



FORMULA GROUP T

GREEN INNOVATION MEETS PERFORMANCE

NI DAYS
9 october 2012

Wouter Vandenhende
MotorControl

The background of the slide is white, featuring a dynamic pattern of numerous thin, straight lines radiating from a central point. These lines are primarily green and yellow, with some appearing as lighter, faded versions of these colors. The lines vary in length and orientation, creating a sense of movement and energy around the central text.

Formula WHO?

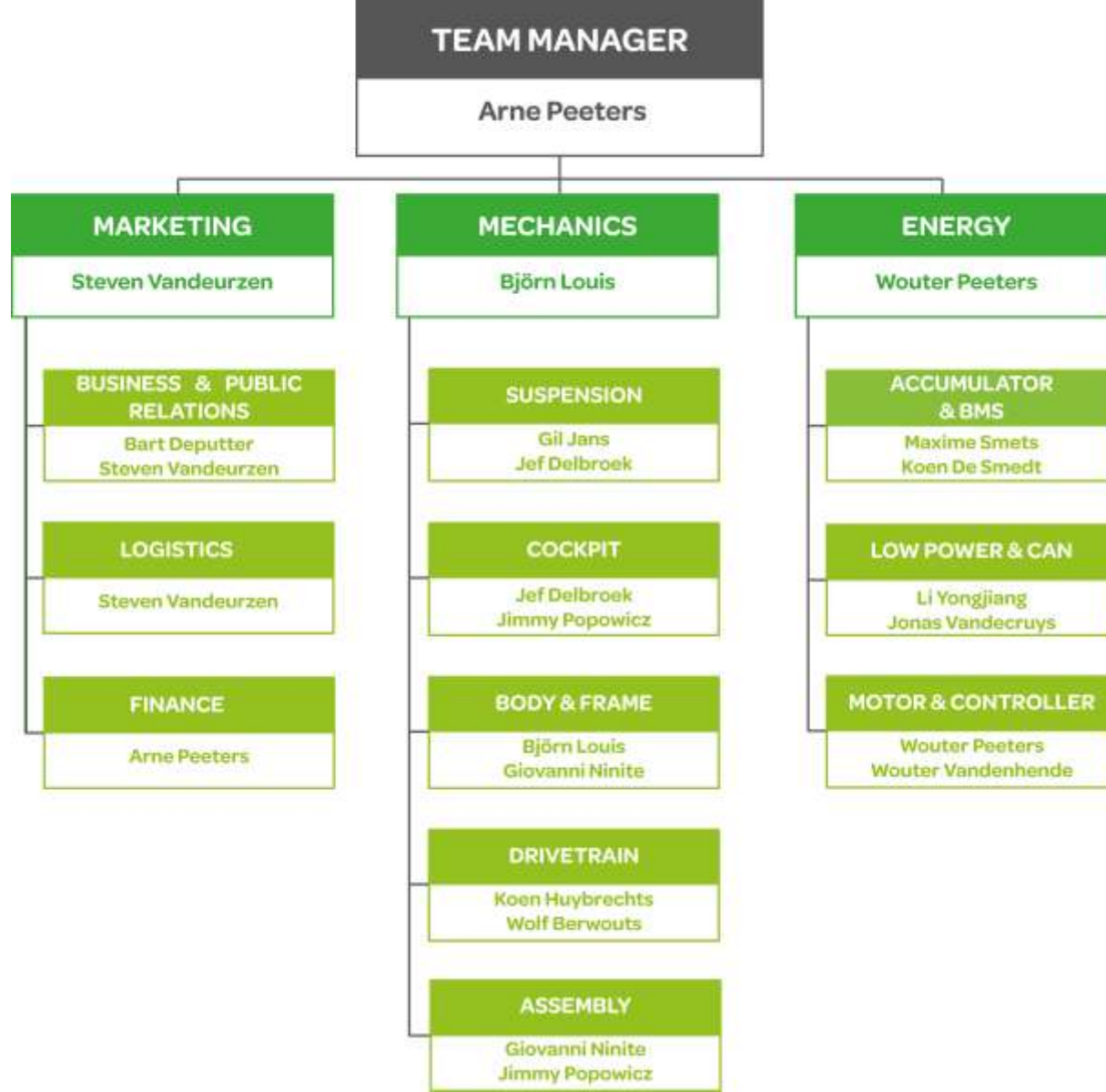
Formula Group T

16 students of GROUP T

- Elektromechanics (12)
- Electronics (3)
- Chemistry (1)

