

Priority Topic Area: Excellence in Education, Skills and Training

1 – Our Purpose

XE01 uses the University of Exeter's first fully electric Formula Student car as a live educational platform, developing research and technical skills in electric powertrain design, sustainable materials selection, and systems thinking. It also tackles an inclusion challenge by creating a multidisciplinary environment where women are actively welcomed into technical and leadership roles. Alongside building the car, we are extending impact through IMechE-linked outreach, school engagement across Devon, Cornwall and Somerset, and collaboration with Exeter College. The deliverable is therefore not only a vehicle, but a repeatable model for training future engineers in sustainable, inclusive and modern-day industry-relevant practice.



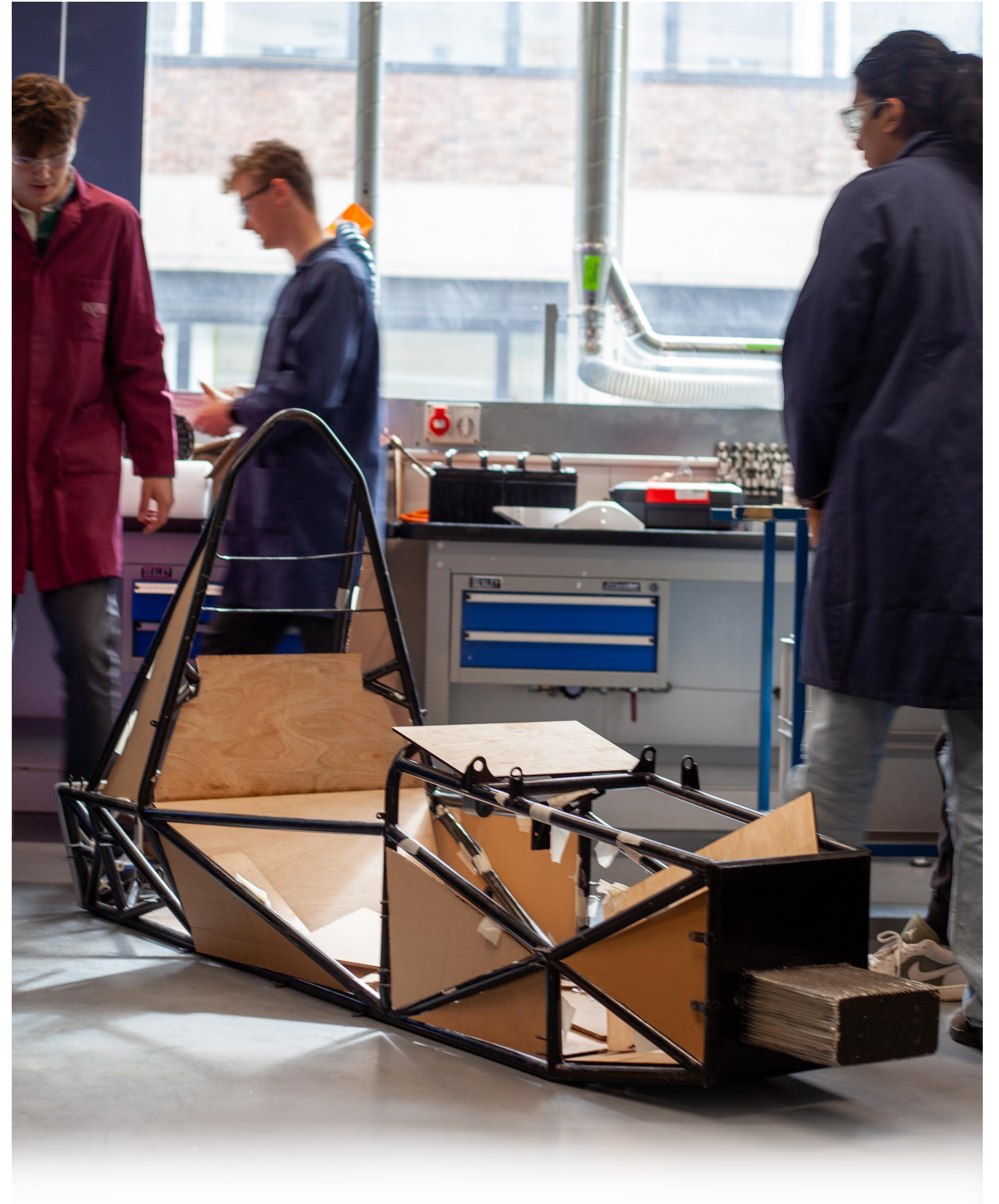
3 – Impact

XE01 has already created a strong educational pipeline. Internally, the project engages a multidisciplinary cohort, showing students, how modern engineering depends on collaboration between technical and non-technical disciplines. The team has developed practical understanding of lifecycle assessment, embodied carbon, energy density, thermal risk, end-of-life recovery and critical material dependency through research comparing Lithium-ion, Nickel-Metal Hydride and Lead-acid systems. We have also investigated hemp-fibre-reinforced composites as a lower-impact alternative to conventional carbon fibre, helping students understand how sustainability now shapes everyday engineering design choices. The programme has strengthened female participation, with more than one third of leadership and technical roles held by women, significantly above older Formula Student participation figures (11%) often cited for the sector. Externally, outreach links with IMechE have opened opportunities for STEM lessons and career talks in schools across Devon, Cornwall and Somerset, extending the project's educational value well beyond the University.



5 – Next steps

Next, we will deepen our outreach with IMechE and local schools, continue material testing and sustainable design research, and carry these findings into manufacture, competition and future XElectric cohorts so that XE01 becomes a lasting educational platform rather than a one-year project.



2 – Methodology

Our approach combines applied engineering with deep research. Team members from engineering, computer science, geography, business, and English work through design reviews, research tasks, procurement decisions, testing plans and technical documentation. Sustainability is embedded as a design criterion, not an afterthought, through research into battery chemistry, rare-earth-free propulsion and hemp-fibre composite bodywork. Professional development is reinforced through accredited electrical safety training with Exeter College, guest-led business plan sessions and outreach partnerships with IMechE. This multidisciplinary model allows students to learn technical analysis, communication and collaboration while applying classroom knowledge from different subjects to a real, complex engineering system.



4 – Benefit to society

XE01 benefits society by preparing engineers who can design with sustainability, safety and inclusion in mind. Students learn that engineering decisions now carry environmental, social and supply-chain consequences, and that sustainable design is becoming a normal professional expectation. The project also broadens participation by showing young women and school pupils that engineering is collaborative, creative and open to them. Through outreach, industry partnerships and public-facing content, XE01 promotes cleaner transport technologies while helping build a more diverse and socially aware engineering pipeline for the South-West and beyond.