



Large scale energy storage



# CryoHub

Developing Cryogenic Energy Storage at Refrigerated Warehouses as an Interactive Hub to Integrate Renewable Energy in Industrial Food Refrigeration and to Enhance Power Grid Sustainability

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691761.

## Deliverable 9.5 Published papers

### Deliverable Information

Dissemination : Public

Nature : Report

Contractual Delivery Date : 31<sup>st</sup> March 2021

Actual Delivery Date : 31<sup>st</sup> March 2021

### Scientific coordinator :

Prof. J.Evans

London South Bank University, UK

e-mail : j.a.evans@lsbu.ac.uk



### Document Information

Project	: CryoHub
Document	: D9.5 Publications
Filename	: D09.05 Publications S1.docx
Last saved on:	31/03/2021 12:58, by Jacques BERTRAND/Miriam RODWAY

### Authorship and Review

	Name (Organisation)	Approval Date
<b>Written by</b>	Miriam Rodway (IOR)	
<b>and</b>	Ina Colombo (IIFIR) Judith Evans (LSBU)	
<b>For review by</b>	all	

### Release Details

Release	Date	Comments
Draft 01	5.3.21	First draft
Draft 02		Second draft after assessment by Reviewer(s)
Release 01	30.3.21	First release for approval by Coordinator
Submitted	31.3.21	Submitted to the Commission

### Distribution List

- On the project Portal
- On the CryoHub Intranet (<http://cryohub.psutec.com/>)



## **Table of Contents**

1. Executive summary .....	4
2. D9.5 Publications (LSBU and all partners) .....	4
2.1. How this activity was organised .....	4
2.2. Table of published papers.....	4



## 1. Executive summary

This report provides a summary and evidence of the activities and achievements of the Dissemination Work Package to promote awareness of the CryoHub project to stakeholder groups including owners of refrigerated warehouses, end users, policy makers, the research community and experts in this field through the publication of papers in academic peer reviewed Journals and Conferences.

It shows that regular and consistent activity to produce papers were carried out across all partners, languages and member states in this project and that a these reached a high level of market players at different key events and in different languages. Due to Covid-19 travel restrictions the organisation of conferences was limited towards the end of the project, however the team continued to publish papers by active participation in and organisation of online conferences.

## 2. D9.5 Publications (LSBU and all partners)

### 2.1. How this activity was organised

According to the usual convention, all draft papers submitted for publication for a journal or conference were circulated in advance by email to all partners for formal approval prior to presentation/publication.

### 2.2. Table of published papers

This table includes Journal Papers, Conference Papers

date	topic	publisher	partners involved	type
2016	almacenamiento energético de energía en la industria alimentaria	Energetica XX1	CENER	conference paper
2017	Refrigerated warehouses as intelligent hubs to integrate renewable energy in industrial food refrigeration and to enhance power grid sustainability	Trends in Food Science & Technology	TUS, LSBU, UB, AL, CORAC, CRAN, IRSTEA, CDR, IIR, CENER, MAY	scientific journal paper
2017	Cryogenic energy storage for renewable refrigeration and power supply	22nd Scientific Conference FPEPM-2017	TUS	conference paper
2017	Developing cryogenic energy storage at refrigerated warehouses as an interactive hub...	IIR 4th International Cold Chain Conference	LSBU	conference paper
2018	Modelling of liquid air energy storage applied to refrigerated cold stores	IIR 4th International Cold Chain Conference	LSBU, Cranfield	conference paper
2018	Financial viability of liquid air energy storage applied to cold storage warehouses	5th IIR International Conference on Sustainability and the Cold Chain, Beijing, China	LSBU, CRAN, TUS	conference paper



## Deliverable D9.5

2018	Analysis of when and where integration of LAES with refrigerated warehouses could provide the grates value to Europe	Science Direct	UB	scientific journal paper
2018	Modelling of liquid air energy storage applied to refrigerated cold stores	IIR 4th International Cold Chain Conference	LSBU	conference paper
2018	Model-based study of transient operation modes of a series of turbogenerators in a cryogenic energy storage system	23rd Scientific Conference FPEPM-2018	TUS	conference paper
2018	Modelling and simulation of the thermal behaviour of a refrigerated warehouse in dynamic operation mode	23rd Scientific Conference FPEPM-2018	TUS	conference paper
2018	Cryogenic energy storage for renewable refrigeration and power supply	Food Processing Industry	TUS	journal article
2019	Cryogenic heat exchangers for process cooling and renewable energy storage: A review	Applied Thermal Engineering	TUS, IRSTEA, AL, LSBU	scientific journal paper
2019	Thermal store small scale demonstrator for liquid air energy storage	International Congress of Refrigeration 2019	LSBU	conference paper
2019	Dynamic energy model of a refrigerated warehouse operating synergistically with a cryogenic energy storage system	25th IIR International Congress of Refrigeration (ICR2019)	TUS CENER	conference paper
2019	Energy mapping of large refrigerated warehouses co-located with renewable energy sources across Europe	International Congress of Refrigeration 2019	TUS, EUREC, Cranfield, CENER, Irstea	conference paper
2020	Europe-wide energy mapping and co-locating of large refrigerated warehouses with renewable resources as key enablers for cryogenic energy storage	Congreso de Ciencias y Técnicas del Frío (CYTEF2020)	TUS	conference paper
2020	Energy management strategy to make CryoHub concept profitable	CYTEF, Spain 2020	CENER	conference paper
2020	Overview of CryoHub thermal storage technologies	CYTEF, Spain 2020	Irstea, Air Liquide, London South bank University	conference paper
2020	Modelling and design of the CryoHub demonstrator	CYTEF, Spain 2020	London South Bank University, Air Liquide	conference paper
2020	Energy storage for RES Grid integration case studies	Energy storage 2020 Berlin	CENER	conference paper
2020	Small-scale demonstrator of a cold thermal store for liquid air energy storage	6th IIR Conference on Sustainability and the Cold Chain, Nantes	AL, LSBU, IRSTEA, CENER	conference paper
2020	Liquid Air Energy Storage (LAES) as a large-scale storage technology for renewable energy integration – A review of investigation studies and near perspectives of LAES,	International Journal of Refrigeration, Volume 110, 2020, Pages 208-218,	IRSTEA, LSBU	scientific journal paper
2020	Cryogenic energy storage systems as a synergistic contributor to the cooling and heating supply of a refrigerated warehouse or food factory	6th IIR International Conference on Sustainability and the Cold Chain, Nantes, France	TUS	conference paper