This document contains six proposals that were submitted to the UKCCSRC Activity Award.

Please use this document to decide which three proposals you would most like funding.

To vote please return to:

https://ukccsrc.ac.uk/membership/early-career-researchers/ecr-activity-fund

How the voting works:

- Votes are weighted so your first choice will be given 3 points, your second choice 2 points and your third choice 1 point. The proposals will then be ranked by highest total score.
- The number of proposals that will receive the fund is not fixed and is at the discretion of the UKCCSRC. The exact number of funded activities will depend on both the quality of the proposals received and the available budget.
- Each ECR member can only vote once.
- You can only vote for each proposal once (i.e. you cannot put the same proposal as your first and second choice)
- No other voting restrictions apply.

Please note: Voting is only open to UKCCSRC Members. Votes from non-ECR UKCCSRC members will be excluded from the final results.

Entry One

Lead Name:	Elsa Lasseuguette
Name of institution, including department:	Institute for Materials and Processes, School of Engineering, University of Edinburgh
Title of proposed activity:	Biannual meetings for Early-Career Researchers
Please give an outline of the proposed activity:	We are proposing two meetings for ECRs annually, in between the UKCCSRC Biannuals. The first event can be held at the University of Edinburgh, as the lead collaborators on this proposal and numerous CCS groups are based in Edinburgh. Locating the first meeting in Edinburgh should draw in a critical mass of ECRs in order that the inaugural event is a success and can lead to more high quality ECR-led events in the future. These meetings are opened to all the ECR UKCCSRC members. However, we aim to give priority to local researchers to attend, so for this first meeting we expect most attendees to come from Scotland and Northern England. Subsequent events will take place at different universities, so the location of the meeting does not repeatedly favour physical attendance from the same group, and local groups will be encouraged to organise the meetings. The events will be broadcast live, for ECRs who cannot attend the meeting. Program: Start: 10 AM (for travel organisation): • Drinks/buns on arrival - (5 min) • Display of posters (With a picture of the poster presenter to facilitate the discussion around the poster session) - (5 min) • Plenary presentation by UKCCSRC - what the Centre does, how ECR are involved - (10 min) • Poster show and tell, 1 min each poster presenter, no slides just verbal 20 x 1 min - (30 min) • Presentation from guest speaker, followed by questions - (60 min) • Group discussion - (30 min) o The organisers will propose a question in advance, related to the invited speaker presentation, for discussion amongst attendees, both physical and online. An appointed moderator will ensure the flow and quality of discussions. Depending on the number of attendees, the discussion could be split into two groups. • Break for lunch, casual networking, presentation of posters - (90 min): o The poster session is open to all of the participants. It is not compulsory but is highly recommended. The poster can present either an individual research project or the research activities of a whole group. Posters from earlier meetings are allowed, so there is no barrier to make a special poster. • Four ECR presentations, 5-10 min each plus quick questions/feedback - (30-45min) o Each participant will have the opportunity to submit an abstract based on his/her poster. These will be reviewed by a scientific panel (the event

