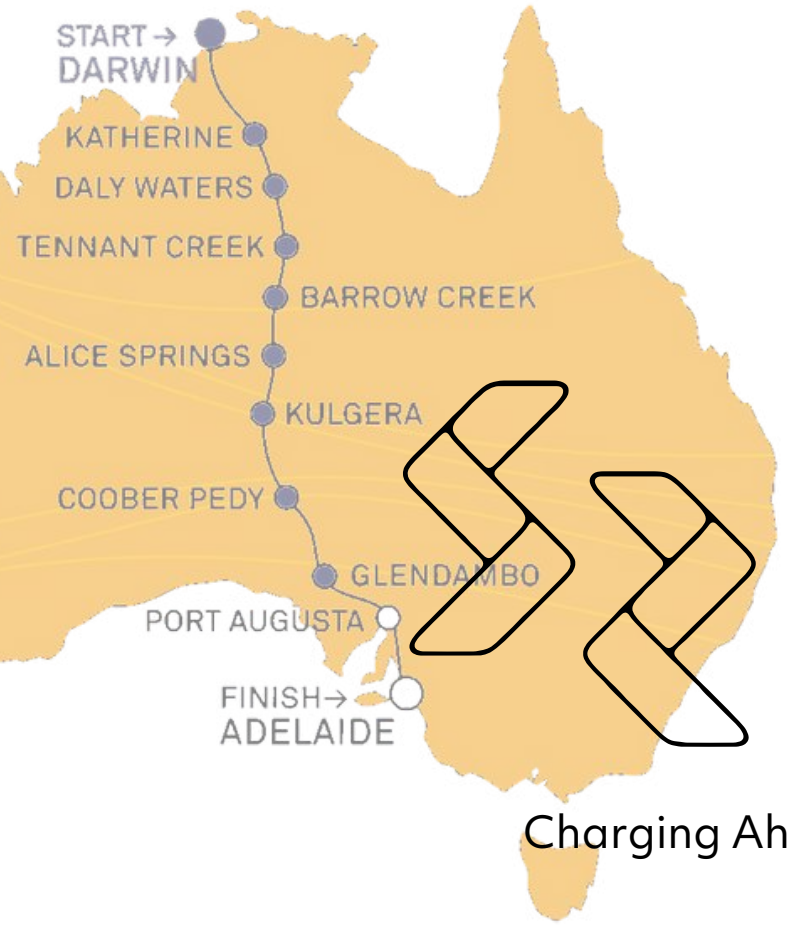
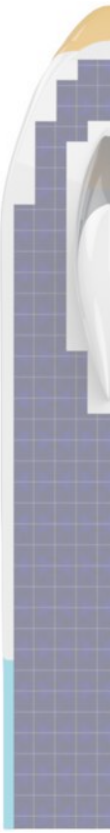


DCU SOLAR RACING

Charging Ahead | 2024/25

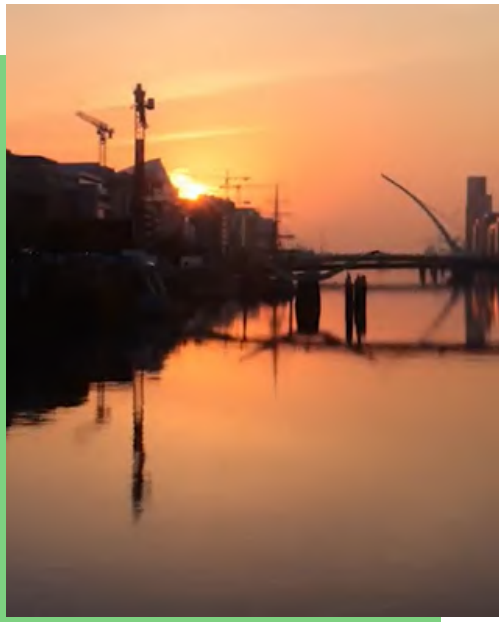


Jump to...

About DCU SR

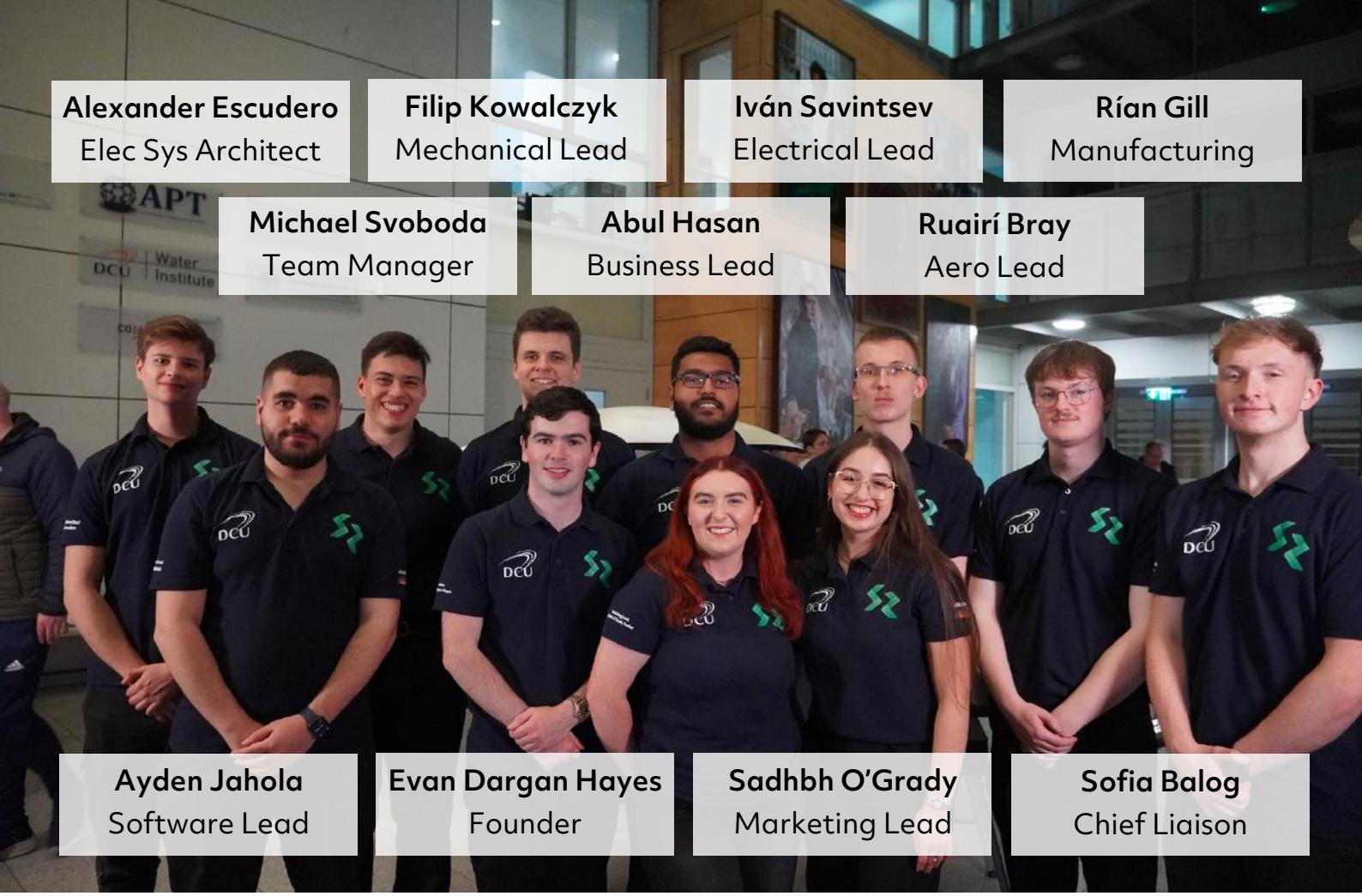
Introducing DCU Solar Racing

We are a student team from **Dublin City University**, building **Ireland's first solar-powered racing car** to race at global solar racing competitions, such as **the Bridgestone World Solar Challenge** and **the iLumen European Solar Challenge**.



