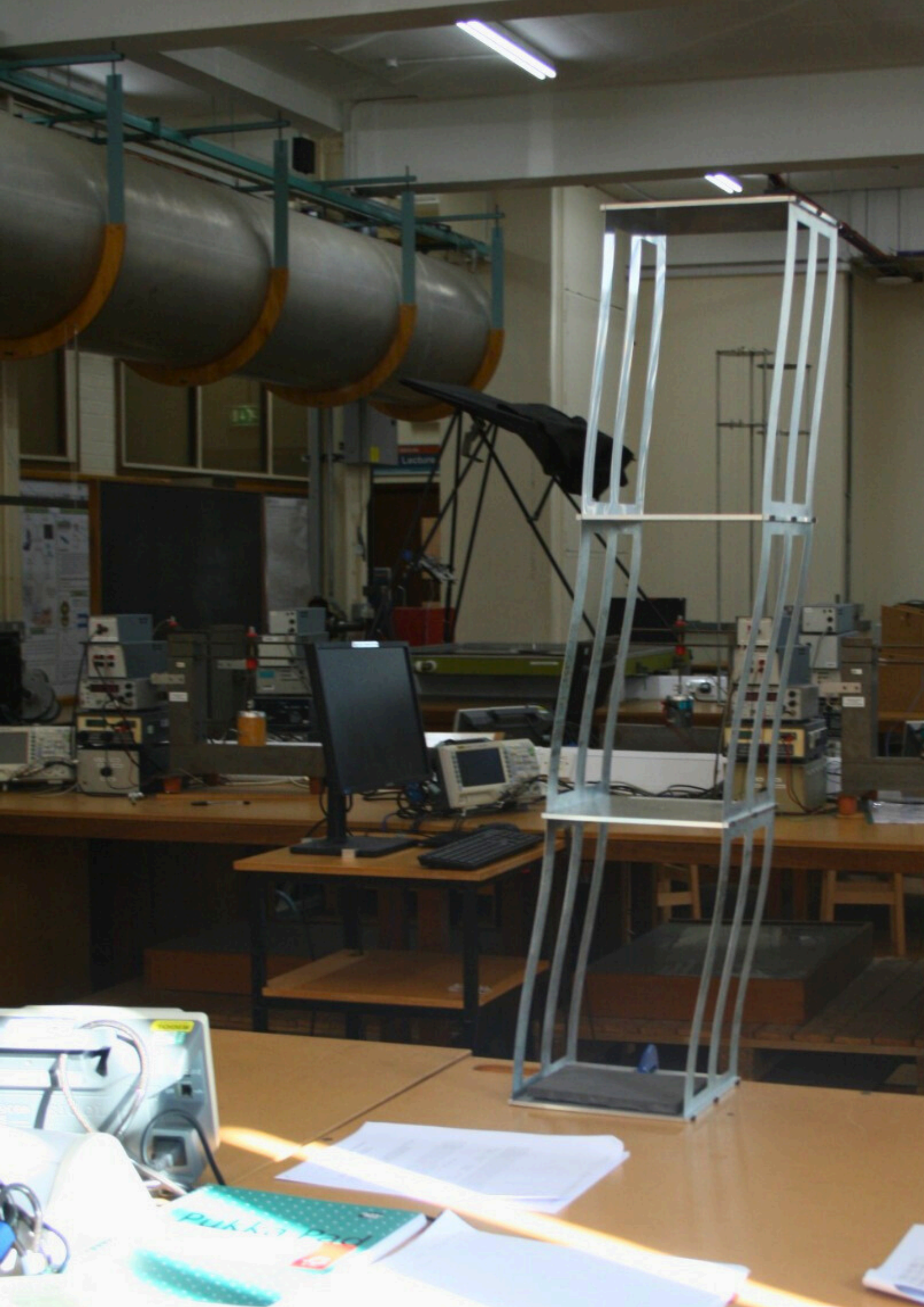
THE CAMBRIDGE ENGINEER

FEBRUARY 2026

CUES



CONTENTS

NOTE FROM THE EDITOR

ARKAPRIYA DE
4TH YEAR, TRINITY HALL

It has been a privilege to working on this magazine. To be entrusted with a publication that serves as a platform for the student body, a showcase for our incredible engineering societies, and a representation of CUES' valued sponsors is a responsibility I have not taken lightly. It has been a humbling experience to help convey the narratives of so many inspirational people and teams, and I sincerely hope that as you turn these pages, you feel the same sense of awe at the work and research carried out by our peers as I did throughout this process.

From the moment I took the helm of Magazine Editor, I knew the theme for this edition had to be 'impact'. It is a word that resonates deeply with who we are as engineers and something we inherently strive to do as humans. In this magazine, you will find the winning entries from the annual CUES Magazine Article competition - our top three articles discussing 'impact' from three remarkably distinct and thought-provoking perspectives. You will find words of advice and encouragement from graduate engineers at CUES' sponsor firms, generously sharing experiences of what it means to be an engineer in industry. And finally, you will find eye-opening deep-dives into our very own societies, learning about all the fascinating and innovative goals they strive to achieve.

I would like to thank everyone who contributed to this magazine, from the talented students who wrote articles, to the CUES committee who have provided unwavering support throughout its creation. I give special thanks to Arwa Fathy and Saakshi Bhat for their guidance and encouragement, and to Vivek Dherani for sparing a few hours to amble about our engineering department with me, capturing it in its quiet moments on his camera. All of the pictures you see in this magazine (excluding those in the articles themselves) were taken by him or myself. Let them be a reminder that beauty, creativity, and inspiration can be found in the most unexpected places.

On a personal note, working on this magazine has been a fulfilling experience. It's been a unique amalgamation of my love for design, writing and engineering. Looking back to last year's edition, my predecessor Saakshi touched upon the history of the CUES magazine - a heritage reaching back to the 1920s or 1930s. Reflecting on that legacy, I've come to think of this magazine not just as a yearly publication, but as a way to pay homage to Cambridge Engineering as a whole - the community that brings us all together in the first place, students and academics alike.

Thank you for picking it up. Happy reading!

NOTE FROM THE PRESIDENT

IBSHAR OISHI
4TH YEAR, MURRAY EDWARDS

Impact has been the guiding principle behind my aims as CUES President this academic year. For me, impact is not only about scale, but about depth - strengthening the identity of CUES and building a community that feels genuinely connected. Within committee, new roles were introduced to ensure seamless planning between different teams to avoid disconnect in organisation and ultimately building closeness within different departments of CUES.

From a professional development perspective, I set out to expand the scope and quality of our networking system. This meant creating events that reflected the full breadth of engineering - from established industry leaders to emerging sectors and actively developing affiliations with companies across diverse types of engineering and consultancy. By broadening our partnerships, we have strengthened the pathways between students and industry, ensuring that CUES is a meaningful bridge between education and professional practice.

A second priority was interconnectivity. Cambridge engineering is rich and multidisciplinary, yet students can often operate in parallel rather than together. We have worked to deepen collaboration with CLIC and CUED, delivering more inter-departmental initiatives that reflect the interdisciplinary nature of modern engineering. Externally, I have taken deliberate steps to elevate CUES' identity beyond Cambridge - initiating collaborations with Imperial College and other engineering societies, including joint events with other university STEM societies. These partnerships position CUES as a recognised and respected counterpart within the wider UK engineering community.

Internally, impact has also meant inclusion. With a significant postgraduate population, we have introduced more events designed to foster interaction between undergraduate and postgraduate cohorts, strengthening vertical integration within the department. The return of the Engineer's Café has been particularly meaningful in this regard - not only as a space for academic dialogue, but as a visible commitment to accessibility and belonging. My aim has been to ensure that CUES is a safe and welcoming space for students of every background and interest.

Finally, our international engagement has expanded our global footprint. Collaborations such as our Berlin engineering trip with BMW, and our forthcoming China Trip, demonstrate our ambition to position Cambridge Engineering confidently on the international stage.

Through these initiatives, my goal has been clear: to ensure CUES leaves a lasting, positive impact - on its members, on the department, and on the wider engineering community.