	organisers), with the four best abstracts being selected to be presented to the audience. The best presentation will receive a prize of £25. • Short talks from local academics about their career path to advise ECRs, 2 x 10mins – (20 min) • Optional Facilities Tour of the host institution – (45 min) • Close, best presentation award, feedback to improve event for next time – (15min) End: 3:30 PM Archiving: All abstracts/posters/presentations will be archived in an online UKCCSRC record of the meeting, unless the presenter wishes not to. We want to maximise the benefit to ECRs, so the guidance for the ECR presentations will be loose to suit ECRs as desired, and the format of the discussion session is open to suggestion, provided that we maintain the desired goal of actively engaging all participants in debate and group discussion.
Please detail the expected learning outcomes that will result from your activity:	The meetings are intended to be of considerable value to the ECRs who attend physically and online, although we will encourage ECRs to attend in person for a more beneficial experience. The main presentation, led by an invited guest from industry or academia, and the ensuing question and answer session will facilitate further learning from an expert on a particular aspect of CCS. In some cases, the presentations will be highly relevant to an ECR's research and so could result in useful information, sources and contacts - thus having a direct impact on their research outputs. ECRs whose work is not as closely related to the content of the presentation will be able to benefit from interesting and important context to enhance their understanding of the field of CCS. As mentioned above, the goal of the discussion session is to encourage lively conversation on particular CCS topics, allowing attendees to develop their own understanding though engaging with others' ideas. This is something that ECRs do not often have the opportunity to do outside of their own research groups. To illustrate, a discussion topic could be: "What are the biggest challenges for CCS in the next decade?" or "What are the emerging carbon capture technologies?" ECRs will be able to showcase their research though displaying their posters and through applying to give a short presentation. Thus, the meeting will allow ECRs to talk about own work, practise presenting to an audience and receive feedback from their peers in a more relaxed and encouraging environment than, say, a research conference. Those not presenting will be able to find out about their peers' research and the work that goes on in other institutes, which could potentially open new doors for collaboration and cooperation. The last aspect of the meetings is to be short talks from academics or industry

	professionals from at or near the host institution on their career paths. We hope that this will provide ECRs with valuable guidance to help them decide if they wish to pursue an academic or business career and, if so, offer insight on how to succeed. Overall, we intend to facilitate informative and fun meetings in a format that is tailored for ECRs. As well as learning from those further ahead in their CCS careers, there will be various opportunities to meet and share knowledge with other ECRs, allowing attendees to publicise their research and build their own networks. Though creating and strengthening relationships in this way, we hope to foster a greater sense of community for ECRs for the benefit of the individual and for the work of the UKCCSRC.
Please provide the full names and institutes of all other collaborators on this application:	Charlotte Mitchell, UoE, School of Engineering Gang Wang, HWU, Institute Petroleum Engineering Jonathan Scafidi, UoE, School of GeoSciences

Entry Two

Lead Name:	Niklas Heinemann
Name of institution, including department:	University of Edinburgh, School of Geosciences
Title of proposed activity:	Geo-Athon on Leakage Risk in Geological Storage
Please give an outline of the proposed activity:	As a part of the ACT Acorn Full Chain CCS project, a workshop is currently being planned to discuss and assess the risk and consequences of leakage in the 'East Mey' area, a potential CO_2 storage site in the Central North Sea. The workshop will take place in August 2018 in Edinburgh and we propose an open and interactive format – what we call a 'geo-athon'. Approximately 20 academic and industry experts with different backgrounds (e.g. geology, well engineering, reservoir engineering, social science …) will be invited to participate in a one-day workshop, where participants will be split in groups to brainstorm on pre-defined risks concerning CO_2 storage in the 'East Mey' area. The planned activities involve: • We will provide a general introduction to the development plan for CO_2 storage in 'East Mey' including a detailed introduction to the regional geology. • The participants will be split in groups of three or four members, trying to make the groups as diverse as possible in terms of the expertise of their members. This will provide us with variety of high quality opinions and results from different perspectives. • Five different risk scenarios will be introduced to the groups. For each scenario, required supporting information such as seismic data or well data will be provided. Risk scenarios will include 'leakage along abundant wells', 'loss of containment by horizontal migration', and 'leakage along faults', for example. • Every group will work on the same scenario. Each scenario should take approximately 1 hour including the presentation of the results. This will be repeated for all 5 scenarios. • Working on the risk scenarios include brainstorming and discussion amongst the groups. Then, every group will summarise their outcomes in a brief presentation to the rest of the groups. Each group will present a quick introduction to the main points of the discussion, an assessment of the risk using a risk matric (severity vs likelihood) including main reasons for the decision and brief outline on methodologies to reduce the risk. This will then be debated amongst all groups. • The meeting will conclude with a general discussion about the main results and conclusions. In order to achieve the best possible results, we want to open this event to other ECR researchers interested in CCS. We will also aim to get involved a few experts from industry and academia to drive the discussions. We ask for the full £1000 to subsidise travel expenses for academic and industry delegates who will have to travel to Edinburgh for the meeting and hence guarantee that delegates with limited funding have the opportunity to join our

