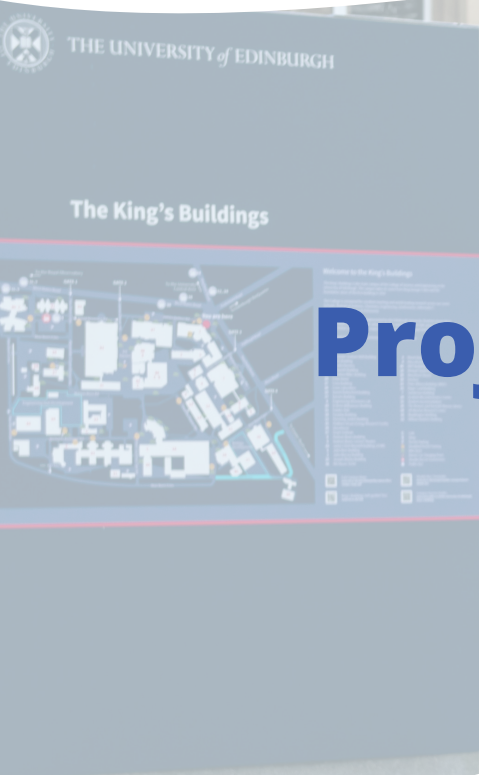




EPSRC & NERC InDustrial CDT
for Offshore Renewable Energy

Stakeholder Project Case Studies



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Vision

IDCORE aims to attract the very best students and, in partnership with industry, trains them to deliver world-class research outcomes that will accelerate the deployment of offshore wind, wave and tidal-current technologies. By developing the next generation of thought leaders (Chief Technical Officers, Principal and Lead Engineers) in the offshore renewable energy sector, the Centre is positioning the UK to meet its 2050 net zero targets. As a direct result, IDCORE is also delivering UK-based technology to solving the energy trilemma by helping to produce secure, affordable, sustainable energy and drive the development of the blue economy.

IDCORE's approach means that all the researchers trained by the Centre graduate with an EngD qualification having completed a three-year research project based in industry with a sponsoring partner. By presenting case studies from a range of stakeholders engaged with IDCORE, this document aims to promote the value that the EngD model brings. These benefits are not only delivered to the academic institutions and other organisations involved, but also to individuals, be they industry sponsors, academic supervisors, members of the support team, or the students themselves.

This document sits alongside similar collections of researcher case studies covering the cohorts that have recently been trained by IDCORE, plus one report providing case studies of IDCORE alumni from earlier cohorts, tracking the progress of their careers since they graduated.

Value

Experience in IDCORE suggests that the EngD model really works. Companies are keen to engage with it, as are individuals within those companies. They make comments like 'they have always supported IDCORE and believe it to be useful', not least because they want the engineers they employ to have practical experience, and they want to invest in this. There are even examples of industrial supervisors who have sought out opportunities to continue to work with IDCORE when they have moved between organisations. Their feedback suggests that EngD training delivers a 'more fertile training environment', creating very employable engineers who are seen as hugely valuable. More than once, interviewees spoke of IDCORE researchers coming into the industry and being able to 'hit the ground running'. The only disappointment expressed was when companies hadn't been successful in sponsoring projects in a specific year because the demand from other sponsors had been too great.

Growth

The transition away from fossil fuels is driving significant growth in the offshore renewables sector and this is creating a demand for skilled resources that is so significant that some respondents identified it as their 'biggest risk in the delivery of net zero'.

IDCORE graduates are able to respond to this demand. The training they receive gives them an unrivalled set of technical, design, advisory, project management, innovation and operational skills that are being sought after by employers. They cover a broad range of topics relevant to the offshore renewables sector, and this creates well-rounded research engineers who also have a depth of knowledge that project sponsors find extremely valuable, especially when this is coupled with access to the wider technical capabilities and facilities available within the IDCORE partner institutions.

Impact

All of these benefits are leading to IDCORE becoming both well-recognised and well thought of across the sector, with a number of companies coming back to sponsor more than one project. This reputation is based on the impact that the Centre has delivered, which has been driven in large part by the industrial sponsors working with IDCORE to identify the research needs that can be met within an EngD project.

As a consequence, the research that is being delivered has direct applicability to funding partners. It is delivered in an 'agile' way that is responsive to the unfolding challenges in an industry that is moving fast. This is breaking down the stereotype of a PhD project that only delivers on a three-year timescale. IDCORE's EngD projects are creating short-term outputs and outcomes that solve immediate problems, primarily because the researchers start from a good grounding and are able to contribute from day one.

There's always been a need for collaboration between industry and academia, but there can often be a disconnection between the outputs of academic research and their industrial application. The model that IDCORE has developed is good at overcoming these barriers, creating effective collaborations that deliver. Having the researchers based with their sponsors for an extended period means that they can make significant contributions to the operational effectiveness of the organisation.

