H2020 Work Programme

D6.4 - PUBLIC AND INDUSTRIAL PERSPECTIVE OF WH/C RECOVERY

Lead Partner: ANTWERP

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Abbreviations

DH: District Heating

DHCN: District Heating and Cooling Networks

EU: European Union

RES: Renewable Energy Sources

WH/C: Waste Heat/Cold

Executive summary

The objective of this report is to study the paradigm change from a public and industrial perspective in regard to WH/C and surplus RES recovery. The opportunities associated to the level of environmental commitment have been explored. They act as economic drivers of the industrial activity, affecting investments and business decisions.

To convince public and industrial entities to invest in WH/C and surplus RES recovery, the possible benefits should first be identified and communicated to public and industrial stakeholders. Therefore, an inventory of these benefits has been made, based on a concise literature review (1). Next, recommendations to accelerate WH/C recovery and RES integration have been gathered (2).

Since there is an abundance of information available on benefits and recommendations to accelerate waste heat and cold recovery and the implementation of renewable energy sources, more emphasis has been placed on how to develop the actual projects and the way the outcomes of this project can contribute to the actual development of WH/C-networks and RES integration.

As a guidance for replication, a service blueprint has been developed. It explains the necessary steps and roles of different actors to set up collaborations between private or public stakeholders to implement WH/C-recovery, to develop district heating networks and integrate RES. The Service Blueprint provides an overview of the process and the possible roles and activities of public and private stakeholders. (3)

Therefore, was used this visual presentation to assign each deliverable of the different work packages to a specific step in the service delivery. This way, it is possible to assess the contribution of the project to the services that it is necessary to provide to actually develop projects. (4) This overview can help new public or private energy brokers to access the right information at the right time of the delivery process.

This way, an overview of possible benefits and a guidance for replication for public and industrial actors to set up collaborations to implement WH/C valorisation and RES integration have been developed.

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1 Introduction to the collaborative side of developing District Heating and Cooling: industrial symbiosis

Climate change and the associated European, national, regional and local objectives are leading to a changed vision on the future energy use and supply. The adjusted objectives are translated into action plans that will be rolled out and are currently being implemented in the run-up to 2030 and 2050. Recent geopolitical evolutions also amplify the need for these changes.

The industrial sector is directly impacted by the changing environment and the resulting targets. Climate targets are already an important criterion when making decisions about future business plans and investments, and this is only expected to increase in the future.

"It is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself" (Darwin & Kebler, 1859). This quote is also applicable to industrial companies and global and local communities that face the impacts of climate change.

Increased energy efficiency and the use of renewable energy sources will be increasingly high on the agenda in the coming years. WH/C recovery and surplus RES integration will have to become an important part in the future energy supply. In this paper, possible benefits are first listed and coupled with recommendations that can accelerate WH/C recovery and surplus RES integration.

This deliverable focusses on the collaborative side of WH/C recovery and RES integration: industrial symbiosis. Industrial symbiosis occurs when industrial companies cooperate with their environment to exchange energy and material flows (Chertow, Industrial symbiosis: literature and taxonomy, 2000) . Industrial symbiosis can accelerate the energy transition and can contribute immensely to the transition to a circular economy. Besides the environmental benefits, it can also help strengthen the competitiveness of local companies and preserve economic welfare.

To convert the knowledge gained from the So What project into a practical and hands-on approach, a step-by-step plan for the implementation of additional WH/C recovery and surplus RES integration projects, by stimulating industrial symbiosis, is presented. The action plan uses the service blueprint methodology. Finally, the other activities and documents of the SO WHAT project are linked to a coherent roadmap so that this can be used as guidance for replication for public and industrial actors to set up collaborations to implement WH/C valorisation and RES integration.

2 Literature Review - Public and industrial perspective benefit of WH/C recovery and RES integration

To accelerate the development of projects focussed on WH/C recovery and RES integration, the benefits have to be visible and widely known by both public and industrial entities. Only then will be a chance to convince public and industrial entities to invest in WH/C and surplus RES recovery. The possible benefits are summarized, based on a concise literature review.

2.1 Benefits of WH/C recovery and RES integration

There are lots of possible benefits of WH/C Recovery and RES integration. Since these have been documented in more extensive research, we summon these in this chapter.

The main source of this overview is based on the results of the Scaler project (Vladimirova, Miller, & Evans, 2019) and the study of VLAIO (Technopolis Group & VITO, 2022). The benefits are split up in the 3 pillars of sustainability: economic, environmental and social aspects.

