

aussie
solar
challenge

2021 Regulations

These regulations are based on the Regulations of the 2021 Bridgestone World Solar Challenge, by The Government of South Australia. This work is licensed under CC BY 4.0.



Introduction and welcome

National solar car events in Australia are not new, however it has been a while!

While the bad news is that the Bridgestone World Solar Challenge has found it impossible to operate in the current climate of international travel restrictions, the good news is that our national solar car community has come together to celebrate all that we have achieved in recent years.

Even better, we have formalised our body as the Australian Solar Car Association Inc. These are early days, but we want you, the Aussie solar car community, to be part of it. In the short term, the best way of showing your support is by becoming a financial member! Your establishing committee have each put their \$50 on the table to kick start the process. So please show your support by contacting the secretariat at aussiesolarchallenge@gmail.com and help us grow. Personal and student memberships are available now, with corporate and sustaining memberships being developed.

Our initial event has been designed to get the minds working and the wheels turning. The event will be what we, together, make it. It is not a replacement for the BWSC, so the arrangements will be different, but the program will be stimulating and the venue accessible. Above all we want to have some fun in these difficult times.

A great deal of work has already been put into the arrangements, volunteers have stepped forward and there is always room for more!

Welcome to the inaugural Aussie Solar Challenge.

Table of contents

Introduction and welcome	2
Table of contents	3
1 Administration	6
1.1 Scope	6
1.2 Correspondence	6
1.3 Conduct of the event	6
1.4 Eligibility	6
1.5 Entrant obligation	7
1.6 Event organiser	7
1.7 Officials of the event	7
1.8 Jury	7
1.9 Judges of Fact	7
1.10 Schedule	8
1.11 Entering the event	8
1.12 Fees	9
1.13 Cancellation of the event	9
1.14 Insurance	9
1.15 Team members	9
1.16 Style guide	10
1.17 Sponsorship obligations	10
1.18 Media and promotional obligations	10
1.19 Remotely Piloted Aircraft (Drones)	11
1.20 Compulsory documentation	11
2 Solar car regulations	13
2.1 Compliance with World Solar Challenge regulations	13
2.2 Signage	13
2.3 Ballast	13

2.4 Safety	13
2.5 Egress	14
2.6 Cooling and hydration	14
2.7 Tyres	14
3 Event regulations	15
3.1 Supervision	15
3.2 Safety	15
3.3 Safety-belts	15
3.4 Helmets	16
3.6 Escort vehicles	16
3.7 Communication	17
3.8 Preparation and testing	17
3.9 Team registration and scrutineering	17
3.10 Static scrutineering	18
3.11 Dynamic scrutineering	19
3.12 Modifications or changes after scrutineering	20
3.13 Briefings	20
3.14 Endurance start line and grid	20
3.15 Energy collection and storage	20
3.16 Endurance timing	21
3.17 Solar car drivers and passengers	21
3.18 Driving conduct	21
3.19 Stopping	22
3.20 Control stops	22
3.21 Overnight stop	23
3.22 Penalties	23
3.23 Protests and appeals	23
4 Awards	25
4.1 Event challenges	25
4.2 Hot lap	25

4.3 Solarkhana	25
4.4 Endurance	25
4.5 Control stop	25
4.6 Consistency	26
4.7 Innovation	26
4.8 Bonus Points	26
4.9 Detailed Scoring	26
4.10 Awards	27

1 Administration

1.1 Scope

- 1.1.1 These regulations apply to the 2021 Aussie Solar Challenge (hereinafter called 'the event'), and comprise participants' eligibility, pre-event preparation, scrutineering, testing, circuit and on-road components and any associated activities published by the event organiser as being part of the event.
- 1.1.2 The event will be conducted under the regulations described in this document and any amendments, further regulations or team notices that may be issued.

1.2 Correspondence

- 1.2.2 Official correspondence must be conducted between the event organiser and the entrant's nominated representative (the Team Manager) as detailed by the entrant on the entry form. Contact the event organiser at aussiesolarchallenge@gmail.com.

1.3 Conduct of the event

- 1.3.1 The on-road component of the event will be conducted on public roads in Canberra. In addition to these event regulations, all activity is conducted under applicable traffic codes, civil laws and regulations.
- 1.3.2 Specific instructions contained in route notes will be considered part of the event regulations.
- 1.3.3 All activities undertaken by a registered entrant, including activities conducted prior to the commencement of the official event period, are governed by statutory regulations, breaches of which may incur event penalties.

