

Life3R

**Circular economy ecosystem to Recover, Recycle and
Re-use F-gases contributing to the depletion of
greenhouse gases -LIFE 3R**

Deliverable: Minutes of the Kick-off meeting

Action F1

**Responsible for Deliverable: National Technical
University of Athens (NTUA)**

OCTOBER 2020



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Abstract

This deliverable shows the minutes of the online Kick off Project Meeting on October 14th 2020.



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1 General information of the meeting

The online LIFE 3R Kick off meeting took place on the 14th October 2020. The main objective of the meeting was to have an overview of the project and to establish the LIFE 3R work plan for the coming months. It was also an opportunity to ensure that all the 4 partners had a common understanding of the project and their roles and to get more information on the project management formalities. The meeting was organized by the Coordinator partner (DACE). Annex I shows the specific agenda for this Kick off project meetings.

1.1 Attendants

The people who attend to the meeting in representation of each institution are shown in the next table:

Table 1: Attendants

No.	Participants	Acronym	Country
1 (coord.)	Daikin Airconditioning Central Europe Handels GmbH - Mr. Daniel Kobelt - Mr. Hrvoje Krpanic	DACE	AUSTRIA
2	DAIKIN EUROPE N.V - DENV (Belgium) - Mr. Nikolaos Barmparitsas	DENV	BELGIUM
3	Gesellschaft fürMaterialienundEnergieanwendungen GmbH - Prof. Christos Argiris	MAT4NRG	GERMANY
4	National Technical University of Athens - Prof. Sotiris Karellas - Dr. PlatonPallis - Dr. VasilikiTsiouri	NTUA	GREECE

2 Minutes

In this section, the most important contributions made in the meeting will be exposed using the agenda main items.

Introduction of project partners / PO

Welcome and introduction of NTUA

Professor SotiriosKarellas, in representation of the National Technical University of Athens (NTUA), welcomed all the attendants explained the importance of the meeting to clarify all action points and did a short presentation introducing NTUA and LSBTP Lab project team.



Short introduction of the partners (2-3 min. each)

Short presentations of all partners - Mr. Nikolaos Barmparitsas in representation of DENV, Mr. Daniel Kobelt and Mr. HrvojeKrapanic in representation of Daikin DACE, and Professor Christos Argirusis in representation of MAT4NRG.

Project Officer introduction

Darek Urbaniak (PO), Unfortunately, due to an urgent issue could not take part in the meeting.

Introduction and scope of the LIFE 3R project

Professor Sotirios Karellas (NTUA) presented the scope, the innovative aspects of the LIFE 3R project, the ambitions, objectives, expected impacts, policy implication and continuation of the project.

- Trademark for this Project Platform: Retradeables

Implementation Actions (C)

ACTION C.1: Self-certification & Self-declaration schemes

Presentation by Dr. Platon Pallis

- Introduction to methodology and Guidelines, formulation of the database, main functions, Installers ranking, qualitative and quantitative criteria.

Actions Planned:

- The development of the methodology & Good Practice Guidelines has started.
- The assistance and corporation of DAIKIN Europe / Greece was agreed.

ACTION C.2: F-gas identification & recycling prototypes

Presentation by Mr. Nikolaos Barmparitsas

- All refrigerants need to be Recovered / Recycled and Reused if they cannot be reused, they have to be disposed properly

- Online platform development

- declaration, certification and trading of recovered products
- changing the entire business model by introducing the recovered refrigerant as an asset to the company

Actions Planned:

- **Evaluation of different F - Gas identification (recovery / recycling) units > from**



- **specific F-gas identifiers to composition analyzers**
- **Evaluation of different Recovery and Recycling methods:**
 - simple recovery units
 - Recovery units with dry filters and separation via evaporation
 - Recovery units with dry filters, separation via evaporation and electrostatic filtering
- **Analysis and definitions of the different quality levels of refrigerants**
 - high quality > contamination with oil and moisture (R 410a)
 - Medium Quality > mix of different HFCs
 - Low quality > mix with CFCs (R 22)
- **Different IOT designs that allows the direct link of the unit with the Eco-System**

Respective Actions Planned:

- Prototype of IOT
 - Test equipment Recovery and Recycling unit/s + Composition Analyzer to be sent at NTUA to evaluate the performance in cooperation with mat4nrg GmbH. In the test the IOT prototype will also be evaluated. Recovery and Recycling unit and composition analyser DAIKIN Hellas can be provided in coming months
 - Evaluate different moisture and oil contamination kits available (which has the best performance)
- The design of the digital platform will start

FLUIDS to be tested:

As A Priority, to proceed with the certification process of the recovery of three common fluids: 1) **R 410A**, 2) R134a, 3) R 404a

- R32 > available on the market for only a few years
- **The Interest of The Marketis R410A**, because there is no alternative in certain applications
- Two Types Of recovery/recycling Units> It is planned that NTUA will receive one composition analyzer and two recovery / recycling Units based on infrared technology (one certified against AHRI 740 & the other not certified)
- The limitation of most uncertified recovery/recycling units: don't measure oil, moisture, chloride ions, particulates contamination. They are measuring the composition, but they cannot measure the percentage of the oil and moisture contamination.
- Test samples By Daikin Hellas will be provided in due time
- **Daikin Europe:** Chromatography Versus Analyzer - Outcome: infrared is quicker even if it's not so accurate as chromatography



- Certification After Recycle, does not exist
- A Refrigerant Quality Standard, **Equipment recovery/recycling/processingStandard**> Making The Process Acceptable
- AHRI_Standard 700 & AHRI_Standard 740
- **F-GAS Identification & Recycling Prototype - Equipment to be tested:**
 1. Refrigerant Composition Analyser
 2. Refrigerant Check kit - Oil and Moisture
 3. Recover and Recycling Unit
 4. IOT prototype

ACTION C.3: Demos: Go-Live and Roll-out to EU markets

Presentation by Mr. Hrvoje Krpanic: Legal Compliance check Hungary, Slovakia and Czech Republic

Three (3) General questions:

- 1) Change of ownership of recovered refrigerant, before regeneration
 - How to sell recovered refrigerant from the unit owner to i.e. installer

- 2) Is refrigerant an immediately waste after taking it from the equipment
 - Are there ways how to avoid declaration of refrigerant as a waste?
 - Can it be that the refrigerant should be declared as a waste before it becomes a waste?

- 3) Transportation of recovered refrigerant - recovered refrigerant handling
 - How to transport the recovered refrigerant from the equipment site to the warehouse of the refrigerant owner?

Major obstacles:

- 1) HU - recovered refrigerant is considered a hazardous waste
 - to be discussed with National Climate Protection Agency and cover some loopholes

- 2) CZ - recovered refrigerant is (in practice) considered a hazardous waste
 - to be discussed with Ministry of Climate Protection
 - > Workaround - buyer needs license for buying / manipulating hazardous waste (they all have it)

- 3) CZ - transport of the refrigerant from the equipment site to the installer warehouse is to be investigated
 - > Workaround - collection of recovered refrigerant for the equipment owner place but it is very impractical and will reduce the project acceptance
 - > Practice - refrigerant is normally transported from site to the warehouses by installers, and it becomes the waste in the moment it is handed over to



the specialized waste companies

NEXT STEP: Discussions with Ministries in HU and CZ about relaxations of waste determination

- DECEMBER 2020: Start of Bratislava implement action

- IMPLEMENTATION SET UP

Testing of prepared scenarios:

- Handling of A, B, C, quality refrigerants
- Quality checking (in situ, buyer testing, etc)
- transport (optimizing) of refrigerants
- Buyer / Seller communication through app

With installer (seller) on site and online:

- During all steps
- App usage
- Communication support

With distributor (buyer) online support:

- During app us, during market scanning
- Quality testing
- Certification
- After sales refrigerant scenarios
 - *re selling, export, destruction*

ACTION C.4: Exploitation & Replication and Transferability plans

Activation in the following months

Monitoring of the impact of the project actions (D)

ACTION D.1: Monitoring of the project impact

Not yet started

Communication and dissemination of result (E)

ACTION E.1: Monitoring of the project impact

Not yet started

Project management (F)