Table 1 - Benefits of WH/C recovery and RES integration

Economic	Environmental	Social
More efficient use of materials and energy streams leading to lower overall costs (Less wasted resources like waste heat/cold, water, ...)	Reduction or avoidance of raw materials consumption, reduced consumption of energy (local resource management): The heat supplied by a heat network has lower CO_2 emissions per unit, because of a higher energy efficiency and possible integration of renewable heat sources.	Less dependence on the import of foreign energy, more independence from geopolitical influences. This way, we retain more value in local economies.
Collective infrastructure also ensures that the costs of making the heat production can be kept within limits. If care is taken to bet on different supply sides, (type of) heat sources and on the demand side on different types of consumers. This has a positive effect on profitability but also lowers the need for security of supply and demand (cf. back-up). (cost sharing)	Crucial for sustainability towards a 100% renewable energy system is the mutual coupling of electricity, heat and transport in a smart energy system. The interaction between power and heat can yield efficiency gains. Various forms of thermal energy play a special role in this storage, which can convert the variable green power from wind turbines and PV panels into heat, store this heat and turn this heat again into electricity. (Vecchi, Li, Ding, Mancarella, & Sciacovelli, 2021)	Innovative cooperation of companies can generate a positive sentiment in a region, this can create local ecosystems of innovative companies that provide new technology and services.

Company compliance with environmental protection policy means that production can continue (license to produce)	Reduced pollution, reduced greenhouse gas emissions: a central boiler or incinerator also has efficient flue gas cleaning which reduce the emissions of other polluting substances such as fine dust or nitrogen oxides compared to small individual boilers.	Less pollution, leading to a better quality of life. Climate mitigation leads to less necessary investments in climate adaptation. This reduces the social effects of damages due to climate change.
Circular economy business development	Align industry with sustainability and circular economy goals including reduction of CO_2 emissions	New supply chains can provide new occupation and new jobs. (regional economic development)
This ecological advantage in combination with attractive and stable heat prices can be a lever for a competitive local economy.	Because the heat is generated centrally, collective sustainability is also possible in which all connected consumers get access to sustainable heat.	Investments in district heating networks can be combined with climate adaptation infrastructure and improved social infrastructure (bicycle lanes, social gardens, public meeting spots ...).
Due to the use of residual heat and renewable sources, the cost price is less dependent on uncertain fossil fuel prices. In addition, the operator of the heat network is responsible for the maintenance of the network, a concern and a cost less for the customer.	Compared to separate individual boilers, a heating or cooling network consumes less energy for the same amount of heat. Higher energy efficiency in the central heat source and fewer standstill losses.	The external supply of heat "unburdens" the heat consumer: there is little infrastructure needed in the connected buildings, it is fire-safe (no fuels required) and without smoke extraction or other nuisance. Periodic maintenance of individual central heating boilers or chimneys is no longer necessary.

2.2 What are the decision-making criteria to develop industrial symbiosis?

The scaler project gathered key decision factors to adopt industrial symbiosis in Europe by an expert inquiry (Vladimirova, Miller, & Evans, 2019) :

- A sound business case with clearly outlined economic benefits.
- Impact on and alignment to organisational goals.
- Environmental criteria - generation of environmental benefits.
- Legal compliance - compliance with environmental protection policies.
- Operational feasibility considering waste composition and volumes.
- Reduction of costs of raw materials.
- Reduction of dependency on virgin material
- Creation of new products.
- Reduction of gas consumption.
- Favourable results of proof vs. opportunity analysis.
- Sharing of resources and costs.

To convince public or private entities to invest time and efforts into the development of industrial symbiosis, it's important to be aware of the key decision factors that drive decision-making. Special emphasis can thus be placed on these key decision criteria.

