks, LCA Models and corresponding data, but cannot alter it, and when the admin selects the "inactive" status, users cannot see the Work Package neither any information within it anymore.

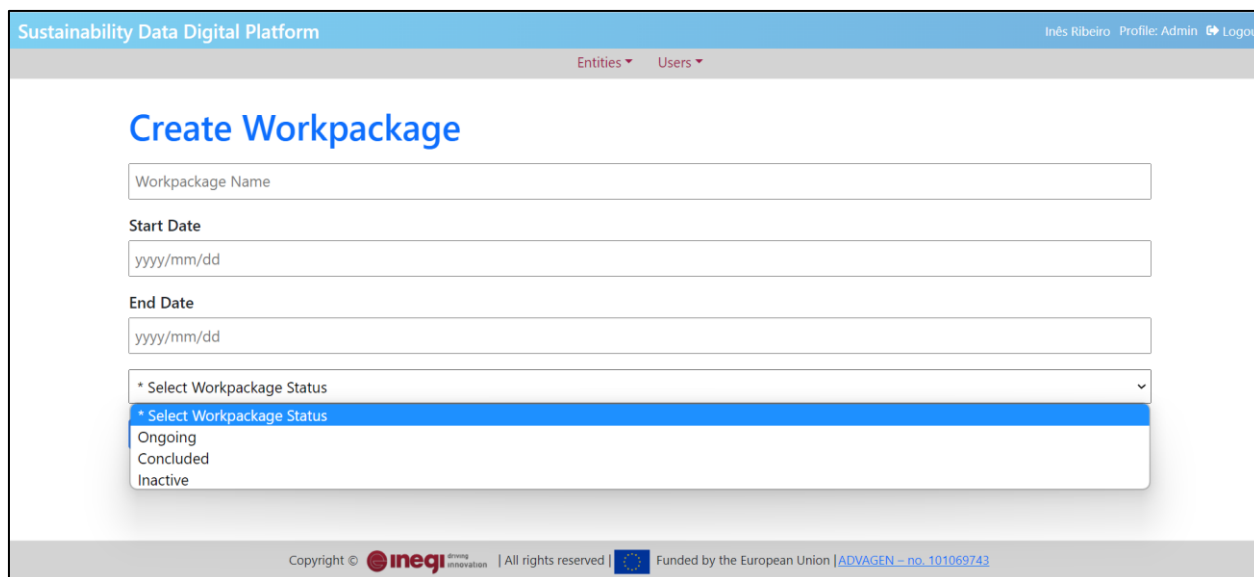


Figure 11: Admin view - Information requested for the creation and status of a work package.

### 3.2. Tasks – specific to admins

Platform admins can also create and manage "Tasks" using this feature. The same Work Package can have multiple Tasks with various LCA Models within each of them.

During the process of creating a task, admins can: name the tasks, define its start and end date (following project's Gantt chart), define which work package it belongs to and define its status, as shown in Figure 12.



Sustainability Data Digital Platform Inês Ribeiro Profile: Admin Logout

Entities Users

## Create Task

Task Name

Start Date

End Date

\* Select Workpackage

\* Select Task Status

- \* Select Task Status
- Ongoing
- Concluded
- Inactive



Copyright ©  | All rights reserved |  Funded by the European Union | ADVAGEN – no. 101069743

Figure 12: Creation of Tasks.

### 3.3. LCA Models – specific to admins

Models are associated to a respective task and work package. In this functionality, admins can create and manage multiple versions of one LCA Model. To create a LCA model, first admins must name the model and select the respective work package and task. Then, admins must select the main partner responsible for that model and add a specific email associated to the main contact of that partner. Lastly, admins must select the users that can have access to that model, as presented in Figure 13. Finally, the LCA model is opened and it is now possible to draw the model flowchart.

Sustainability Data Digital Platform Inês Ribeiro Profile: Admin Logout

Entities Users

## Create Model

Model Name

\* Select Workpackage

\* Select Task

\* Select Main Partner

Main partner email

Users available

<input type="checkbox"/>	Name	Role	Entity	Profile	Can Edit
<input type="checkbox"/>	Henrique Valente	Programmer	INEGI	Admin	Yes
<input type="checkbox"/>	Pedro Bertolucci	LCA Specialist	INEGI	Admin	Yes
<input type="checkbox"/>	Marco Rodrigues	Software Engineer	INEGI	Admin	Yes
<input type="checkbox"/>	Inês Ribeiro	LCA Specialist	INEGI	Admin	Yes
<input type="checkbox"/>	Sara Pinto	LCA Specialist	INEGI	Admin	Yes

5 rows | < > 15 of 15 >>



Copyright ©  | All rights reserved |  Funded by the European Union | ADVAGEN – no. 101069743

Figure 13: Creation of LCA Models.

### 3.4. Model flowchart – specific to admins

SUNDIAL model flowcharts offer an orderly structure to showcase the processes in study, as seen in Figure 14. These flowcharts are the combination of several blocks that symbolize the various main steps in a process that is being developed in ADVAGEN. With the flowchart it is possible to create and visualize the LCA model of any process, from any life cycle stage (e.g., extraction of raw materials, processing, production, use or end-of-life), as it integrates the boundaries already predefined by the admins and the main partner. All users that have access to the LCA Model, are now able to click in each block and insert the inputs and outputs (e.g., material consumption, consumables, energy consumption or costs) of that respective symbolized process step, for later use by INEGI in the environmental and cost assessment.

In the left bottom corner of in Figure 14, several features and tools are available to allow the admin to create the flowchart. The role of each feature is:

- Open process – Open a specific process of the flowchart to access the information of inputs and outputs;
- Add process – adds a new block to be allocated to the flowchart, the blocks are always associated to a specific process;
- Update process – this feature updates the name of a chosen process after naming it in “Element Name” box.
- Link processes – This feature connects two processes, in order to understand the flow direction;
- Invert direction – allows to redirect the direction of the flow;
- Delete process – Delete the process box;
- Save progress – Save all the changes done on the model.

In the bottom right side, there is a chat box that allows the communication between users and admins of that specific LCA Model.

