# **Introduction (868/1,500 words)**

The purpose of this chapter is to provide the reader with some background information and motivation for this project, accompanied by a navigational aid of the structure of this report.

## **Background and Motivation - 447 words**

In 2021, Ireland set a target of reducing greenhouse gas emissions by 4.8%. The result? An increase in greenhouse gas emissions of 5%. This example highlights the problem of a knowledge action gap towards climate change, and specifically, towards reducing individual carbon footprints. With 196 Parties joining The Paris Agreement, a legally binding international treaty on climate change, and with Ireland having set the target of reducing Irish greenhouse gas emissions by 4.8%, it is clear that society has ample knowledge about the threat and importance of reducing carbon footprints to tackle climate change. The problem is the realised action, or lack of action taken to achieve these targets. The solution to achieve these targets is not difficult - reduce carbon footprints. This project focuses on this core issue of a knowledge action gap towards reducing individual carbon footprints. Without a change in meaningful pro-environmental action towards reducing carbon footprints, society will never reach global emissions targets such as reducing global greenhouse gases by 43% by 2030. Clearly there is a need for change to bridge this knowledge action gap.

The difficulty with achieving this shift in reducing individual carbon footprints comes from the fact that there is limited societal motivation to do so. A number of reasons contribute to limited societal motivation to reduce individual carbon footprints such as ineffective altruistic message framing, this issue not targeting psychological needs of the human race and individuals feeling powerless when large corporations continue to release massive amounts of emissions in relation to individual contributions. In order to accomplish sustainability targets, such as reducing Irish emissions by 4.8% in 2021, a more effective form of motivation needs to be applied to society to reduce individual carbon footprints as opposed to the current altruistically framed system of “saving our shared planet”. Without a change in approach to motivating pro-environmental behavioural change, society will continue on its current trajectory of falling far short of emissions targets. Thus, the need for this change in approach to motivating pro-environmental behaviour change is another focal motivation for this project.

Over time, gamification has been proven to be effective at motivating behavioural change, a point evident from analysing the results of existing social mobile apps whose focus is to increase pro-environmental behaviour. The success of existing gamified, environmental social mobile apps has been a massive motivation for this project, proving that gamification has the potential to deliver on this much needed, crucial change in approach to motivating pro-environmental behaviour, specifically to reduce individual carbon footprints, and thus reach global emission targets.

Although gamified social mobile apps to motivate pro-environmental behaviour change already exist, it is clear that there is still much more room for increased engagement and meaningful action to be taken towards reaching global emission targets, and thus reducing the threat of climate change.

## **Goals and Objectives – 500 words**

The overall goal of this project is to apply a social app implementing gamification frameworks to motivate pro-environmental behavioural change. To achieve this goal, the objectives for app design and implementation are providing users the ability to track their daily carbon footprint emissions, compete and view position in individual and team leaderboards, view the history of their individual scores over time to analyse progress, view the breakdown of their carbon footprint score and to view suggestions on how to reduce their carbon footprints. Non-functionally speaking, the app should be easy and enjoyable to use.

After collecting data on users’ carbon footprint scores over time through the app, the goal of this project is to analyse the potential impact and success gamification can have on reducing individual carbon footprints.

## **Structure of Thesis – 220 words**

**Introduction**

This chapter outlines the background and motivation for the project, the goals and objectives of the project, and finally the structure of this report.

**Literature Review**

This chapter provides the reader with relevant background information sourced from academics, in the fields of carbon footprints, behavioural psychology, gamification and existing solutions that exist to motivate pro-environmental behavioural change through a social mobile app.

**Design**

This chapter illustrates how and why the social mobile app implemented in this project was designed, relating back to insights from the previous chapter, the literature review, as well as from insights from the field of Human Computer Interaction (HCI). A series of low-fidelity (hand-drawn) and high-fidelity (software) prototypes are presented for illustrative purposes.

**Implementation**

Having established how and why the social mobile app should be designed, this chapter focuses on how this design was actually implemented by the author. Implementation issues experienced by the author are also presented in this chapter.

**Evaluation and Discussion**

This chapter focuses on how effective the social mobile app created in this project was at achieving the goals and objectives specified in the introduction chapter at the beginning of this report.

**Conclusion**

The final chapter of this report, the conclusion, addresses the limitations of this project, the challenges faced by the author, and areas of future work for the project.