2.3 What determines the success or failure of industrial symbiosis?

A stream of industrial symbiosis research has explored the factors that drive and/or hinder industrial symbiosis, categorizing them as technical, economic, organizational, social, and/or institutional factors (Park, Duque-Hernandez, & Diaz-Posada, 2018):

Table 2 - Key determining factors of industrial symbiosis

Key determining factors of industrial symbiosis	
Categories	Key Determining Factors
Technical	Quality, quantity, and continuity attributes of inputs and output streams
	Availability of reliable and cost-efficient technologies to enable synergies (e.g., in processing by-products)
	Availability of infrastructure (e.g., pipelines)
Economic	Potential economic benefits, including net cost savings (e.g., any change in the cost of virgin inputs, waste management, operations, transportation, and transactions) and revenue (e.g., by-product sales)
	Size of capital investment required and availability of funding
	Contribution to competitive advantage
Organizational	Awareness and knowledge of the concept of industrial symbiosis and its potential benefits
	Attitudes of the manager and/or organizational culture (e.g., openness, commitment, willingness)
	Organizational capacity and availability of organizational resources (e.g., staff, money, time)
	Risk perception (e.g., in disclosing information and/or creating dependency)
Social	Level of social interaction and mental proximity, or trust
	Capacity for communication and negotiation
	Common, aligned strategic vision and belief
	Balance or asymmetry in decision-making power and structure
Institutional	Environmental policies and standards (e.g., policy targets and interventions for industrial symbiosis)
	Nature and implications of relevant laws and regulations
	Policy instruments (e.g., taxes, fees, fines, levies, subsidies, credits)
	Stakeholder pressure

Since the SO WHAT project aims to deliver a technical and economic feasibility tool, most of the deliverables are focused on these aspects of industrial symbiosis. In the next chapters, the focus will be on the Organizational, Social and Institutional aspects of industrial symbiosis and WH/C recovery with RES integration, to complement the work done in the project and to produce a guide for replication.

3 Recommendations to accelerate WH/C recovery and RES integration

Recommendations to accelerate WH/C recovery and RES integration have been gathered. Since these have been documented in more extensive research, in this chapter the recommendations are described more briefly. Most of the information in this chapter is based on the outcome of the Scaler project that focuses on industrial symbiosis.

There is a need to build circles of trust with other stakeholders, namely other industries with which there is the need to start industrial symbiosis projects. For these projects to work it is essential to have guarantees that the material or energy flows, as well as their quality, will be available over a long period of time (Chertow, 2007).

It is necessary to foster strong private sector leadership and build links between industry and research institutes/knowledge intermediaries, essential for effective industrial symbiosis. Raising awareness of the potential benefits of industrial symbiosis is also a strong supporting factor. Projects can be implemented by building a coordinated network that collectively designs and implements appropriate business models. Most of the time, this will require a long-term view for even modest economic, social and environmental benefits to be realised.

Local authorities need to be called into action to support this. They need to create conditions for industrial symbiosis in urban areas/cities, and facilitate public and private sector capabilities to form industrial symbiosis networks in an increasingly urban environment (Södergren & Palm, 2021) .

Finally, there is also the need for people and/or entities to take a leading role in coordinating and developing industrial symbiosis platforms (Vladimirova, Miller, & Evans, 2018):

- Industrial symbiosis is a complex endeavour that requires a coordinated effort among multiple public and private stakeholders - policy makers must take the lead.
- Regional material flows should be mapped, as that will allow companies to better find potential synergies with neighbouring companies.
- For industrial symbiosis to accelerate rapidly, national governments need not only a clear, comprehensive and ongoing engagement policy but a Minister and proper department/body that is accountable for delivering specific targets.
- Within this is the need for comprehensive structures (at multiple levels that are synchronised) to be established in each country. These should be fully funded by national governments and would allow for the dynamic development of industrial symbiosis networks driven by on-going support and interventions.
- Industrial symbiosis best practices must be publicised to promote learning and knowledge sharing among regional/national actors.
- Increase efforts to include industrial symbiosis and circular economy activities in regional/national strategies.
- Invest in accessible high-quality specialist knowledge databases that are continuously updated and supported.
- Invest in actors with deep knowledge and expertise who understand the sectors in-depth, as sector-specific knowledge is critical.
- Organise industrial symbiosis discovery and business model design workshops with world-leading experts for local clusters.

- Enable and create private-public partnerships.
- Create conditions and build trust among industries, research institutes/knowledge intermediaries and public authorities.

4 Guidance for replication – Service Blueprint

Since there is an abundance of information available on benefits and recommendations to accelerate waste heat and cold recovery and the implementation of renewable energy sources, more emphasis has been placed on how to develop the actual projects, from project ideas to collaboration agreements.

As a guidance for replication, **a service blueprint** has been developed. It explains the necessary steps and roles of different actors to set up collaborations between private or public stakeholders to implement WH/C-recovery, develop district heating networks and integrate RES. This Service Blueprint provides an overview of the process and the possible roles and activities of public and private stakeholders. **(4)**

4.1 The role of energy brokers, industrial companies and local and regional authorities

In task 3.1, research was done focussing on barriers to industrial WH/C recovery and exploitation.

