



## **MEDIA RELEASE**

### **Singapore Polytechnic and SP Group launch next-generation solar car for World Solar Challenge 2017**

#### ***SP Group adds \$2 million sponsorship to groom engineering talent***

**Singapore, 21 July 2017** – Singapore Polytechnic and SP Group today unveiled their most advanced solar car, SunSPEC 5, designed and built by the polytechnic's students to take part in the biennial World Solar Challenge 2017 in Australia this October. SP Group's sponsorship of \$1 million over 5 years for the team's participation supports the students in developing innovative green technologies. Three SP Group staff, who are SunSPEC alumni, will also join this year's team to contribute skills and experience, and serve as mentors to the current student cohort.

The SunSPEC 5 edition follows the creation of its predecessor SunSPEC4 in 2015, also supported by SP Group, which beat challenging odds to participate in the race (see Annex 1). It is Singapore's sole entry in the World Solar Challenge, considered one of the world's toughest and most competitive solar car races, alongside leading global universities such as the Massachusetts Institute of Technology and Stanford University.

The SunSPEC team is competing in the advanced Cruiser Class category which focuses on sustainable transport solutions and will test the car's practicality and responsiveness to real-world challenges. This year's car represents another significant stride towards commercially viable applications of solar and energy storage technology. It has leapt forward with integrated dashboard telemetry, a commercial vehicle lighting system and improvements to safety and ride comfort such as sports seats and adjustable steering positions.

Over the past two years, more than 60 students across various Singapore Polytechnic Engineering diploma courses have pushed their knowledge and skills to new heights by designing and building two solar cars to withstand the arduous road trip over 3,000km in the Australian outback from Darwin to Adelaide. Besides learning to integrate their different disciplines, such as electrical & electronic engineering, energy systems & management, mechatronics and robotics, the experience hones resilience, creativity and the ability to solve practical problems.

## **\$2 million SP Group education sponsorship for Singapore Polytechnic's SunSPEC engineering students**

To help develop a core pool of engineers who are ready to drive solutions for a sustainable future, Singapore Polytechnic and SP Group inked a three-year Memorandum of Understanding (MOU), valued at \$2 million. This includes the SunSPEC polytechnic and university sponsorships for students who are part of the solar car team. They will secure job placements before they graduate and undergo a customised training programme including theory and on-the-job exposure in critical areas such as electricity and gas planning and operations.

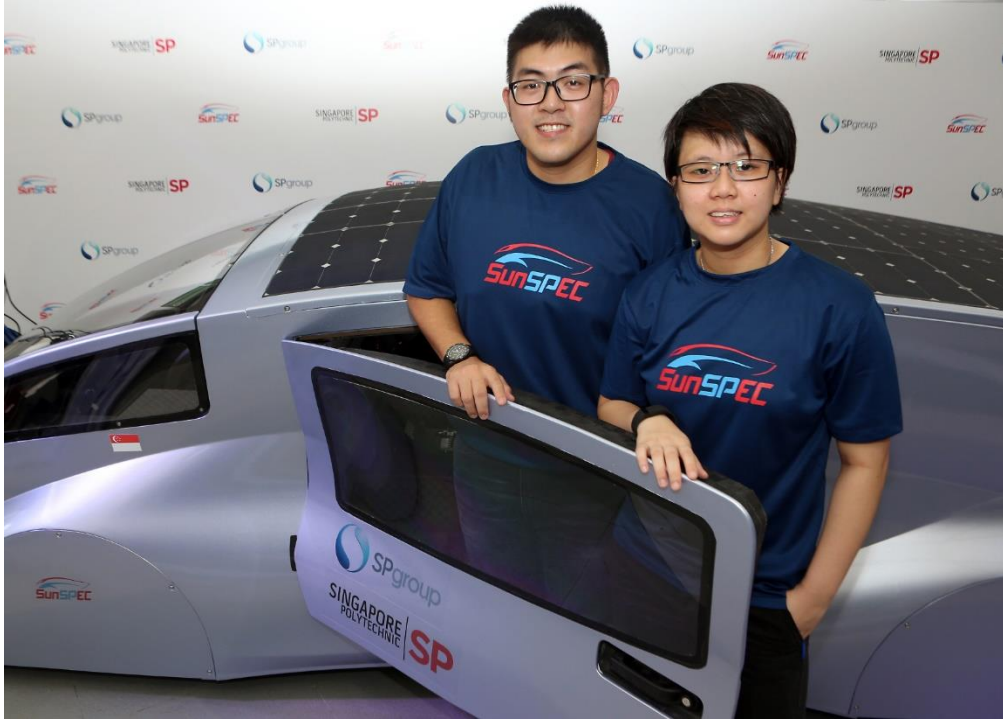
Seow Jing Woon, a third-year student from the Diploma in Mechatronics & Robotics, who received the SunSPEC Polytechnic sponsorship, said, "The solar car project enabled me to work with industry mentors, hone my engineering skills, and produce innovative sustainable solutions for the future."

