



# EU-CIRCLE

A pan-European framework  
for strengthening Critical  
Infrastructure resilience to  
climate change

## D8.10 EU-CIRCLE Exploitation models V1.0

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### *Statement*

This deliverable presents the first version (v1.0) of the exploitation model developed within WP8. The deliverable is composed of this document together with the platform. The functionalities and the way to use the platform are described in this document.

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List here the changes and their rational for each release



## Executive Summary

This document describes the EU-CIRCLE exploitation model and the first version of the commercial portal that will allow customers and vendors involved in Critical Infrastructure (CI) resilience to buy or sell models, tools and services, enabling a marketplace of models and services for CI resilience to climate change and extreme events.

At first, information about the models, data and tools developed in the EU-CIRCLE project will be inserted into the commercial portal by the relevant consortium members. Further information on present or future customised tools and services or new data could be then inserted by consortium members as well as other interested parties, to grow the pool of knowledge and capabilities available in the context of CI resilience to climate change, and make it available to a broader audience.

Through use of the commercial portal, interested parties will be able to search for available products and services or to express specific needs that other users could provide if interested. In this way a market on CI resilience services, data and tools can grow, creating a network of collaborating stakeholders and spreading the use of the EU-CIRCLE project results for application in world-wide real-life cases.

The exploitation model consists mainly in defining the:

- **type and roles of the different stakeholders of the portal:** the types of users identified are national authorities, CI Operators, Law Enforcement Agencies and Civil Protection, financial companies, insurance companies, climatologist and meteorologists, ocean/marine or other technical data/service provider, consultancy companies, software developers, training operators and scientific entities. The roles of the stakeholders are primarily that of consumer or provider, with some types of user assuming both roles i.e. providing services while seeking data;
- **kind of items that can be the subject of exchange:** subdivided into tools, resources and services, these kinds of items can be very different from the EU-CIRCLE framework itself (SimICI and CIRP) and include CI data, impact assessment models, climate and adaptation services and so on;
- **use cases of the portal:** the portal enables each user to express offers and needs, search for interesting items and to reach an agreement between the requester and the offering user for a specified item.

Services items are in general subjected to a payment based on the service customization made on the basis of customer needs. Instead, tools and resource items can be offered with different licensing type ranged from open data and open source paradigms, to closed source/not redistributable but free of charge licensing, to commercial selling or usage fees (per application, per year, per number of users, etc...).

A first version of the exploitation model, based on the results of the other work packages, and commercial portal has been developed and described in this document. The commercial portal itself is accessible on the web at the address "[http://www.dappolonia-innovation.com/eu\\_circle/](http://www.dappolonia-innovation.com/eu_circle/)" and its usage is described in this document.

After a review and usage analysis, a second version of the commercial portal will be issued as deliverable D8.13.



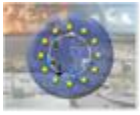
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## 1 Introduction

The EU-CIRCLE framework, standards and methodologies developed in the other work packages of the project, have to be accessible to all interested parties in the CI resilience business. To facilitate this process an exploitation model has been defined and a commercial portal has been designed and developed.

This document describes the EU-CIRCLE exploitation model and the first version of the commercial portal that will allow customers and vendors involved in CI resilience to buy or sell models, tools and services, enabling a marketplace of models and services for CI resilience to climate change and extreme events.

At first the models, data and tools developed in the EU-CIRCLE project will be inserted in the commercial portal by the relevant consortium members. Customised tools and services, together additional data, could be then inserted by consortium members as well other interested parties, to grow the pool of knowledge and capabilities available in the context of the EU-CIRCLE project, and make it available to a broader audience.

Through use of the commercial portal, interested parties will be able to search for available products and services or to express specific needs that other users could provide. In that way, a market of CI resilience services, data and tools can grow, creating a network of collaborating stakeholders and spreading the use of the EU-CIRCLE project results for application in real-life cases.

This document has the following structure:

- Section 1: introduction
- Section 2: description of the exploitation model including identification of actors and items of the exploitation process
- Section 3: description of the structure and use of the commercial portal developed

The commercial portal itself is accessible on the web at the address "[http://www.dappolonia-innovation.com/eu\\_circle/](http://www.dappolonia-innovation.com/eu_circle/)".

Following a period of testing, analysis and evaluation, a second version of the commercial portal will be issued as deliverable D8.13.



## 2 Exploitation Model

The EU-CIRCLE framework enables new kinds of services inherent to CI and their resilience to climate change. The flexibility of the main components (the SimCI and the CIRP) allows the creation of an ecosystem of tools, data and services that could improve the resources available to the CI community and financial sector, enlarging the set of the involved stakeholders and then generating a market where new and improved solutions will be created and integrated in the future.

To exploit the work done in the project, a first step is to identify interested stakeholders and their roles. A second step is to define what kind of items are available or could become available as the EU-CIRCLE related market grows. Finally, the process enabling the exploitation is defined.

### 2.1 Stakeholders roles

Depending on their needs and capabilities, interested parties in the CI resilience business can assume two different roles:

**Provider:** users are providers if they are able to provide data, models or services to other users;

**Consumer:** users are consumers if they need of one or more items that can be provided by other users.

The following table shows an example of possible users and their roles.

Typical User Roles			
Role	Type of user	Context of application	Type of needed/offered items
Consumer	National CI authority, NCP for Directive 114/2008	Check status of national CI network	Customised/specific configuration for each CI
		Identify main needs / response to extreme climate events Planning	Perform simulation, identify critical assets within a region
Consumer	CI Operators	Assess own CI criticalities	Configure CI and dependencies
		Training on climate events, impact and trends Planning of expansion / adaptation options to climate change	Run simulation on general context or nationally configured context Acquire support services from available consultancy companies (i.e. project partners)
Consumer	Police, Fire Corps, Civil Protection	Identify extreme climate scenarios and train/prepare on them	Run simulation on general context or access configured real data
Consumer	Financial company	Evaluate CI risks from climate change point of view – link risk premiums to CI operators for climate hazards	Evaluate dependency and risks related to CI of a business in a specific geographical position Buy the service from consultancy companies.
Consumer	Insurance company	Explore potential market and risks.	Use general data and available data to simulate events impact and evaluate risks. Emphasis on risk modelling – mutihazard analysis



Provider	Geo-technical, Climatologist and meteorologists, ocean/marine or other technical data/service provider	Sell data and services to configure and characterize models to specific locations/conditions	Make available service and/or data to the tool
Provider	Consultancy company	Sell services to help CI operators perform their assessments	Specific configuration for target CI and related networks, access data
Provider	Software company	Implements new plugins for different kind of analysis at different points in the workflow	Integrate plugin into the framework Sell the use of the plugin as service
Provider	Training Operator	Provide critical infrastructure and/or climate change training service	Use CIRP and SimICI
Consumer/ Provider	Scientific Entity	Research on climate change and critical infrastructure models / simulations / data	Acquire/provide data and models. Execute simulations.

From the roles defined above, it is clear that in some cases the same stakeholder can assume both roles but with respect to different items: for example, a consulting company can provide a CI resilience assessment, but could require tools, models and data in order to be able to perform the service. Then in the platform there will no specific role to be selected by a user that wants to sign into the platform, but the specific role will become evident based on the activities of the user.

## 2.2 Exploitable Items

The EU-CIRCLE framework allows exploitation of three main types of items: tools, resources and services. Each type of item is described in the following sections.

### 2.2.1 Methodological frameworks

- Climate data analytics
- Climate risk indicators for CI
- Climate risk assessment framework
- Resilience framework and relevant indicators
- Adaptation framework

### 2.2.2 Tools

Tools are software items that enable the user to perform work on data in order to obtain specific results. The main tools available in the framework are:

- CIRP
- SimICI
- Models, such CI models and their response to different kind of hazards, climate models, hazard models;

Other types of tools are:

- Data translators;
- Analytics;



- Report generators.