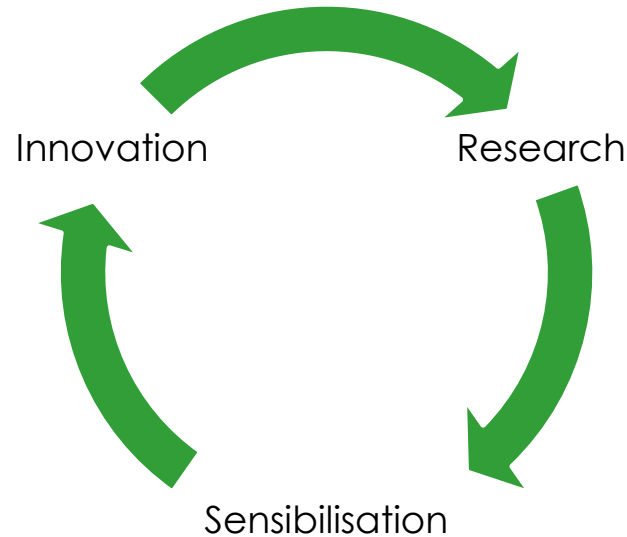
2-year master path





Mission

To Provide an **accademic platform** with the purpose for **research** in a context of **open innovation** about new technologies in the automotive sector.



The background of the slide is white, featuring a dynamic pattern of numerous thin, radiating lines. These lines originate from a central point and extend outwards in various directions. The lines are colored in shades of green and yellow, with some appearing as solid colors and others as thin, light-colored outlines. The overall effect is one of energy and movement, suggesting a burst of ideas or a complex network of connections.

Formula WHAT?

Formula Student

International student competition

Build a **small formule racecar**

To develop a **total package** of an engineer

More than just racing!



Formula Student

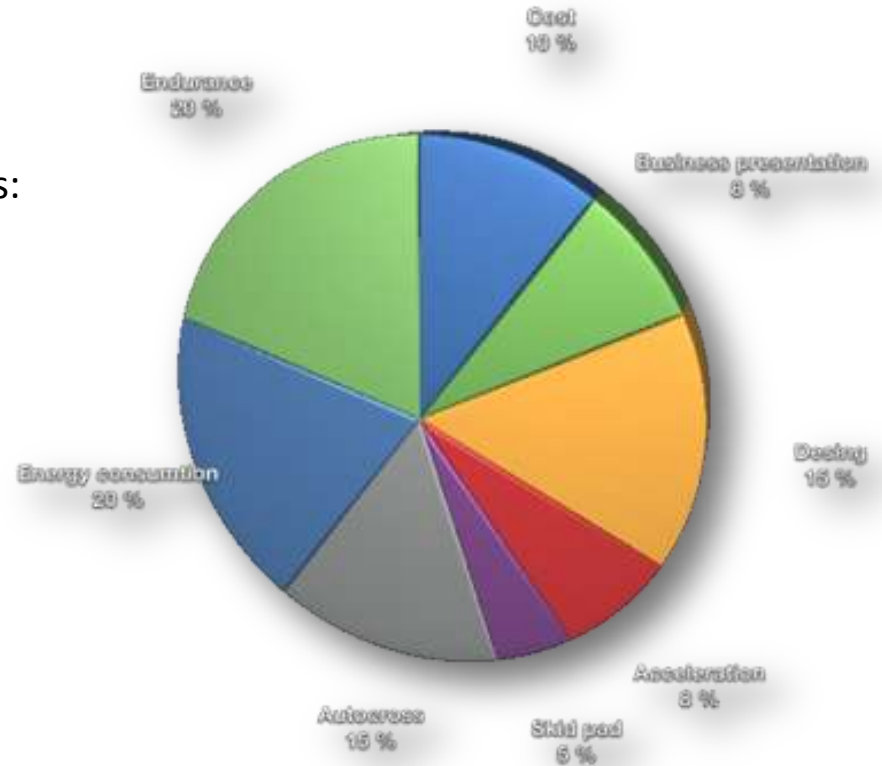
The competition consists out of 2 major parts:

STATIC EVENTS

Cost analysis	100 points
Business Presentation	75 points
Design	150 points

DYNAMIC EVENTS

Acceleration	75 points
Skid Pad	50 points
Autocross	150 points
Energy Efficiency	100 points
Endurance	300 points

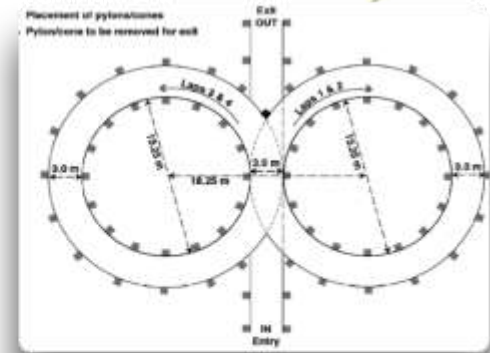
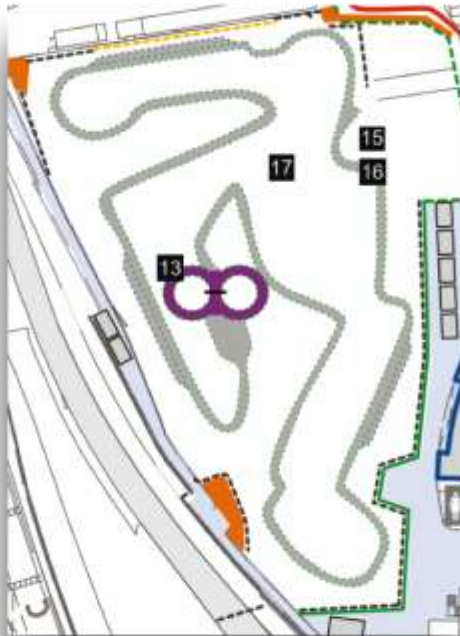


Points will be given by a jury consisting of 50 people from the (automotive) industry (Land Rover, Volkswagen, Mercedes AMG, Airbus, ...) and people from other universities.

Static aspects



Dynamic aspects





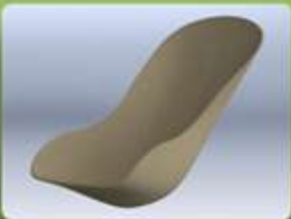
formulastudent.tv

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Formula HOW?

Green innovation...

Biocomposit
racechair



3D- printing



Inteligent
drivetrain



FORMULA GROUP

GREEN INNOVATION MEETS PERFORMANCE

...meets performance

0 – 100 km/h	3,2 sec
weight	290 kg
Torque	1000 Nm
Power	85 000 W
Power density	400 Bhp/ton
Batteries	8 kWh LiPo cels



128 Nm



540 Nm



1250 Nm



How did National Instruments help

Labview courses:

Teammembers went to labview courses about real Time.

Provided Compact RIO:

After the fire we had in our building, they provided a new Compact RIO for Areion. The Compact RIO is used as ECU in the car.

Provided support:

When problems were encountered, they provided the necessary support and help.