Table 3 - Barriers found in earlier studies and/or experienced by the Lighthouse cluster

Barriers which deteriorate the business case	Lack of existing infrastructure
	Low prices for the competing energy sources
	Current policy incentives promote other forms of heat supply
	Long distance between supply and demand (large initial cost for piping)
	Supply and demand not matching, not sufficiently high-grade heat, and varying seasonal demand
	Risk that the excess heat provider will terminate its industrial activities
	High transactional cost in terms of required time for design contract etc
Non-economic barriers	Lack of financial funding
	Low priority to non-core business
	Lack of trust between the stakeholders
	Different views of the value of the heat (price and quality)
	Lack of knowledge about heating issues
	Lack of knowledge about the amount of excess heat
	Lack of knowledge about business arrangements
	Requirement for a short payback period (Different views on suitable contracual length)
	Different views on how to plan revisions/stops for the excess heat

Most of the non-economic barriers can be tackled by service providers that are specialized in setting up collaborations and industrial symbiosis. In addition to certain basic financial and technical conditions, it is mainly certain organisational preconditions that need to be filled in order to work together:

- ✓ neutral actor playing proactive role with vision and generating interest
- ✓ participation of appropriate relevant contacts
- ✓ trust and good personal ties, perception of equality
- ✓ honesty and a shared vision of common goals

- ✓ joint strategy and cooperation agreement
- ✓ communication and information sharing
- ✓ common goals, profit sharing and risk diversification

Trust, joint problem solving, and fine-grained information sharing are very important elements to achieve cooperation. Honesty and shared visions of a common goal are also very important (Päivärinne, Hjelm, & Gustafsson, 2015).

Mastering the organisational aspect can create the right conditions to establish inter-organisational collaborations (Arnell, et al., 2012). The organisational aspects in the development of inter-organisational collaborations are understudied in the literature on heat networks and industrial symbiosis. In other words, there is a knowledge gap on creating the right organisational conditions (Difs, Danestig, & Trygg, 2009).

Research shows that establishing positive feedback loops between government, industry and other stakeholders can support the development of industrial symbiosis. This kind of interaction can help clarify local context and expectations and build local support and accountability for industrial activities (Walls & Paquin, 2015) .

To establish industrial symbiosis, the role of a (supra)local government is therefore very important because it can have a strong influence in terms of spatial planning, economic policy and long-term financing (Chertow, 2007). Indeed, the scientific literature and practice teaches that this kind of project largely depends on cooperation and collaboration between companies. Local agencies can play a supporting role here by creating the right conditions and setting up services (Pellenbarg, 2002).

Since the industrial symbiosis projects are difficult to establish, a new public service has been developed. It can be delivered by local and regional governments, in close collaboration with private actors. Although the importance of this service is emphasised in scientific literature on industrial symbiosis (Pellenbarg, 2002) (Park, Duque-Hernandez, & Diaz-Posada, 2018) (Arnell, et al., 2012), scientific literature does not address what exactly this service can look like.

To develop, visualise and optimize these public services, POM Antwerp has conducted participative action-oriented research in the past, in close collaboration with partners from the Netherlands and Flanders (Interreg-project "DOEN"). The result of this research is a visualisation of the service delivery, in a Service Blueprint. This framework has been used to build a guidance for replication and to assess the impact of this project.

4.2 Service Blueprint as a guidance for replication

4.2.1 What is Service Blueprinting and why do we use this tool?

Service Blueprinting is a Service Design tool. Service Design is an approach that puts end-users at the centre of service delivery. Instead of focusing on separate elements that make up the service, Service Design allows to look at the "user experience" holistically (Radnor, Osborne, Kinder , & Mutton, 2014). The concept of "Service Blueprinting" was developed by Shosack in 1982 (Shostack L. G., 1982). A Service Blueprint creates the opportunity for companies to explore all aspects related to service design or management (Shostack G. L., 1984).

Service Blueprinting is a graphical representation of the service delivery process. A service blueprint graphically depicts all sequences and steps of the service process in a two-dimensional flowchart (Shostack L. G., 1982). It can display the main activities of the service delivery process and the detailed subprocesses and subsystems that affect the delivery of a service. Processes become more understandable with this approach, and it is a powerful tool to stimulate creativity and problem solving (Shostack G. L., 1987).

