DIAMOND

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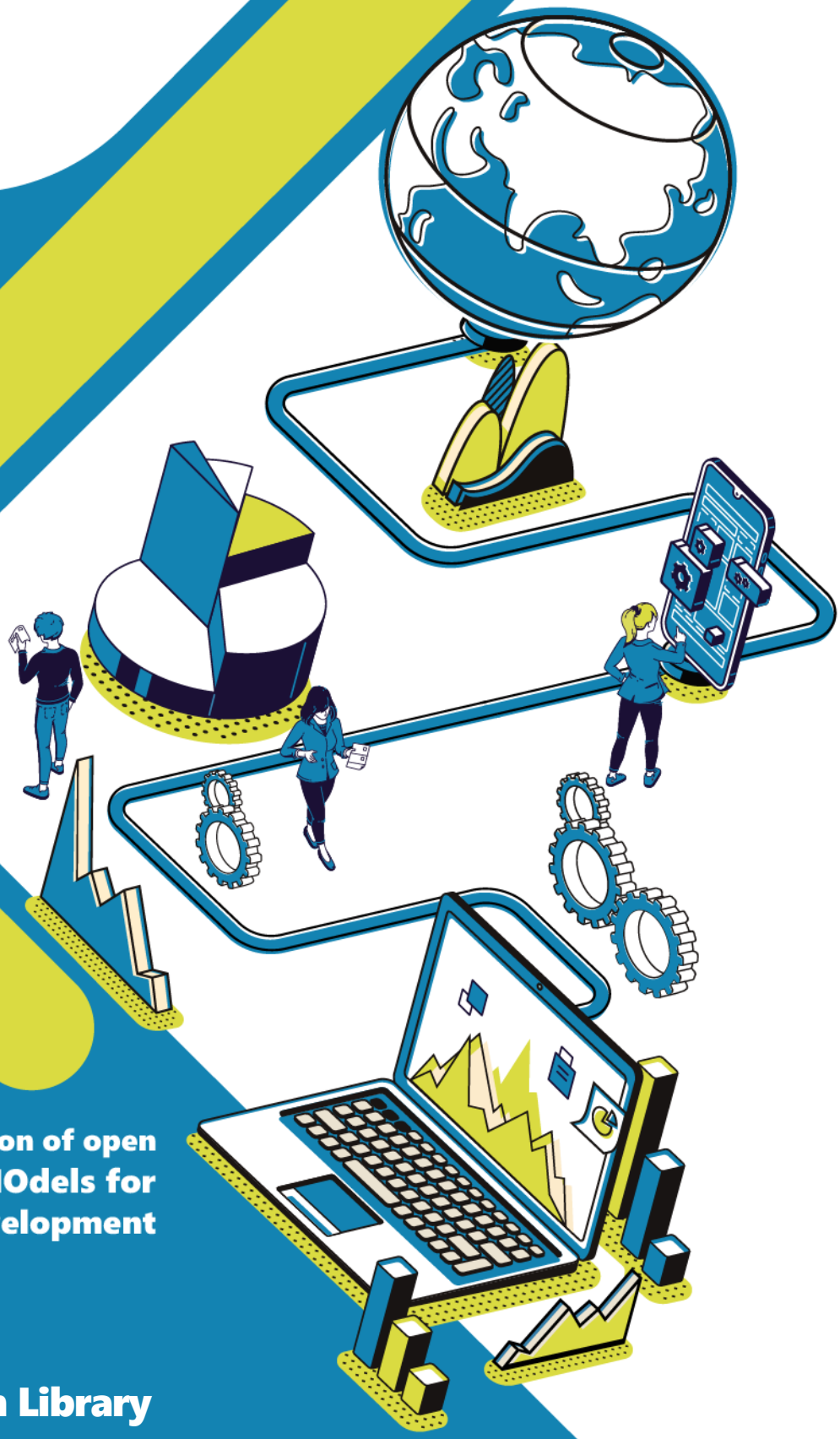

Delivering the next generation of open Integrated Assessment MOdels for Net-zero, sustainable Development

D6.8 - IAM Application Library

WP6 – Open

28/11/2025

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EC Summary Requirements

1. Changes with respect to the DoA

The I²AM PARIS web platform has been revamped and rebranded, and is now referred to, as IAM PARIS web platform. No other changes with respect to the work described in the DoA.

2. Dissemination and uptake

The Application Library is primarily intended to assist different stakeholders and user groups working on climate action to find useful applications that can support their work based on the results of integrated assessment modelling and other relevant tools. In addition, the library includes databases and resources that can help modellers with model development, scenario analyses, and other use cases. The library will be extensively disseminated to the modelling community (e.g., through the newsletter of the Integrated Assessment Modelling Consortium) as well as through communication channels and events related to different user groups, e.g., the EU Sustainable Energy Week. This report will be especially helpful to researchers and advanced users of the library to understand the motivation and design choices behind the development of the first version of the library.

3. Short summary of results

This deliverable presents the initial version of the Application Library developed within the IAM PARIS platform, along with the first application produced under the DIAMOND project. The library intends to constitute a collection of software applications covering the full lifecycle of climate-economy and energy modelling, from model development and configuration to the communication and use of modelling results. Apart from applications developed or curated by the IAM PARIS team, this first release incorporates applications previously catalogued by the Integrated Assessment Modelling Consortium (IAMC) and the World Resources Institute (WRI), aiming to establish a comprehensive portal for applications that support climate action. More than 150 applications are currently featured in the Application Library. Both platform developers and external contributors can extend the library's content with ease using the platform's Content Management System (CMS), helping to keep the library up to date. To further facilitate the usability of the platform, an AI-based chatbot was developed within the DIAMOND project to support users navigate the model documentation and results available on the platform. In the final year of DIAMOND, a second version of the deliverable will be released (D6.9), building on the current functionalities of the library, to further strengthen its comprehensiveness, findability, and usability.

4. Evidence of accomplishment

The deployed application library in IAM PARIS (https://iamparis.eu/application_library), the GitHub repository of the first DIAMOND application on GitHub (https://github.com/i2amparis/iam-data-chatbot), and a GitHub repository documenting the data cleaning and processing activities for assembling the first application library (https://github.com/i2amparis/application-library-data). Additionally, this report aims to act as a descriptor of these resources.

Preface

DIAMOND will update, upgrade, and fully open six Integrated Assessment Models (IAMs) that are emblematic in scientific and policy processes, improving their sectoral and technological detail, spatiotemporal resolution, and geographic granularity. It will further enhance modelling capacity to assess the feasibility and desirability of Paris-compliant mitigation pathways, their interplay with adaptation, circular economy, and other SDGs, their distributional and equity effects, and their resilience to extremes, as well as robust risk management and investment strategies. This will be done via integration of tools and insights from psychology, finance research, behavioural and labour economics, operational research, and physical science. The project will develop a transdisciplinary scientific approach to legitimise the implementation process and co-create research questions that stretch the frontiers of climate science, as well as establish vibrant communities of practice to transparently open model enhancements and to develop capacities, thereby lowering the entrance barriers to the established IAM community.

