NET ZERO CITIES
SGA-NZC

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Updated Design & Specifications for the Portal

Deliverable 5.1

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Abbreviations and acronyms

Acronym	Description
WP	Work Package
NZC	NetZeroCities
CCC	Climate City Contract
CTM	Climate Transition Map
GA	Grant Agreement

Summary

This deliverable provides a detailed account of the NetZeroCities portal's operational structure, core functionalities, and modular design. It explains how the portal serves as a central digital hub for facilitating cities' transition to climate neutrality, detailing key modules such as the Knowledge Repository, which hosts 928 resources, and interactive tools like the Climate Transition Map, Finance Guidance Tool, and NetZeroPlanner. Upcoming tools, such as the City Dashboard and Climate Actions Catalogue, are also outlined, reflecting the portal's adaptability to the evolving needs of the NetZeroCities community. The document further describes the back-end systems supporting the portal, including user registration, tagging, and integration of third-party services like DeepL and Algolia. As the NetZeroCities community grows, the portal will continue to expand its capabilities, focusing on advanced data integration and reporting to ensure its ongoing relevance as a critical resource for achieving climate neutrality.

Keywords

NetZeroCities portal, climate neutrality, knowledge repository, collaboration tools, interactive modules, Climate City Contracts, back-end systems, user management, data integration, digital hub, tagging systems.

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Introduction

The NetZeroCities portal has been operational for two years, following launch in September 2022 (NZC Milestone 5, Platform & Portal Go-Live). In this time, the portal has served as the online nucleus of the NetZeroCities community, functioning as an instrumental tool in facilitating cities' transition to climate neutrality. The initial scope of the portal, as envisioned in NZC D3.1 *Design and Specification for the Portal and Platform*, included features to support collaborative tools, knowledge sharing, and integrated services that would enable cities to make measurable progress towards climate-neutral goals. Almost all the portal functionality outlined in NZC D3.1 has been fully realised. These include:

- **Collaboration and interaction:** the portal hosts collaboration modules (e.g. groups), facilitating interaction among city representatives, experts, and stakeholders, creating a dynamic space for exchanging ideas.
- **Knowledge Repository:** the Knowledge Repository currently hosts 928 resources, including toolkits, guidelines, and best practices for cities to adopt climate-friendly practices.
- **User management & permissions:** reflecting the layered permissions structure planned in D3.1, the portal continues to manage diverse user groups—ranging from city officials to local partners—effectively.

As the Cities Mission advances, the portal remains flexible, evolving to meet new demands and ensuring that it stays relevant to the community's growing needs. As of today, the portal has attracted 5,571 users, with 79% being city or local partner users. On average, the portal gains approximately 100 new registrations per month, signalling its growing role as a trusted resource within the climate neutrality ecosystem.

The user engagement metrics we currently see reflect the original vision set out in NZC D3.1: to create an active, resource-rich digital hub that serves the broader NetZeroCities community. The consistent growth in registrations and engagement also indicates that the portal's core functions—facilitating collaboration, providing resources, and enabling progress—are being effectively utilised.

Recognising the ever-evolving nature of the NetZeroCities community's trajectory and needs, the services offered via the portal will continue to adapt and progress. While much of the original D3.1 functionality has been successfully implemented, the ongoing need for customised content, enhanced data integration and advanced reporting features will guide the next phase of development. The objective is to ensure that the portal remains not only a tool for collaboration but also a critical instrument in helping cities track their progress towards climate neutrality.

This deliverable explains how the portal's modular structure operates and interconnects, including descriptive text, key visuals, and functional workflows for key modules. A summary and basic description for each module is shown in Figure 1 below. This document also describes the back-end systems that underpin portal service management and delivery, including service delivery tools and interoperability.

While this deliverable describes the operational structure of the portal and its key features, for portal performance reports and detailed module technical descriptions can be found in the following deliverables under the NZC Grant Agreement:

- D3.5 Annual Report on Platform Performance
- D3.6 Platform Technical Description and User Guide

1 Overall portal structure

The Portal is composed of a set of interconnected modules, which interlink with each other via front-end links and a common back-end database (see Figure 1).

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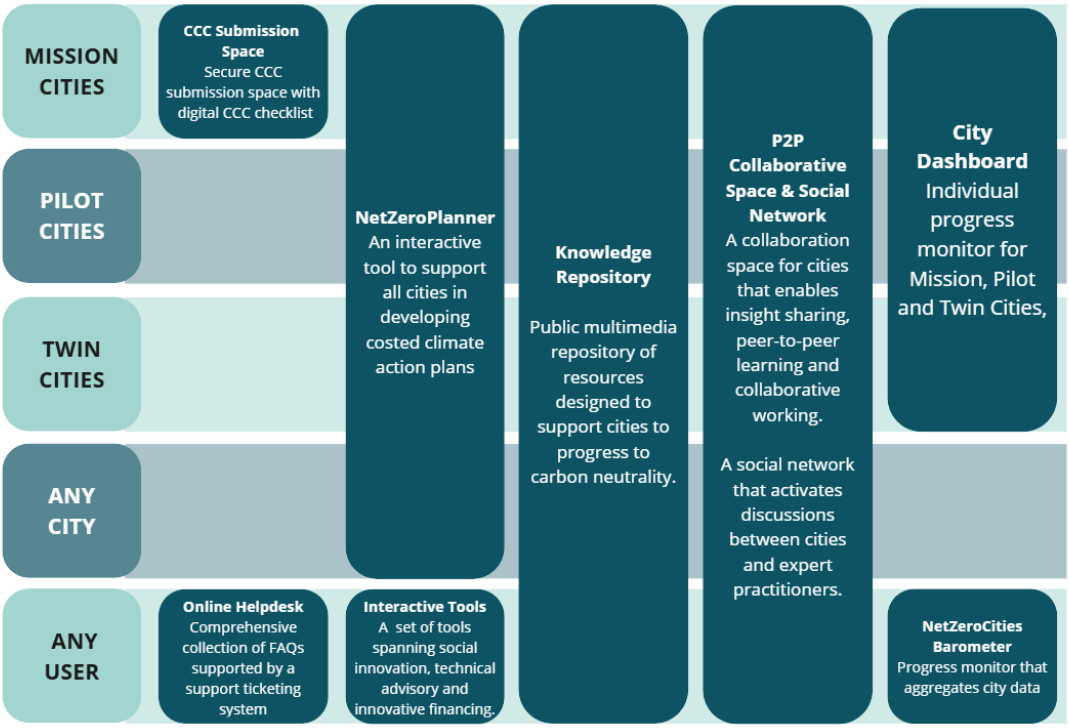

Figure 1 Overall Portal structure

1.1 Portal homepage and navigation

The portal homepage has been redesigned (see Figure 2) from its initial design in NZC D3.1 to focus on **tools, learning & content connections**, shifting away from social media style format as the primary feature. The new navigation helps cities quickly find relevant content for them & connect in dedicated peer-learning groups.

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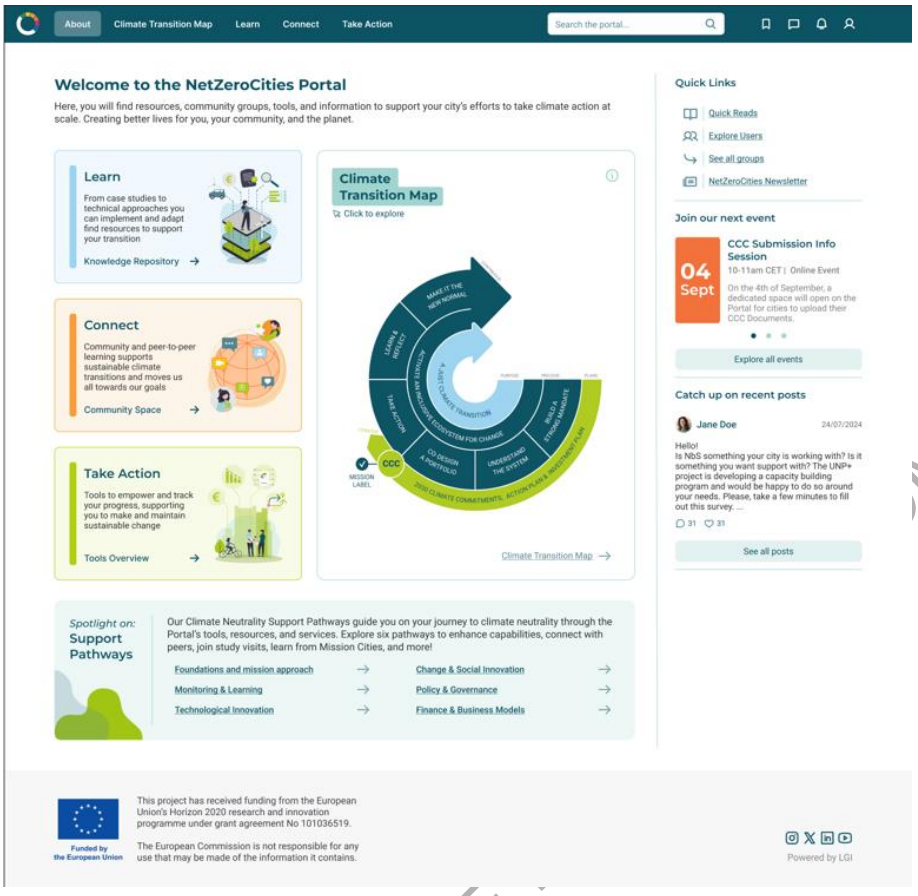

Figure 2 Homepage redesign

In Q2 of 2024, an analysis was conducted of the existing homepage, identifying strengths and areas for improvement. The work aligned redesign objectives with overall portal goals and mission. This included undertaking secondary research about known user goals, experiences and technical constraints for portal design via existing and ongoing consortium documentation and work.

Key user insights were gathered through feedback and usage data analysis. Key 1:1 interview sessions were held across the design cycle with a values-based approach. Interviewees included Mission City representatives, cities interested in the Mission, local partners and organisations, City Advisors and other Consortium members.

The user insights detailed varied experiences and potential avenues for redesign. The pipeline of new elements to be included in the portal in future was also a consideration when deciding an initial approach. The creation of a clear and open interface which enables users to navigate the portal as is most appropriate for them was prioritised.

Wireframes and validated potential interfaces were tested with members across the consortium before holding a session with 20 participants, supported by the Covenant of Mayors in M14. Insights from this session were used to narrow down design decisions for Developer handover.

The updated homepage design now focuses user experience on the Climate Transition Map (CTM) and makes it easier to navigate the core functions of the portal. It implements a consistent use of colour, typography, and iconography across the homepage. The homepage prioritises accessibility features, including colour contrast and clear language. It is expected that this homepage will be adjusted over time to better support the integration of portal features as well as consistent monitoring done through channels such as HotJar (see section 6.4) to ensure viability and user success.