The sponsors are also using their relationship with IDCORE to support longer-term commercial development goals. Funding an EngD project can be a very effective way of creating the time and resource to explore new opportunities, and IDCORE has been instrumental in the development of more than one new product line.

Whilst all of these benefits are being realised by the project sponsors, this does not mean that the research delivered within IDCORE lacks academic rigour ...and the sponsors also value this. They see value in being part of academic publications and the opportunities that presenting at academic conferences provides for engagement with a wider community.

Academics who engage in the programme as supervisors have also seen significant benefits from the EngD model. It can, at first, create some concerns, since it is so different from a normal PhD where the academic supervisor will often have a lot more control over the research being undertaken. However, those with an interest in applied research who have embraced the model have found huge benefits both in shaping their own research but also establishing larger programmes of impactful engagements with non-academic partners.

Most of all, stakeholders point to the impact that the passion of the IDCORE researchers has on their organisations – 'they help to keep us enthusiastic and curious' and 'working with them is both inspiring and enjoyable'. Ultimately, IDCORE projects are driven by the curiosity of the sponsors.

Professional Recognition

Several of the industrial sponsors interviewed during the development of these case studies spoke of how they have used their engagement with IDCORE as a recruitment tool. Developing a relationship with a research engineer as part of an IDCORE project also acts as 'three-year interview' allowing both parties to see if they are a good fit for another. For the researcher this provides additional security as they seek to take the next steps in their career, whilst for the project sponsor it is a very cost-effective way of attracting the best talent.

The value that an EngD qualification has delivered to IDCORE alumni is borne out by the employment record of those graduating from the Centre. Their employment records are significantly better than those for standard PhDs, and most of them have secured substantive posts rather than being recruited into the graduate roles secured by most PhD graduates.

The quality of the training and experience delivered through the EngD model is also reflected in the response of the professional institutions. For most PhD programmes, the institutions do not consider the experience gained as sufficient to meet the requirements of UKSPEC, the document which specifies the competency levels that need to be demonstrated by engineers candidating for CEng status. In contrast, IDCORE has received feedback from a number of institutions suggesting that they consider an EngD programme to deliver the level of experience required by candidates preparing for their professional interview.

Equality, Diversity & Inclusion

Although not necessarily a direct consequence of IDCORE being an EngD programme, the Centre has had significant success with making their recruitment processes inclusive. This is demonstrated by the diversity of the participants in the programme. Not only have they recruited researchers with a diverse range of protected characteristics, but they have attracted applicants with first degrees in a wide range of STEM subjects, not just engineering, who have all gone on to successfully complete the programme. Celebrating the diversity within the IDCORE community has also meant that the programme has recruited applicants returning to study as a way of developing already established careers. Many of them have no intention of seeking an academic career after they graduate, but recognise the value of the EngD qualification as a mark of their capabilities and providing them with credibility in an industry that can be hard to penetrate.

Conclusions

Organisations that have engaged with IDCORE have understood the model and valued it. Many of them have commented on the effectiveness of an EngD programme from an industrial perspective and the value it would have as a principle for wider application.

The offshore renewable industry is broad and diverse in its needs, requiring a wide range of skills from those who are being trained to lead the sector. It is not only proven engineering capabilities that are required but also skills in areas as diverse as environmental protection, project management and stakeholder engagement.

Sponsors speak of the strength of the relationship building skills but also the passion and beliefs of IDCORE researchers. They conclude that the Centre is doing many things right – identifying, recruiting and training high-quality students who make a difference.

We want to recruit engineers who have practical experience, and we are willing to invest in making this happen. The academic training that IDCORE researchers receive is really valuable, as are the links the projects provide to the academic institutions involved. IDCORE does all this in the context of seeking direct application of their research to industry, and the agility they have developed is important in an industry that's moving so fast.

Beth Dickens, Director, Quoceant

The culture in IDCORE marries well with the FloWave approach. The researchers are all lovely people and a pleasure to work with. They are inclusive and collaborative, not just with their industry partners but also with one another, which increases their capability. They're also open and keen, they all go 'above and beyond', and they take advantage of the time that you give them.

Their input has been very valuable both to FloWave and to me personally. I have learnt as much from them as they have from me – they find solutions to the technical problems we encounter, and they are always looking for ways to improve what we do.

Callum Guy, Experimental Officer, FloWave

The highlight of my involvement with IDCORE has been to follow the journeys of our students, seeing them mature as researchers and then come back as colleagues and professionals. For me this demonstrates that the programme is bearing fruit. I am proud of the way the teaching that we are delivering provides a broad understanding of the sector and the disciplines that come together to make it a success. We are giving our researchers a wider outlook, enabling them to communicate well and become very effective.