Service Blueprinting can help service providers identify process failure points and weaknesses to improve service quality (George & Gibson, 1991) . The technique can also be applied to design a new service or implement improvements (Kingman-Brundage, 1989). Finally, by providing an end-to-end view of the service process, designers can analyse requirements and performance statistics. Based on this, the service design (or redesign for an existing service) can be developed, in collaboration with stakeholders (including suppliers and partners). This provides the opportunity to combine changes in process, organisation, technology and tools in an integrative way (Maglio, Srinivasan, Kreulen, & Spohrer, 2006).

4.2.2 What does a standard service blueprint look like?

Service Blueprint Components:

Table 4 - Service Blueprint template (Bitner, Ostrom, & Morgan , 2008)

Physical Evidence	
Customer Actions	Line of Interaction
Onstage/ Visible Contact Employee Actions	Line of Visibility
Backstage / Invisible Contact Employee Actions	Line of Internal Interaction
Support Processes	

A standard Service Blueprint consists of the following 5 components:

1. "Physical Evidence"
   All tangible things customers are exposed to that can influence their perception of quality.
2. "Customer actions": customer actions
   All the steps a customer goes through during the process: these so-called "customer actions" are central and at the top of the service blueprint
3. "Onstage / visible contact employee actions":
   The actions of staff who have contact with clients: every client contact is called a "moment of truth".
4. "Backstage" / "invisible contact employee actions":

The invisible interactions with clients and other activities undertaken by staff who have contact with clients in preparation for service delivery or that are part of their role responsibilities.

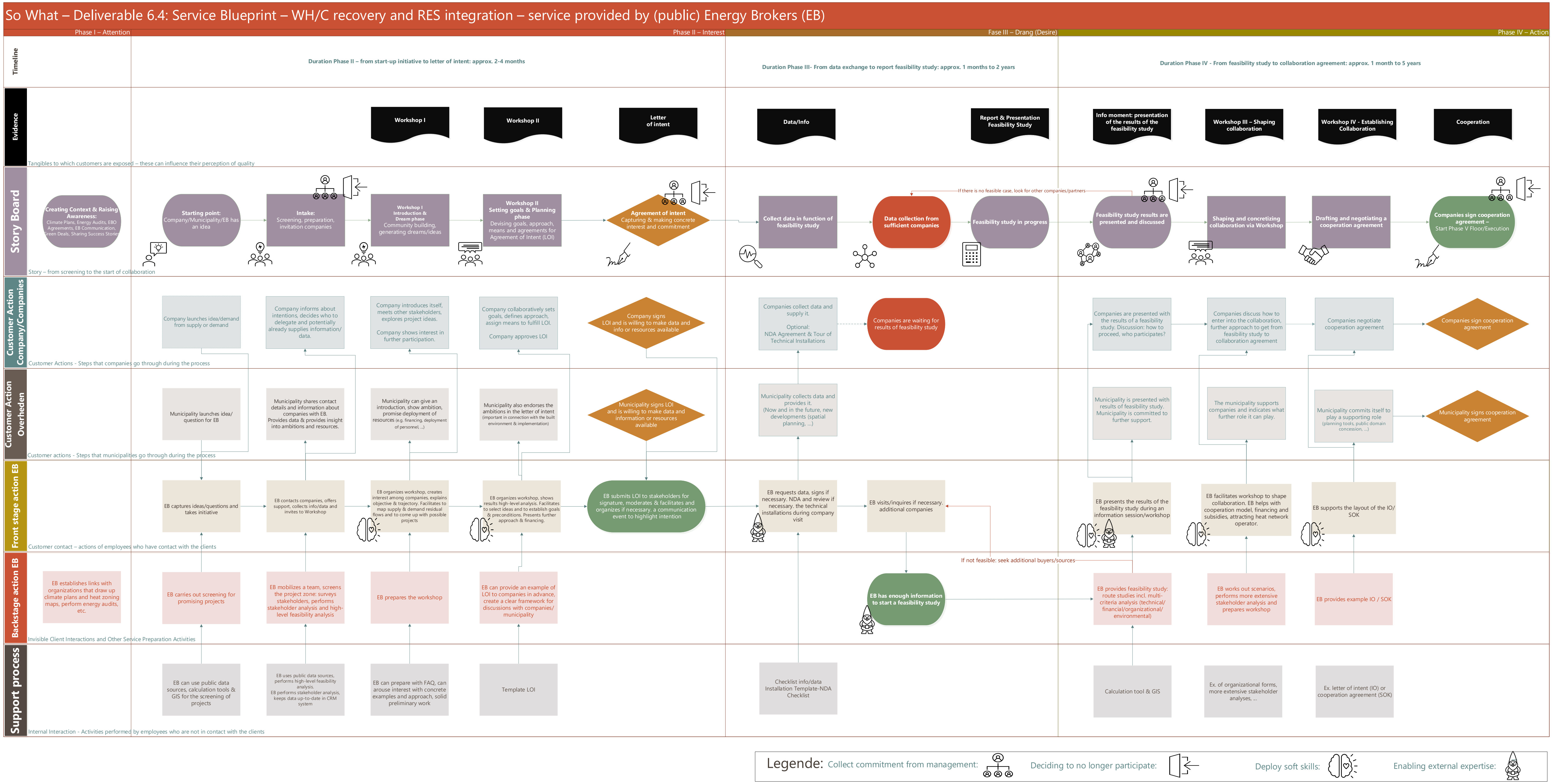
5. "Support processes"
The activities performed by employees who are not in contact with the clients. These activities are essential in delivering client services but are invisible (internal interaction)