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The navigation of the portal through an updated menu (see Figure 3) is also addressed in the new portal layout. Based on work initiated under WP5 and tandem work looking at content structuring on the portal undertaken in NZC-SGA2 WP1, an updated menu has been designed for the portal. This structure aligns with the pillars of 'Learn, Connect, Do' as embedded across the portal and homepage as well as highlighting key elements of the portal, previously hidden by the suboptimal menu approach.

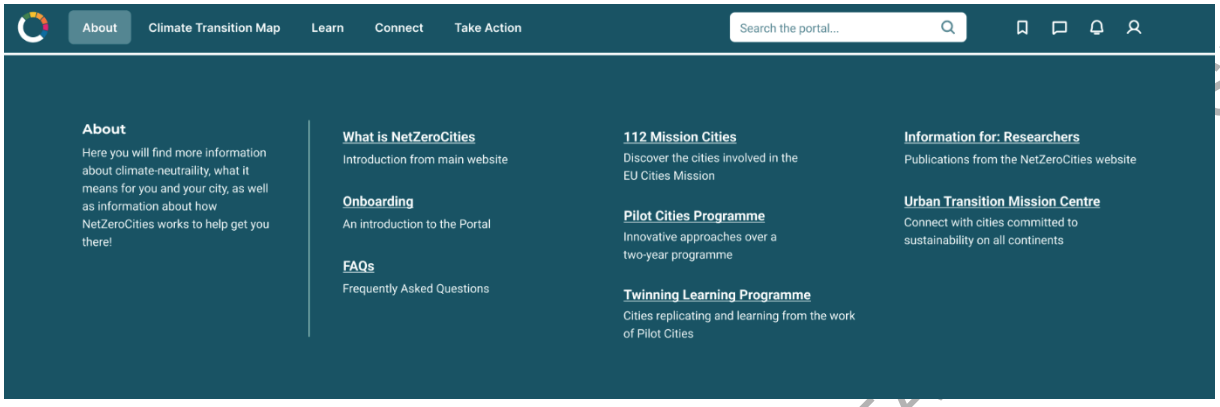

Figure 3 Updated menu design view

2 Knowledge Repository

The Knowledge Repository module is a multi-media repository of resources to support the platform users and cities to progress towards carbon neutrality. It is a publicly accessible module of the NetZeroCities portal, meaning that it does not require users to log in to access its content. It allows users to browse all resources and find relevant content using features such as search, tags and filters. As highlighted in the Introduction, the Knowledge Repository currently hosts 928 resources, 893 of which are published and 35 remain as drafts.

2.1 Core knowledge repository features

Knowledge Repository features enhanced usability, enabling users to search, filter, and upload content efficiently. Key functionalities include:

1. Search functionality:

The Knowledge Repository offers a text-based search. Users input words or phrases, and the system suggests relevant resources. This allows quick access to documents and tools containing those terms in their titles or content.

2. Tagging system:

Knowledge Repository resources are indexed using tags to support search functions for all resource types. This helps users locate specific resources using the filters (outlined below). For a full list of current tags, see section 6.3. Once uploaded, resources can also be tagged to a corresponding section of the CTM, if relevant. This feature automatically populates the *Support & Resources* subsection of the CTM with that resource (see Figure 4).

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Figure 4 Knowledge Repository resources on CTM

3. Filters:

Users can refine search results using filters, narrowing down their options by resource type (text, video, image, etc.) or tags. This feature makes it easy to find tailored content based on specific preferences and locate resources across various formats, such as text, video, or image, regardless of content type.

4. Self-upload:

Registered Portal users can upload resources directly to the platform. The upload function supports the following formats:

- Documents: such as PDFs, DOCX, and PPT files
- Videos: from third-party sites like YouTube and Vimeo
- Adobe Express files: for creating visual case studies
- Articles, methods, and factsheets: where content can be created directly on the portal

Users can assign multiple authors and curators to each resource. They can also select their own tags.

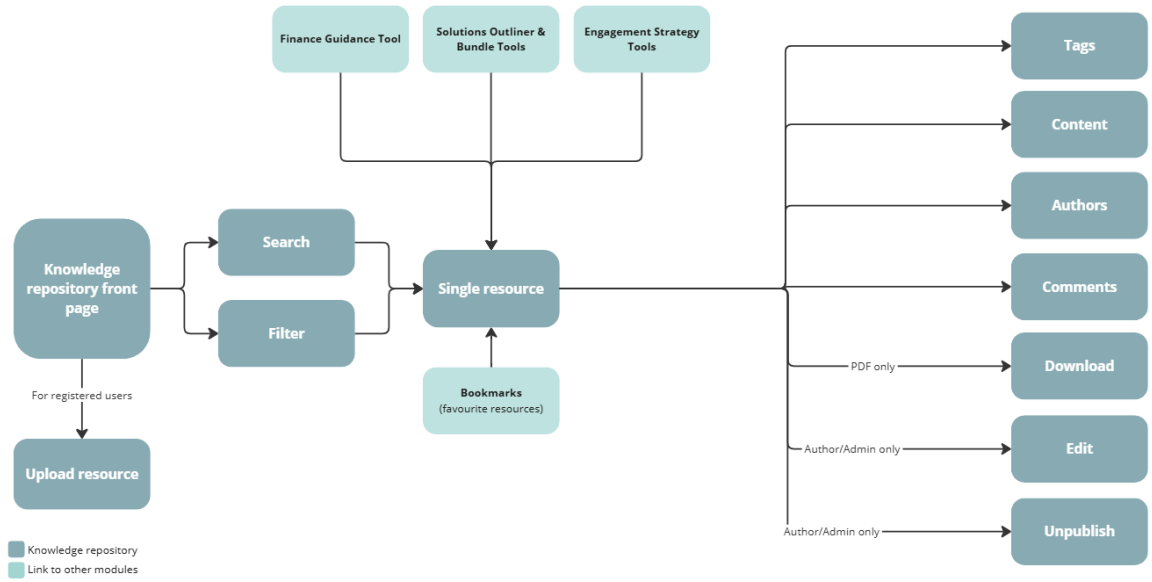

Figure 5 Knowledge Repository features map

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2.2 Search enhancement with Algolia

The Knowledge Repository's search capabilities will soon be powered by Algolia, which offers advanced features that make it easier for users to find the content they need. These features include:

- **Typo-tolerance & AI-driven enhancements**: the system allows for minor typos and adjusts for common errors, making the search more intuitive.
- **Synonym management:** automatically broadens search results to include relevant terms without manual intervention, improving the chances of users finding what they're looking for.
- **Customisable ranking**: resources are prioritised based on relevance, ensuring that the most useful content appears first in search results, tailored to user queries.
- **Improved search result speeds:** search results are retrieved faster than in the pre-Algolia system, allowing users to access the resources they need with minimal delay and enhancing the overall efficiency of the Knowledge Repository.

Algolia provides granular resource analytics (e.g. resource usage metrics) to provide insights into which materials are most accessed or engaged with, helping the portal team understand what content is most valuable to users.

Algolia is expected to be fully implemented and operational on the Knowledge Repository by M19. A new front end has been designed to accompany the Algolia launch (see Firgure 6).

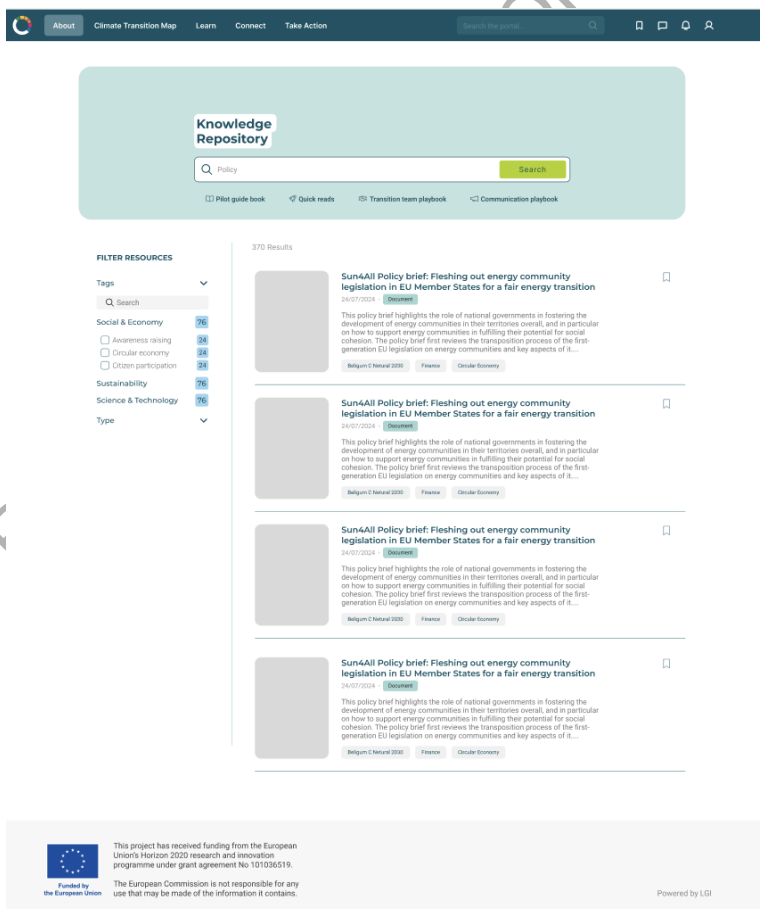

Figure 6 Mock up of new Knowledge Repository front end

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3 Interactive tools & modules

The portal is not intended to be static and continues to evolve through a dynamic process of service review with cities and a co-design approach that fosters the development of new tools and content.

Initially, in NZC D3.1, a framework was set out for the tools to be developed and deployed by September 2022, with an acknowledgment that further tools would be scoped and added in response to city needs. Since then, a suite of tools has been built, tested, and in some cases, already launched, while others are scheduled for release in the coming months.

The tools reflect the ongoing collaborative feedback from mission cities and key stakeholders and are designed to provide cities with robust solutions for navigating their climate neutrality journey. Below is a detailed breakdown of these interactive tools, highlighting their status and anticipated release timelines (if not already released).

3.1 Current interactive tools & modules

3.1.1 Climate Transition Map

The CTM helps cities navigate the complex journey towards climate neutrality by visually breaking down the various phases involved. Users can explore different stages of this journey, access resources, and utilise templates and guidance from the Climate Collaboration Centre (CCC). This tool is integrated with the Knowledge Repository and provides cities with a pathway to action by connecting them to essential resources at each stage of their transition. New resources are added to the CTM by tagging them with the relevant CTM phase when uploaded to the Knowledge Repository, ensuring cities always have access to the most up-to-date tools and guidance.