Philipp Thies, IDCORE Programme Co-Director

By working closely with industry, IDCORE is delivering more effective collaborations, and I am seeing this delivering value across multiple engagements, not just those with IDCORE. I have been really impressed by what their research engineers are achieving, and I was delighted to accept when IDCORE asked me to become a member of their Independent Advisory Board.

Sally O'Brien, Senior Project Manager, SSE Thermal





Case Study

Ajit Pillai

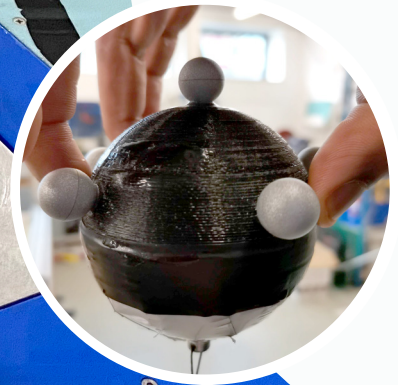
About Ajit

Ajit, a former IDCORE student, is now a Senior Lecturer in Autonomous Systems and Robotics at the University of Exeter. He is a member of the IDCORE Executive Board, an IDCORE project supervisor, and teaches on modules provided as part of the IDCORE training.

As a mechanical engineer, Ajit has specialised in sustainable engineering, applying machine learning and optimisation across the marine sector, with a current focus on optimising the design of offshore wind turbines and improving access models for their operation and maintenance.



I was first drawn to IDCORE as a student when I was unsure whether I wanted a career in industry or academia. IDCORE allowed me to continue pursuing both options. I have now chosen, but as an academic my interest is in industrially applicable research. IDCORE has been, and continues to be, a key part of my professional career. It continues to help me build relationships with project partners, keeping me more fully aware of the challenges facing the sector and the specific research needs these create. In a busy research landscape the IDCORE model is unique, delivering benefits which are highly valued by project sponsors.



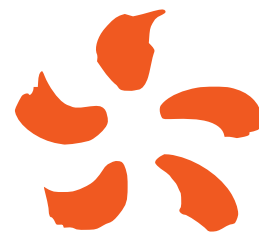
IDCORE Legacy

Ajit still works with colleagues from his IDCORE cohort, project partners who now work across the industry. These relationships were built by 'going through the crucible of IDCORE together' – an invaluable network.

His IDCORE project was sponsored by EDF, and he was based with their Research & Development team in London. There have been a lot of changes in that team since Ajit graduated, but one consistent feature has been their on-going engagement with IDCORE, providing continuity and leading to co-design of research projects which continue to address the specific needs of the organisation.

The code and tools Ajit developed as part of his IDCORE project are still being used by EDF in windfarm design, impacting major development decisions. He is seeing similar impacts from the projects and students he is now supervising.

Not many IDCORE graduates are in academia but most of them work closely with universities. It is the only programme of its kind, and Ajit hopes it will become a case study for other sectors, showing how academia and industry can work together.



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Stakeholder Case Study

Beth Dickens



Beth is a Co-Founder and Director of Quocean, an innovative engineering consultancy dedicated to the development of the offshore renewables industry. She is also an industry supervisor for IDCORE and a member of IDCORE's Independent Advisory Board, as well as being a Citing Commissioner for World Rugby and the Scottish Rugby Union as a former Scotland Women's Rugby Player.

Prior to setting up Quocean, Beth was the Operations Development Manager at Pelamis Wave Power, where she managed the delivery of the full-scale Pelamis operations programme.

Her career in the offshore renewables sector has centred around mechanical system design work, developing more efficient and safer systems for offshore operations, planning their maintenance and execution, simulating the effects of different operational strategies, analysing system reliability, creating test methodologies, fault finding and running rectification programmes.

She is currently leading the development of Q-Connect, a modular and adaptable electro-mechanical system for connecting marine renewable devices to moorings and electrical cables, born out of the team's experience in Pelamis. Supported by Wave Energy Scotland, Q-Connect was originally designed to provide rapid and safe connection and disconnection of wave and tidal devices, but is now also being developed for use with floating offshore wind.

IDCORE Involvement

Beth first became involved with IDCORE as the industry supervisor for a researcher who joined Pelamis in 2012 from the Centre's first cohort. She was so impressed by this experience that she was keen to find opportunities to bring other IDCORE researchers onboard when Quocean was set up. She is now the industry supervisor for Leigh Baxter, one of the researchers from IDCORE's tenth cohort, recruited in 2022. Leigh is supporting the development of Q-Connect, in particular exploring the benefits the system can provide by reducing installation time and extending weather windows for such work.



Physical design work involves a lot of subtle detail. Engaging with IDCORE allows us to extend the range of simulations and analysis we can undertake as part of this design work. Wrapping this up with detailed case studies as we move into the more practical design phase of a project helps us to maximise the benefit for the industry, which compliments everything else we do in Quoceant.