HOW WE CAN CREATE IMPACT BEYOND BIG TECH HUBS

An engineer's journey in the South of Italy from research to patent to responsible entrepreneurship

Written by Gaia A. Bertolino, December 2025

ENGINEERING IMPACT IS NOT JUST ABOUT BREAKTHROUGH ALGORITHMS — IT IS ABOUT WHO BENEFITS, WHERE INNOVATION HAPPENS AND HOW TECHNOLOGY MOVES FROM IDEA TO REALITY.

I grew up and studied in Southern Italy, a place that is often described through what it lacks rather than what it offers. Many students leave as soon as they can, convinced that serious opportunities exist only elsewhere — in the North, abroad, or in global tech hubs. Staying is rarely framed as a choice; more often, it is seen as a limitation. And yet, it was precisely this background that shaped me as an engineer and ultimately made it possible for me to pursue opportunities I once thought were unreachable, including my current studies in Cambridge.

Choosing to stay in the South during my early academic years was not easy. Resources were scarcer, research ecosystems smaller and pathways into industry less visible. But what I found instead was resilience, creativity and a strong sense of responsibility toward community. I learned to build with constraints, to collaborate across disciplines and to see technology not as an abstract exercise, but as something deeply tied to people's lives. Looking back, those lessons mattered far more than access to cutting-edge infrastructure.

THAT PERSPECTIVE FUNDAMENTALLY SHAPED HOW I APPROACH ENGINEERING TODAY.

As a computer engineer specialised in artificial intelligence, I was initially fascinated by models, metrics and performance benchmarks. Like many students in AI, my early work focused on optimising accuracy, efficiency and scalability — important goals, but largely detached from the realities of everyday users. The turning point came when I began working on technology that would not live on a server or in a paper, but would instead be worn on someone's face, integrated into daily life.

This shift led to the creation of **Visionary.AI**, a startup I co-founded with the goal of developing next-generation smart eyewear for wellness and everyday use. The idea was conceived during the "L'Oro di Calabria" Summer School, an environment that brought together students, researchers and mentors to think about innovation in a regional context. What started as a technical concept quickly became something larger: a reflection on how AI could move quietly into daily routines, supporting well-being in a preventive rather than reactive way.

Wellness technologies are often discussed in terms of apps, dashboards and notifications. Smart eyewear offers a different paradigm — an invisible interface that blends seamlessly into daily life. For me, this raised new engineering questions: how do you designI systems that are helpful without being intrusive? How do you balance personalization with privacy? How do you ensure that technology empowers rather than overwhelms?

ANSWERING THESE QUESTIONS REQUIRED FAR MORE THAN WRITING CODE.

One of the least visible but most impactful stages of this journey was the patenting process. Winning the Studio Rubino Prize at Start Cup Calabria 2025 provided us with financial and legal support to begin patenting our technology. Until then, patents had felt distant — something handled by lawyers, not engineers. In reality, the process forced us to articulate our ideas with precision, to think critically about novelty and to translate technical intuition into structured claims.

Patenting, I learned, is not a bureaucratic obstacle to innovation; it is a bridge between research and real-world deployment. It demands clarity, collaboration and long-term thinking.
It also exposes the many systems operating behind the scenes to turn an idea into impact: legal frameworks, institutional support, mentorship and interdisciplinary dialogue. Engineering does not happen in isolation and impact certainly does not.

Crucially, we made a deliberate choice to keep this innovation rooted in Southern Italy. Visionary.AI aims not only to develop technology, but to contribute to an ecosystem — creating opportunities, retaining talent and showing that meaningful innovation does not have to originate in Silicon Valley, London, or Milan. Decentralising technological development is itself a form of impact. It challenges the assumption that certain places are destined only to export talent, never to host it.

This choice is personal. The education I received in the South laid the foundation for everything that followed. Being in Cambridge today is not despite that background, but because of it. Engineering gave me mobility, but it also gave me responsibility. Giving back is not an act of nostalgia; it is an investment in the next generation of engineers who might otherwise feel compelled to leave before they even begin.

Engineering with impact, I have come to believe, is not defined by scale alone. It is defined by intention. It is found in technologies that address real human needs, in processes that connect ideas to society and in choices that recognise the value of place and community. Sometimes, impact is not loud or immediate. Sometimes, it looks like a quiet pair of glasses, a patent application drafted late at night, or a startup choosing to grow where few expect it to.

And sometimes, impact begins simply by deciding to stay — and build — where it matters.

WHAT INDIA'S DAIRY CRISIS TEACHES US ABOUT REAL IMPACT

Written by Sanya Kapoor, based on interviews with Abhishek Jain, Director at CEEW and Ruchira Goyal, Programme Associate at CEEW and their research paper "Securing climate, livelihoods, and nutrition outcomes of India's dairy sector."

India's dairy sector is an intriguing one. It's the world's largest milk producer, supporting 80 million farmers and contributing 5% to national GDP. Though it accounts for 7.5% of India's greenhouse gas emissions, milk consumption is deeply inequitable (the top 30% consume half the country's milk while the bottom 30% get only 15%), and climate change threatens the entire system. Technically elegant solutions exist. But as I discovered interviewing researchers tackling this crisis, technical excellence is just table stakes.

A Cambridge alumnus, Abhishek Jain, Director at the Council on Energy, Environment and Water (CEEW), one of India's leading think tanks driving policy change in the world's largest democracy and Ruchira Goyal, Programme Associate at CEEW, embarked on an ambitious and thoughtful intervention in India's dairy sector. Their project in the Indian state of Madhya Pradesh uses participatory systems modelling to simultaneously improve farmer livelihoods, reduce emissions, and enhance nutrition security. Their work directly informs state policy roadmaps.

But the path there looks nothing like a Part IIB project.

CHOOSING PROBLEMS: PRAGMATISM OVER INNOVATION

"It has to be out there already, but struggling – where there's societal benefit waiting to be unlocked," Abhishek explains when I ask how they choose projects. CEEW focuses on interventions that exist but are fragmented or underperforming.

Around 70-75% of their projects are conceptualised internally, deliberately designed around existing policy levers. The remaining 25-30% come as external requests, often by the government. But project selection also accounts for the political economy of the subject. The technically-best solution and the implementable solution are rarely the same.

SYSTEMS THINKING REVEALS BRUTAL TRADE-OFFS

For their dairy work – just one example of the breadth of problems CEEW tackles – they build causal loop diagrams and stock-and-flow models across diverse producer typologies in Madhya Pradesh.

Ruchira describes their approach: "We use systems thinking tools like the iceberg model of change to build strategy." But here's what makes it work: they bring farmers, policymakers, and researchers into the same modelling process. Primary surveys, focus groups, stakeholder consultations – it's slow, resource-intensive, and depends entirely on sustained engagement.

Their analysis reveals the novel insights: Over the last 20 years, 35% of India's milk production increase came from buffalo yield improvement, 26% from increasing crossbred cattle population. Shifting to high-yielding exotic breeds reduces emission intensity by up to 60% – but these breeds are more vulnerable to heat stress and resource scarcity. Suitable in large commercial farms with temperature-controlled sheds. Highly risky for smallholders who would struggle to afford veterinary care during heat waves.

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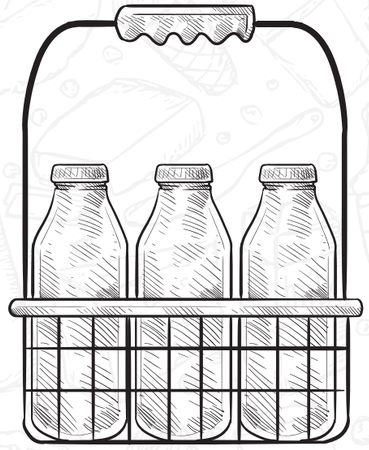
Ration balancing can reduce emission intensity by 31% while increasing per-animal absolute emissions by 13%. Sex-sorted semen accelerates genetic improvement but might actually increase total emissions by expanding the female population. Anti-methanogenic feed additives like Harit Dhara reduce emissions by 17-20% while improving yields – but only if adopted at scale, which requires convincing millions of risk-minimising smallholders who keep cattle for various reasons and not merely for profit maximisation.