1.4 Eligibility

- 1.4.1 The event is open to solar car teams who will be in Australia in October 2021 with a solar car that meets the technical regulations of the 2021 Bridgestone World Solar Challenge or any previous World Solar Challenge.
- 1.4.2 Solar cars must be powered by solar irradiance collected by the solar car. The energy storage system may be charged from external sources prior to the start of the endurance challenge, and after the endurance challenge.

It is accepted that energy from regenerative braking, road gradients and wind incident on the car while driving may also be used.

1.5 Entrant obligation

- 1.5.1 By applying, entrants declare that they know and understand the regulations of the event and agree that participation will constitute their full acceptance.
- 1.5.2 Each entrant will appoint an individual to act as the 'Team Manager'. The Team Manager will be responsible for regulatory compliance, the actions of team members, and any other individuals associated with the team. Once appointed, the Team Manager may only be replaced with the approval of the event organiser.
- 1.5.3 Entrants are expected to act fairly and in good faith in accordance with the regulations.
- 1.5.4 Penalties (which may include exclusion) will be applied to any team deemed to have departed from the spirit of the event by deliberately acting to gain an unfair advantage over others, or by conduct that could bring the event into disrepute.

1.6 Event organiser

- 1.6.1 The event is organised by the Australian Solar Car Association Inc.
- 1.6.2 Contact the event organiser at: aussiesolarchallenge@gmail.com

1.7 Officials of the event

- 1.7.1 The event will appoint officials who will be responsible for the conduct of the event.
- 1.7.2 During the event, these officials will wear white or red event shirts.

1.8 Jury

- 1.8.1 Disputes will be resolved by a jury comprising:
 - the team manager of each team
 - one or two people, not team members, appointed by the event organiser, to make an odd number of jurors.
- 1.8.2 The team of appointed jurors is the only authority empowered to determine the interpretation of these regulations.

1.9 Judges of Fact

- 1.9.1 Each official appointed by the event organiser is a Judge of Fact on any event-related activity.

1.10 Schedule

- 1.10.1 A detailed event schedule including all official functions, promotional activities and public engagement activities will be published on the event website and distributed to teams via a 'Team Notice'.

Monday 26 July 2021	Entry opens
Friday 3 September 2021	Entries close
Sunday 17 October 2021	Arrive at Wakefield Park Raceway Start of static scrutineering
Monday 18 October 2021	Static scrutineering continues Track testing
Tuesday 19 October 2021	Dynamic scrutineering Hot lap Solarkhana Innovation
Wednesday 20 October 2021	Endurance, Day 1
Thursday 21 October 2021	Endurance, Day 2 Most amazing car Most amazing team
Friday 22 October 2021	Trailer to Canberra Ceremonial drive around Canberra Awards Ceremony

1.11 Entering the event

Applications for entry are invited from any entrant prepared to meet the standards and obligations of the competition.

- 1.11.1 Applications may be made from the time these regulations are published, until noon Friday 3 September 2021, or such other time as the event organiser may determine.
- 1.11.2 Applications for entry must be made by filling out the entry form at aussiesolarchallenge.org.
- 1.11.3 The granting of a place in the event will become void if the entry fees have not been received by the due date.
- 1.11.4 The event organiser reserves the right to accept or reject any application without explanation.
- 1.11.5 Team name, Team Manager and solar car details will be taken from the entry form.
- 1.11.6 Requests to change entry details will only be considered when submitted by the Team Manager by email.

- 1.11.7 Once an entry has been accepted, any request to change entry details will be subject to the approval of the event organiser.

1.12 Fees

- 1.12.1 An entry fee, to be announced, will cover hire of facilities and basic insurance.
- 1.12.2 An on-road permit fee (estimated at \$130) will be payable to the relevant authority by the owner of each solar car in respect of compulsory third party bodily injury insurance required by operators of motor vehicles.

1.13 Cancellation of the event

- 1.13.1 The event organiser reserves the right to cancel or abandon the event for reasons beyond its reasonable control, including but not limited to acts of God, natural disasters, acts of war, weather, riots and strikes outside its organisation, communicable disease crisis and quarantine restrictions. If the event is cancelled, all fees that have not been committed will be returned to teams.
- 1.13.2 If a team is unable to attend due to COVID restrictions, all fees that have not been committed will be returned to the team.

1.14 Insurance

- 1.14.1 Details of insurance requirements will be confirmed at a later date. The cost of this coverage will be included as part of the entry fee.
- 1.14.2 The event organiser will facilitate compulsory third-party bodily injury insurance as required by operators of motor vehicles to operate the solar car on public roads, a fee for which may be payable by the owner of the vehicle.
- 1.14.3 Comprehensive insurance for personal effects, tools, equipment, solar cars and other vehicles is the responsibility of the entrant.