We want to recruit engineers who have practical experience, and we are willing to invest in making this happen. The academic training that IDCORE researchers receive is really valuable, as are the links the projects provide to the academic institutions involved. IDCORE does all this in the context of seeking direct application of their research to industry, and the agility they have developed is important in an industry that's moving so fast.

Perhaps most importantly, I personally enjoy it – it's exciting to engage with IDCORE researchers!

Beth Dickens, Director, Quoceant

IDCORE Impact

The offshore renewables industry is still rapidly evolving, requiring new insights and capable people working on the challenges. In this context, Beth is a keen supporter of everything that IDCORE does, not least because the process produces very employable engineers who can 'hit the ground running' - a resource that's desperately needed to sustain the on-going development of this nascent industry.





Stakeholder Case Study

Callum Guy



First Contact

Callum first came across IDCORE when he was looking for a PhD himself. He wanted to work in renewables and had an interest in the programme, but unfortunately, he was looking in 2018, the one year since 2012 when IDCORE didn't recruit any new researchers. Instead, he secured a place in the Wind and Marine Energy Systems and Structures (WAMSS) CDT led by the University of Strathclyde. This CDT operates in a similar way to IDCORE with an initial year of training but the projects they undertake are 'standard' PhDs rather than EngDs based in industry.

Callum continued to observe IDCORE from the outside and then became more directly involved when he became an Experimental Officer at FloWave, initially on a six-month contract alongside his PhD. FloWave is the world's largest circular combined wave and current basin and is based at the University of Edinburgh. The University runs it as a separate company, and a number of IDCORE projects have either been sponsored by them or made use of their facilities.

Having made an impact at FloWave during his initial contract, Callum continued the role on a part-time basis throughout the rest of his PhD, which he completed in March 2024. Since then, he has taken on the role full-time. Callum works with academic and industrial clients to design and carry out test campaigns on a range of offshore renewable energy applications. This has included working closely with three IDCORE researchers as they have delivered their projects.

Working with IDCORE researchers is a real privilege, and the opportunity to mentor them as they learn how to use FloWave has been a real highlight of my time in the organisation.

The culture in IDCORE marries well with the FloWave approach. The researchers are all lovely people and a pleasure to work with. They are inclusive and collaborative, not just with their industry partners but also with one another, which increases their capability. They're also open and keen, they all go 'above and beyond', and they take advantage of the time that you give them.

Their input has been very valuable both to FloWave and to me personally. I have learnt as much from them as they have from me - they find solutions to the technical problems we encounter, and they are always looking for ways to improve what we do.

Callum Guy, Experimental Officer, FloWave



IDCORE Impact

The first IDCORE project that Callum worked on was Anita Nuñez Leite's software-in-the-loop project, looking at thrust loading on floating wind turbine models. He supported Anita in building the hardware, designing the software and then implementing and testing the approach on a commercial client's device. The system has since been taken forward by Callum to become a significant offering to commercial clients, increasing FloWave's reach into the floating wind market.

This has been Callum's largest involvement with IDCORE to date, and such development would have been unachievable alongside their busy commercial test schedule without IDCORE. With the FloWave team acting as technical support, Anita's project delivered the best outcome Callum has ever seen from a PhD project.

IDCORE continues to support the development of FloWave's floating offshore wind capabilities in addition to challenging previous assumptions on general tank test methodologies. IDCORE projects have provided essential research in understanding the experimental implementation of complex mooring dynamics. They have also furthered the technical knowledge of scaling models, with a greater focus on material scaling.

Floating offshore wind has become FloWave's biggest area of growth. They are one of the few test facilities with the capabilities to focus on this challenge, which is impressive for such a small team and has certainly been helped by IDCORE.





Stakeholder Case Study

David Ingram



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It has been a fantastic privilege and a great pleasure to lead IDCORE. We set the Centre up in the belief that the sector needed the training and research support we have been able to deliver. We have succeeded in creating real impact, the sort that only comes from working on industry led projects.

The diversity in the offshore renewable energy sector creates a wide range of research challenges – huge variations in technology, stages of development and commercial success. What is more, participants in the sector recognise the value of engaging with academia to help them address those challenges, and we have been able to make a real difference to their businesses. We have had projects that have saved sponsors millions of pounds, we have helped others radically improve their installation, operations and maintenance processes, and we continue to support the cutting-edge advances in technology that the sector continues to make.

Most importantly, though, we are training people... highly skilled engineers who will in the future lead the industry and ensure that the UK delivers on its target of being net zero in 2050.