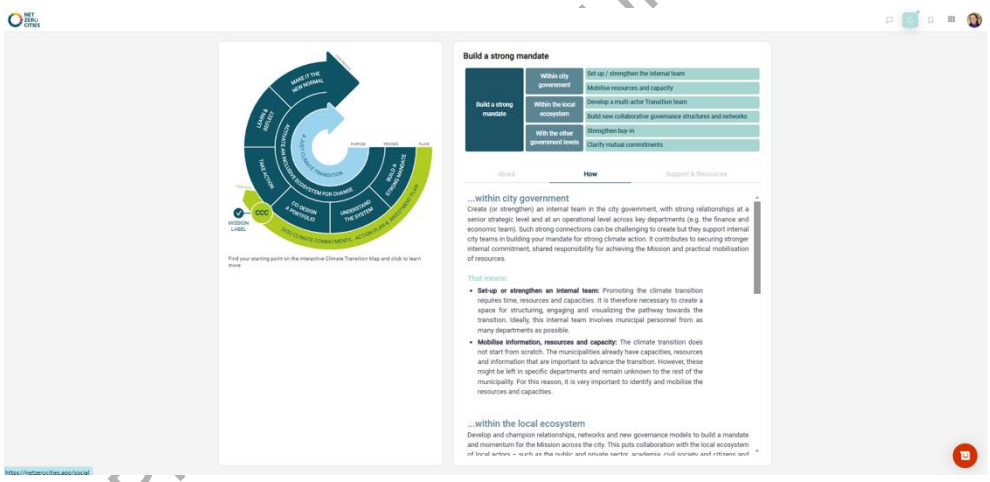

Figure 7 Climate Transition Map module

3.1.2 Finance Guidance Tool

The Finance Guidance Tool assists cities in identifying appropriate private and public financing options for their climate initiatives. Built around a decision matrix, it enables cities to match their needs with available financing instruments. This tool is integrated with the Knowledge Repository, where linked resources offer additional details on finance options, case studies, and best practices. The tool provides crucial support for investment planning and project execution.

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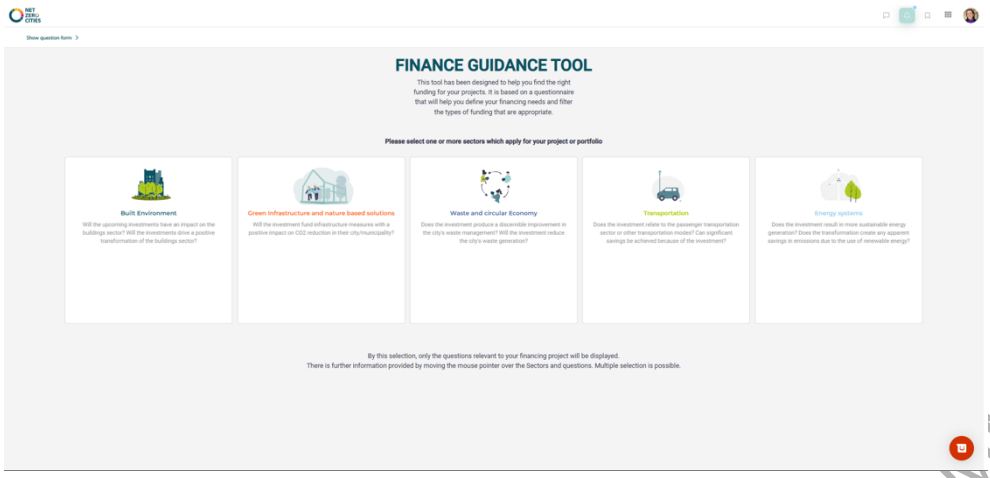

Figure 8 Finance Guidance tool

3.1.3 EU Projects Navigator

The EU Projects Navigator supports cities by helping them find relevant European Union initiatives and projects that align with their climate neutrality ambitions. It provides access to key resources and outputs sorted by topic or sector, enabling cities to leverage EU expertise and frameworks. This tool is an important addition, as it connects cities to broader networks and funding opportunities, enhancing their strategic planning efforts.

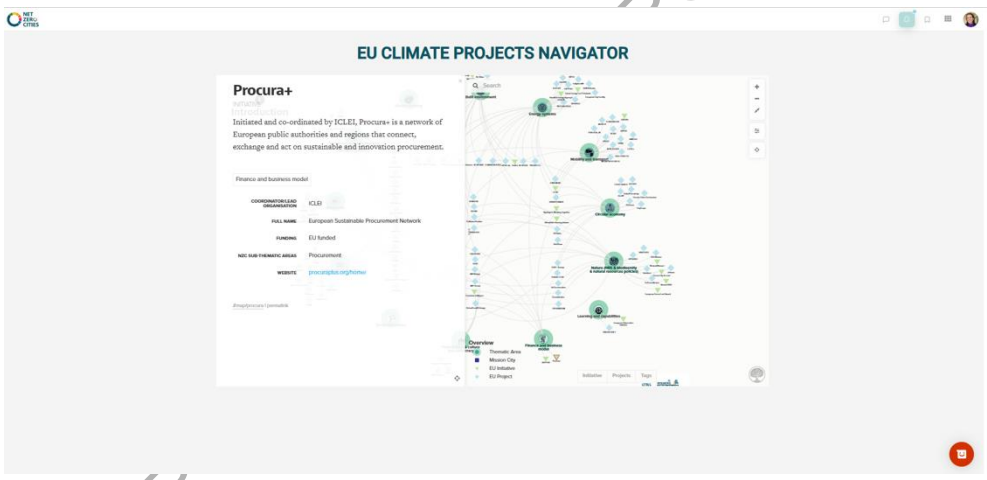

Figure 9 EU Projects Navigator tool

3.1.4 Solutions Outliner

The Solutions Outliner helps cities match their unique needs with potential solutions by connecting contextual factors such as ambition, barriers and expected co-benefits with technical solutions in the Knowledge Repository. This tool also allows cities to simulate different scenarios, making it a powerful resource for planning and refining their climate action pathways. Under WP5 the portal team will explore ways to further develop this tool for improved usability and connectivity to the NetZeroPlanner tool (see section 3.1.7).

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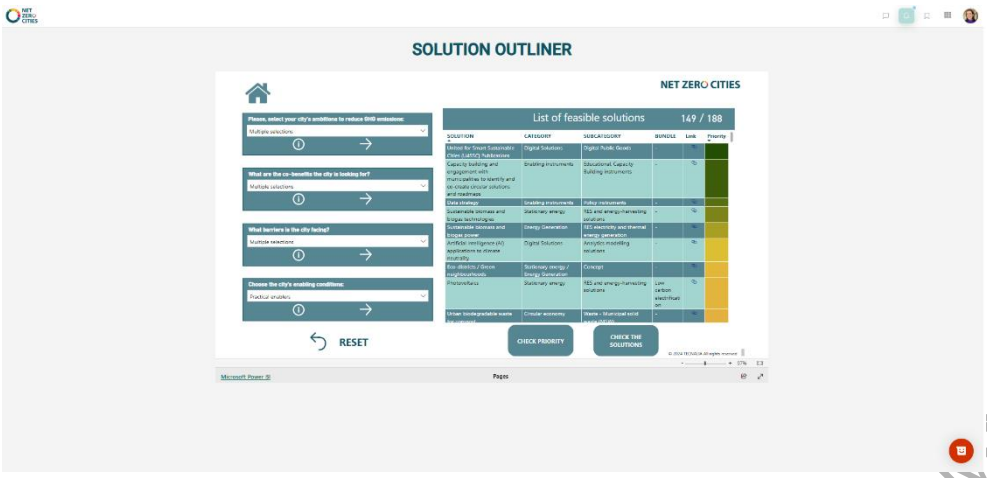

Figure 10 Solutions Outliner tool

3.1.5 Solutions Bundle

The Solutions Bundle offers cities a dynamic, interactive visualisation of city systems, providing a clear and engaging representation of complex concepts such as electrification or carbon capture. This tool fosters collaborative learning and enables stakeholders to engage in workshops where they can explore city challenges and brainstorm innovative solutions through shared visualisations. This tool will be further developed under NZC-SGA2 WP1.

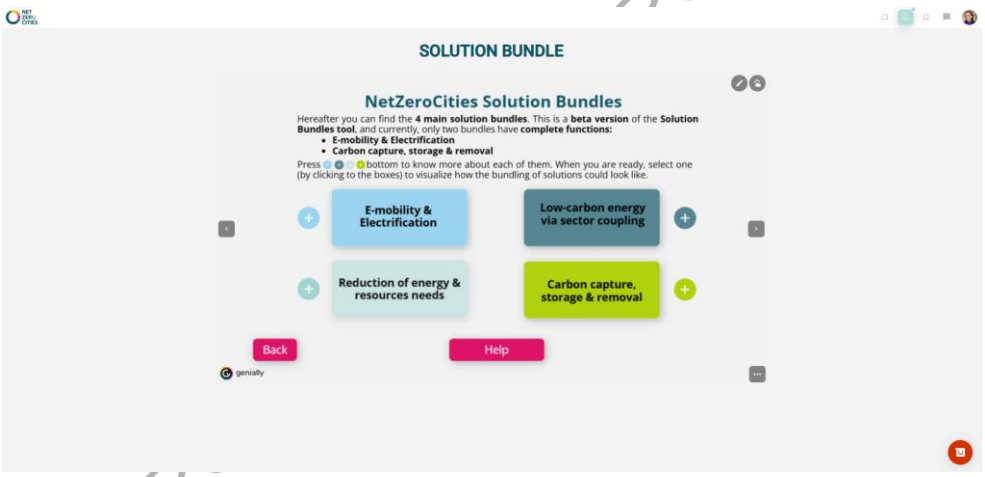

Figure 11 Solutions Bundle tool

3.1.6 Engagement Strategy Tools

The Ecosystem Activation Tool guides cities through a structured approach to engaging local citizens and urban stakeholders in the climate transition process. Based on a questionnaire, the tool identifies user needs and filters NZC services accordingly, helping cities activate relevant segments of their local ecosystem. This tool is essential for fostering participation and building a collaborative approach to city-wide climate action.

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Figure 12 Engagement Strategy tools

3.1.7 NetZeroPlanner

The NetZeroPlanner is designed to help cities develop strategic climate neutrality plans. It offers a structured approach for cities to define their pathways, set targets, and allocate resources effectively. This tool will be a significant asset for long-term planning, enabling cities to map out their actions and milestones towards climate neutrality.

