Teaching Case Study

Ananké SAS: it's all about energy!

Valorising waste heat for a cooler future

Proposal Sheet

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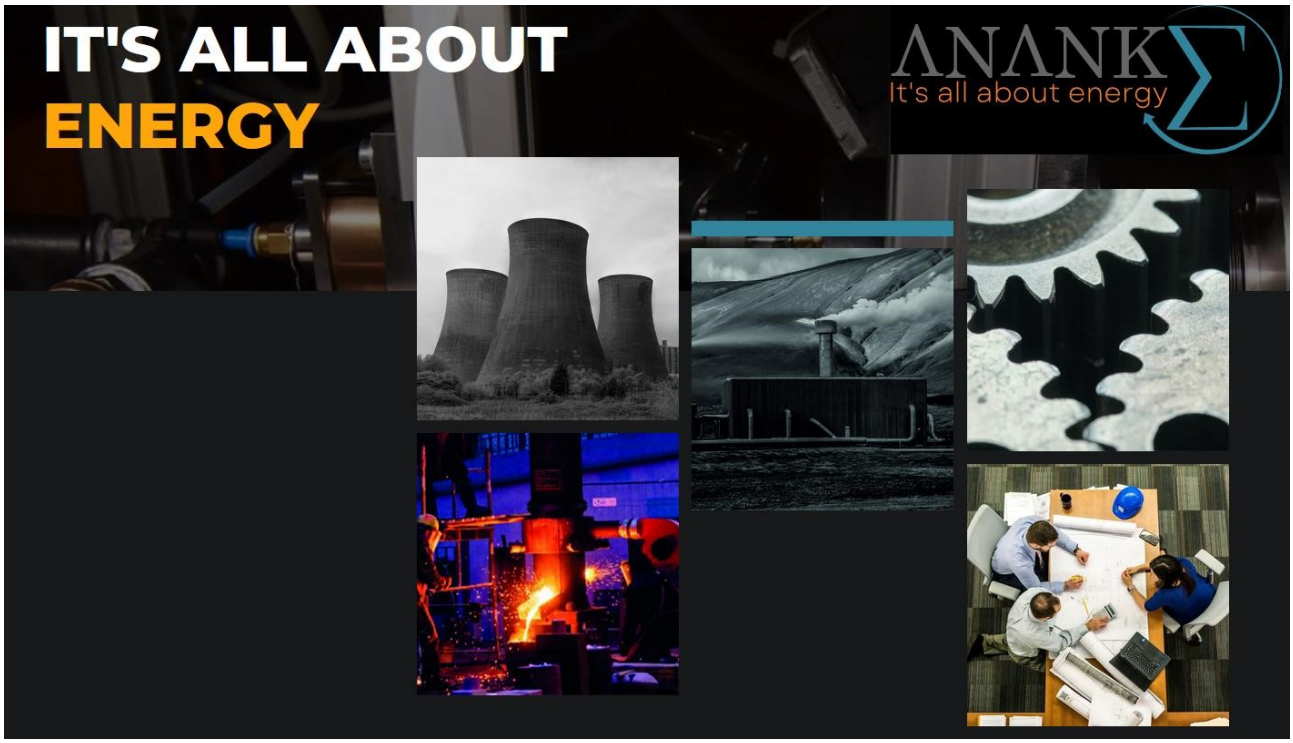

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Project partners
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Content

