

2019 SCHOOL'S HANDBOOK

PART A: NEED TO KNOW

ENERGY BREAKTHROUGH

20-24 NOVEMBER 2019 | MARYBOROUGH, VICTORIA

POWERED BY IMAGINATION

THE PREMIER SCIENCE, TECHNOLOGY, ENGINEERING AND MATHS, ACTIVE LEARNING PROGRAM

A PARTNERSHIP BETWEEN



eb.org.au

PROGRAM PARTNERS



MAJOR SPONSORS



Education
and Training



SUPPORTING SPONSORS



ENERGY BREAKTHROUGH HALL OF FAME

Judy Parker

Inducted 2018

Bruce Reiffel

Inducted 2018

Bob Osborne OAM

Inducted 2017

Ian Rogerson

Inducted 2018

Norm Rasmussen

Inducted 2014

Tricia Walsh

Inducted 2018

ENQUIRIES & ADMINISTRATION

Martin Mark & Alisha Chadwick
Central Goldfields Shire Council

Ph: (03) 5461 0610

Energy Breakthrough

PO Box 194

Maryborough, Victoria, 3465

enquiries@eb.org.au

VISITOR INFORMATION, TOURISM AND ACCOMMODATION

Central Goldfields Visitor Information Centre

Phone: 1800 356 511

Email: visitorinfo@cgoldshire.vic.gov.au

Website: www.visitmaryborough.com.au

ONLINE

Website: www.eb.org.au

Facebook: www.facebook.com/ebmaryborough

Twitter: www.twitter.com/ebmaryborough

Instagram: www.instagram.com/ebmaryborough

YouTube: www.youtube.com/energybreakthrough

ENERGY BREAKTHROUGH 2019 SCHOOL'S HANDBOOK

NOTE: All changes and additions to rules and specifications for 2019 have been underlined in blue throughout this Handbook.

Contents

Part A:

1. About the Energy Breakthrough

1.1. [Program Overview](#)

1.2. [Aims](#)

2. Entries

2.1. [Categories](#)

2.2. [Classes](#)

2.3. [Categories, Classes and Quotas](#)

2.4. [Entry Process](#)

2.5. [Entry Fees](#)

2.6. [Entry Payment Details and Refunds](#)

2.7. [Entry Open and Closing Dates](#)

2.8. [Safety and insurance](#)

3. Prepare

3.1. [Curriculum Integration & Online Resources](#)

3.2. [Additional Programs](#)

3.3. [Rider Training](#)

3.4. [School Team Sponsorship](#)

4. The Event

4.1. [Dates and Location](#)

4.2. [Check-in](#)

4.3. [Accommodation and Camping Information](#)

4.4. [Energy Expo](#)

Part B:

1. Proposed Schedules

2. Specifications for Categories

3. Trial Regulations

4. Event Site Map

1. ABOUT THE ENERGY BREAKTHROUGH



*"I drive a Porsche 928. Enjoy it tremendously.
But I can see huge changes coming, with growing awareness of social and
environmental responsibilities. We can't keep on having inefficient cars.
I don't believe the world can go on consuming fuel recklessly. Wasting fuel.
Not just because of diminishing reserves but what it is doing to the planet.
Spewing out pollution.
Vehicles have to be far more sensible in payload, much lighter,
retain passenger comfort because you do need that, and be much safer.
It needs another breakthrough ..."*

~ Ralph Sarich, Wheels Magazine, February 1991

1.1 Program Overview

The Energy Breakthrough is a joint initiative of the Country Education Project (CEP) and the Central Goldfields Shire Council (CGSC).

The Energy Breakthrough provides opportunities for students, teachers, parents and local industry to work together to design and construct a vehicle, a machine or innovation in technology that will represent an 'energy breakthrough'.

The program encourages participants to examine and use the latest technology while considering its impact on the environment and the way people live locally and globally.

The Energy Breakthrough isn't just a once-a-year event.

School groups work throughout the year to design, build and test vehicles or machines within detailed specifications. It requires a team effort and an across-the-curriculum approach. These groups then bring their vehicles and machines to Maryborough in the Central Goldfields Shire, Victoria for a huge celebration in which they can demonstrate and trial them in action.

The 2019 Energy Breakthrough will be held from **Wednesday 20 November to Sunday 24 November, 2019** at the Lake Victoria Precinct in Maryborough, Victoria.