### 2.2.3 Resources

Resources are items that are used by tools (but that can also be output of other tools) to perform specific analyses. The principal types of resources are:

- Geographical environment data, such as population density, type of environment, natural features, orography, ocean data, etc.;
- Hazard data, such as historical and/or forecasting data on floods, fire, drought, storms, etc.;
- Specific CI data, such as spatial data, impact assessment models, etc.;
- CI network interconnections, such as dependency between transport networks, electrical grids, water distribution, etc.

### 2.2.4 Services

Principal services that can be offered include:

- Training, for example on the EU-CIRCLE framework, how to select and perform the appropriate assessment, how to correctly use the tools, how to identify the required data;
- Data processing, such as data gathering, data format translation (from the format of the original data to the format required by the target software) and preparation in order to perform further analyses;
- Developing, such as creating new CI models, integrating software tools in custom pipelines, etc....;
- Analysis, from partial analysis such as hazard forecasting and assessment, to performing all the required steps.

## 2.3 Link with the Exploitation plan

According to the exploitation plan described in D8.3 and the previous chapters, the table below summarises the list of the key exploitable results that could be exploited through the EU-CIRCLE exploitation Portal. The table below will be completed in the second release of the platform (D8.13) at the end of the project, when all the tools/services/models developed within EU-CIRCLE will be available.

Tool/Service/model	Exploitable results on the Exploitation portal	
	Description	Reference to EU-CIRCLE WP
Generated Climate data, Climate Services	Climate data and statistics, downscaling	WP2
Climate Risk indicators	Risk indicators for CI and their critical thresholds	WP2/WP3
CI Assets and Interconnections	ANDI tool classifying over 200 different asset types and their behavior	WP3
Risk framework	Model for strengthening interconnected critical infrastructure risk assessment	WP3
Risk Assessment Propagation models	Risk for interconnected networks	WP3



Tool/Service/model	<b>Exploitable results on the Exploitation portal</b>	
	<b>Description</b>	<b>Reference to EU-CIRCLE WP</b>
<b>Climate Infrastructure Resilience Platform (CIRP)</b>	Critical Infrastructure Resilience Platform – CIRP. CIRP aims to cover this gap by offering an extensible platform assuring that the science and engineering principles behind the forecasting of damage probability of Critical Infrastructures (buildings, bridges, networks, pipelines, and other inventory items) from anticipated events is both pragmatic and state-of-the-art and therefore critical to minimising the impact of climate change events, reducing losses to economic resources, and the development of more stable communities.	<b>WP5</b>
<b>Resilience tool</b>	CI resilience assessment through the identification of its capacities	<b>WP4</b>
<b>Resilience indicators</b>	CI resilience indicators	<b>WP4</b>
<b>Business continuity model</b>	CI business continuity model under climate change and extreme events	<b>WP4</b>
<b>Cost-effectiveness analysis</b>	Adaptation option support tool for conducting cost-effectiveness analysis	<b>WP4</b>
<b>Adaptation model</b>	CI adaptation model	<b>WP4</b>
<b>SimICI – virtual data set</b>	Innovative software for resilience modeling	<b>WP7</b>
<b>Virtual data set</b>	Reference data set for testing different risk and resilience tools in controlled environment / dissemination to scientific community	<b>WP7</b>
<b>Training material</b>	Performing training for target groups	<b>WP8</b>
<b>Booklet on Resilience Framework for Critical Infrastructure</b>	Booklet on Resilience Framework for Critical Infrastructure	<b>WP8</b>
<b>Continuous Professional Development (CPD) course on Critical Infrastructure (CI) Resilience</b>	Continuous Professional Development (CPD) course on Critical Infrastructure (CI) Resilience 1 or 2 day workshop/seminar course	<b>WP8</b>

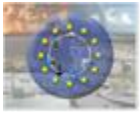
Hereafter, will be also defined and described the licensing terms (open or payment needed after economical negotiation and transaction.) and the related cost (if present) for each tool/service/model developed.

Services items are in general subjected to a payment based on the service customization made on the basis of customer needs. Instead, tools and resource items can be offered with different licensing type ranged from open data and open source paradigms, to closed source/not redistributable but free of charge licensing, to commercial selling or usage fees (per application, per year, per number of users, etc...).

## 2.4 Exploitation Portal Use Cases

### 2.4.1 User Registration and Profiling

At first access, a new user must register with an email address, name and a password. The email address will be the id used to access the platform in the future. Once registered, the user can create a new profile for their organization (becoming the administrator for that new profile) or asking the existing administrator of their organization's profile to become linked to that profile. In the EU-CIRCLE exploitation platform inserted items (needs and offers) will be owned by the organization (identified by the profile) and not by



single users. In this way, multiple users within the same organisation can collaborate on the platform on behalf of their organization.

The organization profile is a page (editable by the profile administrator within the platform itself) describing briefly the organization and its interests and skills in CI resilience or in general within the EU-CIRCLE framework. Data about business sectors and interests are also recorded in a standardised way for fast classification of organizations.

#### **2.4.2 Expressing Offers and Needs**

Users interested in providing items will be able to insert and specify each item offered, defining its category (services, products or data) and the specific type (i.e. demographic data, fire spreading models, conversion tools, training services, etc.). Based on the item type, multiple fields can be filled to characterize the offered item in a standard way.

In the same way, consumer users that have specific needs can create an item needed by filling in all relevant fields and providing a brief description on what is needed, so that interested providers can propose a customized solution if required. In case the item offered suit the needs without further customization, the involved parties will start the commercial transaction (outside of the scope of the EU CIRCLE marketplace).

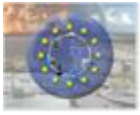
#### **2.4.3 Searching for Items of Interest**

Providers and consumers could search for business opportunities looking at the needs and products available. This will be possible by looking at the complete lists of needs or offered items, and using filters that enable the user to refine and narrow the list to the items of interest. For items having a geographical reference (such as infrastructure models, environmental data, infrastructure topology etc.), a thematic map of available items is presented allowing the identification of items of interests based on their geographic location.

#### **2.4.4 Contacts and Agreements**

Once a consumer user has found an item that they are interested in, a related request to inform the providing user that there is an interest for the relevant item can be created. Based on this, the platform will enable the users to privately chat about the item and to complete the transaction. The platform will not manage money transfers, as its single purpose is to facilitate contact between the users in order to create a marketplace.

In similar way, a provider user that has found a need he can satisfy, he could create a related offer in competition with other providers. The user that has expressed the need could then decide to initiate a negotiation with the preferred provider or wait for more providers to make offers. Once the consumer user has identified the most interesting offer, he can close the transaction, resulting in the relevant need to be marked as “satisfied” and to be removed from the dashboard so it is no longer visible in, informing in the same time the “not selected” providers that have make an offer that their offers have been rejected.



### 3 Exploitation Portal

#### 3.1 Index Page

The index page is the first page that is visible when accessing the portal. This page contains brief information on: the project itself linking back to the project's main web-site, the purpose for the portal and the related exploitation model and process.

From the index page the user can sign-up to the system as a new user or log-in to the system if already signed up. Log-out will be possible from every page of the portal.

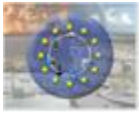


Figure 1: Index Page

#### 3.2 Sing Up

The sign-up procedure requires the new user to insert their first and last name, email and password.

Figure 2: Sign Up form



After submission of the sign up form, an e-mail will be sent to the user-provided email address for verification. Access to the platform is not possible at this stage.