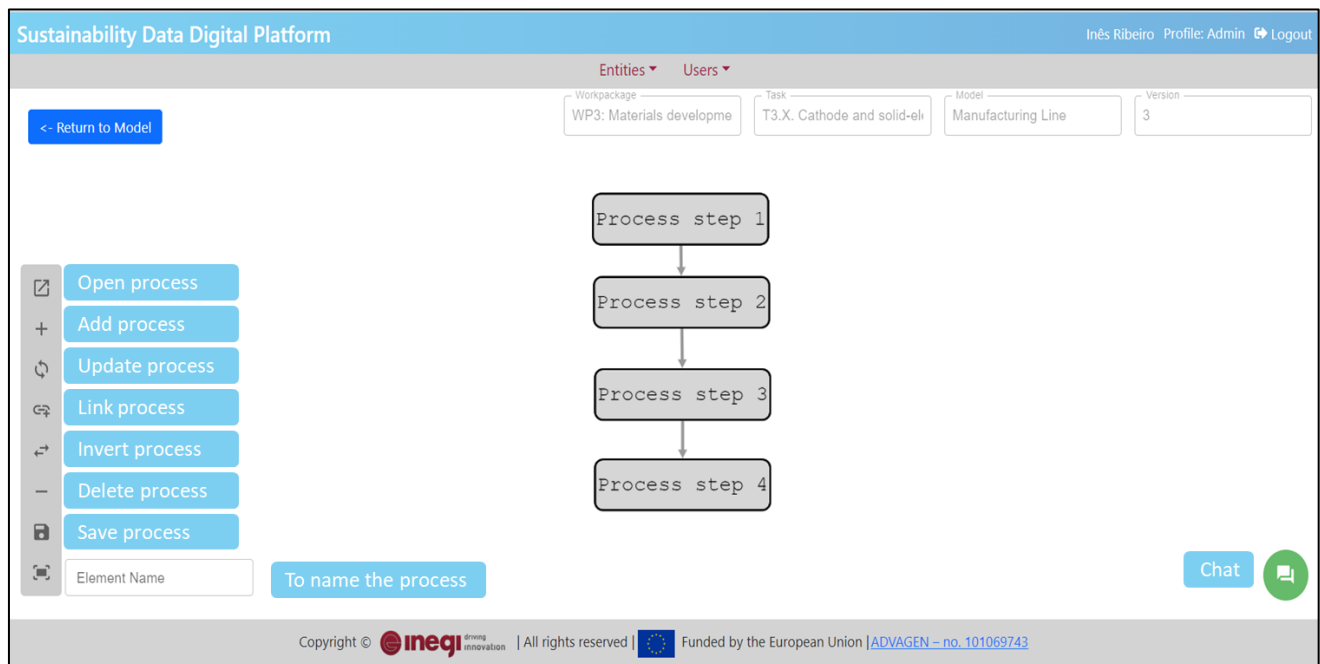
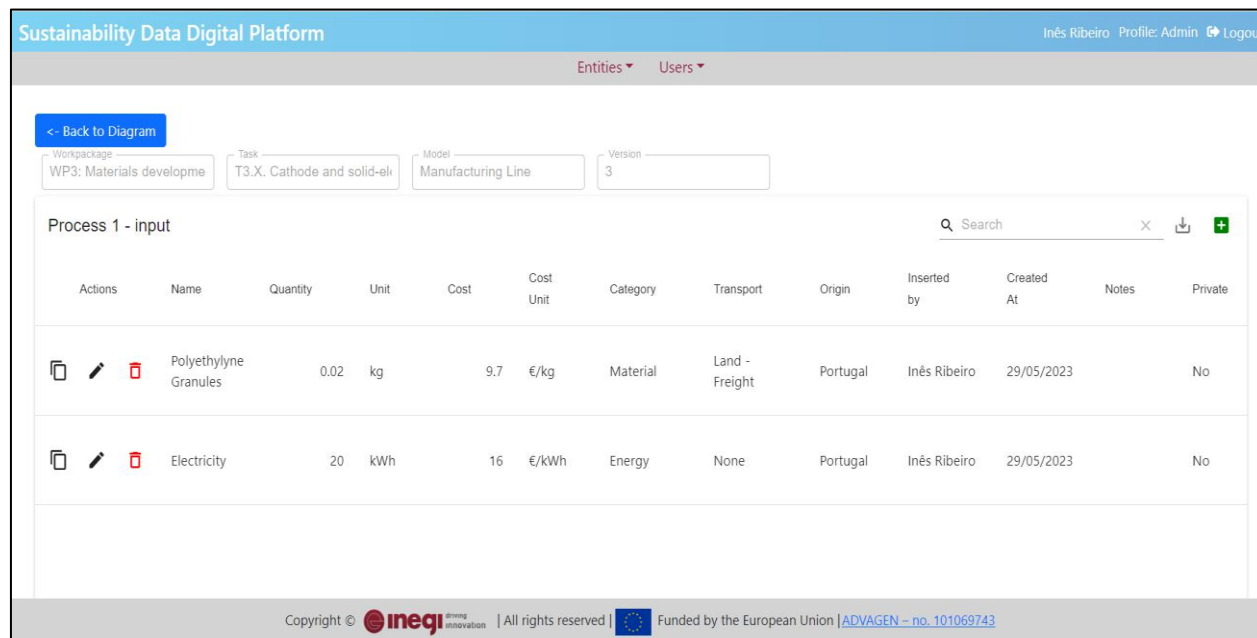






Figure 14: Flowchart design of the LCA Model (Admin view, with tools to create or edit the flowchart).

### 3.5. Life Cycle Inventory tables

Each specific block of a model flowchart has two life cycle inventory tables (one for the inputs and one for the outputs) that are related to that specific process step represented. In these tables, information is provided by the users and collected by the admins referring to the material and energy flows that occur during the selected process. This information is divided into columns that represent the several kinds of data that can be provided (e.g., names, values, category and general notes) as well as data registry information for the metadata files. Both the input and output tables are in same window. The table on the top of the window (Figure 15) collects data that enters the process, per example: material consumption, water consumption, equipment and respective energy consumption, etc.