Compact RIO in Areion

AD conversion:

Throttle pedal (2x)

Brake pedal

Can:

Communication with sensor modules in the car

Communication with motordrive

Digital IO:

Extra control signals used while testing



Compact RIO in Areion

2 VI's

FPGA for the CAN messages

Real Time for control of the car

Control of HV

Contactor control and pre-charge

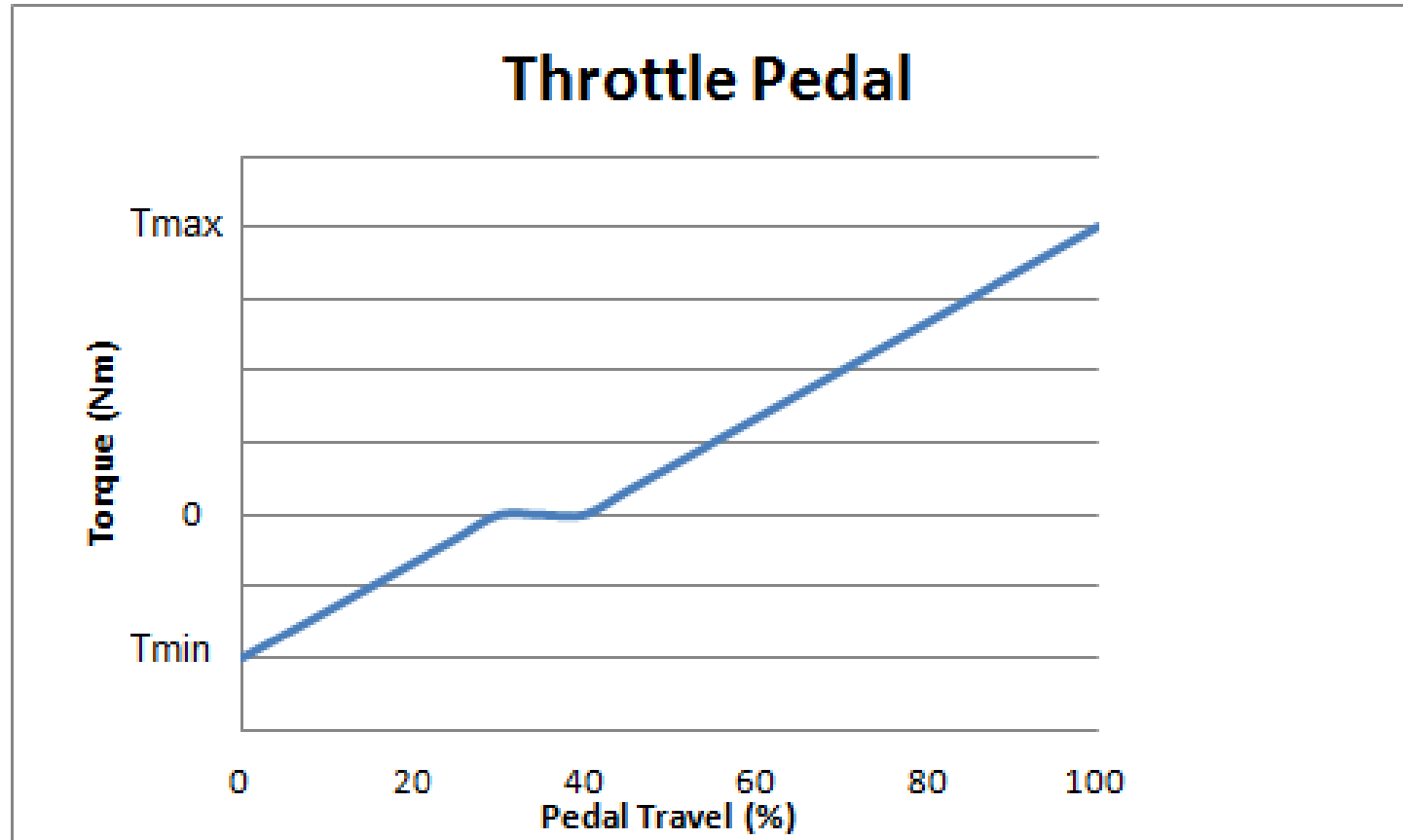
Torque encoding:

Power limit for forward operation

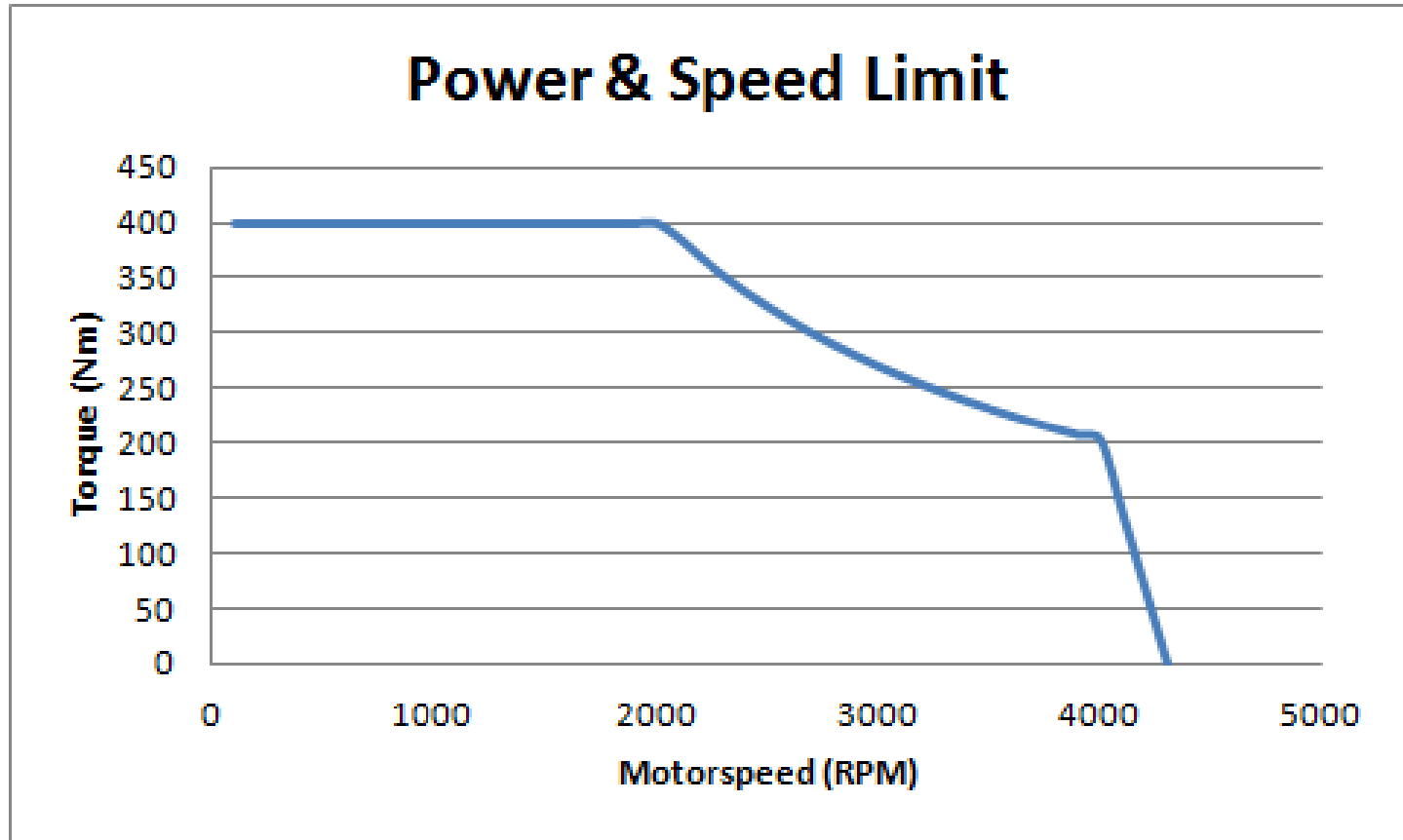
Speed limit

Control of regenerative braking