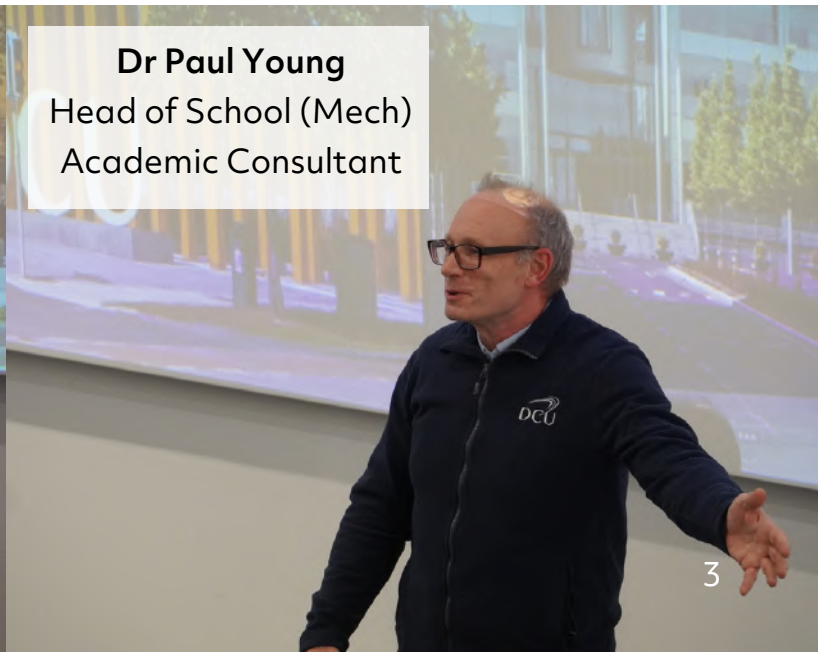
Powered by the sun

Solar racing is an engineering discipline that involves the **design, construction, and competition** of vehicles powered by solar energy, all while navigating high-pressure environments. It is the seamless union of **electrical, mechanical, and software engineering**, with a steadfast focus on maximizing efficiency, all in the pursuit of innovating sustainable energy solutions.

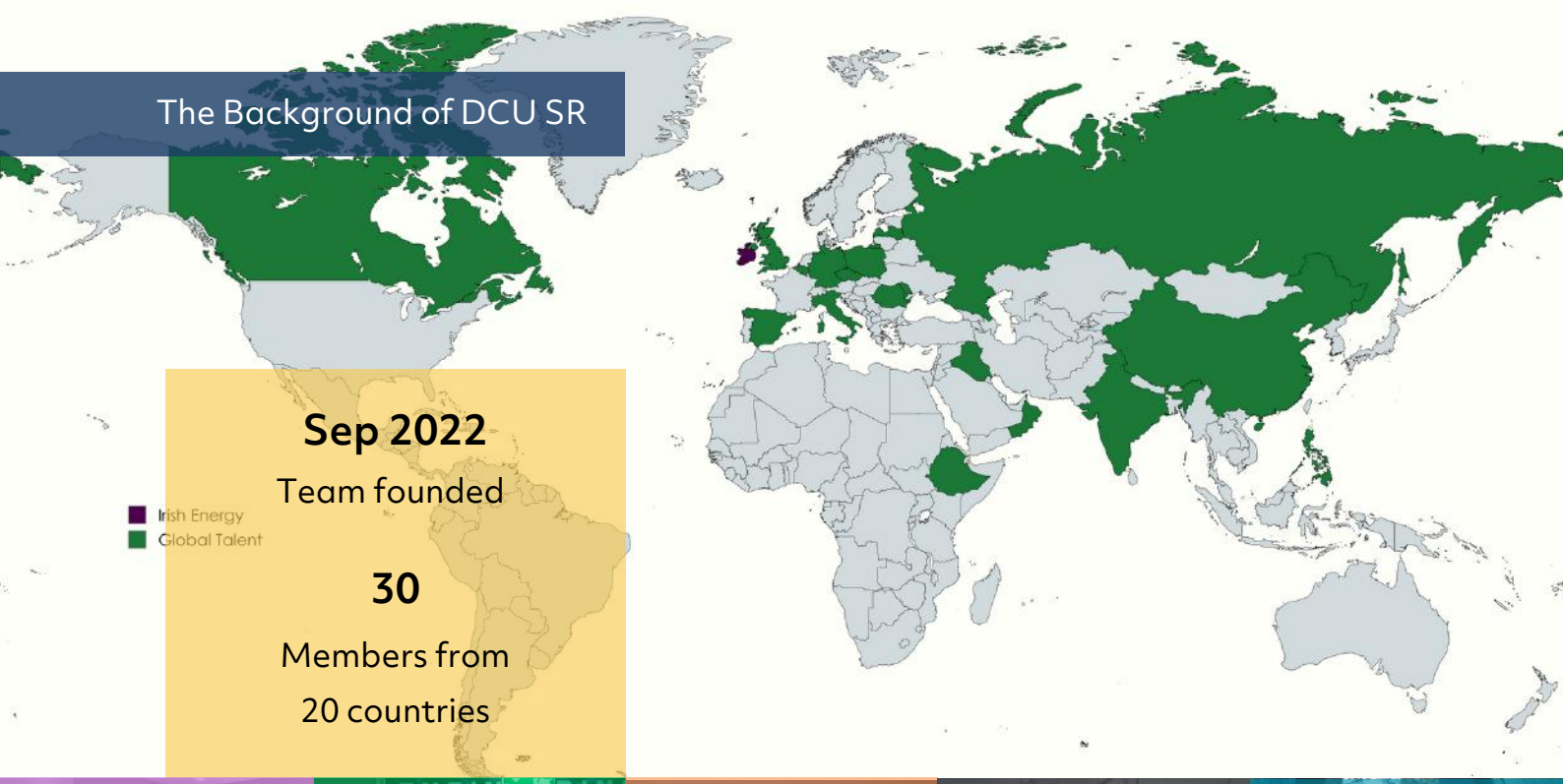


Bottom-up

The team is incorporated within the **DCU Faculty of Engineering and Computing**. The university provides technical and marketing help, permanent access to cutting-edge facilities and robust academic support. The team is **entirely student-run** and cultivates its **own domain expertise** related to the competitions, as well as relationships with relevant suppliers and manufacturers.



The Background of DCU SR

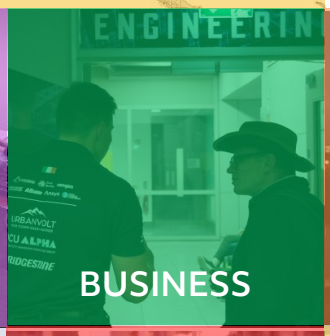


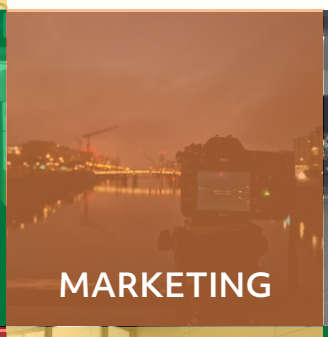
Sep 2022

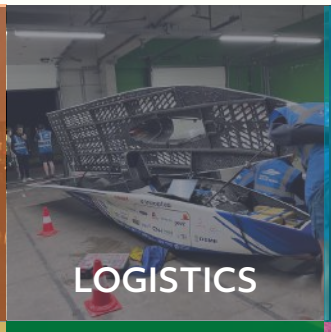
Team founded

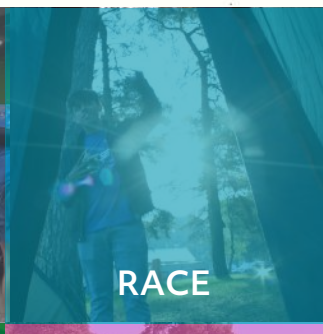
30

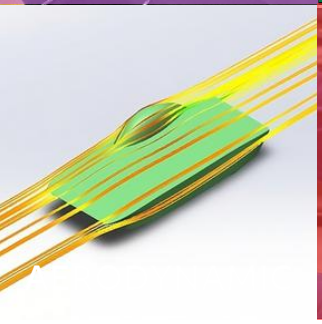
Members from
20 countries

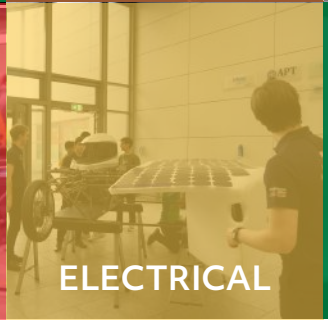












DCU
Dublin City University

Media Production Society

Redbrick
DCU's Networking Society

Nurturing Future Leaders

A foundational part of our team is **mentorship. The team develops expertise through iterations of design, testing, and racing. We share this expertise across years, departments,** and **degree programmes,** looking towards the future. Diligently passing on the hard-earned experience is our greatest strength.

