



# IDE Master Graduation Project

## Project team, procedural checks and Personal Project Brief

In this document the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document may also include involvement of an external client, however does not cover any legal matters student and client (might) agree upon. Next to that, this document facilitates the required procedural checks:

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

### STUDENT DATA & MASTER PROGRAMME

Complete all fields and indicate which master(s) you are in

Family name	Peeters	IDE master(s) IPD	<input type="checkbox"/>	Dfl	<input type="checkbox"/>	SPD	<input checked="" type="checkbox"/>
Initials	I.M.J.	2 <sup>nd</sup> non-IDE master	<input type="text"/>				
Given name	Inès	Individual programme (date of approval)	<input type="text"/>				
Student number	4611527	Medisign	<input type="checkbox"/>				
		HPM	<input type="checkbox"/>				

### SUPERVISORY TEAM

Fill in the required information of supervisory team members. If applicable, company mentor is added as 2<sup>nd</sup> mentor

Chair	Suzanne Hiemstra van Mastrigt	dept./section	DOS/ RMCB	<p>! Ensure a heterogeneous team. In case you wish to include team members from the same section, explain why.</p> <p>! Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.</p> <p>! 2<sup>nd</sup> mentor only applies when a client is involved.</p>
mentor	Sylvia Mooij	dept./section	DOS/ RMCB	
2 <sup>nd</sup> mentor	Luciana Monteiro			
client:	Emrbaer-X			
city:	Amsterdam	country:	Netherlands	
optional comments	I have supervisors from the DOS department. Their expertise aligns with my goals, and they have no dependent relationship. Suzanne's mobility expertise supports passenger-centered electric aviation, while Sylvia ensures a structured, effective research process.			

### APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in by the Chair of the supervisory team

Sign for approval (Chair)

Name Suzanne Hiemstra-van Mastrigt      Date 19-12-2024      Signature SHiemstra

## CHECK ON STUDY PROGRESS

To be filled in by **SSC E&SA** (Shared Service Centre, Education & Student Affairs), after approval of the project brief by the chair. The study progress will be checked for a 2<sup>nd</sup> time just before the green light meeting.

Master electives no. of EC accumulated in total \_\_\_\_\_ EC

Of which, taking conditional requirements into account, can be part of the exam programme \_\_\_\_\_ EC


X	YES	all 1 <sup>st</sup> year master courses passed
	NO	missing 1 <sup>st</sup> year courses

Comments:

Sign for approval (SSC E&SA)

Name Lisette Boot

Date 08-01-2025

Signature 

## APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be checked and filled in by IDE's Board of Examiners

Does the composition of the Supervisory Team comply with regulations?

YES	<input checked="" type="checkbox"/>	Supervisory Team approved
NO	<input type="checkbox"/>	Supervisory Team not approved

Comments:

Based on study progress, students is ...


<input checked="" type="checkbox"/>	<b>ALLOWED</b> to start the graduation project
<input type="checkbox"/>	<b>NOT</b> allowed to start the graduation project

Comments:

Sign for approval (BoEx)

Name Monique von Morgen

Date 9/1/2025

Signature 



# Personal Project Brief – IDE Master Graduation Project

Name student Inès Peeters

Student number 4611527

## PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT

Complete all fields, keep information clear, specific and concise

**Project title** A passenger vision for the future of the electric aviation 9-seater services: a case study on the Førde - Bergen route in Norway

*Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.*

### Introduction

*Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)*

A 9-seater aircraft is an electric aircraft with a range up to 400km. Compared to bigger aircrafts, the 9-seater offers a more viable business case due to less complex certification requirements. Electric aviation presents a sustainable alternative for current fossil emitting aviation to reduce CO2 emissions by 88%, as outlined in the Paris Agreement's 2050 zero-emission aviation goals (Nordic Innovation, 2024). Electric aviation increases regional connectivity, lowers operational costs and reduces noise levels (Tybjerg, 2024; Ydersbond & TØI, 2023). However, Embraer lacks a viable and desirable business case. The viability is missing to convince airlines to enter the 9-seater market that it could be profitable to operate in. The desirability is unclear, as it remains unclear who the passengers are of this new type of aircraft. Therefore, this project investigates the viability and desirability of 9-seater electric aviation services from a passenger perspective within the domain of sustainable Regional Air Mobility (RAM) (Roland Berger & DLR, 2024).