SP Group's Head of Corporate Affairs, Ms Amelia Champion, who has journeyed with the solar car team since the start of the partnership in 2015, said, "The spirit of innovation, resilience and passion among the students is unwavering from one cohort to the next. They have outdone themselves in delivering the latest SunSPEC solar car, which has pushed the boundaries in engineering and green technology."

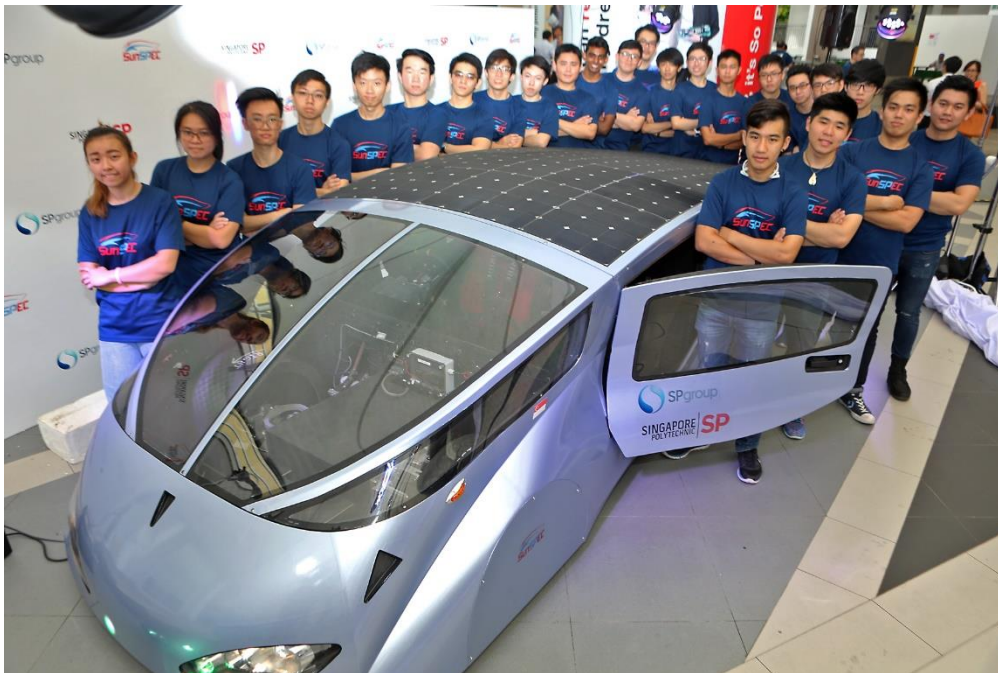
Please refer to Annexes for more details:

- 1) Annex 1: SunSPEC and World Solar Challenge
- 2) Annex 2: Factsheet on SunSPEC 5
- 3) Annex 3: Details on MOU between Singapore Polytechnic and SP Group
- 4) Annex 4: Key Terms in Chinese

Follow the SunSPEC team's journey on Facebook at <https://www.facebook.com/TeamSunSPEC>.



**SP Group staff and Singapore Polytechnic alumni Leow Wei Lin, with Singapore Polytechnic student Sheryl Choo and the SunSPEC 5 solar car.**



**Singapore Polytechnic Engineering students in the SunSPEC 5 solar car team.**

For high-resolution photos, please download them from:

[https://www.dropbox.com/sh/uakn2geq577pncy/AABUWuoCTVLNIOV\\_1ISOeL5Va?dl=0](https://www.dropbox.com/sh/uakn2geq577pncy/AABUWuoCTVLNIOV_1ISOeL5Va?dl=0)

Photo credits to SP Group

### **About Singapore Polytechnic ([www.sp.edu.sg](http://www.sp.edu.sg))**

Established in 1954, Singapore Polytechnic (SP) is Singapore's first polytechnic. It has 10 schools that offer 46 full-time courses for close to 16,000 students. SP adopts a proven creative teaching and learning framework and offers students a holistic, authentic and industry-relevant curriculum, innovative and vibrant learning spaces, and enriching overseas programmes.

The Polytechnic is committed to producing competent and versatile graduates who are also imbued with sound values, so that they can be work ready, life ready and world-ready. SP has more than 195,000 graduates and among them are successful entrepreneurs, top executives in multi-national and public-listed corporations, and well-known professionals across various industries and leaders in government.

SP clinched the inaugural ASEAN People's Award in 2015 for its contributions toward the region's community-building efforts. SP is also the first polytechnic to be awarded the President's Award for the Environment in 2010 and the President's Social Service Award in 2011.

Follow SP on Facebook at <http://www.facebook.com/singaporepolytechnic> and Twitter and Instagram at @singaporepoly.

### **About SP Group**

SP Group is a leading energy utilities group in the Asia Pacific. It owns and operates electricity and gas transmission and distribution businesses in Singapore and Australia, and district cooling businesses in Singapore and China. SP Group is committed to providing customers with reliable and efficient energy utilities services. More than 1.4 million industrial, commercial and residential customers in Singapore benefit from SP Group's world-class transmission, distribution and market support services. These networks are amongst the most reliable and cost-effective world-wide. For more information, please visit [spgroup.com.sg](http://spgroup.com.sg) or follow us on Facebook at [fb.com/SPGroupSG](https://www.facebook.com/SPGroupSG).

### SunSPEC 4 Rises From The Ashes

It was a near-miracle that SunSPEC 5's predecessor, SunSPEC 4, took to the roads at the 2015 World Solar Challenge. SunSPEC 4 was destroyed in a fire on 25 August 2015, just three weeks before it was scheduled to be shipped off to Darwin, Australia, for the race flag-off.

Undaunted, the Singapore Polytechnic team of 52 students and lecturers worked through nights and weekends to rebuild a new vehicle in four weeks, compared to eight months for the original car. With additional funding and logistical support from SP Group, the team acquired and assembled parts under a highly-compressed schedule. Airfreight saved an extra two weeks, compared to marine freight. SP Group staff – all alumni of Singapore Polytechnic – also provided additional support and mentorship before and during the race in Australia.

SP Group recognised the tenacity, determination and passion of the students towards this project and launched the SunSPEC Polytechnic & University Sponsorship scheme, specifically for Singapore Polytechnic students involved with SunSPEC4 and for two subsequent editions of the solar car.

### About the partnership between SP Group and Singapore Polytechnic

SP Group and Singapore Polytechnic formalised a SGD \$1 million, five-year partnership for the two organisations to collaborate in participating at the World Solar Challenge in 2015, 2017 and 2019.

SP Group is contributing funding, manpower, subject-matter expertise, logistics and public education.

Singapore Power's key objectives for this partnership are:

- Nurture and develop the next generation of engineering talent
- Innovative sustainable solutions – develop energy-efficiency initiatives and promote the use of renewable and green technology such as solar powered applications and energy storage systems.

## About the World Solar Challenge

The [World Solar Challenge](#) is considered one of the world's toughest solar car challenges, and regularly sees leading global universities such as Cambridge University, the Massachusetts Institute of Technology, and Stanford University participating.

The SunSPEC team is competing in the advanced Cruiser Class category which focuses on sustainable transport solutions and will test the car's practicality and responsiveness to real-world challenges. Participants in this Class race undergo the arduous road trip over 3,000km in the Australian outback from Darwin to Adelaide, using mainly power from the sun, with minimal grid charging. Vehicles operate on actual roads, at road speeds.

### About the Team & SunSPEC 5

<b>Size</b>	35 students, 12 lecturers and 3 SP Group staff
<b>Background</b>	Multi-disciplinary team representing expertise from the schools of Electrical & Electronic Engineering; Mechanical & Aeronautical Engineering; Digital Media & Infocomm Technology and Communication, Arts & Social Sciences

The team designed and built SunSPEC 5 over a 20-month period – from December 2015.

SunSPEC 5 is Singapore Polytechnic's fifth solar car, and its second two-seater model. Designed and built completely in-house, SunSPEC 5 resembles a futuristic saloon car – albeit one powered by solar cells and batteries. In contrast to the polytechnic's previous solar models, SunSPEC 5 is designed to perform similarly to a standard commercial car in terms of speed, seating capacity, and range.

Incorporating leading-edge technology throughout its engineering, many of the car's features out-perform commercial variants. For example, SunSPEC 5 weighs a mere 330kg (unladen) – a quarter of an average 1.6-litre car. SunSPEC 5's drag coefficient of 0.13 is more than 2.5 times more efficient than an average passenger car. SunSPEC 5 uses ultra-low rolling resistance tires which are 6 times more efficient than regular car tires. The car is Singapore Polytechnic's most technologically advanced and highest performing model to date.

This year, SunSPEC 5 will feature new innovative green technologies, including being fitted with ultra-high efficiency silicon solar cells which are more efficient than those used in 2015. The flexible solar panel encapsulation has very low loss and allows the car to absorb indirect sunlight, thereby maintaining cell efficiency. The flexible solar panel is also able to conform to the shape of car for better aerodynamics. SunSPEC 5 is equipped with very efficient Maximum Power Point Trackers to maximise solar array. It is installed with a custom-designed telemetry system to monitor the car's parameters, allowing team to optimise vehicle performance. The car also features a cruise control mode, which reduces driver fatigue, minimises variation in speeds under manual control, and improves vehicle performance.

SunSPEC 5 will be Singapore's sole representative at the World Solar Challenge; and the only team from a polytechnic, competing alongside leading global universities such as Stanford University and the Massachusetts Institute of Technology.

For the second time in Singapore Polytechnic's participation at the World Solar Challenge, the team will be competing in the more advanced Cruiser Class. In this category, teams are encouraged to design their cars based on practicality and marketability for end-users, innovation and energy consumption.

### SunSPEC 5 Key Specifications

<b>Dimensions</b>	5m (l) x1.75m (w) x 1.3m (h, max)
<b>Body</b>	Carbon Fibre Reinforced Polymer (CFRP) body
<b>Motor Drive System</b>	2-wheel drive, powered by two – 1.5 kilowatt high efficiency brushless DC motor
<b>Top Speed</b>	90 – 100 km/h
<b>Drag Coefficient</b>	0.13
<b>Passenger Capacity</b>	1 driver and 1 passenger
<b>Power Supply</b>	122V 15 kW Li-ion battery pack – 5m <sup>2</sup> of ultra-efficient solar array delivering 1kW (peak), less energy than an electric kettle
<b>Unladen Weight</b>	330kg – About a quarter of the weight of an average 1.6 litre family sedan
<b>Driving Range</b>	A single charge provides a range of 500km – enough to drive a journey from Singapore to Malacca and back



### MOU between SP Group and Singapore Polytechnic

With the signing of the Memorandum of Understanding, SP Group and Singapore Polytechnic will collaborate on the following:

- Scholarships / Sponsorships / Book Prizes
- Career and internship Opportunities – To promote a better understanding of the power engineering industry and enhance SP Group’s reputation to the students as an employer of choice
- Knowledge and Information Sharing – Exchange/Sharing of information, knowledge, ideas within the power sector, and Training Experiences in areas of pedagogy and lesson delivery
- SkillsFuture Earn and Learn Programmes
- Jointly Develop and Conduct Courses

### SunSPEC Polytechnic & University Sponsorship Scheme

The SunSPEC Polytechnic & University Sponsorship Scheme is part of SP Group’s strategy to develop a strong engineering talent pipeline. Recipients will secure job placements before they graduate and undergo a customised training programme of theory and on-the-job exposure in critical areas such as electricity and gas planning and operations.

Opportunities are provided for the students through structured graduate development programmes like EDGE and LEAP.

#### Engineering Development for GraduatEs (EDGE) Programme

Recipients of the SP Group SunSPEC University Sponsorship Award will join the EDGE Programme – a ground-up approach to grooming fresh engineers.

Participants will undergo:

1. One-week orientation – Comprises of presentations on SP Group operations, case study discussions, site visits and a leadership and team building programme.
2. Customised one-year structured training – Includes a series of blended training of theory-based lessons, attachments to different parts of the value chain and on-the-job

training to accelerate the learning process of new engineers in transmission and distribution operations.

3. Two 2-year job rotations to critical operations of the business.

4. Sponsorship to attain Professional Engineer Certification.

#### **Learning Through TEchnical Accelerated Programme (LEAP)**

The LEAP programme sees fresh polytechnic graduates undergo a series of structured blended training which consists of theory-based lessons and on-the-job training, tailored to build a strong technical foundation.

1. Foundation Training – Topics include overview of Singapore's electricity and gas network, safety, first aid, customer service excellence

2. Core Technical Training – Courses to deepen technical foundational knowledge

3. On-The-Job Training which is aimed to complement classroom training – paired with experienced mentors to perform key operational duties

## Annex 4

### Key Terms in Chinese

SP Group	新加坡能源集团
Singapore Polytechnic	新加坡理工学院
World Solar Challenge	世界太阳能汽车挑战赛
Steven Chew, Senior Lecturer, Singapore Polytechnic	周来杰, 高级讲师
Seow Jing Woon, Diploma in Mechatronics and Robotics, Singapore Polytechnic	萧锦文, 机电与机械人工程文凭
Amelia Champion, Head, Corporate Affairs, SP Group	Amelia Champion, 企业事务主任
Lee Kok Kin, Deputy Director, SP Group	李国坚, 副主任
Leow Wei Lin, Technical Officer, Gas Operations, SP Group	梁维麟, 技术人员, 网络运作