"We'll push Ireland's innovation onto the global stage and show that DCU is the place to be for engineering in Ireland."

— Evan Dargan Hayes
Team Founder (DCU SR)

"The top competitive teams develop their solutions from the ground up, which then become introduced to the industry. This is the level we are seeking to reach, and the reason why the team must learn, iterate and improve long after each of us graduates. "

Michael Svoboda —
Team Manager (DCU SR)

"...we're hosting an event by the end of January in Morton Stadium to show off our work."

"Will you invite me in a personal capacity? I'd be honoured to be there."

Simon Harris, TD —
The 16th Taoiseach

— Rían Gill
Head of Manufacturing (DCU SR)

Competition #1

iLUMEN EUROPEAN SOLAR CHALLENGE

The Endurance Race

The **iLumen European Solar Challenge** is a biannual 24-hour-long endurance race taking place on the former F1 track of **Circuit Zolder, Belgium**. International teams build solar-powered race cars to compete in reaching **the greatest distance** over the race period. The competition selects for the most efficient energy use aided by **a lightweight design, AI systems & race strategy**.

2016
First iESC

24 h
Race duration

3 x 60 min
Max allowed charging time

1359 km
Winner's final distance (2024)

16
International teams (2024)

The Long Run

The next two races are set to take place in **Aug 2026** & **Aug 2028**. These will share the regulations of the BWSC 2025 & 2027, so teams can build one vehicle and improve its systems between the competitions, making use of the time and resources already invested in the car.

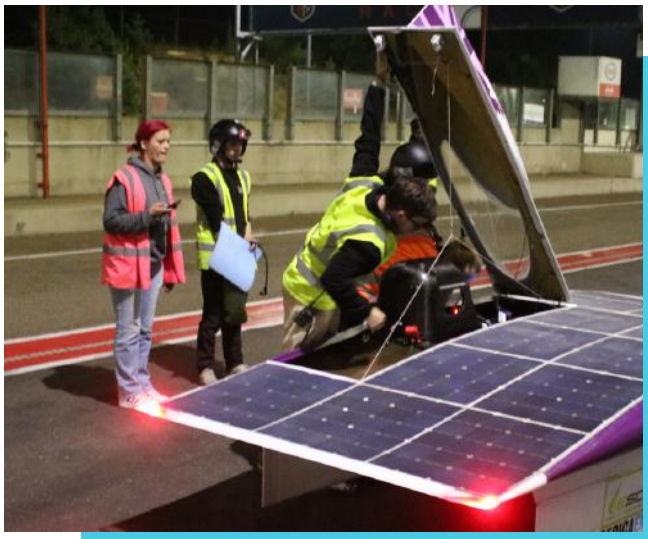
Putting together the Bridgestone World Solar Challenge of **2025** & **2027** and the iLumen European Solar Challenge of **2026** & **2028**, DCU Solar Racing will compete in **all four events.**

Harnessing the Sun

The temperate Belgian climate forces teams to adapt to irregularly clouded, **less powerful sunlight**. Ireland & much of Europe share these conditions, **extending the consumer application** of the solutions developed for this race.

Innovating on the Clock

Teams are improving **all aspects** of the car's complex renewable energy system to gain an edge over each other. The competition pushes each engineer to combine technical skill with **efficiency, teamwork and cohesion** under pressure. The event produces engineers ready to take on the immense real-world challenges of bringing us toward **a sustainable future**.



International teams at iESC

Competition #2

BRIDGESTONE WORLD SOLAR CHALLENGE

The Journey of 3000 km

For 30 years the Bridgestone World Solar Challenge has been challenging students to create a car that will travel across **the 3000 km journey** from Darwin to Adelaide **using only solar power**. The race represents the pinnacle of modern engineering, pushing the boundaries to spur **innovation in handling green energy** and proving the **endurance, power and adaptability** of solar race cars.

1987
First BWSC

50 h
Race time limit

~3,000 km
Race distance

24 (+1!🇮🇪)
Participating countries

25,000,000
Global viewers

The Winding Road

DCU Solar Racing competes in the **Challenger class**, prioritising **speed efficiency** in all aspects of the design. A single driver cuts through the outback each day until 5:00 p.m. The teams then camp in the desert and continue until they **cross the finish line** or run out of the **50-hour time limit**.

The Regulations change **every 4 years** - this cycle emphasizes **milder sunlight, a small battery, and a large solar array**.

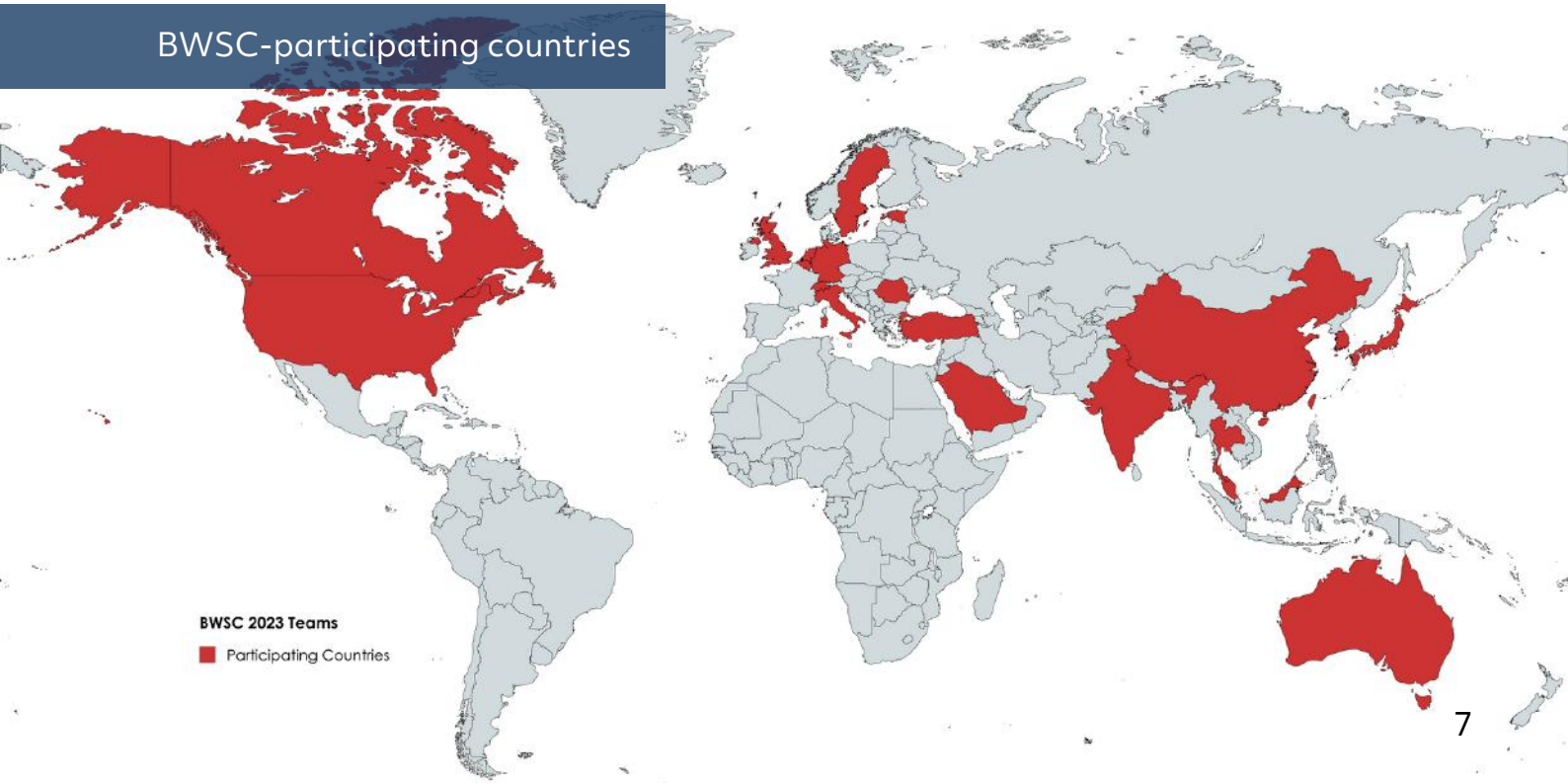
The Highest Standards

The race takes place on public streets and highways, at high speeds. Each solar car must earn **a certificate of roadworthiness**, and pass **static & dynamic scrutineering**, proving the car is safe and fit to compete.