	event. Since the venue costs and catering will be funded by ACT Acorn, we would use the money provided by UKCCSRC ECR activity fund mainly to bring as many young CCS researchers as possible together in one room to discuss safe future CO_2 storage projects in the North Sea.
Please detail the expected learning outcomes that will result from your activity:	The Geo-athon has been conceived to address three issues: 1) Crowd-sourced elicitation: a major aim of this initiative is to organise the (to our knowledge) first crowd-source meeting related to CO_2 storage. The crowd-sourced approach can be an effective tool for elicitation, provided that the crowd presents a diverse range of knowledge, and that members are able to provide their opinions independently and freely. We will encourage multidisciplinary interactions by combining participants with different expertise in the groups, with the overarching aim of addressing the main research questions from different opinions. We will obtain a range of results (in this case, an assessment of leakage risks, including a threat and consequence analysis and a list of actions to reduce the risk), that will allow us to produce: a. Quantitative assessments on the uncertainty associated to the different parts of the problem. As an example, from the range of storage capacity calculation results obtained we will be able to produce a quantitative assessment of the uncertainty related to this parameter. This can be used to identify elements that may require further research effort. b. A variety of risk assessments that will inform and complement the leakage risk assessment of the ACT-Acorn CCS Project. The diversity in knowledge of the participants will provide useful insights on different elements of the risk assessment that might be overlooked by an individual (e.g. economic, policy, engineering implications). If the saying four eyes see more than two is correct, there is a better chance of achieving a comprehensive risk assessment with twenty pairs of eyes with a variety of expertises. 2) Study of group behaviour: We will ask the participants for permission to record their deliberations, conforming to UOE ethics procedures. The crowd-source elicitation requires independent thinking of each individual within the group, we will monitor dominant personalities to study their impact on decisions taken by the group. We will engage with social scientists and psychologists to analyse these behaviours and identify potential biases in the results. 3) Strengthen network for ECR: we will encourage multi-disciplinary groups, where ECR participants will collaborate with other ECRs, academics and industry experts with different specialities. We will also invite experts from industry and academia that will provide feedback on the results and drive the discussion about real-life implications. This will be a great opportunity for ECRs to engage with experts in a wide variety of fields and to establish dialogue with other CO_2 storage colleagues.

Please provide the full names and institutes of all other collaborators on this application:	Juan Alcalde, University of Aberdeen, School of Geosciences Saeed Ghanbari, Heriot Watt University, Institute of Petroleum Engineering

Entry Three

Lead Name:	Gang Wang
Name of institution, including department:	Institute of Petroleum Engineering, Heriot-Watt University
Title of proposed activity:	CO_2 Capture and Storage Researchers' Forum (CCSRF)
Please give an outline of the proposed activity:	A 6-monthly webinar series (held twice during year of application) with contributions from industry professionals and ECRs working in tandem. Preparation: We will invite a senior professional from industry and two ECRs to share their knowledge at each webinar with the UKCCSRC ECR community. UKCCSRC ECRs and academic colleagues in our institutions will be invited to help identify the speaker and the CCS topics. The webinars will be delivered from a recording studio in Heriot-Watt University in Edinburgh, with the costs of travel to Edinburgh for the industry professional and the two ECRs, and the use of the studio covered by the budget. Time will be allocated for the industry professional and ECRs to discuss their areas of interest in advance of the webinar. In order maximize the benefits for the young researchers working on CCS, all the ECRs will be invited to send a one-page abstract of their study to us. All the proposals will be reviewed by the judging committee, which will consist of the three event coordinators, two academic staff at our institutions, and if offered by UKCCSRC, up to two members of the Managament Team or the Secretariat. The two selected candidates will be invited to produce a presentation one month in advance of each webinar. In order to guarantee the quality and consistency of the webinars, and to develop the knowledge exchange expertise of the ECRs, the invited speaker from industry will be asked to give feedback to the ECRs on their presentations before the webinar. Agenda of the webinar: 1. Talk given by one senior professional from industry (30-minute talk and 20-minute questions and discussions). 2. Talks given by two ECRs. (10-minute talk and 10-minute questions and discussions for each person). Feedback: Besides the feedback regarding the quality of the webinar, attendees will be asked to express their preference on specific speakers and topics for future webinars. A recording of the webinar will be available to be downloaded from the UKCCSRC website after the webinar. (For cost reasons, the maximum number of attendees at the webinar will be limited to 100.) All ECRs who submitted a one-page abstract will be given the option of having their abstract uploaded to the UKCCSRC website, along with their contact details.