1.15 Team members

- 1.15.1 Each team must include (but not be limited to):
- a Team Manager
 - a safety officer, responsible for the safety of the team
 - a battery officer, responsible for the solar car battery
 - an interpreter if the Team Manager is not proficient in English
 - at least three and at most six solar car drivers

- at least two drivers for each support vehicle (solar car drivers should not drive support cars on the same day as driving the solar car)
 - at least one person with a recognised first aid certificate that is current for the duration of the event
 - passengers for Cruiser Class teams.
- 1.15.2 Each team member will be required to register and be physically present for team registration at the Wakefield Park Raceway on 17 October 2021.
- 1.15.3 A person holding the position of Team Manager, safety officer or battery officer may not hold any other of these roles.
- 1.15.4 The person holding the position of safety officer may not be a solar car driver.
- 1.15.5 Each solar car driver must hold an appropriate motor vehicle driver's licence valid for the total period of the event.
- 1.15.6 The event organiser is unable to take responsibility for any person under the age of 18.

An entrant may make a request for a minor to be included in their team provided such request is accompanied by a document giving permission and acknowledging that supervision of the person concerned is the responsibility of the Team Manager, not the event organiser. The document must be signed by both the parent or legal guardian of the proposed participant, and the Team Manager.

1.16 Style guide

- 1.16.1 The correct title of the event is the Aussie Solar Challenge. Entrants and their sponsors must use the correct title in all references to the event.
- 1.16.2 The official logo of the event will be available from the event organiser. The official logo will be supported by a style guide that details its conditions of use.

1.17 Sponsorship obligations

- 1.17.1 It is a condition of participation that the entrant acknowledges event and category sponsors in their own publicity. Failure to do so may result in the team being delisted from event publicity.

1.18 Media and promotional obligations

- 1.18.1 The event organiser will respect the Intellectual Property of the respective owners. Technical details of solar cars will be kept confidential until the start of static scrutineering and commercial in confidence requests and media embargos will be honoured.
- 1.18.3 Media supporting any team must comply with the event media requirements.

- 1.18.4 Entrants will be held accountable, through the application of event penalties, for the unacceptable actions of media representatives travelling with or in support of their team, whether registered as such or not.
- 1.18.5 Registered entrants who maintain an internet presence are required to provide a link to the official website: <https://www.ausssiesolarchallenge.org>
- 1.18.6 The creation and use of any sound recordings or still or moving images of the event used for commercial gain or public performance by the entrant or their sponsors are subject to the prior written approval of the event organiser.
- 1.18.7 Non-commercial media content generated by the entrant must reference the event.
- 1.18.8 Teams and or their sponsors shall not engage in any marketing or promotional activity that will materially detract from the value and standing of the event or its sponsors.
- 1.18.9 Activity by sponsors of teams shall not imply ownership or sponsorship of the event.
- 1.18.10 Entrants are responsible for the activities of their sponsors.
- 1.18.11 Any social media posts made that mention the event must tag the event's official profile where possible.

1.19 Remotely Piloted Aircraft (Drones)

- 1.19.1 Remotely piloted aircraft (RPA) may only be operated with the approval of the event organiser.
- 1.19.2 RPA registration and pilot accreditation must be in accordance with [Civil Aviation Safety Authority \(CASA\) regulations](#).

1.20 Compulsory documentation

- 1.20.1 Each team must submit a roadworthiness certificate, signed by their certifying engineer. Blank roadworthiness certificates are available from the event organisers.
- 1.20.2 Teams must bring the following documentation to scrutineering:
- the completed roadworthiness certificate
 - documentation showing the layout of PV cells in the solar collector, and confirming the solar collector area
 - documentation showing the layout of the energy storage system
 - a battery incident plan
 - two printed A4 copies of a diagram of the solar car in plan view, with the front of the solar car depicted at the top of the diagram, and clearly showing how emergency isolation is to be activated

- a simplified wiring diagram, printed on A4 paper, showing how the main functional blocks (PV array, energy storage packs, electronics modules, etc.) are connected, together with circuit breakers, contactors, and fuses.

2 Solar car regulations

Numbering of regulations in this section corresponds to the numbering in the Regulations of the 2021 Bridgestone World Solar Challenge.

2.1 Compliance with World Solar Challenge regulations

- 2.1.1 Solar cars must comply with the regulations of the 2021 Bridgestone World Solar Challenge or any previous World Solar Challenge, except where superseded by the following regulations.
- 2.1.2 Teams must specify which edition of the World Solar Challenge regulations applies to their car.

