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Solar Energy in Industrial Processes*

FRIENDSHIP

Forthcoming Research and Industry for European and National Development of SHIP

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Development and maintenance of FRIENDSHIP website

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RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	



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FRIENDSHIP

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Executive Summary

FRIENDSHIP website <https://www.friendship-project.eu> has been set up in order to increase public awareness of project.

Final version of the webpage with information on the project has been reviewed by partners and has been operational since 4th September 2020. The FRIENDSHIP website will be actively maintained during the whole course of the project. The whole content of the webpage is public.

The website structure is composed by 6 pages and 11 subpages. *Homepage* aims to target and capture the attention of the broad public, *Project* aims to provide information about FRIENDSHIP project, *Dissemination* and *News and SHIP development* are the main channels for dissemination and communication activities and *Contact us* are the channels to contact the consortium directly.

At the footnote of the website, an acknowledgment of EU funding is placed: **This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 884213, project FRIENDSHIP.**

Table of Contents

1. INTRODUCTION5

2. FRIENDSHIP WEBSITE STRUCTURE.....6

2.1. HOMEPAGE6

2.2. PROJECT6

2.3. SHIP200 & SHIP30010

2.4. DISSEMINATION11

2.5. NEWS AND SHIP DEVELOPMENT11

2.6. CONTACT.....11

2.7. MAINTENANCE OF FRIENDSHIP WEBSITE12

2.8. CONCLUSIONS12

2.9. DEGREE OF PROGRESS.....13

2.10. DISSEMINATION LEVEL13

1. Introduction

Deliverable 9.2 “Development and maintenance of FRIENDSHIP website” is part of the task T9.1 Dissemination, communication, and public events. The objective of this task is to assure that the results of the project will be disseminated to the European research and industrial community, and will target all important stakeholders in use of SHIP, and will assure an on-going communication between general public, experts, technicians, SHIP plants owners and operators etc. on one side, and partners of the project on the other. FRIENDSHIP webpage will be the main tool to reach the target audiences and for dissemination activities.

FRIENDSHIP website will be established at the beginning of the project and will be set up both for consortium members’ and public access. The website will be actively maintained during the project period.

The website is fully operational with public contents, already approved by the coordinator, exploitation manager and partners, from 4th September 2020.

2. FRIENDSHIP website structure

The website has been created in Open Source software called WordPress. WordPress started as a blogging system but has evolved to be used as full content management system, that is completely customizable and can be used for almost anything within the field of web design. It allows fast and reliable customization and user-friendly back-office environment which is a key for the website updates and file uploads.

The content of individual pages is divided in 6 parts (frames): heading with project's logo, project full name and navigation menu with titles of the pages and subpages (visible as soon as moving the mouse on the page title), four moving photos of the ABSOLICON and Industrial Solar products and plants, a central area with content description related to the page, a moving bar with all partners' logos, and finally a footnote with the acknowledgment of EU funding and EU flag. The website also contains a search tool.

The main navigation menu is placed at the top of the central area and includes the following sections (with their respective subsections): Home, Project with subsections Projects facts, Consortium and EAB members, Work Packages, Dissemination with subsections Public deliverables, Scientific publications Repository Tool, Sister Projects & Clustering, Gallery, News & SHIP development with News, Events, SHIP in the industrial sectors, and Press & Media, and Contact us.

2.1. Homepage

The FRIENDSHIP homepage provides basic information on the project. The content of the Homepage is divided in 6 parts. A short project overview is in the central area as well as the latest news and events related to the project with hyperlinks to the News and Events subpages; the four moving photos of the ABSOLICON and Industrial Solar products and plants have the aim to capture the attention of a broad public. Figure 1 displays a screenshot of the Homepage.