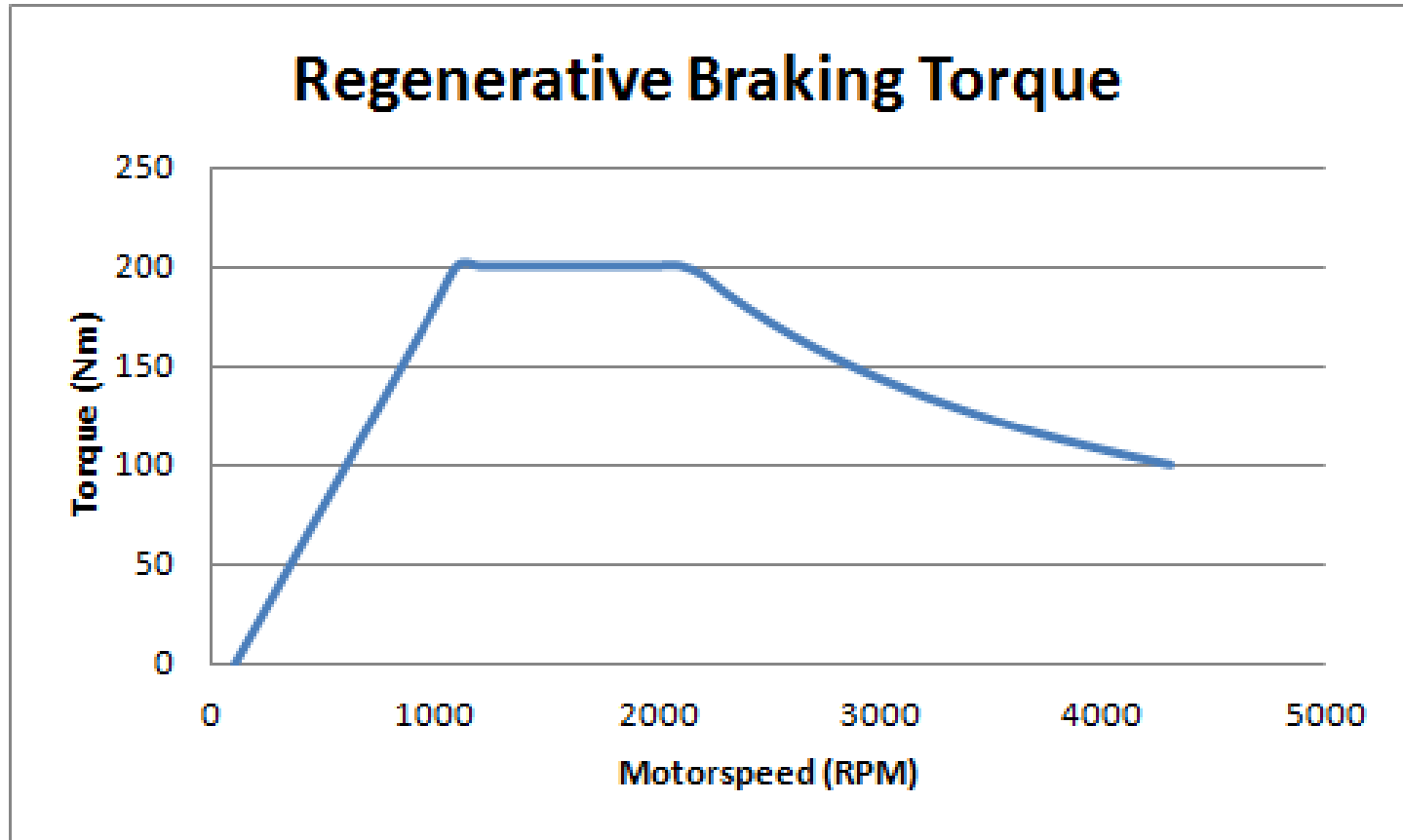
Torque encoding



Power and speed limit



Regenerative braking







Vragen ?