Business models for the deployment of Solar Heating for Industrial Processes

Deliverable 8.1

WP8. Business model, Replication and Exploitation

SHIP2FAIR - Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Prepared by: EDF

Date: 18/10/2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 792276.

Disclaimer: The sole responsibility for any error or omissions lies with the editor. The content does not necessarily reflect the opinion of the European Commission. The European Commission is also not responsible for any use that may be made of the

DELIVERABLE FACTSHEET

Deliverable no.:	Deliverable 8.1 Business models for deployment of solar heating for industrial processes
Responsible Partner:	EDF
WP no. and title:	8. Business model, Replication, Exploitation
Task no. and title:	8.1. Business models for deployment of solar heating for industrial processes
Version:	1
Version Date:	18/10/22

Dissemination level	
	PU = Public
	PP = Restricted to other programme participants (including the EC)
	RE = Restricted to a group specified by the consortium (including the EC)
	CO = Confidential, only for members of the consortium (including the EC)

Approvals

	Company
Author/s	EDF
Task Leader	EDF
WP Leader	RINA C

DISCLAIMER OF WARRANTIES

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 792276".

This document has been prepared by SHIP2FAIR project partners as an account of work carried out within the framework of the EC-GA contract no 792276.
Neither Project Coordinator, nor any signatory party of SHIP2FAIR Project Consortium Agreement, nor any person acting on behalf of any of them:

(a) makes any warranty or representation whatsoever, expressed or implied,

(i). with respect to the use of any information, apparatus, method, process, or similar item disclosed in this document, including merchantability and fitness for a particular purpose, or

(ii). that such use does not infringe on or interfere with privately owned rights, including any party's intellectual property, or

(iii). that this document is suitable to any particular user's circumstance; or

(b) assumes responsibility for any damages or other liability whatsoever (including any consequential damages, even if the Project Coordinator or any representative of a signatory party of the SHIP2FAIR Project Consortium Agreement has been informed of the possibility of such damages) resulting from your selection or use of this document or any information, apparatus, method, process, or similar item disclosed in this document.

ABREVIATIONS

SWOT: Strength Weakness Opportunity Threats
PESTEL: Politic Economy Social Technology Environment Legal
SHIP: Solar Heat in Industrial Process
HRB: Horizon Results Booster
LCOE Levellised Cost Of Energy
BMC: Business Model Canvas:

PARTNERS SHORT NAMES

CIRCE: FUNDACIÓN CIRCE CENTRO DE INVESTIGACIÓN DE RECURSOS Y CONSUMOS ENERGÉTICOS
RINA-C: RINA Consulting S.p.A.
CEA: Commissariat à l'énergie atomique et aux énergies alternatives
LINKS: Fondazione links – leading innovation & knowledge for society
SOLID: S.O.L.I.D. Gesellschaft für Solarinstallation und Design mbh
TVP: TVP Solar
IS: Industrial Solar GmbH
BEST: Bioenergy and sustainable technologies GmbH
M&R: Martini & Rossi S.p.A.
RODA: Bodegas Roda S.A.
RAR: RAR – Refinarias de Açúcar Reunidas S.A.
Larnaudie: SNC JEAN LARNAUDIE
EDF: Electricité de France
EUREC: EUREC EESV
SPANISH CO-OPS: Cooperativas Agro-alimentarias de España, U. de Coop.
SOLID: SOLID SOLAR ENERGY SYSTEMS GMBH

PUBLISHABLE SUMMARY

The present deliverable aims to highlight all the relevant elements of both internal and external environment, which impacts the development of solar heat in industrial process in agri-food industry. Its final purpose is to provide an overview of different business models suitable for the development of SHIP2FAIR in food and beverage industries. To achieve these goals, a state of the art of the SHIP market worldwide and in Europe more specifically was conducted. An analysis of the environment, both intern and extern, was made through a SWOT matrix and a PESTEL study. This work package task also benefited from the support of the EU service Horizon Results Booster (HRB). They provided a methodology for the elaboration of the business model canvas. On top of that, workshops with SHIP2FAIR partners were held to add information related to the experience acquired through the work done so far in the project.

The market analysis revealed the many assets of SHIP as of today. Indeed, through the last two decades tremendous progress was made in terms of development of SHIP (Sola Heat in Industrial Processes) projects. 311 solar thermal installations have been identified worldwide with a total thermal capacity installation of 491MW_{th}. However, it is important to note the gap between the different installations in terms of size. The world 3 largest SHIP installations account for 74% of the worldwide installed thermal capacity. With 74% of energy needs being thermal ones and 75% of consumed energy produced from fossil sources, the industrial sector has a great potential for solar heat. The branches mainly covered with solar heat worldwide are mining, agriculture, food & beverage, textile and chemical. Food and beverage industry have an important number of installations in comparison to others, but relatively lower capacity installed. During the last 15 years, in Europe, the power installed associated with SHIP projects for the food and beverage industry shows an ascending trend. The reduction of costs enabled through economies of scale gave a push in the right direction. Solar thermal has today competitive Levelised Cost of Energy (LCOE) (for South and Central Europe, 0.04-0.11 EUR/kWh based on IRENA report) in comparison to fossil fuels. The capital takes between 50-70% of the total costs. However, there are still many hindrances to SHIP expansion. One of the main seen by SHIP planners is the low fossil fuel prices. Actual inflation noted worldwide can be seen as an opportunity, but it also depends on other factors. For example, other obstacles are political regulations, financial support scheme, access to project financing and growing economy (source: solar Payback).

To fight all these barriers, a lot of effort should be put on stepping-up communication efforts to raise awareness of the technology among potential customers in industries, implementing a carbon pricing mechanism that reflects adequately negative externalities of fossil fuels consumption across the European economy and adjust their prices, supporting financing models to reduce risks and initial costs to small and medium industrial investors. On that last aspect, in Europe, different funding options have been developed. In the different countries involved in SHIP2FAIR the followed measures were implemented:

EU Countries	INCENTIVES FOR SOLAR HEAT
Austria	CAPEX incentives for SHIP projects, amount depends on the size
France	CAPEX contribution up to 65% of the investment
Germany	Loan and CAPEX incentives if supplying 50% or more of the heat demand
Greece	Many different programs based on CAPEX & taxation deductions
Italy	50-75% tax deduction for expenses related to installation of RES heating technologies & loan up to 70% of the admissible costs

Spain	CAPEX/grant up to a maximum amount between 50% and 80% of the eligible investment cost
Sweden	Renewables are exempt from taxes in relation to technologies used for heating at houses, industry or NO tax.

The SWOT and PESTEL diagrams highlight the main advantages of solar heat and the existing opportunities. The main aspects that require further thinking and work were also identified. Finally, 3 different business models were suggested, and a business model canvas (BMC) was elaborated.

TABLE OF CONTENTS

INTRODUCTION 9
Methodology & structure of the report 9
Ship market analysis 10
Potential of development of Solar heat installations 10
Principal obstacles to SHIP expansion and perspectives 14
PESTLE results summary 17
SWOT matrix 17
Business models for SHIP 18
SHIP Project Value Chain 18
Business models schemes for SHIP 18
Build and handover business model 18
Build and operate business model 19
Build and operate hybrid version business model 19
SHIP business model canvas 20
Business Model Canvas 20
Customer Segment 21
Unique Value Proposition 22
Channels 23
Customer Relationship 23
Key Partners 24
Key activities 24
Key resources 25
Revenue streams 26
Cost structure 26
6 CONCLUSIONS 27
References 28
7 ANNEX I: 29
European Incentives for SHIP projects 29
PESTLE Results Summary 34
DISSEMINATION POTENTIAL ..... **Error! Bookmark not defined.**

TABLE OF ILLUSTRATIONS

Figure 1:Solar process heat applications in operation worldwide by the end of March 2021 by capacity and collector area (IEA SHC, 2021)..... 10
Figure 2:Solar process heat applications in operation worldwide by the end of March 2021 by collector type..... 11
Figure 3:Solar process heat applications in operation worldwide by the end of March 2021 by industry sector (IEA SHC, 2021)..... 11
Figure 4 : Type of collectors depending on the temperature level and its matching sectors..... 12
Figure 5 : Total heat demand for low and medium temperature applications..... 12
Figure 6 : Key figures for solar heat potential of development in the industrial sector..... 13
Figure 7 : Weighted average, total installed costs of 101 SHIP plants in Europe (2020)..... 13
Figure 8 : Results from survey on 71 SHIP suppliers worldwide (Solar Payback, 2021)..... 14
Figure 9 : Funds at a glance accross Europe (IEA SHC TASK 64, 2021)..... 16
Figure 10 : Build and handover business model illustration..... 18
Figure 11 : Build and operate business model illustration..... 19
Figure 12 : Build and operate business - hybrid version illustration (part 1)..... 19
Figure 13 :Build and operate business - hybrid version illustration (part 2)..... 20

INTRODUCTION

The results presented in the following deliverable were conducted in Task 8.1, Business models for the deployment of Solar Heating for Industrial Processes. Task8.1 is part of WP 8, Business Model, Replication and Exploitation. The deliverable main goals are to provide an analysis of the environment in which SHIP2FAIR project will be developed, to propose different suitable business models for the deployment of Solar heat in industry in particular food & beverage. A business model canvas depicting the whole value chain of solar heat is also included.

These results were achievable using the learned experience during the first phase of the project especially during the development and the commissioning of the demo-sites. It also benefited from the support of the HRB service in terms of BMC methodology. Workshops with SHIP2FAIR partners provided reliable information in understanding the main challenges during development of SHIP projects.

Methodology & structure of the report

The deliverable is structured into 3 main chapters. The first one depicts the state-of-the-art of the market regarding SHIP (Solar Heat in Industrial Processes) projects. Starting with the current situation of solar heat installations worldwide, the European situation is analysed. More specifically a focus on different industrial sectors emphasizes the progress achieved and the improvements to be done. Different technologies implemented regarding the needs but also the economical trend is described. Some obstacles have been identified and suggestions to counter them proposed. A special focus on existing measures and incentives in favour of the development of SHIP in different EU countries, especially the ones involved in SHI2FAIR, is given.

At the beginning of the WP, a PESTEL analysis of solar heat in the 7 different EU countries of SHIPFAIR was made by each partner (Austria, Germany, Greece, France, Italy, Portugal and Spain). It gave the first information to better understand the current situation regarding solar heat across Europe. All the material collected during that first phase were synthetized in a SWOT matrix. The tool provided a good picture of internal and external advantages and hindrances. The solar heat value chain was defined and led to the identification of 3 different business models for SHIP deployment.

As a final step, the business model canvas was described.

