

## D17.22 P&G demonstrator set-up progress report

### Summary of demonstrator

The P&G Living Lab (LL) will address a global supply chain issue related to product integrity due to high/low temperature across the globe. P&G has a large number of finished products and raw materials which do not normally require a temperature controlled supply chain. Containers used for inland and sea shipping might undergo severe climatic condition throughout the journey resulting in altered product integrity, e.g. quality loss, damage, security etc. Current technologies to monitor and control temperature in containers are too expensive while not efficient in terms of energy consumption. Hence, this Living Lab aims to demonstrate a solution which will reduce cost and energy footprint while guaranteeing product integrity shipped in containers/trucks throughout the entire supply chain.

### Summary of demonstrator objectives

The main objectives for this Living Lab are summarized below:

- Complete the design and construction of lead prototypes – based on Sunwell unique proprietary technology (ICECUBE). The prototype will be deployed inside seatainers and trucks used on existing P&G supply chain trade lanes.
- Above prototypes will also be used to monitor product integrity throughout the entire supply chain and against severe climatic conditions.
- This demo will integrate and validate procedures and interfaces through real time seatainers and truck transport conditions during 3 years. This full scale trial will consist of using a similar P&G supply chain across at least 2 oceans and a comprehensive road distance which will qualify sea and land shipments.
- This Living Lab will allow learning from real time experience and improving design based on real-time feedback provided by P&G collaborators.

### Progress summary

The “set-up” element focused on the definition of the overall goals, ambition and scope for this Living Lab and on the identification and consultation of crucial partners. Furthermore, the legal framework, procedures, protocols for communication and deliverables were defined and issues identified.

The ambition of the P&G Living Lab has been defined as addressing a global supply chain issue related to product integrity due to high/low temperature across the globe. Specifically, the ambition is to construct and test a novel device unit which will be loaded in normal seatainers and allow passive and on demand cooling capability to the transported goods. This new solution – called ICECUBE – will demonstrate a much more efficient solution which will reduce both the cost and energy footprint related to guarantying product integrity by keeping mild temperature conditions ( $\pm 30^{\circ}\text{C}$ ) in trucks and seatainers during shipments.

The LL will be used to monitoring effectiveness of above novel solution throughout existing P&G supply chains. It will demonstrate Real-time Lean Agile Resilient Green and Optimized supply chain solutions by ensuring that “ICECUBE solution” allows a 30-40% the overall carbon footprint reduction caused by commonly used diesel generators.

The scope of this Living Lab, defining the boundaries of the Living Lab and giving a first high level description of what is within this system, has been expressed as follows: The living lab will demonstrate that the ICECUBE prototype can maintain the product integrity by keeping the goods temperature below 30°C throughout the entire tested supply chain (Europe to South Africa).

The participating partners and their individual ambitions in this Living Lab have been described.

In preparation for making the Living Lab operational, a ½ scale prototype of the proposed Living lab solution has been designed, constructed and tested from both a thermodynamic and operability point of view. The first test validated the concept efficiency in cooling P&G loads over a long period of time. The second test focused on user case of operability and validated the “easy to use” concept of the prototype.

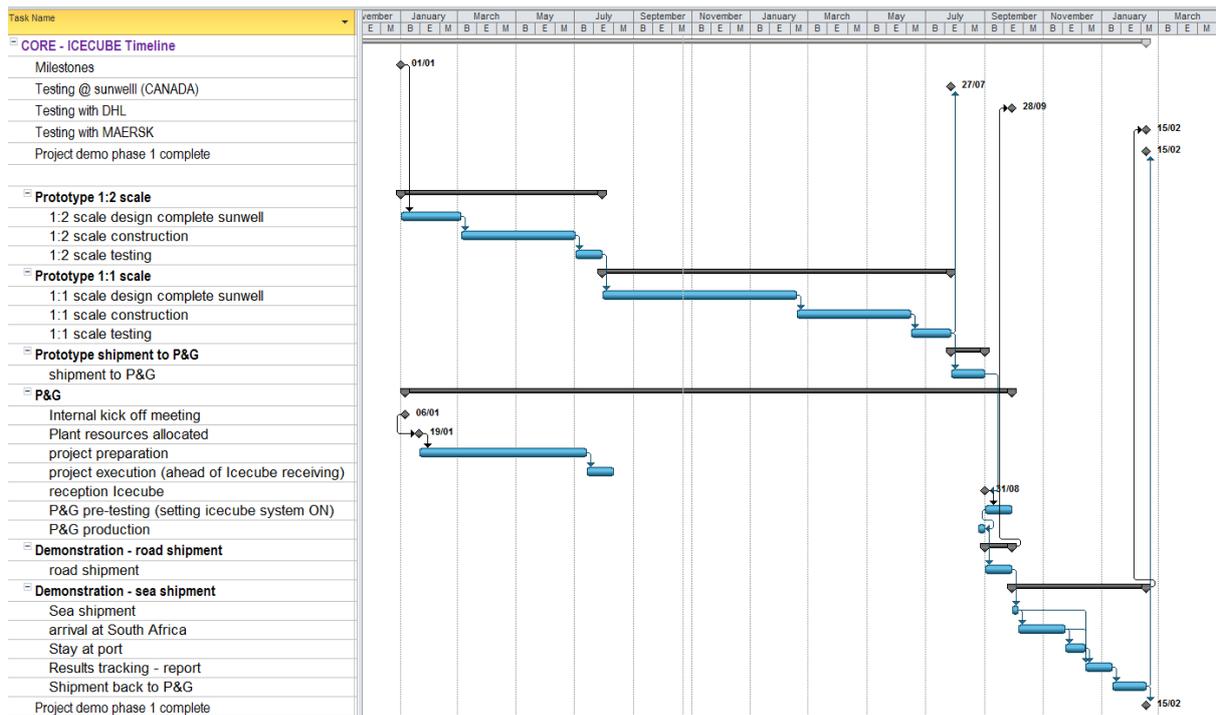
To assist the evaluation of the success of the Living Lab’s solutions after implementation, baseline or reference measurements have been made of the Living Lab system before the solutions were implemented, relating to the key performance indicators of lower cost versus reefer containers (leading to positive NPV) and Lower carbon footprint emission.

### **Timeline and planning**

An Implementation Plan has been developed for this Living Lab, covering preconditions for success, external dependencies and assumptions, with the critical quality factors identified as product integrity and continuous and reliable data gathering plus data sharing across land and ocean.

Most of the activities of this Living Lab are estimated to happen before December 2016. Later developments will refine designs and specifications to produce the final prototype for testing in a real supply chain environment.

The living lab will be implemented as per the plan and timeline below:-



The next steps to be undertaken are set out below.

- Full scale Prototype re-design based on learning from ½ scale prototype testing
- Full scale prototype testing at manufacturer
- Demonstration plan + pre-testing (at manufacturer) success criteria definition
- Clarification of the Custom clearance documentation requirement
- Integration of ICECUBE technology to partners IT structure (for demonstration only)
- Business model definition