1.2 Program Elements

There are three program elements unique to the Energy Breakthrough:

Display & Presentation, sponsored by La Trobe University

A 20 minute presentation to judges for team members to demonstrate their knowledge and understanding of their entry.

This represents 25% of a team's score.

Design & Construction

An informal conversation assessing the student's understanding of the vehicle and the concepts involved in its design and construction.

This represents 25% of a team's score.

Trials

Thousands of students ranging in age from nine to 19 push, pedal and pilot carts, human powered vehicles and energy efficient vehicles in dynamic tests that can last just a few minutes or as long as 24 hours.

This represents 50% of a team's score.

"Each year we get to watch kids surprise us in what they achieve in terms of fitness, self confidence and drive. We quite often see couch-potatoes develop in to active and engaged kids waiting to improve and be involved.

Without fail the Energy Breakthrough changes kids for the better every year."

~ Roger Byron, White Hills PS, Team Manager, 2013

1.3 Aims

The Program aims to ...

- Provide an excellent technology project for students from Prep to VCE level
- Encourage young people to explore solutions to environmental and transport issues
- Provide an opportunity for schools and communities to work and learn together
- Provide an opportunity for women and girls to participate in what has traditionally been a 'male' dominated area of the curriculum
- Be a fun program with real world challenges
- Offer students opportunities to explore and address vehicle design, driving skills and vehicle and passenger safety issues.

The Energy Breakthrough encourages and supports learning that ...

- Is fun and engaging.
- Is student focused.
- Involves hands-on activities
- Requires active problem solving – on 'real life' issues (authentic).
- Is collaborative – builds teamwork skills.

- Creates links with the community.
- Requires students to act on their learning.
- Involves celebration.
- Values and requires different skills, knowledge, (inter-disciplinary).

1.4 Child Safety

The Energy Breakthrough is committed to the care, safety and wellbeing of all children and young people attending our event. We work in partnership with schools to keep participants safe from harm, including all forms of abuse in our environment, on site and online.

Our practices take into account relevant legislative requirements within the state of Victoria, including the specific requirements of the Victorian Child Safe Standards as set out in Ministerial Order No. 870.

Link to Central Goldfields Shire Council's Child Safe Policy

<https://www.centralgoldfields.vic.gov.au/Council/Policies-Plans-Strategies-and-Documents/Council-Policies>

1.5 Timeline of Key Events

February:	Schools' Handbook Released
March:	Entries open online.
June:	Entries close.
October:	School camping details to be submitted online.
Early November:	Team Name, Rider Details to be submitted online.
Early November:	Schools' Info Kit Released (Event details and schedules).
November:	The Event in Maryborough!
December:	Feedback and Evaluation.

2. ENTRIES

2.1 Categories

The Energy Breakthrough has five separate categories designed to cater for different levels of technology application and understanding:

1. Innovations in Technology
2. Pushcarts
3. Try-athlon
4. Human Powered Vehicles (HPV)
5. Energy Efficient Vehicles (EEV)

2.2 Classes

Within the five categories, teams are entered into classes based upon the participating students' school year level, gender and school size. Each category

offers a different mix of classes for schools to participate in, please refer to the relevant Category in Section 2.5 for more detail.

The classification for schools entering the A1 and A2 classes will include the TOTAL school enrolment, not the Primary component of a school. This classification will be made by the organisers using information published on each school's website and the MySchools website.

CLASS	YEAR LEVEL	TEAM SIZE	GENDER REQUIREMENTS	SCHOOL SIZE
A	Years 1 - 6	Min 4 – Max 10	At least 50% female.	N/a
A1	Years 1 - 6	Min 6 – Max 10	At least 50% female.	Schools with an enrolment of 200 or less
A2	Years 1 - 6	Min 6 – Max 10	At least 50% female.	Schools with an enrolment of more than 200.
B	Years 7 – 10	Min 6 – Max 8	At least 50% female.	N/a
B1	Years 7 - 8	Min 6 – Max 8	At least 50% female.	N/a
B2	Years 7 - 10	Min 6 – Max 8	At least 50% female.	N/a
C	Years 7 - 12	Min 6 – Max 8	At least 50% female.	N/a
All Female	Years 7 - 12	Min 6 – Max 8	Female only	N/a
Open	Up to Year 12	Min 6 – Max 8	No gender requirements.	N/a

2.3 Team composition

- All entries are to be team entries and must consist of current school students (Young people enrolled in a school or young people enrolled in a secondary school certificate/program and under 20 years of age as at 31 December).
- Team members do not have to all come from the same school. They could be part of a scout, church, or other community group, however they must all be current school students and be covered by the group's insurance. Where non-school teams have riders from other schools participating in Energy Breakthrough, they must have written approval from the Principal of the school.
- Team composition and classes for each category varies. Please refer to the relevant category for more detail.