4.3 Guidance for replication - Service Blueprint for 'Energy Brokers"

The Service Blueprint consists of 14 steps and a long waiting period for companies at the data exchange and feasibility studies stage.

- Create the right context and raise awareness
- Idea-raising: a company, municipality or energy broker has an idea
- Intake: screening, preparation and invitation of companies and other stakeholders
- Workshop I: introduction, dream phase: community building, generating dreams/ideas
- Workshop II: setting out goals and planning phase
- Letter of intent: capture interest and create commitment
- Data collection: collect data for the feasibility study
- Sufficient data for feasibility study: gathering of data of all stakeholders
- Feasibility study: calculation of technical and economic feasibility
- Info moment: results of the feasibility study are presented
- Workshop III: shaping the collaboration: exploration of possible collaboration
- Workshop IV: establishing the collaboration
- Signing of the collaboration agreement

Thus, the development of the tool, and the improvement on gathering data can help accelerate the processing time of the service delivery and the success ratio of these projects.



So What – Deliverable 6.4: Service Blueprint – WH/C recovery and RES integration – service provided by (public) Energy Brokers (EB)
Phase I – Attention
Phase II – Interest
Fase III – Drang (Desire)
Phase IV – Action
Timeline
Duration Phase II – from start-up initiative to letter of intent: approx. 2-4 months
Duration Phase III- From data exchange to report feasibility study: approx. 1 months to 2 years
Duration Phase IV - From feasibility study to collaboration agreement: approx. 1 month to 5 years
Evidence
Workshop I
Workshop II
Letter of intent
Data/Info
Report & Presentation Feasibility Study
Info moment: presentation of the results of the feasibility study
Workshop III – Shaping collaboration
Workshop IV - Establishing Collaboration
Cooperation
Tangibles to which customers are exposed – these can influence their perception of quality
Story Board
Creating Context & Raising Awareness: Climate Plans, Energy Audits, EBO Agreements, EB Communication, Green Deals, Sharing Success Stories
Starting point: Company/Municipality/EB has an idea
Intake: Screening, preparation, invitation companies
Workshop I Introduction & Dream phase Community building, generating dreams/ideas
Workshop II Setting goals & Planning phase Devising goals, approach, means and agreements for Agreement of Intent (LOI)
Agreement of intent Capturing & making concrete interest and commitment
Collect data in function of feasibility study
Data collection from sufficient companies
Feasibility study in progress
If there is no feasible case, look for other companies/partners
Feasibility study results are presented and discussed
Shaping and concretizing collaboration via Workshop
Drafting and negotiating a cooperation agreement
Companies sign cooperation agreement – Start Phase V Floor/Execution
Story – from screening to the start of collaboration
Customer Action Company/Companies
Company launches idea/demand from supply or demand
Company informs about intentions, decides who to delegate and potentially already supplies information/data.
Company introduces itself, meets other stakeholders, explores project ideas. Company shows interest in further participation.
Company collaboratively sets goals, defines approach, assign means to fulfill LOI. Company approves LOI
Company signs LOI and is willing to make data and info or resources available
Companies collect data and supply it. Optional: NDA Agreement & Tour of Technical Installations
Companies are waiting for results of feasibility study
Companies are presented with the results of a feasibility study. Discussion: how to proceed, who participates?
Companies discuss how to enter into the collaboration, further approach to get from feasibility study to collaboration agreement
Companies negotiate cooperation agreement
Companies sign cooperation agreement
Customer Actions - Steps that companies go through during the process
Customer Action Overheden
Municipality launches idea/ question for EB
Municipality shares contact details and information about companies with EB. Provides data & provides insight into ambitions and resources.