The screenshot shows the 'Sustainability Data Digital Platform' interface. At the top, it displays the user 'Inês Ribeiro' with 'Profile: Admin' and a 'Logout' button. Below this, there are dropdown menus for 'Entities' and 'Users'. A navigation bar includes a '< Back to Diagram' button and several input fields for 'Workpackage' (WP3: Materials developme), 'Task' (T3.X. Cathode and solid-el), 'Model' (Manufacturing Line), and 'Version' (3). The main content area is titled 'Process 1 - input' and features a search bar and a table with the following data:

Actions	Name	Quantity	Unit	Cost	Cost Unit	Category	Transport	Origin	Inserted by	Created At	Notes	Private
 	Polyethylene Granules	0.02	kg	9.7	€/kg	Material	Land - Freight	Portugal	Inês Ribeiro	29/05/2023		No
 	Electricity	20	kWh	16	€/kWh	Energy	None	Portugal	Inês Ribeiro	29/05/2023		No

At the bottom of the interface, there is a footer with copyright information for 'ineq' (Innovation Engineering Innovation), a logo for the European Union, and the text 'Funded by the European Union | ADVAGEN - no. 101069743'.

Figure 15: Life cycle inventory table - inputs of a process step.

The table on the bottom of the window (Figure 16) collects data that exits the process, per example: dust, co-product, waste, etc. The inserted data is always referenced to the amount of the final product that leaves that block (functional unit). Functional unit is a reference unit regarding a particular function that the process delivers, per example, to produce a certain amount of a specific final product, is necessary a specific quantity of materials, energy, water and etc. The tables contain a set of common attributes in order to characterize each data entry the flows that go in, such as:

- **Name** – name of the material, energy or equipment that enters or exits the process;
- **Quantity** – specific amount consumed per functional unit;
- **Unit** – quantity inserted by unit SI;
- **Cost** – numerical cost of the amount inserted;
- **Cost unit** – respective unit of the cost inserted (e.g., euro, “€”, dollar);
- **Category** – categorization of the flow inserted: material, energy or equipment;
- **Transport** – type of transport used from the supplier until the final destination: aerial, maritime, land-rail, land-freight, land-other, or none);
- **Origin** – location of the supplier (address, city or country);

- **Inserted by** – name of the user that inserted the flow;
- **Created at** – date of the information inserted;
- **Notes** – additional information relevant about the flow;
- **Private** – feature that restricts or not the data from the inserted flow. If the user is ok with the information being available to the other partners that are working in the LCA Model, they should select “No”. If the provided information is confidential or sensitive, and should be restricted to just the INEGI team for the environmental and cost analysis, users must select “Yes”.

Sustainability Data Digital Platform Inês Ribeiro Profile: Admin Logout

5 rows | < < 1-2 of 2 > >

Process 1 - output Q Search X [Download] [Add] [Refresh]

Actions	Name	Quantity	Unit	Cost	Cost Unit	Category	Transport	Origin	Inserted by	Created At	Notes	Private
[Copy] [Edit]	Bottle	1	kg	1	€	Equipment	None		Inês Ribeiro	29/05/2023		No
[Copy] [Edit] [Delete]	Dust	0.001	kg		€	Material	None		Inês Ribeiro	29/05/2023		No

5 rows | < < 1-2 of 2 > >



Copyright ©  driving innovation | All rights reserved |  Funded by the European Union | [ADVAGEN – no. 101069743](#)

Figure 16: Life cycle inventory table: outputs of a process step with the reference flow in orange.

### 3.6. Change or reset of password

Each user account, has the power to change or reset its own password in the platform. This functionality is found in the user profile information, to access this functionality, the user has to click in its user name in the superior right corner, as illustrated in Figure 17.

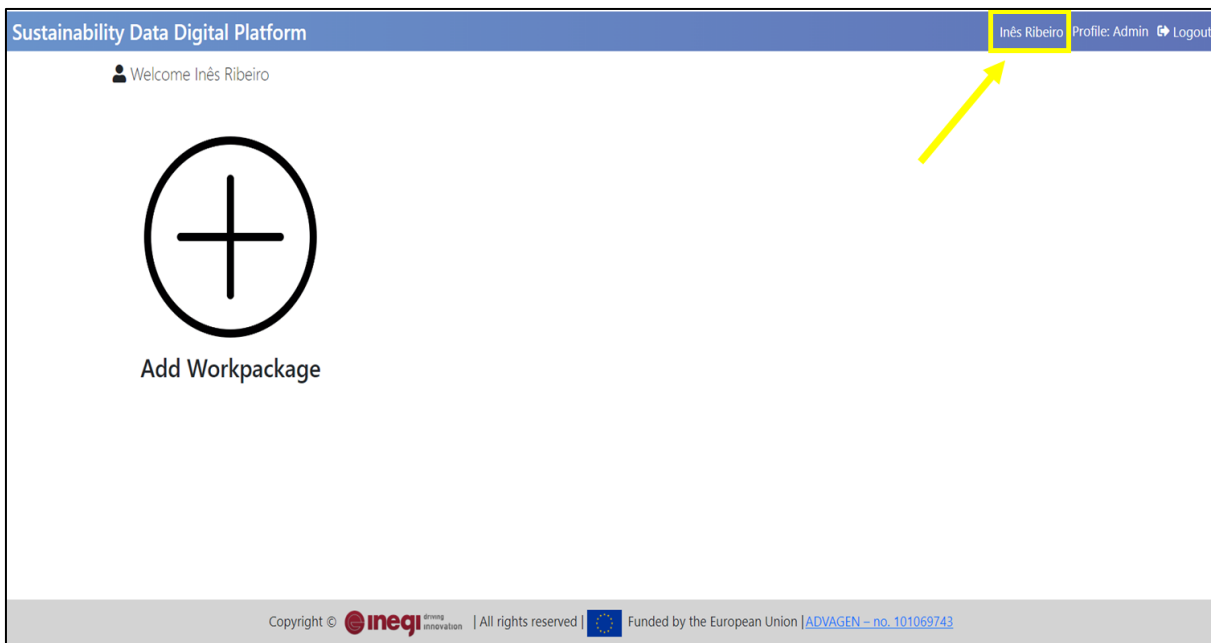


Figure 17: Accessing user profile information.

In the user profile information, it is found particular information related to the user, as its name, e-mail, role, entity, and type of user profile in platform. Besides this, the change/reset the password functionality is found, as illustrated in Figure 18 .

