THERMOS

Sustainable Adoption Roadmap (SAR)

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THERMOS (Thermal Energy Resource Modelling and Optimisation System) is to provide the methods, data, and tools to enable public authorities and other stakeholders to undertake more sophisticated thermal energy system planning far more rapidly and cheaply.

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1. Executive Summary

The THERMOS tool is a free, web-based software designed to optimise local district energy network planning processes and results, according to user and project specific requirements such as budget, climate and energy targets. THERMOS places instant, address-level mapping and built-in energy demand estimations in a user-friendly open-source software. It helps identify optimal heating and cooling network solutions in almost any part of the world.

During the 4-year period of the Horizon 2020 project, the THERMOS tool has been tested and used by many stakeholders including cities, consultants, utilities, energy agencies, NGOs and scientific institutes. **This Sustainable Adoption Roadmap (SAR) outlines the adoption of the THERMOS tool in the last few years, its uptake by specific project partners and stakeholders, and outlines the next steps to come beyond the project lifetime**.

More specifically, the THERMOS SAR provides insights on how THERMOS could be used to achieve district heating and cooling planning related goals in policy, commercial and/or research applications. Doing so, it reflects different experiences and stages from twinning and replication processes by the THERMOS city partners as well as the learnings from the THERMOS Train-the-Trainers and Ambassador programmes implemented during the project's lifetime. In addition, it briefly describes the results of the THERMOS business modelling process including the definition of a Software as a Service (SaaS) model that will allow THERMOS to ratify its unique value proposition to offer "*a state-of-the-art Tool to help Local Authorities (LAs) plan District Heating and Cooling (DHC) networks using a free, fully scalable, and user-friendly web-based application. Compared to existing practices, it offers a much faster, cost-effective and replicable way for LAs to deliver robust heat mapping and energy masterplanning studies involving DHC networks*".[1]

The Sustainable Adoption Roadmap, which has been **designed for a three-year period (2021-2024)**, consolidates and builds on the considerations expressed during several workshops and sessions, in which different parties showed their interest in exploitation opportunities of THERMOS in the future. Thus, it **provides an overview of the roles to play by THERMOS partners, Ambassadors, trainers and potential users in its current and future adoption**, focusing on a value proposition that brings benefits and exploitation options to all stakeholders in the short, medium and long-term.

In its final part, this document **provides further indications and recommendations for new users to consider when adopting THERMOS**. It also includes an overview of future areas of growth for THERMOS as a tool that supports local energy transitions mainstreaming DHC in the core of energy planning processes.

1 THERMOS Business Plan. 2021

2. Introduction and Background

The race to a low-carbon and resilient future requires accelerated action in the transformation of local energy systems under schemes of technological innovation, improved energy efficiency and increased adoption of renewable energy. Given the ambitious EU and national energy and climate targets of carbon neutrality by 2050, together with a successful green recovery in line with the EU Green Deal, affordable and low-carbon energy supply is high on the priority list of local authorities. With heating and cooling responsible for 50% of the final energy consumption in Europe, district energy systems can be a key instrument to achieving these goals. In this context, THERMOS arises as a tool that makes District Heating and Cooling (DHC) planning processes easier, faster and more cost-effective.

During the H2020 project development time, it was repeatedly demonstrated that the THERMOS tool supports energy planners in the evaluation of three main DHC scenarios: the optimised expansion of an existing system, the planning of an entirely new system, or for comparing and assessing the performance of a potential network with a non-network scenario. Thereby, the software not only facilitates the rollout of energy efficient DHC networks, but also supports the decarbonisation and refurbishment of existing heating and cooling systems by allowing users to prioritize renewable energy sources and energy and climate targets.

Following the experience and success of THERMOS' adoption during the project's timeline, partners have envisioned a continuation of the roll-out of THERMOS for different types of users across Europe, including local governments, energy planners, engineering and consulting firms, research and academic organisations, among others. This vision has been summarized in the THERMOS Sustainable Adoption Roadmap as a contribution to an enhanced interest to accelerate the optimization and development of DHC networks towards a sustainable energy transition worldwide.

2.1 Sustainable Adoption Roadmap Goals

THERMOS partners have worked together to define a business model that delivers THERMOS to different users, under a Software as a Service (SaaS) structure. This model enables and maintains free access to the latest version of the THERMOS tool, and at the same time offers a premium version to allow for continued improvement of the software and business application in the future.