The tool is currently accessible to all city users, with NetZeroCities consortium users able to request access for testing. Future iterations will enable any user to create a test city within the tool. A progress monitoring feature will be developed in Q4 2024 to track cities' implementation of Climate City Contracts.

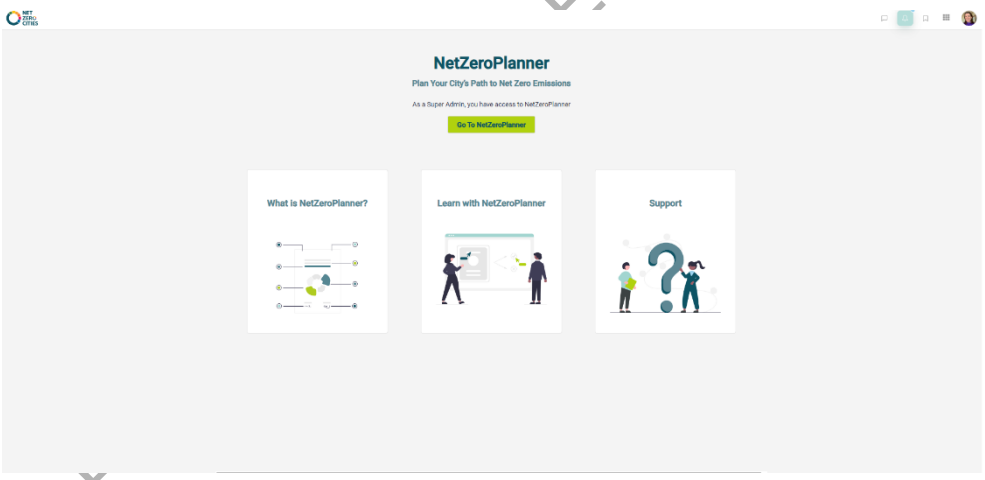

Figure 13 NetZeroPlanner tool landing page

3.1.8 Barometer

The Barometer is a tool that visualises Mission aggregated data insights. The tool presents:

- Emissions reduction objective vs year-on-year reported total emissions.
- Reduction effort per sector.
- Baseline vs 2030 projected emission reductions per sector.

The used data includes population size, GHG inventories, baseline and target data from Window 1-3 CCCs, the original NetZeroCities Expressions of Interest, Covenant of Mayors, CDP-ICLEI Track and

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Eurostat. The tool is currently available on the portal and will continue to evolve as new datasets become available.

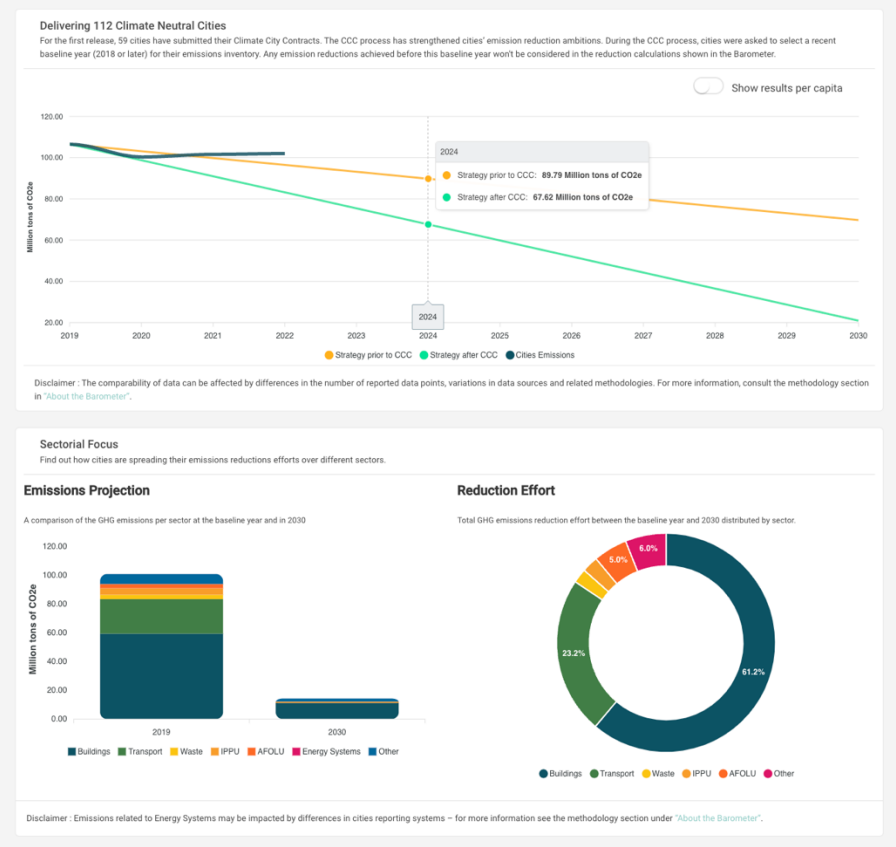

Figure 14 Cities Mission Barometer

By the end of M18, the Barometer will include W4 cities' data and a broadened analysis that includes the distribution of CCC commitments signatories over several classifications and an overview of cities' action plans distributed over systemic levers and sectors, as well as the estimated costs and reduction potential. In Q2 2025, there are plans to further improve the Barometer by exploring the possibilities of including:

- Additional city **data sources**
- **Co-benefits** of action plans
- **Scope 3** emissions to cities' inventories
- **Investment** data (CAPEX/OPEX)

3.2 Upcoming interactive tools

3.2.1 City Dashboard

The Dashboard visualises city-level data and integrates with the Barometer to provide a cohesive overview of progress and performance. City users can switch the Barometers view to show only the data from their own city, enabling the dashboard functionality. In the aggregated (barometer) view, data from cities awarded the mission label can be filtered down to the level of the individual city. Data from all other cities is then only visible in an aggregated collection of multiple cities.

Dashboard launch is marked for the end of M18.

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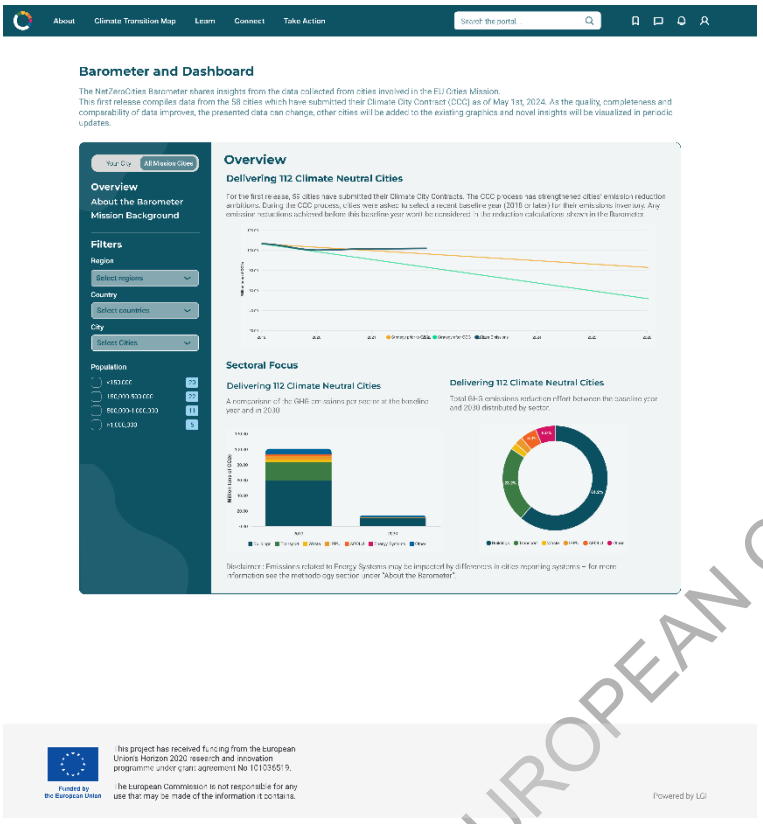

Figure 15 A conceptual design of the updated barometer and dashboard tool

3.2.2 Climate Actions Catalogue

The Climate Actions Catalogue is a searchable repository of real-life city climate actions. It allows users to explore and filter successful climate initiatives based on various parameters, providing a valuable reference for cities looking to implement similar actions. This tool is expected to enhance knowledge-sharing and inspire the development of locally tailored climate strategies by showcasing diverse solutions from around the world. Development of this tool is likely to take place in Q1 2025. Furthermore, under WP5, the connectivity of this tool to the NetZeroPlanner tool will be explored.

4 CCC digital workspace

The CCC digital workspace currently supports the CCC upload and review process in a controlled and data-secure environment. The workspace will soon be expanded to support CCC iteration by the end of 2025, with initial designs (see section 4.2) currently being reviewed by the portal development team for technical feasibility.

4.1 CCC submission and review

4.1.1 CCC submission

The city submission interface is accessible only to city users who have been allocated city administrator rights. The submission space sits within the City Dossier (see Figure 16). Detailed step-by-step instructions on CCC upload for cities are provided to cities using ScribeHow. See Figure 17 for an overview of the CCC submission process.

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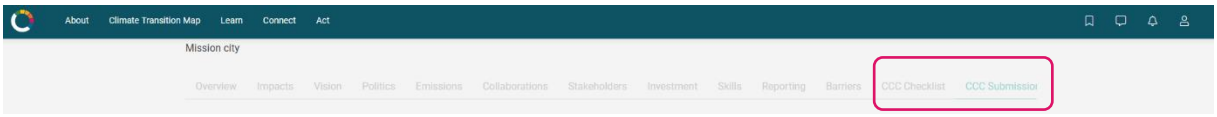

Figure 16 CCC submission & checklist tabs within City Dossier

The Portal also hosts a **digital CCC checklist** (see appendix I). This can also be found through the City Dossier for city users. CCC submission can only be completed with a completed checklist.

The Checklist is divided into 3 main categories, each corresponding to one of the mandatory elements of the CCC:

- CCC Commitment document & overall coherence
- CCC Action Plan
- CCC Investment Plan

Questions have Yes and No answer formats or a range of four to select from (A, B, C, D). For each question, only one answer can be selected. CCCs can only be submitted once the CCC checklist progress bar is 100% complete.