Ship market analysis

Potential of development of Solar heat installations

As of today, 311 Solar thermal installations worldwide is used to supply part (or the full) heat demand of industrial processes have been identified (IEA SHC, 2021). This represents 491 MW_{th} total thermal capacity of SHIP projects worldwide. The average size of most SHIP installations (in number) is below 35 MW_{th} for industrial applications. The world 3 largest SHIP installations account for 74% of the worldwide installed thermal capacity from SHIP projects, with the largest one representing alone 65% of the total thermal capacity with 300 MW_{th}, located in Oman. The Figure 1 shows such installations on the first column

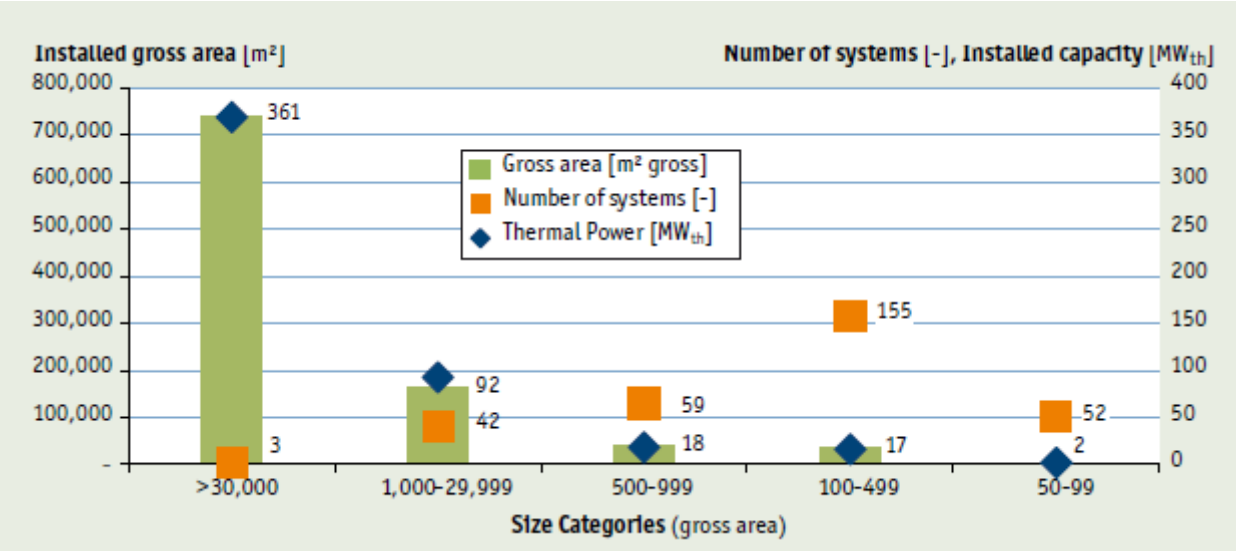


Figure 1:Solar process heat applications in operation worldwide by the end of March 2021 by capacity and collector area (IEA SHC, 2021)

In terms of type of technologies installed, the Figure 2 below illustrates the different technologies installed with the details in terms of gross area, number of systems and thermal power (IEA SHC, 2021). Most of the systems use flat plate collectors. Even though being lower in number of installations, parabolic trough collector delivers the larger part of the thermal power, but this greatly depends on the largest SHIP installation in Oman, without considering that project, parabolic trough will rank third in terms of installed gross area. In comparison, the types of collectors used in SHIP2FAIR demo-sites are:

- Linear Fresnel with vacuum receiver
- Ultra-high vacuum Flat Plate Collector
- Flat Plate Collector

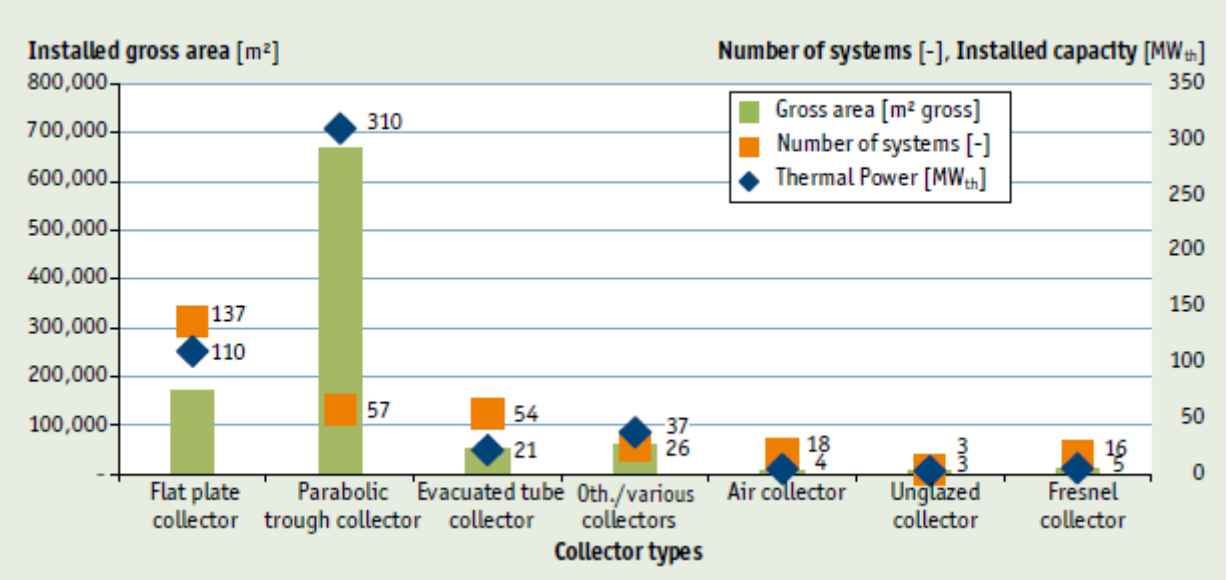


Figure 2:Solar process heat applications in operation worldwide by the end of March 2021 by collector type

The main sectors using solar heat for their needs are mining, food, and textile, with the mining sector being the dominant one now. However, food and beverage sectors combined account for 47% of the total installed system by number of installations. The size of F&B installations tends to be smaller than those of the mining sector. But they are still relevant when considering that 2 of the largest SHIP installations serve the mining sector (IEA SHC, 2021)

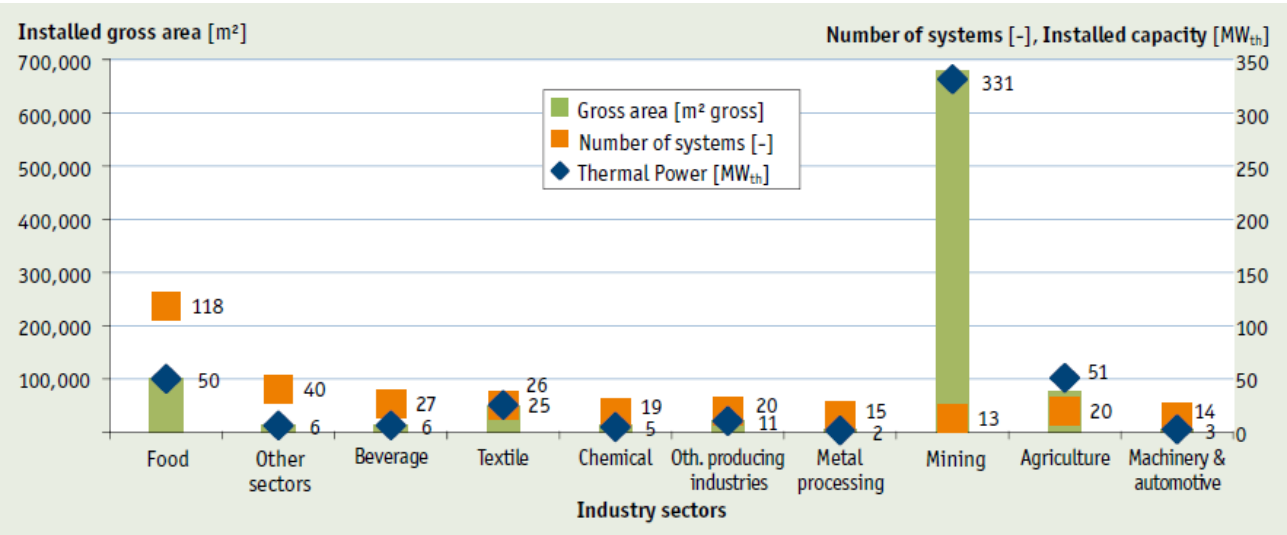


Figure 3:Solar process heat applications in operation worldwide by the end of March 2021 by industry sector (IEA SHC, 2021)

Solar collectors supply heat at different temperatures for production processes in several industries. The chart below shows the market segments most suitable for each collector type.

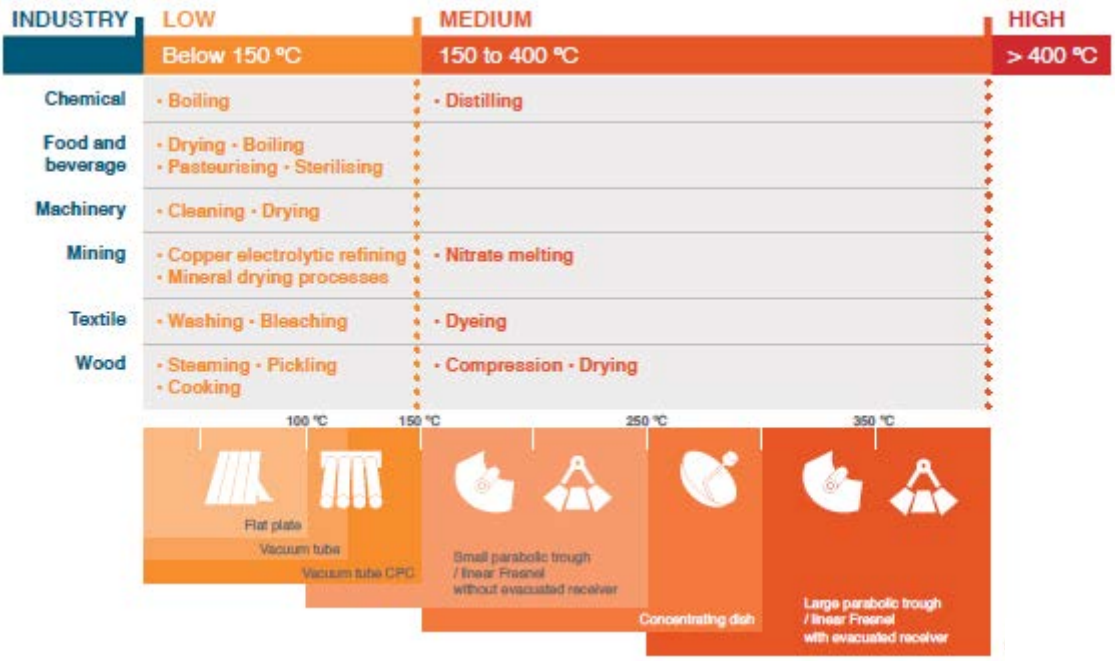


Figure 4 : Type of collectors depending on the temperature level and its matching sectors