2.2 Signage

- 2.2.1 Event stickers may be provided by the organiser. These will be placed in the signage areas defined in the Regulations for the Bridgestone World Solar Challenge (any year).

2.3 Ballast

- 2.3.1 Each team must provide ballast for each of its drivers and passengers.

2.4 Safety

- 2.4.2 Each team must engage a professionally qualified engineer to certify that the solar car is designed and constructed using sound engineering practice, meets the design parameters where stated, maintains stability while driving during testing, and is roadworthy and fit for being driven on the Wakefield Park Raceway circuit and on public roads. The certifying engineer must be qualified to certify vehicles for operation on public roads.

The Roadworthiness Certificate must be signed by a single certifying engineer. However, that engineer may engage other engineers to advise on aspects outside their expertise.

- 2.4.3 Any changes made after certification to items described in the roadworthiness certificate must be re-approved by the team's certifying engineer.
- 2.4.4 All parts of the solar car must be fixed so that they cannot detach while driving. Latched parts such as doors, canopies and top shells must be secured with redundant or two-stage latches.

2.5 Egress

- 2.5.1 Teams must demonstrate that all occupants can exit the solar car in less than 15 seconds, without assistance. Cruiser Class solar cars with more than four seats will be tested with four occupants.
- 2.5.2 Doors and canopies used for egress must be capable of being secured and released from inside the solar car and from outside the solar car.
- 2.5.3 Emergency openings, and the methods of opening, must be clearly indicated on the exterior of the solar car, and be visible to an emergency services first responder.
- 2.5.4 Occupants must be able to exit the solar car without assistance.

Teams may not use adhesive tape to secure exits.

2.6 Cooling and hydration

- 2.66.1 Each solar car occupant must be provided with ventilation or cooling sufficient to ensure that they will not overheat. The team must describe the system, and have it approved by their certifying engineer.
- 2.6.2 Each solar car occupant must have space for at least two litres of drinking water (see Regulation 3.17.3).

2.7 Tyres

- 2.7.1 Tyres must be suitable for highway use and used in accordance with their manufacturer's recommendations.
- 2.7.2 Solar cars must be fitted with tyres that
 - are compliant with UNECE Regulation 30 or UNECE Regulation 75, as indicated by an E approval marking on the tyre, or
 - were approved for the 2019 BWSC.

Solar car tyres may not be suitable for the endurance event at the Wakefield Park Raceway.

- 2.7.3 The speed rating of the tyres must be more than the maximum speed of the solar car. The load rating of each tyre must be more than the maximum static load imposed on it by the fully-laden solar car.
- 2.7.4 Tyres must be approved by the team's certifying engineer.
- 2.7.5 Tyres must be free of any apparent defect.

3 Event regulations

Numbering of regulations in this section corresponds to the numbering in the Regulations of the 2021 Bridgestone World Solar Challenge.

3.1 Supervision

- 3.1.1 The Clerk of the Course is responsible for supervising circuit and on-road activities.

3.2 Safety

- 3.2.1 The team safety officer is responsible for the general safety of the team.
- 3.2.2 The team battery officer is responsible for the safe operation of batteries and for supervising response to any battery emergency.
- 3.2.3 Battery incident response kits must be readily available to the solar car and any other vehicle carrying solar car batteries.
- 3.2.4 A team member with a recognised first-aid certificate, current for the duration of the event.
- 3.2.5 It is the responsibility of each team to ensure that the vehicles under its control are maintained in a safe, roadworthy condition and are operated safely and within the law always.
- 3.2.6 All solar cars and escort vehicles are operated and driven at the team's own risk.
- 3.2.7 The Clerk of the Course may exclude any team from the event at any time if any team member operates a solar car or any other vehicle in an unsafe manner.
- 3.2.8 Teams must look after the health and safety of their team members.

Fatigue and dehydration are serious hazards in this event. This is especially relevant to drivers, particularly those of solar cars.

- 3.2.9 Drivers, team members, officials and observers are to be drug free and maintain a blood alcohol level less than 0.01% whilst engaged in any duties associated with the event.

3.3 Safety-belts

- 3.3.1 The use of safety-belts is mandatory for all occupants of motor vehicles in Australia, including solar cars.