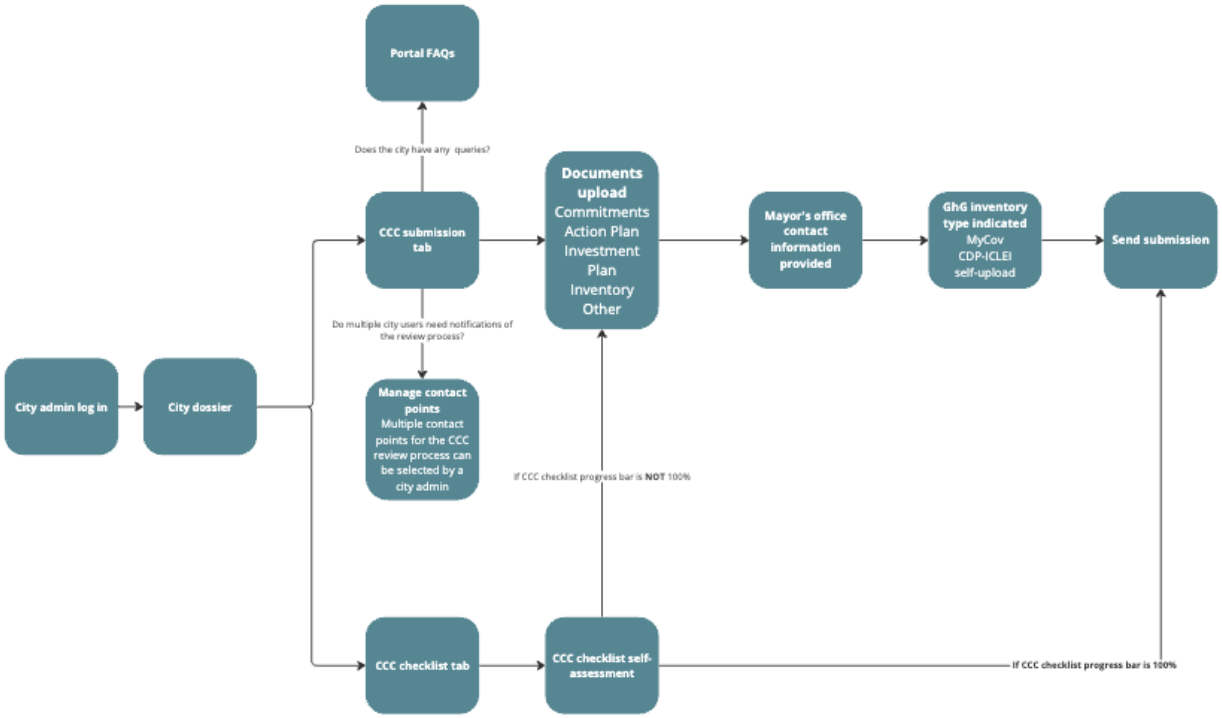

Figure 17 CCC submission process

4.1.2 CCC review

The CCC Review Space enables reviewers to assess and provide feedback on cities' CCC submissions The CCC review space (see Figure 18) is available only to portal users granted reviewer access to CCC documents. There are additional access rights for reviewers who need access to a city's Investment Plan. Its design supports an efficient and structured review process with the following key functionalities:

- Accessing submissions: Reviewers can select a specific city's submission from the dashboard, where documents are organised by type (e.g., CCC Commitments, Action Plans, Investment Plans).

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- Viewing and downloading: Each document can be opened directly within the portal or downloaded for offline review.
- Completeness checklist: A built-in checklist helps reviewers track whether mandatory elements are included, with options to mark items as "complete" or flag issues for follow-up.
- Providing feedback: A dedicated comment section allows reviewers to leave detailed notes for cities, ensuring clear communication. Comments are timestamped for reference.
- Status tracking: Submissions can be marked as "in review," "complete," or "requires revisions," providing a clear overview of submission progress.
- Notifications: Automated alerts notify both reviewers and city users of updates, ensuring timely communication and action

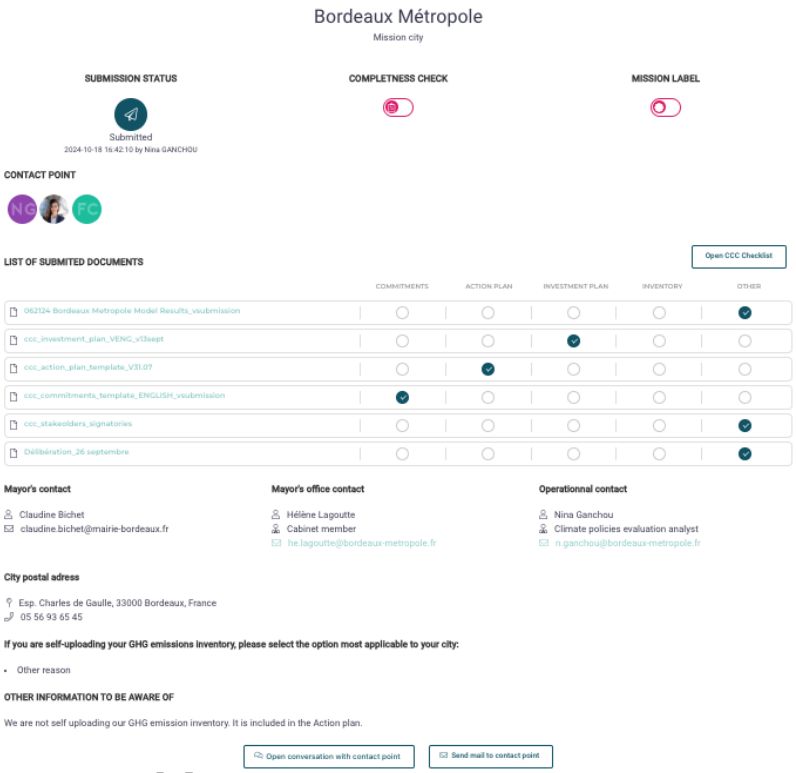

Figure 18 CCC review space

4.2 CCC iteration

The development of a CCC iteration upload space is planned for M19 and M20. It will serve as a dedicated area within the portal's existing CCC submission space, allowing cities to upload new or updated documents critical to their climate neutrality journey.

This feature will support cities in submitting progressive versions of CCC documents. While iteration is not mandatory for maintaining the EU Mission Label, cities are encouraged to leverage this feature to enhance their CCC as a dynamic implementation tool.

In this space, each upload section will be clearly labelled in a sequential manner (e.g., V1, V2, V3) to indicate distinct iterations, encouraging continuous development without requiring cities to re-upload all documents in each version. Cities can add as many or as few documents as they wish per iteration, streamlining the process by allowing partial updates. Once a new version (e.g. V2) is initiated, the previous version will be automatically locked and archived, preserving a record of past submissions.

To support transparent documentation of changes, a comment box will accompany each upload, enabling cities to describe specific updates or modifications made since the previous submission. An integrated Completeness Checklist will help cities track their progress within each version, with the section marked 'complete' once the city has uploaded at least one new document and updated the

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checklist. Upon completion, the system will automatically unlock the next upload section for future updates. Additionally, notifications will notify the CA of any new CCC activity.

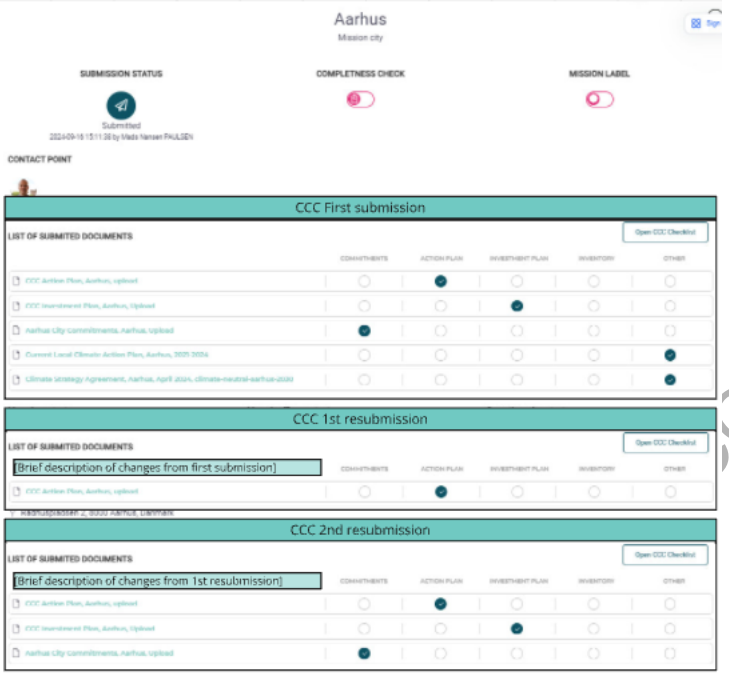

Figure 19 CCC iteration space V1 mock-up

5 P2P collaboration spaces & social network

A central objective of the NetZeroCities portal is to connect users to their peers and to a diverse community of climate neutrality changemakers and practitioners. The community spaces on the portal support cities on their journeys to climate neutrality by creating a space for networking, exchange and knowledge dissemination.

The **Community Space** refers to the social network services and spaces hosted on the portal. The services enable open discussion, user-to-user connections and cross-posting between all registered users, which include Mission Cities and their transition teams, other cities, public and private partners, academic institutions and independents.

The services that collectively compile the Community Space include:

The **Global feed** is the main social network space on the portal. Users post about innovation, collaboration opportunities, events, as well as milestones, achievements and challenges. All users have access to the global feed and can share posts. The feed is moderated, and all content should adhere to the portal code of conduct.

Group pages provide a space for more structured ongoing interactions, with facilities for document sharing, event organisation, and collaborative working by cities and other stakeholders. Groups can be private or public depending on their purpose and the chosen setting: Public groups are accessible to all portal users, whereas membership to private groups is by request. Administrators approve or reject membership requests and moderate content.

There are currently over 160 group pages on the Portal. These can be grouped into the following categories:

- Geographical groups: For users from or working with individual cities, or cities in a specific country or regions. These groups allow users to use their native languages or exchange on contextual opportunities and challenges.

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- Typography groups: For users from or working with cities involved in specific actions or activities, i.e., Pilot cities, Mission cities, Twin cities etc.
- Thematic and learning groups: For users interested in a specific theme or topic related to climate neutrality, i.e., circular economy, scope 3 emissions, etc.

The **Events calendar** allows users to sign-up and promote learning and exchange events related to climate neutrality in cities. Typically, the events include webinars and learning/sharing events.

The **City profile pages** are managed by city administrators. Currently 181 cities have a profile on the portal and feedback has been gathered on how to expand the profiles to highlight key milestones and achievements in the cities. The profiles feature a directory of city users from the city and portal users can contact a city representative directly on the portal. City profile improvements are currently being explored and will be implemented in Q1 2025.

User profiles are also built into the portal to allow users to network and connect. The user profiles include a photo, personal information (contact, position and organisation), as well as languages spoken and a short user biography.

The portal's in-built **Chat function** allows users to initiate a conversation with any portal user in a safe and intuitive space. Groups chats can also be created, and new users can be added to a group chat.

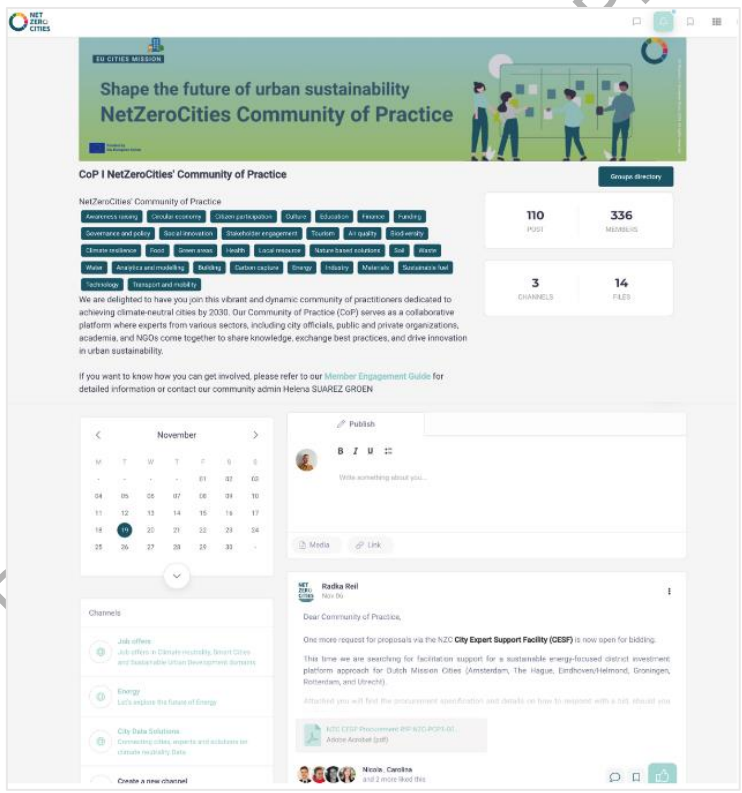

Figure 20 NetZeroCities Community of Practice online space

6 Back-end systems

6.1 Portal registration and log-in management

For registration and access, a password-free authentication process has been implemented. Users authenticate with a six-digit PIN system. Each PIN is a unique code tied to the specific user and is valid only once – acting *de facto* as a *one-time password* (OTP). This code is sent directly to the user's email, allowing them to authenticate by entering it correctly.

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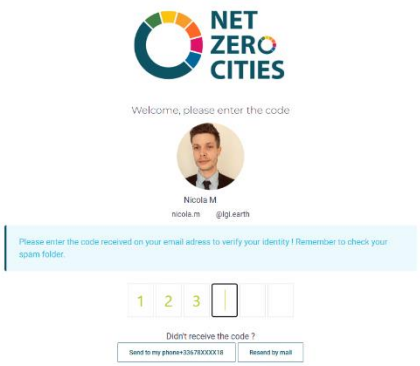

Figure 21 Login screen

To account for instances where the email containing the six-digit pin may be lost, redirected to a spam folder, or blocked by cybersecurity filters within users' organisations, users also have the option to request the pin to be sent via text message to their mobile phone (provided they entered the correct mobile phone number during registration). The button enabling users to request the code by text appears after 30 seconds.

Once authenticated, the user's device is recognised through a token stored in the cached data of the browser. This system is also used on other social network platforms to enhance ease of use and improve user experience. The token remains valid for three months. Each time the user visits the portal, including when it is unnecessary to authenticate via a PIN, the connection token is renewed for three months. If the user clears their browsing history or cached data, they must repeat the authentication process.

Type of registration	What is your role?	Additional fields	Additional fields	Final user role
Spontaneous registration or by invitation	I'm employed by a city	Choose city and indicate position	I requested City Profile Admin rights	City Admins
				City user
	I work for a European, National or Regional Authority	Public Authority you are active in and indicate position		Public Authority user
	I work for a public or private organisation working on urban transformation	Enter the organisation and indicate position		Community of Practice or local partner user
Invitation to join the NetZeroCities Portal by a registered user	The invited user has not registered yet			Simple user
Recognition of registration links specific to each organisation and intended for the consortium only	I'm a member of the NetZeroCities Project	Automatic organisation assignment		Consortium user
			I am a City Advisor	City Advisor
			I was granted Super admin rights on the NetZeroCities Portal	Super Admin

Table 1 User log-in process

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When logged in on the Portal, users have different access and permissions levels. They are defined in Table 2 below, which can be modified at any moment.

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Module / Page	Any user	Simple User	City User	City Admin	Public Authority User	CoP / Local Partner User	Consortium User	City Advisor	Super Admin
Newsfeed			•	•	•	•	•	•	•
User directory			•	•	•	•	•	•	•
Groups			•	•	•	•	•	•	•
Events			•	•	•	•	•	•	•
Cities			•	•	•	•	•	•	•
Knowledge	•	•	•	•	•	•	•	•	•
Climate Transition Map	•	•	•	•	•	•	•	•	•
Finance Guidance Tool	•	•	•	•	•	•	•	•	•
Engagement Strategy tools			•	•	•	•	•	•	•
EU Climate Projects Navigator			•	•	•	•	•	•	•
NetZeroPlanner			•	•	•	•	•	•	•
Chat			•	•	•	•	•	•	•
City Dossier			• Access to user's city only	• Access to user's city only			• Access to all Dossiers	• Access to all Dossiers	• Access to all Dossiers
CCC Review (access rights granted by Super Admins)						•	•	•	•
Barometer	•	•	•	•	•	•	•	•	•
FAQ	•	•	•	•	•	•	•	•	•
Settings			•	•	•	•	•	•	•
Admin									•

Table 2 Module access by user type

Please note:
Restrictions may be applied within certain modules. These restrictions are based on status within the module rather than the user's role. For example, all users can create groups. But within a group, only group administrators can create a chat channel. All users can view City Pages, but only City Page Admins can modify the City Page for which they are Admin.

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6.2 Tagging system

The Portal currently uses a set of tags to index resources in the Knowledge Repository. These tags support search functions for all resource types but don't limit the searchability of resources, which can be done also through regular text-based searches, filters, or a combination of these methods. The current tags (see Table 3) were initially developed under WP6 to WP10 in the first NZC Grant Agreement. The main requirements for these tags can be seen in D10.4 of the NZC GA.

Social & Economy	Sustainable environment	Science & Technology
Culture	Biodiversity	Technology
Tourism	Climate resilience	Building
Governance and policy	Nature based solutions	Transport and mobility
Education	Soil	Industry
Citizen participation	Waste	Energy
Stakeholder engagement	Water	Sustainable fuel
Social innovation	Food	Carbon capture
Awareness Raising	Health	Materials
Circular economy	Air quality	Analytics and modelling
Funding	Green areas	
Finance	Local resource	

Table 3 Current tag list

A hackathon in M13 brought significant updates to the existing tagging structure, expanding the system to be both comprehensive and strategically layered. The new structure categorises tags into core tags and granular tags:

- **Core Tags**: Core tags, such as resource type, intended users, and high-level topics, are mandatory and applied to all resources for consistent indexing.
- **Granular Tags**: These tags capture more detailed information like technical domains, change levers, and Climate Transition Map connections and are used to integrate resources with other portal elements (e.g., tools, groups, discussions).

The new tagging system will enable seamless back-end connectivity to enable effective integration of all Portal content, including tools, discussions and groups. See Appendix III for examples of new tagging structures.

6.3 Third-party Back-end Software

6.3.1 DeepL

Translation on posts in the NetZeroCities portal is powered by DeepL, a leading AI-based translation service known for its high accuracy and fluency. DeepL supports translations for nearly all official European Union languages, with the exceptions of Irish and Maltese. Additionally, it offers translations for several non-EU languages, including Arabic, Chinese, Japanese, and Korean. To ensure information is protected and cannot be read by third parties, DeepL employs end-to-end encryption and is fully GDPR-compliant. On each post within the NetZeroCities community space, users can use a prompt to translate the text. The translation language defaults to the language of the user's web browser.

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Figure 22 Translation option on comment

6.3.2 Hotjar

Hotjar is integrated into the NetZeroCities Portal to enhance user analytics and improve user experience. Hotjar (see Figure 23) provides anonymised insights into user behaviour, helping to identify issues and optimise portal functionality. The tool supports portal development by tracking user journeys, gathering key data and KPIs, and collecting real-time feedback via questionnaires on new and existing modules. This data is crucial for portal improvements. Following Hotjar integration, the portal privacy policy was updated to Hotjar's use.

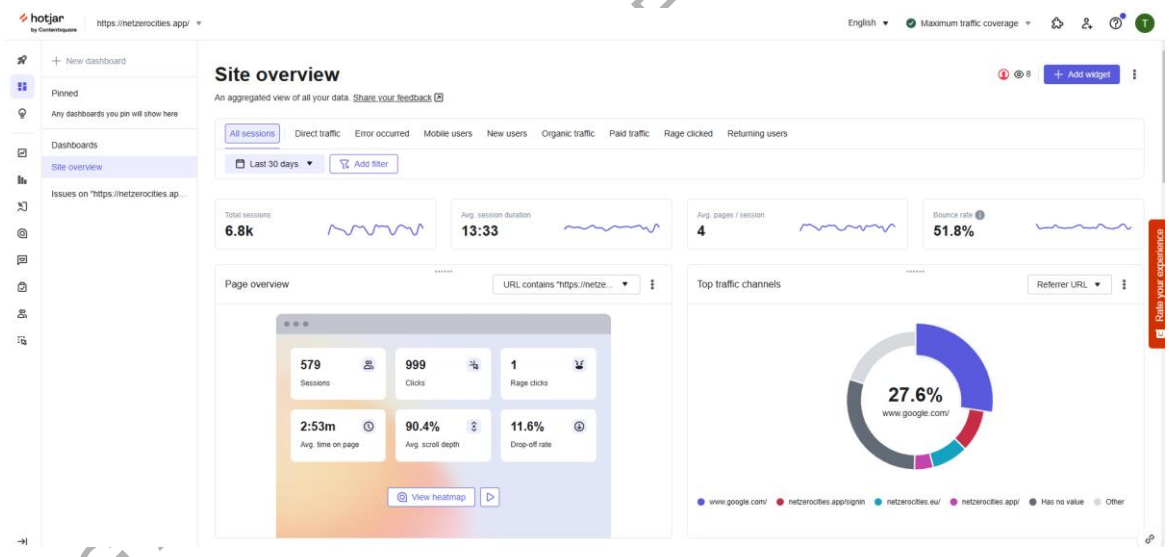

Figure 23 NZC portal HotJar dashboard

6.3.3 Algolia

Algolia is a powerful search and discovery API that will soon power the Knowledge Repository, offering advanced functionalities like typo-tolerance, synonym detection, and dynamic re-ranking, as outlined in Section 2.2. Its integration provides faster and more accurate search results, enhancing the user experience by ensuring relevant resources are easily accessible. Beyond the Knowledge Repository, we plan to explore expanding Algolia's capabilities across the wider portal throughout 2025. This will include improved connectivity and searchability across different portal modules, enabling a more seamless user experience and fostering better integration of portal content.