The present document outlines the three-year horizon of the current roadmap including the following key aspects:

- Definition of mechanisms to guarantee the reliability, maintenance and upgrade of the software in the long-term.
- Identification of the governance model to provide technical support and services to users interested in THERMOS for commercial or strategic energy planning purposes.
- Establishment of an integrated strategy for the demonstration and promotion of THERMOS by project partners.

1.2 THERMOS adoption during project lifetime

The THERMOS Tool has been tested and adopted by THERMOS partners, especially by pilot and replication cities, as well as by a group of Trainers and Ambassadors. These user experiences have been crucial to improve the functionalities of the software. The THERMOS Tool is now available in all its facets for different users following the completion of the H2020 funded project in March 2021. The application, improvement and further development will continue in various forms.

Based on these experiences and internal discussions on the Tool's usability and exploitation options, several groups of users have been defined for THERMOS:

- Local and regional governments;
- DHC utilities;
- DHC project developers;
- Urban developers;
- Consulting and engineering firms;
- Research and academic organisations,
- Energy agencies, ESCOs and energy managers
- Others (energy communities, etc.)

Each of these users has shown different interests in THERMOS. In addition, they have shared insights on the Tool's applicability, effectiveness and possibilities for improvement. Technical gaps have been identified, prioritised and addressed in the different versions of the Tool wherever possible within the scope of the project and available resources. Table 1 summarizes the key uses and applications of THERMOS as well as the adoption challenges faced by each type of user.

Table 1. THERMOS users' experience and adoption challenges (2018 - 2020)

THERMOS Users	Uses and applications	Adoption challenges
Local and regional governments (Warsaw, Granollers, Islington, Greater London Authority, Alba Iulia, Berlin, Jelgava, Cascais, Metropol Region of Strasbourg, Province of Treviso, Bristol, Porto Metropolitan Area, Ayuntamiento de Murcia...)	• Developing pre-feasibility studies for the expansion or creation of a DHC network. • Studying of DHC alternatives to develop planning processes in order to meet local targets (environmental, economic or social). • Engaging key stakeholders in the energy transition by showcasing the benefits of DHC on a local level. • Obtaining an initial spatial overview of the heat demand situation (heat mapping).	• Difficulties on the availability and management of data for the Tool. • Lack of regulatory frameworks incentivizing DHC developments on a local level. • Limited access to funding for the development of DHC infrastructure on a local level. • Diversity of stakeholders involved in DHC processes. • Need to have accurate data of economic information e.g. network infrastructure costs, energy costs, etc. • Limited interest and capacities from local authorities.
Consultancy, engineering firms and DHC project developers (CREARA, Manergy, Applied Energy...)	• Developing a pre-feasibility study of expansion or creation of a new DH network. • Identification of high heating and cooling demand areas for s upply location. • Comparison of energy supply technology alternatives.	• Technical constraints, i.e. Tool contains some bugs (not connected paths, non-eligible buildings,...) • Limited internal expertise on using the Tool. • Difficulties in modelling the case as accurately as possible. • Uncertainty on the Tool continuity and access for commercial activities. • Alignment or integration of the Tool's inputs and outputs with existing models or practices.
Research and Academia (Hawk University, Aalborg University...)	• Definition and demonstration of THERMOS for diverse scenarios modelling. • Delivering basic DHC modelling capacity for energy engineering students. • Development of research case studies and modelling exercises.	• Limited research programmes know about the existence of the Tool. • Uncertainty on the Tool continuity for free-access for research and academic purposes.
Energy Agencies (ie. dena, KAPE, ZREA, ALEA, International Energy Agency DHC/CHP...)	• Regional energy planning including DHC options. • Studying different DHC scenarios for local and regional planning. • Advocacy development on the relevance of DHC for local energy transitions.	• Complexity of regional energy planning processes. • Limited interest from local authorities to evaluate DHC options with innovative tools such as THERMOS.

See part II next page

Part II: **Table 1. THERMOS users' experience and adoption challenges (2018 - 2020)**

THERMOS Users	Uses and applications	Adoption challenges
Utilities (Fortum, TUB Verde...)	• Pre-feasibility studies development with DH networks. • Developing comparative analysis of THERMOS modelling results in relation to other commercial or proprietary tools.	• Lack of understanding on the details of the THERMOS modelling process. • Need clarity on the data-management policies of the THERMOS Tool. • Need to understand the economic and technical feasibility of DHC projects in THERMOS modelling results.
Urban Developers and Energy Communities (Distrito Castellana Norte...)	• Studying the feasibility of DHC networks for project planning.	• Uncertainty on energy demands and other data for a project under development. • Uncertainty on the scope of work to be provided by THERMOS in the medium and long term. • THERMOS limitations for feasibility planning.
Networks/associations (ICLEI, DBDH, ADHAC etc.)	• Dissemination of THERMOS Tool benefits. • Promotion of DHC. • Foster the development of DHC network technologies for energy transition.	• Lack of knowledge in DHC from some parties.