2.4 Category caps, changes and waitlists:

- A maximum of three entries per school will be accepted in any category, except Innovations in Technology, which has no limit. Multi-campus schools may apply to organisers for special consideration on this quota.

- Additional entries from a school will be placed on a waiting list and will be notified if accepted into the event.
- Teams registered in the HPV B or C classes who request a transfer to the HPV Open class will incur a 50 lap penalty in the trial.
- Teams registered in the Try-athlon A or B/C class who request a transfer to the Try-athlon Open class will incur a 15 lap penalty in the endurance trial.
- Only one entry per school will be accepted in the HPV Open and Try-athlon Open classes.
- Schools that have an existing entry in the HPV Open or Try-athlon Open classes will not be able to enter additional teams into this class.
- Schools who won their class overall in the event previous, will be entitled to a guaranteed place for the following year. Team Managers will receive an email to advise of the process. If the team accepts the entry an invoice will be issued. If the overall winner for 2018 of a class does not want their automatic entry, this WILL NOT pass onto the second placed team.
- Correspondence regarding the status of entries on a waiting list will be made directly to a Team Manager only.

2.5 Categories, Classes and Quotas

CATEGORY	CLASS	QUOTA	QUOT A
HPV Primary	HPV A1	20	90
	HPV A2	65	
	New Schools	5	
HPV Secondary	HPV All Female	10	102
	HPV B1	15	
	HPV B2	30	
	HPV C	20	
	HPV Open	22	
	New Schools & Maryborough Tech Challenge (Qld)	5	
HPV Try-athlon	Try A	<u>30</u>	<u>70</u>
	Try B/C	<u>15</u>	
	All Female	10	
	Try Open	15	
Energy Efficient Vehicles (EEVs)	Hybrid 1 B/C: Pedal power, plus one other power source.	10	30
	Hybrid 1 Open: Pedal power, plus one other power source	10	
	Hybrid 2 Open: Two power sources, excluding pedal.	5	

	Single Power Source B/C/Open (Electric-only)	5	
Pushcarts	PC A1	25	80
	PC A2	55	
Innovations In Technology	Crafty Design A Crafty Design B/C	30	42
	Junkyard Challenge A Junkyard Challenge B	12	

2.6 Entry Process

Entries will only be received through the online EB Team Managers Portal via the Energy Breakthrough website: www.eb.org.au

- New Team Managers are advised to sign-up to our online EB Team Managers Portal at any time.
- Existing Team Managers are encouraged to sign-in again before entries open to ensure they remember their username and password and that their contact details are correct.

2.7 Entry Fees

- \$ 40** each Innovations in Technology entry.
- \$ 360** each Pushcart entry.
- \$ 590** each Human Powered Vehicle (HPV) entry.
- \$ 590** each Energy Efficient Vehicle (EEV) entry.
- \$ 590** each Try-athlon entry.

2.8 Entry Payment Details and Refunds

- All entry fees are GST inclusive.
- Entry fees include access to on-site facilities, activities, entertainment, planning and administrative expenses.
- Entries are filled on a first come, first served basis.
- Only online entries are accepted.
- Payment must be received with 14 days from date of invoice.
- A team's entry in the event will not be confirmed until payment is received.
- Invoices can be paid by Electronic Funds Transfer (EFT) or Cheque. Details for payment are included on the Invoice.
- Team Managers will be notified by email when a payment has been processed.
- If, after 14 days, payment has not been received, the team's entry will be dropped onto the 'Waiting List'.
- No refunds except for teams who are on a waiting list and are not offered a place.

2.9 Entry Open and Closing Dates

Entries are only accepted via our online EB Team Managers Portal.

Team Managers are reminded to register and/or check log on details **BEFORE** the entry opening times.