General information

Activity Sector	Waste heat recovery for industry		
Key words	Heat recovery, Energy reduction, Cost calculation, Impact assessment, Project Management, Commercial offer		
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Public	Initial and alternative education ☒ Beginners ☒ Intermediaries ☐ Experts	Continuing education ☒ Beginners ☒ Intermediaries ☐ Experts	
Domain(s)	☐ CSR ☐ Economics ☐ Entrepreneurship ☐ Finance ☐ HRM ☐ Information Systems ☐ Law ☒ Marketing & Sales ☐ Political Sciences ☐ Strategy ☐ Supply chain & logistics	☐ Arts, Architecture, Design, Ergonomics ☐ Education Sciences ☐ Geography & Urban planning ☐ Information & communication Sciences ☐ Literature & language Sciences ☐ Medical Sciences ☐ Physical activities & Sport Sciences ☐ Psychology, Sociology, Philosophy, Demography	☐ Biology & Neurosciences ☐ Chemistry, Biochemistry ☐ Earth & Universe Sciences ☐ Electrical, Electronics ☒ Energetics ☐ Mathematics & Computer Science ☒ Mechanical Engineering ☐ Physics ☐ Processes
UN SDG	☒ 9 Industry, Innovation, and infrastructure ☒ 12 Responsible consumption and production		
Place in the Circular Economy Model	☐ Raw materials ☐ Sustainable design ☒ Production ☐ Distribution ☐ Consumption Reuse Repair ☐ Collection ☐ Waste management ☒ Residual waste		

2 Abstract

Students are working as Junior Project Manager at Ananké SAS, a Belfort (France) based engineering and integration company active in the field of heat recovery.

Ananké is in contact with Alsace Burnhaupt Metallurgie SARL (virtual customer), a company producing metal parts for the automotive industry. They want to improve their environmental impact to be in line with European and national legislation. Therefore, the management is looking for potential solutions in their plant in Burnhaupt-le Haut/France (location can be chosen and adapted to local situation) to reduce their energy consumption and carbon footprint.

Two potential usages have been identified in previous discussions:

1. Reinject preheated air into the oven to reduce gas consumption for heating up the air
2. Contribute to the heating of the shopfloor in winter to maintain a minimum temperature.

Crucial data have already been gathered and documented in two internal notes of the previous meetings.

Students must analyse these different options and create a line of reasoning, and then present their preferred option to their project manager in order to prepare the commercial proposal for the customer.

Optionally, students may develop a project plan of the selected solution.

3 Pedagogic goals & prerequisites

This Teaching Case Study aims at the following **pedagogic goals**:

- Enable students to discover and identify suitable environmental and economic indicators to compare different industrial solutions and to find arguments for a discussion.
- Discover heat exchange as an economically interesting mean to reduce energy consumption and carbon footprint of production tools.
- Present and defend the solution to be presented to the customer to the project manager and the team.

The following **prerequisites** are recommended:

- Basic knowledge about heat exchangers and potential energy recovery solutions helps better understanding the case (self-learning material is provided)
- Basic knowledge about technical calls for tender
- For the detailed project development (optional step): Basics in project management

4 Sustainability goals

This TCS allows students to reflect and benchmark two different technical solutions to recover and reuse waste heat from an industrial installation, and to identify and present the better one to the customer. The decision is based on an evaluation scheme developed by the students that considers economic and sustainability criteria.

The TCS shows students how to reduce a company's environmental impact while maintaining an economic equilibrium. As this is a quite common situation in industry, students may initiate or implement this kind of solution in their future jobs.

5 Case description

Year of the problematic	2024	
Duration for students	Preparation:	30 (60) min 30 min: reading of all related information + potentially 30 min: working through the self-learning material
	Implementation:	4,5 h 3,0 h: Analysis phase and result elaboration by students 1,5 h: Result presentations + debriefing
Languages	☒English	☒ Other: French (Documents addressing students only)
Use case	☒ In class	☐ Examination TCS
Category	☒ C1: Case written in collaboration with a company which has given its consent for using of its internal sources such as the company name, figures, photos, videos, and so on. Join the agreement sheet. ☐ C2: Case based on real company information and with the acceptance of the company to use its data, but names or figures (of company and persons) are modified to keep them confidential. Join the agreement sheet. ☐ C3: Case written using external public sources (annual report, websites, brochures, newspapers, …) where names or verbatims of the protagonists are used. Join the agreement sheet. ☐ C4: Case based on real company using public information without the agreement of the company (generally, the names (company and persons) are changed to anonymous ones. Impossibility to make the link between the TCS and the company. ☐ C5: Imaginary case based on teacher's experience who collected information from several companies in order to write a case study with a fictive integrative company. It can also be a compilation of different situations of several periods put together at the same time to form a pedagogic tool.	
Number of pages: Statement / Annex		9 / 16
Number of pages: Teachers' note:		5
Number of pages: Debriefing support		18 + 4 backup
Diffusion licence		See cover page