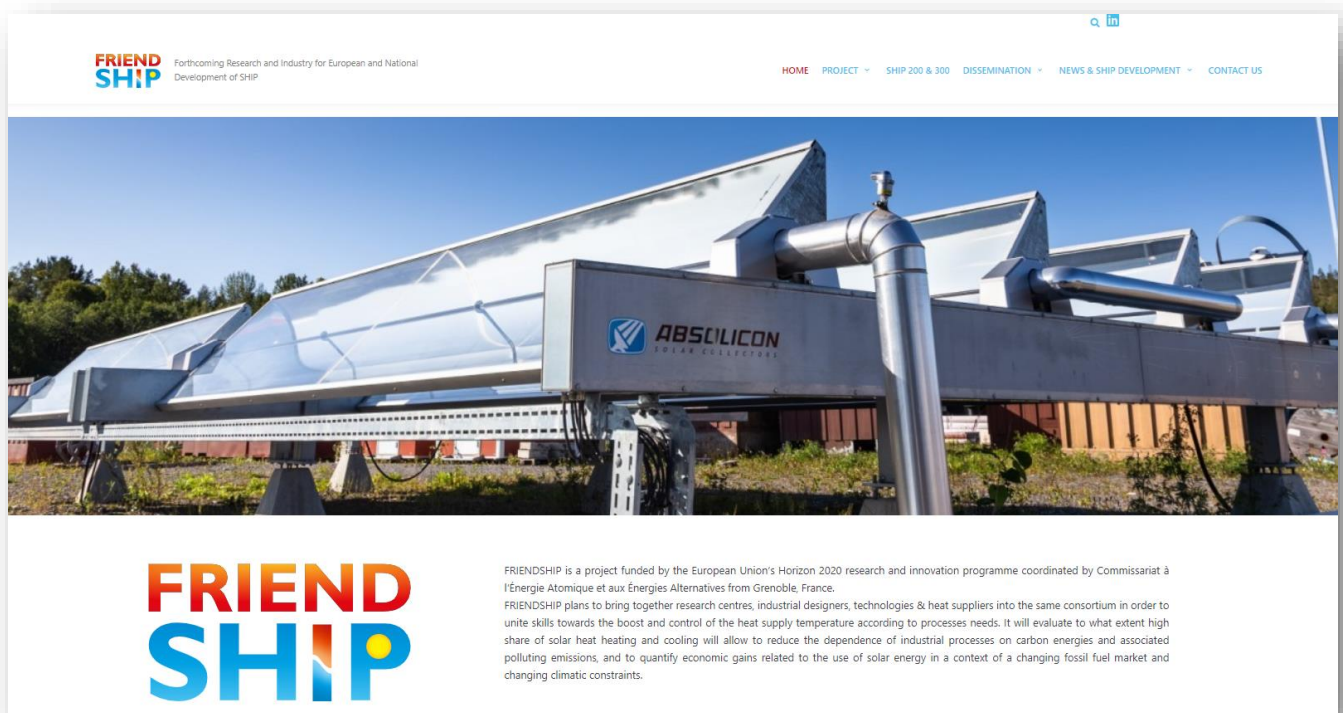


Figure 1. FRIENDSHIP website Homepage

2.2. Project

FRIENDSHIP

This section contains general information and description of the FRIENDSHIP project. It is divided into three subsections: *Projects facts*, *Consortium & EAB Members*, *Work packages*.

- Projects facts subsection summarizes all important facts about the FRIENDSHIP project, including the full project title, project acronym, grant agreement number, starting date, duration, project costs, project funding, funding scheme, funding programme, call identifier, topic, free keywords and project's abstract (Figure 2).

Project Facts

Project full title:	Forthcoming Research and Industry for European and National Development of SHIP
Project acronym:	FRIENDSHIP
Grant Agreement no.:	884213
Start date:	01 May 2020
Duration:	4 years
Project funding:	4,999,423.74 € (100% of total cost)
Funding scheme:	Cooperative research project
Funding programme:	H2020-LC-SC3-2019
Call (part) identifier:	H2020-LC-SC3-2019-NZE-RES-CC
Free Keywords:	Renewable heating & cooling, Solar Heat Industrial Processes, SHIP, Decarbonisation, SPIRE, BREF, Heating, Cooling, Solar Thermal