Please detail the expected learning outcomes that will result from your activity:	We are aiming to enable the participants to • Realise the significance of CCS in the big picture of energy, society and climate. • Understand the key issues of planning, designing, and implementing CCS projects, both in terms of scientific and practical aspects. • Recognize the current opportunities and challenges of CCS application at industrial scale. • Be informed of CCS related research across the UK. • Develop their networks. • Develop their Knowledge Transfer skills and confidence.
Please provide the full names and institutes of all other collaborators on this application:	Gang Wang, Heriot-Watt University (Lead applicant) Charlotte Mitchell, University of Edinburgh Elsa Lasseuguette, University of Edinburgh

Entry Four

Lead Name:	Michael Onoja
Name of institution, including department:	Coventry University, Centre for Flow Flow Measurement and Fluid Mechanics (FMFM)
Title of proposed activity:	Carbon Capture and Storage (CCS) Development in the UK: A Contemporary Academic and Industrial Perspective
Please give an outline of the proposed activity:	The general aims of this one-day workshop, proposed to take place in the Summer of 2018, preferably July, are to present an overview of the current state of development of the UK CCS industry and through the interactions between the attendees to improve the knowledge and awareness of the UK R&D priorities for CCS. Additionally, the workshop aims to highlight the following: • Identify the research facilities as well as the capacity and skills currently available for CCS in the UK, and • Discuss the ambitions and targets for CCS in the UK. The workshop will consist of formal and informal presentations and a discussion forum. Presentations will be given by invited speakers from industry, leading national and international organisations, research institutes and academia. The workshop shall include the following topics: • Current status of CCS in the UK – presenting the on-going developments and research activities of the UK CCS industry. • Challenges and progress of CCS deployment in the UK – including case/feasibility studies on CCS deployment in power generation and industry. Proposed Agenda: 10.00 – 10.30 Coffee and Arrivals 10.30 – 10.45 Welcome address from the organisers & Introduction to UKCCSRC, Background and Aims of the Workshop 10.45 – 12.00 Session 1: Research and development activities of the UK CCS industry Presentation by three invited speakers: 25 minutes each. Followed by Q&A 12.00 – 12.20 Coffee Break 12.20 – 13.10 Session 2: Three Minute Thesis (3MT) Challenge (here ECRs present a compelling spoken presentation on their research topic and its significance in just three minutes. Amazon vouchers of £50 and £30 will be available as prizes for the winner and the 1st runner-up, respectively) 13.10 – 14.10 Lunch 14.10 – 15.00 Session 3: Challenges and progress of CCS deployment in the UK. Presentation by two invited speakers: 25 minutes each (plus Q&A) 15.00 – 15.30 Facilitated discussion session: All invited speakers 15.30 – 15.40 Concluding remarks from the organisers 15.40 – 16.00 Workshop close NB: The number of speakers to be invited is estimated as five at present, plus one session chair, due to the limit on funding. The proposers of this workshop

	would like request support from the ECR meeting fund towards the costs of this workshop as this will facilitate increased attendance, especially from industry. Since this is a one-day workshop, the meeting fund will only be required to cover the costs of travel as Coventry has excellent transport links to all parts of the United Kingdom. Alternatively, a reimbursement scheme may be created for only those who indicate participating in the Three Minute Thesis Challenge. The workshop is limited to 50 places, and attendance will be on a first come first served basis. The host institution, Coventry University, has offered to provide additional financial support for this activity.
Please detail the expected learning outcomes that will result from your activity:	Overall, the workshop will provide an ideal forum in which renowned academics and industrial experts can engage with early career researchers and provide participants an opportunity to meet and hear what researchers and developers across the UKCCS platform are working on and its importance. The 3MT challenge is an academic competition developed by the University of Queensland, Australia. Its benefit to UKCCSRC in this workshop will be to engage ECRs in something different and establish an awareness of the early career researchers' profile within UKCCSRC while creating opportunities for future collaboration within the organisation. This will help to build networks in the doctoral candidate community across the UKCCS platform and provide an opportunity to raise the profile of postgraduate research within their respective institutions. More importantly, the ECRs will have the opportunity to develop and present a concise account of their project and effectively communicate their research to a wide audience. The workshop intends to emphasise the message that good communication is key and identify potential collaborations based on current research interests within the CCS research community. Speakers that have been contacted in regard to attending such a workshop, tentatively to be held in July include: Alan James, Managing Director, Pale Blu Dot Energy, Aberdeen Sam Krevor, Senior Lecturer, Department of Earth Science and Engineering. Imperial College London Ismael Falco-Suarez, Research Fellow in the Marine Geophysics Team at the National Oceanography Centre, Southampton Sessions' Chairman: Seyed Shariatipour, Reservoir Engineering Theme Leader, Flow Measurement and Fluid Mechanics Research Centre (FMFM), Coventry University Other speakers that we are interested in contacting for this workshop include: Matthew Hall, Director, GeoEnergy Research Centre (GERC), Nottingham Andy Chadwick, CCS Individual Merit Research Scientist, BGS Nottingham Jasmin Kemper, Senior Technology Analyst at IEAGHG, Gloucester Dennis Gammer, Strategy Manager for CCS, ETI, Loughborough Confirmation of speakers will depend on the fixed date for this workshop.
Please provide the full names and institutes of	Masoud Ahmadina, FMFM, Coventry University Emmanuel Luther, FMFM, Coventry University

all other collaborators on this application:	Azadeh Pourmalek, FMFM, Coventry University Gloria Mensah, Sheffield University

Entry Five

Lead Name:	Dawid Hanak
Name of institution, including department:	Cranfield University, Power Engineering Centre
Title of proposed activity:	Research development sandpit - generate research idea and make it happen!
Please give an outline of the proposed activity:	Research development sandpit will bring UKCCSRC ECRs together two times before September UKCCSRC meeting and will provide an opportunity to share research, brainstorm and generate ideas in the area of CC(U)S. These meetings are planned to be intensive networking and collaboration development activities that will be held at Cranfield University. A first meeting will begin with an overview of the sandpit structure and expected outcomes. This will also focus on the ways ECRs can collaborate within sandpit (manuscripts, proposals) and will provide an overview of potential sources of funding for further collaborations. Then, each ECR will present their research and research interests for collaboration via 5-10 minutes presentation. A whiteboard/flipchart will be used to collect the information from the presentations to narrow down the focus of the research development activities. A presentation template will be sent to participants before the meeting to ensure that each presentation contains relevant information. Then, the participants will be encouraged to network over coffee and discuss their ideas, while the information from the presentations will be summarised and a number of collaboration areas will be identified. The collected information will be then used to kick-start the discussion about the focus of this sandpit, including generation of research ideas and hypotheses to be tested. Each participant will be able to pick the research field/idea they would like to collaborate on and the cohort will be divided into a number of focus groups. These will then work on action plans for 1) a study to address the particular idea/hypothesis using the existing skills and capabilities of the ECRs or 2) for development of a research proposal to address a larger research question. Each focus group will then assign tasks to its members that will be taken offline before the next meeting. The action plans developed by the focus groups will be then presented to and reviewed by all participants. A second meeting will take place approximately 2-3 months after the first meeting and will aim to present the progress of the focus groups. The groups working on the particular idea/hypothesis will present their progress and outcomes first, in a 15-30 minute group presentation. Then, the groups working on a research proposal will present their progress in a 15-30 minute group presentation. Each presentation session will be followed by a discussion session to seek feedback from all participants and assess the challenges experienced in the process. The focus groups will be also encouraged to prepare posters for the September UKCCSRC meeting. After the networking lunch, the focus groups will be asked to reflect on and discuss their experiences and challenges of working in groups, by answering a number of coaching questions. The venue cost and the collaborators time will be covered by the Cranfield University.
Please detail the	Having participated in the research development sandpit, the participants are