The stakeholder is Embraer-X, specifically Embraer's strategy department, which seeks to access the European electric 9-seater market. Embraer-X focusses on direct routes to remote areas that currently require flight transfers, and where public transportation options are limited. Therefore, showing a viable business case for 9-seater solutions.

Norway leads in sustainable transport options, such as electric ferries and cars. Norway provides governmental subsidies, available renewable energy, and owns many regional airports with short fleets. Norway also has a high user dependency on air travel in rural areas (Nordic Innovation, 2024). These factors position Norway as an interesting case study for the implementation of electric aviation services.

The Førde–Bergen route shows a promising case-study. The route has geographical constraints, where mountains and waters limit residents to travel. The current travel options are not time efficient for a daily commute: car (3.5 h), bus (3,5 h), flight with transfer in Oslo (4,5 h) or departing by air from Florø instead of Førde (4,5 h). These inefficiencies hinder economic and social growth in the region, making residents feel left out compared to other local regions (Ydersbond & TØI, 2023).

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introduction (continued): space for images

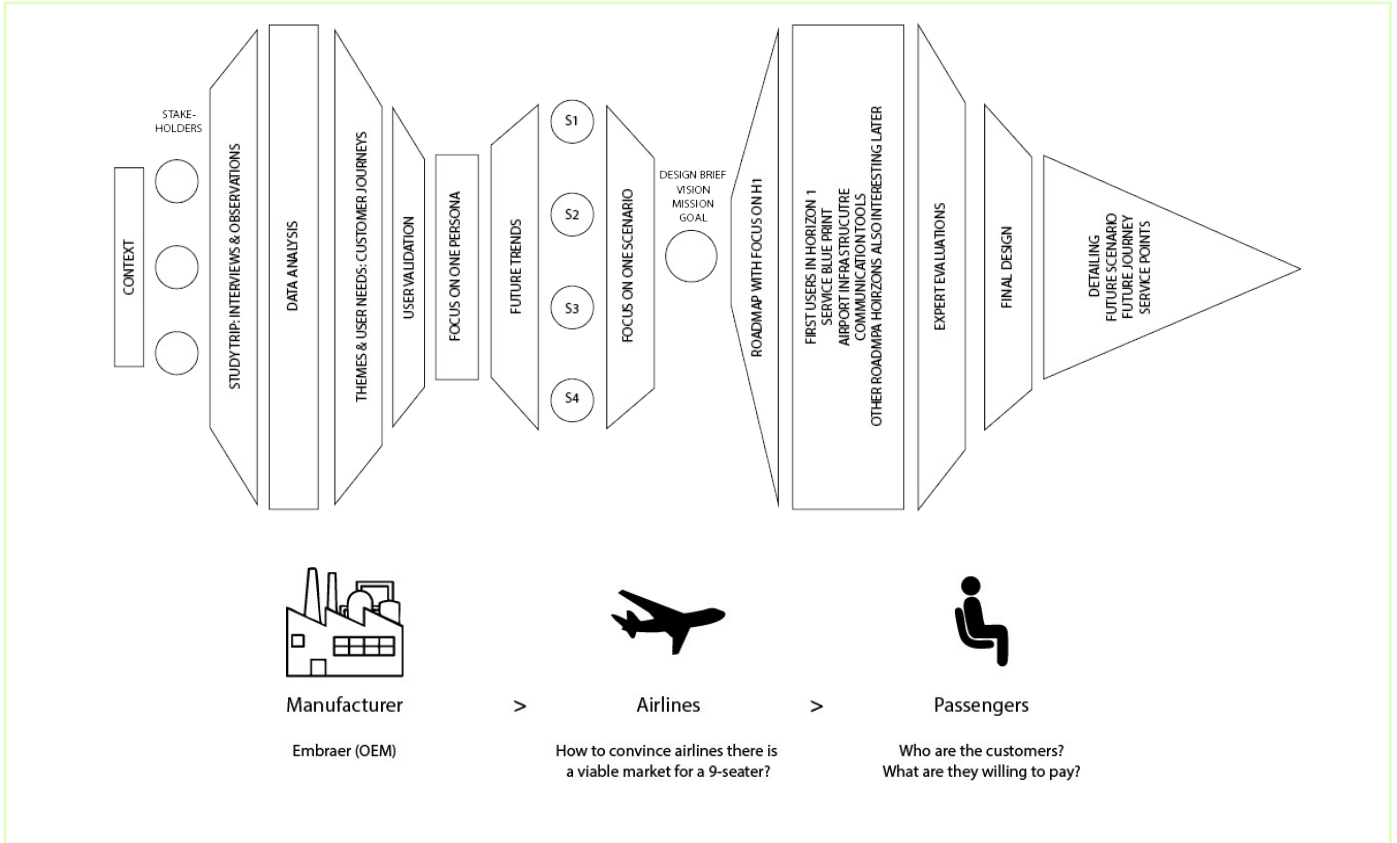


image / figure 1

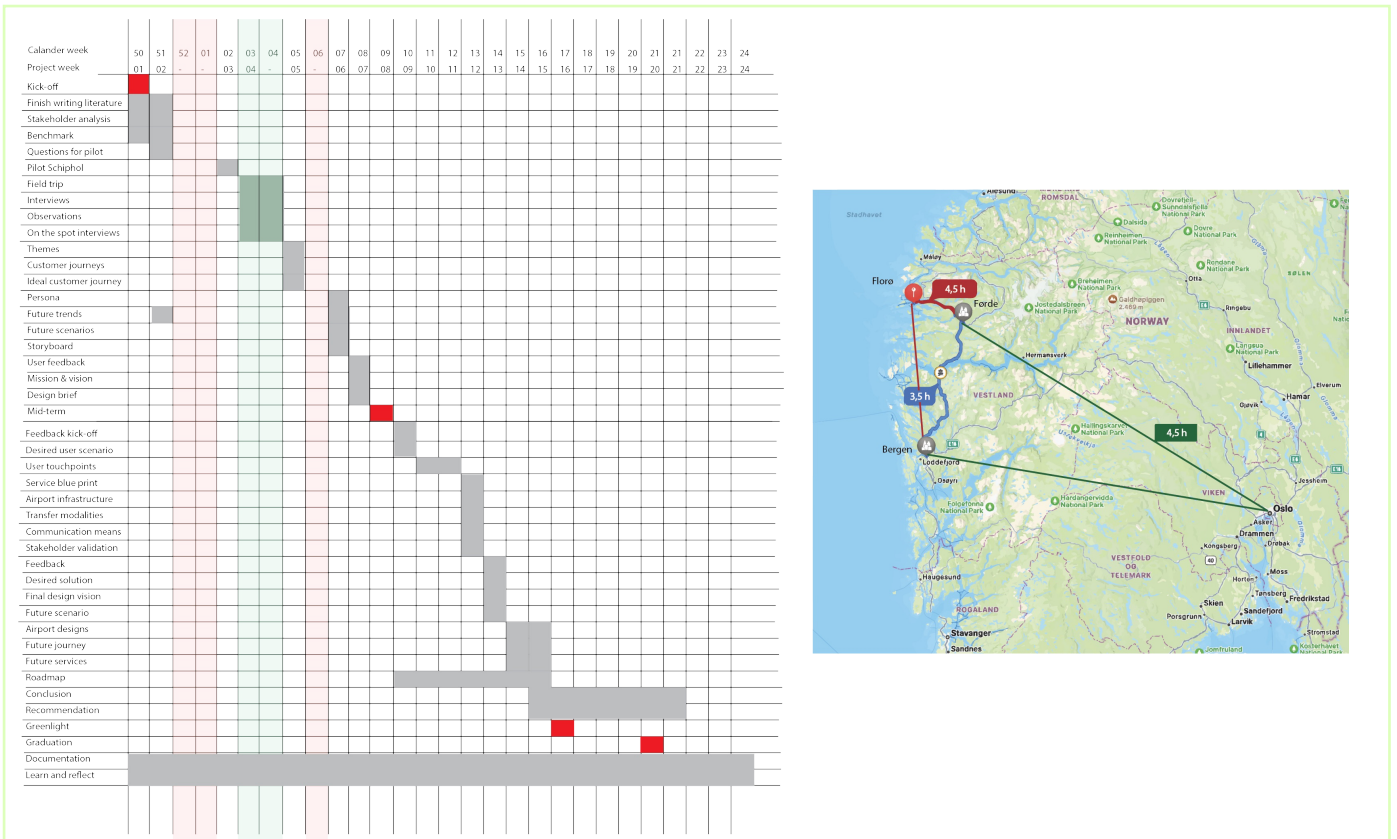


image / figure 2

## Personal Project Brief – IDE Master Graduation Project

### Problem Definition

*What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.  
(max 200 words)*

The problem in this project is that while the electric 9-seater aircraft is technologically feasible, it lacks a viable and desirable business case. Embraer has the technological know-how to build the aircraft, but it remains unclear who the passengers are for this 9-seater aircraft. The design challenge is to research whether there is a viable and desirable business case for Embraer to enter the 9-seater electric aircraft market, focusing on designing for the passengers of the airlines. Existing research has focused on the technical and economic feasibility for implementing electric aviation, leaving a gap in understanding how such services should be designed to from a passenger perspective. It is important to understand the current pains and gains to design a future service that is desired. Understanding the user needs helps to achieve a better fit between the technology developments to encourage the adoption of more sustainable solutions (Calabretta et al., 2017).

### Assignment

*This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:*

Design a general roadmap for Embraer-X, projected on the Førde–Bergen route in Norway, developed from a passenger perspective to illustrate how the service can create a viable and desirable business case. The roadmap helps Embraer-X with a strategic plan to convince stakeholders of the 9-seater business case.

*Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)*

This project adopts a qualitative research approach. The project explores the context and stakeholder network of electric aviation in Norway. Along desk research, a qualitative case-study trip is planned on the Førde–Bergen route to gather insights into passenger pains and gains during their travel journeys. This involves conducting observation studies, in-depth interviews, and mapping out the different passenger journeys by plane, bus, car, and ferry. Based on the insights into passenger needs, various personas are created. Focusing on a passenger group, future scenarios for 2040 are designed to explore the potential contexts in which the 9-seater could operate. A scenario that is most feasible for the future is selected for detailed analysis. The roadmap initially focuses on this target group in Horizon 1, including steps such as developing a service blueprint to illustrate how stakeholders should support the ideal future passenger journey. It outlines the infrastructure required, how to transfer to other types of modalities, the communication tools needed to inform future passengers about the new modality, and how service touchpoint prototypes interact with passengers. Over time, the roadmap expands to include other types of passengers. It shows the steps stakeholders must take to implement the horizons to realize the future vision of the 9-seater service. The roadmap highlights what is needed from a technical, regulatory, and economic perspective at each stage.

## Project planning and key moments

To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting, mid-term evaluation meeting, green light meeting and graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).

Make sure to attach the full plan to this project brief.  
The four key moment dates must be filled in below

Kick off meeting 10-12-2024

Mid-term evaluation 25-02-2025

Green light meeting 24-04-2025

Graduation ceremony 23-05-2025

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	<input type="checkbox"/>
For how many project weeks	<input type="text"/>
Number of project days per week	<input type="text"/>

Comments:

## Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.

(200 words max)

I feel very lucky to conclude my study period with a project that combines all my interests. I really like to work on a future mobility project, through qualitative research and where multiple cultural backgrounds come together. Having the chance to work together with Embraer-X makes me happy, since I like the way they work in a small team, identifying new potential markets to enter and how they should do this. On top of that, a project that is works with sustainable mobility solutions gives me energy to design sustainable solutions for the aviation industry. Personally, I also wanted to work on a project in a different culture than the Netherlands. To have the opportunity to work on a project that could (partly) be executed in Norway, is something that really excites me. Next to that, Embraer-X is a Brazilian company, and I like to learn different cultures communicate and work.

My learning objectives:

1. Becoming an expert in electric aviation purposes from a user perspective
2. Customer journey mapping
3. Being able to visually communicate my conclusions and findings
4. Working with a SMART planning: project planning, time bound tasks & clear goals.