ICCS	INSTITUTE OF COMMUNICATIONS AND COMPUTER SYSTEMS	EL
BC3	ASOCIACION BC3 BASQUE CENTRE FOR CLIMATE CHANGE - KLIMA ALDAKETA IKERGAI	ES
CESAR	KRATENA KURT	AT
CICERO	CICERO SENTER FOR KLIMAFORSKNING	NO
CYI	THE CYPRUS INSTITUTE	CY
E4SMA	ENERGY ENGINEERING ECONOMIC ENVIRONMENT SYSTEMS MODELING AND ANALYSIS SRL	IT
HOLISTIC	HOLISTIC IKE	EL
COMILLAS	UNIVERSIDAD PONTIFICIA COMILLAS	ES
ISINNOVA	ISTITUTO DI STUDI PER L'INTEGRAZIONE DEI SISTEMI (I.S.I.S) - SOCIETA'COOPERATIVA	IT
SEURECO	SEURECO SOCIETE EUROPEENNE D'ECONOMIE SARL	FR
UM	UNIVERSITEIT MAASTRICHT	NL
ESMIA	ESMIA CONSULTANTS INC.	CA
USMF	THE UNIVERSITY OF MARYLAND FOUNDATIION INC	US
UMD	UNIVERSITY OF MARYLAND	US
EPFL	ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE	CH
ETH	EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH	CH
UNIBAS	UNIVERSITAT BASEL	CH
Imperial	IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY AND MEDICINE	UK
Oxford	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD	UK
UCL	UNIVERSITY COLLEGE LONDON	UK

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Executive Summary

This deliverable describes the first version of the Application Library developed in the IAM PARIS platform as well as the first application developed by the DIAMOND project. The library is a catalogue of platforms, visualisations, interfaces, and utilities that can support the entire lifecycle of modelling for climate action, from model development and configuration to visualisation and use of the results. The first version of the library provides access to applications that were developed or collected by the IAM PARIS team. The library also includes links and descriptions to applications that were previously assembled by the Integrated Assessment Modelling Consortium (IAMC) and the World Resources Institute (WRI). Currently, more than 150 applications are featured in the Application Library. All applications are accessible through a user-friendly interface on the platform, allowing visitors to explore applications that feature specific topics, scales, and geographies and find the ones that best match their needs and abilities. Platform developers and external users can easily expand the application list through the Content Management System (CMS) of the IAM PARIS platform. This key functionality allows the library to stay up to date, increasing its relevance for the users and, subsequently, contributing to the longevity of the library and the IAM PARIS platform in general.

Towards this goal, an AI-based chatbot was also developed as part of the DIAMOND project, to help users navigate through model documentations and results that are included in the platform. The IAM PARIS Chatbot is a multi-agent conversational framework designed to facilitate user-friendly access to complex modelling data from the IAM PARIS platform. The system integrates natural language processing, semantic search, and data visualisation, enabling stakeholders to interactively explore details and results of integrated assessment and other models in the platform. This would be especially important for policymakers and other decision makers that have a specific use case in mind to support climate action but have limited knowledge of modelling nuances. By combining structured data retrieval with semantic reasoning and generative explanation, the Chatbot aims to democratise access to climate knowledge, accelerate scenario exploration, and enhance evidence-based decision-making in climate policy contexts.

While the library will be continuously updated in the coming years, the next version of this deliverable will be released towards the end of DIAMOND (Deliverable D6.9), documenting all new functionalities and content. More applications will be added while the library will be enriched with links to databases that are frequently used in modelling as well as utilities that support modelling applications in different stages. More filters and detailed metadata will be also added to help match more user groups such as local policymakers and financial actors with specific applications. On this, the AI-based chatbot will be further improved to help platform visitors identify the most fitting applications by providing their exact use case as a text prompt. The CMS and front end of the IAM PARIS platform will also be enhanced to allow users to easily develop applications that can be directly hosted in the platform.

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1 Introduction

Integrated Assessment Models (IAMs) have been used for over 30 years to underpin climate change mitigation research and inform climate action (Fisher-Vanden & Weyant, 2020). IAMs are often used in the context of scenario analysis, where different policy choices, technological advancements, and other parameters are modelled in IAMs to identify impacts and nuances of each potential future pathway (Elsawah et al., 2020). Gaining prominence during the last decade and especially after the Paris Agreement, hundreds of models have been developed leading to thousands of scenarios (van de Ven et al., 2025) as well as extensive model intercomparison projects where dozens of models are running the same scenarios (Fujimori et al., 2025). The results from all these modelling studies are usually analysed and published in scientific studies or are directly used in policy reports, for instance, the latest Assessment Reports (AR) of the Intergovernmental Panel for Climate Change (IPCC) and the reports of the European Scientific Advisory Board on Climate Change (ESABCC).

As these publications often have limited space to present the wealth of modelling results and explain in detail how they came about, interactive web tools and other applications have been increasingly developed to help different audiences explore all available results and exploit them in different use cases, e.g., for informing policies or supporting decisions (Curley et al., 2025). Some of the most famous applications are the Scenario Explorer from IIASA and the respective scenario databases that accompany the latest IPCC reports (Cointe, 2024). Other platforms have been explicitly co-created with stakeholders to help them on explicit use cases, such as the platform of the SENSES project that developed interfaces for policymakers and stakeholders from finance to explore their selected indicators from modelling studies (Auer et al., 2021). In addition, there are several other applications—apart from those dedicated to integrated assessment modelling—that can potentially support climate action, such as scenario building tools based on the results of energy system models, decision support tools based on environmental modelling results, and tools for exploring climate impacts based on detailed global climate models (Xexakis & Trutnevyte, 2019). Conversely, apart from applications for facilitating the use of modelling results, there are several tools for supporting modellers during their work, including utilities for visualising and validating model results such as the *pyam* Python package (Gidden & Huppmann, 2019).

While these applications can be very useful for different stakeholders from policymaking, research, industry, or civil society, they may not be readily accessible. Most of the applications are hosted in the websites of the organisations or projects that created them and it is thus difficult for a user to find them if they are not aware of their existence in the first place. While there are some efforts to collect these applications, e.g. from the Integrated Assessment Modelling Consortium (IAMC)[1], the list is far from complete and difficult to continuously update, with more tools being recently developed, such as the Climate Solutions Explorer[2] or the Scenario Compass Initiative platform[3]. Even if such lists were kept up to date, the ever-increasing number of applications may discourage users from navigating through them to try to find what they need through trial and error and, instead, require more elaborate methods for improving findability. This is further complicated by the potential lack of support for some applications after their development (Curley et al., 2025). Even if an application fits the needs of a user, it may not function as designed due to lack of maintenance or relying on outdated data. And, even if such applications work and the results are still relevant, there may be an issue of transparency. Such applications focus mostly on the results of a modelling exercise or a research project, and it might be difficult for the users to understand how these results were produced (e.g., what were the modelling assumptions), which is also a general discussion point in IAM research (Robertson, 2021). With the rise of AI applications, there are many opportunities to increase

[1] https://www.iamconsortium.org/resources/
[2] https://www.climate-solutions-explorer.eu
[3] https://scenariocompass.org

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engagement with climate information in a meaningful way (Bago et al., 2025), for instance by communicating modelling results that inform climate action.