ABSTRACT: Solar heat is already used for Agro-Food industrial processes, mainly under 120°C. The FRIENDSHIP project will aim to demonstrate that solar heat can also be a reliable, user-friendly, high quality and cost-effective resource to meet the heat requirements for other industrial sectors as Textile, Plastics, Wood, Metal and Chemistry. To this end, the project plans to bring together research centres, industry leaders, technologies & heat suppliers into the same consortium in order to unite skills towards the boost and control of the heat supply temperature according to processes needs. Different coupling of technological and control innovations will be investigated: optimization of heat transfer coefficients; coupling and reliability of different solar technologies; introduction of high-temperature heat pumps; combined heat storage bringing flexibility on both solar and process loops with guarantees of continuous operation as well as plug-and-play integration; thermal chillers for cooling demand; and smart control to ease operation of the overall installation according to the process specifications. The proposed systems will be able to supply together heat at temperature up to 300°C and negative cold at temperature down to -40°C. In order to guarantee the replicability and scalability of the proposed demonstration, specific work will be carried out with world-class industries involved in the consortium (regulatory studies, financial incentive schemes, local energy markets creation), especially turned towards relevant users cases: industrial sites and parks in European countries where solar heat is currently underused. Ultimately, the project will evaluate to what extent high share of solar heat heating and cooling will allow to reduce the dependence of industrial processes on carbon energies and associated polluting emissions, and to quantify economic gains related to the use of solar energy in a context of a changing fossil fuel market and changing climatic constraints.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 884213, project FRIENDSHIP.

Figure 2. FRIENDSHIP Website Subpage Project Facts

- FRIENDSHIP Consortium consists of **10 partners from 8 countries** with complementary background know-how in order to achieve challenging goals of the project. This subsection describes the members of the project consortium. For each partner the name, short name, country of origin, primary contact, institution webpage and also a short company description (Figure 3). In this section, it is also reported the External Advisory Board members in the consortium with their names and their organisations.

Consortium & EAB members



Commissariat à l'Energie Atomique et aux Energies Alternatives

CEA

Primary contact: Valéry Vuilleme

Country: France

Website: <http://portail.cea.fr/>

CEA (France's Alternative Energies and Atomic Energy Commission) is a Research and Technology Organization (RTO) and a full member of EARTO. It aims to produce, integrate and transfer science and technology to help resolve the main EU challenges (low carbon energies, defense and security, information and healthcare technologies) and to exploit opportunities for new wealth creation, improved standards of living, and economic competitiveness.



SINTEF Energy Research

SIN

Primary contact: Francesco Finotti

Country: Norway

Website: <https://www.sintef.no/en>

SINTEF Energy Research is a part of the SINTEF Group, which is the largest independent research organisation in Scandinavia, with more than 2100 employees. SINTEF is a broadly based, multidisciplinary research institute with international top-level expertise in technology, medicine, and the social sciences.



Absolicon Solar Collector AB

ABS

Primary contact: George Pius

Country: Sweden

Website: <https://www.absolicon.com/>

Absolicon has a unique technology, based on 20 years of research, for extracting energy in different forms using concentrated solar collectors, or solar concentrators. The concentrators help reduce the production costs, while simultaneously providing a high degree of energy efficiency in the form of thermal energy, solar electricity, solar cooling, solar heat and solar steam.



Industrial Solar GmbH

ISG

Primary contact: Farah Gammoh

Country: Germany

Website: <https://www.industrial-solar.de/>

Industrial Solar GmbH (ISG) provides customized solutions for renewable energies and energy efficiency in the medium power range. Industrial Solar systems use solar thermal energy, photovoltaic, combined heat and power or efficiency measures. In addition, Industrial Solar offers consulting on optimizing existing energy systems and comprehensive engineering services. Industrial Solar has extensive know-how and experience in international projects and is world leader in solar Fresnel collector projects for industrial applications.



NATIONAL INSTITUTE OF CHEMISTRY

NIC

Primary contact: Ivan Jerman

Country: Slovenia

Website: <https://www.iki.si/en/>

National Institute of Chemistry (NIC) is a leading research institution in Slovenia in the field of chemistry and related science. NIC currently employs 331 employees, of which around 292 carry out research work in nine departments and two infrastructure centres; 149 of these have doctorates of science degrees. The mission of the NIC is to expand knowledge, transfer knowledge to younger generations as well as apply the newly acquired knowledge in industry.