ACTION F.1: Project Management

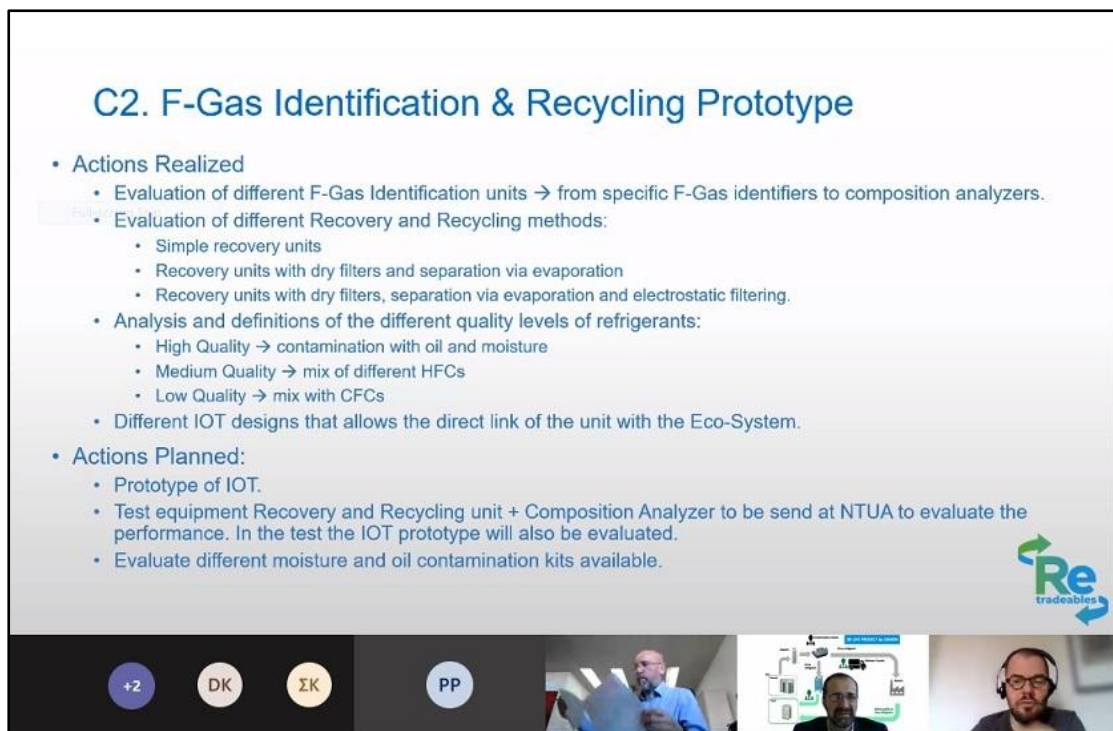
Professor SotiriosKarellas presented

- Final Draft version of the deliverable is to be sent to coordinator and all partners one month prior to submission date
- Final draft of the Partnership Agreement to be sent to partners / to be signed by the partners
- Regular meetings between partners and regular technical meetings of specific partners

Discussion. Questions. /Meeting closure and scheduling of the next project meeting

- Share Point: To Be Defined by DACE
- Establishing communication channels between DAIKIN Hellas (subsidiary company of Daikin Europe in Greece) & NTUA LSBTP for methodology & equipment regarding the recovery unit
- Next project meeting: To be defined by NTUA

3 Pictures of the meeting



C2. F-Gas Identification & Recycling Prototype

- Actions Realized
 - Evaluation of different F-Gas Identification units → from specific F-Gas identifiers to composition analyzers.
 - Evaluation of different Recovery and Recycling methods:
 - Simple recovery units
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 - Analysis and definitions of the different quality levels of refrigerants:
 - High Quality → contamination with oil and moisture
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 - Different IOT designs that allows the direct link of the unit with the Eco-System.
- Actions Planned:
 - Prototype of IOT.
 - Test equipment Recovery and Recycling unit + Composition Analyzer to be send at NTUA to evaluate the performance. In the test the IOT prototype will also be evaluated.
 - Evaluate different moisture and oil contamination kits available.

Re tradesbles

+2 DK ΣK PP