The total heat demand for low and medium temperature applications accounts for 44 EJ globally (12,222 TWh). The Figure 5 shows the heat demand in selected industries. Being the food and beverage industry the sector with the highest low temperature process heat demand, it is an ideal candidate for SHIP applications

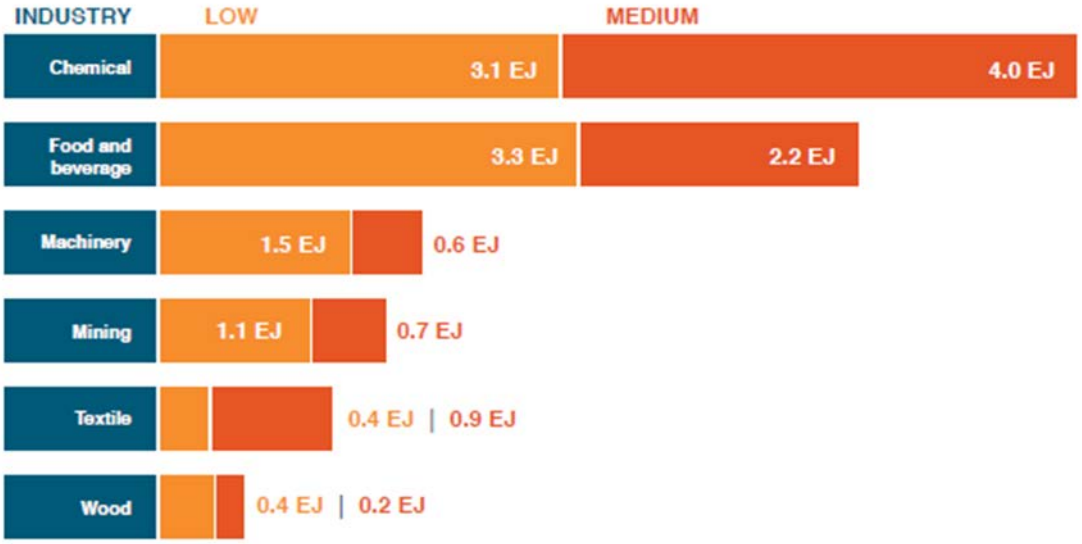


Figure 5 : Total heat demand for low and medium temperature applications

The key figures below prove the adequation between solar heat and the needs in industry. Industry sector is the most energy intensive one with a lot of fossil sources of energy use. Knowing that thermal needs represent 74% of the total energy needs in that sector, solar heat has a wide potential of development.

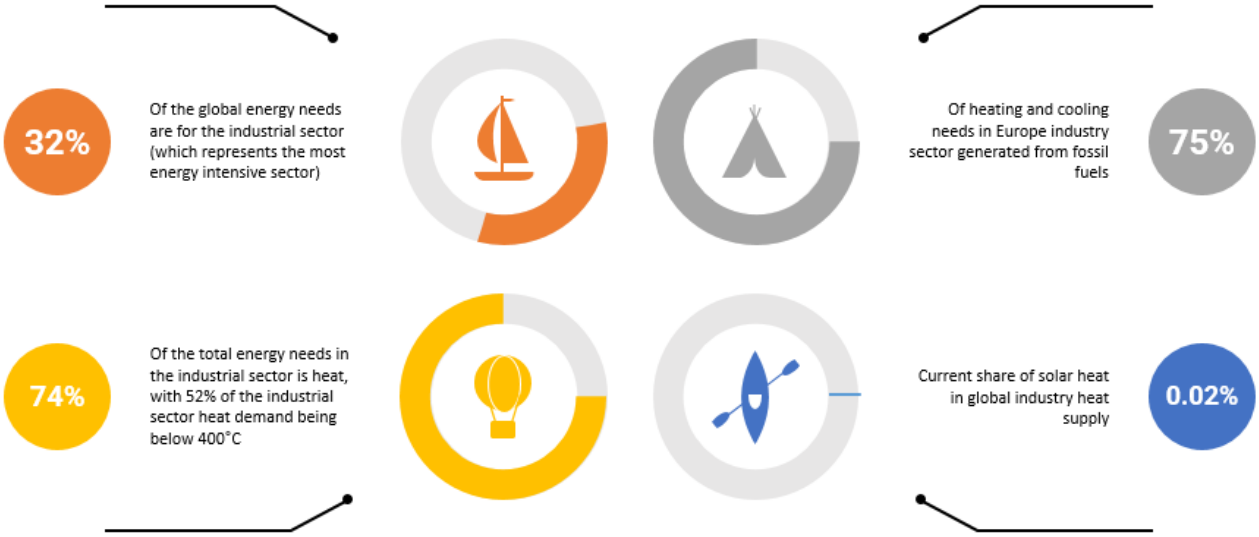


Figure 6 : Key figures for solar heat potential of development in the industrial sector

Economies of scale drive down the SHIP costs in Europe (Solar Payback, 2021). Support policies were a key factor for a larger deployment of SHIP projects, resulting in cost reductions. For examples, the investment grants in France and the solar heat tariff in the Netherlands have allowed for the commissioning of more multi-MW SHIP plants over the last few years. As consequences, the costs decreased by two-thirds in six years.

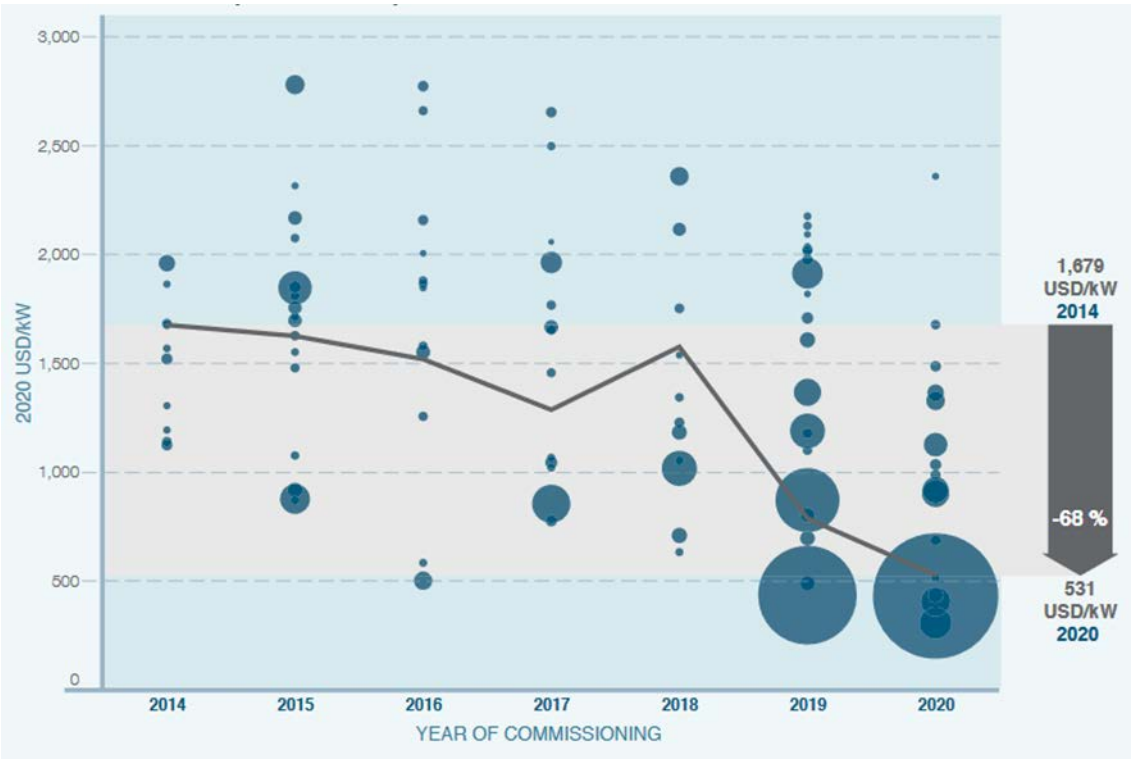


Figure 7 : Weighted average, total installed costs of 101 SHIP plants in Europe (2020)

The diameter of each circle denotes project capacity in kW and the centre the total installed cost in USD 2020 on the Y-axis, while the bold line represents the weighted-average installed costs by year (Solar Payback, 2021).

In 2014, the weighted-average installed costs of 11 SHIP projects were 1,679 USD/kW, while the average of 15 plants commissioned in 2020 dropped to 531 USD/kW, a decrease of 68 %. Such values are consistent with what was found in the analysis of www.ship-plants.info database. Large-scale SHIP plants benefit from "economies of scale" where larger projects tend to have lower costs, some of the drivers of these economies of scale are:

- Lower bill-of-materials for larger quantities
- Improved efficiency in manufacturing
- Lower fixed costs per kW for permissions, design and logistics
- Faster and more efficient installation

Then why aren´t SHIP applications incredibly common?

Principal obstacles to SHIP expansion and perspectives

According to a survey conducted on 71 SHIP suppliers worldwide, the most relevant criteria for a good market development are:

- High fossil energy prices
- Political regulations that require solar process heat
- Financial support schemes
- Easy access to project financing
- Growing economy

The Figure 8 below shows the order of importance of each of the above-mentioned reasons.

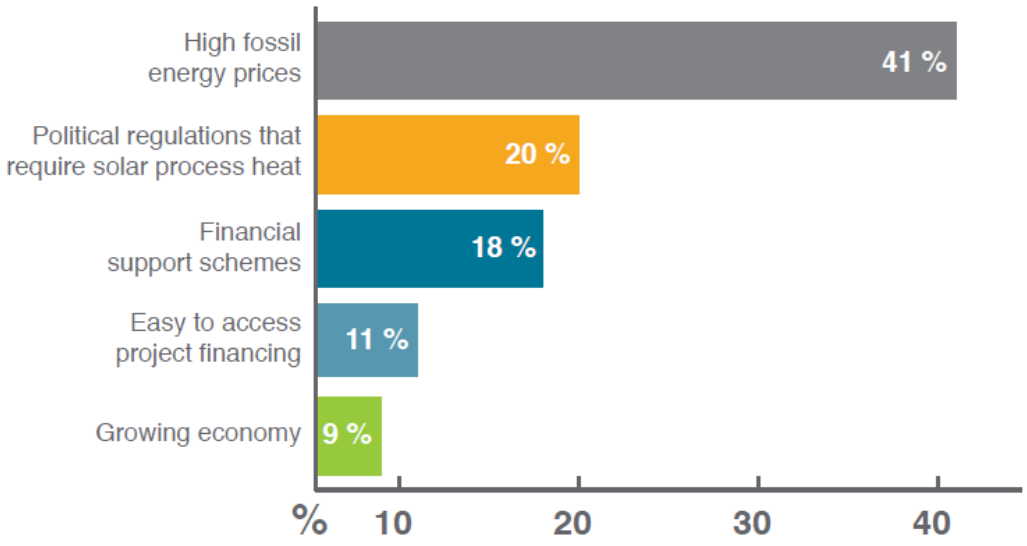


Figure 8 : Results from survey on 71 SHIP suppliers worldwide (Solar Payback, 2021)

SHIP planners see the low fossil fuel prices as a barrier for the development of SHIP projects.