Fighting, Together

In 2023, **31 teams** (university and high school) from **24 countries** took part in the race. Each team and each round of regulations gives rise to unique solutions tested in the competition. The event generates innovation and industry partnerships across **energy, finance, engineering, automotive, material sciences,** and **IT** sectors

BWSC-participating countries



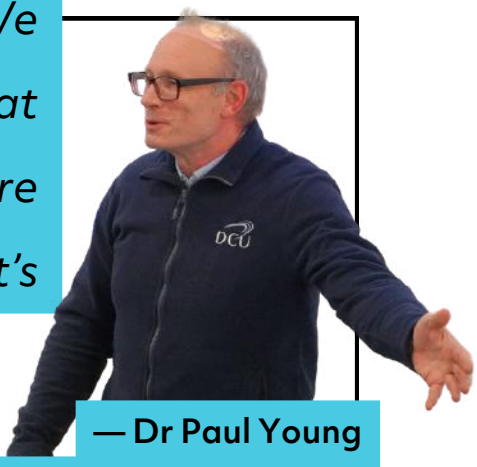
"Over the past couple of years, these dedicated students, faculty, and industry partners have poured their hearts and minds into this project, driven by a shared vision of a future where solar power can propel us forward, revolutionising the way we live in an ever-evolving sustainable world."

— Dr Jennifer Bruton
Exec. Dean of the Faculty of Engineering and Computing (DCU)

"This is a seed and you're leaving a legacy that students will hopefully benefit from over the next several years ."

Prof Stephen Daniels —
Head of School of Electronic Engineering (DCU)

"You're the people who make us proud. We get inspired by you. We rely on the skills that you bring to the table. Because you're delivering this. Not DCU, not the sponsors, it's [the team], together."



— Dr Paul Young
Head of School of Mechanical Engineering (DCU)

Car & Innovation

Not Quite F1

Compared to F1 vehicles, solar cars are **~4x lighter** and have a **~150x less powerful engine**. And while the car can achieve a top speed of **130 km/h**, the most successful race strategy consists of driving slower part of the time to take in **more solar energy**.

130 km/h
Max speed

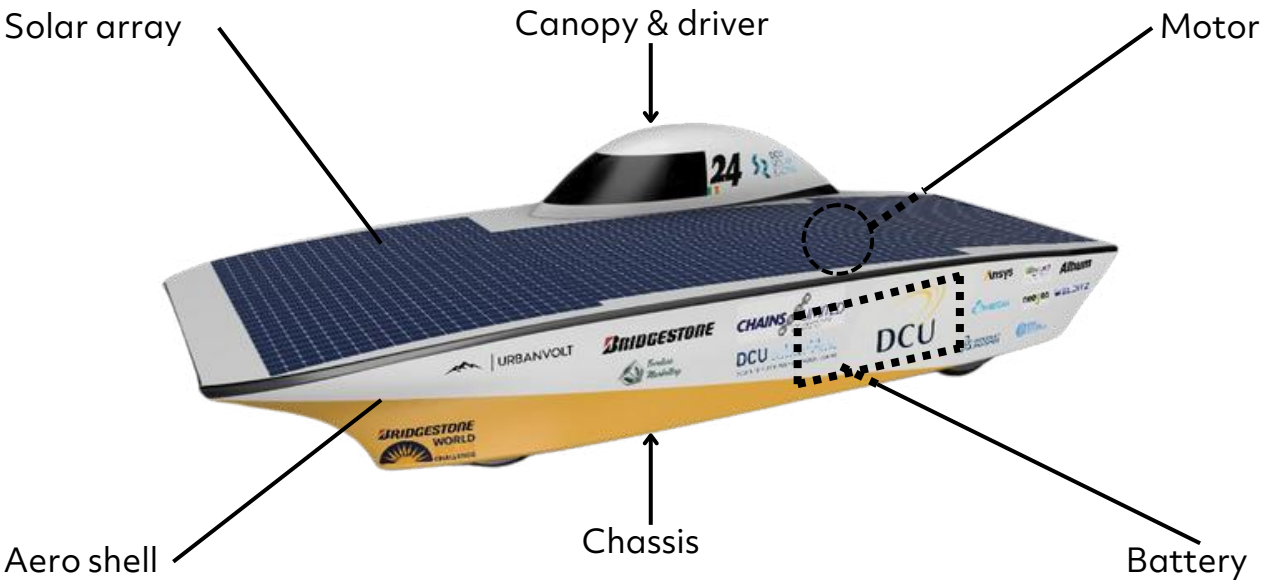
6 m^2
Solar array area

3 kWh
Battery capacity

~250 kg
Total weight (incl. driver)

Regulations

The event regulations of the current four-year campaign allow a **large solar collector** and a **small battery capacity**. They also move the date of the Australian race to a winter month - **August.** This forces the cars to become better adapted to **milder climate**.

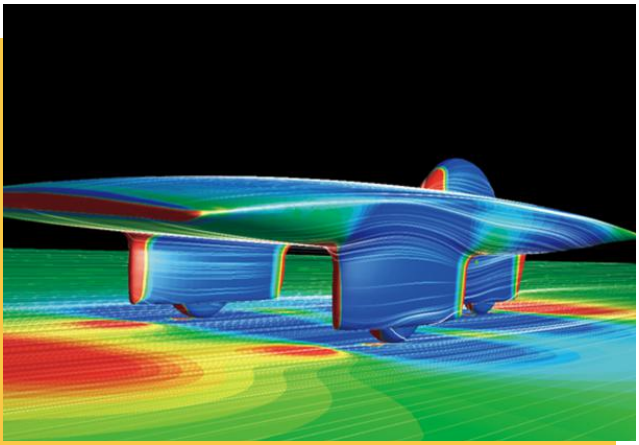


Mechanics & Aerodynamics

100 m^2	**< 0.18**	**5.8 m x 2.3 m x 1.65 m**
of layered carbon fibre	aero drag coefficient	size limit
170 kg	**4**	**70 pages**
total weight (excl. driver)	number of wheels	of race regulations

The Backbone

The race places the structure of the car under conflicting demands of becoming **ultra-light**, yet **robust**. This favours materials like **aluminium, carbon fibre** & **foam,** machined into the slimmest, safest shape for weight reduction.



Aero Optimization

The catamaran-shaped aeroshell of the car makes **the greatest difference in performance**. Designing its shape is an iterative process of both computer-based and real-world wind tunnel testing for every possible combination of **wind angle, speed and temperature**.

Mechanical Safety

Before the car is allowed to compete, its full safety documentation must be **approved by a chartered engineer** and submitted to the organisers for review. The car must then be granted a **license of road-worthiness** and pass a set of **scrutineering challenges** before it is admitted on the starting line.