FRIENDSHIP

	<p>Rina Consulting S.p.A.</p> <p>RIN-C</p> <p>Primary contact: Michele De Santis</p> <p>Country: Italy</p> <p>Website: https://www.rina.org/en/</p> <p>RINA is a global corporation that provides services across the Energy, Marine, Certification, Transport & Infrastructure and Industry sectors through a global network of 170 offices in 65 countries. Through its 3.700 talented professionals, RINA provides a wide range of high quality tailored solutions aiming to back up the market operators across the entire life cycle of their projects. All RINA services are performed at the highest professional level, understanding, and complying with Client's needs and requirements while taking into due consideration sustainability and health, safety and environmental targets.</p>
	<p>Institut National de l'Energie Solaire</p> <p>INES</p> <p>Primary contact: Immaculada MIRACLE</p> <p>Country: France</p> <p>Website: https://www.ines-solaire.org/</p> <p>Institut National de l'Energie Solaire (INES) is the leading solar energy centre in France, the third in Europe, the fourth in the world and the French representative of the International Solar Alliance, dedicated to research, innovation and training on solar energy. INES is organised in three main platforms: the Research & Innovation Platform (named CEA Liten), the Training and Evaluation Platform and the Dissemination Platform (both named INES PFE).</p>
	<p>CLARIANT PRODUKTE (DEUTSCHLAND)</p> <p>CLA</p> <p>Primary contact: Herbert Maier</p> <p>Country: Germany</p> <p>Website: https://www.clariant.com/en/Corporate</p> <p>Clariant is one of the world's leading globally operating specialty chemical companies headquartered in Muttenz near Basel in Switzerland with an annual turnover of about 5.9 billion EUR and a total staff of about 18'000 employees. Active in most countries of the world on five continents, Clariant contributes to value creation with innovative and sustainable solutions for a multitude of customers from many industries and businesses.</p>
	<p>SONAE</p> <p>SON</p> <p>Primary contact: Ana Silva</p> <p>Country: Portugal</p> <p>Website: https://www.sonae.pt/en/</p> <p>SONAE is a multinational group managing a wide portfolio of businesses, creating value across several geographic areas, which includes its affiliate company SONAE ARAUCO, one of Europe's largest manufacturers of wood-based panels. SONAE was established in 1959 as a manufacturing company, it diversified its business during the 1980s also to retail and in the 1990s also to telecommunications, achieving a turnover of over €5bn in 2017.</p>
	<p>AMIRES</p> <p>AMI</p> <p>Primary contact: Fabrizio Perrotta</p> <p>Country: Czech Republic</p> <p>Website: https://amires.eu/</p> <p>AMIRES is a consulting and management company for research, development and innovation projects, which provides the necessary strategic and administrative support to high quality international teams to achieve their objectives and facilitates the research-industrial and research-policy making interface. AMIRES follows projects from their initiation and planning, through negotiation, execution and management to the final stage, where exploitation of new technologies, products or services is facilitated. Moreover, main mission of the company is to facilitate the access of European research to high-tech SMEs and improve exploitation of innovative ideas. AMIRES s. r. o. is based in the Czech Republic but provides its services all around Europe.</p>

Figure 3. FRIENDSHIP Partners Descriptions in Consortium & EAB Members subpage

FRIENDSHIP

- Work Packages subpage shortly describes the **ten Work Packages (WPs)** with all targeting specific objectives.

2.3. SHIP200 & SHIP300

This section presents the FRIENDSHIP technological challenges: the two different systems SHIP200 & SHIP300. It is reported the detailed concept and explanations of the systems:

In the first concept, **SHIP200**, solar heat will be provided by low-cost PTCs with a maximum output temperature of 170-200°C. The coupling of the High Temperature Heat Pump and the Combined Heat Storage (a heat storage not only able to store heat from the solar loop, but from the process loop as well in case of excess heat in the process loop) will then boost the HTF temperature, store the heat and stabilize the delivery of heat for demand up to 180°C in a short-term development, and 250°C in the longer term. In the second concept, **SHIP300 system**, the High Temperature Heat Pump is replaced by an LFR field in order to boost the HTF temperature to higher temperature (280-300°C).

Sister Projects & Clustering

It is expected that the consortium activities will be reported to ESTELA Association and other relevant European Technology Platforms and similar activities are expected also on the national levels. The project will contribute, upon invitation by the INEA, to common information and dissemination activities to increase the visibility and synergies between H2020 supported actions.

Cooperation and synergies with other projects in the field of CSP by the European Commission will be used to enforce a rapid exploitation and potential cross-linking of project goals and marketing initiatives.

Following projects were identified as possible for clustering:

- **INSHIP:** INSHIP aims at the definition of a ECRIA engaging major European research institutes with recognized activities on SHIP, into an integrated structure that could successfully achieve the coordination objectives of: more effective and intense cooperation between EU research institutions; alignment of different SHIP related national research and funding programs, avoiding overlaps and duplications and identifying gaps; acceleration of knowledge transfer to the European industry, to be the reference organization to promote and coordinate the international cooperation in SHIP research from and to Europe, while developing coordinated R&D TRLs 2-5 activities with the ambition of progressing SHIP beyond the state-of-the-art.
<http://www.inship.eu/>
- **SHIP2FAIR:** SHIP2FAIR (Solar Heat for Industrial Process towards Food and Agro Industries commitment in Renewables) aims to foster the integration of solar heat in industrial processes of the agro-food industry. With this purpose, SHIP2FAIR will develop and demonstrate a set of tools and methods for the development of industrial solar heat projects during their whole life-cycle.
<http://ship2fair-h2020.eu/>
- **SFERA III:** The overall objective of this project is to carry on with the work done during the past 8 years in the SFERA 1 and SFERA 2 projects and reinforce the sustainability of the activities of the European advanced Concentrating Solar Power research infrastructures.
<https://sfera3.sollab.eu/>
- **DURASOL:** Durasol is a platform containing scientific equipment for testing the durability of solar materials and systems. Aim is to increase the durability of any type of solar energy systems, such as photovoltaic, solar thermal or concentrated solar power.
<https://www.durasol.fr/>
- **SUNHORIZON:** The main objective of SunHorizon is to demonstrate up to TRL 7 innovative and reliable Heat Pump solutions (thermal compression, adsorption, reversible) that acting properly coupled and managed with advanced solar panels (PV, Hybrid, thermal) can provide heating and cooling to residential and tertiary building with lower emissions, energy bills and fossil fuel dependency. A cloud-based functional monitoring platform will be realised in the project to be the "performance data mine" for the development of Data Driven/KPI oriented optimized algorithms and tools for predictive maintenance, optimize the management towards maximisation of solar exploitation and give to the manufacturer inputs for new installation design.
<http://www.sunhorizon-project.eu/>
- **IN POWER:** IN POWER aims at developing and integrating new innovative material solutions into concentrated solar technology to increase the efficiency while simultaneously decreasing the energy production cost.
<https://in-power-project.eu/>
- **S-PARCS:** S-PARCS presents a sound concept for reducing energy costs and energy consumption in industrial parks, while, at the same time, increasing renewable on-site energy production. The pre-assessment of the seven Lighthouse Parks from Spain, Portugal, Italy, and Austria, which participate in the study, has shown a high potential for joint energy actions, many of which are transferrable to the community of S-PARCS. Followers in the UK, Sweden, Turkey, Russia, Italy, Portugal, Austria and Norway.
<https://www.sparcs-h2020.eu/>

Figure 4. Subpage Clustering & Sister projects

2.4. Dissemination

This section, together with News and SHIP development, is related to the dissemination activities of the project. The goal of this section is to present the FRIENDSHIP latest achievements and outputs as well as to support the public awareness of the project.

It includes the subsections *Public deliverables*, *Scientific publications Repository tool*, *Sister projects & Clustering*, and *Gallery*.

- This subsection shows the list of all public deliverables of the FRIENDSHIP project. As soon as the deliverables are ready, they will be available for download in the .pdf format file in this section.
- Scientific Publication subpage will be offering a list of scientific publications related to FRIENDSHIP (Conference papers and Journals). This subsection will be continuously updated till the end of the project with inputs from partners.
- Sister projects have been identified by the Dissemination manager to establish contacts for clustering activities. A list of sister projects is reported in this subsection as you can read in the Figure 4.
- Subsection Gallery will offer pictures from project's meetings, workshops, conferences as well as pictures related to project activities.

2.5. News and SHIP development

This section contains four subsections *News*, *Events*, *SHIP in Industrial Sectors* and *Press & Media*. The newest news and events are shown on the homepage where links to the namesake subpages:

- In subsection News is reported the main news related to the project.
- Events subsection illustrates the main conferences, symposium and other relevant events interest for the SHIP community and the target audiences.
- In the subsection *SHIP in Industrial Sectors* are highlighted the dissemination activities related to the involvement of industries in the use of the SHIP technologies.
- In the Press & Media section is reported the press and media activities of the project. For each press release the title, date of publication, name of the newspaper and, also a link or a pdf file to the full text of the article will be mentioned.

2.6. Contact

Contacts section offers direct contacts to FRIENDSHIP Project Coordinator, Project Manager and Exploitation Leader (Figure 5).

Contact us

Project Coordinator

CEA [Coordinator]

Valery Vuillerme

[Valery.VUILLERME\(at\)cea.fr](mailto:Valery.VUILLERME(at)cea.fr)

Project Manager and Dissemination leder

AMIRES

Fabrizio Perrotta

[perrotta\(at\)amires.eu](mailto:perrotta(at)amires.eu)

Exploitation leader

Rina-C

Anna PARABOSCHI

[anna.paraboschi\(at\)rina.org](mailto:anna.paraboschi(at)rina.org)

Your Details

Let us know how to get back to you.

First Name *

Last Name *

Email Address *

How can we help?

Feel free to ask a question or simply leave a comment.

Comments / Questions *

SEND MESSAGE

Figure 5. FRIENDSHIP Contact us subpage

2.7. Maintenance of FRIENDSHIP Website

Website of the FRIENDSHIP project will be actively maintained and updated on a regular basis during the project life span. Especially the sections Dissemination and NEWS & SHIP development will be further reinforced.

Beyond the periodic updates and publication of results two activities need to run in parallel. First, the constant security check and control is needed to protect all sensitive data uploaded on server of Czech provider Active24 (<http://www.active24.cz>). This will be assured by the generation of more secure login details and by continuous adaptation of WP plugins and add-ons to avoid any sensitive data leakage. Special attention has to be given to random search engines crawlers, which download any accessible document and keep it for a long time in their cache system (even already erased documents). This activity will last till the end of the project and beyond its duration. Second, more optimization of the website will assure its positioning among first search results for relevant keywords.

2.8. Conclusions

FRIENDSHIP project website <https://www.friendship-project.eu> meets the requirements which were set for the website in the respective task D9.1 Dissemination and public events. The project website has been set up in order to increase public awareness of FRIENDSHIP project and to disseminate project's results. Basic information on the project can be found on the webpage as well as public deliverables and project's outcomes and publications. It will serve both public and the consortium partners. Direct contacts to Project Coordinator, Project Manager and Exploitation Leader are to be found in the Contacts section.

Provisional webpage with basic information on the project (i.e. project facts, the abstract, list of partners and contacts) has been operational already since July 2020 and final website has been officially launched on the 4th September 2020. The FRIENDSHIP website will be actively maintained during the whole course of the project.

2.9. Degree of Progress

The development of the project's website is to 100% fulfilled. The maintenance of the website will be carried out during the whole course of the project.

2.10. Dissemination Level

The Deliverable D9.2 "Development and maintenance of FRIENDSHIP website" is public and therefore it will be available to download on the project's website and on demand.