3.4 Helmets

- 3.4.1 Each occupant of a solar car must wear an approved motorcycle helmet securely fitted and fastened in accordance with the manufacturer's instructions.
- 3.4.2 Motorcycle helmets must have a mark certifying compliance with either:
- Australian/New Zealand Standard AS/NZS 1698:2006
 - United Nations Economic Commission for Europe Regulation No 22 (UNECE 22.05).
- 3.4.3 Helmets must not be modified, have unauthorised attachments, or be used in any way contrary to the manufacturer's instructions.

3.5 Safety equipment

- 3.5.1 Each team must have suitable and appropriate safety equipment available at all times. The minimum safety equipment is:
- a first-aid kit
 - safety glasses and gloves for handling batteries
 - at least two hazard warning cones
 - two **yellow** warning flags, minimum size 300 mm x 300 mm
 - suitable fire extinguishers
 - fire blankets
 - sand (or similar material) for extinguishing fires
 - a spade
 - suitable containers for damaged electrochemical cells
 - safety vests
 - two whistles.

3.6 Escort vehicles

- 3.6.1 On-road permit conditions may require each team to provide a front and rear escort vehicle for escorting their solar car on public roads. Details will be announced in a Team Notice.
- 3.6.2 Front and rear escort vehicles must be fitted with amber flashing lights visible from all directions at a distance of at least 200 m in daylight. Flashing amber lights must not be obscured by signs or other equipment on the roof of an escort vehicle.

Beacons designed as warning devices for industrial equipment are unlikely to meet the visibility requirement.

3.7 Communication

- 3.7.1 Every solar car must have means of two-way voice radio communication with its team. Communication must be possible whenever the driver is in the solar car, including when the main energy storage contactors are open and when the car is in safe state.
- 3.7.3 Each team must have an 80-channel UHF CB radio compliant with [Australian regulations](#). Teams must monitor the channel they have been allocated while at the track and while on the road, and respond promptly and courteously, in English, to reasonable communications with other road users, teams and officials.

3.8 Preparation and testing

- 3.8.1 Teams must arrive at the Wakefield Park Raceway on Sunday 17 October.
- 3.8.2 The Wakefield Park Raceway track will be available for testing when it is not being used for event challenges.
- 3.8.3 The event organiser will appoint a paddock manager to supervise the preparation and test facility. The directions of the paddock manager must be followed.
- 3.8.4 [Australian workplace standards](#) will apply to all event-related activities.
- 3.8.5 The Clerk of the Course may impose event penalties for breaches of speed limits or other rules at the Wakefield Park Raceway.
- 3.8.6 No test driving is to be conducted in the paddock, car park or access roads.
- 3.8.7 The track must not be accessed without clearance from the track controller.
- 3.8.8 Any team driving a solar car on a public road without a permit is liable to civil penalties and exclusion from the event.
- 3.8.9 The event organiser reserves the right to request a security deposit against damage, rubbish removal or cleaning beyond reasonable expectations.

3.9 Team registration and scrutineering

- 3.9.1 All participants are required to attend with their team to complete the registration process and present their solar car for the scrutineering process. The scrutineering process is divided into static and dynamic operations.
- 3.9.2 Team registration and static scrutineering will take place at the Wakefield Park Raceway.
- 3.9.3 Teams must attend registration and static scrutineering with:

- the Team Manager, and an interpreter if required
- all solar car drivers, with their driving licences
- any waiver documents required for participants under the age of 18
- all solar car passengers
- the team safety officer
- the team battery officer
- the solar car, in road-ready condition
- front and rear escort vehicles, including any trailer that may be attached to the front escort vehicle, in road-ready condition
- the solar car trailer or solar car transport truck they intend to use in the event
- tools and personnel required to facilitate inspection of the solar car
- a list of all vehicles associated with the team, including make, model, colour and registration number
- roadworthiness certificate
- a spare solar car tyre of each type
- a sample energy storage cell (if cells inside the energy storage packs are not clearly visible).

3.9.5 The Team Manager must attend all registration and scrutineering stations.

3.9.6 All team members must complete their registration by signing in at registration.

3.10 Static scrutineering

3.10.1 Static scrutineering will check for compliance with the appropriate design regulations and review the roadworthiness certificate. It will also document any variations from the 2021 Bridgestone World Solar Challenge Regulations that could give the team a competitive advantage or disadvantage.

3.10.2 Qualification must be achieved in road-ready condition. Teams that do not present at the designated time in road-ready condition may fail to qualify.

3.10.3 Up to seven members of a team (including an interpreter and any team media personnel) may accompany the solar car at scrutineering. Team members may be substituted between inspection stations.