Source: THERMOS Replication Guide, Trainers, Ambassadors and Partner experiences, THERMOS Case Studies.

The different challenges that THERMOS users have experienced, while using the software for their particular and diverse interest, have contributed to the evolution and validation of the Tool as well as adjustments of its features. The close relationship and exchange between the developers and software users through an 'agile' process is one of the core assets of THERMOS. This will continue to play a decisive role in the years to come to guarantee its future use and sustainability in combination with a competitive value proposition.

In order for THERMOS to continue operating as an accessible and up-to-date cloud-service, it is important to secure adequate technical capacity, resources and a team prepared to address user needs on a professional level. In addition, investments are needed in the server infrastructure, marketing or legal advisory services e.g. related to the General Data Protection Regulation (GDPR) to guarantee a reliable existence and upgrade of THERMOS.

3. THERMOS Value Proposition and Business Model

During the project development, THERMOS partners evaluated the best options to guarantee the continuity of the THERMOS Tool to provide services to different types of users such as local authorities, consultancies, utilities, research and academic organisations. In addition, a potential market has been identified for THERMOS as a tool for sustainable energy planning, considering current market trends in the DHC market in Europe.

The experience of THERMOS users as well as the strategic work to define a correct business model and exploitation strategy resulted in the definition of a unique **THERMOS value proposition**:

"*THERMOS offers a state-of-the-art tool to help Local Authorities plan District Heating and Cooling networks using a free, fully scalable, and user-friendly web-based application which has been validated with experts and successfully trialled with local authorities and other practitioners. Compared to existing practices, it offers a much faster, cost-effective and replicable way for LAs to deliver robust heat mapping and energy master planning studies involving DHC networks. Its key features are*:

- *Efficient and flexible, allows consideration of options at very low cost;*
- *Standardised and rigorous, one application covers several stages of the analysis;*
- *Based on a transparent approach*".

As a result of this process and with a deep understanding of THERMOS' unique value proposition, after the project ends, THERMOS will be available as 'Software as a Service' (SaaS), including complementary services that will be carried out by THERMOS partners.

3.1 THERMOS Software as a Service

"*Software as a Service (Saas) is a cloud-based distribution model for systems software and programs, where a provider is responsible for creating, hosting, managing, and maintaining applications, and making these applications available to their clients over the internet under a licensing model.*"[2] In the THERMOS context, this means that at the end of the project, it will continue to be operational and accessible for current THERMOS users who will become THERMOS clients.

Considering the overarching goal of THERMOS as a tool to drive local energy transitions and that the current THERMOS users are diverse, the THERMOS SaaS model has been adapted for two general categories of user: *non-commercial and for-profit or commercial purposes*.

- Non-commercial use: by users such as local and regional governments, research and academic institutions, etc; to develop pre-feasibility analysis, to explore high level sustainable energy planning scenarios, heating and cooling modelling, etc.
- For-profit or commercial use: by users such as consultants, utilities, engineering firms, etc. carrying out a detailed district heating and cooling analysis, often on behalf of a third party.

2 TenFold. Software as a Service: Definition, History, and Benefits. 2020

3.2 THERMOS Business Model

The Tool will continue having the 'free-access' standard version for public use by all THERMOS users for at least three years after the project ended (until 2024). However, its functionality will be limited in terms of storage space and limits to computational resources (maximum runtimes, size/number of maps created and size of map data upload). Those aiming to use THERMOS regularly and professionally for commercial or for-profit purposes will be offered the option of becoming paying users without these restrictions and with access to 'premium' features, including technical support. This support and dedicated premium instances of the software would be subject to additional costs depending on the specific requirements of the user.

In general, it is expected that THERMOS will be available for users with different interests in the two following versions:

- Standard version: for users at no cost, with limited scope and functionalities shaped for non-commercial application and purposes.
- Premium version: for users aiming to perform specialised work requiring full unrestricted use of THERMOS functionalities with dedicated server and technical support, especially for commercial and/or for profit purposes.