6 Case Pack components

6.1 General documents

Document	Description	File name*	Folder	# pages
Proposal Sheet	Teaching Case Study description. This file can be published to inform interested persons about the Teaching Case Study	SCABEE TCS Ananké (2024) - Proposal Sheet (EN).pdf	Root	6
Company agreement	Agreement of the company to use their internal information and data	SCABEE TCS Ananké (2024) – Company agreement Ananké.pdf	Root	3

6.2 Documents for students

Document	Description	File name	Folder	# pages
Base scenario	The document for students including the mission and all necessary information.	SCABEE TCS Ananké (2024) - Base Scenario (EN).pdf SCABEE TCS Ananké (2024) - Scenario de base (FR).pdf	Student & In-class documents_EN Student & In-class documents_FR	26
Introduction to heat exchangers	A document with technical information and elements for students interested in better understanding the functioning of heat exchangers.	SCABEE TCS Ananké (2024) - Introduction to heat exchangers (EN).pdf SCABEE TCS Ananké (2024) - Echangeurs de chaleur-Une introduction (FR).pdf	Student & In-class documents_EN Student & In-class documents_FR	11
Analysis form (student, beginner)	Excel file including forms to analyse the different possible options with the given information. Forms including formulas for use without profound skills in thermodynamics. The document structure and sheets are protected to avoid inadvertent deletions or modifications. The password to unprotect is 'SCABEE'.	SCABEE TCS Ananké (2024) - Analysis form (students) (EN).xlsx SCABEE TCS Ananké (2024) - Analysis form (étudiants) (FR).xlsx	Student & In-class documents_EN Student & In-class documents_FR	7
Project Management add-on	Additional information for those students who shall develop a project plan for the heat exchanger.	SCABEE TCS Ananké (2024) - Project Management Add-on (EN).pdf SCABEE TCS Ananké (2024) - Project Management Add-on (FR).pdf	Student & In-class documents_EN Student & In-class documents_FR	3

6.3 Documents for Teachers only

Document	Description	File name	Folder	# pages
Teacher's note	Document for teachers to guide them through the Teaching Case Study. This document.	SCABEE TCS Ananké (2024) - Teacher's note (EN).pdf	Root	25
Introduction	Document allowing introducing the in-class preparation (step 2).	SCABEE TCS Ananké (2024) – Introduction (base scenario) (EN).pptx SCABEE TCS Ananké (2024) – Introduction (base scenario) (FR).pptx	Student & In-class documents_EN Student & In-class documents_FR	6
Analysis forms (teachers)	Excel file with completed analysis forms to help teachers in the evaluation phase. This document may also help when teachers want to update data or replace, e.g., the customer in their own country (see SCABEE TCS Ananké (2024) – Update form.docs) The document structure and sheets are protected to avoid inadvertent deletions or modifications. The password to unprotect is 'SCABEE'.	SCABEE TCS Ananké (2024) - Analysis form (teachers) (EN).xlsx SCABEE TCS Ananké (2024) - Analysis form (enseignants) (FR).xlsx	Student & In-class documents_EN Student & In-class documents_FR	7
Debriefing support	Document that can be used during the debriefing phase with students (step 3).	SCABEE TCS Ananké (2024) - Debriefing support (EN).pptx SCABEE TCS Ananké (2024) - Debriefing support (FR).pptx	Student & In-class documents_EN Student & In-class documents_FR	18 + 4 backup
Evaluation (viva-voice presentation)	Suggestion for the evaluation of the oral presentations	SCABEE TCS Ananké (2024) - Evaluation oral presentation (EN).docx	Root	1
Evaluation (report)	Suggestion for the evaluation of the submitted presentation document/report	SCABEE TCS Ananké (2024) - Evaluation report (EN).docx	Root	1
Uptdate form	Form that can help teachers in case of personalisation by moving the customer from France to another location.	SCABEE TCS Ananké (2024) – Update form.docx	Root	1