

World Solar Challenge (WSC) 2011



The international event to display advancements in solar technologies

**The aim is to build the world's fastest solar car for
the 2011 World Solar Challenge Events**

**Our car is to be known as
*Solar Spirit Australia***

Solar Car Racing is the "brain sport" for the 21st Century.



Contents	Page
Solar Spirit Australia TAFESA project plan	3
Our Vision	3
Our History	3
Project aims for sustainable education	4
Proposal for R&D of the solar electric vehicle	5
Game Changing Technology R&D applications	6
Promotional Coverage before, during and after WSC event	6
Web Coverage	7
New promotional opportunities for greater coverage	8
Sponsorship of Solar Spirit for 2008 – 2009 preparation	8
Naming Rights Sponsor	8
Major Corporate Sponsor	8
Corporate Sponsor	8
Solar Spirit Australia Friends Award	8
Watt Hour Power Certificate Award	8
Time line to achieve production target for October 2009 WSC	9
Termination & obligations	9
Agreement 2009 – 2011	10
Appendix 1 Deliverables	11
Illustrations:	
Solar Spirit Australia concept – Simon Read	
Kelly on Dynamic tester at Croydon TAFE	
Kelly team in Charley Boorman’s ‘By Any Means’ film project	
Capturing the last bit of the sun’s energy	
2007 solar car WSC team	

The Solar Spirit of TAFESA project plan

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|---------|--|
| Stage 1 | Design and build the fastest, most efficient solar electric vehicle in the world. The engineering students will use the latest technology materials in production. |
| Stage 2 | Design and build the plug-in “Spirit Electric Vehicle” using the Solar Spirit technology and enable recharging via mains or solar power. |
| Stage 3 | Enable commercial production of plug-in “Spirit Electric Vehicle” components here in South Australia. |

Our vision:

- Enable TAFESA Solar Spirit team, in partnership with industry, to research, develop and build the world’s fastest solar car for the 2011 and 2013 World Solar challenge.
- Be the catalyst in developing applications for the latest technology in energy storage and renewable energy systems.
- Be the catalyst for South Australia to mass produce plug-in electric vehicles
- Promote excellence, quality and R&D capabilities within TAFESA
- Provide opportunities for students to learn and apply the very latest in technology for the development of energy efficient products in a world class training facility.

Our History

TAFE SA has a committed Solar Car Team <http://solarspiritaustralia.com> new sponsor website, plus the <http://solarcar.tafesa.edu.au/history.htm> and a Renewable Energy Education centre <http://greening.tafesa.edu.au/>. We have built “Kelly” in partnership with Uni SA, Seaton and Elizabeth High schools (based on the Uni SA solar car Ned). The ‘Kelly’ car has been very successful so far, on a very limited budget. Below are her achievements after entering the challenge in 2001:

- 1st in Production Class in 2003, against solar vehicles from around the globe etc.
- 2nd in Production Class out of 43 entrees, in the 2005 WSC.
- 15th in the open adventure class of the 2007 WSC
- The TAFESA solar car Kelly in action at Darwin’s Hidden Valley Raceway during time trials for grid position in the 2007 WSC
- Kelly will be used in a “Try Engineering” campaign with high schools throughout South Australia
- Kelly will be entered in the “Adventure Class” by South Australian High School students with TAFESA mentors

The project aims for sustainable education

The Solar Spirit Project plans to develop products, technologies and skills for South Australia to compete in global markets. This is a great training R&D partnership opportunity.

World Solar Challenge presents an opportunity to advance the cause of renewable energy research in Australia and will also provide an opportunity to allow diversification into research into electric vehicles using the outcomes from the solar car experience.

This project will provide chances for students, and staff, to develop in-depth understanding of these technologies while providing opportunities for industry to gain from that experience.

Its activities encompass initiatives such as;

- Building a self funding technology rich program with long term benefits.
- Allow the team to allocate funds to departments to include R&D projects into the lecturer's teaching program and mentor the students working on the project
- Enable lecturers time to write the R&D projects into their curriculum
- Greatly accelerate programmed development of the Solar Spirit
- Have greater resources available to provide world class training and education
- Together with Industry, we can optimise the available resources in South Australia
- Skills development will include confidentiality practices for Intellectual Property protection arrangements with industry R&D partners
- Engage students in the design and manufacture of the most efficient solar electric vehicle in the 2009 World Solar Challenge
- Provide engineering students with R & D skills to develop innovative solutions in a world class learning environment and become an asset to any future employer.
- Opportunity to be involved with high school science awareness "Try Engineering" campaign. The educational program will encourage students from as many high-schools as possible around the state, to build the "Suns of Kelly" model solar cars and other renewable energy projects