Every intervention has unintended consequences. This is what systems thinking teaches: there are no simple solutions, only trade-offs waiting to be understood and navigated.

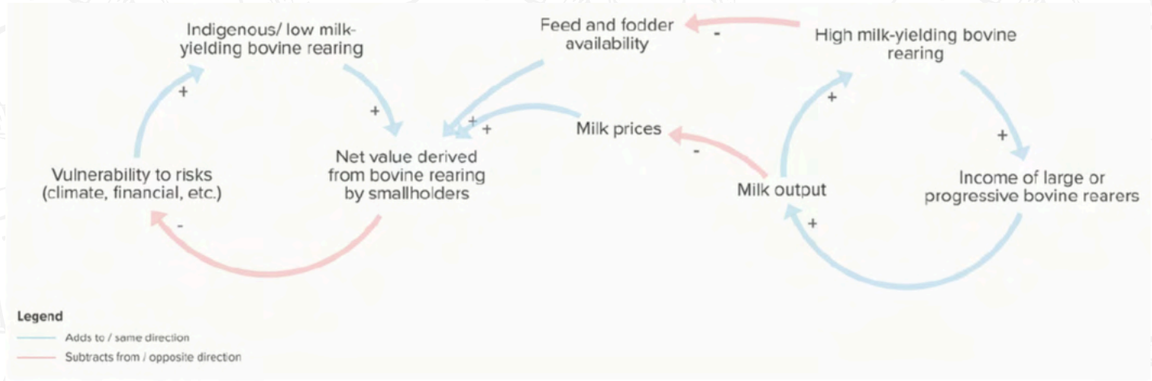
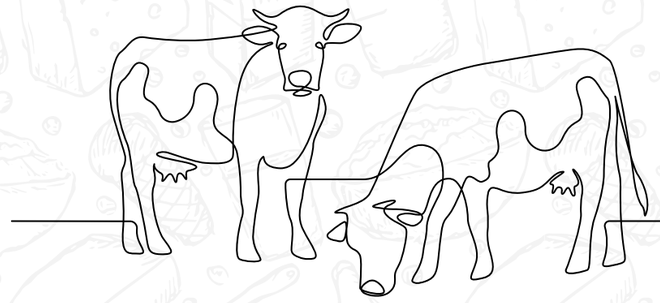


Figure 1: A causal loop diagram depicting how climate mitigation strategies promoting larger herd-keeping create a reinforcing cycle of success for high-yielding bovine rearers

THE TIMING TYRANNY

"Timing is critical in policy think tanks," Abhishek tells me. Their work on critical minerals started in 2015, struggled to find relevance for years. Today, it's central to India's strategic planning. The technical insight didn't change – the geopolitical context did. The idea of maintaining technical rigour while waiting for the suitable policy or political moment feels impossibly difficult – yet it's essential for real-world impact.



"GOOD ENOUGH" BEATS "OPTIMAL" EVERY TIME

When CEEW reaches out to government with proposals, Abhishek says they do so "with strong perseverance." A good policy only works when it aligns with bureaucrats' immediate risks and constraints, not just environmental benefits.

Recommendations must be implementable, defensible, and politically viable. This often raises the billion-dollar question: **where's the line between pragmatism and complicity in a democratic system?**

PARTICIPATION ISN'T OPTIONAL – IT'S THE PRODUCT

Their participatory modelling doesn't just gather data; it creates buy-in. When farmers see their constraints reflected in the models, when policymakers understand feedback loops, implementation becomes possible. But this approach is nearly impossible to scale nationally without massive institutional support.

Figure 2: CEEW conducting on-ground participatory research

This might be CEEW's most radical innovation: recognising that the process of developing a solution is as important as the solution itself. But even more impressive is CEEW's culture of "daring to fail" and its internal annual award. They've moved beyond rhetoric to institutionalise support for experimentation through concrete practices. They don't just tolerate failure – they expect it as part of learning what works in complex policy environments.

It is hard to know where we may land between Cambridge's technical perfection and CEEW's strategic pragmatism. But refusing to choose between them is the point.

Somewhere in that uneasy middle lies the future of engineering with real impact. The world does not need more optimised solutions that die in journals – perhaps it needs engineers willing to work in the messy, political, deeply human space where change actually is waiting to happen.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THE ENVIRONMENTAL BENEFITS OF INDUCTION HOBS

THE PHYSICS OF INDUCTION HOBS

Below the surface, coils of wire carrying alternating current produce a changing magnetic field as a consequence of its changing electrical field (Faraday's Law). This magnetic field induces a voltage in the pots and pans (since they are made of a conductive material) and the electrons within them try to move in response to this voltage. Heat is generated as the electrical resistance of the pan opposes the flow of electrons and converts their kinetic energy into heat. As a result, your pan heats up, while the stove stays cool save for conduction from contact with the pan. This way, almost all the electrical energy that goes into the cooktop turns into heat in the pan itself with minimal losses.

AN INVESTIGATION: WHAT IF, INSTEAD OF NATURAL GAS STOVES, ALL HOUSEHOLDS IN THE UK HAD INDUCTION HOBS?

Statistic	Value	Unit
Raw Data		
Percentage of UK homes with a gas stove	28	%
No. of households in the UK	2.86	$\times 10^7$
Combustion emission by-products from 15 mins of cooking	0.14	kg CO_2e
Total time cooking per household per year	17	days
Time spent using stove compared to oven	50-50	
Energy demand of induction hob	1.5	kWh/day
UK grid electricity emissions factor (2023)	0.22535	kg CO_2e kWh^{-1}
Processed Data		
No. of kitchens with gas stoves in UK	8.01	$\times 10^6$
Avg. time spent cooking daily on stove per household	39.37	min
Emissions reduction from switching to induction hob	0.00933	kg CO_2e min^{-1}
Supply-side emissions increase per kWh	0.0424	kg CO_2e kWh^{-1}
Supply-side emissions increase per household per day	0.0636	kg CO_2e day^{-1}
Demand-side emissions decrease per household per day	0.3675	kg CO_2e day^{-1}
Net decrease in UK emissions	0.89	Mt CO_2e yr^{-1}

Table 1: Raw and processed data for carbon emissions calculations

Written by Rajat Kale, February 2026

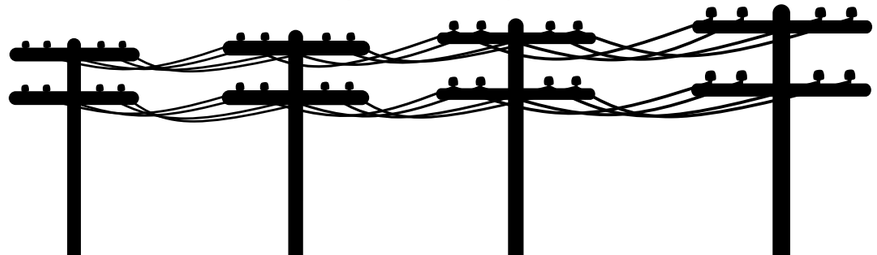
One aspect is that it has been difficult to obtain quantitative data for is the embodied carbon in manufacturing, transport, and end-of-life. Favi et al. (2017)[7] performed related calculations based on a bill of materials of a gas stove and induction hob, and concluded that the induction hob had more embodied carbon during production, although they did not quantify it explicitly. The end-of-life embodied carbon figures were roughly equal, and it was assumed that embodied carbon in transport was the same. However, the conclusion noted that over a typical 19-year lifespan of the 2 products, the overall embodied carbon of the induction hob is lower than the gas stove.