Electronics

> 24.4%
solar cell efficiency

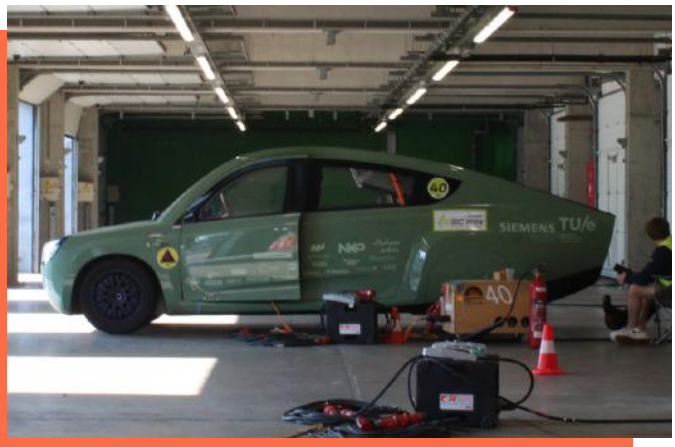
11 Mj
battery capacity

> 95%
motor efficiency

386
solar cells, in **3 strings**

10x per second
battery data reporting

Temp Sensors
for every **2** cells

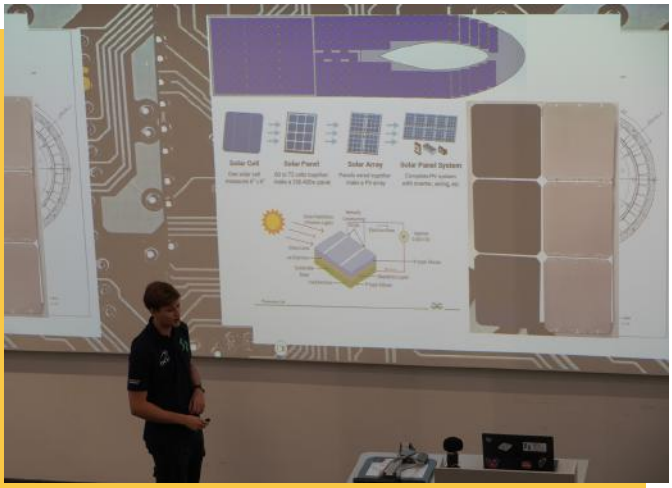


Power

The high-voltage systems must safely harness as much solar energy as possible and convert it to speed with **minimal losses**. This is aided by advanced systems such as **Maximum Power Point Trackers**, a **Battery Management System**, or **regenerative braking**.

Network

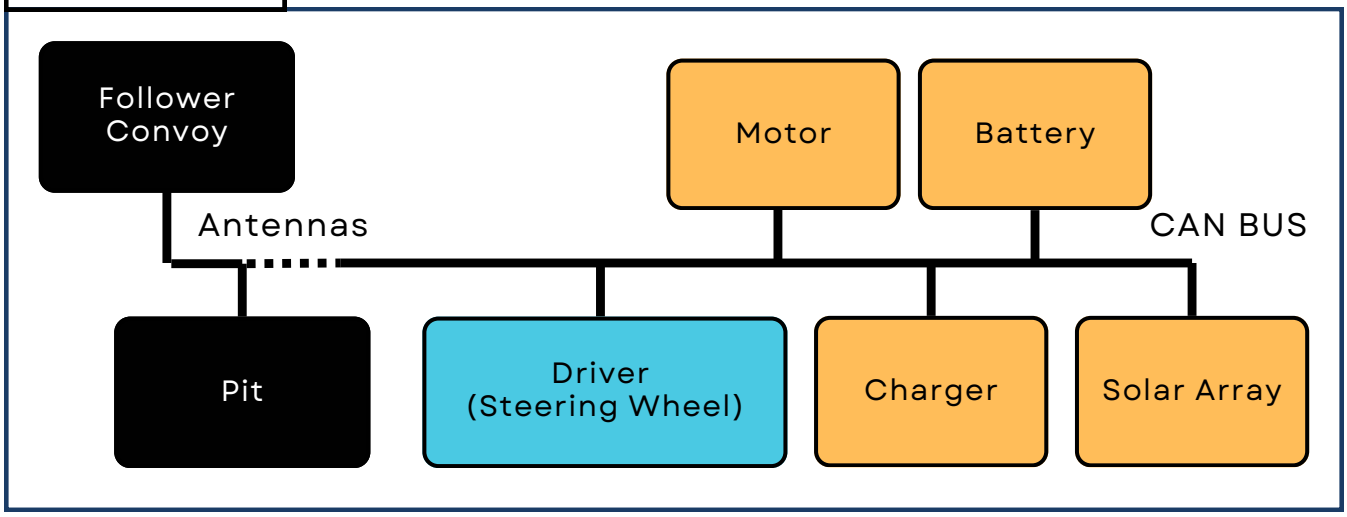
The car's power and driving systems generate a high volume of telemetry data. They communicate with the driver via the vehicle **CAN BUS** and send data to the pit and the follower convoy.



Electrical Safety

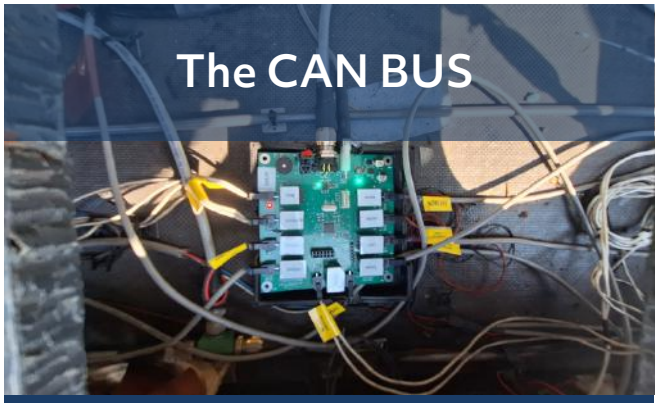
The most crucial mandatory feature is the **Battery Safe State** - in case of an emergency, the battery must be **isolated** from the car and the electrical system must be **shut down**. Each high-volt system has built-in safety components and real-time telemetry to prevent **overheating, surge current** etc.

Software



Measuring vehicle performance in real-time gives the solar car its **competitive edge**. Effective development, testing, and race energy management depend on the intelligent handling of **telemetry data** gathered from each system. Both the car and the driver rely on a support network linking each node, as shown above.

The CAN BUS



Like in a typical race car, all the onboard systems communicate via the **Vehicle CAN BUS -** the Driver via **Steering Wheel -> Motor -> Battery (& Charger) -> Solar Array**.

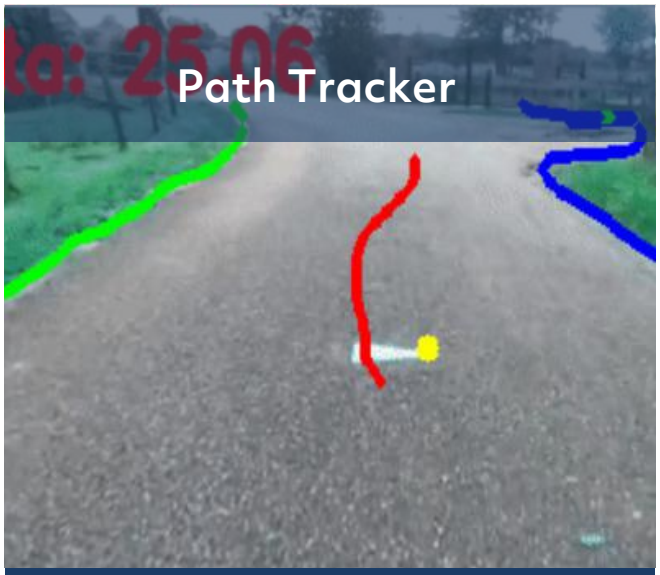
The CAN BUS now connects a network of compatible **off-the-shelf microprocessors** which will later by upgraded into **PCBs**.

Race Telemetry

During the Bridgestone World Solar Challenge, the car maintains a **wireless two-way communication** with the vehicle's **CAN BUS,** Ie. its systems - these numbers are crucial for **race strategy, safety**, & **analysis**.

At the iLumen European Solar Challenge, **the Pit** becomes the target, just like in a Formula E race.