Municipality can give an introduction, show ambition, promise deployment of resources (e.g. financing, deployment of personnel, ...)
Municipality also endorses the ambitions in the letter of intent (important in connection with the built environment & implementation)
Municipality signs LOI and is willing to make data and information or resources available
Municipality collects data and provides it. (Now and in the future, new developments (spatial planning, ...)
Municipality is presented with results of feasibility study. Municipality is committed to further support.
The municipality supports companies and indicates what further role it can play.
Municipality commits itself to play a supporting role (planning tools, public domain concession, ...)
Municipality signs cooperation agreement
Customer actions - Steps that municipalities go through during the process
Front stage action EB
EB captures ideas/questions and takes initiative
EB contacts companies, offers support, collects info/data and invites to Workshop
EB organizes workshop, creates interest among companies, explains objective & trajectory. Facilitates to map supply & demand residual flows and to come up with possible projects
EB organizes workshop, shows results high-level analysis. Facilitates to select ideas and to establish goals & preconditions. Presents further approach & financing.
EB submits LOI to stakeholders for signature, moderates & facilitates and organizes if necessary, a communication event to highlight intention
EB requests data, signs if necessary. NDA and review if necessary. the technical installations during company visit
EB visits/inquires if necessary. additional companies
EB presents the results of the feasibility study during an information session/workshop
EB facilitates workshop to shape collaboration. EB helps with cooperation model, financing and subsidies, attracting heat network operator.
EB supports the layout of the IO/ SOK
Customer contact – actions of employees who have contact with the clients
Backstage action EB
EB establishes links with organizations that draw up climate plans and heat zoning maps, perform energy audits, etc.
EB carries out screening for promising projects
EB mobilizes a team, screens the project zone: surveys stakeholders, performs stakeholder analysis and high-level feasibility analysis
EB prepares the workshop
EB can provide an example of LOI to companies in advance, create a clear framework for discussions with companies/ municipality
EB has enough information to start a feasibility study
If not feasible: seek additional buyers/sources
EB provides feasibility study: route studies incl. multi-criteria analysis (technical/ financial/organizational/ environmental)
EB works out scenarios, performs more extensive stakeholder analysis and prepares workshop
EB provides example IO / SOK
Invisible Client Interactions and Other Service Preparation Activities
Support process
EB can use public data sources, calculation tools & GIS for the screening of projects
EB uses public data sources, performs high-level feasibility analysis. EB performs stakeholder analysis, keeps data up-to-date in CRM system
EB can prepare with FAQ, can arouse interest with concrete examples and approach, solid preliminary work
Template LOI
Checklist info/data Installation Template-NDA Checklist
Calculation tool & GIS
Ex. of organizational forms, more extensive stakeholder analyses, ...
Ex. letter of intent (IO) or cooperation agreement (SOK)
Internal Interaction - Activities performed by employees who are not in contact with the clients
Legende: Collect commitment from management:
Deciding to no longer participate:
Deploy soft skills:
Enabling external expertise:

5 Guidance for replication – Contribution of the SO WHAT project to the Service Delivery of 'Energy Brokers"

The SO WHAT project has delivered a lot of new insights, tools and formats. To provide a guidance for replication, it is important to organize this huge content into a concise format. This way, it is possible to access the right information at the right time in the process of the service delivery.

To make this accessible, this visual presentation to assign each deliverable of the different work packages to a specific step in the service delivery has been used. This way, it is possible to assess the contribution of the project to the services that are needed to provide to actually develop projects.