*David Ingram,
IDCORE Programme Director*

IDCORE – a unique programme

For over fifteen years, as Centre Director, David has been responsible for shaping, developing and leading a unique Centre that has been so effective at engaging industry partners that IDCORE projects regularly feature in impact case studies. There are now very few pure EngD programmes in the UK, but the model works. It is not just the industry engagement that makes IDCORE stand out, the training programme is unique too, creating a breadth of skills in the participants that is sought after by project sponsors. David and the IDCORE Leadership Team have also put a lot of effort into designing the programme to deliver strong cohort building during the first year of training, creating a vital support network for the researchers when they are delivering their research projects.

In addition to being Centre Director, David delivers part of the taught programme and provides academic supervision for a number of IDCORE projects. The original concept for a PhD training programme in offshore renewables had been through several iterations before the funding for IDCORE was secured, so the programme was well thought out. However, it has continued to evolve as the industry has developed and, most important from David's perspective, he continues to enjoy it – "It's been a fun and very satisfying part of my role in the University".



Wider Responsibilities

David is a mathematician by background and developed his career in offshore renewables on the back of his interests in mathematical modelling and simulation of the behaviour of fluids, using tools like Computational Fluid Dynamics (CFD). As a senior academic at the University of Edinburgh, David's recent work has included the development of standards and protocols for marine energy systems, including procedures for quality-assured scale testing of devices using both physical test facilities and computational models.

Alongside IDCORE, David is the Director of FloWave, the University's state-of-the-art wave and current simulation tank for use in the testing and development of novel ocean energy technologies. He was instrumental in the design of the hydrodynamic systems for FloWave, and is Principal Investigator for a number of EPSRC projects that use the facility.

He is also the Director of Diversity and Inclusion for the School of Engineering.

Impact of IDCORE

Running IDCORE has allowed David to build strong relationships with developers and technology companies which has led to a number of other significant research projects, as well as developing the client-base for FloWave. Some IDCORE projects have also had a direct impact on the development of FloWave, developing new methodologies and test regimes for the facility, creating a broader 'library' of sea states for testing under both operational and extreme weather conditions, and in one case directly supporting the development of a new wave energy device concept.

But it is not just the technical successes that David reflects on, it is also experiences like going to a conference where presentations from IDCORE researchers and alumni dominate whole sessions because they have been invited by the conference organisers, and then seeing them walk away with all the prizes.

Future

IDCORE is making a difference, the need for the training it provides has not reduced, if anything it has grown, so David is determined to keep IDCORE running for as long as that need exists. He knows that the training will continue to evolve as the project partners and delivery team change, but he believes that success will require IDCORE to remain true to its original vision of 'delivering the next generation of leaders for the offshore renewable energy sector'.

David describes IDCORE and FloWave as two amazing achievements in his career, but of the two it is IDCORE that makes him the most proud.





Stakeholder Case Study

Julia Race



EPSRC & NERC Industrial CDT
for Offshore Renewable Energy www.idcore.ac.uk

Equality, Diversity and Inclusion

During Phase 2 of IDCORE Julia was the Co-Director with responsibility for equality, diversity and inclusion. In Phase 3 this role has been taken on by one of the earlier career researchers who have joined the Management Team, but she stills takes a keen interest in the issues.

Applications from students wishing to join IDCORE suggest that the programme has been particularly successful in attracting traditionally under-represented communities to participate. Julia wants to understand why this is, so that the lessons can be applied more widely. She is also keen to explore how the experience and expertise of existing IDCORE students can be used to help and influence potential students more.

Alongside her role as Co-Director of IDCORE, Julia is Professor of Subsea and Pipeline Engineering in the Department of Naval Architecture, Ocean and Marine Engineering at the University of Strathclyde, where she is also Vice Dean (Academic) in the Faculty of Engineering. Prior to pursuing an academic career, she worked for over 20 years as a materials and structural integrity engineer in the petrochemical, power generation, and oil and gas industries. In academia, her research interests have diversified to include material responses in subsea and renewable energy structures and the potential for reuse of offshore infrastructure to deliver pathways to net zero through, for instance, the generation and transportation of green hydrogen. Expertise from oil and gas is proving to be very important in the development of offshore renewable energy, and Julia has the advantage of having worked in both industries.

The first IDCORE project I supervised was delivered by a researcher whose background was in biology rather than engineering. It was a project focussed on corrosion and fouling, and it opened up a whole new area of application for my own research.

This highlights one of the many benefits of IDCORE – our researchers come in with a range of backgrounds and it is great to be part of their progression from saying 'I am a chemist' to 'I am a research engineer with an important role to play in the delivery of net zero.' At the same time, they influence and inform us as the academics supervising them.

I really believe that what we are doing is making a difference, and the destinations of our graduates show that IDCORE researchers are out there changing things. I am doing everything I can to make sure that this continues to be the case.

We are attracting high quality individuals – they are confident 'self-starters' who believe they can change things and make a difference, and this is inspiring, because it is not only a pipe dream or wild ambition but has demonstrated by so many of our graduates to be achievable.