3.10.4 Some dismantling (such as removal of the solar collector or top shell) may be required to facilitate inspection of the following components:

- mechanical systems (including seats, tyres, brakes and steering)
- electrical systems

- energy storage system.
- 3.10.5 Dismantling and reassembly of the solar car when required to facilitate inspection of the solar car must be conducted (in the sole opinion of the Chief Scrutineer) in a reasonable time.
- 3.10.6 Checks and inspections with the solar car in a road-ready configuration will include, but not be limited to:
- signage
 - dimensions
 - solar collector type and size
 - egress—all solar car drivers and passengers are required
 - vision—all solar car drivers are required
 - lights, indicators and horn
 - electrical compliance.
- 3.10.7 All energy storage devices must be declared at static scrutineering. Failure to declare any energy storage device may lead to disqualification.
- 3.10.8 The mass of each Challenger or Cruiser Class solar car driver or passenger, with helmet, driving clothes and shoes, will be determined at scrutineering. If the mass of a driver or passenger is less than 80 kg, ballast provided by the team must be added to make up the difference. No credit will be given if a driver or passenger weighs more than 80 kg.
- Deliberate consumption of excessive food and drink prior to weigh-in is not in keeping with the spirit of the event and may be hazardous to the health of the individual.*
- Solar car occupants must wear similar clothes (including shoes) while driving as when they weigh in.*
- 3.10.9 Drivers and passengers may be re-weighed at any time during the event. Changes in weight considered unreasonable will be referred to the Clerk of the Course.
- 3.10.10 Non-compliance penalties may be imposed at the absolute discretion of the Chief Scrutineer and may include failure to qualify. Penalties will be published.

3.11 Dynamic scrutineering

- 3.11.1 Dynamic scrutineering exercises will test the speed, stability and braking capability of the solar car.
- 3.11.2 Dynamic scrutineering will be held at the Wakefield Park Raceway on Tuesday 19 October 2021.
- 3.11.3 No solar car may be submitted for dynamic scrutineering without having first passed static scrutineering.

- 3.11.4 Solar cars must complete dynamic scrutineering in road-ready condition and with occupants and ballast in place.
- 3.11.5 Cruiser Class solar cars with four or fewer seats must complete dynamic scrutineering with all seats occupied. Cruiser Class solar cars with more than four seats must complete dynamic scrutineering with four seats occupied.
- 3.11.6 No solar car will be given permission to start the event until it has passed dynamic scrutineering. Any solar car failing dynamic scrutineering will only be permitted to re-present at the absolute discretion of the Chief Scrutineer.

3.12 Modifications or changes after scrutineering

- 3.12.1 Once a solar car and its drivers have passed static scrutineering, no changes to the design or configuration of the solar car or changes to drivers will be permitted.
- 3.12.2 Once a solar car has passed dynamic scrutineering, and until released from the start line, component exchange, modification or repair of the solar car is not permitted without the approval of the Chief Scrutineer.

3.13 Briefings

- 3.13.1 A compulsory briefing for Team Managers and team safety officers will be held at Wakefield Park Raceway on Sunday 17 October 2021.
- 3.13.2 Further briefings will be announced at the event.

3.14 Endurance start line and grid

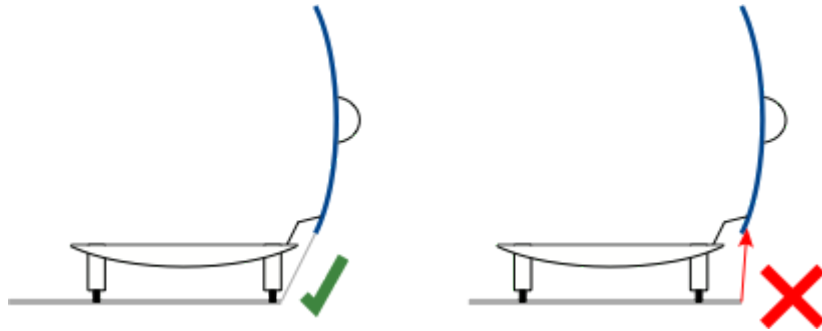
- 3.14.2 Starting position for the endurance challenge will be determined by performance during the Hot Lap challenge.
- 3.14.3 All solar cars must be in their starting grid position by the appointed time for final inspections. Any solar car not present will have their starting position amended.
- 3.14.4 Teams must not work on their solar cars on the start grid.
- 3.14.5 Two team members must stay with the solar car on the start grid to assist officials with final inspections.

3.15 Energy collection and storage

- 3.15.1 During the Endurance Challenge, charging the energy storage system or powering the solar car from an unauthorised source will lead to exclusion from the event.
- 3.15.2 External devices intended to increase the irradiance on the solar collector or increase the efficiency of the solar collector must not be used at any time.