5.1 Contribution of the SO WHAT project to the Service Delivery of 'Energy Brokers"

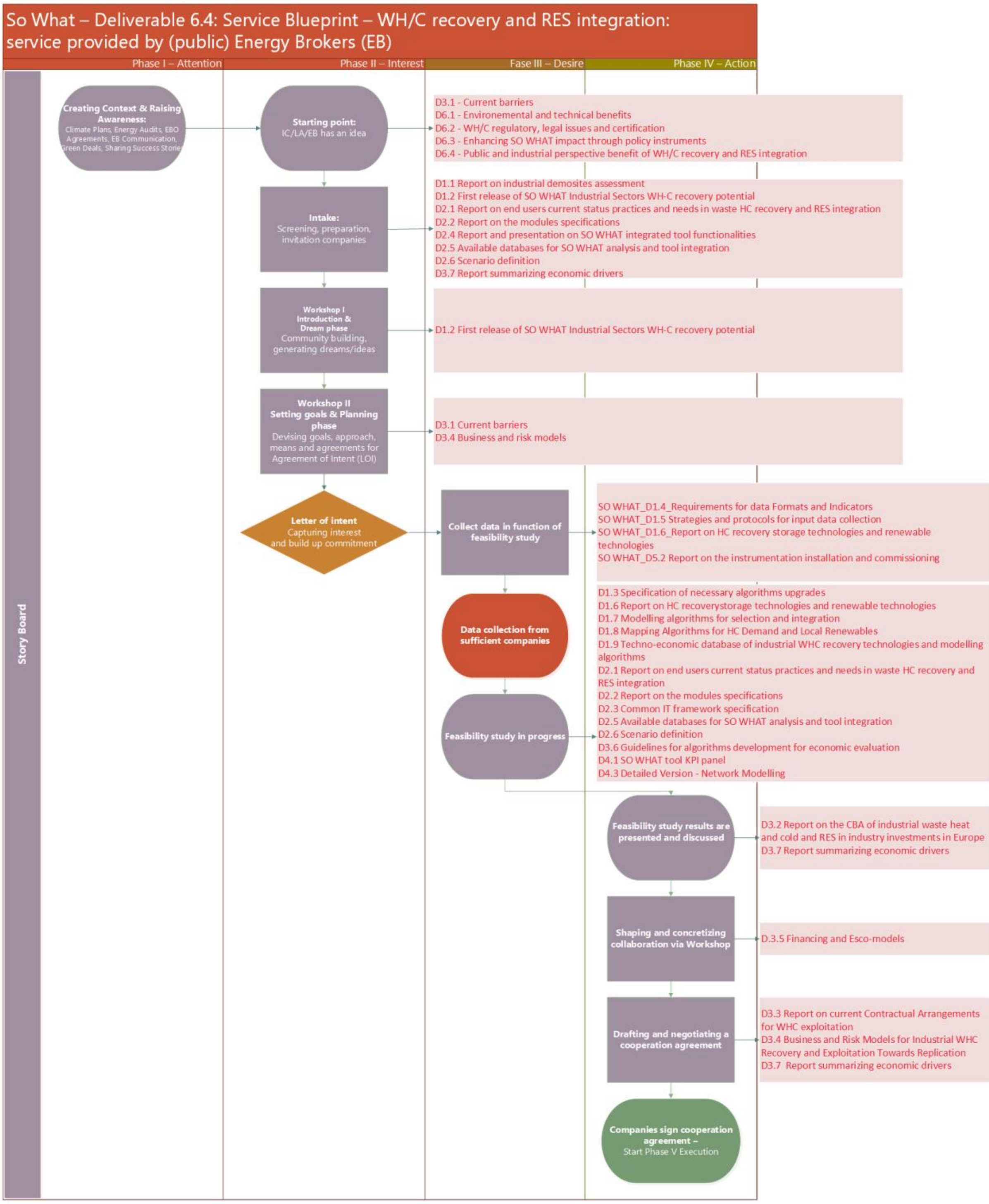


Figure 1 - SO WHAT - Service Blueprint - WH/C recovery and RES integration: service provided by (public) Energy Brokers (EB)

6 Conclusions

WH/C recovery and RES integration projects are subject to a long process of discussions, technical and financial feasibility studies. One of the most time-consuming and complex tasks has been integrated into the software tool. Once the tool is fully functional, this can drastically improve the lead time of project developments.

Although most of the tasks in the project were focussed on the development of the tool and the underlying algorithms and specifications, lots of other deliverables are useful in other stages of the service delivery. This paper presents a visual representation which helps to access the right information at the right time.

To further improve this guidance for replication, more service blueprints for different types of services can be developed. This way we can provide guides for (private or public) energy brokers that focus on interorganisational collaboration, or guides for in-house energy specialist or private consultants for internal energy optimizations.

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