THERMOS users will be informed about changes and possibilities of upgrades to the Premium version once available through the tool and THERMOS website in 2021.

In order to deliver these services, Table 2 describes the proposed structure to run the THERMOS SaaS model:

Table 2. THERMOS SaaS Delivery Structure and Key Components

THERMOS SaaS	Key component
Software development and administration	Tasks related to software development, computational resource management and administration involved in managing user-accounts and in maintaining and hosting the Tool will be managed centrally.
Technical support and service provision	THERMOS as a priced supported software service may include services such as LIDAR data provision, GIS/data upload support, customising presentation of results/outputs, general user support and troubleshooting.
Demonstration and promotion	Activities involving the demonstration, training and/or promotion of the Tool as an open-access resource where opportunities arise.

Source: THERMOS Partners Exploitation Agreement, 2021.

This THERMOS business model allows the creation of new alliances and strategic partnerships with the public and private sector to reach as many users as possible in the future.

4. THERMOS Sustainable Adoption Roadmap

The Sustainable Adoption Roadmap has been developed taking as input the different experiences and learnings from THERMOS users and has been aligned with the THERMOS business model proposed for the Tool.

4.1 Strategic Vision

A three-year period has been considered in the design and implementation of the Roadmap with the current strategic vision:

April 2021 – March 2022

Consolidation of THERMOS as a science-driven in-demand tool, including the assessment of potential future delivery mechanisms such as the creation of a Special Purpose Vehicle (Company) to facilitate SaaS delivery in Europe.

April 2022 – March 2023

Consolidation of THERMOS use in Europe, with a structured value proposition and a commercial strategy reaching key customers to support them in reaching commercial and policy-related sustainable energy goals.

April 2023 – March 2024

THERMOS commercial upscaling and global outreach, based on the European commercial roll out, highlighting THERMOS contribution to attainment of affordable and sustainable energy networks. This vision will include the contribution of THERMOS to global and European sustainability goals, e.g. Sustainable Development Goals, European Green Deal, etc.

The Roadmap includes the different activities that should be carried out and implemented by THERMOS partners to deliver the THERMOS SaaS Model. It also includes detail of the geographical scope of the different alternatives and the exploitation and dissemination strategy for each of the options.

4.2 Key Activities

In order to achieve the strategic vision of THERMOS in a three-year period, it is important to define key activities that need to be developed. Table 3 summarizes these activities for the proposed schemes.

Table 3. Key Activities for THERMOS Adoption 2021-2024

Year	Commercial Scheme	Non-Commercial Scheme
March 2021 – March 2022	• Assessment of potential delivery mechanisms such as a Special Purpose Vehicle (a company) to run the SaaS value proposition. • Prepare and support a premium software version package. • Consolidate the SaaS structure for service delivery (infrastructure, software upgrade roadmap, etc) • Consolidate the technical support & service component, including expertise. • Generate marketing material for communications and dissemination • Evaluate user feedback on THERMOS features, outputs and development options.	• Provide access to the free standard THERMOS version to all THERMOS users via the project website. • Identification of case studies for THERMOS use, together with cities and research and academic organisations using the Tool for non-for profit applications. • Develop training, communications and dissemination activities for interested stakeholders with the support of THERMOS partners. • Identify synergies with other projects or initiatives to disseminate THERMOS in Europe including potential new Ambassadors recruitment.
March 2022 – March 2023	• Further develop premium access version of software and services to selected customers. • Consolidate and where appropriate upscale the commercial offer for THERMOS European customers and elsewhere. • Develop agreements with strategic partners.	• Maintain free access to the standard version of THERMOS, applying updates as appropriate. • If applicable, support the publication of Academic and Research papers. • Support for dissemination and case studies development, new THERMOS Ambassadors recruitment, etc. within other H2020 projects.
March 2023 – March 2024	• Further develop premium access version of software and services to selected customers. • THERMOS trials beyond Europe. • Upscaling by utilities and consultancies, energy agencies, etc.	• Maintain free access to the basic version of THERMOS, applying updates as appropriate. • Review conditions for maintaining the free access public version of THERMOS beyond 2023.

4.3 Roles of THERMOS Partners

Project partners will be encouraged to take different roles for ensuring the maintenance, development and promotion of the Tool after the THERMOS project ends. These roles and responsibilities can be divided into three main areas as explained below.

Local partners, especially cities, will be encouraged to help in the dissemination of THERMOS to other municipalities based on their experiences. ICLEI will continue working to disseminate THERMOS among their members.