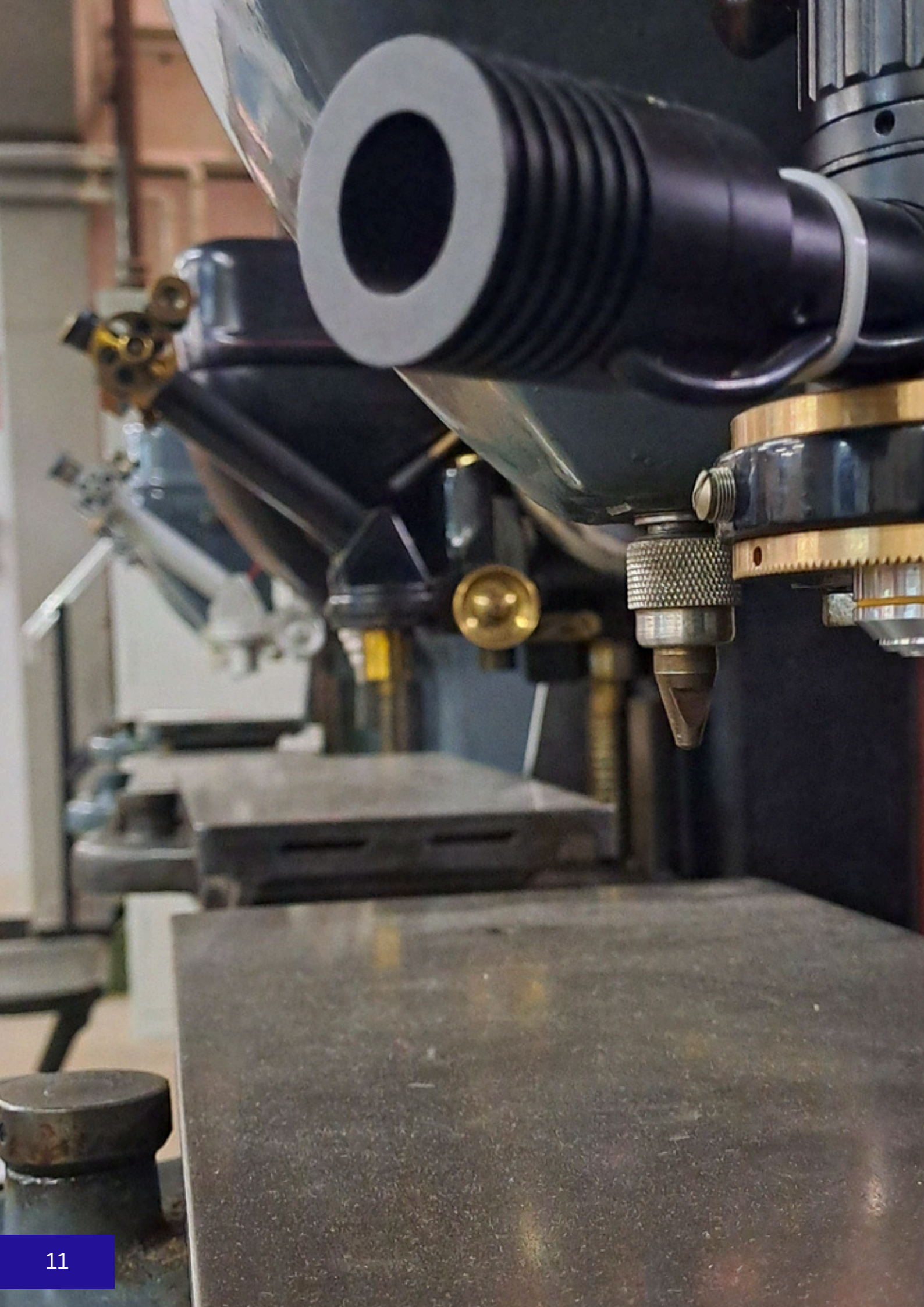
CHALLENGES AND HOW TO OVERCOME THEM

Currently, the emissions from consuming electricity from the grid are still slightly higher than the emissions required to produce, transport and combust natural gas by an amount of 0.0424 kgCO_2e kWh^{-1} [6]. A possible supply-side catalyst for the change would be the continued decarbonisation of electricity generation by growing the capacity of renewable energy sources in line with the government's existing climate targets. Another catalyst could be a decrease in the embodied carbon in manufacturing induction hobs, possibly by manufacturing them domestically to negate the need for international shipping (although this is likely to increase costs in the short-term), or by making the heating element within them more efficient to reduce operational carbon and cost (although current technology is near its limit in this regard).

In terms of demand-side catalysts, the issue boils down to convincing the public to make the switch. The environmental argument will persuade some of them, but to most, it has to have some appeal. There are certain advantages of induction stoves over natural gas stoves: many users describe them as easier to clean, for instance [8]. Modern induction hobs are also quick to heat up, something which used to be a competitive advantage of the gas stove. If the retrofit was marketed as a renovation at a discount, more residents, particularly in older kitchens, would prefer to make the switch.

It is quite likely that if this scheme is publicised exclusively highlighting it in the interest of the climate crisis, the public will only be marginally motivated and supportive of the scheme due to the inconvenience it will entail: not just in the installation and retrofit, but to many, a permanent change in habits and lifestyle. To help persuade people with such a mentality, one possible strategy could be to market it as a health and safety issue: indeed, reducing emissions of the by products of the combustion of natural gas in enclosed kitchens should reduce the user's likelihood of developing a respiratory illness [3]. This marketing technique is also applicable for other mitigation strategies, such as replacing internal combustion engine vehicles with battery powered electric vehicles. Aside from public opinion, this aspect of the solution could also better leverage political capital to increase the likelihood and speed of such a law being approved by parliament.





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MICHAEL ALLAN: A TTP CAREER JOURNEY

AS A CHILD, WHAT DID YOU WANT TO BE WHEN YOU 'GREW UP'? WAS ENGINEERING ON YOUR RADAR?

The first thing I ever wanted to be was probably a firefighter.

AH. A CLASSIC CHOICE!

I'd always enjoyed electronics though. When I was young, my Grandad got me into soldering electronics kits of light-up Christmas trees. I enjoy the tangible nature of engineering. One of my A-Levels was computer science, and I enjoyed software, but when it came to deciding what to do at university, I remember thinking: I want to make stuff. The thing with computer science was that it's all on the computer, it doesn't interact with the physical world. Whereas with electronics and embedded software you drive something real, that you can see moving and lighting up. And that's what I wanted.

THINKING BACK TO YOUR FIRST YEAR AT TTP, CAN YOU REMEMBER WHAT THAT EXPERIENCE OF FINDING YOUR FEET WAS LIKE?

It was over ten years ago since I joined as a graduate, but I remember that in my first week, I jumped straight into a new project to make a capacitive sensor that could detect an attofarad of change with a bandwidth of 100kHz. It was daunting but a great first project with a lot of responsibility... getting in the lab, making rigs that could fling bits of sample between sensors quickly; and building something from the beginning. I soldered that first PCB together myself because I hadn't learnt yet that asking a technician would have been cheaper, faster, and they'd have found it a lot easier than I did! It takes a while to get out of the 'just do it yourself' mindset.

HOW DID YOU GO FROM A GRAD OPERATING ON PROJECTS, TO GRADUALLY TAKING ON MORE PROJECT LEADERSHIP RESPONSIBILITY?

It was probably around 2 years before I ran my first project. It was a helpful stepping stone because the client had worked with us before, and I'd worked on a project of theirs before. They came wanting something else and we split it into two parts – two sister projects I suppose, each with around three people in. I was responsible for designing an experimental rig, doing some testing and characterisation, whilst someone else took on the more physics-y, modelling side.

I remember it being exciting but daunting. The responsibility goes from 0 to 60 quickly. But it was good fun, and the project went well. Around a year later the client came back with more project ideas. And they came straight to me that time. They called me and we talked it through. It wasn't an electronics problem at all, but a materials science, modelling problem. I took the project – sold it and managed it, despite the fact it had no electronics in it at all. And that – managing a team completely outside of my own technical skillset – was really good fun.