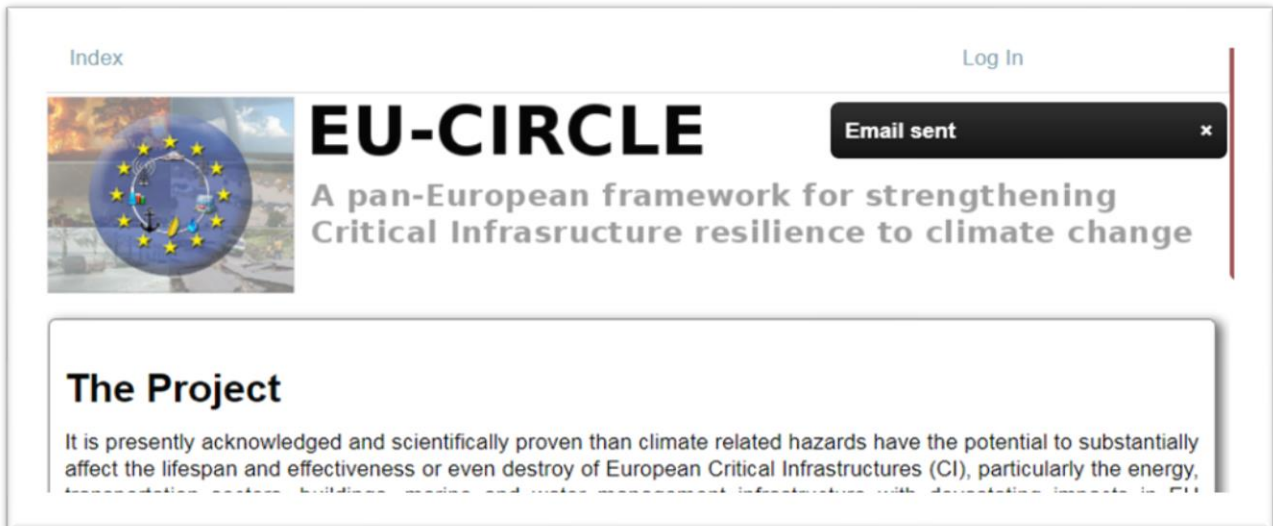


Figure 3: Verification e-mail correctly sent

The user will have to open the verification email and select the confirmation link by clicking on it or copying it into the browser address bar.

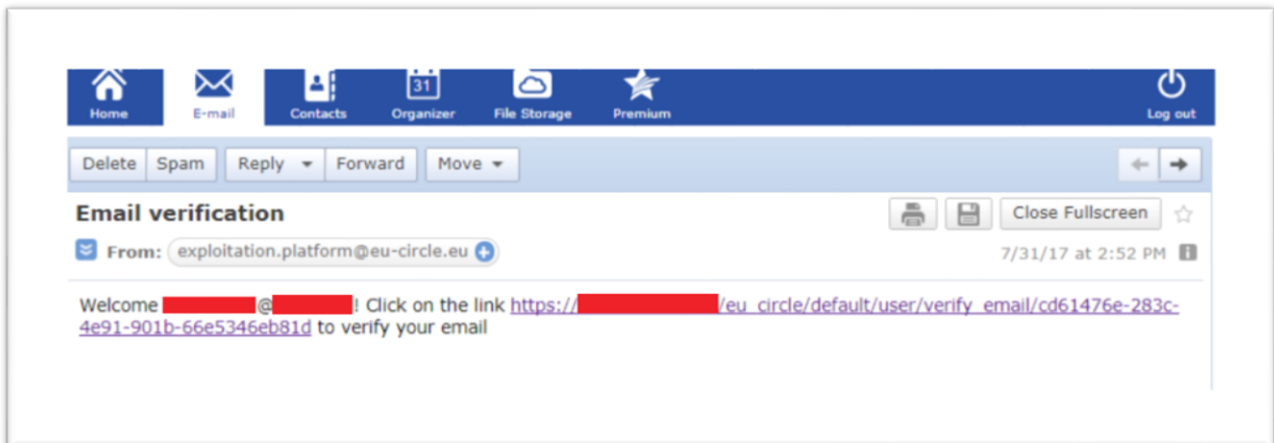


Figure 4: E-mail verification message and link

After the user-provided email address is verified the user can then log-in using the email address and the password provided in the sign-up form.

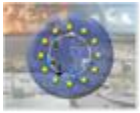


Figure 5: E-mail verification successful and log in form

### 3.3 User profile

After the first login, the user has to create a new organization profile or join an existing one.

Figure 6: A profile is requested to proceed with the tool

If the user creates a new profile, a form to insert the profile name, organisation description, sector and CI interests will be presented. The description field will implement an editor allowing the user to create a rich and complete description of their organisation in order attract other users.

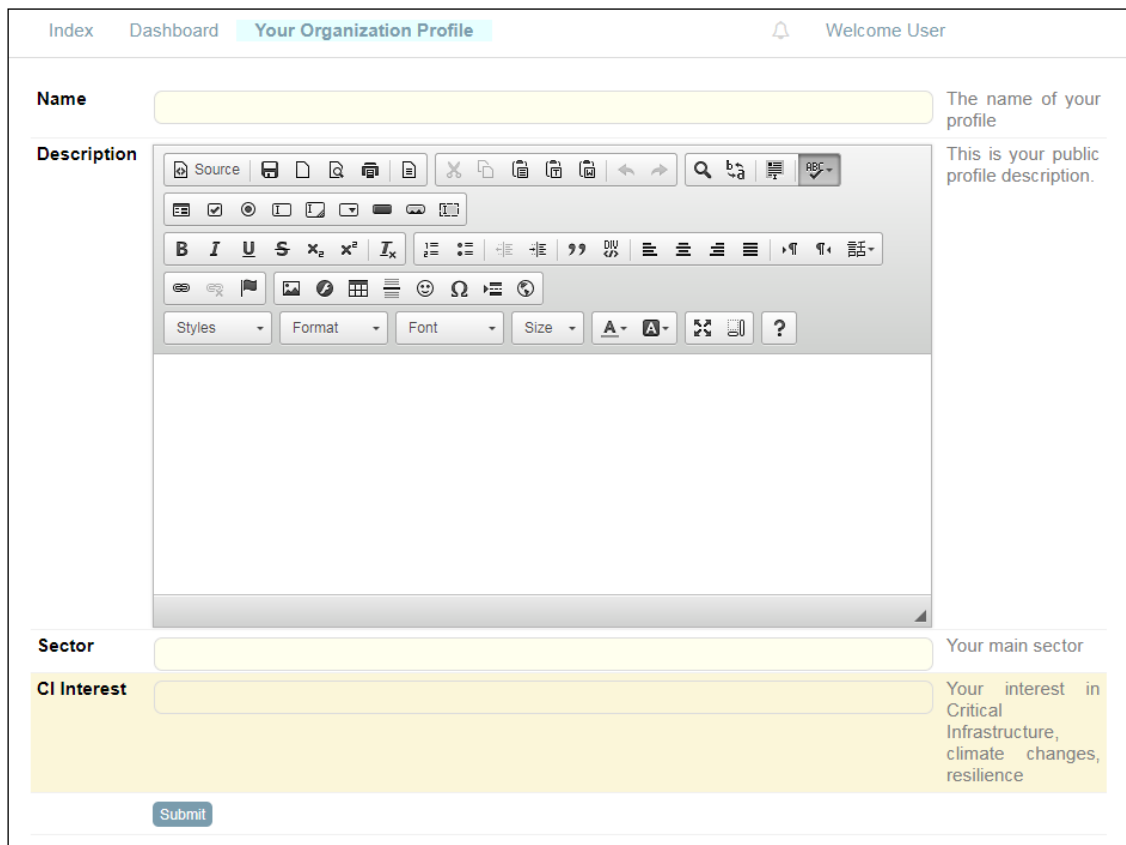


Figure 7: Profile creation and editing form

If the user is working for an already registered organisation, they can click on the “Ask to join” button and their request will be registered. The user always has the possibility to abort the request and restart the process.