Julia Race, IDCORE Programme Co-Director

Project Supervision

Because of her background, the IDCORE projects that Julia has supervised have tended to focus on the relationship between renewable energy and hydrogen as a way of delivering net zero. The nature of these projects has undoubtedly helped Julia develop her own relationships with the industrial partners involved. They have created interactions that wouldn't have happened by other routes helping to establish a track record with the partners far more quickly.

Some partner companies have very clear ideas about the projects they want to sponsor. Others are more 'fluid' in their approach, allowing the researchers to develop questions to explore in the context of the company's needs, helping them to build up their in-house expertise. In some cases this has led to IDCORE researchers working together on specific concepts, a process that is helped by the Centre's efforts in cohort development.

The outputs of these projects have informed Julia's own research, and the knowledge the researchers gather through their reading and attendance of conferences and seminars also help to keep her 'up to speed' with the latest developments in the sector.

In addition, co-supervision across different institutions opens up opportunities outside of normal routes for collaboration. The network of supervisors across IDCORE projects has helped Julia develop these connections and has led on to other collaborative work.





Stakeholder Case Study

Katrina Tait



EPSRC & NERC Industrial CDT
for Offshore Renewable Energy www.idcore.ac.uk

Role

Katrina is the Administrator for IDCORE, a role that has proved key to the successful delivery of the programme, not least because of her personal passion and dedication.

She supports the day-to-day running of the centre making sure that the taught programme runs smoothly, and ensuring students' progression elements are met. Katrina also looks after the needs of students and course deliverers from across the partner institutions, as well as external training providers, and she facilitates the governance processes for the Centre including the Executive Board the Exam Board and the Independent Advisory Board. In addition, she is directly involved in the recruitment of students to become IDCORE researchers, maintaining the website, organising interviews and planning the other events that make up IDCORE's busy calendar. Most importantly, however, she plays a pastoral role for the students, which is vital, particularly when they are out working in their sponsoring companies as IDCORE researchers.

Progression

Katrina achieved a PhD in Chemistry in 2004 and, after a long time away from academia, she joined the University of Edinburgh as a member of the Engineering Graduate School Team. She was offered the role of IDCORE Administrator when the previous incumbent left in 2019, and IDCORE received its second tranche of funding. At that time, Katrina was responsible for supporting the eleven new students that had been recruited into the first cohort of Phase 2 and she split her time between IDCORE and the Engineering Graduate School, where she provided similar support for traditional Engineering PhD students on campus, particularly the progression elements that each student needed to complete.

I was aware of IDCORE because of my previous role in the university but I didn't know about EngDs or Centres for Doctoral Training (CDTs) before I joined the Centre.

I now work full-time for IDCORE and I am currently looking after 50 projects sponsored by companies with research problems to be solved. This represents 50 opportunities to push the boundaries, work collaboratively with industry and contribute to the understanding of the whole sector. The projects are not based on an academic whim; they are issues that the industry needs answers to and are driven by commercial need.

When working with other PhD students I often found that they were working in niche areas and I couldn't engage with their research in the way I do with the IDCORE researchers. I can understand what they are doing because they are delivering tangible outputs and they're good at communicating what these are. I've also managed to learn quite a bit about Offshore Renewables which is a real bonus!

This job comes with high levels of job satisfaction. I love being part of IDCORE, not least because friends and acquaintances always admire the area I work in and I am proud of what our researchers are achieving.

Katrina Tait, Administrator of the EPSRC and NERC Industrial CDT for Offshore Renewable Energy (IDCORE)

Starting with just eleven students to look after meant that Katrina was able to develop individual relationships with each of them. Now, with experience under her belt, she achieves this with all of the 50 researchers in her care. This is another difference from providing wider support to the 500 other PhD students on campus, sadly it just wasn't possible to have the same level of engagement with them.

Highlights

Katrina finds it impossible to pick just one highlight from her time with IDCORE – there are so many of them. She really enjoys the annual trip to Orkney with students returning from their first year with their sponsoring companies - a chance to further build relationships - and all the site visits that she gets to be part of. She also enjoys watching the journey of each student. They come into the Centre 'unsure of what is ahead but excited', and then she sees them mature, grow and become competent, skilled and in their 'right place'.

She was really pleased to be part of the Celebration Dinner for the 2019 Cohort in October 2023. As the first cohort she had supported, they had been through hard times, having undertaken their training and projects throughout the Covid Pandemic, but they had all been hugely successful and were clearly at the start of really exciting careers.

Her role is also giving her the opportunity to engage with the academic community more widely, attending the CDT Directors Meeting organised by the EPSRC at the start of Phase 3 of IDCORE in 2024. She found it eye-opening to see the range of other CDTs and what they're doing and she is now starting to network with the Administrators and Programme Managers in other Centres.