expected learning outcomes that will result from your activity:	expected to: 1. Develop a strong network of contacts in the field of CC(U)S; 2. Become aware of the ongoing research within the UKCCSRC; 3. Develop networking, communication, brainstorming, and presentation skills; 4. Develop teamwork skills in both face-to-face and virtual environment; 5. Understand the challenges of working in multi-disciplinary groups. In addition to the professional development of the ECRs identified above, it is expected that each participant will actively engage in the activities of their focus group that will lead to establishing long-term and fruitful collaborations. Moreover, if high-quality research outputs will be generated by the focus group, these will be disseminated in the form of the manuscript(s) submitted to the relevant journal and posters at the UKCCSRC meeting(s). Finally, the research proposal(s) developed by the focus groups will be discussed with the senior academics within the UKCCSRC network and, if deemed to be of high-quality, these will be submitted for consideration to the relevant funding body (for example Network Grant or Standard Grant from EPSRC).
Please provide the full names and institutes of all other collaborators on this application:	This application will be led by Dr Dawid Piotr Hanak (Lecturer in Clean Energy, Cranfield University) in collaboration with a team of UKCCSRC ERC members including: Dr Seyed Ali Nabavi (Research Fellow in Low-Carbon Energy Systems, Cranfield University) Dr Maria Erans Moreno (Research Fellow in Carbon Capture and Storage, Cranfield University) Dr Sebastian Stanislaw Michalski (Research Fellow in Low-Carbon Energy Systems, Cranfield University)

Entry Six

Lead Name:	ABDUL'AZIZ ALIYU
Name of institution, including department:	University of Sheffield
Title of proposed activity:	Cross-country CCS Campaign: 'The role of CCUS in decarbonizing the the Energy Industry'.
Please give an outline of the proposed activity:	The 'Cross-country CCS Campaign' team will visit 3 proposed major cities (London, Sheffield and Edinburgh) and spent two days in each city with their CCS campaign table, cubicle, stand or tent and talking to people from a diverse background and profession with regards to how key, CCS is pivitol in decarbonizing the energy industry. Fliers, booklets and souvenirs will be handed out especially to young people in a simplified 'cartoonish' form to highlight what CCS is and how it will contribute to limiting the global temperature increase to 2C. Lemonade, coffee, tea and biscuit will be free at the stand to attract more people to speak to us.
Please detail the expected learning outcomes that will result from your activity:	The Cross-country CCS Campaign is aimed at raising awareness to the public with regards to CCS as a means to saving our planet. We hope to speak to at least 150 people about CCS on a daily basis. That is about a thousand people in the course of the campaign. It is our hope that we will meet with politicians, celebrities, school children, activists, freelancers and gain more insight and understanding of the public opinion about CCS. We could very likely meet with people who will be willing to help in some way or the other to help us advance the course of CCS in the UK and abroad. More importantly, this campaign will give us an insight and understanding with regards to how to engage the public from a perspective that will be interesting to people with no scientific or climate knowledge.
Please provide the full names and institutes of all other collaborators on this application:	Kelachi Omehia: University of Sheffield Hisham Al-Baroudi: Cranfield University