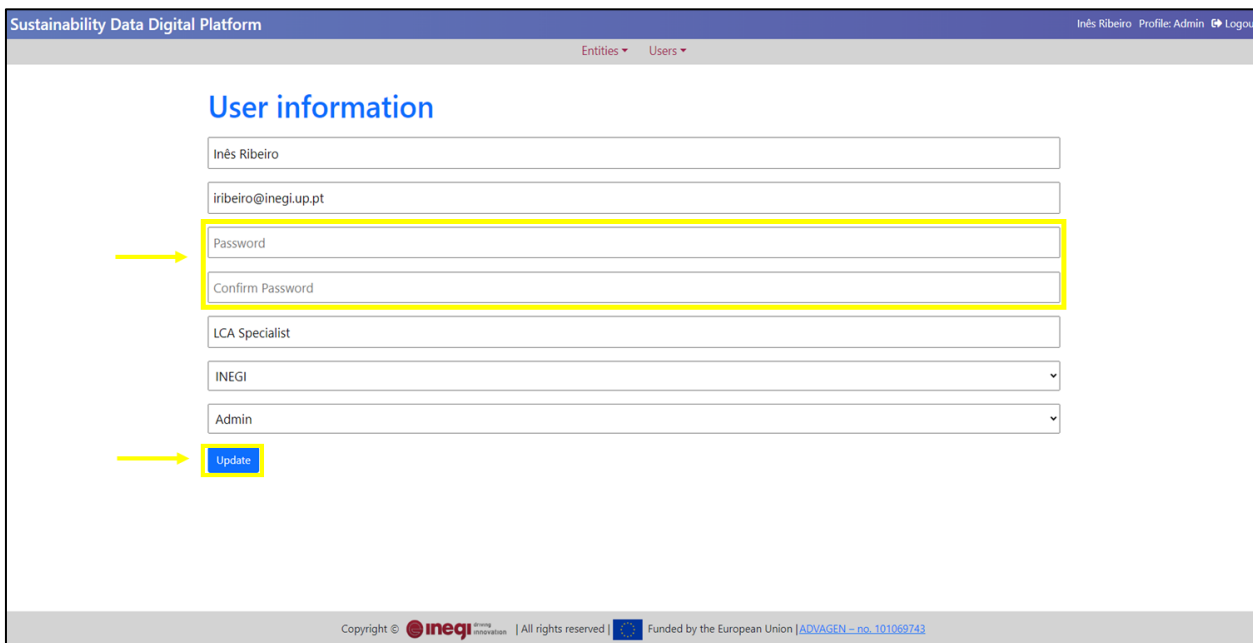


Figure 18: User profile menu.

To change or reset the password, the user must insert the new desired password in the “*Password*” box and then confirm it in the “*Confirm Password*” box. The user must save these changes by clicking in the

A small blue rectangular button with the word "Update" written in white text.

button to finalize this process.

## 4. Tutorial

This chapter presents practical instructions for using SUNDIAL in two perspectives: admin profile and user profile (data provider). These instructions describe how both can interact with the available different features.

### 4.1. Admin Profile

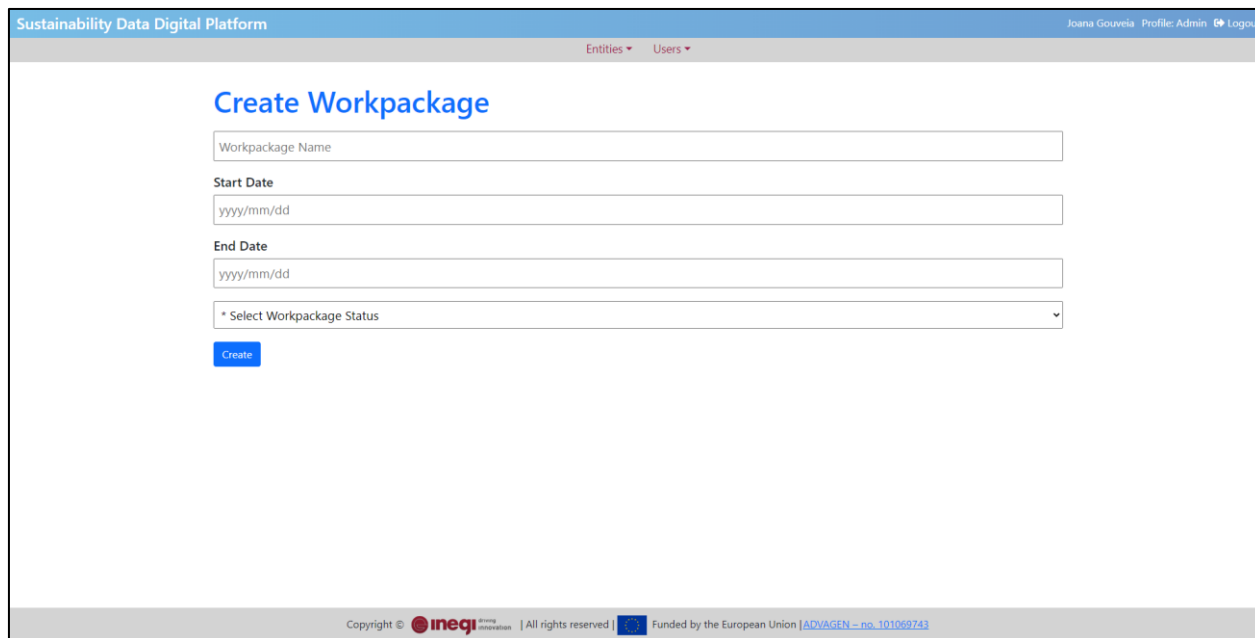
#### How to create a Work Package?

After logging in, in the dashboard, admins are taken to the Work Package page. This page has a “plus” button where admins can click to create a new Work Package, as illustrated in Figure 19.



Figure 19: Admin view - creation of Work Package (dashboard).

After clicking in the plus button, a new page will open, requesting information regarding that work package, as presented in Figure 20. Fill the requested information according to the instructions in subsection 3.1.