Table 4. Roles of THERMOS partners

Action	Partners involved
Software development and administration	Centre for Sustainable Energy (CSE), UK
Technical support and service Provision	Centre for Sustainable Energy and CREARA: user support; business development, marketing and sales support Potential technical consultancy services (e.g. in Latvia, Poland) could be provided by: • Krajowa Agencja Poszanowania Energii SA (KAPE), (National Agency for Energy Conservation), Poland • Zemgale Regional Energy Agency (ZREA), Latvia ICLEI Europe service provision to ICLEI members.
Demonstration and promotion	All partners to disseminate. ICLEI Europe to support marketing and communications. Scientific and Research Partners develop case studies and research and academic publications on the use of THERMOS for a sustainable energy transition.

Source: THERMOS Partners Exploitation Agreement, THERMOS partner responses to proposals. 2020

4.4 Roles of Trainers and Ambassadors

Trainers and Ambassadors recruited during the THERMOS project have an important role in disseminating THERMOS and supporting the demonstration of the Tool on a local level.

THERMOS Trainers will be encouraged to continue using the THERMOS Tool after the project ends and will be invited to participate in training sessions, future conferences or seminars in order to disseminate their THERMOS experience and feedback on the Tool. This would add credibility to promotion efforts, as Trainers are external to the project.

Ambassadors will be encouraged to support the dissemination of the Tool in their scope of action, including if possible conferences or seminars to represent THERMOS and share their experience. They could also promote THERMOS in an active way on their own channels. During the consolidation of the THERMOS SaaS model, Ambassadors will be invited to actively engage and support this process and evaluate further opportunities for collaboration to widen the use of THERMOS with their support. Ambassadors will be kept involved in Tool development and roll-out processes upon their availability and interest.

5. THERMOS Adoption Recommendations

The contribution of THERMOS for local energy transitions is based on the Tool's flexibility to provide the above-mentioned scenarios for different contexts. A list of recommendations are provided below for the successful adoption of THERMOS for different stakeholders. These stakeholders represent the main user types that have been considered to benefit from the Tool.

5.1 For Local and Regional Governments

- Clarify how THERMOS can help define a DHC case with a focus on a local authority's sustainable energy and climate action planning processes. In addition, the definition of district energy infrastructure costs is crucial for the planning process and it should be based on local realities and real DHC project development experiences.
- Have in place a governance structure to allow an initial screening of THERMOS based on the area's needs and assemble all relevant stakeholders to agree the input required. An evaluation of the regulatory framework and the energy market on a local and regional level is necessary to better define the case or cases to be modelled with THERMOS.
- The local administration should consider municipal legal regulations or incentives for companies that are interested in developing thermal networks, for example to connect to industrial parks or to new renewable energy sources development. The participation of citizens, enterprises and local authorities in renewable energy projects, through local energy communities can generate a significant added value in relation to the local acceptance of renewable energies and access to additional private capital.
- Access to key data to be used with the Tool requires standardised frameworks and data security considerations, especially for data related to building classification, energy costs and energy consumption.
- Evaluate the skills needed to use THERMOS and interpret results, along with any complimentary skills such as capability with Geographical Information Systems (GIS) and energy demand analysis.
- Consider DHC developments in the core of cities' Sustainable Energy and Climate Action Plan (SECAP), as key mitigation and adaptation actions.

5.2 For Energy Agencies

- Define case studies for THERMOS and consider its use to inform regional energy planning and for scenario-building within options appraisals.
- Collect and share data that can be input to THERMOS for better modelling, encouraging the engagement of local governments where appropriate.
- Offer and share expertise on district heating and cooling planning with THERMOS to local authorities who may lack knowledge in the field.

5.3 For DHC Utilities

- Gather information and expertise on the THERMOS Tool and its possibilities.
- Define a case study for THERMOS to compare the results obtained with those from modelling processes within their own tools and current planning activities.
- Gain expertise in economic aspects of DHC networks to understand the results obtained and the benefits offered from using THERMOS.

5.4 For Consultancies, Engineering Firms & DHC Project Developers

- Identify a clear case within THERMOS which may serve to illustrate an improvement on existing modelling processes. Allocate responsibilities to develop business cases using THERMOS that are replicable and scalable. This can be done with the company's internal resources or by drawing on THERMOS partners' expertise.
- Evaluate the commercial opportunities of using THERMOS in broader projects.