Spraying of water from external sources is not allowed.

Ground sheets must not be placed in any position where it is possible to draw a straight line from any part of the ground sheet to any part of the solar collector.



- 3.15.4 Damaged energy storage cells may be bypassed, but must not be removed from the energy storage system unless it would be unsafe to leave them in. Cells removed must be replaced by ballast with mass greater than the mass of the removed cells.
- 3.15.5 If a solar car is unable to continue because too many energy storage cells have been damaged, the team may, with the event organiser's permission, replace cells and continue. The lap count of the team will be based on the lap count achieved before replacing cells.

3.16 Endurance timing

- 3.16.1 The official start time each day will be 09:00 for all teams. The official finish time each day is 17:00.

3.17 Solar car drivers and passengers

- 3.17.1 Only registered solar car drivers may drive the solar car during event hours.
- 3.17.2 When driving, ballast must be carried in accordance with the provisions of Regulation 2.3.
- 3.17.3 Each solar car driver and passenger must have at least two litres of water whenever they start their stint.

3.18 Driving conduct

- 3.18.1 Each team must ensure that all vehicles associated with their attendance at the event are driven in a careful and courteous manner.
- 3.18.2 Overtaking on the circuit must be done in a safe manner and take into account prevailing conditions.
- 3.18.3 Solar cars may be subject to scrutineering at any time during the event to ensure compliance with the regulations.

3.19 Stopping

- 3.19.1 No team vehicle may stop on the circuit except in an emergency or when required by traffic conditions.
- 3.19.2 When stopped adjacent to the circuit, all wheels of the solar car must be clear of the road.
- 3.19.3 If a solar car has suffered damage to any component certified by the team's certifying engineer, other than tyres, then the team may repair their solar car but may not resume driving until:
 - the team's certifying engineer has recertified the repaired car
 - the team has submitted the new certification to the Clerk of the Course
 - the Clerk of the Course has approved the resumption of driving.
- 3.19.4 If a solar car rolls onto its side or roof then the team must withdraw immediately.

3.20 Control stops

- 3.20.1 Teams must have two 30-minute control stops each day of the Endurance Challenge. Teams may choose the times of their control stops, but must notify the Clerk of the Course at least 10 minutes in advance.
- 3.20.2 Solar car drivers and passengers may not be in the solar car for more than 3.5 hours without an intervening break of at least 2 hours.
- 3.20.3 Teams must obey all directions given by the control stop manager.
- 2.20.4 Teams must park in the spaces designated by control stop officials. Teams may not modify the parking space in any way. Ground sheets may not be used. No team members other than arriving occupants may touch the solar car once it is in the parking space.
- 2.20.5 Occupants must get out of the solar car without assistance from other team members. Occupants must remove their ballast from their solar car.
- 3.20.6 Once all occupants are out of the car, the arriving driver, alone, may reconfigure the car for charging before control stop timing commences.
- 3.20.7 Control stop timing commences when the arriving driver activates the control stop timing system.
- 3.20.8 No team member may touch the solar car for 25 minutes unless undergoing a Control Stop Challenge. The solar car may reconfigure itself.

- 3.20.9 During the control stop, the team may be given a Control Stop Challenge to complete (see Regulation 4.5).
- 3.20.10 After 25 minutes, the departing driver, alone, may reconfigure the car for driving. The driver and any passengers may get into the car and prepare for departure. No other team member may touch the car.
- 3.20.11 The solar car may depart once 30 minutes have elapsed. The solar car must not depart until ballast and drinking water are in place, seat belts are fastened, helmets are secured, and the solar car is ready for the road.

The control stop manager may reset the remaining time to 30 minutes if team members interfere with the solar car during the 30-minute control stop period.

3.21 Overnight stop

- 3.21.1 At 17:00 on Day 1 of the Endurance Challenge, teams must complete their current lap and set up their car for solar charging until sunset. Solar charging may resume at sunrise on Day 2.

3.22 Penalties

- 3.22.1 The Clerk of the Course may impose a time penalty of 30 minutes for:
- obstructing other solar cars
 - stopping on the circuit (other than when required by traffic conditions)
 - unsafe driving.
- 3.22.2 The Clerk of the Course may exclude any team from the event for wilful disregard of any regulation or of the spirit of the event. These offences include but are not limited to:
- misrepresentation
 - wilful obstruction, or aggressive or unsafe driving
 - replacement of energy storage cells
 - charging of the energy storage system from any unapproved source
 - accumulation of three or more penalties.