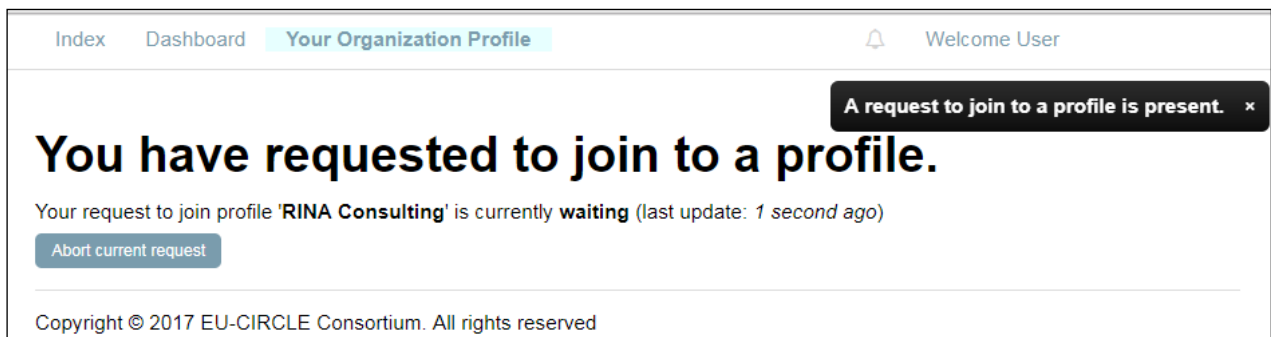


Figure 8: Profile join request pending

The administrator of the target profile will be notified by the system that a pending ‘join request’ is present and by clicking on the notification will be redirected to the profile management where the request can be accepted or declined.

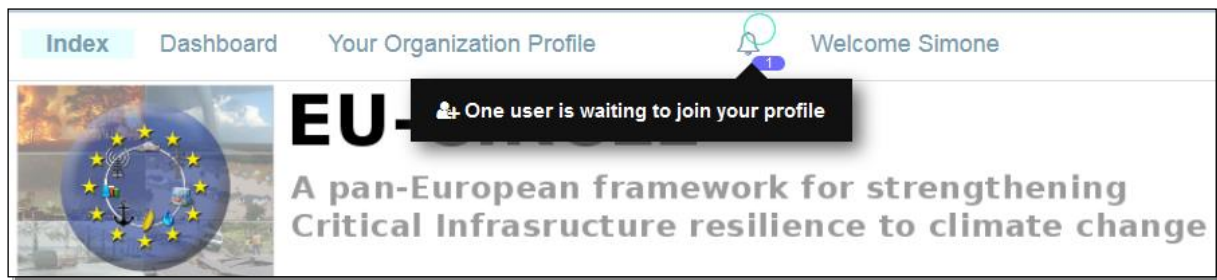
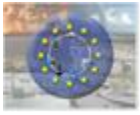


Figure 9: Pending profile requests notification

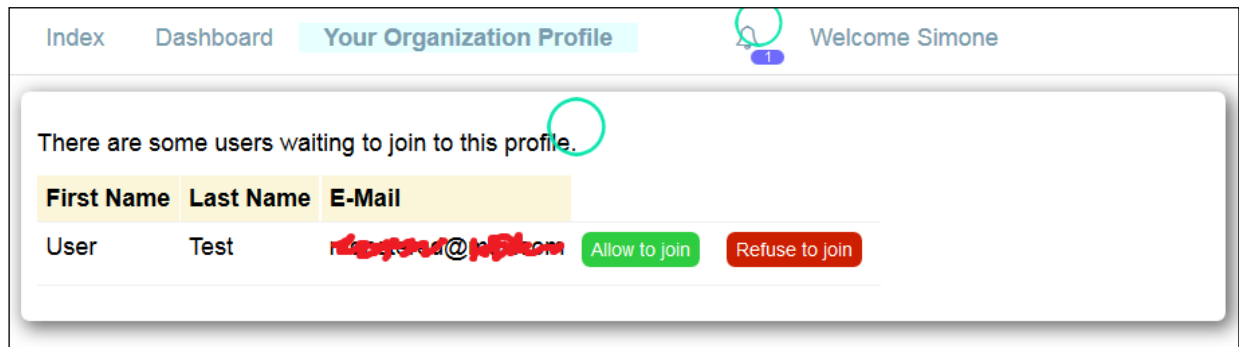


Figure 10: Pending profile requests management

### 3.4 Creating a new “item offered”

To create a new “item offered”, the user goes to the dashboard page and opens the “Your offer” tab. A page listing currently offered items will appear. Initially there are no offered items, so only the “Create a new offered item” will appear (see Figure 11). Clicking on this button will open an item creation page.

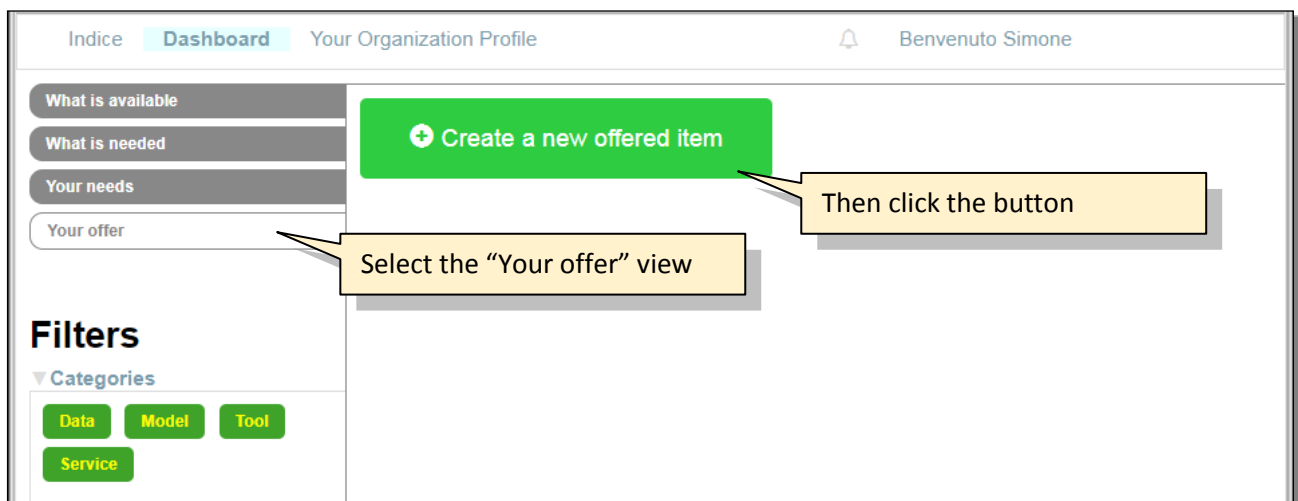


Figure 11: Create a new item for offer

In the item creation page, the user can insert the title of the item offered, a description of what is offered, the type of item (selected among the item types identified in the exploitation model, see Paragraph 2.2) and other fields enabled based on the selected item type (different item types can have different additional fields, as showed in Figure 13).



