

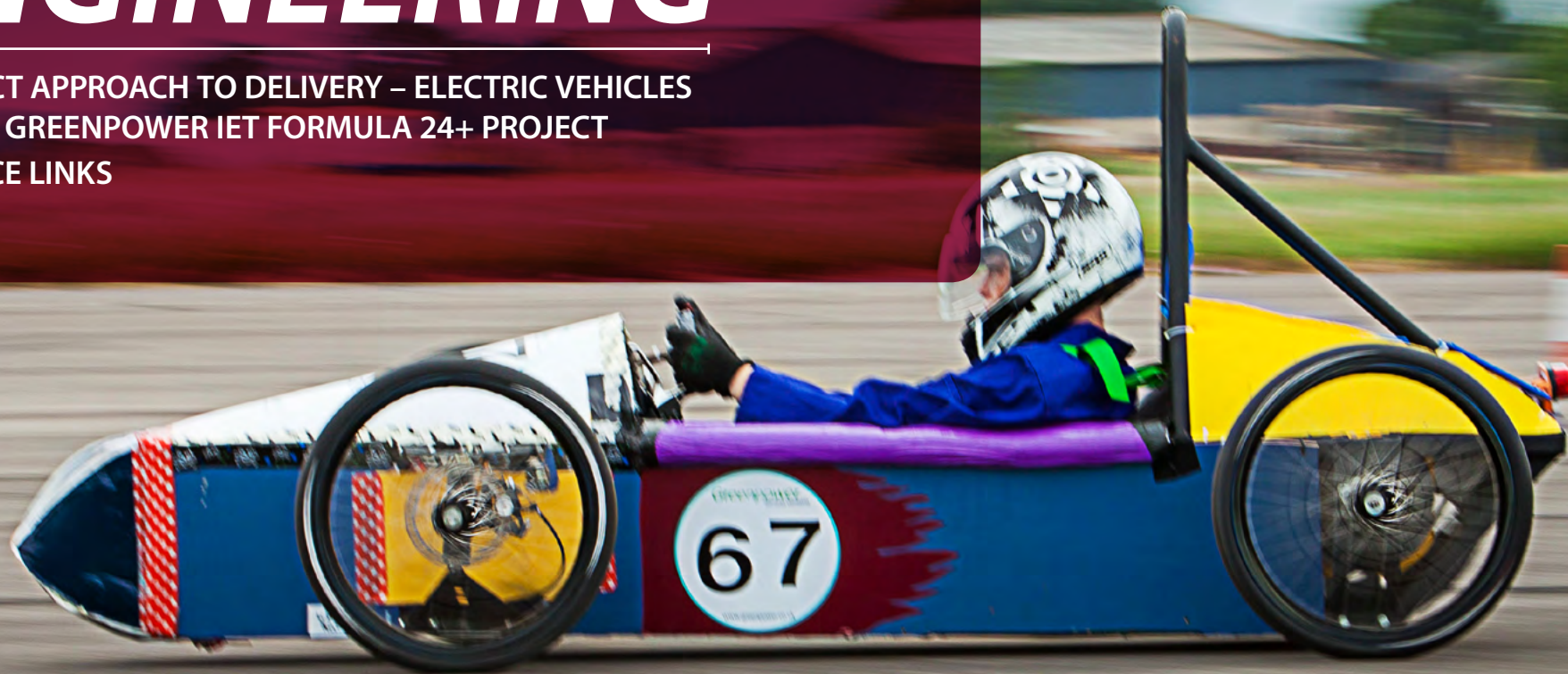
Cambridge TECHNICALS LEVEL 3

ENGINEERING



A PROJECT APPROACH TO DELIVERY – ELECTRIC VEHICLES
AND THE GREENPOWER IET FORMULA 24+ PROJECT
RESOURCE LINKS

Version 1



INTRODUCTION

Resources Link is an e-resource, provided by OCR, for teachers of Cambridge Technicals in Engineering. It provides descriptions of, and links to, a variety of teaching and learning resources that you may find helpful.

Where appropriate, we have mapped these resources to this OCR unit and Learning Outcomes (LOs), and provided information about their cost and format.

If you know of other resources you would like to see included here, or discover broken links, please let us know. We would also like to hear from you if you have any feedback about your use of these, or other, OCR resources. Please contact us at resources.feedback@ocr.org.uk

To find out more about this qualification please go to: <http://www.ocr.org.uk/qualifications/cambridge-technicals-engineering-level-3-certificate-extended-certificate-foundation-diploma-diploma-05822-05825/>

TYPES OF RESOURCE

OCR Produced Resources

These are resources devised and produced directly by the Resources Development Team at OCR.

Publisher Partner Resources

For many subjects OCR works with a publisher partner to ensure that good quality resources such as textbooks are available for first teaching.

Whilst the publisher partner has access to our subject experts and we quality check and endorse these resources they are produced by, and remain the property of, the publisher partner. There is no financial link between OCR and its publisher partners and we do not pay for the development of, or receive any royalties from, these resources.

Endorsed Resources

These resources were produced entirely independently of OCR, but we have quality checked them for their suitability as a resource to support our qualifications.

Other Resources

Unless specifically stated these resources are completely independently produced and are not endorsed by OCR. We have looked at them though, and we think they could be useful in supporting our specifications.

We leave it to you, as a professional educator, to decide if any of these resources are right for you and your students, and how best to use them.