Sustainability Data Digital Platform

Joana Gouveia Profile: Admin Logout

Entities Users

## Create Workpackage

Workpackage Name

Start Date

End Date

\* Select Workpackage Status

Create



Copyright ©  | All rights reserved |  Funded by the European Union | ADVAGEN – no. 101069743

Figure 20: Admin view - creation of a Work Package.

### Creation of a “Task”

After the creation of a work package, it’s possible to create the associated tasks. To do this, the admin must click the plus button that says “Add Task”, as demonstrated in Figure 21.



Figure 21: Admin view - creation of task (dashboard).

After clicking in the plus button, a new page will open requesting information regarding of that task, as presented in Figure 22.





Sustainability Data Digital Platform Inês Ribeiro Profile: Admin Logout

Entities Users

## Create Task

Task Name

Start Date

End Date

\* Select Workpackage

\* Select Task Status

Copyright ©  | All rights reserved |  Funded by the European Union | ADVAGEN – no. 101069743

Figure 22: Admin view - information requested for the creation of task.

The open fields must be completed according to the Gantt chart of ADVAGEN and the instructions in subsection 3.2.

### Creation of a “LCA Model”

After the creation of a task, it’s possible to create the associated LCA models corresponding to the developing processes. To do this, the admin must click the plus button that says “Add Model”, as demonstrated in Figure 23.

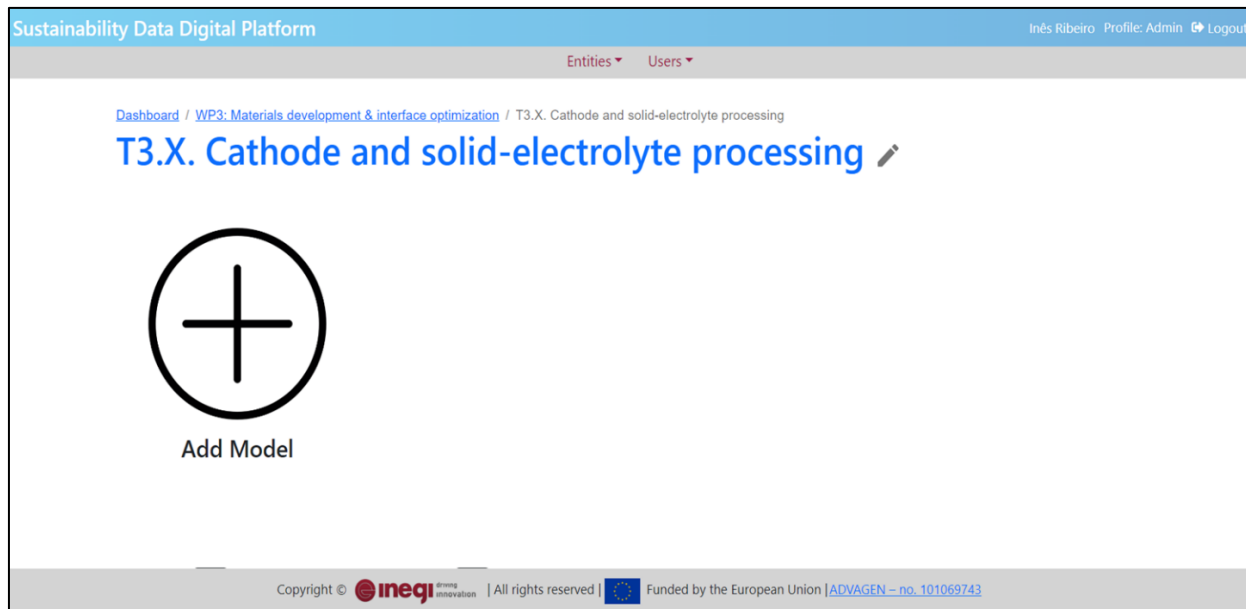
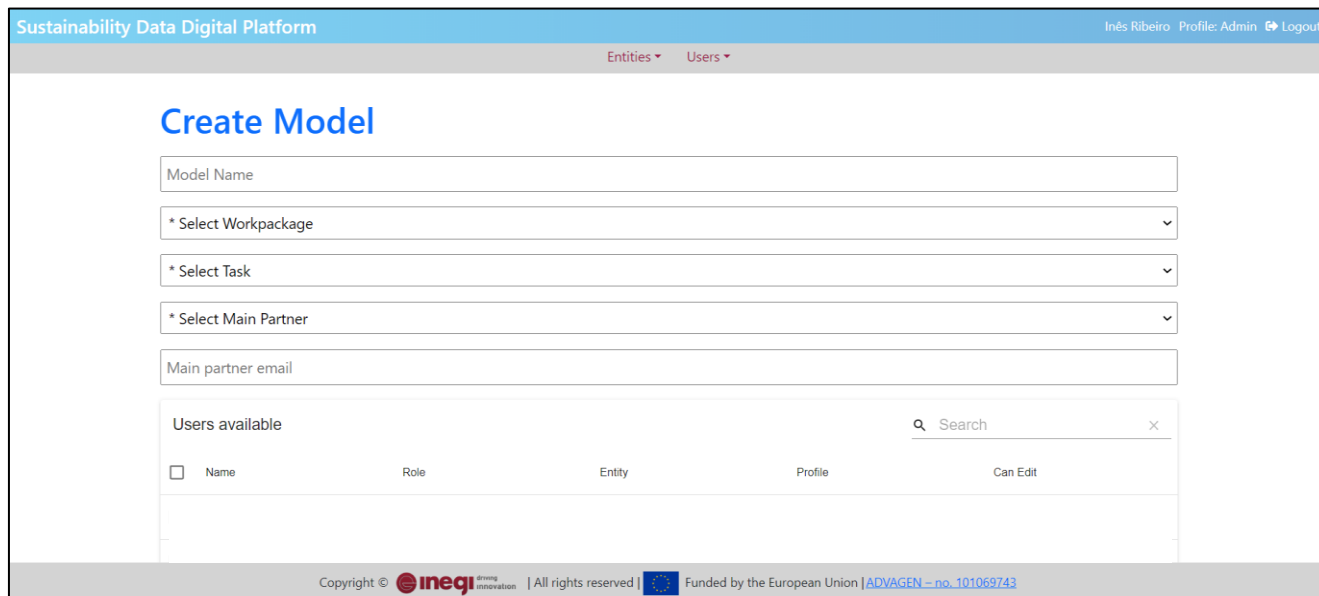


Figure 23: Admin view - creation of model (dashboard).

