

# Utilization of Bicycle Break Energy

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## INTRODUCTION

With increasing focus on the environmental issues of our planet, the beneficial ways of bicycle transportation has never been more topical. Especially in flat European countries like Denmark and Holland, the bicycle is very applicable for trips both of short distances as well as longer distances like 10 kilometers or even 20 kilometers. In the search of making the bicycle an even more attractive alternative to the car for transportation, this project seeks to find a way to store the energy used for braking when stopping the bicycle, and utilize this energy when starting again. The solution should be entirely or almost entirely mechanical, as mechanical solutions tend to be favorable when it comes to implementation, maintenance, and so on.

## THEORY

Different technologies for storing energy mechanically include springs - both linear and torsion springs - and flywheels. The different possible solutions come with different advantages and disadvantages, and among the critical focus points are weight, strength, volume, friction and effectiveness. Since this project is made as a part of the DTU course '41801 Fagprojekt' which stretches from January to June, the solution has yet to be definitively decided.

## METHODS

Literature studies have been made amongst the group members individually in order to make most of the effective work hours. These studies have included researching springs, flywheels, clutches, cables, gears, materials, and so on. Furthermore, experiments have been conducted in order to determine the common acceleration and deceleration when riding bicycles. Forces, torques, etc. have been calculated using the laws and formulas of physics. Regarding shape and design of the mechanism, the method of systematic product development has been utilized.

## RESULTS

As before mentioned, this project is an ongoing process and hence no actual results have come of our studies yet.