Proposal for R&D of the solar electric vehicle

1. Design and build a state-of-the-art solar electric vehicle capable of running competitively in the 2011 World Solar Challenge.
2. Design and manufacture a set of car wheels, to suit direct drive motors, which will drive the Solar Spirit electric vehicle at speeds in excess of 130km/hr
3. Test the direct drive electric wheel motor assemblies for performance on a dynamometer and for power consumption at different velocities and loads.
4. Investigate the parameters to reprogram the direct drive motor controllers to enable to operate the drive motors up to 1600 rpm. Adjust the optimum running efficiency settings to work from 1000 to 1300 rpm (approx 100 to 130Km/hr)
5. Design power management system to drive and operate the direct drive motors at a extended voltages to achieve extended speed and efficiency
6. Modify the motors to enable electrical regenerative braking with ABS control.
7. Research and adapt a regenerative ABS and traction control system suitable for solar electric or plug-in electric vehicles
8. Research and adapt energy storage devices to replace batteries.
9. Adapt the electrical energy storage units to receive the rapid charging of an efficient regeneration braking system, and provide controlled voltages to supply the direct drive motors and instrumentation
10. Research and design a DC-DC converter system between the energy unit, motors, controllers, instrumentation and accessories.
11. Design the instrumentation for ergonomic visual control information
12. Adapt computer technology to collect and collate performance data
13. Adapt Telemetry equipment to send data to website and provide live information
14. Provide information to the general public to enable the progress of the solar cars

15. Train TAFESA and high school students to drive Kelly and the new solar electric vehicle with maximum efficiency

To prepare for the use of the energy storage systems, the Solar Spirit research and development team will use the best available Super Capacitors to simulate energy storage system to enable us to design and build the energy management system to make widespread use of these devices.

Promotional Coverage

During the 2007 World Solar Challenge, the involvement of TAFESA's vehicle 'Kelly' was well supported by the media. Coverage was achieved through a range of environments including television (state and national), radio, newspapers (city & regional), internet and event appearances.



'Kelly' appeared on Channel Ten News in Adelaide in two stand-alone articles immediately prior to the 2007 event. It also appeared as the backdrop and subject of discussion in coverage of the race on Channel Ten News during progress and also appeared as the backdrop and was discussed in an article on the national Channel Ten Late Evening News on the second day of the 2007 race.

In addition, there were live crosses to the team manager from ABC Radio 891 on each day of the race (5 days), on the road. This was supported by a strong relationship with Telstra BigPond and Next G. There were numerous articles in The Advertiser and various magazines mentioning or discussing 'Kelly' and TAFE SA, including a two page article in the RAA Magazine as part of their sponsorship of the team. News Limited will also run a number of related stories in August and September as the lead up to 2009 WSC.

TV coverage continues with ABC Totally Wild footage recorded in September 2009 and replayed to national audiences in February 2010.

Australian Live TV has just added video streaming content coverage of media interviews given by Solar Spirit Australia sponsors, which now appears on the Solar Spirit Australia website www.SolarSpiritAustralia.com and will be viewed by an estimated 200,000 national audience.

ATA's new digital media technology will run 30 second commercials promoting public awareness of Solar Spirit Australia website www.SolarSpiritAustralia.com. The commercials featuring sponsor interviews will appear to an estimated 250,000 Adelaide audience, through approximately 50 public locations, such as entertainment venues and shopping centres.

Web coverage

New www.SolarSpiritAustralia.com innovative sponsors' promotion and web shop built by WallCann, leading SA eSolution marketer, was launched August 2009. There is also a blog at <http://solarcar.tafesa.edu.au>, a forum on the Adelaide Now website and Solar SpiritAu tweet on <http://twitter.com/SolarSpiritAU>. In addition, short articles in the Messenger Newspaper and two articles in the Sunday Mail in the weeks prior to the race plus two articles in the Coober Pedy Times to assist regional exposure of the initiative and the brand.

Try Engineering Campaign

TAFE SA also had major involvement in a promotional campaign with high school and primary schools across the state immediately prior to the race. This campaign had a focus on solar energy as a renewable resource and 'Kelly' was feature of that program. The high school involvement from here on, will focus on the Try Engineering Campaign to generate interest in renewable energy engineering pathways. Energy Education Australia has agreed to manage Kelly and a school team for the 2009 WSC. See <http://www.energy.edu.au/>

Also, 'Kelly' has now also appeared in Charlie Boorman's 'By Any Means' documentary on UK television (BBC)

Steam meets Solar in the BBC 'BAM' (By Any Means) documentary.
'Kelly' with Charlie Boorman and steam train in Pitchie Richie Pass, South Australia



New promotional opportunities for greater coverage and benefits

Both solar cars will have new [Live Telemetry Feed links](#) which can be used to let the world know the progress of the two solar vehicles, through uplink satellite feed.

Relationships are now being established with media for many events between now and October 2011. The live TV, digital and telemetry displays will be available on websites for every supporter and may be used by news media outlets for all to follow our progress.