After clicking in the plus button, a new page will open requesting information about that Model, as presented in Figure 24. Please follow the indications presented in subsection 3.3.



The screenshot shows the 'Create Model' page in the Sustainability Data Digital Platform. The page header includes the platform name and user information (Inês Ribeiro, Profile: Admin, Logout). Below the header, there are navigation links for 'Entities' and 'Users'. The main content area is titled 'Create Model' and contains several form fields: 'Model Name', '\* Select Workpackage', '\* Select Task', '\* Select Main Partner', and 'Main partner email'. Below these fields is a 'Users available' section with a search bar and a table with columns for Name, Role, Entity, Profile, and Can Edit. The footer contains copyright information for ineqi, a disclaimer, and funding information from the European Union (ADVAGEN - no. 101069743).

Figure 24: Admin view - information requested for the creation of a model.

### Creation of the flowchart

After the creation of the LCA model, it's possible to start forming the model flowchart. Flowcharts portray a visual representation of different stages of a process. To do this, the admin must go to the desired model version, and select the arrow button (Figure 25) to open the flowchart design page (Figure 26).



The pencil feature opens the LCA model information editing (previously presented in Figure 24).



The plus feature allows the creation of an additional version. This is conducted when an update on the ongoing process occurs that changes the flowchart (e.g., elimination of a process step, new process step added, different order of process steps, etc.).

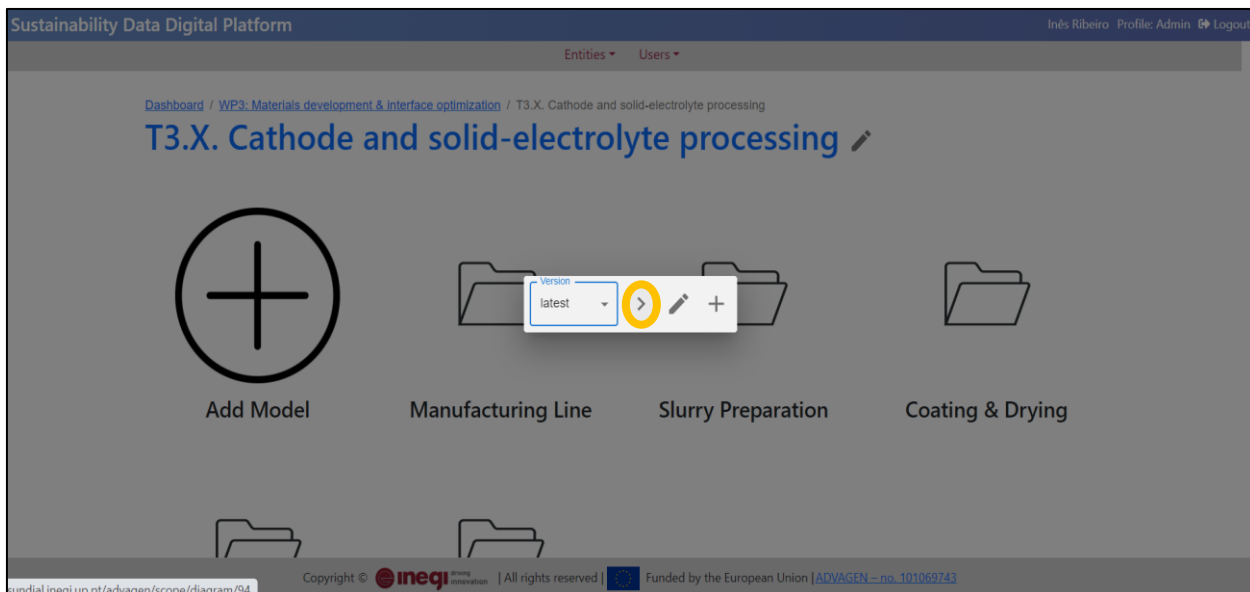


Figure 25: Admin view - accessing a model to create a flowchart.

The flowchart can be created using the tool kit in the left inferior side, as presented in Figure 14 and in Figure 26, in subsection 3.4.

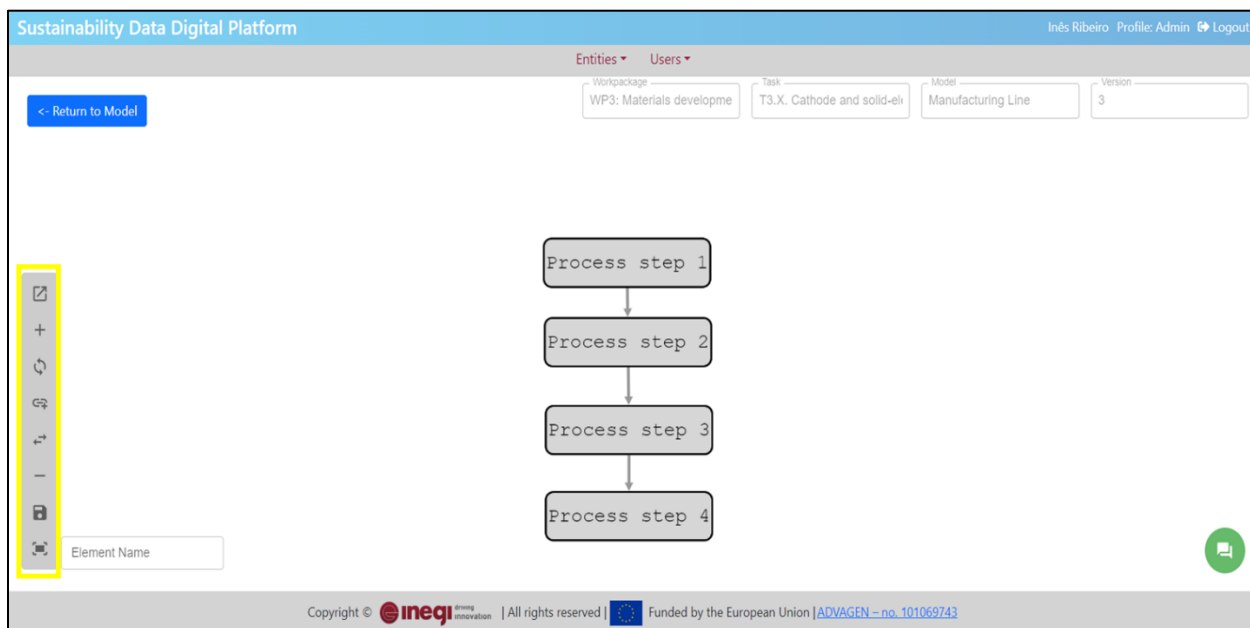





Figure 26: Admin view - flowchart creation.