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A big step for me was then owning the relationship with a big client. I ran the first phase of a gas leak detection project, and this naturally led on to proposing for the second phase. In parallel with leading the second phase, I was involved in negotiating the licence agreement. It all took a long time, around two years, but overall, the project came in around the £1 million mark.
Towards the tail end of that project, I got involved in leading a part of a bigger programme. Then moving from that, I went into another programme which was twice as big again.

AS THE PROJECTS YOU'RE LEADING GRADUALLY GET LARGER AND MORE COMPLEX, WHAT DO YOU THINK ARE THE DIFFERENT SKILLSETS YOU NEED TO HONE?

Ultimately in big projects, you have to delegate. Giving others the freedom to approach the problem in their way – albeit within the bounds you set of timelines and budget – and trusting them to deliver. Really, it's the same as anything else in TTP: we don't generally tell people how to do things. That just takes a while to get used to if you're new or used to having full control of things.

How what you communicate also becomes important. The way you would communicate in a £150k project with a team of 2-3 people, where you may do an every-other-week client update with 45 minutes walking through the technical progress and 15 minutes on the project management side, is completely different to how you would communicate in a £1 million project.

Also, the bigger a project, the greater the probability of something going wrong. You have to get better at dealing with that.

GIVEN ALL THESE EXPERIENCES OVER THE LAST TEN YEARS AT TTP, WHAT HAS KEPT YOU HERE?

Variety. It's a cliché, but it's true.

I'm an electronics engineer, a firmware engineer, a software engineer. I'm a project leader of electronics projects, a project leader of non-electronics projects. I'm someone who writes project plans, someone who mentors people in the team.

Whatever number of different roles I'm doing today, that picture has changed over time. What I do now bears no resemblance to what I did on that first project I worked on as a grad. Over the years, I've worked on Deep Tech things, Life Science things, Health Tech things; I've done all different kinds of software and electronics; I've worked for start-ups and for big corporates.

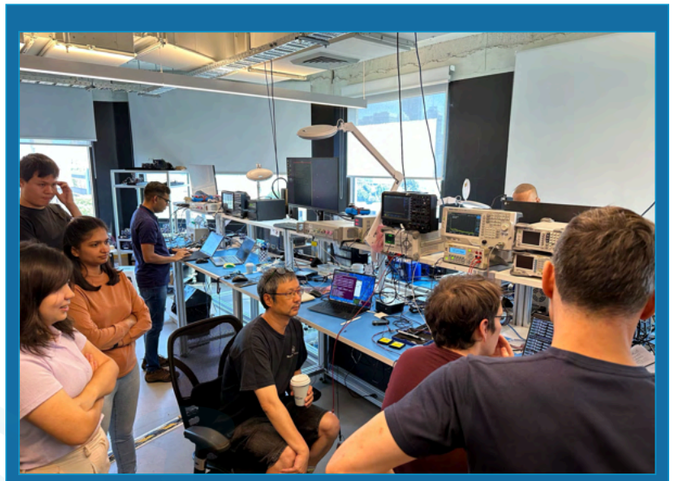
It's not one job, it's twenty!

MORSE MICRO

An interview with Alex Hiller

COULD YOU GIVE A QUICK RECAP OF YOUR EXPERIENCE AT MORSE MICRO, HAVING COME THROUGH THE GRADUATE PROGRAM?

I graduated from University Technology Sydney (UTS) in Sydney in 2020 and started in the graduate program at Morse Micro in March 2021. We were rotated through multiple teams – Firmware, Digital, Applications, Systems, and Radio/Analogue. I originally thought I would end up on the firmware team but because of a curiosity with how everything was working I ended up being drawn to the Radio/Analogue team. I spent a year on the bench testing our newly designed Wi-Fi test chips, characterising the Power Management Unit (PMU), doing some impedance matching of transmissions lines, and some small work on internal software testing tools.



During 2022, I worked in California for around 6 months helping scale up the mass testing capability of the company using Automated Testing Equipment (ATE). Following that I came back to Sydney and spent 2023 helping bring up our second generation Wi-Fi chip, now on the market as MM8108. Because of all the testing I was keen to try my hand at design. I had my first op-amp manufactured on one of our chips in 2023, and moved into full-time design in 2024 after taking over the maintenance of some existing designs. Since then I've done a few circuits, including a high frequency divide-by-five circuit, rail-to-rail input-output amplifier, and continued to maintain the crystal oscillator and clock generation for the CPU. More recently since I moved to Cambridge in June 2025, I've been working on overhauling the clock generation and PMU for our next generation Wi-Fi chip.

HOW HAVE YOU FOUND MORSE MICRO'S GRADUATE PROGRAM FOR SUPPORTING TECHNICAL GROWTH AND LEARNING?

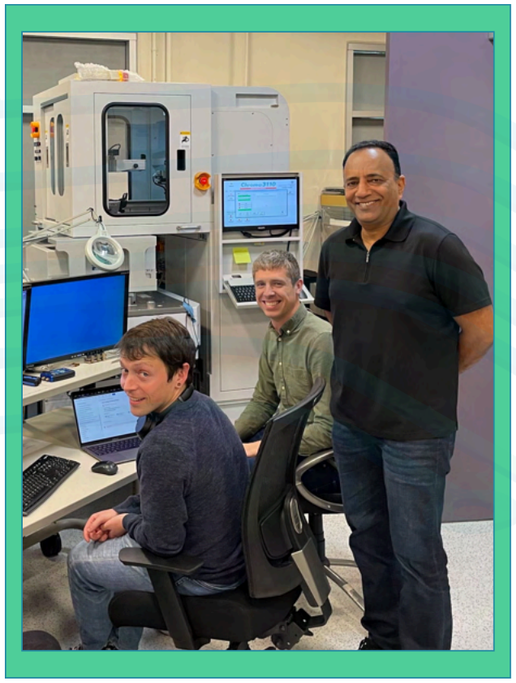
After our rotations we were placed and immediately began to take on technical tasks. Days into my new team I was characterising Low Dropout (LDO) Regulators for their maximum current output.

Since then, if I wanted to learn to do something, all I had to do was ask. I've found that generally if you show initiative and passion then opportunities for growth will be given at Morse.

An example is that when I asked to do more Analogue design, Morse sent me to Switzerland to attend a MEAD course on Advanced Analogue Design. These courses are considered the best training courses for practicing analogue designers and it demonstrates how Morse Micro invests in its employees.

WHAT IS THE CAREER PROGRESSION LIKE FOR THOSE COMING THROUGH THE GRADUATE PROGRAM?

There are a fair number of former graduates who have been promoted up to Senior Engineer now, myself included. The company does reviews twice a year and is always aiming to improve the process. The expected performance and behaviour of the different levels of engineer (Engineer, Senior Engineer, Principal Engineer, etc) are clearly defined on our internal documentation and it's fairly clear how to get to the next level.



WHAT KIND OF MENTORSHIP AND COLLABORATION OPPORTUNITIES EXIST?

There is a formal mentor program within the company and you can set up an Individual Development Plan to set a goal and formally appoint a mentor. More informally, because Morse is a chip company there is also a large amount of cross-disciplinary collaboration by necessity, because of this I have worked with and learned extensively from our Systems team, Digital team, and Back-End engineers to learn more about how and why things are done. I've found all the more senior members of staff very knowledgeable and generous with their time if you want to learn more from them.

HOW ARE YOU ENCOURAGED TO INNOVATE AND MAKE CUTTING-EDGE ADVANCEMENTS IN YOUR DAY-TO-DAY WORK?

In the semiconductor industry the bar is very high for what a chip has to do. The standard is always being raised each year, whether it be by other chip companies or by researchers in academia. We are encouraged each year to scour through International Solid-State Circuits Conference (ISSCC) and continually keep up with IEEE Journal of Solid-State Circuits (JSSC) to ensure that we are across the cutting edge of what's possible. There is also a strong understanding of what our competitors are doing and we are constantly re-evaluating how to make our next generation products better.