3.23 Protests and appeals

- 3.23.1 A Team Manager may appeal any decision of the Chief Scrutineer to the Jury by lodging a written Notice of Appeal with the Clerk of the Course within one hour of the notification of the decision. The Notice of Appeal must detail the grounds for the appeal. An appeal fee of \$500 will apply.

- 3.23.2 A Team Manager may lodge a written protest with the Clerk of the Course. Protests must be lodged before 18:00 on the day of the incident giving rise to the protest. The protest shall specify the details of the incident and a protest fee of \$200 will apply.
- 3.23.3 A Team Manager may appeal any decision of the Clerk of the Course to the Jury by lodging a written Notice of Appeal with the Clerk of the Course within one hour of the notification of the decision. The Notice of Appeal must detail the grounds for the appeal. An appeal fee of \$500 will apply.
- 3.23.4 Protest/appeal fees will be returned if the protest/appeal is upheld.
- 3.23.5 The Jury will consider any protest or appeal requiring final resolution. The Jury may take advice from any party about the incident giving rise to the decision being appealed. The majority decision of the Jury is final and binding.
- 3.23.6 The decision of the Jury must be conveyed to the Team Manager lodging the appeal within one hour of reaching the decision and confirmed in writing within 12 hours to all parties to the appeal including the Clerk of Course.

4 Awards

4.1 Event challenges

- 4.1.1 The 2021 Aussie Solar Challenge will comprise eight challenges.

4.2 Hot lap

- 4.2.1 Each team will complete two laps of the Wakefield Park circuit. The second lap will be timed.
- 4.2.2 Teams will be ranked by the duration of the second lap, lowest first.
- 4.2.3 Starting position for the Endurance challenge will be in the order of hot lap times.

4.3 Solarkhana

- 4.3.1 Teams will manoeuvre their solar cars around a tight course, marked by traffic cones, as quickly as possible.
- 4.3.2 Teams who do not start, do not finish or do not complete the course correctly will not be given a score.
- 4.3.3 Each cone knocked over adds 5 seconds to the time.
- 4.3.4 Teams will be ranked by duration, lowest first.

4.4 Endurance

- 4.4.1 Teams will drive for two days, with solar charging between the two driving sessions.
- 4.4.2 Teams will be ranked by the number of laps completed, highest first.

4.5 Control stop

- 4.5.1 At each control stop during the Endurance challenge, teams will be asked to complete a task such as changing a tyre or putting out an imaginary fire. Each task will be timed.
- 4.5.2 Teams will be ranked by the cumulative duration, lowest first.

4.6 Consistency

- 4.6.1 During the Endurance challenge, teams must nominate, in advance, a period when they will complete 5 consecutive laps as consistently as possible.
- 4.6.2 The consistency score will be the difference between the highest lap time and the lowest lap time.
- 4.6.3 Teams will be ranked by consistency score, lowest first.

4.7 Innovation

- 4.7.1 Each team will be given 10 minutes to explain an innovation they have made. It could be a technical innovation, or an innovative way of doing the tasks associated with designing, building or campaigning a solar car.
- 4.7.2 The winner will be determined by [STAR voting](#). Each team manager and up to 5 officials will give scores to each team. The teams with the top two total scores will be finalists, and the winner will be the finalist preferred by the majority of voters.

4.8 Bonus Points

- 4.8.1 **Most Amazing Solar Car.** Each team and up to 5 officials will use STAR voting to determine the most amazing solar car.
- 4.8.2 **Most Amazing Team.** Each team and up to 5 officials will use STAR voting to determine the most amazing team.
- 4.8.3 **Best Garage Vibe.** Each team and up to 5 officials will use STAR voting to determine the team with the best garage vibe.

4.9 Detailed Scoring

Ranking	Endurance 50%	Solarkhana 15%	Hot Lap 12%	Control Stop 10%	Consistency 7%	Innovation 6%
1	50	15	12	10	7	6
2	32	10	8	7	5	3
3	21	7	5	4	3	1
4	14	4	3	2	2	0
5	9	2	2	1	1	0
6	5	0	0	0	0	0

Bonus Points

- Most Amazing Car: +3
- Most Amazing Team: +3
- Best Garage Vibe: +3

4.10 Awards

- 4.10.1 An awards ceremony will be held in Canberra on the afternoon of Friday 22 October 2021 (exact date, time, and location to be confirmed).
- 4.10.2 Winners of each challenge will be announced.
- 4.10.3 The overall winner will be announced and awarded the 2021 Aussie Solar Challenge trophy.