In response to these issues, Task 6.5 of DIAMOND aims to create an open and user-tailored library of applications related to modelling in support of climate action. The library is created in IAM PARIS, an open data sharing platform for documenting modelling information and scenario results that was developed from the Horizon 2020 PARIS REINFORCE project and further enhanced by more than eight other EU-funded projects. The Application Library is featuring a comprehensive list of real-world applications for different use cases, such as policymaking (e.g., setting climate goals) or financial analysis (e.g., analysing climate risks in different assets and supply chains). Applications are sourced from the available scientific literature as well as from reports and websites of major institutions, modelling consortia, and projects and will be further enriched with new applications as they become available. In addition, DIAMOND intends to create dedicated applications for each of the major stakeholder categories of the project: policymakers, industry representatives, civil society. Each application will be in the form of an online decision support tool and WP2 stakeholders will inform its design and evaluate its use.

This deliverable report presents the first version of the Application Library and the IAM PARIS Chatbot, the first application that has been developed in the context of DIAMOND to facilitate the interaction of policymakers with modelling results. The first version of the Application Library is presented as an interactive interface in the platform featuring more than 150 applications existing in the climate action domain and allowing users to explore the applications using different filters[4]. The Chatbot is provided as a Python application that will be hosted in the future directly in the IAM PARIS platform[5]. Section 2 presents the working definition of applications that is used in this deliverable, documents the sources of applications, and describes the current implementation of the Application Library including the filters that are used and the possibility to add more information. Subsequently, Section 3 presents the chatbot that was developed in DIAMOND to access the model information and the results shown in the platform. Finally, Section 4 summarises the contributions of this deliverable and provides indications for future work, including in terms of updates of the application library and the development of the other applications expected in DIAMOND.

[4] https://iamparis.eu/datastories
[5] https://github.com/i2amparis/iam-data-chatbot

2 Application library

2.1 Definition of applications

There is a variety of names to describe applications based on modelling results in the literature, from decision support tools and policy platforms to data platforms and interactive web tools (Curley et al., 2025). This diversity allows developers to signpost the use of their application by characterising it in a particular way, e.g., a decision support tool for an application that is explicitly built to help decision makers in a specific use case. Yet, this may also hinder the identification and dissemination of the application through online search engines (with or without AI support), as it is potentially difficult to match the prompt of the user with the description that the developers gave to their application. This issue has been also discussed in the literature with the development of an intermediary "climate change scenario service" that can guide users through the scenario results that are developed (Auer et al., 2021) and, recently, with the suggestion to develop a centralised platform to systematise model intercomparison exercises and make their results more transparent (Fujimori et al., 2025). However, these suggested improvements have not yet been developed at an adequate scale to influence the community of model developers and users at large.

For Task 6.5, we use the term "application" for all items in our library, following the Cambridge Dictionary definition of "a computer program that is designed for a particular purpose."[6]. Although this may be a broad definition, it is useful to encapsulate all applications that relate to the modelling workflow, not only the applications that visualise modelling results. This includes: 1) applications that can provide model inputs, such as the online databases of IEA[7], 2) utilities to facilitate modelling and analysis, such as the pyam package[8] or the validation interface of IAM COMPACT[9], and 3) platforms that present and enable the exploitation of modelling results, such as the Scenario Explorer for the IPCC AR6[10], the interactive visualisations of the SENSES Toolkit[11], and the online EUCalc calculation model[12]. Additionally, many of these applications are not only informed by integrated assessment models but also other models used to support climate action such as Earth System Models, Energy System Models, macroeconomic models, or sectoral impact models. In short, the library presented in this deliverable includes both applications informed by IAMs and other climate-relevant models, and applications that support different stages of the modelling process. In the future, it may be useful to extend the library to go beyond modelling and include resources to support climate action in general. Nevertheless, this may lie beyond the context of the DIAMOND project as its focus is on supporting modelling processes and the usefulness of their results.

2.2 Sources of applications

IAM PARIS already hosted several applications developed by EU-funded modelling projects that served as the initial seed for the application library. In addition, the authors have identified two other catalogues of such applications: (a) the aforementioned catalogue of tools, visualisations, and scenario databases that was assembled by the IAMC and (b) an overview of more than 100 climate data platforms put together by the World Resources Institute (WRI). Links and descriptions for all these applications are integrated in the IAM PARIS Library to provide a comprehensive "one stop shop" of applications related to modelling in support of climate action. Thus, on top

[6] https://dictionary.cambridge.org/dictionary/english/application
[7] https://www.iea.org/data-and-statistics
[8] https://pyam-iamc.readthedocs.io/en/stable/
[9] https://validation.iam-compact.eu
[10] https://data.ece.iiasa.ac.at/ar6/
[11] https://climatescenarios.org/toolkit/
[12] https://www.european-calculator.eu

of the valuable work by IAMC and WRI to catalogue these applications, the added value of integrating them in the IAM PARIS Application Library is to improve their findability and usefulness for stakeholders. In the current version of the Library, this is now achieved by a variety of filters to help users dynamically explore the numerous applications (more than 150) and through expanding on their metadata, e.g., by linking applications to different use cases related to the modelling process and its outputs, e.g., modelling preparation, visualisations of scenario results etc. Additionally, the library also features an interface in the Content Management System (CMS) of the platform to easily upload links and information of new applications and help keep the library up to date. For the second version of the platform (Deliverable D6.9), an AI-powered service will also be incorporated to help users navigate to the appropriate applications based on text prompts.

2.2.1 Collection of project-based applications

The applications that were already hosted in IAM PARIS were initially called data-stories and consisted of custom-made interfaces for visualising data from different modelling projects, providing overviews of data characteristics, and allowing for interactive exploration. By the end of November 2025, the hosted applications included the following:

- A database of recovery policies used in EU Member States put together by IAM COMPACT, PARIS REINFORCE, and other projects.
- An open database of policies and technologies for industrial circularity and decarbonisation from the TRANSIENCE project.
- An analysis of the policy questions used in the Policy Response Mechanism of the IAM COMPACT project.
- Two technology inventories for promising low-emission technologies in the steel and petrochemical industries from the EU-CHINA BRIDGE project (see Figure 1 below).
- Barriers, enablers & policy analysis related to climate change mitigation feasibility in Kenya, Ethiopia, Ukraine, and Sri Lanka from IAM COMPACT.
- Curated results for national policymakers and energy industry stakeholders from the IAM COMPACT.

