# Improved Kayak Ergometer

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## INTRODUCTION

Ergometers are widely used in many different competitive fields, especially when it comes to watersports. Ergometers are used both for practice and tournaments, as they eliminate the need for water and gives a more controllable environment. In kayaking, ergometers use air or water to simulate resistance. These sources give an incomplete simulation of the act of kayaking, and as such there is room for improvement. Our design implements a generator and regulates the power through its windings to control the resistance experienced by the user. On top of that, the generator's output could be used to charge electronic devices as a clean, sustainable source of alternative energy.

## THEORY

The current through a generators stator determine the resistance felt towards the turning of the rotating axis. The greater the resistance, the greater the amount of work that can be put into the generator, which gives for a greater output of power. Through the use of a custom built power regulator, we can control the resistance of the generator based on its output, meaning that gearing will be implicit, as it is with electrical cars. The power generated can be used to improve the simulation of kayaking, whilst charging a 12V battery.

## METHODS

An ergometer has been made available from Team Danmark, and it is on this that the generator will be installed. A working prototype will be available at the GRØN DYST student conference. A further advantage of the implementation is that it eliminates the need for expensive custom built flywheels for the ergometer, as the generator can make use of readily available mass produced cogwheels and generators built for cars, reducing the overall cost of the machine.

## RESULT

From previous projects and existing technology, it has been ascertained that the intended project is very much within the scope of what is possible. Further tests will be conducted on the prototype once build.

## CONCLUSION

As there is a market for the improved ergometer and it gives a useful funnel for work put into it by the user, said improvement can and should be made. The prototype will function as a proof of concept and a staging platform for future improvements.