Path Tracker



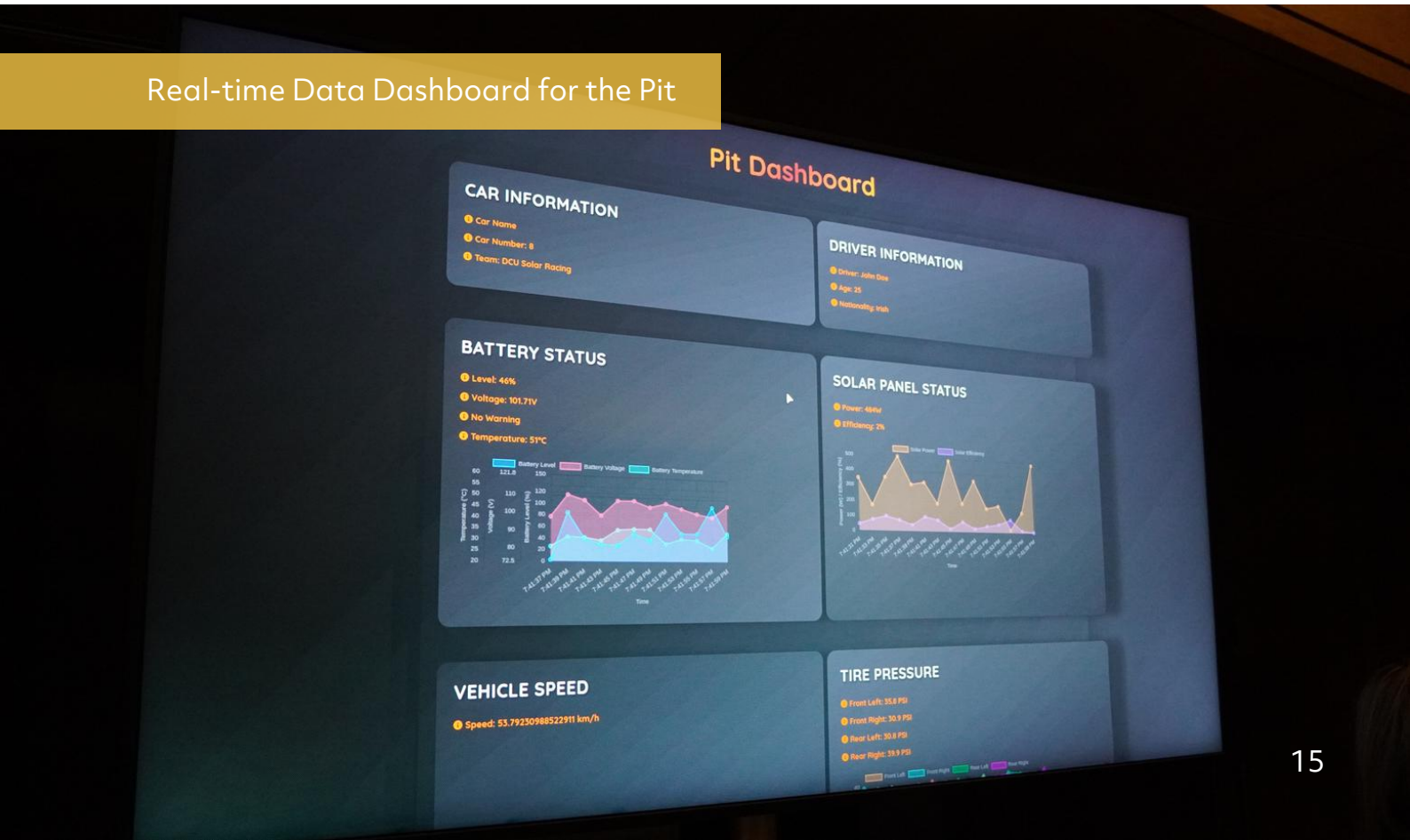
Linekeeping is an essential skill both in Australia and on a circuit. Using a **computer vision system**, the car is capable of projecting an optimal path through the complex race landscape, even under **poor visibility conditions**. This helps mitigate risks of damage or injury.

Fatigue Detector

Our car uses cameras with **AI image processing** to monitor key indicators of fatigue, such as **eye movements, blink rates,** and **head positions**.

This scanning for signs of drowsiness or lack of focus enables **efficient** and **safe driver management.**

Real-time Data Dashboard for the Pit



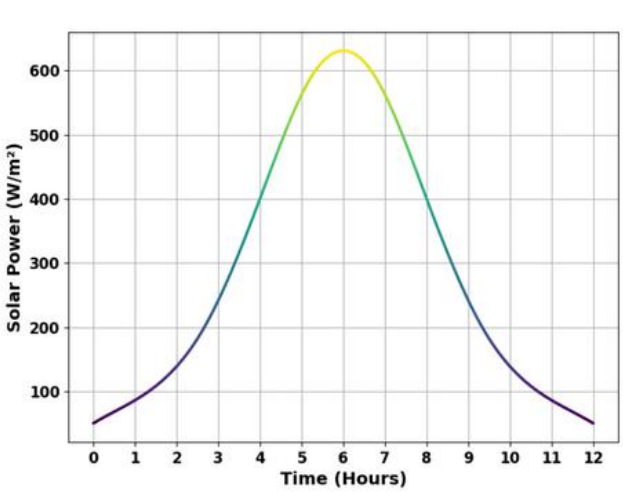
Strategy

The **faster** a solar racecar drives, the quicker it **depletes its stored energy**. It is often better to drive at a moderate speed to take advantage of **peak sunlight hours** by accumulating as much solar energy as possible.

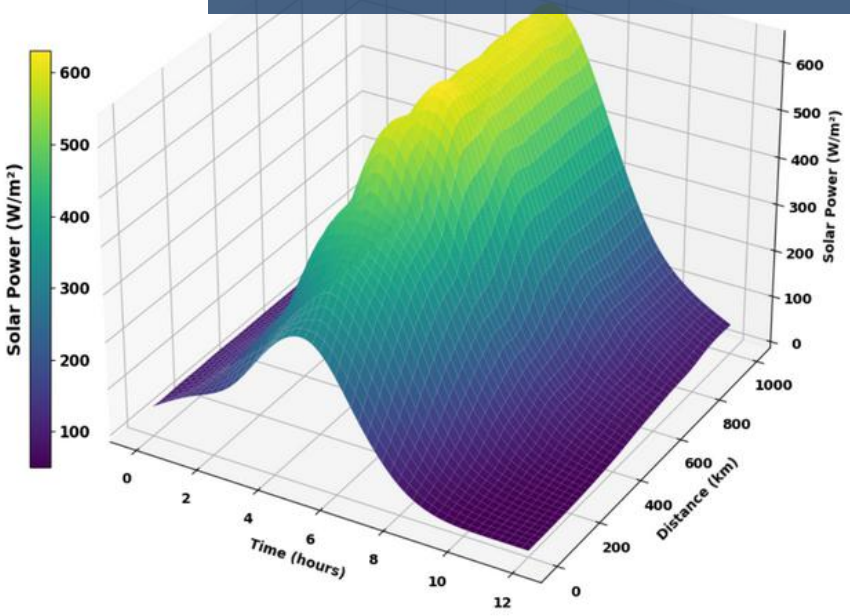
The amount of gained solar power depends on **the local climate** and **weather** at the time - this is the case of the **iESC race circuit**, as shown **below on the left**.

As the car crosses 3,000 km in Australia, it faces **changing climate conditions**. Thus each **Distance (km)** in the graph on the right has its own profile. The Strategy team combines this data with the car's **real-time battery reporting** to determine **the optimal speed** for any given point of the adventure.