### Viewing and exporting data from the LCA model

Admins can access information by clicking in the desired block of the model flowchart, per example: “process step 1” and then clicking in the  “open process” button to access the data table. To add the final product, admins users may click in the  grey button. To export the table information, click in the  export button. These buttons are signalized in yellow in the Figure 27.

Sustainability Data Digital Platform Info: Ribeiro Profile: Admin Logout

Entities - Users

[← Back to Diagram](#)

WP3: Materials developme 
 Model: Manufacturing Line

**Process 1 - input** Search  X

Actions	Name	Quantity	Unit	Cost	Cost Unit	Category	Transport	Origin	Inserted by	Created At	Notes	Private
No records to display												

5 rows  < < 0-0 of 0 > >

**Process 1 - output** Search  X

Actions	Name	Quantity	Unit	Cost	Cost Unit	Category	Transport	Origin	Inserted by	Created At	Notes	Private
No records to display												

5 rows  < < 0-0 of 0 > >

Copyright © | All rights reserved | Funded by the European Union [\(ADVAGEN - no. 10106074\)](#)

Figure 27: Admin view - data table of a process.



#### 4.2. User (data provider) Profile

In this subsection a step-by-step description is presented on how the user interacts with the platform to insert data. After logging in, the user will visualise the work packages, tasks and LCA models that are accessible, as presented in Figure 28.

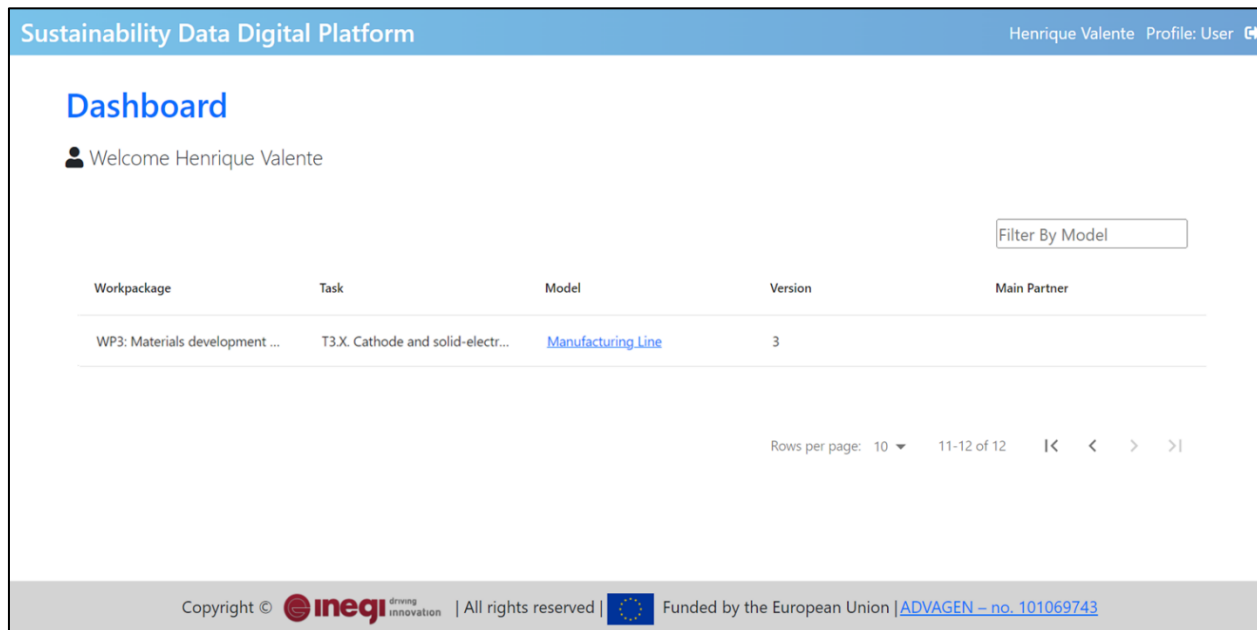


Figure 28: User view - dashboard.

To access the flowchart related to an LCA model, click in the hyperlink in blue. Afterwards, it is possible see the model flowchart, as shown in Figure 29.