LINKS

Greenpower website

Official website for Greenpower. Contains full details of the Greenpower project including regulations, technical details and a forum.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.greenpower.co.uk/>

Greenpower [Facebook page]

Greenpower Facebook page.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free (needs Facebook account to interact)

Format: Web page

<https://www.facebook.com/GreenpowerRacing>

Siemens Greenpower website

Siemens Greenpower web page. Includes links to Greenpower website and videos.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

http://www.siemens.co.uk/en/about_us/index/sponsorship/greenpower.htm

Official Greenpower YouTube channel

YouTube channel – includes videos of Greenpower electric cars.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<https://www.youtube.com/user/OfficialGreenpower>

Framco Motor Datasheet

Framco DC motor datasheet – for motor specified for Greenpower project (please check regulations for current motor). Website also includes details of how to interpret diagram.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Online PDF

<http://www.greenpower.co.uk/sites/default/files/GreenpowerF24PerformanceGraph%5B1%5D.pdf>

Battery Datasheet (for Greenpower project)

Datasheet for battery suitable for the Greenpower project (please check current regulations for specified battery).

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Online PDF

<http://www.yuasa.co.uk/batteries/industrial/rec-vrla-cyclic-use/rec36-12-rec36-12.html>

CTEK battery chargers

Commercial website with battery chargers suitable for the Greenpower project.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.ctek.com/gb/en>

Battery Charger

Selection of simple battery charger circuit with diode rectifier, smoothing capacitors and 3-terminal regulator. Also include circuit protection.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.eleccircuit.com/the-most-lead-acid-battery-charger-circuit-by-lm317/>

Circuit Diagrams

Website with details of many different circuit diagrams.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.circuitdiagram.org/lead-acid-battery-charger-circuit.html>

GpSpeed Motor Speed Controller

MOSFET speed controller for use in the Greenpower car. Includes technical details of kit that can be purchase, and circuit diagrams.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.greenpower.beamweb.co.uk/groups/electronics/GpSpeed/index.html>

4QD speed controllers

Website with details of batteries, motors and speed controllers for the Greenpower car. Also includes details of how to evaluate system performance.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.4qd.co.uk/evs/greenpower.html>

4QD-TEC speed controller

Details of a speed controller for use in the Greenpower car.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.4qdtype.com/pwm-01.html>

Measuring EMC (radiated)

Discussion of how to measure EMC (radiated) using a simple AM radio.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://electronics.stackexchange.com/questions/21097/simple-radiated-emc-measurement>

Speed Monitor Circuit

Selection of speed monitoring and display circuits. Includes ideas for sensors to measure speed.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

http://www.brightengineering.com/diy-electronics-devices/123919-bicycle-speed-indicator-circuit-explained/#imgn_0

Speed Monitor Circuit

Selection of speed monitoring and display circuits and circuit design ideas. Includes ideas for sensors to measure speed.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://homemadecircuitsandschematics.blogspot.co.uk/2013/12/simple-accurate-speedometer-circuit.html>

Daily Mail article – electric cars must make artificial engine sounds

An article highlighting EU rules for all new electric cars to make artificial engine sound.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.dailymail.co.uk/news/article-2595451/Silent-deadly-EU-rules-electric-cars-make-artificial-engine-noise-fears-kill-unsuspecting-pedestrians.html>

Car engine sound generator circuit

Circuit ideas for a sound generator circuit including circuit diagram containing audio amplifier

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://www.talkingelectronics.com/projects/DieselSound/DieselSound-1.html>

Car reversing sound circuit

Car reversing sound circuit and indicator.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Web page

<http://circuits-projects.blogspot.co.uk/2012/08/car-reversing-horn-with-flasher.html>

Bosch – systems for electric cars

Bosch design and manufacture electrical and electronic systems for cars – including electric cars. Website contains many examples and case studies.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Website

http://www.bosch.com/en/com/innovation/insidebosch/powertrains_of_tomorrow/electrical_powertrains_of_tomorrow/electrical_powertrains_of_tomorrow.html#

Siemens – systems for electric vehicles

Contains details of Siemens systems for electric vehicles. Includes videos.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Website

<http://w3.siemens.com/powerdistribution/global/EN/lv/green-applications/electromobility/Pages/electromobility.aspx>

Texas Instruments – embedded systems for electric vehicles

PDF document outlining Texas Instruments embedded systems for electric vehicles. Texas Instruments general website also contains further useful information.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Online PDF

http://www.ti.com/lit/ml/szza058c/szza058c.pdf?DCMP=Automotive_in&HQS=hybrid-in

Electronics in Cars

Interesting article discussing the increase in the incorporation of electronics and embedded systems into cars. Includes systems for electric, hybrid and combustion vehicles.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Website

http://electronicsforu.com/newelectronics/circuitarchives/view_article.asp?sno=840&title%20=%20Electronics+in+Cars&id=11280&article_type=8&b_type=new

Smart materials in cars – the 2014 Corvette

News article about the use of electrically-heated Shape Memory Alloy (SMA) in the 2014 Corvette to assist with closing of the boot lid.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Website

<http://www.gizmag.com/smart-material-2014-corvette/26249/>

Smartforvision

A concept car that includes a range of smart and modern materials.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Website

<http://smartforvision.basf.com/>

Siemens – Solid Edge CAD software for students

Solid Edge Student Edition is available to students of all ages in full- or part-time education and provides a perpetual student license.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Website

<http://www.siemens.com/plm/solid-edge-student>

Siemens – Solid Edge CAD software for secondary schools and UTCs

Solid Edge High School Edition is available for all secondary schools and UTCs and provides a perpetual site license which allows the school to install and use Solid Edge on as many computers as required.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Website

<http://www.siemens.com/plm/solid-edge-highschool>

Siemens – Solid Edge Greenpower related content

Siemens has developed a range of material including fully detailed Solid Edge models of the Greenpower Formula 24 kit car and Greenpower focused project tutorials.

Supports: A Project Approach to Delivery – Electric Vehicles and the Greenpower IET Formula 24+ Project

Cost: Free

Format: Website

<http://www.siemens.com/plm/academic/greenpower>



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Vocational qualifications

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