Katrina strongly believes that the sort of training offered by CDTs is an important part of accelerating our progress towards a more sustainable future, but she also knows that this will only be possible if the researchers passing through these programmes are given the support needed to ensure their well-being and effective development.





Stakeholder Case Study

Philipp Thies



EPSRC & NERC Industrial CDT
for Offshore Renewable Energy www.idcore.ac.uk

IDCORE Involvement

Philipp has been an IDCORE Co-Investigator and Member of the Executive Board since the start of Phase 2 of the Centre. For Phase 3 he has taken on additional management responsibilities by becoming a Co-Director.

Philipp's involvement in the Executive Board has been shaped by his experiences of teaching on the programme, which he has been doing since he graduated from his own PhD in 2012. The training content and the modules he has taught have varied over the years, including theoretical aspects of reliability certification through to the more applied knowledge delivered through the summer schools. He enjoys teaching at doctoral level, not least because the modules are designed from a research-led perspective. It also allows him to try new approaches, like using role plays and research briefs, that he can then adapt for use in his undergraduate teaching. He describes the moorings and reliability summer school that he runs for IDCORE as the most enjoyable teaching in his career so far.

In addition, Philipp has been a member of the supervision team for 20 IDCORE projects, five of which are still 'live'. He tends to get involved with any IDCORE project that incorporates elements of risk and reliability – his specialism. However, he sees his role in supporting the well-being and welfare of the research engineers as being of equal importance to the academic input he makes through the supervision process. Sometimes this involves challenging the companies, but it also means challenging students as the skills required to deliver research in industry are different from those required in an academic setting.

Specialism

Philipp's research interests lie in the reliability engineering of renewable energy technologies with a focus on offshore energy. His work has focussed on critical components such as dynamic submarine cables and moorings for floating offshore wind, using techniques such as analytical system reliability assessment and Bayesian statistical methods. His work on physical component reliability testing is supported by well-established capabilities in numerical and experimental modelling of operational marine field load conditions. In addition, his training as an interdisciplinary researcher gives him a strong background in economic theory and transition pathways using renewable energy technologies for climate change mitigation, as well as energy and emission trading.

Within IDCORE, Philipp has used this skill set to work with researchers exploring systems boundaries and failure criteria. Projects he has supervised have been diverse, going from traditional engineering topics such as instrumentation, control and materials, through to developing new 'assurance' methodologies based around reliability data gathered but not utilised or even available to asset owners. 'Unlocking' these data flows has been one of the key benefits of IDCORE for Philipp. Other projects continue to support developers as they work out how to deliver effective operation and maintenance (O&M) regimes once plants are out of their initial manufacturer warranty periods. This work has even extended into supporting the risk appraisals undertaken by investors – understanding failure modes and reliability data can feed into financial modelling and future O&M strategies.

IDCORE Benefits

None of this would have been possible without the effective relationships that the IDCORE team has built with project sponsors. It has created a space where sponsors are open to ideas creating useful conversations and relationships even where these haven't led immediately to projects. But perhaps most important to the success of IDCORE has been the students. IDCORE researchers are high quality engineers who have been delivering excellent results.

The highlight of my involvement with IDCORE has been to follow the journeys of our students, seeing them mature as researchers and then come back as colleagues and professionals. For me this demonstrates that the programme is bearing fruit.

I am personally committed to the continued growth and development of the programme. There are going to be huge opportunities, particularly around floating offshore wind as it matures, and the O&M needs of that sector become apparent.

I am proud of the way the teaching that we are delivering provides a broad understanding of the sector and the disciplines that come together to make it a success. We are giving our researchers a wider outlook, enabling them to communicate well and become very effective.

We are training the engineers who will deliver net zero in the offshore sector, and what is more, the effort we are putting in to supporting them as cohorts is developing a network that will support them throughout their careers. It not only helps them, it also helps the organisations they work for. We are creating a mycelium for the industry.

Philipp Thies, IDCORE Programme Co-Director





Stakeholder Case Study

Sally O'Brien



sse Thermal

SSE are currently sponsoring three separate IDCORE projects, each placed in a different business unit within the company. This has been driven by the SSE's Academic Partnerships Team, which serves all business units within the company. The work of this team is bringing enormous benefits to us - developing relationships that are more effective than we could achieve on our own.

We have always recognised the need for collaboration between industry and academia, but colleagues had often encountered a disjoint between academic findings and their application in industry. Having graduated from a Centre for Doctoral Training myself, I understand how these problems can arise, but I also know the benefit of overcoming them.

By working closely with industry, IDCORE is delivering more effective collaborations, and I am seeing this delivering value across multiple engagements, not just those with IDCORE. I have been really impressed by what their research engineers are achieving, and I was delighted to accept when IDCORE asked me to become a member of their Independent Advisory Board.