Maximising the benefits and investment opportunities for R&D Partners

For South Australia to gain the maximum benefit from this project, it is proposed to form the “Solar Spirit of South Australia Association”. The members of the association will be companies who can visualise their products being developed and used as components for plug-in EV manufacture. The companies will collaborate to be part of the plug-in EV manufacturing industry here in South Australia. The group may employ full time staff to seek out, support and fast track the R&D.

Confidentiality & Audit Statement

The Solar Spirit of TAFESA working group will comply with confidentiality arrangements and be able to provide an auditable expenditure of sponsorship moneys. This means Industry and the Solar Spirit of TAFESA partnership will comply with taxation deduction rules and conditions.

Note: *There is up to a 175% tax deduction benefit offered for R&D expenditure on renewable energy projects.*

Note: *TAFESA is a “Tax Deductable Gift Recipient”*

Sponsorship of Solar Spirit for 2011 preparation

We are raising research and development funds, from five distinct types of bi-annual WSC preparation sponsorship packages and each sponsorship package has defined benefits.

Project costs for management, research, design, materials and manufacturing of the Solar Spirit EV and participation in the WSC event is projected as \$1,250,000.

The specific sponsorship commitments entered into in this agreement are detailed in Appendix 1.

The levels of Sponsorship.

1	Naming Rights Sponsor (“-- Solar Spirit”) 1 @	= \$100,000
2	Major Sponsors 4 @ \$ 50,000	= \$200,000
3	Corporate Sponsors 10 @ \$ 20,000	= \$200,000
4	Solar Spirit Australia Award 100 @ \$ 2,500	= \$250,000
5	Watt Hour of Power Certificates* 50,000 @ \$ 10	= \$500,000

***Limited to cover 2011 WSC Event**

Note: *To travel from Darwin to Adelaide at 100 km/h, we need 50,000 Watt Hours of power from the solar panels and the regenerative braking system. We plan to market 50,000 “One Watt Hour of Power” Donor Acknowledgment Certificates, at \$10.00 each, to raise a minimum \$500,000, to enable the purchase of the most efficient Solar Array, the instrumentation, the regenerative braking materials and the power management system.*

2011 World Solar Challenge ‘Solar Spirit Australia an initiative of TAFESA’

Special function at TAFESA to celebrate achievements, acknowledge sponsorship and supporters

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Termination of Sponsorship

A party may terminate this sponsorship agreement at any time with immediate effect by giving written notice to the other party.

On termination of this agreement each parties' right to use Confidential Information ceases and each party must immediately, at the other parties' discretion:

- (a) Return the confidential information;
- (b) Destroy and certify in writing the destruction of; or
- (c) Destroy and permit the other party to witness destruction of;
all Confidential Information in the other parties possession or control.
- (d) Termination of this agreement does not affect any accrued rights or remedies either party may have under this agreement.

Continuing Obligations

The obligations of confidentiality under this agreement will continue to apply to the parties (in addition to any permitted assignee) after termination of this agreement.

Assignment

Either party must not assign or otherwise transfer any or all of its rights arising out of this agreement without the written consent of the other party.

Governing Law

This agreement is governed by the laws of the state of South Australia and the parties expressly submit to the exclusive jurisdiction of the Courts of that State.

Executed as a Sponsorship Agreement: See Appendix 1 – Benefits and Expectations

Signed for and on behalf of

TAFESA

Adelaide North Regency Campus

Regency Park SA 5010

Adrian Marron

.....

Signature

Date

Managing Director

Signed for and on behalf of

WallCann Pty Ltd

209 Richmond Road

Richmond SA 5033

Clive Wallace

.....

Signature

Date

Managing Director

Signed for and on behalf of

“Client” Pty Ltd

A street address

A city

A CEO

.....

Signature

Date

Managing Director

Appendix 1

Corporate Sponsor Benefits and Expectations 2011: “Client Pty Ltd”

1 Corporate Sponsor will receive “\$ to be determined” value for sponsorship

- Worldwide exposure with live radio coverage, TV news items, news papers, magazines and website articles
- SolarSpiritAustralia.com website quarter page exposure.
- Direct benefit of expanding the brand awareness of “Client”.
- “Client” logo located on Solar Spirit trailer and on the body of the car.
- “Client” incorporated in promotional merchandise, materials and presentations
- Invitations and recognition at all events and presentations
- “Client” banner link to your organisation
- Framed team photograph for your premises.
- “Client” can book the promotional use of Solar Spirit Australia vehicle 31st October 2009 to 31st October 2011 by arrangement with TAFESA, provided the vehicle is available and is not already booked out by TAFESA, under maintenance, being rebuilt or used in use for TAFE training courses.

2 Corporate Sponsor will donate “\$ to be determined” value of services.

Sponsorship estimated contribution comprising:

- “\$ To be determined” cash donation paid towards R &D payable in stages for Solar Spirit Australia
- “\$ To be determined” commission proceeds from sales of “Client” products to 2011
- Advocacy encouraging business to appreciate the importance and value of building a strategic position by supporting Solar Spirit Australia.