CATEGORY	ENTRIES OPEN
Primary HPV's	8am Wednesday March 27, 2019
Secondary HPV's	8am Thursday March 28, 2019
All <ul style="list-style-type: none">Innovations in TechnologyPushcartsEEV'sTry-athlon	8am Friday March 29, 2019

[Entries close at 5pm on Friday 28 June 2019. \(Last day Term 2, Victoria\)](#)

2.10 Safety and insurance

- Team Managers must ensure they fulfil all Education Department requirements (including insurance), as you would for all school excursions. This includes the completion of Working with Children Checks and, or police checks of **ALL** attending parents and volunteers, as per the requirements of the Working with Children Act.

Excursion staff

Excursion staff must be approved by the principal or school council (as outlined in Excursions - [Planning and Approvals](#)) and may include:

- teachers employed by the Department or school council
- other adults on a volunteer or paid basis such as:
- parents or carers
- education support class officers
- community members
- trainee teachers
- campsite staff
- specialist instructors for excursion activities.

Important: school students cannot be used as excursion staff.

Excursion staff who will provide supervision of students and who are not registered teachers must have a Working with Children check.

(<https://www.education.vic.gov.au/school/principals/spag/safety/Pages/staffing.aspx>)

- Non-school entries must ensure that all adults attending the Energy Breakthrough with their team/s have current Working with Children Checks and, or Police checks completed prior to the event.
- While every precaution is taken to make the event as safe as possible (including vehicle checks, first-aid facilities and on-going safety checks), no responsibility can be taken for teams.

3. PREPARE

3.1 Curriculum integration & online resources

The Energy Breakthrough is an **education** event that encourages *‘learning by doing’* and focuses on **science, technology** and the **environment**.

“Through the RACV Energy Breakthrough, students were given responsibility for their own learning, teachers broke away from the conventional classroom practice and found that it worked, parents were more closely involved in the educational development of their child and community members contributed time, expertise, goods and money.”

~ Deakin University, *RACV Energy Breakthrough Evaluation - 1997*

Schools undertake the Energy Breakthrough in a variety of ways, ranging from an out of school activity to the program being a central part of the formal curriculum. In whatever way the program is undertaken it can contribute to students’ learning in a wide range of areas.

Schools have identified the following curriculum links: technology studies, science, English, arts, environmental science, maths, accounting, computer studies and health and physical education.

3.2 School Team Sponsorship

Individual entries are encouraged to negotiate sponsorship with local businesses or service groups. Such support must be consistent with the health and welfare of young people and the overall objectives of the Energy Breakthrough. As a school-based, education event, entrants are prohibited from advertising products or services not suitable for young people, including but not limited to alcohol and gambling.

There are enormous promotional opportunities for sponsors of teams and the event itself.

Entrants should ensure that sponsors receive a good return for their investment. This includes maintaining a good relationship with sponsors, generating media coverage and reporting back to the sponsors on what their funds have enabled.

If you have any doubts about the suitability of a sponsor, please [contact us](#).

4. THE EVENT



4.1 Dates and Location

The 2019 Energy Breakthrough will be held from **Wednesday 20 November to Sunday 25 November, 2019** at the Lake Victoria Precinct in Maryborough, Victoria.

4.2 Check-in: Administration Centre

After arriving in Maryborough and setting up camp, Team Managers and their students should report to the Administration Centre for “Check-in”, as soon as possible. The Admin Centre is located in the Maryborough Lawn Tennis Club building inside Track 1. The Admin Centre will be the main point of contact with event organisers for team managers throughout the event. Please refer to the Schools Information Kit available in early November for Admin Centre opening times.

Check-in will involve:

- A welcome and update on the event,
- Confirmation of team details: team member names, support crew, team names, etc.
- Allocation of Team Manager Identification,
- Issuing of team number stickers and transponders (if applicable),
- Confirmation of Display & Presentation, Design & Construction and Scrutineering times, and
- An Emergency Procedures Briefing.

4.3 Team Member Identification

After check-in, Team Managers and all members of the team will then report to the marquee in front of the Administration Centre for registration of individual team members.

Coloured wrist bands are issued to identify team members participating in the event and must be worn at all times. Team Managers and support crew who are camping on site must wear a white wrist band at all times to assist us in managing the camping grounds.