CU ECO RACING

Written by Michael Miskin, Team Principal, February 2026

Cambridge University Eco Racing (CUER) is a student team that, at its core, is a learning tool for our team members – this is done through the designing, building and racing of innovative solar powered cars, raising awareness of energy-related challenges and the problem-solving that engineers can bring to solve environmental challenges along the way. Having started out driving our first car, *Affinity*, from Land's End to John 'o Groats in 2008, becoming Britain's first road-legal solar car, the team took their second car, *Endeavour*, to Australia the following year to compete in the **World Solar Challenge (WSC)**, a 3,000 km race from Darwin in the North to Adelaide in the South, a test of endurance, strategy and reliability. The team would make a return visit down under two years later with *Endeavour*, before building new cars for the subsequent races in 2013, 2015, 2017 and 2019. *Evolution*, the team's fifth car also became the first British car to compete in the European Solar Challenge, a 24-hour endurance race that takes place on the former Formula 1 circuit at Zolder, Belgium. *Helia*, the team's sixth car, was a marked change from those before it, being a four-seat 'cruiser'.

Evolution, CUER's 5th car, in Cambridge

Current work focuses on three cars. *Evolution*, our 2015 WSC Challenger class car is nearing the end of an extensive rebuild to return it to running condition as a demonstration vehicle and test bed. Having competed for the final time at Zolder in 2016, it was pillaged for parts for subsequent projects, but the shell itself survived. The last couple of years has seen a new steering system fitted, missing parts produced and a new powertrain fitted. The work to commission the powertrain should be completed by the time you are reading this magazine.

Helia, the 2019 WSC entrant has also been receiving a substantial package of work. *Helia's* trip down under exposed some unsatisfactory handling characteristics which has led to a new rear suspension being designed by the team and fitted. Additionally, all wiring in the car has been replaced.

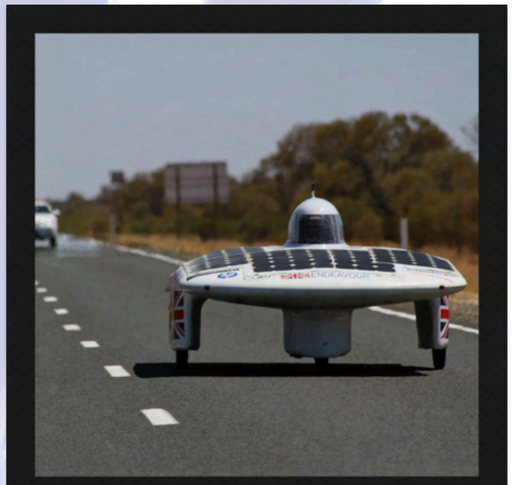
The biggest challenge with *Helia* has been the design and manufacture of all-new battery packs. Designed in-house with specialist processes such as the wire-bonding taking place in the facilities of industrial partners, this has proved a steep learning curve, but with final assembly well underway, there is light at the end of the tunnel.

The third key pillar of the technical work is the next team's next car – the as yet unnamed *SC7*. This car will be a return to the single-seat challenger class at the WSC. The team is currently working on simulation and aerodynamic design work, with a view to having a completed car design by the end of the year, ready to begin manufacture.

Affinity, CUER's 1st car, in Scotland

Michael, Team Principal, joined the team during his first year. Having initially been involved with an assortment of mechanical design tasks on *Helia*, he took on the leadership for Mechanical Design during his second year, particularly focussing on the initial work to get *Evolution* running again. His third year with the team was spent as Deputy Technical Director, gaining knowledge that would prove useful upon taking on the position of Team Principal. Leading the team has been immensely satisfying, seeing productivity high and team numbers growing again after dwindling in recent years and the key fundamentals of who we are and how we go about our work as a team are now well-rooted. With many of the team now in their second year of study, seeing them taking on leadership roles and watching their knowledge and confidence grow as they share their enthusiasm with newly-arrived first year team members, the team will be in a good position for the years ahead.

As the team looks ahead to a triumphant return to Australia for the WSC in 2027, the summer of 2026 will see the team embarking on an ambitious UK tour, taking *Helia* and *Evolution* to events across the country, including a first visit to the Techno Zone at the Royal International Air Tattoo, the British Motor Show at Farnborough and Beaulieu (the home of the British Motor Museum) for their Supercar Weekend in August, wrapping up the tour at the Shuttleworth Collection's Race Day in October. More events are in the pipeline too. These events will be the first time in a few years that the Great British public have been able to see the cars outside of the Engineering Department here in Cambridge and offers us a chance to engage with budding young engineers who could be the future of CUER in the years ahead. It also presents us with a chance to meet future partners and raise awareness ahead of our return to Australia in 2027, which the team is determined to secure the necessary funding to make a reality.



Endeavour, CUER's 2nd car, in Australia

CU RIVIERA RACING

Written by Tyr Hogsander, Operations Director, February 2026

The maritime sector is notoriously bad at decarbonisation. For most engineers, the shift to electrification is studied in a lecture theatre – but for the members of Riviera Racing, that shift flies past at 20 knots on the open waters of the Mediterranean.

Riviera is, fundamentally, an incubator for the next generation of maritime tech. We set out in 2023 to show the world that zero-emissions transit isn't just a regulatory necessity; it's a competitive advantage. Every year, we prove that point at the Monaco Energy Boat Challenge, a prestigious competition where the top engineers from universities across the world compete fiercely in the Monaco harbour. That makes our impact twofold - we're demonstrating what this tech can accomplish, but we're also giving students hands-on experience.

INNOVATION AGAINST THE CLOCK

While most other Universities operate on multi-year build cycles (backed by PhDs devoting their entire doctorate to the boat) we're all undergrads, and we design, build, test and compete in a single year, every year. While we don't get the luxury of a slow roll, that means everyone gets to see what they've built in action, and we learn at breakneck pace.

The resources needed to make that work in real-life are a significant obstacle. Securing high-end materials (like our space-grade solar panels and bespoke motor controller) has taught us the hard way that a flashy design is only as good as the final product in the water. The 2024 competition is a great example - we had tremendously ambitious hydrogen and hydrofoil subsystems, but ended up having the most success when we stripped back the vessel on the spot to its battery-powered core.

But perhaps the hardest challenge we've faced has been piecing together the best minds from such different fields. A change in the battery layout affects the weight that our Body & Structures team keeps a close eye on, and a new propulsion system can only be tested with the advanced telemetry from our software team. We learned quickly that communicating clearly is more important than any individual tech development we've accomplished.

FUTURE HORIZONS

Looking forward, our future is expansive (technically and otherwise). While our ambitions remain in hydrofoiling (which no other energy-class team has accomplished yet), we're also looking to reach a wider audience. The team is constantly visiting industry roundtables like the Southampton International Boat Show and Imperial's "MExhibition". To get the next generation inspired, we're even in conversation with local schools, not to mention freshers looking to get a professional skillset.

Beyond Monaco, our story is far from over. At its core, Riviera Racing isn't really about a fast electric catamaran - it's about changing the world for the better, one fuel source at a time.

BUILDING FUTURES

Alongside the development of the boat, we're learning as people. Many of us have been with the team since 2023, and take great pride in showing beginners the ropes in hopes that they might one day replace us. I (as a Land Economy student) began barely capable of wielding a jigsaw, but eventually went on to lead the team as co-captain. For me, the most satisfying part has always been watching new joiners (across economics, medicine and beyond!) take the same alien steps I did 3 years ago, bridging the gap between disciplines as much as the one between theory and the commercial maritime world.

