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Developing a standard modularised solution for flexible and adaptive integration of heat recovery and thermal storage capable of recovery and management of waste heat.

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1. EXECUTIVE SUMMARY:

The following report will outline the operation and results obtained throughout the duration of WP2 (M4-M16). The outcomes of WP2 are based from the site visits and observations gathered from consortium meetings. A full progression for each task can be found in the respective deliverables.



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3. INTRODUCTION

The main focus of WP2 is the development of a HPHE system and the associated simulation work. The work package is split into six tasks:

- Task 2.1: Heat Transport Capacity Requirement
- Task 2.2: Modelling and Selection of Working Fluid
- Task 2.3: Modelling and Selection of Compatible Pipe and Wick Material
- Task 2.4: Selection of Wick Structure
- Task 2.5: HPHE Overall design, cost modelling and manufacturing of heat pipes.
- Task 2.6: Testing of heat pipes and model validation

Throughout the duration of the work package, a series of site visits and data collection methods were employed to aid the HPHE design and operational conditions. The series of tasks listed in WP2 ensure the full development of maximum and minimum operating temperature systems.

4. Initial Site Visit

Both conducted site visits clarified information such as installation location and set operating conditions. Both respective locations cover the maximum (600°C) and minimum (200°C) operating temperatures of the smartrec system.

4.1 Maximum Operating Temperature Facility

The site visit conducted for the maximum operating temperature system at an aluminium recycling plant kiln exhaust stack has been selected as shown in figure 1. The installation of the HPHE will be connected via a piece of duct work with valves to control and divert the exhaust flow to the HPHE or through the exhaust stack.

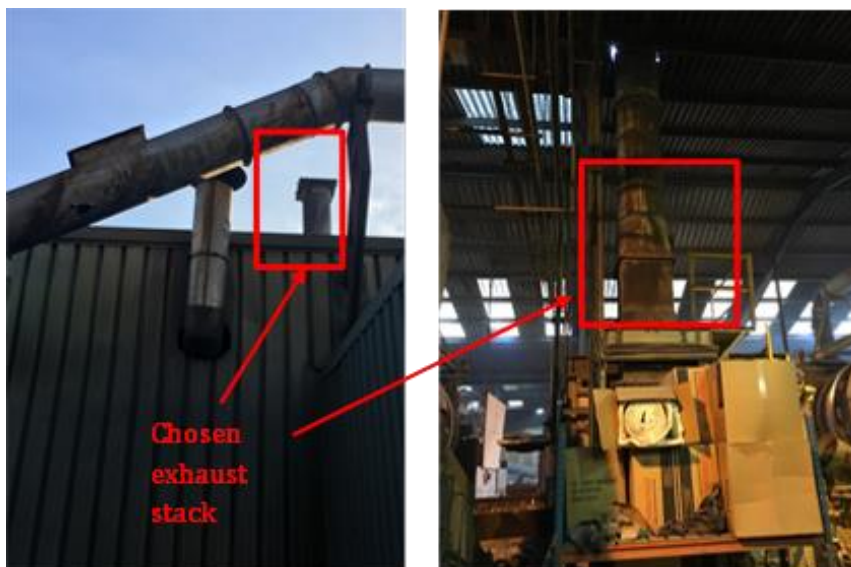


Figure 1: Maximum Temperature operation installation location.

As previously discussed in consortium meetings; the temperature and composition gas data will directly affect the design and operational conditions of the HPHE.

4.2 Minimum Operating Temperature Facility

The findings obtained from consortium meetings, and chosen testing facility shown in figure 2 is the minimum temperature operation facility. The HPHE will be installed on the exhaust section of a test kiln and designed to fit in the available space.



Figure 2: Minimum Temperature operation installation location.

As of 10/11/2017, the HPHE unit arrived at the low temperature operating facility. Further information regarding the HPHE system can be found in the associated deliverables.

5. WP2 Progress

5.1 Submitted Deliverables

Deliverable	Progress
D2.1 Preliminary Heat Pipe Design	Submitted
D2.2 HPHE model and Design Ready	Submitted
D2.3 Report on the HPHE model validation	Submitted

Table 1: WP2 Submitted Deliverables



5.2 Milestones

The end of WP2; highlights the completion of MS2 Heat Pipe Model Tested and Validated [M16]

5.3 Subsequent Progress

Following on from the progress in WP2, the high temperature HPHE is connected to an inoperable high temperature exhaust stream. Both ALTEK and ECONOTHERM agreed that need for monitoring and controlling the temperature of flue gas is required. ALTEK agreed to monitor the flue gas and try to achieve a semi constant operating range of 400°C and 600°C for a sufficient HPHE operation.

Agreed on: 01/12/2017