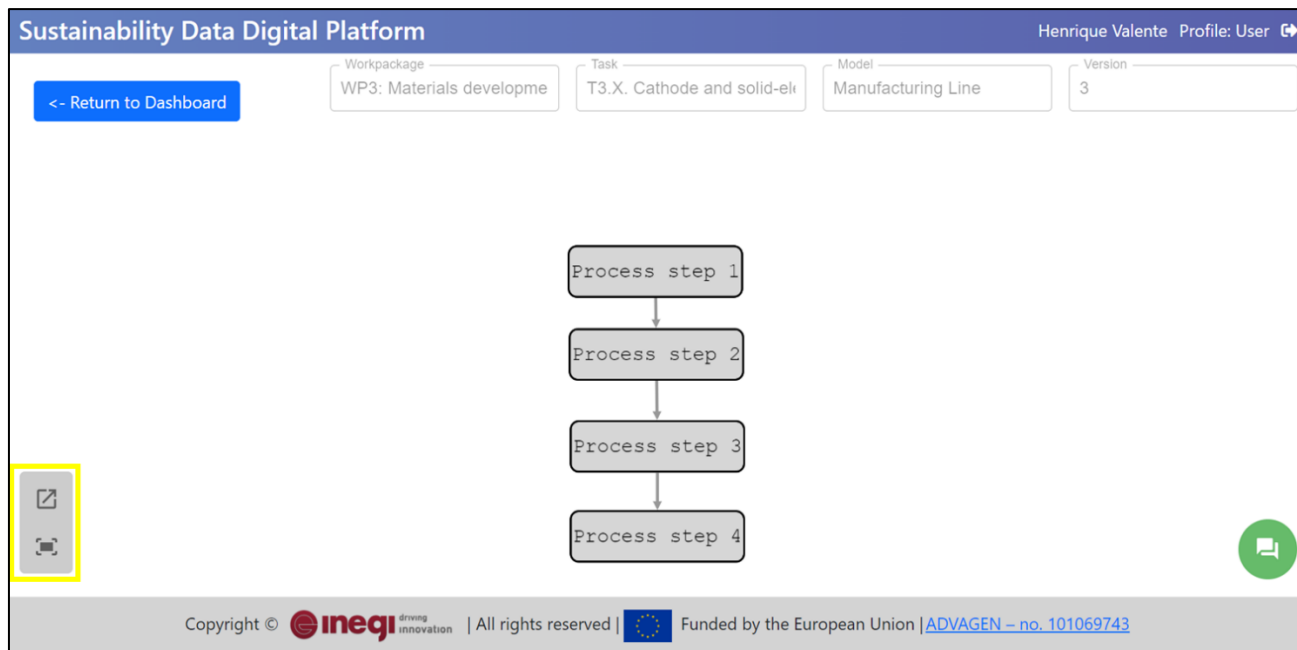



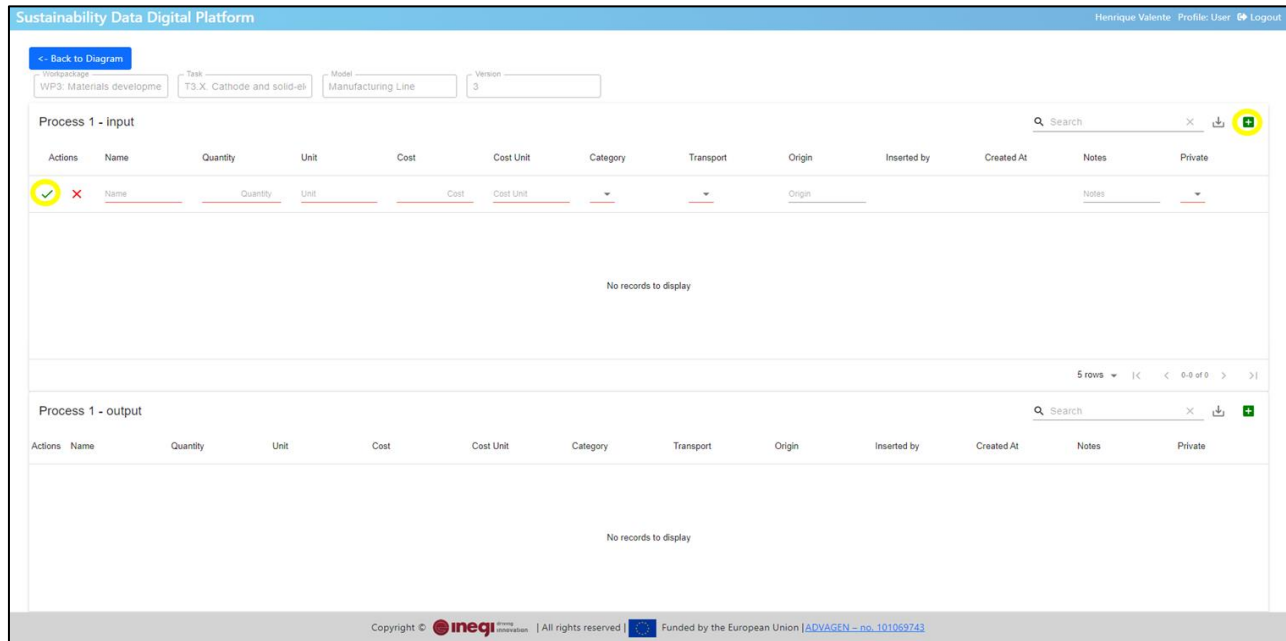


Figure 29: User view - model flowchart.

To insert the data referring to a process step, the user must click in the  “open process step” button to access the data tables. The user may insert the information in the input or output inventory tables by clicking in the  green plus button. After filling all the fields in the flow line (following the instructions in subsection 3.5), the user must save the data by clicking in the  green check (Figure 30, in yellow).



The screenshot displays the 'Sustainability Data Digital Platform' interface. At the top, there is a navigation bar with the user's name 'Henrique Valente' and a 'Logout' button. Below this, there are several input fields for 'Workpackage' (WP3: Materials developme), 'Task' (T3.X. Cathode and solid-el), 'Model' (Manufacturing Line), and 'Version' (3). A 'Back to Diagram' button is also present.

The main content area is divided into two sections: 'Process 1 - input' and 'Process 1 - output'. Each section features a table with columns: Actions, Name, Quantity, Unit, Cost, Cost Unit, Category, Transport, Origin, Inserted by, Created At, Notes, and Private. In the 'Process 1 - input' table, a yellow checkmark icon is visible in the 'Actions' column of the first row. Both tables currently show 'No records to display'.

At the bottom of the interface, there is a footer containing copyright information for 'ineqi' and a note that the platform is 'Funded by the European Union | ADVAGEN - no. 101069743'.

Figure 30: User view - data table.

## 5. Final remarks

The Deliverable 7.1 describes the main applications of the matured digital data platform “SUNDIAL”. The document introduces instructions for the two types of profiles (admin and user), as well as a tutorial with the several functionalities available for creating LCA models and the collection of primary data.

The SUNDIAL structure follows the guidelines provided by the data management plan (deliverable 1.2), regarding FAIR principles and storage requirements. The available features will allow users to provide life cycle information in an organized, safe and confidential manner, as well as for the INEGI team to quickly collect primary information for the environmental and cost inventories to perform the assessments in tasks 7.2 and 7.3.

An initial version was provided to the project coordinator ABEE, in line with the milestone MS16, validating the safe external access to SUNDIAL through the implemented VPN. Through this validation, as well as the round of several tests and debugging, the platform is ready for usage by the ADVAGEN consortium.