Index Dashboard Your Organization Profile Welcome Simone

Please insert new offer data

## Insert a new offer

**Item Type**  The type determine the category and the fields of this item

**Provided by** RINA Consulting Who is providing this item

**Title**  short identification of the item

**Description**  Description of the item

Submit

Figure 12: Create a new offered item

Index Dashboard Your Organization Profile Welcome Simone

Please insert new offer data

## Insert a new offer

**Item Type** (Service) Critical Infrastructure Assessment Consulting The type determine the category and the fields of this item

**Provided by** RINA Consulting Who is providing this item

**Title** CI Climate Change Resilience Assessment short identification of the item

**Description** Rina Consulting offer a service to assess critical infrastructure resilience against climate changes based on EU-CIRCLE framework.  
The data gathering about the CI and interconnected infrastructures could be part of the service. Description of the item

**Temporal extent begin** 2017-09-01 The begin date of the temporal extent of the item

**Temporal extent end** 2025-12-01 The end date of the temporal extent of the item

**Topic** Transport Infrastructures, Energy Infrastructures, Supply Chain The topic of the item

Submit

Additional fields

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Figure 13: Example of item fields dependency on selected item type

After submitting the item, it will become visible in the dashboard under the “Your offer” tab (where the user can reopen and edit) and in the “What is available” tab, visible to all the platform users.



The screenshot displays the EU-CIRCLE Dashboard interface. At the top, there are navigation tabs: 'Indice', 'Dashboard' (highlighted), and 'Your Organization Profile'. A user greeting 'Benvenuto Simone' is visible on the right. On the left sidebar, there are four main sections: 'What is available', 'What is needed', 'Your needs', and 'Your offer'. Below these are 'Filters' with 'Categories' (Data, Model, Tool, Service) and 'Contains Keyword' (a search bar). The main content area features a green button '+ Create a new offered item' and a list of two offered items. Each item is displayed in a yellow box with the following details:

Name:	Type:	Category:	Offered by:	Status:
CI Climate Change Resilience Assessment	Critical Infrastructure Assessment Consulting	Service	RINA Consulting	Available
Italian transport infrastructure macro graph	Geographical Infrastructure Data	Data	RINA Consulting	Available

At the bottom of the dashboard, a copyright notice reads: 'Copyright © 2017 EU-CIRCLE Consortium. All rights reserved'.

Figure 14: List of owned items for offer

### 3.5 Express a request for an “item offered”

A user having needs in the context of CI resilience to climate change and extreme events, will first conduct a search on items already available, to see if their need can be met by some other stakeholder on the portal.

#### 3.5.1 Looking for an “item offered”

Through accessing the dashboard in the “What is available” tab, every user can see a list of offered items and a map where items with geographical information are shown by means of a thematic map on item types. Items on the map are automatically clustered by position to keep the map uncluttered at every zoom level.

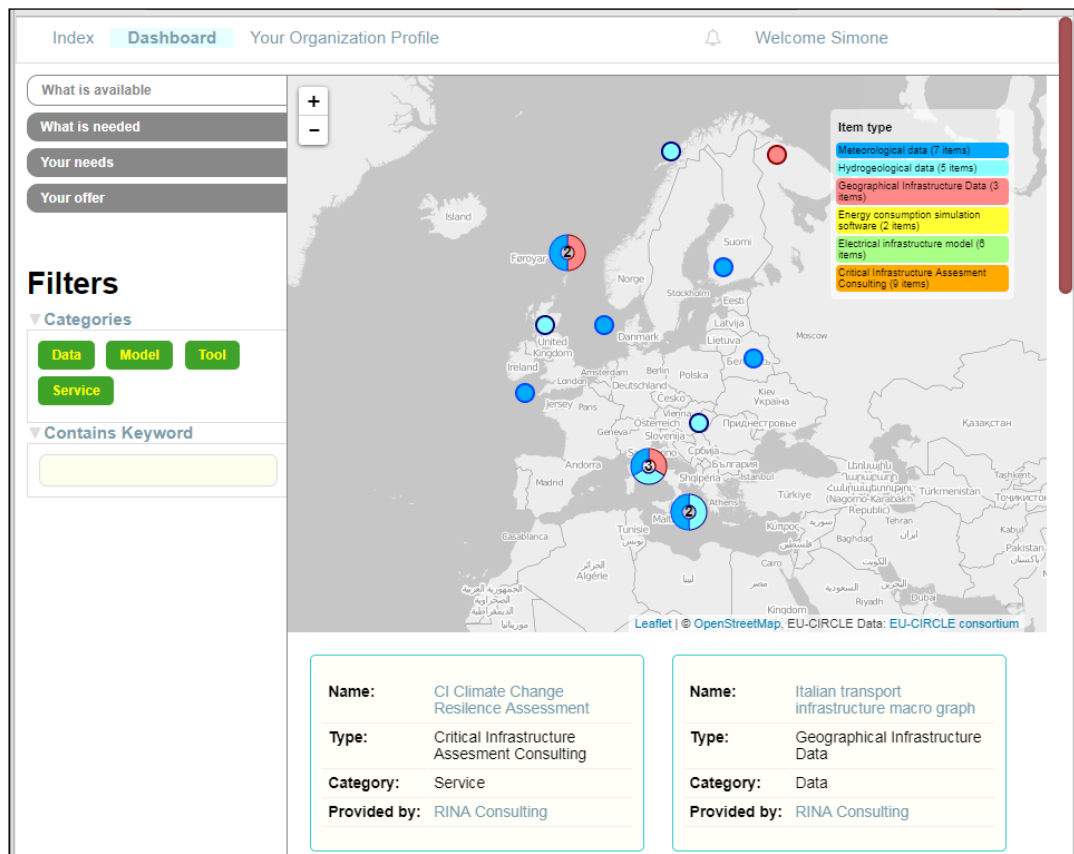
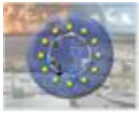


Figure 15: Browsing of offered items

Clicking on a selected item, a pop-up summarising the item will open on the map. Figure 16 shows an example of the item's card displayed on the map. From this card, it is possible to open an item and/or the profile of the providing user. A set of controls on the right will allow the user to hide items that are not of interest through filtering by item categories or a specific keyword.

### 3.5.2 Make a “request” item

Once a user has an item of interest from the dashboard, the related item fiche can be opened by clicking on the relevant link. All data inserted by the user providing the item will be displayed and a button will enable the interested user to make a request for the item.



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### Italian transport infrastructure macro graph

Item provided by: **RINA Consulting**

Description: 

A macro-level transport infrastructure network graph with major transport (mainly road, rail and water) and logistic (such as ports, industrial districts, etc) nodes and edges, with geographical references and transport data, suitable for macro analysis.

Category: **Data**

Type: **Geographical Infrastructure Data**

Temporal extent begin: **2010-01-01**

Temporal extent end: **2014-01-01**

Coordinate: **[42,13]**

Spatial Resolution: **10000**

Format: **ESRI Shapefile**

Last update: **2017-09-10 21:30:11 (2 hours ago)**

There are **0** open linked items for this item , while **0** linked items were closed , with an average satisfaction index of **0.0**

List of your requests for this item

Requester	Title	Description
-----------	-------	-------------

Create a request for this item

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Figure 16: Offered item fiche

Clicking on the button, a request creation page will be displayed, allowing the potential consumer user to add further detail to the request (the request item type will be locked with the item type that is offered to avoid irrelevant requests).