Other frequently cited issues are the high cost of the systems which then results in long payback periods. This explains why a high fossil fuel price together with a high energy price is seen as a driver for a favorable market development for SHIP projects.

Another important aspect usually mentioned is the "acute lack of awareness about how solar heat can be a reliable and economically feasible option for high temperature heat supply, which can be addressed through pioneering efforts and showcase projects" – Bhoovarhan Thirumala, India

To increase the share of SHIP projects it is required to:

- Greatly step-up communication efforts to raise awareness of the technology among potential customers in industries: 70 % of turnkey SHIP suppliers (strongly) agree that SHIP has already been competitive in many markets, but is not known well enough to customers
- Support financing models to reduce risks and initial costs to small and medium industrial investors: 79 % of turnkey SHIP suppliers (strongly) agree that heat supply contracts / ESCO models are an important means of increasing deployment
- Implement a carbon pricing mechanism that reflects adequately negative externalities of fossil fuels consumption across the European economy and adjust their prices. This a very challenging aspect considering that EU industries want and need to stay competitive on a global scale. That puts on the table the question of the alignment of worldwide nations positions on the urge for a cleaner global industry.

On the financing part, some measures have been implemented in different countries. We can list funding and incentives programs that can be divided in few different categories (IEA SHC TASK 64, 2021):

- **Subsidies/CAPEX**: direct subsidy on initial investment (capital expenditure, CAPEX) for SHIP investments or cost related to SHIP installations
- **Loan**: loans, typically provided under advantageous conditions, for SHIP investments or cost related to SHIP installations
- **Taxation**: tax exemption or tax abatement for SHIP investments or cost related to SHIP installations
- **Services**: support / grant / subsidy for services related to SHIP installations, e.g. Energy Audits, Planning/Engineering support, Consultancy, etc…
- **OPEX/generated heat**: Feed in Tariffs, subsidized heat supply, etc…
- **Research funding**: Partial or full coverage/support of research activities on SHIP related topics, including demonstration projects
- **Others**: Support for Contracting, issue of certificates, vouchers, or any other type of support

The figure below illustrates the different funds or incentives set up by countries across Europe:

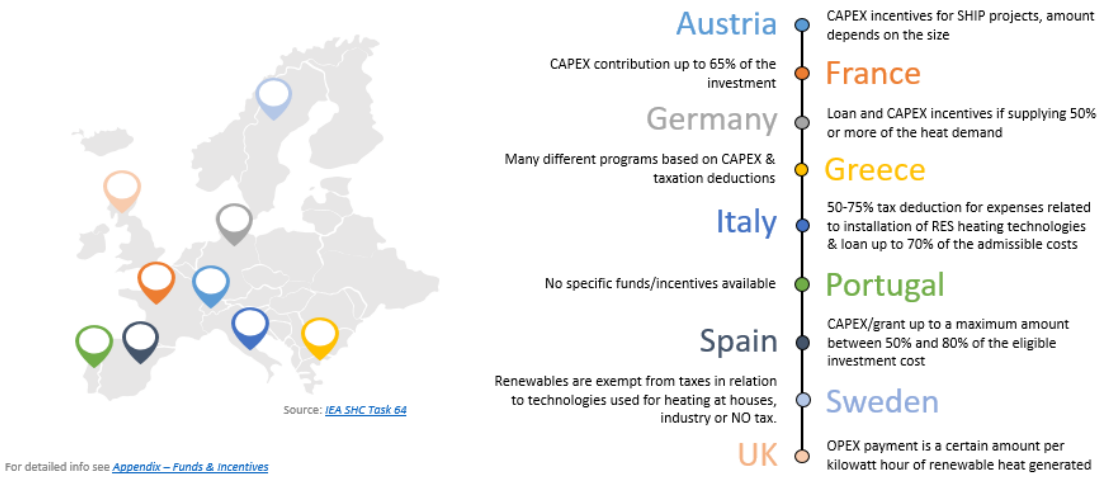


Figure 9 : Funds at a glance accross Europe (IEA SHC TASK 64, 2021)

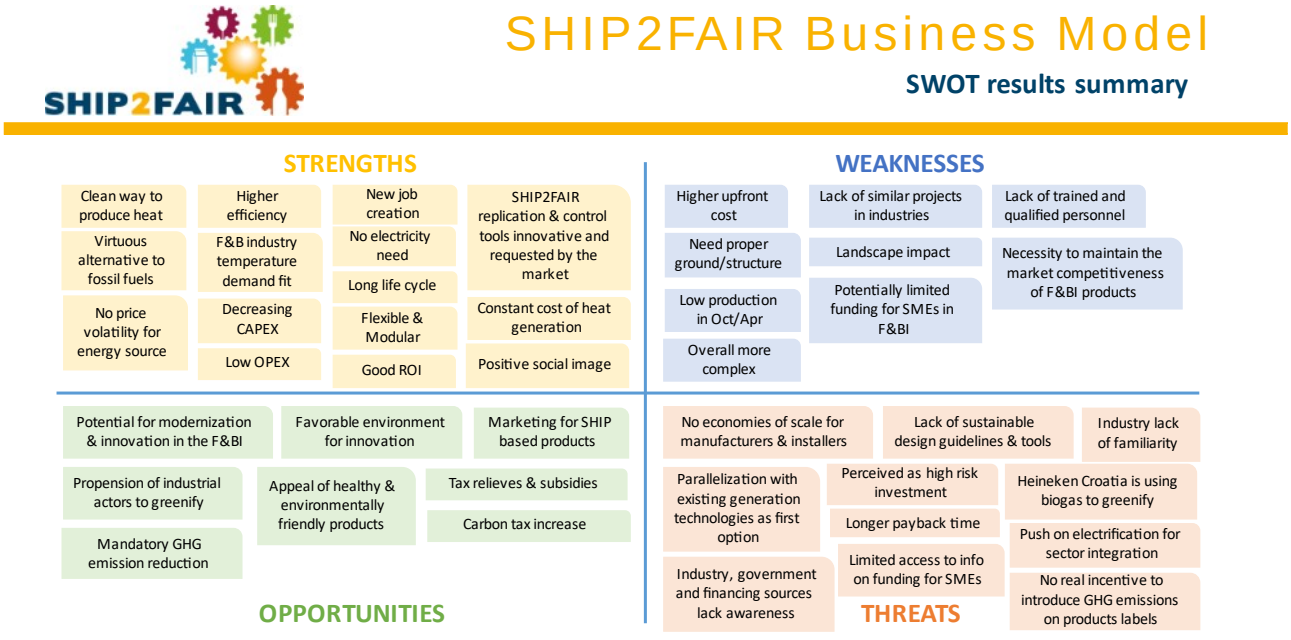
To sum-up this first chapter on the market analysis of SHIP:

- Trending technologies for the last 15 years
- Possible alternative for several segments of the industrial sector
- Decreasing SHIP costs throughout time
- New global context with high rise in fossil fuels prices
- Several successful stories of implemented projects around the world
- Diverse funds resources available for SHIP projects

PESTLE results summary

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

SWOT matrix



Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Business models for SHIP

SHIP Project Value Chain

The main actors of the SHIP value chain are mentioned below. They are all somehow linked, and the business models canvas will address the point of view of these different stakeholders.

Industrial Companies: Industrial companies whose heat demand fits the range of application of solar thermal (i.e., the agro-food industry). They are the potential clients in the value-chain

Energy/Heat Suppliers: Companies that supply heat to their customers. They can also assume the role of facility operator

Government, Policy Makers, European organizations and national institutions: Policy makers in charge of changing regulation related to renewable heat sources. They shape the environment within the different players involved. They provide guidance for the development of less traditional systems

Energy Consulting Companies: provide a support service to their customers, helping them make informed choices about their energy consumption/provisions. They can also assist them in the building phase

Solar Thermal Equipment Manufacturers, Suppliers & Installation Builders: Companies that manufacture the different types of solar thermal equipment, usually turnkey suppliers are also in charge of physically building the installation

Third party investors: Investment companies that specializes in the third-party financing of renewable heat production projects and energy efficiency projects

Business models schemes for SHIP

3 different business model schemes were identified, the third being a hybrid version of the second.