More such applications are expected to be hosted in IAM PARIS in the context of ongoing projects, such as a database of climate policies from EU and China as part of the EU-CHINA BRIDGE project and a simplified model for industrial decarbonisation and circularity as part of TRANSIENCE.

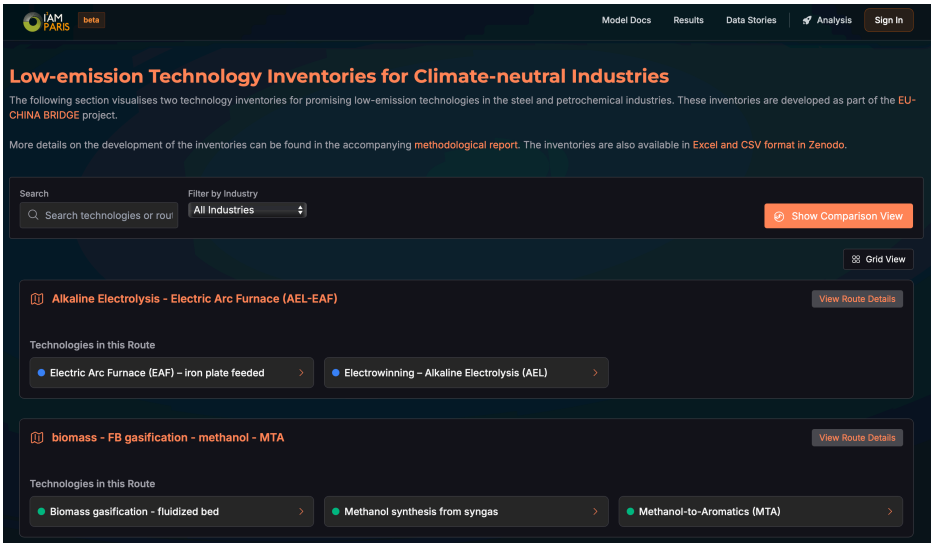

Figure 1. Screenshot from a data story on technologies for climate-neutral industries hosted by IAM PARIS

2.2.2 Collection of IAMC-based applications

Turning to the IAMC, the catalogue of collected applications (Figure 2) mainly includes "online and interactive tools to better communicate the findings of their research to policy stakeholders and the public"[13]. Additionally, the IAMC website hosts several scenario databases to "collect quantitative integrated assessment scenarios from the research community"[14], including the widely used scenario databases for the AR5 and AR6 reports of IPCC. As of 1 November 2025, there are 14 scenario databases and 45 tools and visualisation applications featured in the aforementioned catalogues in the IAMC website. The tools include utilities for interacting with models and their results, such as *pyam*[15], databases for input data such as Carbon Monitor[16], and applications based on modelling results, such as the Climate Risk Dashboard[17]. For each tool or database, the IAMC website included a short description, a link to the application, as well as metadata for helping users to understand its type, geographical scope and time horizon. The website also included information related to the initial release of the tool, its developing institution(s) and a designated contact person along with their email. By skimming through the list, it is clear that there is a large variety of tools from many different organisations. However, it seems that newer platforms are not added as the last entry seems to be about a platform developed in 2023. Additionally, it is understood that all this information is self-provided by each tool developer or requested by the IAMC secretary and it is unclear whether this information is validated by a third party.

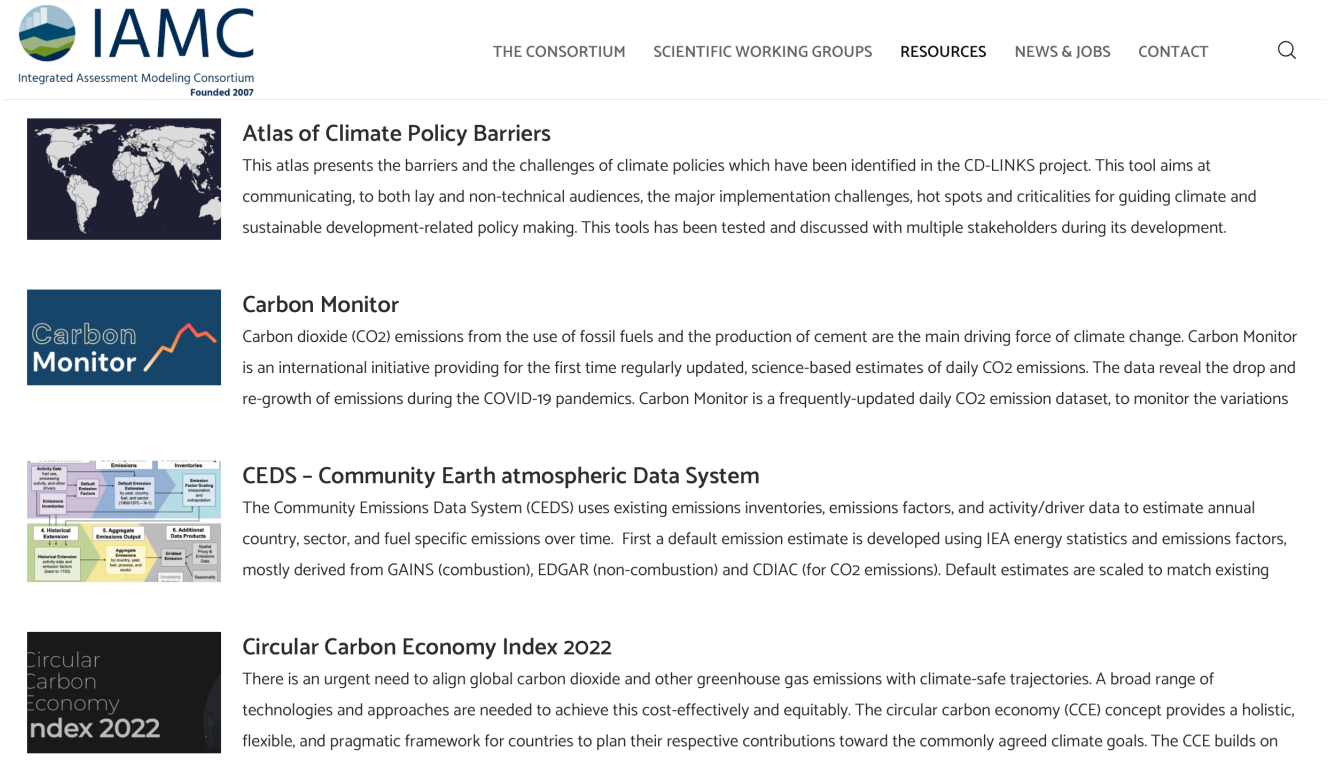

Figure 2. Screenshot of tools and visualisations page in the IAMC website

[13] https://www.iamconsortium.org/resources/tools-visualization/
[14] https://www.iamconsortium.org/resources/databases/
[15] https://www.iamconsortium.org/resources/tool-resources/pyam-analysis-and-visualization-of-assessment-models/
[16] https://www.iamconsortium.org/resources/tool-resources/carbon-monitor/
[17] https://www.iamconsortium.org/news-from-the-community/news-f-the-community/climate-risk-dashboard/