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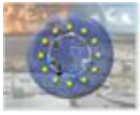
Please insert new request data x

### Insert a new request

Item Type	(Data) Geographical Infrastructure Data	The type determine the category and the fields of this item
Requested by	Test profile	Who has requested this kind of item
Title	Request for 'Italian transport infrastructure macro graph'	short identification of the item
Description	<div></div>	Description of the item
Temporal extent begin	<div></div>	The begin date of the temporal extent of the item
Temporal extent end	<div></div>	The end date of the temporal extent of

Figure 17: Creation of a request for an offered item

When reviewed, the request form also includes the data of the relevant item offered for easy cross-reference.



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[Chat with the provider](#) [Edit this item](#) [Close as FULFILLED](#) [Close as NOT FULFILLED](#) [Delete this item](#)

## Request for 'CI Climate Change Resilience Assessment'

Item requested by: **Test profile (YOU)**

Description: We need an assesment for the regional electrical energy distribution infrastructure

Category: **Service**

Type: **Critical Infrastructure Assesment Consulting**

Temporal extent begin: **2018-01-01**

Temporal extent end: **2018-01-31**

Topic: **Energy infrastructure**

Last update: **2017-09-13 02:38:54 (7 seconds ago)**

This is a request for:

### CI Climate Change Resilience Assessment

Item provided by: **RINA Consulting**

Description: Rina Consulting offer a service to assess critical infrastructure resilience against climate changes based on EU-CIRCLE framework.  
The data gathering about the CI and interconnected infrastructures could be part of the service.

Category: **Service**

Type: **Critical Infrastructure Assesment Consulting**

Figure 18: View of an existing request

### 3.5.3 The “request” agreement phase

Once submitted, the new request will then be visible in the offered item fiche only by the user providing the item and by the user making the request. In that way, the user providing the item can see all requests for the item in question, while the requester can only see his requests.

There are <b>1</b> open linked items for this item , while <b>0</b> linked items were closed , with an average satisfaction index of <b>0.0</b>			
List of requests from others for this item:			
Requester	Title	Description	Status
Test profile	Request for 'CI Climate Change Resilience Assessment'	We need an assesment for the regional electrical energy distribution infrastructure	Pending...

Figure 19: Pending request list for an offered item from the provider point of view

From this list, users can open the request of interest to them (see Figure 18 for an example from the requester point of view). On the upper part of the page, there are buttons to manage the lifetime of the request. Buttons for editing and deleting a request are visible only to the owner of the request. For both the requester user and the provider user of the related item, buttons that enable communication with each-other (chat) and for closing a request are present.

The chat button will open a chat session, were the stored messages exchanged between the involved users are shown and new messages can be created.

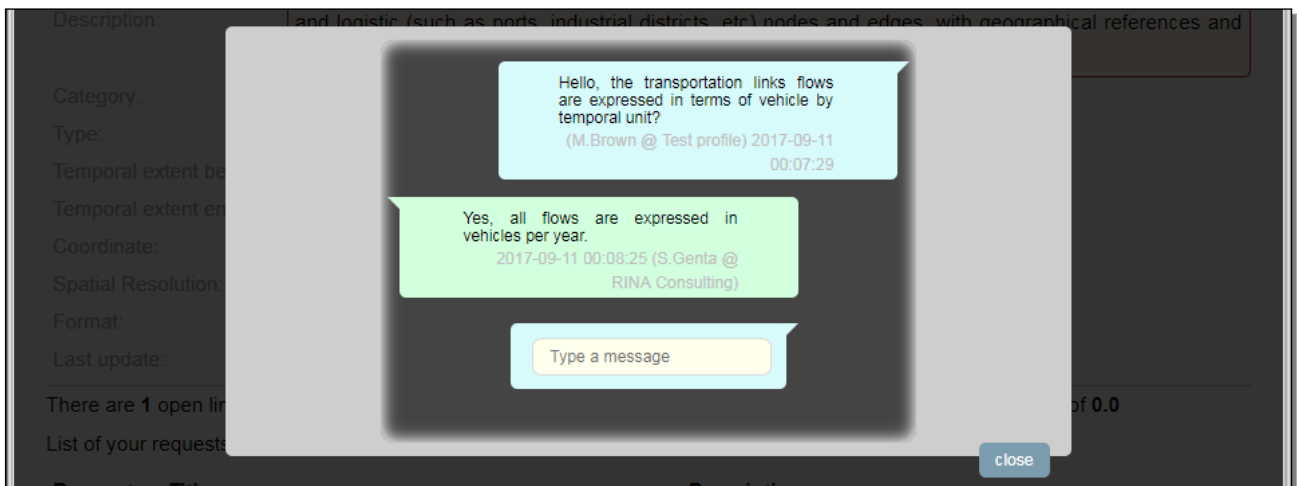


Figure 20: Chat between providing user and requesting user about an item

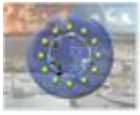
In this way, the two parties can contact each-other, reach an agreement and finalize the business transaction. Once the request is satisfied, it can be closed as “FULFILLED” through the relevant buttons or if an agreement can’t be reached it can be closed as “NOT FULFILLED”. If the request was not correctly assigned to the offered item, it can be deleted by the requester, and all related information and messages will also be deleted.

Once closed, the request will be displayed in the related item accordingly.

### 3.6 Creating a new “needed” item

If the user need cannot be satisfied by the items offered, a new need can be expressed in a way that, hopefully, some provider will find interesting enough to create a specific offer and/or a new product (available also to the other users).

The user that has the need, will create a “needed” item from the “Your needs” tab of the dashboard (see Figure 21) then insert all relevant data about the need such as the item type, a short title, a longer description and some field is available for the chosen item type (see Figure 22).



The screenshot shows the EU-CIRCLE dashboard with the 'What is needed' tab selected. A large blue button labeled '+ Create a new needed item' is prominent. The left sidebar contains navigation links: 'What is available', 'What is needed', 'Your needs', and 'Your offer'. Below these are filter sections: 'Filters' with 'Categories' (Data, Model, Tool, Service) and 'Contains Keyword' (a search box). The footer states 'Copyright © 2017 EU-CIRCLE Consortium. All rights reserved'.

Figure 21: Creating a new needed item

The screenshot shows the 'Insert a new request' form. A black notification box at the top right says 'Please insert new request data'. The form has four main fields: 'Item Type' (with a dropdown showing '(Model) Electrical infrastructure model'), 'Requested by' (with a dropdown showing 'RINA Consulting'), 'Title' (with a dropdown showing 'Urban city electric infrastructure model'), and 'Description' (a text area with the text 'Need of a model of urban electric power infrastructure model linked to environmental impacts on the city and surrounding main infrastructure.'). To the right of each field is a brief explanation. A blue 'Submit' button is at the bottom.

Figure 22: New need item data filling

### 3.7 Respond to a “needed” item

Users that can provide some type of items to the CI community, with particular reference to climate change resilience, will be able to look for new business opportunities other than the set of items already offered and available in the platform (inserted as described in Paragraph 3.4). Responding to needs expressed by other users, a service/tools/data provider can expand its business and the pool of offered resources.

#### 3.7.1 Looking for a need

Accessing the dashboard in the “What is needed” tab, every user can see a list of needed items and (as per the Item for offer) a map where needed items with geographical information are shown by means of a thematic map.