Sally O'Brien,
Senior Project Manager, SSE Thermal

Wider benefits

SSE are finding that collaborating with academia and creating links with local universities in key locations is helping them to win funding competitions. It also supports recruitment, but perhaps more importantly, particularly in the context of the IDCORE projects, it is creating effective answers to real problems.

The project that Sally is personally supervising is helping to cut through the sales pitches of commercial suppliers, providing evidence to senior management that is leading to better decisions around digital twins, increasing the efficiency of the organisation. It is helping them to identify additional digital capabilities that will add value to a range of projects, covering issues such as emissions modelling and how this feeds into permits, or trading forecasts – predicting when would and where you would want to supply hydrogen. Where projects have complex funding support, effective digital tools can even help maximise subsidies or optimise maintenance regimes.



Direct Value

Sally is a Senior Project Manager in SSE's Hydrogen Development Team. She has responsibility for taking projects through the front-end-engineering-design process to the point where they are ready for a financial investment decision. This is a 'gated' process requiring input from a range of internal teams. Currently, Sally's main project is the Aldbrough Pathfinder Project, a flagship hydrogen project within SSE's Thermal Business Unit.

It is cutting edge work, which has made it a perfect candidate for support from an EngD researcher, and in this case, Sally is expecting the outputs of the work to be generically applicable across a range of project 'archetypes'. This will create benefits for Sally's wider team as well as for her personally. It is helping her to re-engage with a specific area of research, since one of her business objectives is to keep a foothold in this field.

Reflections on IDCORE

Having trained in a Centre for Doctoral Training herself, Sally recognises the very specific value that these centres deliver. SSE envisages a future energy system comprising of predominantly renewable energy sources, coupled with flexible generation - including hydrogen and CCS technologies - providing low carbon/net zero power availability at times of need.

As IDCORE also prepares for that future, Sally is keen to see them reflect on how they can support that drive for flexibility, recognising issues like the inherent inefficiency of converting renewable electricity into hydrogen and then back to electricity again. This will require IDCORE to take a strategic approach to the organisations they engage with, not least to build on the work they are already doing with the supply chain in wider collaborations that develop capabilities and bring others along the journey with them.



Stakeholder Case Study

Wini Obande



EPSRC & NERC Industrial CDT for Offshore Renewable Energy www.idcore.ac.uk

About Wini

Wini is an early career researcher and an Elizabeth Georgeson Fellow in Sustainable, Multi-Functional Composites at the University of Edinburgh, where she is currently building a portfolio of advanced composites research focussed on industrial applications that support the circular economy. She has a particular emphasis on low-cost, lightweight composite materials derived from bio-based and recycled feedstocks and aims to reduce the reliance on virgin resources and minimise waste streams headed for landfills by adding value to end-of-life composite wastes.

Wini joined the IDCORE supervision team in response to a specific request from one of the researchers who had a gap in her supervision team and recognised Wini's work as having direct relevance to her own project.

As I continue to build my own research career, I am keen to work with talented postgraduate research candidates and postdoctoral researchers from various engineering disciplines looking to work on sustainable composite materials and manufacturing, especially for energy-related applications. I was delighted when Ione Smith approached me and asked me to join her supervision team as it presented an opportunity to engage with closely aligned research within IDCORE. By creating a postgraduate research route that appeals to diverse cohorts who are as interested in working with industry as they are in an academic career, I believe IDCORE attracts high-quality, resilient and self-motivated candidates. I am delighted to be part of the team and it is having a positive influence on my own research.

Wini Obande

Background

Wini started her engineering career at the University of Limerick in Ireland, where she obtained both BEng and MRes degrees, finishing her time there as a researcher in advanced polymer and composite materials at the Irish Composites Centre. She then moved to the University of Edinburgh where she completed a PhD in Mechanical Engineering and continued to build her experience as a postdoctoral researcher through a Supergen project that extended the research outputs of her PhD to tidal turbine blade applications. Alongside this, she delivered an industry-funded project exploring energy-efficient manufacturing processes that convert bio-based and recycled feedstocks into valuable processing materials.

Since securing the Fellowship, Wini has continued to build her research interests, focussing on circular material design and production across a range of industrial applications including a number that are related to the energy industry. It was her work on in-situ polymerisation of thermoplastic-matrix composites, and in particular her use of novel polymer blends, that made her such a good fit for the IDCORE project that she is now supervising.

Benefits of IDCORE

Wini is already seeing the benefit of engaging with IDCORE. The project is directly relevant to her knowledge and experience, and provides crucial research leadership experience. Not only that, but it is also helping to build the collaborations that are so important to someone seeking to deliver applied research in such a specialised field. The engagement is extending her network of industrial partners and also providing opportunities for collaboration with other leading academic institutions, which will be invaluable as she develops other funding proposals in the future.



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