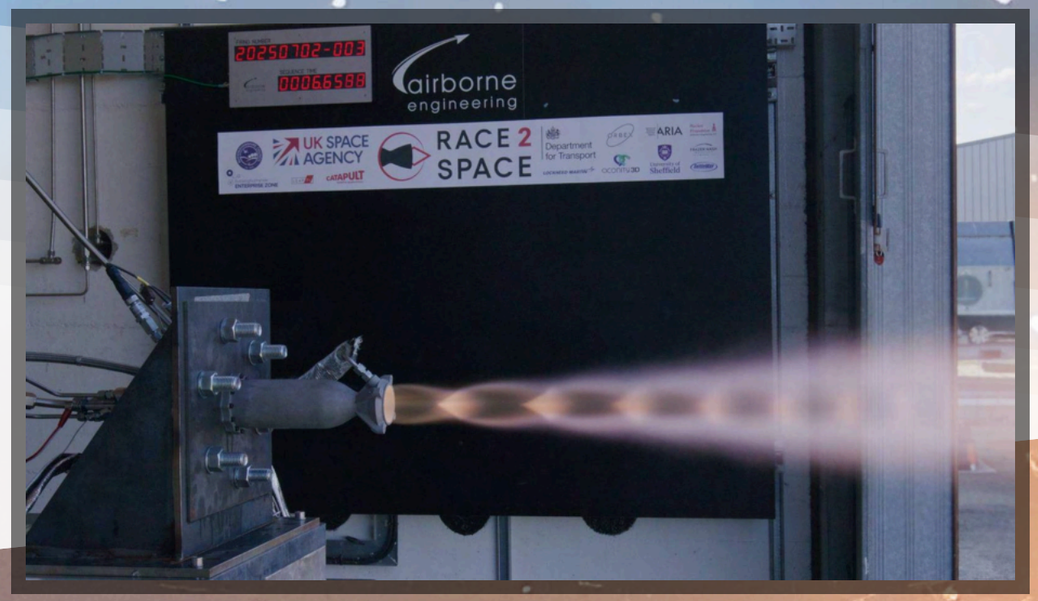
No matter the background, we can all agree that standing on the quayside in Monaco gives you a kind of confidence that can't be found elsewhere, knowing that the craft speeding out of the marina was built as one team through all those hours in the Dyson centre.

CU SPACEFLIGHT

Written by Ben Sutcliffe and Elisabeth Rakozy, CUSF Co-Presidents, February 2026

Cambridge University Spaceflight (CUSF) aims to equip students with the skills to take aerospace projects from conception to completion, and to prepare them for future careers. Our work involves over one hundred students split into project teams in broad divisions of high powered rocketry, liquid bi-propellant engines and feed systems, high altitude balloons, electronics and control, and a special projects division involving a powered glider project and a propulsive lander. Regular collaborative outreach events with companies in the air and space sector also allow students to make industry connections and, in some cases, to work on projects together with these companies.

Some of our recently completed projects include designing and testing one of the most efficient nitrous oxide/IPA engines, hotfiring the UK's first two-pass regeneratively cool engine, and launching a rocket in competition that deployed a CanSat within 2% of the intended apogee. Looking ahead, the projects we are working on include a rapidly accelerating supersonic rocket, a powered glider of 5m wingspan, a high altitude balloon to test a company's thermal imaging camera and many more.



One of the challenges we face is limited access to test sites. Testing liquid bipropellant engines in the UK is a challenge, and we currently do not have the funds to test more than once a year at the Race2Space competition. Because we are a student society, the high workload of the course makes it difficult at times to dedicate a lot of time to CUSF. Continuity is also a challenge as our society is composed of a new student body every four years. As a result, we have placed an emphasis on creating projects that are achievable in the span of one to two years. We also improved the quality of the introductory projects at the beginning of each year to ensure that new members are given the skills they need to successfully complete projects in CUSF. As a result, our retention of new members has increased significantly and our membership has more than doubled in the last two years.

Speaking personally as co-presidents, it has been incredible to be involved in CUSF since our first year at university. Working and leading various projects has prepared us well for industry and given us invaluable experience and knowledge for industry. We have made many great friends and memories as part of CUSF, whether it involved launching a rocket in the sweltering Mojave desert or camping in rainy Scotland waiting for a launch window. We have always enjoyed the privilege of seeing hard design work become a tangible and very cool reality.

Now leading the society together, we are both learning a lot about running such a large and busy organisation; how to set it up for future success, how to run its administrative side and how to present our work to sponsors and our own members. We see a very bright future for CUSF as our membership grows each year, and as students are becoming increasingly better prepared for the ever-more ambitious projects that we attain funding to work on. There are many exciting opportunities we are currently working on so follow our channels to stay up to date with what's going on!

ADASTRA

CUSF CAMBRIDGE UNIVERSITY SPACE FLIGHT

CU WOMEN IN ENGINEERING

Written by Alina Liedtke and Joanna Li, CUWES co-presidents, February 2026

At CUWES, we're convinced that diversity in engineering means more than including a picture of a woman in a hardhat and hi-vis on the front cover of a brochure. From civil to software, from the lecture theatre to the workplace – the reality is that women and non-binary people are still heavily underrepresented from the very beginning of their career path. Our goal is to bridge that gap.

The Cambridge University Women in Engineering Society (CUWES) has three main aims:

FOSTERING A SUPPORTIVE ENVIRONMENT WHERE OUR MEMBERS CAN ENGAGE WITH AND LEARN FROM ONE ANOTHER

CONTRIBUTING TO OUR MEMBERS' PROFESSIONAL DEVELOPMENT BY ORGANISING INDUSTRY-RELATED EVENTS

INSPIRING PROSPECTIVE STUDENTS TO CHOOSE ENGINEERING-RELATED DEGREES THROUGH OUTREACH

It would be fair to say that engineering is already a difficult discipline. Coupled with the worry of not keeping up, not fitting in, or needing to prove ourselves (experiences shared by nearly all our members!), CUWES acts as a sort of pressure relief valve.

Whether it's a technical workshop to sharpen skills or just a casual social to hang out, the goal is to ensure every student feels included. Someone who feels backed by a solid support network is more likely to speak up in supervisions, take up challenges with projects, and stick with engineering as a career path rather than getting discouraged. It's so rewarding to see a first-year student attend an event feeling a little hesitant or overwhelmed, and then leave an hour later having made a new friend, received some advice from a senior student, or even gotten a lead on an internship. It's about building a community that feels friendlier.

Our impact also goes beyond the current student body. We spend a lot of time on outreach striving to dismantle the old stereotypes of what an engineer "looks like". By showing younger students that Cambridge is a place where they can thrive, we hope to make the future of the industry look a bit more balanced.

One of the best parts of being involved with CUWES is seeing the tangible results of what we do. It's a unique kind of pride to represent a society that consistently shows up for its members, growing from a small interest group into a significant part of our engineering community. In particular, CUWES has really focused on strengthening inter-community links – our annual swap with the Oxford Women in Engineering society (OUWiE) has become a highlight of the events calendar, and we're really proud to have taken the initiative to bring together six Women in STEM societies across Cambridge last Michaelmas for what we hope will become another flagship event. We're looking forward to seeing these ties strengthen in the future (look out for an upcoming International Women's Day collaboration)!

We (Alina and Joanna) joined the committee in March 2024, and it's easily been one of the best things we've done during our time at Cambridge. We've learned the ins and outs of managing a highly-capable but undeniably busy fourteen-person team, building a casual yet close-knit culture from the top-down and making sure no committee member feels overloaded. We've had the privilege of pitching to and collaborating with a huge number of sponsors, which has been a masterclass in communication and stakeholder engagement but more importantly, kept CUWES membership free and significantly improved the accessibility of our events. Learning to lead a team that genuinely enjoys each other's company is a skill that will undoubtedly benefit our future careers... although perhaps the biggest takeaway of all is that nothing brings people together like Ben's Cookies!

As we look ahead, the goal for CUWES is to flourish. We are set on scaling our outreach initiatives to reach younger students earlier in their journey, alongside a significant expansion of our postgraduate team to ensure our community supports engineers at every academic level. To sustain this, we hope to grow our committee, bringing in fresh perspectives to help deliver an even more ambitious calendar of technical and social events. Ultimately, we want CUWES to be the reason a student decides to stick with engineering when the workload gets particularly tough. We want to be that support system that makes the difference.

To anyone thinking about getting involved with the committee: just do it! There is so much to gain from stepping away from the sidelines. Being part of CUWES has made us more confident, more industry-aware, and generally more capable. We're incredibly proud of how far the society has come since we were Freshers, and we're incredibly excited to see what the next group of CUWES engineers will achieve.