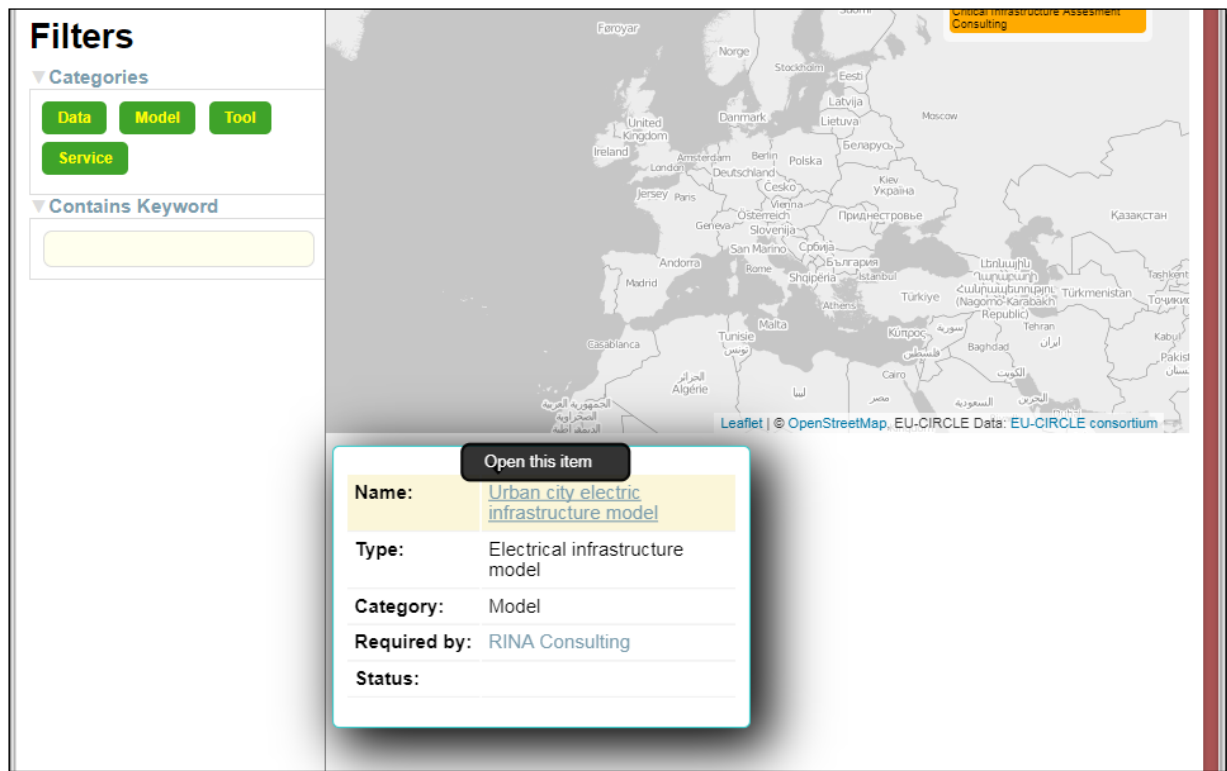
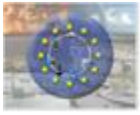


Figure 23: Needed items browsing

### 3.7.2 Propose an “offered” item

Once the user has found a request of interest from the dashboard that he can satisfy, the related item fiche can be opened clicking on the relevant link. All data inserted by the requester user will be displayed and a button will enable the interested user to make an offer to satisfy the need.

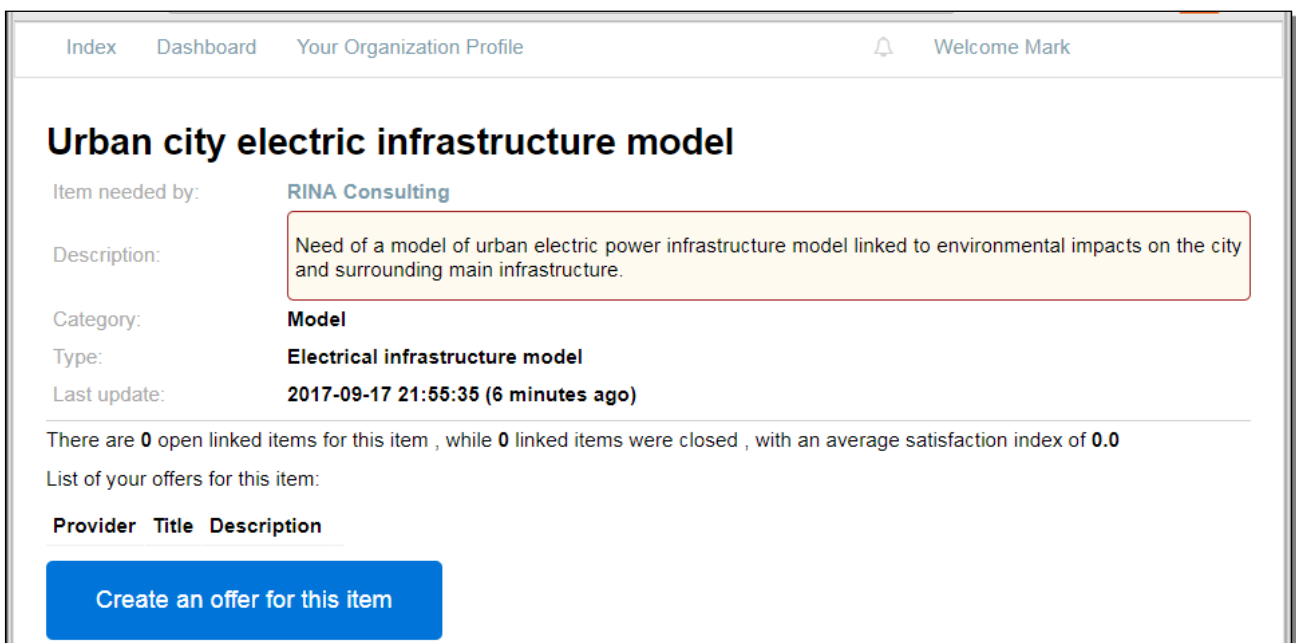
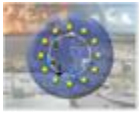


Figure 24: Needed item fiche

Clicking on the button, an offer creation page will be displayed, allowing the potential provider user to provide further details related to their offer (that is forced to be about of the same item type of the need).



The screenshot shows the 'Insert a new offer' form. At the top, there is a navigation bar with 'Index', 'Dashboard', and 'Your Organization Profile'. A notification bubble says 'Please insert new offer data'. The form fields are:

- Item Type:** (Model) Electrical infrastructure model. A tooltip explains: 'The type determine the category and the fields of this item'.
- Provided by:** Test profile. A tooltip explains: 'Who is providing this item'.
- Title:** Offer for 'Urban city electric infrastructure model'. A tooltip explains: 'short identification of the item'.
- Description:** We can provide mid-detail model of urban power infrastructure, linked to public services such as traffic control, security, and other infrastrucutre such as water management and others. A tooltip explains: 'Description of the item'.

A blue 'Submit' button is at the bottom.

Figure 25: Creation of an offer for a needed item

When inspected, the offer will also display for ease of cross reference the data of the relevant need. The owner can then further edits the offer, chat with the requester or delete the offer.

The screenshot shows the 'Offer for Urban city electric infrastructure model' view. At the top, there is a navigation bar with 'Index', 'Dashboard', and 'Your Organization Profile'. A notification bubble says 'Welcome Mark'. Below the navigation bar, there are three buttons: 'Chat with the requester', 'Edit this item', and 'Delete this item'.

The main content area shows the offer details:

- Item offered by:** Test profile (YOU)
- Description:** We can provide mid-detail model of urban power infrastructure, linked to public services such as traffic control, security, and other infrastrucutre such as water management and others.
- Category:** Model
- Type:** Electrical infrastructure model
- Last update:** 2017-09-17 22:06:03 (20 minutes ago)

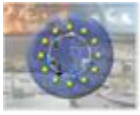
Below this, it says 'This is an offer for:' and shows the details of the needed item:

- Urban city electric infrastructure model**
- Item needed by:** RINA Consulting
- Description:** Need of a model of urban electric power infrastructure model linked to environmental impacts on the city and surrounding main infrastructure.
- Category:** Model
- Type:** Electrical infrastructure model
- Last update:** 2017-09-17 21:55:35 (31 minutes ago)

Figure 26: View of an existing offer (owner point of view)

### 3.7.3 The “offer” agreement phase

Once submitted, the offer will be visible in the needed item fiche by only the user that expressed the need and by the user making the offer. In that way, the requester user can see all offers for the needed item, while the provider user can see only their offer(s).