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6.3.4 Jitsi

Jitsi is an open-source videoconferencing tool embedded into the portal, offering an integrated option for users who wish to create events directly within the platform. It supports features like HD video and audio calls, screen sharing, and meeting moderation, making it an accessible and versatile choice for collaboration. Users can choose to host meetings through Jitsi or upload external links to other tools like Microsoft Teams or Zoom.

6.4 Web Technology, Data Licenses, Open & Proprietary Software

A primary aim of the portal is to use whenever possible open-source software and APIs. For the server, we use the php8 technology; it is a powerful and widely accessible programming language with open-source code, mainly used for website development.

All the software licenses we use are open-source, except for those used for some APIs. Below in Table 4 is the list of these licenses.

Licence software (open source):	APIs :
• PHP 8 • Linux • CentOS 8 • Plesk • Apache 2.2 • MySQL 5.5 • nodejs • javascript • jaxon • CK editor	• Jitsi (functionality: communication, meeting and chat) • DeepL (functionality: translation) • Algolia (module : Knowledge Repository)

Table 4 Overview of licenses used by the portal

Moreover, the site and the data are hosted on a secured server whose characteristics are the following:

- Firewall, anti-DDoS Protection
- Load balancers
- Unlimited bandwidth 1 Gbit/s guarantee
- Service Level Agreement – 99.95 %
- Daily backup on remote backup server 500Go (FTPS, NFS)
- Data centre in France (Roubaix 59)*
- Handling of incidents in 24/7 and Guaranteed response time 15 minute
- SSL Certificate

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Conclusion

Since its launch in September 2022, the NetZeroCities portal has transitioned from a conceptual framework outlined in NZC D3.1 to a fully operational platform. The portal now serves as a dynamic hub supporting cities and other stakeholders in their climate neutrality efforts. Its development is guided by iterative enhancements and community feedback, resulting in new functionalities such as a CCC upload space, a suite of integrated tools, and improved technical connectivity.

As highlighted in NZC D3.5, the portal has demonstrated substantial usage and performance, aligning with its original design principles while adapting to the needs of Mission Cities. Looking ahead, usability enhancements are planned for 2025, focusing on greater language accessibility and mobile optimisation. The portal's ability to foster collaboration and enable resource discovery remains central to its ongoing development.

To support CCC implementation phase for Mission Cities, and the delivery of services to other cities via NZC-SGA2, the portal is evolving to enhance tool interconnectivity and resource navigation. In the coming years the portal team will focus on exploring options to link reporting tools to the Barometer and Dashboard, as well as efforts to integrate the Climate City Capital Hub to the portal for streamlined financial resources. Additionally, the Learning Hub outlined in NZC-SGA2 T1.4 will be supported by the portal.

Finally, the portal's future vision is developed collaboratively, in alignment with the exploitation work carried out for the Mission Platform under NZC T3.4, NZC-SGA1 T9.7, and NZC-SGA2 T1.3. This ensures that its evolution is closely tied to the long-term goals of the NetZeroCities initiative.

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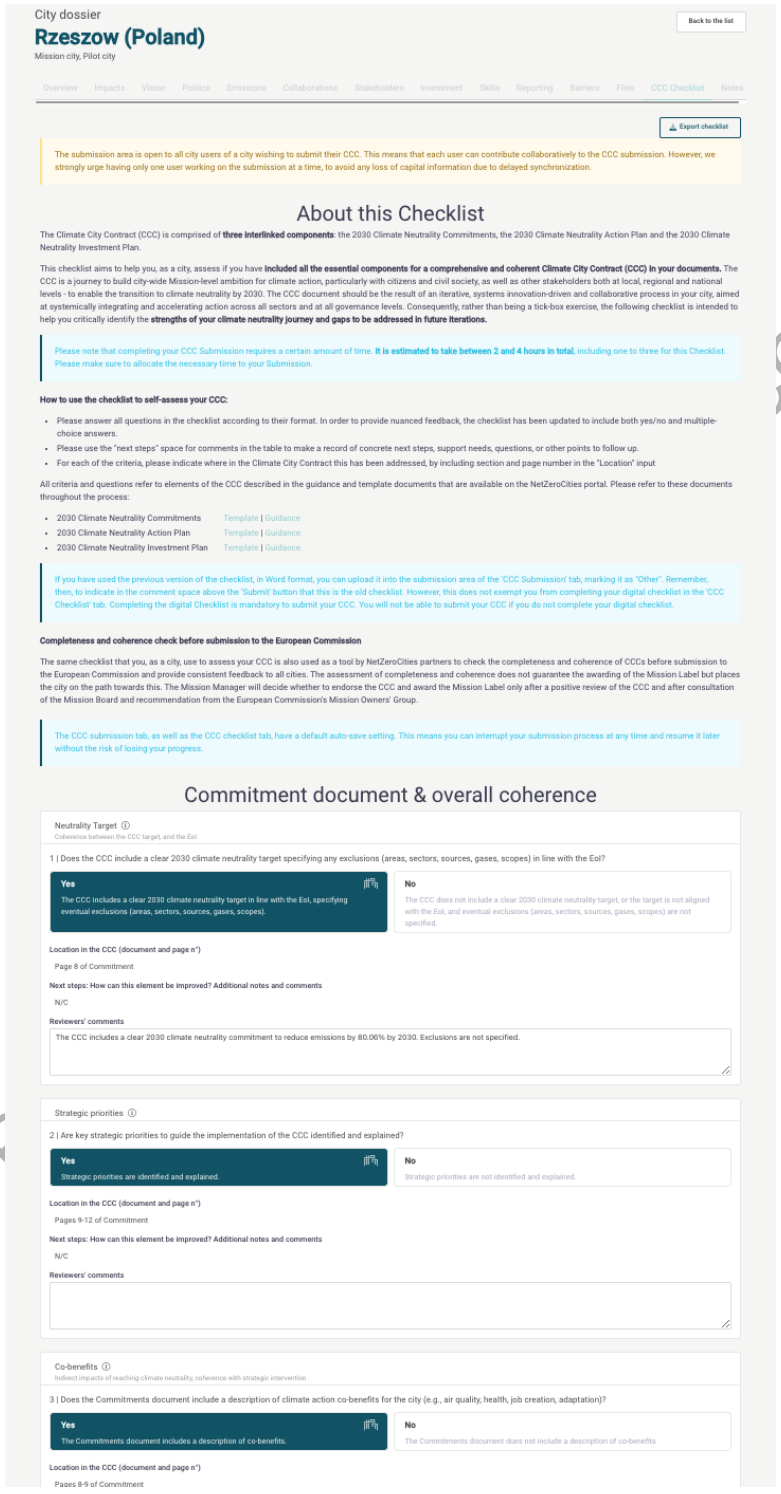
Appendix I: CCC digital checklist



City dossier

Rzeszow (Poland)

Mission city, Pilot city

Back to the list

Overview | Impacts | Vision | Politics | Emissions | Collaborations | Stakeholders | Investment | Skills | Reporting | Barriers | Files | CCC Checklist | Notes

Export checklist

The submission area is open to all city users of a city wishing to submit their CCC. This means that each user can contribute collaboratively to the CCC submission. However, we strongly urge having only one user working on the submission at a time, to avoid any loss of capital information due to delayed synchronization.

About this Checklist

The Climate City Contract (CCC) is comprised of **three interlinked components**: the 2030 Climate Neutrality Commitments, the 2030 Climate Neutrality Action Plan and the 2030 Climate Neutrality Investment Plan.

This checklist aims to help you, as a city, assess if you have **included all the essential components for a comprehensive and coherent Climate City Contract (CCC) in your documents.** The CCC is a journey to build city-wide Mission-level ambition for climate action, particularly with citizens and civil society, as well as other stakeholders both at local, regional and national levels - to enable the transition to climate neutrality by 2030. The CCC document should be the result of an iterative, systems innovation-driven and collaborative process in your city, aimed at systemically integrating and accelerating action across all sectors and at all governance levels. Consequently, rather than being a tick-box exercise, the following checklist is intended to help you critically identify the **strengths of your climate neutrality journey and gaps to be addressed in future iterations.**

Please note that completing your CCC Submission requires a certain amount of time. **It is estimated to take between 2 and 4 hours in total**, including one to three for this Checklist. Please make sure to allocate the necessary time to your Submission.

How to use the checklist to self-assess your CCC:

- Please answer all questions in the checklist according to their format. In order to provide nuanced feedback, the checklist has been updated to include both yes/no and multiple-choice answers.
- Please use the "next steps" space for comments in the table to make a record of concrete next steps, support needs, questions, or other points to follow up.
- For each of the criteria, please indicate where in the Climate City Contract this has been addressed, by including section and page number in the "Location" input

All criteria and questions refer to elements of the CCC described in the guidance and template documents that are available on the NetZeroCities portal. Please refer to these documents throughout the process:

- 2030 Climate Neutrality Commitments Template | Guidance
- 2030 Climate Neutrality Action Plan Template | Guidance
- 2030 Climate Neutrality Investment Plan Template | Guidance

If you have used the previous version of the checklist, in Word format, you can upload it into the submission area of the 'CCC Submission' tab, marking it as "Other". Remember, then, to indicate in the comment space above the 'Submit' button that this is the old checklist. However, this does not exempt you from completing your digital checklist in the 'CCC Checklist' tab. Completing the digital Checklist is mandatory to submit your CCC. You will not be able to submit your CCC if you do not complete your digital checklist.

Completeness and coherence check before submission to the European Commission

The same checklist that you, as a city, use to assess your CCC is also used as a tool by NetZeroCities partners to check the completeness and coherence of CCCs before submission to the European Commission and provide consistent feedback to all cities. The assessment of completeness and coherence does not guarantee the awarding of the Mission Label but places the city on the path towards this. The Mission Manager will decide whether to endorse the CCC and award the Mission Label only after a positive review of the CCC and after consultation of the Mission Board and recommendation from the European Commission's Mission Owners' Group.

The CCC submission tab, as well as the CCC checklist tab, have a default auto-save setting. This means you can interrupt your submission process at any time and resume it later without the risk of losing your progress.

Commitment document & overall coherence

Neutrality Target

Coherence between the CCC target, and the EoI

1 | Does the CCC include a clear 2030 climate neutrality target specifying any exclusions (areas, sectors, sources, gases, scopes) in line with the EoI?

Yes — The CCC includes a clear 2030 climate neutrality target in line with the EoI, specifying eventual exclusions (areas, sectors, sources, gases, scopes).

No — The CCC does not include a clear 2030 climate neutrality target, or the target is not aligned with the EoI, and eventual exclusions (areas, sectors, sources, gases, scopes) are not specified.

Location in the CCC (document and page n°)

Page 8 of Commitment

Next steps: How can this element be improved? Additional notes and comments

N/C

Reviewers' comments

The CCC includes a clear 2030 climate neutrality commitment to reduce emissions by 80.06% by 2030. Exclusions are not specified.

Strategic priorities

2 | Are key strategic priorities to guide the implementation of the CCC identified and explained?

Yes — Strategic priorities are identified and explained.

No — Strategic priorities are not identified and explained.

Location in the CCC (document and page n°)

Pages 9-12 of Commitment

Next steps: How can this element be improved? Additional notes and comments

N/C

Reviewers' comments

Co-benefits

Indirect impacts of reaching climate neutrality, coherence with strategic intervention

3 | Does the Commitments document include a description of climate action co-benefits for the city (e.g., air quality, health, job creation, adaptation)?

Yes — The Commitments document includes a description of co-benefits.

No — The Commitments document does not include a description of co-benefits

Location in the CCC (document and page n°)

Pages 8-9 of Commitment

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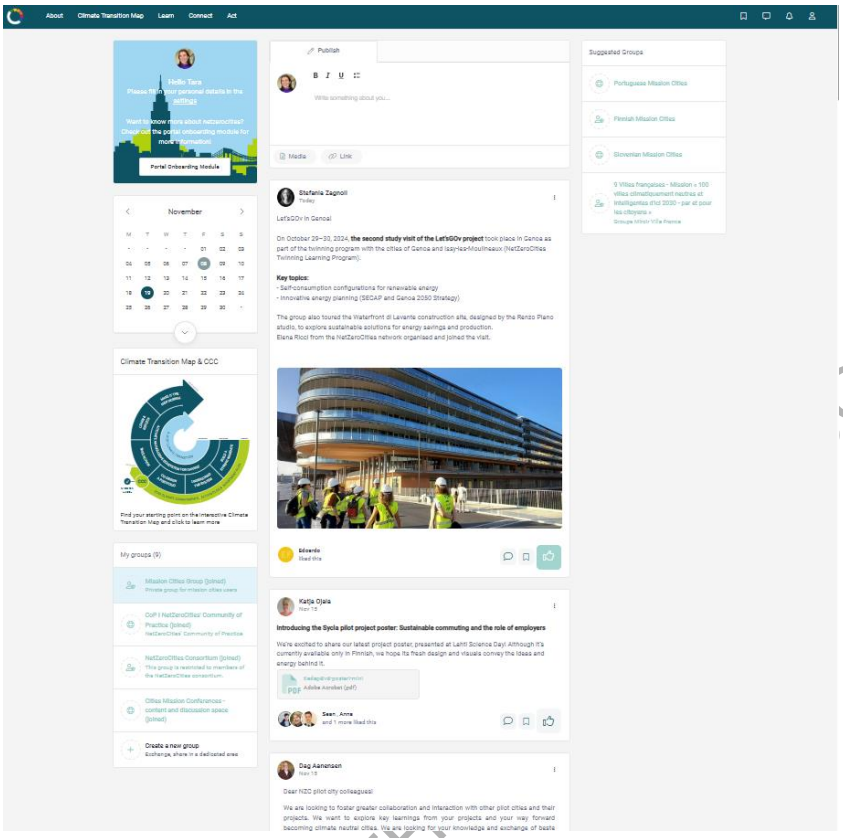
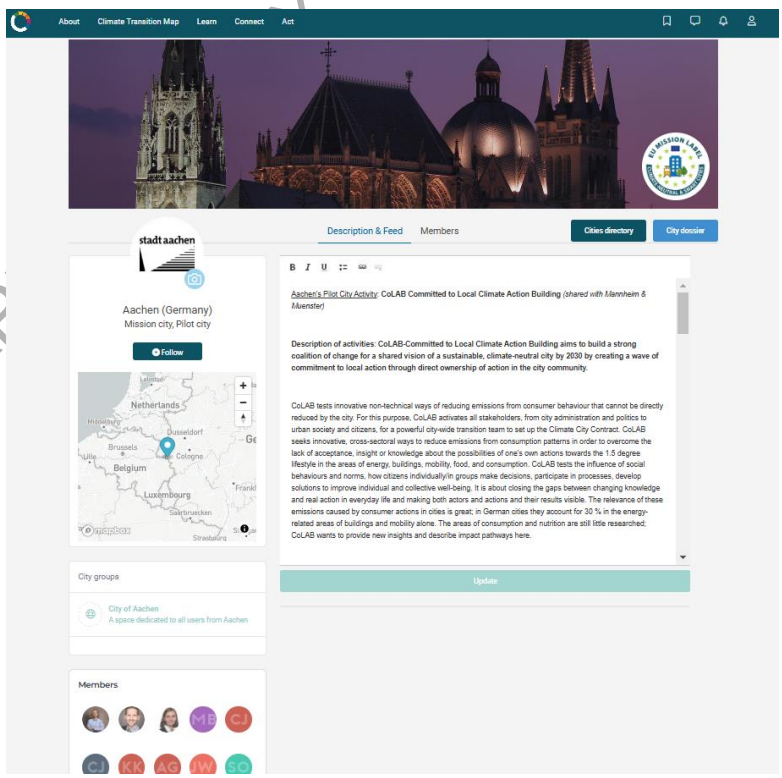
Appendix II: Community space features

Global feed



City profile pages



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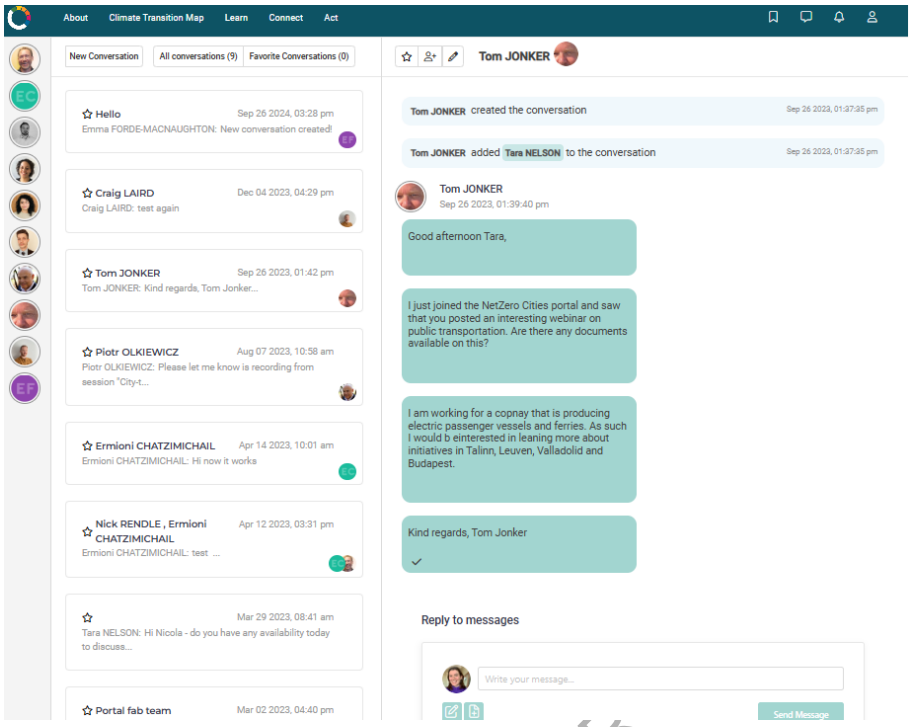
Chat module



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Appendix III: Updated tagging structure

Core tags – resource type

Tag Level 1 - Type of Resource	Tag Level 2 - Sub-Category
Page	Overview
	Focused
methods and canvas	
videos	
podcasts	
academic publication	
solution factsheets	Household/Building Level
	Neighbourhood Level
	City Level
	Country Level
case studies	Household/Building Level
	Neighbourhood Level
	City Level
	Country Level
visual case studies	Household/Building Level
	Neighbourhood Level
	City Level
	Country Level

Core tags – intended users

Tag Level 1: Intended user	Tag Level 2: Expertise/Role of Officer
City User	All Cities - No prior subject knowledge required
	All Cities - Prior subject knowledge required
	All Cities - Only relevant for expert officers
	Only relevant for Mission Cities officers
	Only relevant for Pilot Cities officers
	Only relevant for Twin Cities officers
NZC Consortium Users	
Other Public Authorities and Local Partners	
Press	

Core tags – high-level topic

Tag: High-Level Topics
What is NZC and the Mission
What and why climate neutrality
What is a CCC
Action Planning & Finance
Impact pathways
Systemic innovation
Buildings - Stationary Energy
Energy Generation

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Transport & Mobility
Circular Economy
Green Industry
Nature Based Solutions
Governance and policy
Participation, culture and democracy
Social Innovation
Learning and capabilities
Technology and infrastructure

Example of updated **granular tags**. This table does not include all Tags (e.g. Buildings, Mobility).

Tag Level 1 (Solution Outliner sectors & enabling instruments)	**Tag Level 2 (Technical Solutions tags categories from D10.2)**	**Tag-Level 3 (Sub-thematic area tags for K/Rep resources)**	**GHG Emissions Scope (same hierarchy as Tag Level 3 but applies as a separate filter)**
Circular Economy	Waste	MSW collection and separation	1 & 3
		Textiles	1 & 3
		Electronics and ICT	1 & 3
		Batteries and vehicles	1 & 3
		Plastics	1 & 3
		Packaging	1 & 3
		Construction & buildings (reducing embedded emissions)	1 & 3
		Biodegradable waste & food	1 & 3
	Water	Water recovery and reuse at building level	1 & 3
Green industry	Green industry	Carbon Capture & Storage / Carbon Capture & Utilisation	Offset
		Replacement of equipment (electrification, higher energy efficiency) in industry processes	1 & 2
		Industrial heat pumps (process energy)	1 & 2
		Energy efficiency & energy management in industrial processes	1 & 2
		Industrial symbiosis (process energy)	1
Nature-based solutions	Urban carbon storage and sequestration, and singular green infrastructure	Net increase in trees and green spaces, public space	Offset
		Soils	1 & 3
	Water interventions	Drainage solutions	1 & 3
		Irrigation and water	1 & 3

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