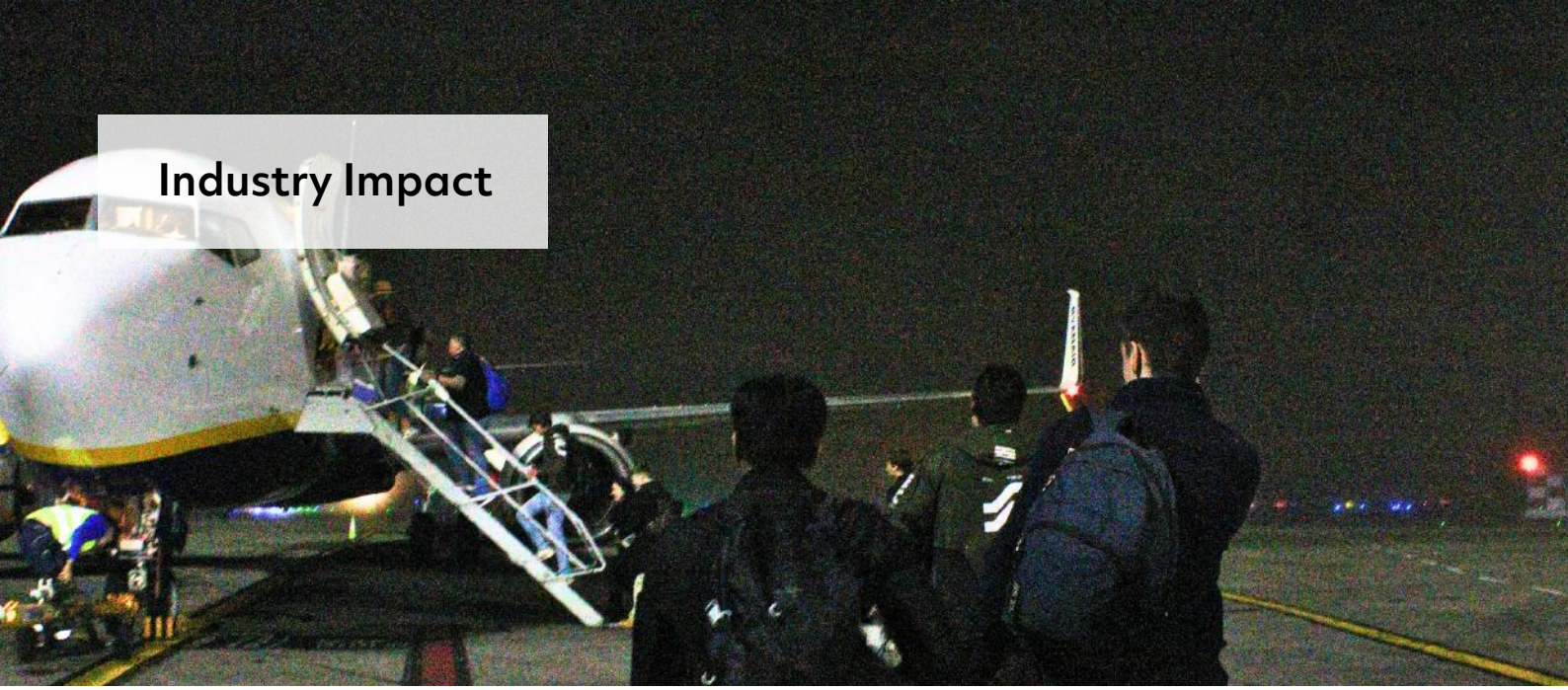
Irradiance Profile (Circuit)



Irradiance Profiles (Outback)



Industry Impact



Solar Panels

The Regulations always impose a Solar Array **area limit**. This has driven the teams to develop and use increasingly **more efficient cells** - and when the space-grade GaAs cells were banned, this innovative focus shifted to cheaper, non-toxic cells.

Energy Storage

All electric vehicles greatly rely on the efficiency of the **Energy Storage system.**

The progress made in **telemetry, temperature management** and **high-voltage safety** continues to influence the design of **EVs.**

Aerodynamics

Of all systems, **the Aero shell** has the greatest impact on the speed of the vehicle.

The Solar Challenges serve as **a testing ground** for new ideas in this space, such as **shark skin**.

Materials & Structures

With a total car weight of **~170 kg**, every system responds to competing demands to remain robust while becoming lighter and smaller. This leads to both innovative, replicable uses of **new materials** and to ubiquitous **weight reduction** strategies.

"Together, we're not just building a solar car, we're driving the future of innovation in Ireland and beyond."

— Mary Gray
Marketing Manager (UrbanVolt)

"Working with the team, I'm absolutely amazed at how mature and how engaged and how resourceful all of the team have been."

Colm Conyngham —
Marketing & PR Manager (Bridgestone Ireland)

Timeline & Deliverables

The 2024/25 Campaign

Both competitions are run in **4-year-long cycles**. Each cycle shares a set of design regulations which determine the properties of the solar car. This means that **a car built for the 2026 iESC will also be allowed to enter the next two competitions.**

The iLumen European Solar Challenge in September 2026 will be DCU SR's first race. The team successfully **unveiled the Alpha prototype** of the solar car on the 8th of October. The next build milestone is a demonstration of a **race-ready car** on the **Mondello Park circuit in May 2025.**

May 2025
Mondello Park Scrutineering Demo

September 2026
iLumen European Solar Challenge

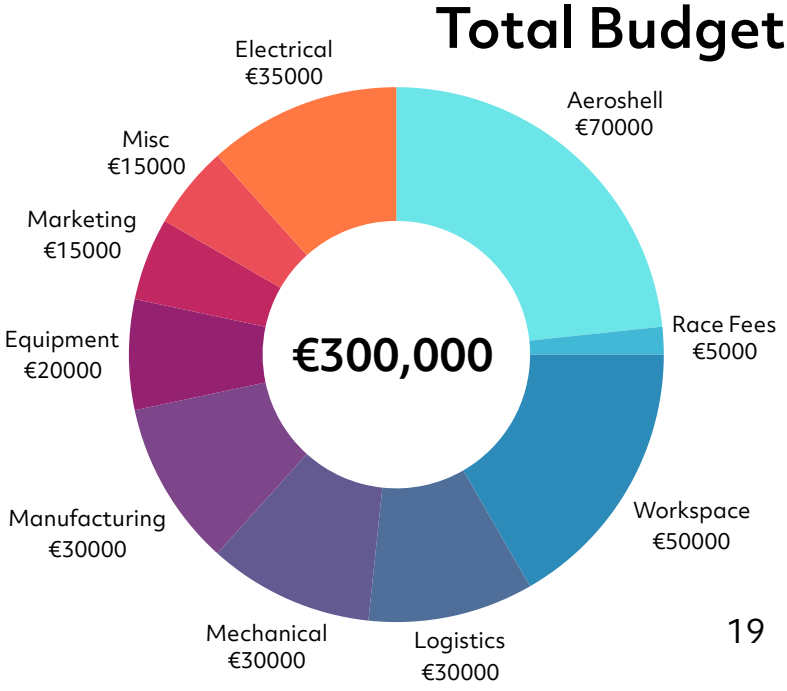
August 2027
Bridgestone World Solar Challenge

September 2028
iLumen European Solar Challenge

Budget Breakdown

The total budget of the 2024/25 campaign year is **€300,000.** This includes the costs of all components, manufacturing and race logistics. **Most invested resources remain useful throughout the next 2 races, as the rules are compatible.**

Total Budget



DCU & Partners

Purposefully Different

DCU Solar Racing thrives on nurturing lasting relationships with its partners. Our university is a young, flexible, **modern tech hub** with a diverse pool of talent and well-developed technical facilities. Here, the team connects the school's **19,000 STEM and Humanities students** with **expert technical and academic staff**, a **large alumni network** and its own private **Partners**. This powerful alliance makes DCU the perfect host for Ireland's first solar racing team.

The full-time team members are self-selected for their **initiative**, **teamwork**, **ambitious attitude** and **stubborn persistence**. To our Partners, they make for a demonstrably **more experienced**, **collaborative, more valuable** talent pool.

Welcome to the Family

The team recognises its Partners as our most valuable asset and takes care to include them in multiple promotional events in each campaign, such as the Prototype Unveiling, an **Endurance Run Fundraiser,** the **Mondello Park Scrutineering Demo**, and the final race.

Partner Impact

Press Release | Bridgestone Ireland

Bridgestone Ireland have released a press release (link in title), signaling their expertise and community involvement to the industry.

Irish Media Reach | Futureproof (Newstalk), Ray D'Arcy Show...

The early interviews were conducted on shows with 224,000 and 68,000 daily listeners - linked further.

Event Announcement | Niedax Group

Niedax (who sponsor Bayern Leverkusen) have shared our unveiling internally as part of their newsletter, which includes their major suppliers across Europe.

Team Documentary | Urbanvolt

Urbanvolt are recording a reserved-rights behind the scenes documentary of our project which will be used as both a case study and also for marketing purposes

Every Step of the Way

The team carries its partners and their brand through **every event** on **all merchandise, uniforms, banners, visual materials and the car**. The prominence and benefits of each partner corresponds to their level of support, as outlined on the next page.