Build and handover business model

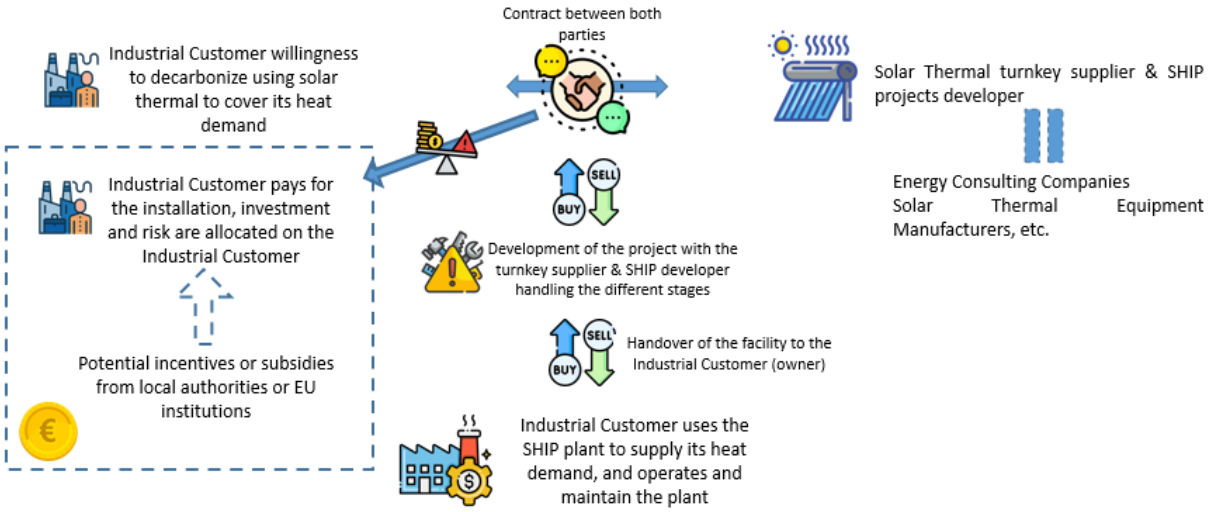


Figure 10 : Build and handover business model illustration

Build and operate business model

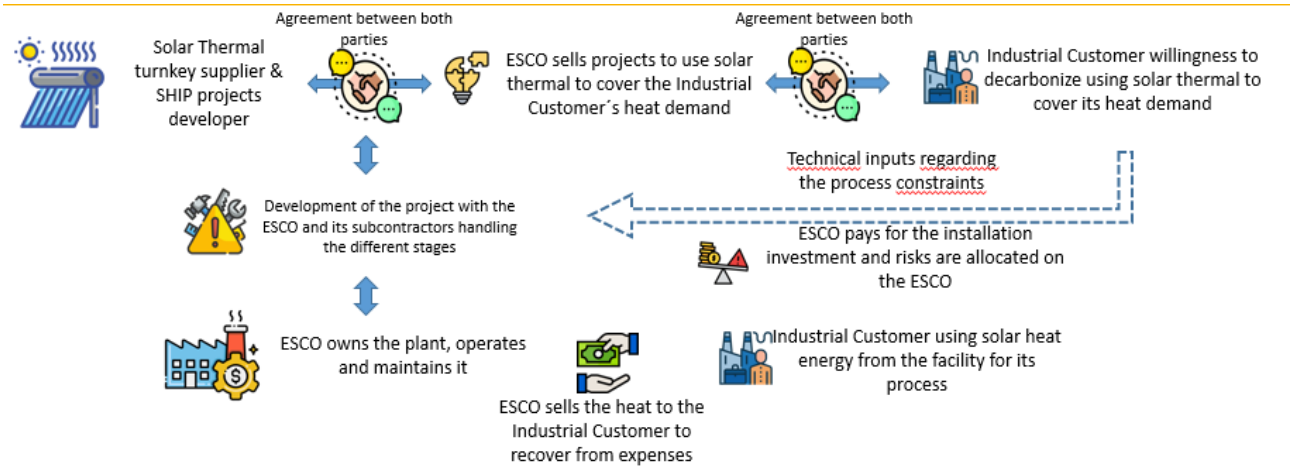


Figure 11 : Build and operate business model illustration

Build and operate hybrid version business model

It is the same principle as in the build and operate BM. Except that the scheme is temporary. The first years, the duration being defined by both partners, the ESCO will oversee the installation operation. He is the one assuming all risks of the project.

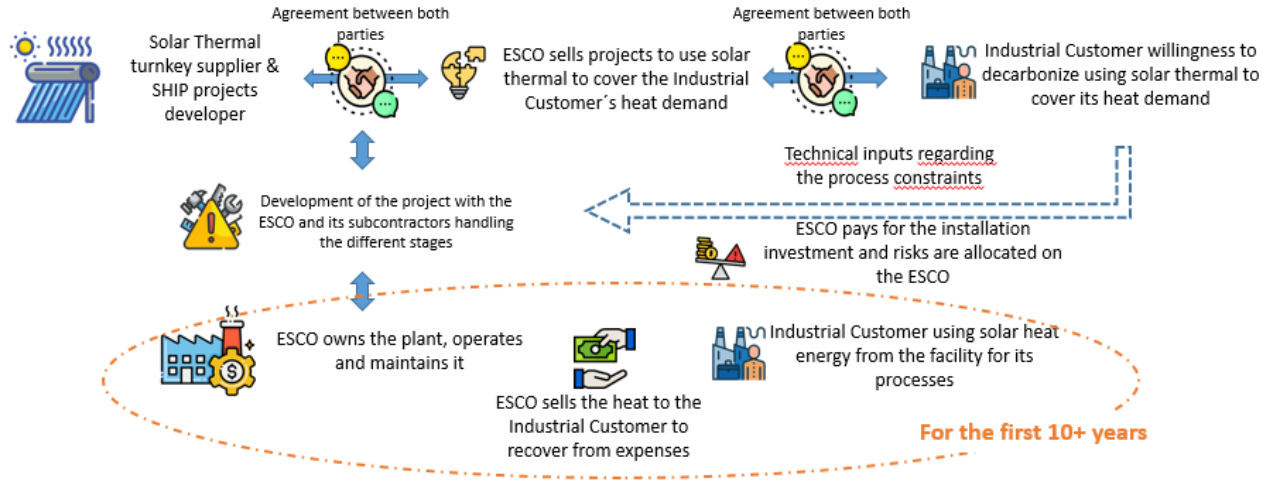


Figure 12 : Build and operate business - hybrid version illustration (part 1)

Once the determined period is elapsed, the installation is then sold to the industrial who is now in charge of operating it. The advantage being the installation is fully integrated into the process and the risks mainly endorsed by the ESCO.

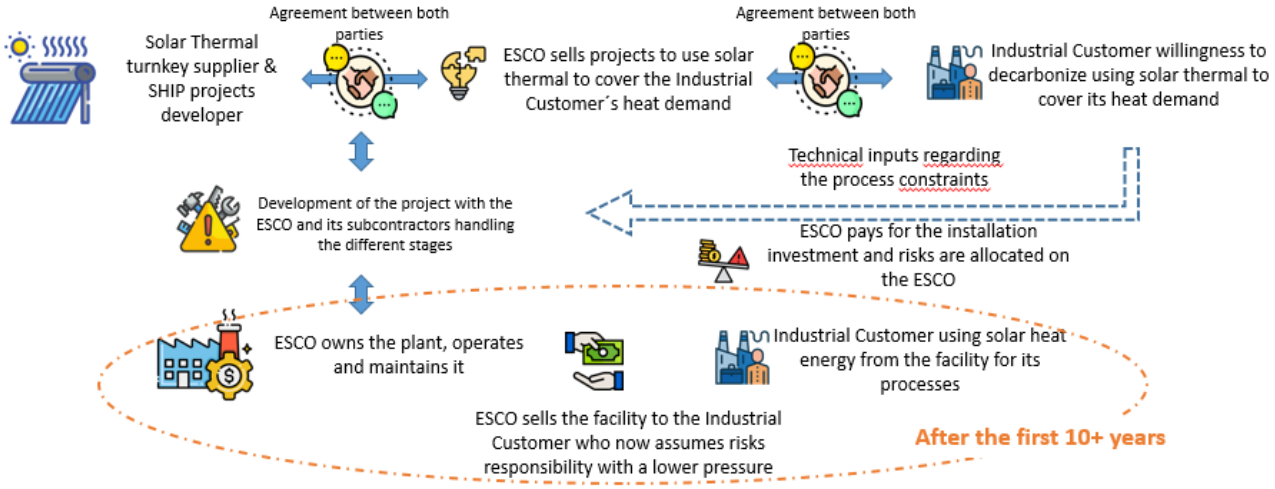


Figure 13 :Build and operate business - hybrid version illustration (part 2)

SHIP business model canvas

Business Model Canvas

SHIP2FAIR

SHIP2FAIR Business Model

SHIP2FAIR Business Model Canvas

Key Partners
Who are our key partners?
Who are our key suppliers?
Which key resources are we acquiring for them?

Key Activities
What key activities do our value propositions require?
Our distribution channels?
Customer relationships?
Revenue streams?

Key Resources
What key resources do our value propositions require?

Unique Value Proposition
What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each customer segment?
Which customer needs are we satisfying?

Customer Relationship
What type of relationship does each of our customer segments expect us to establish and maintain with them?
Which ones have we established?

Channels
Through which channels do our customer segments want to be reached?
How are we reaching them now? How are our channels integrated?
Which ones work best? Which ones are most costefficient?
How are we integrating them with customer routines?

Customer Segments
- For whom are we creating value? Who are our most important customers?

Cost Structure
What are the most important costs inherent in our business model?
Which key resources are the most expensive? Which key activities are the most expensive?

Revenue Streams
For what value are our customers really willing to pay? For what do they currently pay?
How are they currently paying? How would they prefer to pay? How much does each revenue stream contribute to overall revenues?

SHIP2FAIR Business Model

Customer Segment

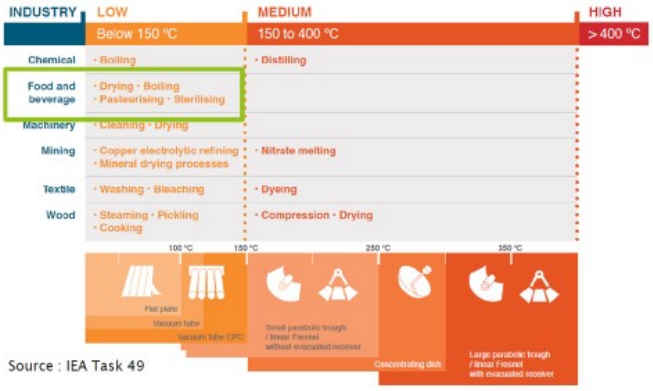
Customer Segments

Main industrial sectors suitable for solar thermal systems are the ones with low to medium temperature heat needs :

- Food & beverage
- Transport equipment
- Textile
- Machinery
- Pulp and paper industries
- Chemical industries

An extremely high percentage of heat demand in the low temperature range is found in food, beverages, paper and textiles with medium temperature ranges in the plastics and chemical industries

The paper and food industries have the highest heat demand



Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Source: (IEA Task 49, 2015)

SHIP2FAIR Business Model

Customer Segment

Customer Segments

SHIP2FAIR addresses the food and beverage industry more specifically. Indeed, F&B industry have the highest heat demand together with paper sector

Some interesting figures are added in the chart on the right

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Source: (Data and trends EU Food and Drink Industry 2021, 2021)

Unique Value Proposition

SHIP2FAIR

SHIP2FAIR Business Model

Unique Value Proposition

Slowing down the increase of gas emissions in the environment is the challenge of our time. Solutions based on solar heat systems present tremendous opportunities for Europe ambition in its solar energy strategy. A detailed designed and sized solar heat for industrial project, together with the optimized control strategy, brings value to the whole stakeholders by:

- Reducing the heat purchase/generation expenses thanks to its potential to ensure an affordable and constant price of heat during the system's lifetime (typically 25 years)
- Reducing the carbon emissions and carbon footprint of manufactured products
- Foster the growth of a European solar industry that already has a strong manufacturing capacity
- Providing a reliable source of energy for important processes such as industrial ones
- Helping to obtain eco-labels for industrial sector companies
- Improving overall products image and customer perception

Unique Value Propositions

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each customer segment?
Which customer needs are we satisfying?