5. ACCOMMODATION & CAMPING



5.1 Camping Areas

There are five camping areas within the event site. Please refer to the Event Map for locations. These camping areas are spread throughout the precinct on grassed areas.

Camping Area	Group
Princes Park Oval	Primary Schools only
Jubilee Oval (inside Track 1)	Secondary Schools only
Soccer Field (inside VicRoads Track)	Secondary and Primary Schools
Maryborough Caravan Park	Primary Schools (<i>by prior arrangement please refer to 5.3</i>).
EEV Campsite (inside Track 1)	EEV Teams only
Off-Site	By own arrangements.

Team Managers will be required to login to the online EB Team Managers Portal to complete your school's camping details by mid-October.

On the camping form you will select the camping area in which you prefer to camp.

Upon arrival to the event site please proceed to your preferred camping area and a camping coordinator will direct you to your site.

5.2 Facilities

Schools will need to provide:

- Your camping equipment (tents, sleeping, non-electrical cooking facilities)
- Your food
- Electrical leads with compliant labels
- Campsite lighting.

Facilities provided include:

- Toilets
- Showers
- Water
- Power (for lighting only).

5.3 Camping conditions

- You will be allocated a camping area by the event organisers and you will be directed to your campsite by a Camping Coordinator upon arrival.
- Camp sites should be set up as soon as possible after arrival.
- The Energy Breakthrough is an alcohol-free event.
- No parking is allowed on the ovals. Temporary access is provided for unloading and loading only.
- **Schools must not use very long tent pegs over 30 cm**, especially those used for hire marquees, or star pickets, on any of the camping grounds.
- Hired marquees MUST be removed from all camping sites by 5pm on the Sunday of the event. Non-removal will attract a removal fee charged to the school. Hired marquees MUST use weights to be secured (no pegs).
- Campers must position cooking devices on the outside perimeter fence of Princes Park Oval. In all instances please ensure fat drip trays and protective sheeting is positioned underneath cooking devices to prevent heat and hot fat damage to camping surfaces on all camp grounds.
- **Electricity is available for lighting only.** Campers are required to bring gas fired cooking equipment. Schools must ensure that gas equipment and cylinders meet Australian Standards.
- **All electrical leads must to be ‘test and tagged’.** A licensed electrician will be on-site at the Princes Park Grandstand to ‘test ‘n’ tag’ leads.
- Power for camp sites will be organised to prevent vehicles driving over and minimise people walking over power leads. Distance from power outlets to camp sites will also be minimised. Longer power leads are encouraged rather than a number of smaller leads joined together.
- Power leads must be run along the ground and from the bottom of the power poles and outlet points.
- Mobile cool rooms will NOT be permitted onsite without prior written approval. Consideration will be given if the use of the cool room will be shared by up to five schools or a significant number of people (eg. 120+ people). All mobile cool rooms will be parked at the direction of event organisers. This guideline is based on advice from our environmental auditors.
- Caravans, camper trailers or campervans (“wheeled sleeping vehicles”) will NOT be permitted at the Energy Breakthrough. Schools that prefer to bring caravans or camper vans will need to make arrangements through the Maryborough Harness Racing Club.

Contact: Maryborough Harness Racing Club
Ph: 03 5464 2451
Mobile 0418 552 294
Email maryharn@bigpond.com

5.3.3 Maryborough Caravan Park

Primary Schools wishing to camp in the Maryborough Caravan Park must make their own booking arrangements. Only 10 students and two adults per team, for three

nights, will be covered by your team's Energy Breakthrough entry fee. Additional campers and nights must be paid directly to the Maryborough Caravan Park.

Contact: Maryborough Caravan Park

Ph: 03 5460 4848

W: <http://www.maryboroughcaravanpark.com.au/>

Please consider the needs of other campers by ensuring that:

- there is adequate supervision of team members within the camping area,
- your camping area is a quiet area at all times, and
- you leave your camp site clean when you depart.

5.4 Sunday night post-event

Teams are welcome to stay overnight on the Sunday after the event to ensure a safe journey home on the Monday. Please contact us for more information.

5.5 Visiting friends and relatives

Friends and relatives are encouraged to contact the Central Goldfields Visitor Information Centre on 1800 356 511 or www.visitmaryborough.com.au for off-site accommodation options.