Current Team Partners

DCU Ollscoil Chathair Bhaile Átha Cliath Dublin City University

DCU ALPHA
DUBLIN CITY UNIVERSITY INNOVATION CAMPUS

URBANVOLT

BRIDGESTONE

CHAINS LIMITED
LIFTING EQUIPMENT TESTING & SAFETY SINCE 1960

Timeless Marketing

Snickers WORKWEAR

HULTAFORS GROUP

teg

IRISH GARAGE EQUIPMENT

WELDITZ

Benson ENGINEERING
bringing business together

NIEDAX

global

Hybrid Technology Partners
Technology Experts in Streamlining Business

Altium

Ansys

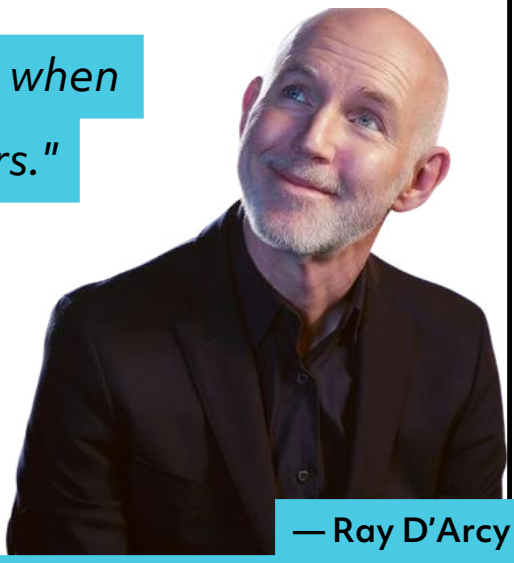
neogen

DASSAULT SYSTEMES

Sponsorship Tiers

Title Partner (please inquire)	*Diamond tier benefits plus:* Naming of car / shared team name 'Drive the car' events (subject to availability pre/post BWSC event) Additional tailored benefits
Diamond €50,000+	*Platinum tier benefits plus:* Designated section on the website Use of solar car for company events (subject to availability pre/post BWSC event) Corporate talks / Outreach support
Platinum €25,000 - €49,999	*Gold tier benefits plus:* Meet and greet events with the team Limited access to the solar car (subject to availability pre/post BWSC event) Tailored promotion at the campaign events
Gold €10,000 - €24,999	*Silver tier benefits plus:* Access to CVs of team members (s. to agreement) Logo and description on the team website Personal social media exposure
Silver €5,000 - €9,999	*Bronze tier benefits plus:* Logo on team uniform Logo and hyperlink on the team website
Bronze €2,000 - €4,999	*Supporter tier benefits plus:* Logo on solar car Logo on the website
Supporter Below €2,000	Acknowledgement on the team website Invitation to launch events & our grateful thanks!

"There will be a time in the future (...) when people will be driving solar-driven cars."



— Ray D'Arcy
Host of the Ray D'Arcy Show (RTÉ)

"It's so cool! It's such a cool idea. I didn't study science or engineering, but that would make me go: 'I wanna be a part of this project'."

Jonathan McCrea —
The *Futureproof* Podcast Host (Newstalk)

Audience and Media

50+ million
YouTube views ("Lightspeed")

20+
competing countries

30 years
of BWSC Races

7 days
race duration

100s of Partners
associated with BWSC

21+ million
global BWSC audience

The Irish Brand Presence

Being Ireland's **first solar racing team** with a long-term growth strategy and a robust local network for support and recruitment attracts media attention. In Ireland, **our supporters' brand presence** is channelled through these along with the digital media of the team and the university.

Our Partners connect with our audience best through numerous **real-life team events** such as **Faculty Open Days, Scrutineering Demos**, or **Webinars** within the broader green tech community.

The Global Scope

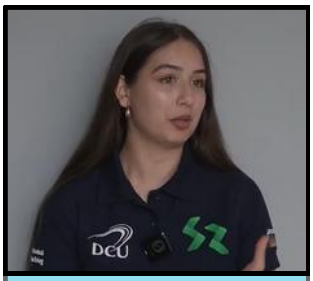
The competition's popularity has surged, following a documentary series with **50 million YouTube views**. As a result, participants, media coverage, and reputable sponsors continue to grow each year. The BWSC now attracts a global audience of **over 20 million fans** each season.

Past Appearances

This page contains the catalogue of DCU Solar Racing media appearances to date. The status of the **first Irish team** with a **unique focus on smart computer-vision assistant systems** means this list will keep expanding as the team crosses the upcoming visually appealing milestones:

1. The **endurance run fundraiser** in January 2025
2. The **scrutineering & driving demo** of a race-ready car in March 2025
3. The team's **first Bridgestone World Solar Challenge** in August 2025

Interviews



Team Intro
Alpha Trailer

Ray D'Arcy show (RTÉ)

Futureproof (Newstalk)

Radio Kerry

Articles

DCU

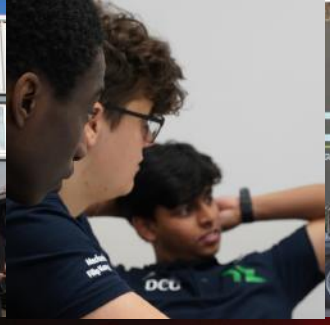
Engineers Ireland

Made in Ireland

Killarney Advertiser

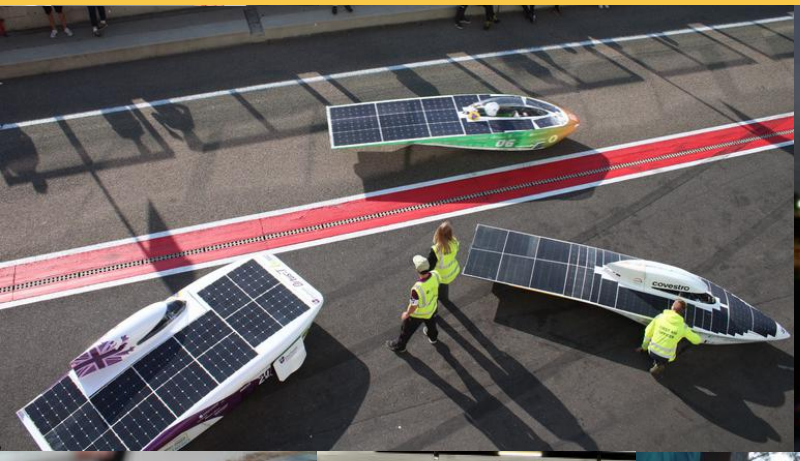
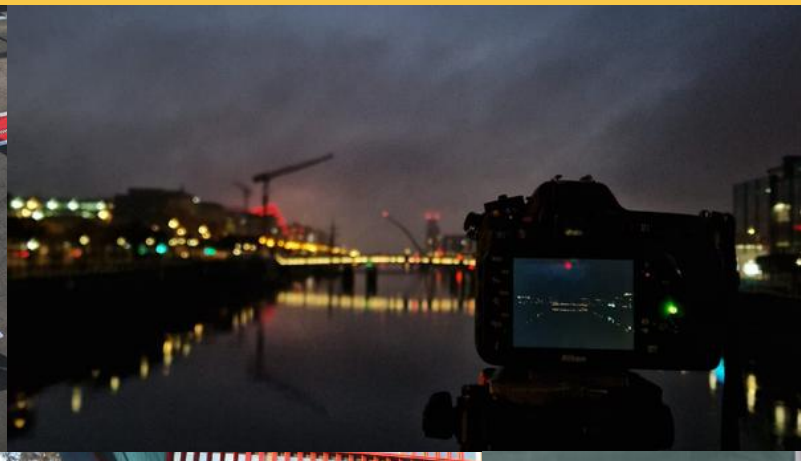
SR Originals

Gallery | LinkedIn | Instagram | Website

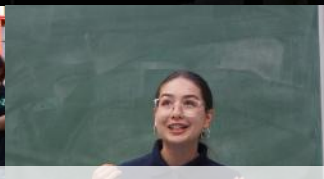





Join us on our mission to create and keep a hotspot of **exceptional engineering**, **applied sciences** and **creative spirit**, solving the challenges of **sustainable transport**.




DCU
SOLAR
RACING

Charging Ahead | 2024/25