2.2.3 Collection of WRI-based applications

Similar to IAMC, WRI has collected a list of more than 100 climate data platforms[18], including datasets that can be used as data inputs for IAMs such as the Net Zero Tracker[19], as well as applications using IAMs results such as the NGFS Scenarios Portal[20]. Apart from that, the platform also includes established databases such as the ones from IEA as well as tools to visualise other climate-related information such as climate impacts (e.g., Climate Impact Explorer[21]) or policies (e.g., Climate Policy Radar[22]). Figure 3 shows an interactive visualisation provided by WRI to show the scales and topics of all selected platforms. As observed, most platforms have a coarse regional scope targeting the global, national, and regional levels, with fewer platforms available for cities or businesses. In terms of topics, most applications are related to mitigation efforts, while noticeably fewer applications explore topics related to equity, finance, or forest and agriculture. Apart from these, the full dataset includes the name, description, and link of each application as well as information on the year that it was established, the included geographies, the visualisation type, and the target audience. As with IAMC, the last platform documented in the list was established in 2023 and there are no signs of further updates.

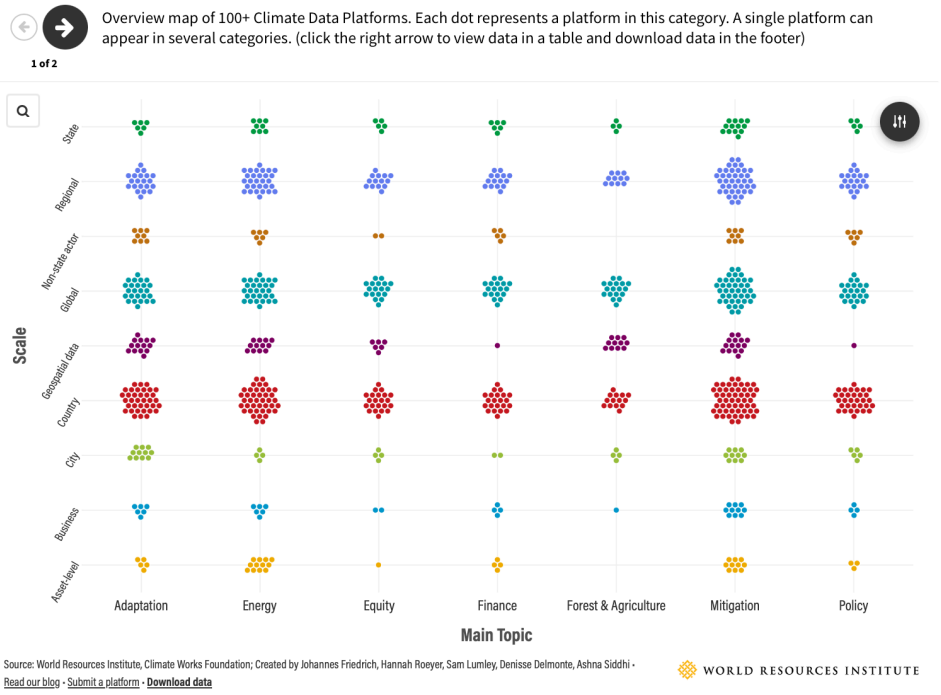

Figure 3. Screenshot of a collection of 100+ climate data platforms by WRI

2.3 Current implementation

The implementation began with acquiring, processing, and harmonising data from each of the sources listed above. Both the original and processed datasets for every source, along with the final harmonised list, are stored in a GitHub repository[23]. Among these, the WRI platform data were the most straightforward to obtain, as they were already available for download in spreadsheet format from the WRI website's data visualisation page. They

[18] https://www.wri.org/data/overview-100-climate-data-platforms
[19] https://zerotracker.net/
[20] https://data.ene.iiasa.ac.at/ngfs/#/workspaces
[21] https://climate-impact-explorer.climateanalytics.org/
[22] https://climatepolicytracker.org/
[23] https://github.com/i2amparis/application-library-data

also required minimal cleaning: the entries were relatively consistent and concise across fields, which made it possible to apply meaningful filters (e.g., the seven main topics used to categorise applications). It is noted that the dataset contains entries that are not directly related to modelling inputs or outputs such as the Systems Change Lab platform, which features indicators for monitoring climate action[24]. For the first version of the platform, these entries are retained while a more comprehensive cleaning will take place in the coming months and will be reported in the updated deliverable D6.9. In contrast to the WRI, the dataset of all community-developed tools, visualisations, and platforms that are promoted in the IAMC website is not available to download. Thus, the information for each tool was scraped from each page using a Python script, allowing for short pauses between HTML requests to avoid overloading the IAMC website. By 1 November 2025, the main IAMC website did not have a robot.txt file to suggest rules for scrapping and thus this methodology was considered as appropriate. A subset of the scraper results has also been visually validated by the main author.

The union of column names from the WRI and the IAMC dataset was used to create the structure of the final harmonised dataset. For instance, the "Geographical Scope" column in IAMC was renamed into "Geographies" and was merged with the respective column in the WRI dataset. Additionally, some duplicate entries between the IAMC and the WRI datasets were removed, usually keeping the ones from WRI as they generally provided more details. The six data stories of IAM PARIS have been added to the harmonised dataset by filling in the information required to be in line with the applications from WRI and IAMC. Some additional metadata fields were added, such as a reference to where the application has first been catalogued (IAM PARIS, WRI, IAMC) and what the original link of the information was. All entries have been slightly cleaned by removing unnecessary trailing spaces, while some fields have been harmonised: for instance, the scale field contained references to both "City" and "Cities," which were subsequently merged using only "City" as an entry. The exact mapping and conversion of column names is provided in the aforementioned GitHub repository that accompanies this report[25]. The repository also includes a Jupyter Notebook called clean_applications.ipynb that details the data cleaning process, while all entries that were removed are listed in the "duplicates" sheet in the application_list.xlsx file.

Figure 4 shows the interface of the first version of the application library that was developed by the end of November 2025. The interface was developed within the existing IAM PARIS front-end[26] using a technology stack based on Svelte, Typescript, and TailwindCSS. The interface presents all the application data using card-like elements, with flexible filters that help users to navigate through all applications and find the ones that they need based on their use case. By clicking on a card element, the user is transported to an individual page that contains the full information stored for each application, along with a link to visit it (Figure 5).