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

SHIP2FAIR

SHIP2FAIR Business Model

Unique Value Proposition

Solar thermal potential in Europe within 2030 (source : Solar Heat Europe)

Achieving decarbonisation with an exceptional solution that …

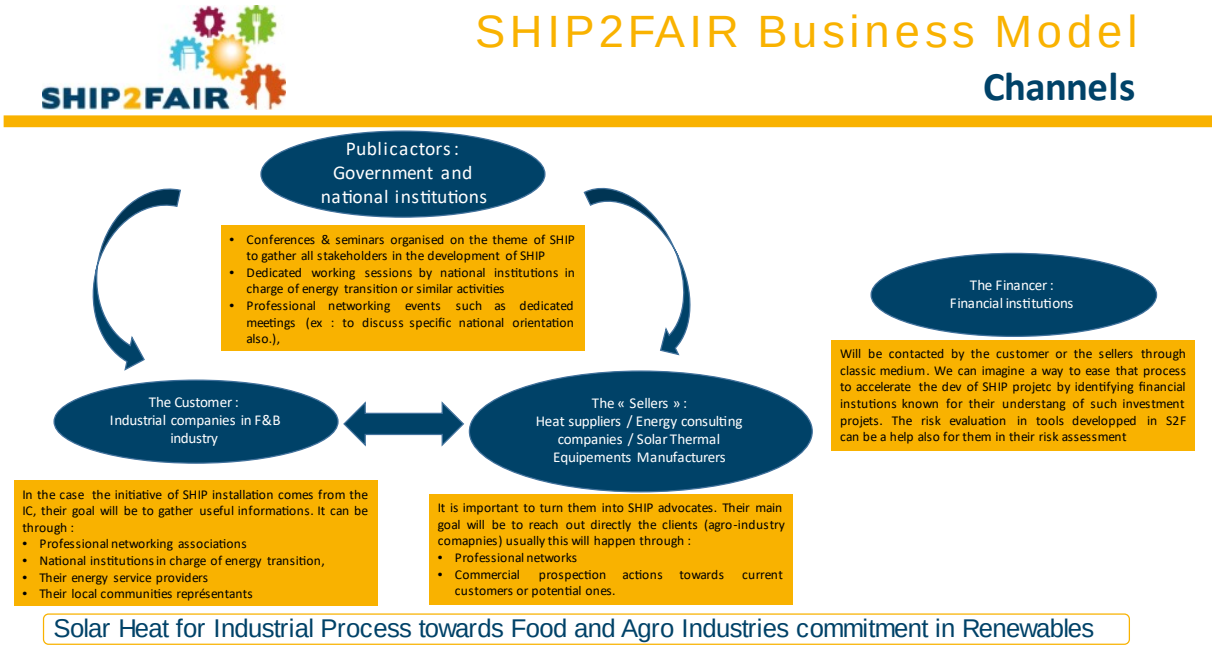
… is cheaper than electrification
… has a positive trade balance for Europe
… provides the largest energy storage capacity from all RES
… provides the best energy density from all solar technologies
… has been constantly growing in Europe for three decades
… has an exceptional contribution to the climate and energy security

… that can provide extraordinary socio-economic benefits to Europe by 2030!

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Source : (ESTIF)

Channels



Customer Relationship

Key Partners

SHIP2FAIR Business Model

Key Partners

Key Partners

The key partners are the major actors of the value chain we mentioned in the beginning. They are all involved somehow in the development of the project

Industrial Companies

Industrial companies whose heat demand fits the range of application of solar thermal (i.e. the agro-food industry)

Heat Suppliers/ Energy Service Companies (ESCO)

Companies that are supplying heat to their customers. They can also assume the role of facility operator

Energy Consulting Companies

Companies that help their customers make informed choices about their energy consumption/provisions. They can also assist them in the building phase

Solar Thermal Equipment Manufacturers

Companies that manufacture solar thermal equipment

Contractors for Installation Build

Third party in charge to physically build the installation once materials and detailed design are provided

Government, Policy Makers, European organisations and national institutions

Policy makers in charge of changing regulation related to heat in particular

Third-party investors

investment companies that specialises in the third -party financing of renewable heat production projects and energy efficiency projects.

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Key activities

SHIP2FAIR Business Model

Key Activities

Heat Suppliers/ Energy Service Companies (ESCO)

- Design projects in the best way to match with the industrial players expectations taking into consideration technical, economical and social constraints
- Assure operation and maintenance for optimal return on investment and low risk investment

Industrial Companies

- Production of manufactured goods relying on industrial processes that demands a source of energy
- Can also be in charge of the O&M of the solar heat process depending of the business model. Their priority being the good functioning of the installation above energy efficiency

Key Activities

What key activities do our value propositions require?
Our distribution channels? Customer relationships? Revenue streams?

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

SHIP2FAIR Business Model

Key Activities

Energy Consulting Companies

- Counselling and providing support to customers companies into informed choices about their energy consumption/provisions .
- Can also assist them in in the different phases of their projects (designing, building, commissioning etc.)

Solar Thermal Equipment Manufacturers or suppliers

- Manufacture or distribute different types of solar thermal equipment capable to fit the needs of the market
- Can provide technical advice and support especially though customers services

Third party investors

- Provides third-party finance for project development
- Can be involved in different aspects of the project from the development and construction to the operational management after commissioning
- Could supply the heat or energy saving to the end user over contract periods .

Key Activities

What key activities do our value propositions require?
Our distribution channels? Customer relationships? Revenue streams?

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Key resources

SHIP2FAIR Business Model

Key Activities

Energy Consulting Companies

- Counselling and providing support to customers companies into informed choices about their energy consumption/provisions .
- Can also assist them in in the different phases of their projects (designing, building, commissioning etc.)

Solar Thermal Equipment Manufacturers or suppliers

- Manufacture or distribute different types of solar thermal equipment capable to fit the needs of the market
- Can provide technical advice and support especially though customers services

Third party investors

- Provides third-party finance for project development
- Can be involved in different aspects of the project from the development and construction to the operational management after commissioning
- Could supply the heat or energy saving to the end user over contract periods .

Key Activities

What key activities do our value propositions require?
Our distribution channels? Customer relationships? Revenue streams?

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Revenue streams

SHIP2FAIR Business Model

Revenue Streams

Revenue Streams

For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each revenue stream contribute to overall revenues?

Heat Suppliers/ Energy Service Companies (ESCO)

- Retribute themselves by selling the renewable energy produced to the industrial site. These depend on the size of the equipment, the forecast of thermal production,

Industrial companies

- Retributes themselves through the retail of their goods and products. Optimal CAPEX and OPEX costs for energy production strengthen the competitiveness of final products.

Energy Consulting companies

- Retribute themselves through the consulting contracts with industrial companies. Amount can vary depending on the scope of work covered by the contract, the company size and reputation etc.

Third-party investors

- Revenue streams can come from supplying the heat or energy saving to the end user over contract periods.

Solar Thermal Equipment Manufacturers or suppliers

- Retribute themselves by selling equipments.

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Cost structure

SHIP2FAIR Business Model

Cost Structure

Costs related to SHIP developments are mainly :

- CAPEX & OPEX costs : impacted by economy of scale (lower bill of materials for larger quantities, improved efficency in manufacturing, lower fixed costs per kW for permissions, design and logistics, faster and more efficent installations, subsidies, etc.), irradiation levels,
- Heat supply costs (if contracted services via an ESCO)
- Eventually all costs related to the contracts with subcontractors
- Products commercialization and marketing activities

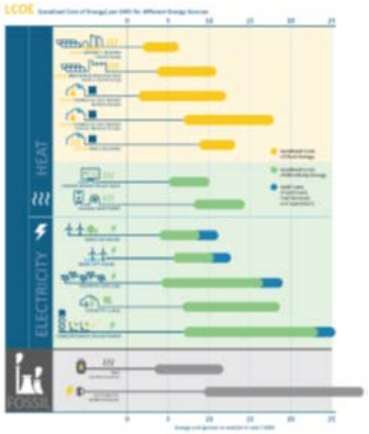
Source: https://www.solrico.com/index.php?id=23

Table 3-1 Solar thermal technologies review

Motion	Collector type	Absorber type	Indicative range of output temperature [°C]	CAPEX [€/kW]
Stationary	Flat plate collector (FPC)	Flat	30 - 100	250 – 700
	Evacuated tube collector (ETC)	Flat	50 - 120	800 – 1,100
	Ultra High Vacuum FPC (UHV-FPC)	Flat	50 - 200	1,200*
	Compound Parabolic Collector (CPC)	Tubular	60 – 150	600 - 1300
Single-axis tracking	Linear Fresnel reflector (LFR)	Tubular	60 - 400	800 – 1,800
	Parabolic trough collector (PTC)	Tubular	60 - 300	600 – 2,000
Two-axis tracking	Parabolic dish reflector (PDR)	Point	100 - 500	600 – 1,800
	Heliostat field collector (HFC)	Point	150 - 2000	ND**

* Based on TVP information
** Non-interesting for agro-food application

Source: SHIP2AIR Deliverable D2.1



Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

Sources : SHIP2FAIR deliverable D2.1 and (Solar Payback/IRENA 2022, 2022)

6 CONCLUSIONS

The previous pages depict the whole picture for a favorable development of solar heat in food and agro-industries. The technology is mature and set to be implemented around EU countries. Many projects have been already developed so far as tangible examples. Beyond the food and beverage industry, the large spectrum of temperature met across industrial sector are covered by the various equipment and techniques.

Accelerating the deployment of solar heat will require mindset shift from energy companies, engineering firms, industrial companies but also financing institutions. This will go along with proper training of the workforce. A skilled workforce assures a solid basis for exemplary projects. Another main challenge is the competitivity of solar heat compared to traditional fossil alternatives. Although it has been demonstrated that the levelized cost of energy of solar heat has been equal and sometimes inferior to its competitors. Many efforts remain to make it more common. Some ideas were suggested: mitigating the risk for industrial companies with the intervention of a 3rd part investor for example. National incentives, subsidies, or programs to encourage the implementation can also send a good signal to stakeholders. Sharing and advertising about their existence with the sector should not be neglected. Different sorts have been launched across Europe.

None of the below mentioned milestone can be achieved without the support of financing institutions. They should be granted support to transition into analysing such projects. More and more actors enter the field of energetic transition. Towards that goal, the replication tool that was developed in SHIP2FAIR is a good illustration of the kind of tool that can be used by different actors: engineering companies and industrial companies for designing and planning, banks, and financing actors for assessing projects submitted for funding.