CU FULL BLUE RACING

Written by Ryan Teh, Sub-Team Leader of Vehicle Dynamics, and James Williams, Head of Powertrain, February 2026

Full Blue Racing (FBR) is the University of Cambridge's Formula Student Team – over 60 members work together to design and build a single-seater open-wheel race car every year to compete in Formula Student (FS) competitions around Europe. They meet every Sunday afternoon at the DPO to work on their car, stored in the Oatley Projects Garage, a workshop shared with CU Eco Racing.
FS is the world's largest student engineering competition. Often held in summer, it consists of static (design, cost, and business judging) and dynamic (on-track) events (acceleration, skidpad, sprint, and endurance). Teams compete to earn the most points in each event. Eligibility for dynamic events requires the car passing a strict technical inspection process (scrutineering) in several categories: safety, chassis, tech, noise, tilt, and brake tests. The competition provides a platform for students to gain real-world engineering experience and essential transferrable skills. It is thus often considered the "gold standard" for engineering students, as the work to prepare for the competition, as well as the intense, time-limited pressure faced during it, teaches them to navigate failure and build resilience under stress. It shapes them into highly skilled and sought-after "industry-ready" engineers.

Since FBR's debut in Formula Student Germany (FSG) in 2007, they have made huge progress, most recently finishing 22nd in design and 16th in cost out of 59 teams at Formula Student UK (FSUK) in 2025. This year, they are building on that experience and bringing upgrades to the car like a new chassis and engine rebuild to improve reliability and hopefully finish in the endurance race event.

AIMS

As a student team, FBR's key aims are centred around its members. Aiming to compete in at least one FS competition annually gives their members the chance to both upgrade the car and develop practical engineering skills in the process. It also ensures valuable knowledge and expertise are handed down to future generations of engineers.

FBR aims to give its members free rein to develop practical engineering skills beyond the academic curriculum in a supportive environment, where members use industry-standard tools such as CAD, FEA and CFD in the car development process, helping them hone skillsets directly applicable to their future engineering careers. Beyond development of technical skills, FBR also aims to provide an environment for student leadership to shine, as the most driven and committed members are often promoted to leadership and operations roles, giving them an intensive crash course in project management, and a plethora of other soft skills.

The hope is that through this exposure, students can develop the hard and soft skills required to become competent, work-ready engineers, and use them to secure their dream engineering roles. This year alone, five students have used the expertise and experience they gained from working in FBR to secure Formula 1 internships/roles, and many more have found FBR to be a stepping stone to other prestigious roles in industry.

CHALLENGES

Every year, passing scrutineering at competition is always a challenge – there are a lot of things that can unexpectedly go wrong. However, some years have definitely tested our abilities more than others, as you will see from the accounts of some team members and alumni below:

Dan Logan, 2025-26 Team Principal (3rd Year Engineer, incoming Race Operations intern at Atlassian Williams F1 team):

The biggest challenge I've faced was in 2024 during FS Spain, after a day of engine problems due to a sweltering Spanish heatwave. Just 3 hours before the acceleration event, our starter motor started to melt, and we could no longer start the car. With such little time, we started ripping parts off the car, disassembling part of the engine and repairing internal breakages. As our time was nearly up, we connected the starter motor to a truck battery to test if our fix had worked. The whole team erupted in cheers as the little motor buzzed back into life and we set about rebuilding the engine making it to the start line just in time.

Kishan Zala, 2024-25 Team Principal (Graduated 2025, Graduate Aerospace Engineer at Martin-Baker Aircraft:

Another significant challenge was the insane deadlines and a lack of time from everyone on the leadership team. The 5 of us on it were grinding out documents 12-15 hours a day for up to a week and pulling all-nighters just to meet some of those deadlines as they were impossible for only one person to do. These were properly difficult technical documents on top of our degree, so it was really quite challenging. I'm pretty proud of the effort we put in as we did quite well in our static cost and design judging events this year and I heard a lot of good feedback from the judges.

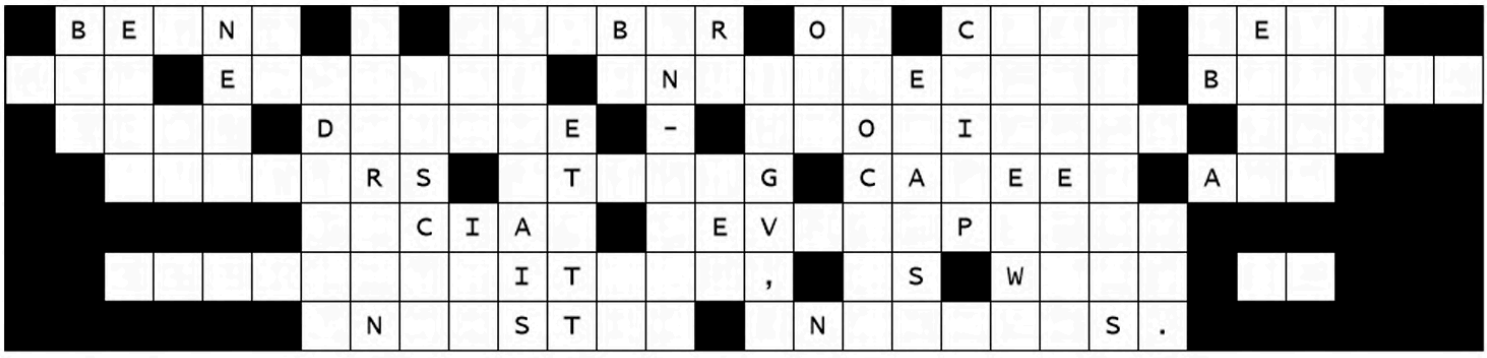
I've watched FBR grow a lot from quite a dead state just after COVID. We only had 15 truly active members at competition in my 2nd year and only 12 in my 3rd year which made it really tough. In my final year as Team Lead, we grew massively and became more organised. Every year we've become an increasingly well-oiled machine, and I've loved seeing the progress FBR has made this year as everyone seems incredibly on top of things.

THE FUTURE OF FULL BLUE RACING

FBR plans to keep bringing annual upgrades to their car. Other than their goal of improving reliability this year, they also aim to significantly cut vehicle weight to enhance agility, as well as to finally run their aerodynamics package at competition. Furthermore, over the coming years, FBR also plans to transition to being an EV team, in light of growing environmental concerns around motorsport. They are currently working with suppliers and sponsors to source and design the necessary components and architectures for the EV transition.

PUZZLE CORNER (BONUS!)

CUES Fallen Phrase Puzzle

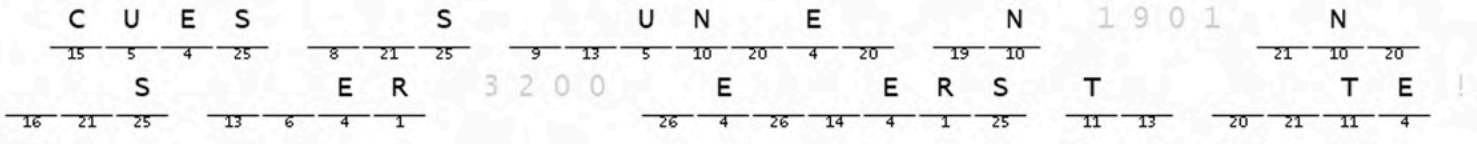


Instructions:

Try to rebuild the message. The letters from each cell are below the puzzle. Try to rebuild the original message by choosing the letters for each cell.

CUES Cryptogram

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
		15		4									10				1	25	11	5					



Instructions:

Decode the message. Each letter in the phrase has been replaced with a random letter or number. Try to decode the message.

These puzzles were created using Discovery Education's Puzzlemaker.

SOLUTIONS

Fallen Phrase: *Being a member of CUES lets you explore engineering beyond your degree - providing its members strong career and social development opportunities, as well as industry insights.*

Cryptogram: *CUES was founded in 1901 and has over 3200 members to date!*

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
21	14	15	20	4	9	23	16	19	18	17	22	26	10	13	2	3	1	25	11	5	6	8	7	24	12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