[24] https://systemschangelab.org
[25] https://github.com/i2amparis/application-library-data
[26] https://github.com/i2amparis/i2amparis-frontend

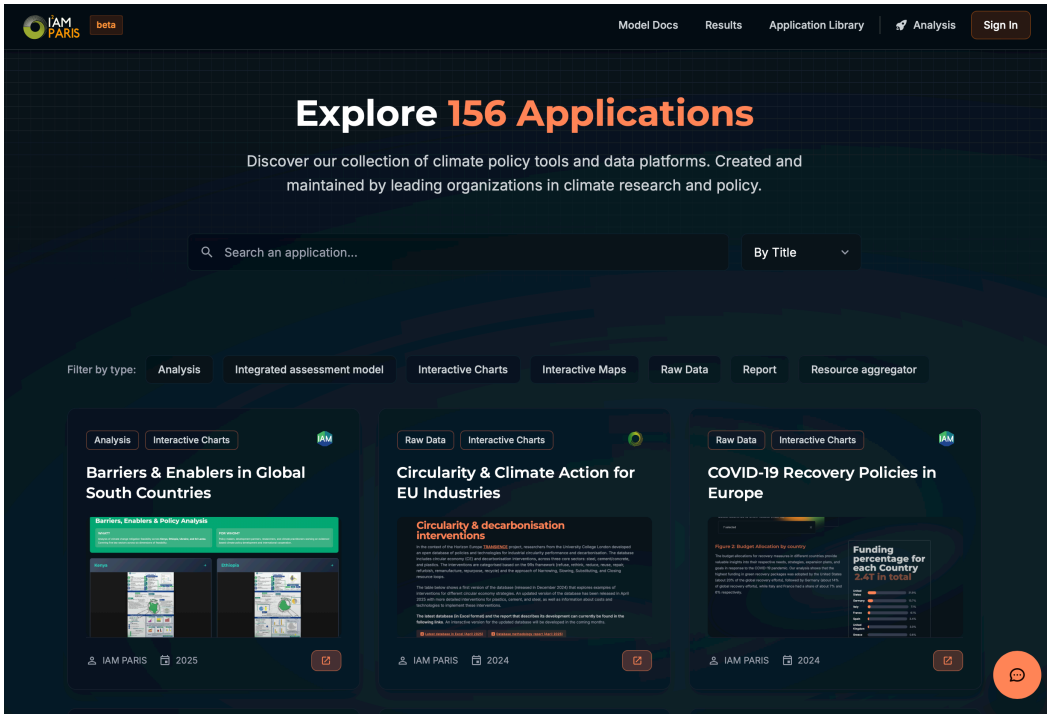

Figure 4. Screenshot from the first version of the Application Library in IAM PARIS

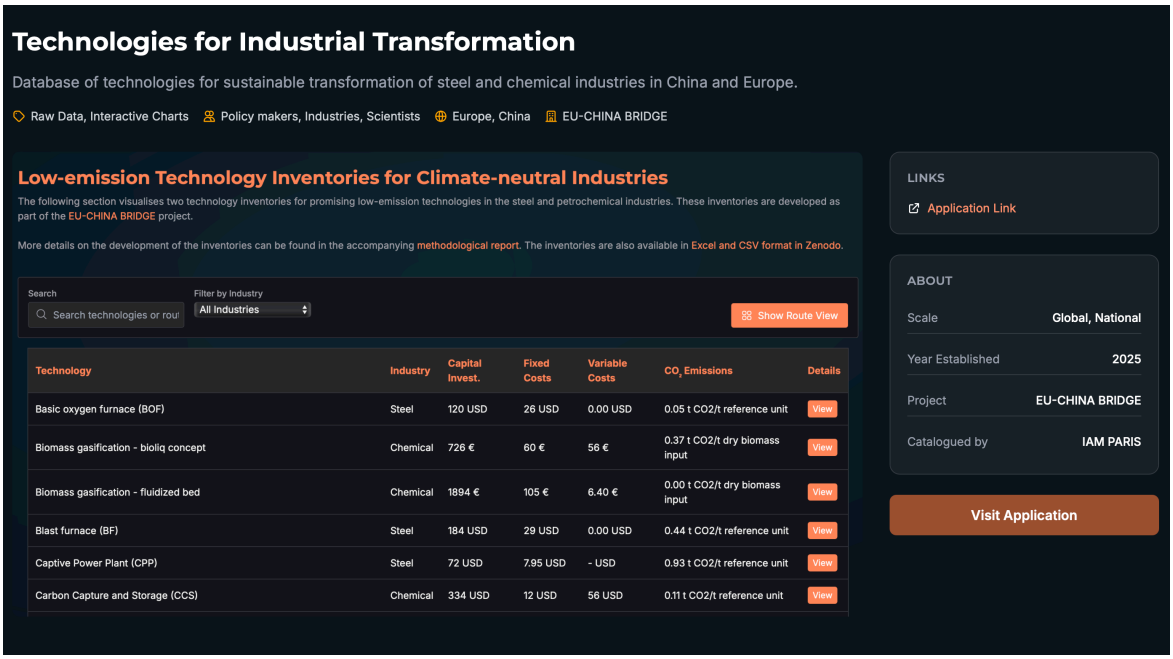

Figure 5. Screenshot from a dedicated page for an application in the Library

Emphasising transparency, the page for each application also clearly indicates where this information was first catalogued and authored, i.e., the websites of IAMC and WRI or the IAM PARIS itself. The data used in this interface is connected to the content management system (CMS) of the platform that is implemented in the Directus framework (v.11), allowing for new applications to be easily added, even from external users. Users can add new applications directly through a menu in the CMS as shown in Figure 6. External users can request connection through a contact form in the platform[27].