A cross study between following deliverables and the present one will give a more complete vision through the SHIP2FAIR demonstrators:

- Lessons learnt from demo-sites
- Engineering and demo-sites commissioning
- 10 pre-feasability studies for different sites
- Roadmap for the deployment of Solar Heating for Industrial Processes

References

IE

(2022). Récupéré sur Solar Payback/IRENA 2022: https://www.solrico.com/index.php?id=23

Data and trends EU Food and Drink Industry 2021. (2021). Récupéré sur Food Drink Europe : https://www.fooddrinkeurope.eu/resource/data-trends-of-the-european-food-and-drink-industry-2021/

ESTIF, S. H. (s.d.). *Energising Europe with Solar Heat.*

IEA SHC. (2021). Récupéré sur https://www.iea-shc.org/solar-heat-worldwide

IEA SHC TASK 64. (2021, April). Récupéré sur https://task64.iea-shc.org/Data/Sites/1/publications/IEA-SHC-Task64-SolarPACES-TaskIV-D.E1--Collection-of-solar-process-heat-related-research-and-funding-programs.pdf

IEA Task 49. (2015, Decembre). Récupéré sur http://task49.iea-shc.org/data/sites/1/publications/Task%2049%20Deliverable%20A1.3_20160504.pdf

Solar Payback. (2021, August). Récupéré sur https://www.solar-payback.com/download/cost-analysis-flyer-august-2021/?wpdmdl=2374&refresh=62beb0ec12fb21656664300

7 ANNEX I:

European Incentives for SHIP projects

SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
Austria	UFI – betriebliche Umweltförderung im Inland	Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie (BMK) / EU	Solar Thermal, biomass, geothermal, hydro, wind	Natural or legal persons. The extent of the support/reimbursement might differ for companies, municipalities or private individuals.	CAPEX	Depends on the size of the installation. Aid up to € 200,000 over a period of three years. Or reimbursement of 30 - 45% of the investment costs to a maximum additional 10% (for medium-sized companies) or even 20% (for small-sized companies)	Environment-related investment costs must amount to a minimum of € 10,000	ongoing	For 2017-2021 the annual budget stands at € 80 million	https://www.umweltfoerderung.at/alle-foerderungen.html
Austria	Programme des Klima- und Energiefonds	Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie (BMK)	Large solar thermal for industrial heat or district heating and space and water heating	All private and legal entities engaging in commercial activities	CAPEX	Solar process heat: € 700 per MWh up total support of € 750,000 Feed-in of solar heat into district heating grids: € 550 per MWh up total support of € 750,000 High solar coverage rates (>20%) in service and commerce: € 950 per MWh up total support of € 750,000 Combinations of solar thermal with heat pumps: € 1,100 per MWh Combination of solar thermal with heat pumps and PVT collector: € 1,600 per MWh	-	ongoing	-	https://www.klimafonds.gv.at/

SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
France	Fonds Chaleur	ADEME	heat pump, solar thermal, geothermal, biomass, energy efficiency etc.	Heat producers for industrial or commercial purposes or heat consumers	CAPEX	up to 65% of CAPEX (depends on the size of the beneficiary if SME)	-	ongoing	350 MEUR	https://www.ademe.fr/expertises/energies-renouvelables-enr-production reseaux-stockage/passer-a-laction/produire-chaleur/fonds-chaleur-bref
Germany	Zuschuss-Bundesförderung für Energieeffizienz in der Wirtschaft - Modul 2: Prozesswärme aus Erneuerbaren Energien	BAFA (Federal Office for Economic Affairs and Export Control)	Solar Thermal, Heat Pump, Biomass	Heat producers for industrial or commercial purposes	CAPEX	Up to 55 % of CAPEX or enlargement of solar thermal systems	>= 50% of produced heat for industrial processes	ongoing	-	https://www.bafa.de/DE/Energie/Energieeffizienz/Energieeffizienz_und_Prozesswaerme/Modul2_Prozesswaerme/modul2_prozesswaerme_node.html

SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
Germany	KfW-Programm - Bundesförderung für Energieeffizienz in der Wirtschaft - Modul 2: Prozesswärme aus Erneuerbaren Energien	KfW (German state-owned development bank)	Solar Thermal, Heat Pump, Biomass, CHP, Storage, RE Heating networks(similar scheme for energy efficiency)	National companies, private persons, private or public, includinge.g. farmers or contractors.	Loan	Up to 25 million € per project, Up to 100 % of eligible investment costs, low interest loan and combination with subsidy (reduced payback, up to 55%)	>= 50% of produced heat for industrial processes	ongoing	-	https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/Förderprodukte/Energieeffizienz-und-Prozesswärme-aus-Erneuerbaren-Energien-(295)/
Greece	Development Law (Law 4399/2016) Subsidies	Ministry of Economy, Development and Tourism (ΥΡΟΙΑΝ)- Υπουργείο Οικονομίας, Ανάπτυξης και Τουρισμού	All RES H&C are eligible.	All enterprises based in Greece or have a branch in Greece at the time the Development Law	CAPEX	Depending on the size of the company from: 45-65% for cases a and b of the EU Regulation 651/2014 and from 30 50 % for case c of the EU Regulation 651/2014	To be eligible, the investment should be > than a certain amount depending on the size of the company	ongoing	-	https://startupgreece.gov.gr/procedures-laws-regulations/development-law-43992016

SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
Greece	Development Law (Law 4399/2016) Tax regulation	Ministry of Economy, Development and Tourism (YPOIAN)	All RES H&C are eligible.	All enterprises based in Greece or have a branch in Greece at the time the Development Law	Taxation	The following types of support are alternatively offered by the Development law (art. 10 Law No. 4399/2016): 1. Income tax relief and 2. Stabilization of income tax coefficient	To be eligible, the investment should be > than a certain amount depending on the size of the company	ongoing	-	https://startupgreece.gov.gr/procedures-laws-regulations/development-law-43992016
Greece	Law No. 2238/1994 on the Income Tax	Ministry of Economy, Development and Tourism (YPOIAN)	Primarily solar thermal. But all RES-H technologies are eligible	Natural and legal persons of Greek nationality and Greek descent	Taxation	10% of the project costs may be deduced from taxable income (up to a maximum of € 3,000)	-	ongoing	-	https://www.e-forologia.gr/lawbank/document.aspx?digest=D2510C09ACCA3910.1D031AEA53&version=2018/12/24
Greece	Development Law (Law 4399/2016) Subsidies	Ministry of Economy, Development and Tourism (YPOIAN)- Υπουργείο Οικονομίας, Ανάπτυξης και Τουρισμού	All RES H&C are eligible.	All enterprises based in Greece or have a branch in Greece at the time the Development Law	CAPEX	Depending on the size of the company from: 45-65% for cases a and b of the EU Regulation 651/2014 and from 30-50 % for case c of the EU Regulation 651/2014	To be eligible, the investment should be > than a certain amount depending on the size of the company	ongoing	-	https://startupgreece.gov.gr/procedures-laws-regulations/development-law-43992016

SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
Greece	Development Law (Law 4399/2016) Tax regulation	Ministry of Economy, Development and Tourism (YPOIAN)	All RES H&C are eligible.	All enterprises based in Greece or have a branch in Greece at the time the Development Law	Taxation	The following types of support are alternatively offered by the Development law (art. 10 Law No. 4399/2016): 1. Income tax relief and 2. Stabilization of income tax coefficient	To be eligible, the investment should be > than a certain amount depending on the size of the company	ongoing	-	https://startupgreece.gov.gr/procedures-laws-regulations/development-law-43992016
Greece	"Law 4342/2015, Part B Integration of the European Energy Efficiency Directive 2012/27/EU" (Article 9), establish "Energy efficiency obligation schemes", created according to the Article 7 of the "Energy Efficiency Directive 2012/27/EU".	Ministry of Environment and Energy of the Hellenic Republic - Υπουργείο Περιβάλλοντος και Ενέργειας	ST installations are included in the given list of indicative measures for achieving the requires energy saving targets	Energy distributors and/or retail energy sales companies must achieve a cumulative end-use energy savings target	Services	Avoiding penalties that will be implemented in case of not reaching the targets	-	ongoing	-	www.cres.gr/obs/index.html

SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
Italy	Art. 14 DL 4/6/2013 Art. 1, c. 344–347, l. 296/06	Ministero dello sviluppo economico	Biomass, Aerothermal, geothermal and solar thermal	Any party installing eligible plants	Taxation	This scheme allows for a 50-75% tax deduction for expenses related to refurbishment of existing buildings and / or energetic requalification of buildings and / or installation of RESH technologies	-	ongoing	-	https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto-legge:2013-06-04;63!vig=
Italy	Fondo nazionale per l'efficienza energetica	MISE (Ministero Sviluppo Economico)	The solutions that allow a reduction of the energy consumption in the industrial processes, the realization of district heating or cooling, building efficiency solutions	Private or public	Loan	Up to 70% of the admissible costs	An evaluation is performed in order to evaluate the technical feasibility of the intervention, so the acceptance of the requirements. In addition, the conditions reported in Conto Termico apply	ongoing	310 MEUR	https://www.mise.gov.it/index.php/it/198-notizie-stampa/2039728-il-20-maggio-online-la-piattaforma-del-fondo-nazionale-per-l-efficienza-energetica

SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
Portugal	No direct support scheme for RES in the heating sector is currently in place. The Energy Efficiency Fund (FEE) provided a subsidy to investments in solar thermal installations for heating water through "Efficient Buildings 2016" that opened for new applications on 8 July 2016 and ran until 8 November 2016.	-	-	-	-	-	-	-	-	IEA SHC Task 64

SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

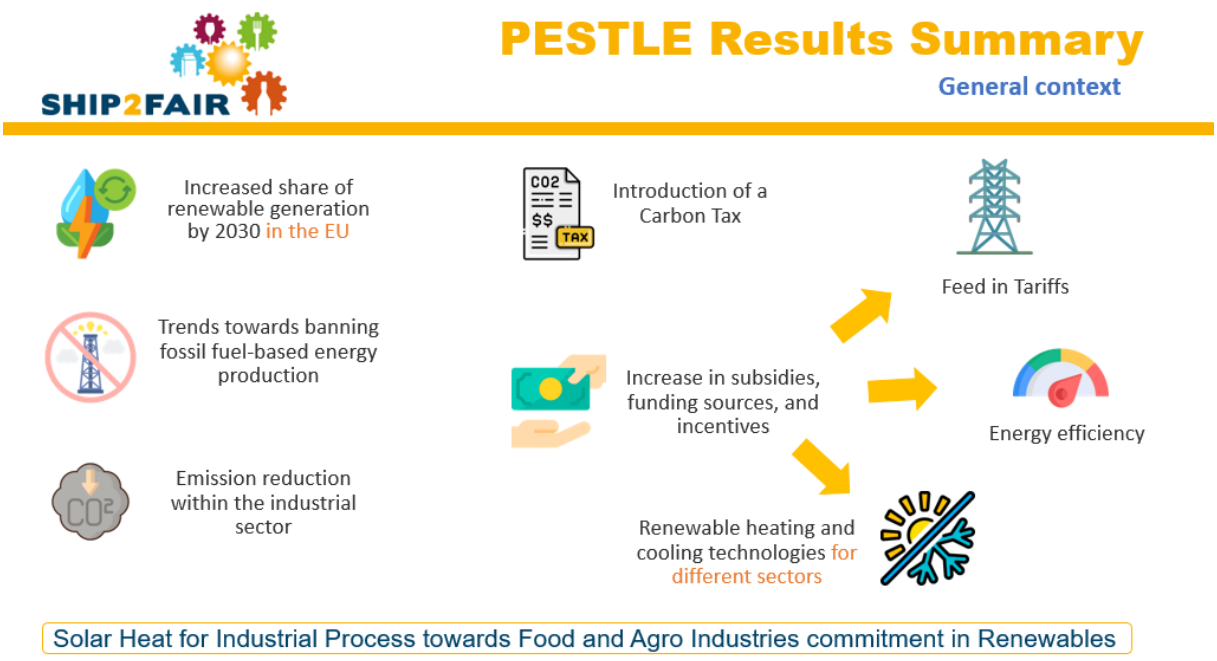
Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
Spain	"Ayudas a la inversión en instalaciones de producción de energía térmica con fuentes de energía renovable" / "Incentives to investments in installations to generate thermal energy by renewable energy sources"	IDAE (Institute for Diversification and Energy saving)	Solar thermal, heat pump powered by renewable sources, biomass, geothermal	Public or private companies and persons	CAPEX / grant	up to 15 million € per project, up to a maximum amount between 50% and 80% (depending on the development degree of the region within Spain) of the eligible investment cost.	General requirements: those related to ERDF (European Regional Development Fund)	to be opened in Q4-2020	110 million EUR for thermal installations	https://www.idae.es/en/node/14672
Spain	Ayudas a la inversión en instalaciones de producción de energía térmica con fuentes de energía renovable, susceptibles de ser cofinanciadas con fondos de la Unión Europea	IDAE (Instituto para la Diversificación y Ahorro de Energía)	Thermal Energy: Solar Thermal, Heat Pump, Biomass, Geothermal energy, Green gases, RE Heating networks	Industrial processes, Public sector, ESCOs, Energy communities	CAPEX	From 74 % to 54 %, depending on the region, technology and size	-	Submission closed. Evaluation ongoing	73.7 MEUR	https://www.idae.es/ayudas-y-financiacion/lineas-de-ayudas-la-inversion-en-renovables-fondos-feder/consulte-el-estado-de-la-convocatoria-en-su-comunidad-autonoma-produccion-energia-termica

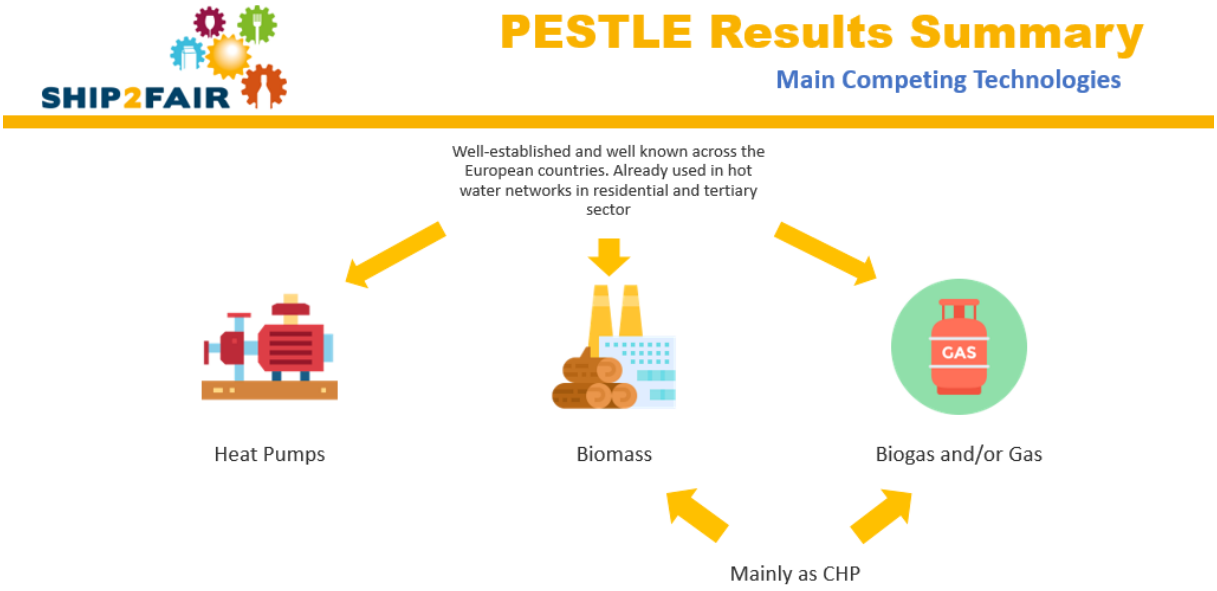
SHIP2FAIR Business Model

European Incentives for SHIP projects

Source: IEA SHC Task 64

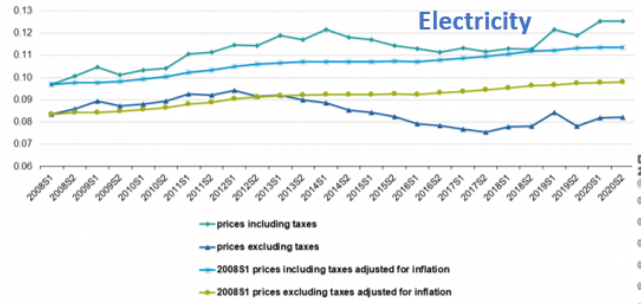
Country	Program Name	Funding Institution	Funded Technology	Funded Sector / Beneficiaries	Instrument Type (CAPEX, loan, taxation, etc.)	Incentive (quantitative)	Brief Conditions / Requirements	Duration / Expiry Date	Impact / Total Available Funds	Source / Reference
Sweden	Act No. 2009:194 (Deduction Process for Installation Works in Household‡) Act No. 1994:1776 (Act on the Energy Tax) Act No. 1990:613 (Act on Environmental Charges on Nitrous Oxide Emissions from Energy Generation) Act No. 2010:598 (Act on sustainability criteria for biofuels and bioliquids	Swedish Tax Agency (Skatteverket)	All renewables	All beneficiaries: households and industry	Taxation	Renewables are exempt from taxes in relation to technologies used for heating at houses, industry or NO tax.	-	ongoing	-	In government pages. But also available in English here: http://www.res-legal.eu/search-by-country/sweden/tools-list/c/sweden/s/res-hc/t/promotion/sum/200/lpid/199/
UK	Renewable Heat Incentive (RHI)	Department for Business, Energy & Industrial Strategy (BEIS)	Solar thermal, geothermal, biomass, heat pumps	Industry, businesses and public sector organizations	OPEX / Annual incentive	Payment is a certain amount per kilowatt hour of renewable heat generated. The payment can vary from 0.8 -11.52 pence/kWhth, depending on technology, age of appliance, amount of heat produced.	-	ongoing	-	https://www.ofgem.gov.uk/system/files/docs/2016/06/eligible_technologies_in_the_non-domestic_rhi.pdf

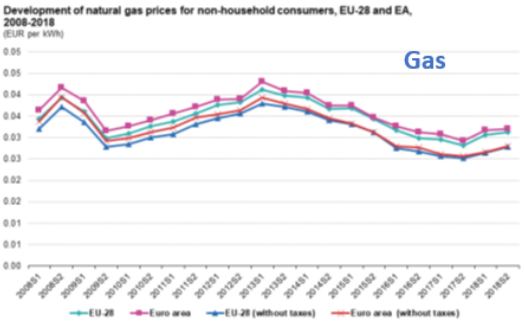

SHIP2FAIR
PESTLE Results Summary
General context
Increased share of renewable generation by 2030 in the EU
Introduction of a Carbon Tax
Feed in Tariffs
Trends towards banning fossil fuel-based energy production
Increase in subsidies, funding sources, and incentives
Energy efficiency
Emission reduction within the industrial sector
Renewable heating and cooling technologies for different sectors
Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables


SHIP2FAIR
PESTLE Results Summary
Main Competing Technologies
Well-established and well known across the European countries. Already used in hot water networks in residential and tertiary sector
GAS
Heat Pumps
Biomass
Biogas and/or Gas
Mainly as CHP
Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

PESTLE Results Summary

Electricity Price Evolution for Industry





Development of electricity and gas prices for non-household consumers in EU-27 in EUR/kWh between 2008-2020

Source: eurostat

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

PESTLE Results Summary

Main source of heat in Industry

France, Greece, Italy, and Spain still have **cheap oil and gas prices**

CHP is still the cheapest option to generate heat for the industry

Vapor networks are fairly common and exhaust vapor from industrial processes is frequently used to supply industrial hot water demand through heat recovery

Overall, **biomass is the main source of produced renewable heat across Europe**, with some pioneer examples as Spain, where solid biomass is at the center of national energy policies

Even when the share of renewable heating is high, **solar thermal represents just a minor fraction** of it (add figures on solar thermal share) and it´s mainly used for **residential** or tertiary applications

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

PESTLE Results Summary

Incentives amongst EU countries

Germany is the only country that specifically tackles incentives for **industrial players**, with subsidies loans for renewable heat investments

Newly built / freshly renovated buildings presents requirement for renewable heat generation

France & Italy offer **incentives** in the form of tax discounts **for energy transition to renewable** generation and financing schemes for renewable energy production systems

Portugal requires to install **solar collectors** to cover the DHW demand

BUT

No funding scheme is envisioned for renewable heat production in industry in particular

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

PESTLE Results Summary

F&B Industry Trends

F&B is one of the biggest branch in the European Industry

Growing F&B Industry

Growing awareness of product´s origin

Increased consumption of organic food

Growing awareness of food and beverage environmental impact

Growing eco-labelling business

Health is the **main criteria** regarding food buying from a customer point of view

Environmental impact take **less weight** in the decision-making process

BUT

Money remains the **main selling argument** when groceries shopping in Germany, Portugal and France

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

PESTLE Results Summary

F&B Industry Emission Trends

Growing emissions

-

Spain

Constant emissions

-

Italy, France, and Austria

Decreasing emissions

-

Germany and Greece

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables

PESTLE Results Summary

Country Specific Trends

Growing F&B Industry

Growing awareness of product´s origin

Growing eco-labelling business

High share of RES in electricity generation, so HPs operate with low GHG

Increased consumption of organic food

Growing awareness of food and beverage environmental impact

Growing eco-labelling business

Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables