

# Facilitation of green commuting through electrical

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## INTRODUCTION

Due to DTU's relatively remote location, there are a high number of daily commuters to and from DTU. This is associated with a massive amount of transportation, which causes a high environmental impact. This environmental impact gives motivation to investigate whether it is possible to change people's travel behavior, so that the environmental impact associated with transportation to and from DTU is minimized.

## METHODS

Based on studies from the Danish Ministry of Transport and information from Danish energy and transportation companies the average emissions per person for the four most used transportations methods (car, bus, train and bicycle) were derived.

The distribution of commuters on the four transportations methods is based on a study made by DTU Transport and a survey with response from more than 700 students and employees.

## GREEN WHEEL DEAL

Green Wheel Deal is a product service system based on an existing product where people connected to DTU can subscribe to an electrical rear wheel, which can be applied on any common type of bicycle. The wheel transforms a normal bicycle into an electrical driven bicycle that is controlled by a smartphone. DTU students and employees subscribes on DTU campusnet and can pick up the wheel at the HQ located at DTU or at any of the collaborating bicycles shops in Lyngby or Copenhagen. In the event of a malfunctioned wheel the customer can quick and easy exchange the broken wheel for another one free of charge at any of the pick up points.

## CONCLUSION

A conservative estimate based on the answers from the survey is that 30% of the commuters using car, bus or train convert to the product service system. With this estimate it will be possible to reduce DTU's commuting related emission of CO<sub>2</sub>, NO<sub>x</sub> and particles, with 26%, 30% and 24% respectively. Furthermore it is possible to offer the product service system at a considerable lower price than the expenses related to commuting by car, train or bus. This will render Green Wheel Deal even more attractive, especially to student living on a budget.