[27] https://iamparis.eu/contact

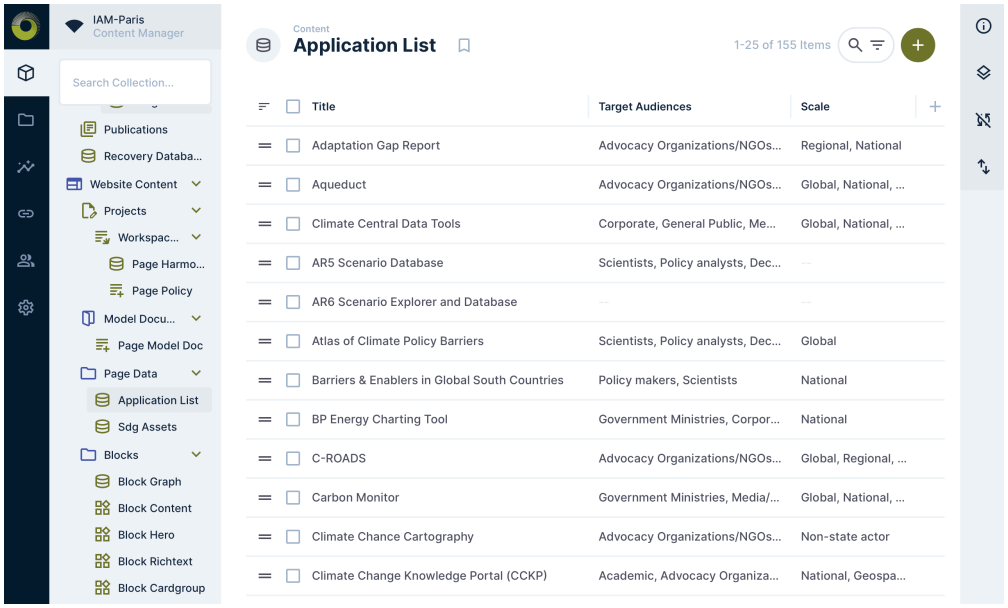

Figure 6. Screenshot from the CMS of the Application Library in IAM PARIS

3 1st DIAMOND app: IAM bot

3.1 Context

Integrated Assessment Models and the scenario modelling techniques that are used to inform climate action are usually quite complex (Guivarch et al., 2017). Despite efforts to provide extensive documentation for models and open up their code (Skea et al., 2021), modelling details are often incomprehensible for others apart from the modelling teams that use them, especially non-modellers (Nikas et al., 2021). Additionally, modelling studies are usually providing a wealth of outputs that can be difficult to navigate. For instance, only the global scenario results that were included in the AR6 scenario database contained almost 700,000 entries (Byers et al., 2022). While there are many scenario databases that provide interactive functionalities to navigate through scenario results, users usually need to know the name of the variable that they are looking for and the nuances behind the generation of results in the models, e.g., what are the differences between scenarios and models. Tools using artificial intelligence have been recently pinpointed as a way to support climate change scientific assessments, including the models that underpin them (Al Khourdajie, 2025a, 2025b).

The development of a structured CMS and database of modelling results and documentation in IAM PARIS served as an opportunity for building an assistant to help users efficiently navigate through the documentation and results hosted in the platform. The IAM PARIS Chatbot is a multi-agent conversational framework designed to facilitate user-friendly access to complex modelling data from the IAM PARIS platform. The system integrates natural language processing, semantic search, and data visualisation to enable stakeholders to interactively explore the details and results of integrated assessment models and other models in the platform. The chatbot was designed focusing on policymakers working on climate topics as a target audience, but can be used by other stakeholders too, including researchers, civil society, etc. By combining structured data retrieval with semantic reasoning and generative explanation, the Chatbot aims to democratise access to climate knowledge, accelerate scenario exploration, and enhance evidence-based decision-making in climate policy contexts.

3.2 Technical implementation

The code of the Chatbot is publicly available on GitHub[28]. The Chatbot can be currently run in a command-line interface (CLI) through the code directly from the code repository, while a beta version[29] is also integrated into the IAM PARIS platform (Figure 7). Figure 8 shows the project workflow for the Chatbot, while Figure 9 shows the structure of the code repository. The workflow for mainv.py begins with environment setup, loading required API keys and URLs from a .env file, followed by fetching models and timeseries data that are included in the IAM PARIS platform. Data fetching was achieved using the IAM PARIS REST API, with caching enabled to avoid redundant requests. Definitions for regions and variables are loaded from YAML files in the /definitions directory, converted into documents, and combined with API records before being split into chunks using RecursiveCharacterTextSplitter. OpenAI embeddings are generated for these chunks, and a FAISS vector index is built or loaded from disk for efficient similarity searches. Shared resources including the models, timeseries, vector store, environment variables and bot instance are prepared, before a MultiAgent Manager is initialised to handle query routing. In CLI mode, the script enters an interactive loop where user queries are processed through the manager, with responses displayed or plots rendered from base64-encoded images; in API mode via Fast API, POST requests to /query trigger the same process, returning structured responses with chat history while handling

[28] https://github.com/i2amparis/iam-data-chatbot

[29] The current beta version is under continuous refinement to expand the types of queries the tool can accurately respond to. Responses provided by the tool should be treated with caution.

errors gracefully.

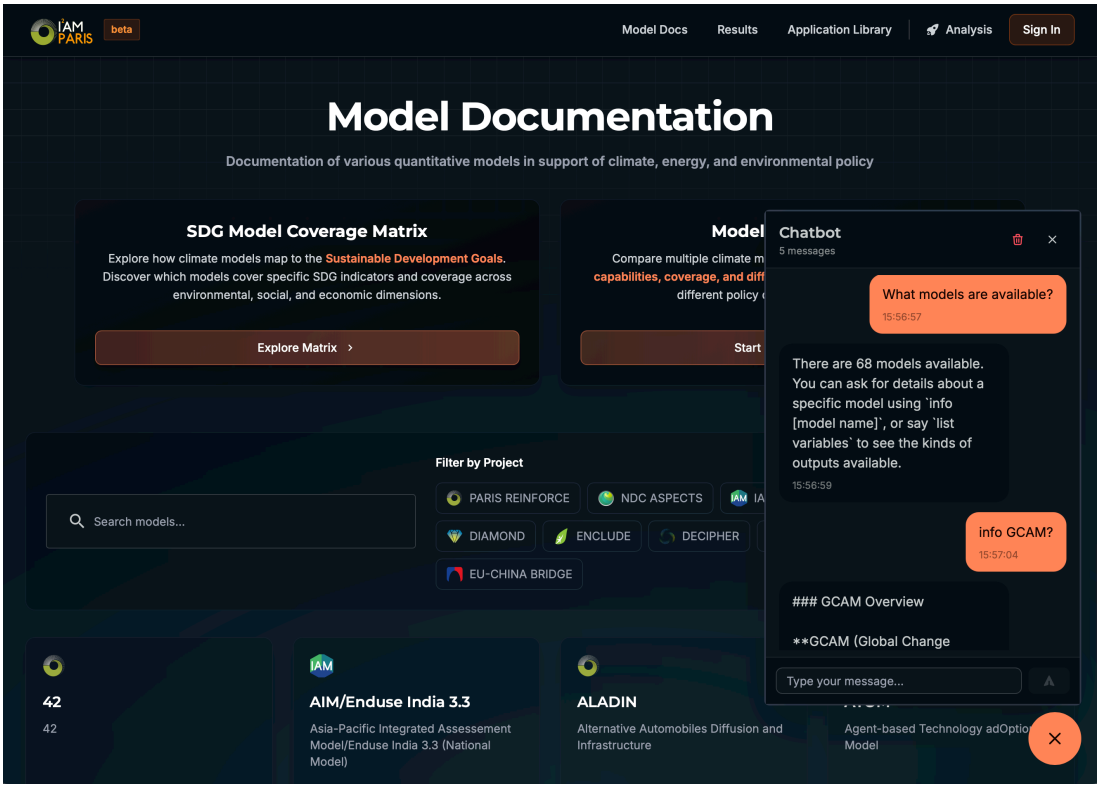

Figure 7. Graph of the IAM PARIS Chatbot workflow

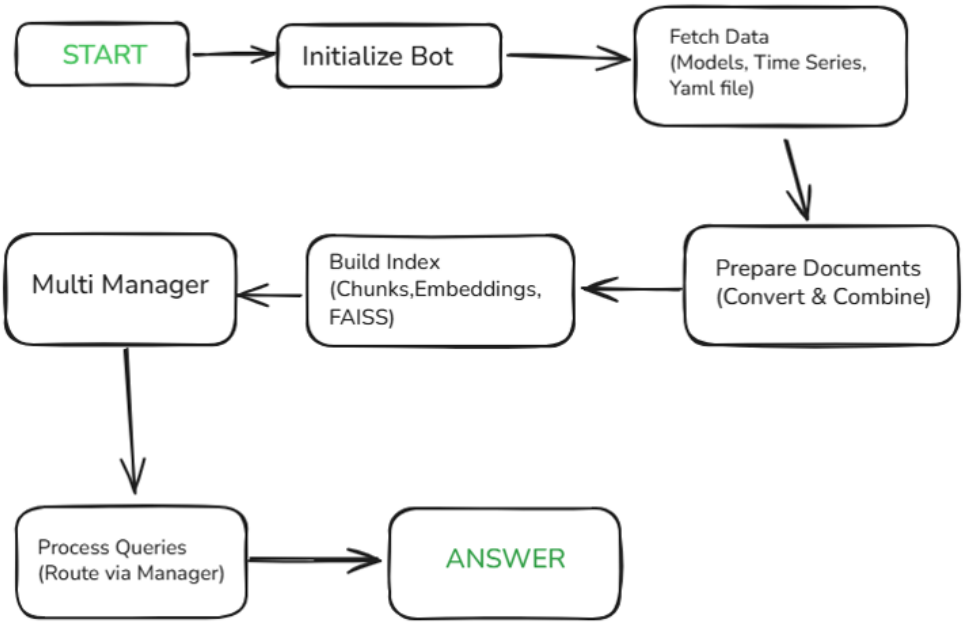

Figure 8. Graph of the IAM PARIS Chatbot workflow

```
iam-data-chatbot/
├── .gitignore
├── README.md
├── requirements.txt
├── main.py
├── fastapi_app.py
├── manager.py
├── agents.py
├── data_utils.py
├── utils_query.py
├── simple_plotter.py
├── comprehensive_iamparis_metadata.json
├── cache/
├── chatbot.log
├── faiss_index/
├── definitions/
│   ├── .gitkeep
│   ├── region/
│   └── variable/
└── utils/
    ├── __init__.py
    └── yaml_loader.py
```

Figure 9. IAM PARIS Chatbot repository structure

The system uses a multi-agent architecture, where specialised agents collaborate to process user requests and generate coherent responses. Each agent encapsulates a well-defined functionality, such as a query agent that is executing structured queries and retrieving IAM PARIS data via REST APIs. The application is developed in Python based on the OpenAI GPT-4-Turbo model and the Facebook AI Similarity Search (FAISS) while its API is built using FastAPI. Details for all agents can be seen in Table 1, while the full technology stack is shown in Table 2.

Table 1. Multi-agent architecture of the IAM PARIS Chatbot

Agent	Function
Query Agent	Executes structured queries and retrieves IAM data via REST APIs
Data Plotting Agent	Produces time-series visualisations and scenario comparisons
Model Explanation Agent	Performs semantic retrieval and explanation generation using FAISS and language models (LLMs)
General QA Agent	Handles general questions on IAM methodology and climate police
Data Modelling Suggestions Agent	Generates research and analysis recommendations based on retrieved context

Table 2. Technology stack used in the development of the IAM PARIS Chatbot

Category	Technology	Purpose
Language	Python	Core implementation
Data Handling	Pandas, JSON, Requests	Fetching API data
Visualization	Matplotlib	Plot generation
Vector Database	FAISS (Facebook ai similarity search)	Semantic retrieval
NLP/AI	Lang chain, OpenAI GPT-4-Turbo	Query understanding and response generation
Embedding model	Text embedding 3 small (OPENAI)	Document vectorization
Memory	LangChain (conversation buffer memory)	Multi-turn conversational context
API	FastAPI	Web API for HTTP interactions

4 Next steps

This deliverable describes the first version of the Application Library developed in the IAM PARIS platform, as well as the first application developed by the DIAMOND project. The library is a catalogue of platforms, visualisations, interfaces, and utilities that can support the whole lifecycle of modelling for climate action, from model development and configuration to visualisation and use of results. Aiming for comprehensiveness, the first version of the library includes links to applications that were previously catalogued by the Integrated Assessment Modelling Consortium and the World Resources Institute, in addition to the applications that were developed or collected by the IAM PARIS team. The library is currently featuring several filters that allow visitors to *inter alia* identify applications for specific topics, user groups, scales, and geographies, improving findability and enhancing the re-usability potential of the existing platforms. Additionally, the library is linked to the Content Management System of the IAM PARIS platform, allowing for platform developers and external users to easily add links and information to new applications. This key functionality allows the library to stay up to date, increasing its relevance for the users and, subsequently, contributing to the longevity of the library and the IAM PARIS platform in general. Towards this goal, an AI-based chatbot was also developed as part of the DIAMOND project, to help users navigate through the model documentations and results that are included in the platform. This would be especially important for policymakers and other stakeholders that have a specific use case in mind to support climate action but have limited knowledge in modelling and its nuances.

During the last year of the DIAMOND project, the next version of the deliverable will be released (D6.9), documenting new features, content, and usability improvements for the library. Specifically, more applications will be added based on a structured review of the scientific and grey literature and by scanning the websites of key organisations related to climate action, such as the International Energy Agency (IEA), the Joint Research Centre (JRC) of the European Commission, and the World Wide Fund for Nature (WWF). Additionally, the library will be enriched with links to databases that are frequently used in modelling (i.e., GTAP[30]) as well as utilities that support modelling applications in different stages such as on validation and results visualisation. More filters and detailed metadata will also be added to help match user groups needs such as local policymakers and financial actors with specific requirements in terms of applications used. On this, the AI-based chatbot will be further improved to help platform visitors identify the most fitting applications by providing their exact use case as a text prompt.

The CMS and front end of the IAM PARIS platform will also be enhanced to allow users to easily develop applications that can directly be hosted in the platform. This feature aims to help modellers with promoting their modelling results in a way that is usable by all intended users and to avoid the development of unnecessary platforms that may end up being abandoned after a modelling study or project ends. This is especially important for projects funded through the Horizon Europe programme, as there is already a tendency to leave platforms without maintenance and support after the project's end (Curley et al., 2025), undermining—in essence—the investment spent for developing the platform in the first place. Finally, two new applications will be developed using DIAMOND results, aiming specifically for industry representatives and civil society groups. For industry representatives, an initial idea would be to develop a tool to stress test assumptions for Environmental, Social, and Governance (ESG) reporting using IAM scenarios. For civil society groups, a similar application can help contextualise and refine claims related to the feasibility of climate action using results from large scenario ensembles. The scope and implementation of the applications will be defined among the DIAMOND consortium and informed (and potentially co-created) based on the stakeholder engagement activities as part of WP2.

[30] https://www.gtap.agecon.purdue.edu

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