6.0 ENERGY EXPO



The Energy Expo operates all day Friday and Saturday and includes displays of commercial applications of new technology and energy efficient systems.

You probably won't have time to visit yourself, but it's definitely worth encouraging your support crews, parents, friends and relatives of your team to visit.

Organisations and companies interested in exhibiting should contact the Energy Breakthrough office in Maryborough for more information.

More details available at: <http://www.eb.org.au/expo>

Special Awards

Energy Breakthrough Safety Award

Energy Breakthrough is committed to safety and It Is a priority in everything we do.

This Award recognises a team that has met all the safety requirements in their design and construction processes and therefore presented a vehicle that protects their riders or other participants.

M.R. Recumbents Encouragement Award

M.R. Recumbents (and before them Greenspeed) have been supporting a school each year that overcomes a great deal of adversity in the lead up to, and during, the Energy Breakthrough.

This Award recognises a school that has overcome significant challenges to participate in the Energy Breakthrough.

Tricia Walsh Encouragement Award

A passionate and active member of Maryborough community, Tricia Walsh was a driving force in leading the Innovations In Technology category and a volunteer across various roles for over 15 years before she sadly passed away in 2012.

Tricia had wonderful networks in Maryborough and across the region throughout education, adult and further education, arts and local businesses. She played a significant role in publicity and promotion of the event and took every opportunity to acknowledge the outstanding work of students, teachers and parents.

This is an Encouragement Award – as Tricia believed the event wasn't about winning – she preferred to encourage participation.

Judy Parker Award for the Best First Year School

Judy Parker was part of the Country Education Partnership when the Energy Breakthrough was conceived way back in 1990. She was passionate about engaging new and rural schools into the project.

This Award recognises the best performing first year school across all primary and secondary categories.

Austin7 Club Innovation Award

The Austin7 Club are dedicated to encouraging the next generation and supporting innovative vehicle design.

This Award recognises a team which has created an outstanding innovation in the HPV or EEV categories.

Bruce Reiffel Award for the Best Small Primary School

Bruce Reiffel was a local teacher at Maryborough Education Centre who dedicated himself to encouraging and supporting small schools enter the program. He was a tireless worker, always helping young people to build better vehicles, prepare themselves for the event and was always willing to help the smaller schools. He understood education and he understood the 'Breakthrough'. Bruce Reiffel sadly passed away in 2005.

This Award recognises the best performing HPV team from a primary school with an enrolment of less than 200 students.

Ian Rogerson Award for the Best Display & Presentation

Ian 'Rogo' Rogerson was a lifelong educator and the first Coordinator of the Display & Presentation section of the Event.

This Award recognises the schools with the highest Display & Presentation scores across all primary and secondary categories.

McCulloch's Engineering Prize for School-Based-Built Vehicles

The McCulloch's Engineering Prize aims to encourage and reward school-based design and construction. Use of commercially or professionally designed vehicles is not allowed in this Award which is open to students in Year 7 to Year 12 entered in the HPV and EEV categories.

This Award recognises a team who has built the majority of their vehicle at school and completed at least 500km during the 24 hour trial. Teams will be invited to self-nominate themselves for consideration for this Award during Design & Construction assessment.



CIRCUIT LENGTHS

TRACK 1 - 1.58 km

VICROADS - 1.11 km

KEY

Toilets

Showers

Camping Area

First Aid

Food & Refreshments

Assembly Point

Marshall Point & Number

Track Direction

Wrist Banding Station

Stage #1

VicRoads Stage

Road Closure

Repair Station

Recharge Station

Parking Area

On-site Supermarket

Wrist Banding Station

Stage #1

VicRoads Stage

Road Closure

Repair Station

Recharge Station

Parking Area

On-site Supermarket

Wrist Banding Station

Stage #1

VicRoads Stage

Road Closure

Repair Station

Recharge Station

Parking Area

On-site Supermarket

Wrist Banding Station

Stage #1

VicRoads Stage

Road Closure

Repair Station

Recharge Station

Parking Area

On-site Supermarket

Wrist Banding Station

Stage #1

VicRoads Stage

Road Closure

Repair Station

Recharge Station

Parking Area

On-site Supermarket

Wrist Banding Station

Stage #1

VicRoads Stage

Road Closure

Repair Station

Recharge Station

Parking Area

On-site Supermarket