5.5 For Research and Academic Organisations

- Identify cases and opportunities for THERMOS use and encourage researchers to test the Tool. Identify innovative projects that could benefit from THERMOS.
- Collect data to test the Tool and explore ways to improve the models, where appropriate liaising with the software development team.
- Specifically for universities, establish mechanisms for students to test THERMOS, using data applicable to real cases or new cases created in alignment to course curricula.

5.6 For Networks / Associations

- Promote the benefits of DHC and the THERMOS Tool through workshops, live demonstrations and other dissemination activities.

5.7 For Urban Developers and Energy Communities

- Gather as much information as possible to help improve estimations of energy demand data, for example by finding similar existing buildings or areas to those being modelled.
- Develop case studies using THERMOS drawing on local data as far as possible.

Unsplash / Kaspars Upmanis

6. THERMOS Future Areas of Development

THERMOS has shown its potential to support local energy transitions. In order to multiply the effect of THERMOS as a key sustainable energy planning tool, we have identified new areas around which THERMOS could potentially be explored and developed by partners, users, trainers and Ambassadors. Some of these areas will be developed as part of the THERMOS Sustainable Adoption Roadmap activities, but others will require further support and engagement to be implemented. These further areas are described as follows:

6.1 THERMOS integration into SECAP processes

Energy and climate goals could be good drivers for district energy transformation processes. Often DHC technology options are not evaluated as mitigation and/or adaptation actions in sustainable energy and climate action planning processes in cities, due to a lack of knowledge or understanding of DHC and its benefits. A formal process to identify KPIs that may reflect THERMOS application success could be of interest within the SECAP reporting processes that cities have to develop within their Covenant of Mayors' commitments.

6.2 THERMOS to drive data-driven projects in cities

THERMOS capabilities can be explored to enhance the development of new data-driven projects in cities within the fields of sustainable energy and climate action. It would be beneficial to explore the potential of THERMOS for big data applications, AI applications, open energy data projects etc. Synergies with existing projects or the development of pilots with cities should be fostered.

6.3 THERMOS to promote innovation in district energy

THERMOS is an open-source software, and the source code of the Tool is available for software engineers to develop new applications and solutions which may enhance district heating and cooling projects. The potential of THERMOS to support innovation towards facilitating the deployment of DHC networks for sustainable energy transitions should also be encouraged in further dissemination activities of the Tool.

6.4 THERMOS to accelerate sustainable transitions

The potential of THERMOS to support the development of DHC networks could bring important insights on how the Tool and DHC systems could support the achievement of local and regional sustainability goals, for example:

- Environmental quality: DHC developments can improve local environmental quality in urban and rural areas, especially indoor and outdoor air pollution levels, noise level reductions, etc.
- Economic development: such as the capacity to attract new companies to cities, increase companies' competitiveness due to reduced energy costs, and direct job creation through the implementation, management and maintenance of DHC infrastructure.
- Empowering of energy communities: local community stakeholders and individuals could get involved in district energy solutions. This enhances innovative, bottom-up business models and increases the diversity of actors in the heat supply sector.
- Reducing energy poverty: reduction of energy poverty rates on a local level can be achieved thus improving the quality of life of citizens facing periods of energy poverty.

6.5 THERMOS to unlock low-carbon district energy finance

THERMOS is an effective tool to facilitate decision-making on DHC investments. Therefore, it should be brought to the attention of, and used in dialogue with institutions financing sustainable urban infrastructure such as DHC networks e.g. EIB, GCF, etc). Used in this way, THERMOS can be especially useful to rapidly evaluate the viability of projects, investments and proposals.

6.6 THERMOS for cities beyond Europe

THERMOS can be exploited in other territories beyond Europe. The geographic flexibility of the Tool together with the newly defined SaaS model, could facilitate the broader use of THERMOS. This should be further explored together with project partners, trainers and Ambassadors.

6.7 THERMOS integration to new applications

Future THERMOS software development should also consider the integration of THERMOS with other applications to create synergies around data use and DHN analysis. Examples could potentially include:

- Housing/building stock databases containing energy demand data and information on energy efficiency measures;
- Technology-specific sustainable heat supply assessment tools;
- Rooftop solar energy assessment tools;
- Power network mapping tools.

7. References

THERMOS D4.1. Thermos Baseline Replication Assessment Report. 2018

THERMOS D5.15. Replication Guide. 2021

THERMOS D4.4. THERMOS Twinning Report. 2020

THERMOS Train the Trainers Evaluation Reports, 2018, 2019, 2020

Partners

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