The screenshot shows a web interface for a requester. At the top, there are navigation links: 'Index', 'Dashboard', and 'Your Organization Profile'. On the right, a bell icon and the text 'Welcome Simone' are visible. Below the navigation bar, there are three buttons: 'Edit this item' (blue), 'Close as NOT FULFILLED' (orange), and 'Delete this item' (red). The main heading is 'Urban city electric infrastructure model'. Below this, the item details are listed: 'Item needed by: RINA Consulting (YOU)', 'Description: Need of a model of urban electric power infrastructure model linked to environmental impacts on the city and surrounding main infrastructure.', 'Category: Model', 'Type: Electrical infrastructure model', and 'Last update: 2017-09-17 21:55:35 (48 minutes ago)'. A summary line states: 'There are 2 open linked items for this item , while 0 linked items were closed , with an average satisfaction index of 0.0'. Below this, it says 'List of all offers for this item:'. A table follows with three columns: 'Provider', 'Title', and 'Description'. The first row shows 'Test profile' as the provider, 'Offer for 'Urban city electric infrastructure model'' as the title, and 'We can provide mid-detail model of urban power infrastructure, linked to public services such as traffic control, security, and other infrastrucutre such as water management and others.' as the description. The status 'Pending...' is shown to the right. The second row shows 'Another test profile' as the provider, the same title, and 'We can provide a simplified model for a general electrical power geographical grid that can be adapted to the urban case.' as the description, also with a 'Pending...' status. At the bottom, a copyright notice reads: 'Copyright © 2017 EU-CIRCLE Consortium. All rights reserved'.

Index Dashboard Your Organization Profile Welcome Simone

Edit this item Close as NOT FULFILLED Delete this item

## Urban city electric infrastructure model

Item needed by: **RINA Consulting (YOU)**

Description: Need of a model of urban electric power infrastructure model linked to environmental impacts on the city and surrounding main infrastructure.

Category: **Model**

Type: **Electrical infrastructure model**

Last update: **2017-09-17 21:55:35 (48 minutes ago)**

There are **2** open linked items for this item , while **0** linked items were closed , with an average satisfaction index of **0.0**

List of all offers for this item:

Provider	Title	Description	
Test profile	Offer for 'Urban city electric infrastructure model'	We can provide mid-detail model of urban power infrastructure, linked to public services such as traffic control, security, and other infrastrucutre such as water management and others.	Pending...
Another test profile	Offer for 'Urban city electric infrastructure model'	We can provide a simplified model for a general electrical power geographical grid that can be adapted to the urban case.	Pending...

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Figure 27: Pending offers list for a needed item from the requester point of view

If the requester has been unable to find an offer to satisfy their need, they can close the need by selecting the “Close as not fulfilled” button on its own needed item fiche (as visible in Figure 27). Otherwise the requester can open each offer (see Figure 28).

The screenshot shows a web interface for a requester viewing an offer. At the top, there are navigation links: 'Index', 'Dashboard', and 'Your Organization Profile'. On the right, a bell icon and the text 'Welcome Simone' are visible. Below the navigation bar, there are three buttons: 'Chat with the provider' (grey), 'Close as FULFILLED' (green), and 'Close as NOT FULFILLED' (orange). The main heading is 'Offer for 'Urban city electric infrastructure model''. Below this, the offer details are listed: 'Item offered by: Test profile', 'Description: We can provide mid-detail model of urban power infrastructure, linked to public services such as traffic control, security, and other infrastrucutre such as water management and others.', 'Category: Model', 'Type: Electrical infrastructure model', and 'Last update: 2017-09-17 22:06:03 (22 minutes ago)'. Below this, it says 'This is an offer for:'. A section titled 'Urban city electric infrastructure model' follows, showing the item details from the requester's perspective: 'Item needed by: RINA Consulting (YOU)', 'Description: Need of a model of urban electric power infrastructure model linked to environmental impacts on the city and surrounding main infrastructure.', 'Category: Model', 'Type: Electrical infrastructure model', and 'Last update: 2017-09-17 21:55:35 (32 minutes ago)'.

Index Dashboard Your Organization Profile Welcome Simone

Chat with the provider Close as FULFILLED Close as NOT FULFILLED

## Offer for 'Urban city electric infrastructure model'

Item offered by: **Test profile**

Description: We can provide mid-detail model of urban power infrastructure, linked to public services such as traffic control, security, and other infrastrucutre such as water management and others.

Category: **Model**

Type: **Electrical infrastructure model**

Last update: **2017-09-17 22:06:03 (22 minutes ago)**

This is an offer for:

### Urban city electric infrastructure model

Item needed by: **RINA Consulting (YOU)**

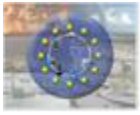
Description: Need of a model of urban electric power infrastructure model linked to environmental impacts on the city and surrounding main infrastructure.

Category: **Model**

Type: **Electrical infrastructure model**

Last update: **2017-09-17 21:55:35 (32 minutes ago)**

Figure 28: Offer view from the requester perspective



The chat button will open a chat session, where the stored messages exchanged between the requester and the users making the offers are shown and new messages can be created (as in the request agreement phase, see Figure 20).

In the window of the offer being created by the user making the offer, there are buttons for editing and deleting the offer available (see Figure 26). For the requester user instead, there are buttons to select the offer as the preferred one (and consequently closing the corresponding need) or to close the offer as not fulfilling the need (leaving the need open for other offers).

After selection of the preferred offer, the list of the offers for the need is updated accordingly.

[Index](#) [Dashboard](#) [Your Organization Profile](#) Welcome Simone

**Urban city electric infrastructure model**

Request closed as fulfilled

Item needed by: **RINA Consulting (YOU)**

Description: Need of a model of urban electric power infrastructure model linked to environmental impacts on the city and surrounding main infrastructure.

Category: **Model**

Type: **Electrical infrastructure model**

Last update: **2017-09-17 22:49:52 (1 second ago)**

There are **0** open linked items for this item , while **2** linked items were closed , with an average satisfaction index of **0.0**

List of all offers for this item:

Provider	Title	Description	
Test profile	Offer for 'Urban city electric infrastructure model'	We can provide mid-detail model of urban power infrastructure, linked to public services such as traffic control, security, and other infrastrucutre such as water management and others.	FULFILLED
Another test profile	Offer for 'Urban city electric infrastructure model'	We can provide a simplified model for a general electrical power geographical grid that can be adapted to the urban case.	NOT FULFILLED

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Figure 29: Offers list after closing the need.



## 4 Conclusion

An exploitation model was defined and described in this document. The model explains what and how the results of the other EU-CIRCLE work packages can be made accessible by interested parties.

A web portal that implements the exploitation model has been designed and developed. An initial definition of the types of items within the model has been achieved and an initial set of available items has been inserted into the portal. A way to search for items of interest by keyword and geographical mapping is provided by the portal. A system to put in contact the users is also provided, avoiding direct mailing between the users. Users however will be free to exchange their contact details and to execute the process on their own.

The next version of the portal will include comments by partners related to esthetic and usability matters, and missing functionalities will be added, such as a voting system and a periodic mail to the users reporting new items offered or needed and contact requests. Further data will also be inserted into the portal to make it more interesting and attract the public.