

Research Associate/ Research Fellow: Transmission Network Planning Under Uncertainty

Department	Electronic and Electrical Engineering (www.strath.ac.uk/engineering/electronicelectricalengineering/)		
Faculty	Faculty of Engineering (www.strath.ac.uk/engineering/)		
Staff Category	Research	**Reference No**	34957
Reports To	Prof Keith Bell	**Grade**	Grade 7 or Grade 8, as commensurate with knowledge and leadership experience.
Salary Range	Grade 7: £37,694 - £46,049 Grade 8: £47,389 - £58,225	**Contract Type**	Fixed Term (32 months)
FTE	1	**Closing Date**	30/11/2026
Working Arrangements	Hybrid. The standard requirement across the University is that at least three days per week (based on 1FTE) will be spent working on-site (with flexibility as appropriate).		
Work Location	Technology and Innovation Centre		

Job Advert

Great Britain has been at the forefront of decarbonising its electricity system, one of the first countries to commit to net zero in law, and a world leader in offshore wind. GB's electricity system is changing quickly, and the planning decisions made today will shape how well it performs in the future. We are seeking a researcher to work within the publicly-funded NextNet project to develop new methods for planning the GB transmission network under uncertainty, working closely with the project's advisors and industry so that the research has a clear route into practice.

Demand, generation, weather and market conditions are all uncertain, and the way they interact makes network planning increasingly difficult. The postholder will study and classify these sources of uncertainty across both short-term operation and long-term planning and examine how they are connected in space and time, drawing on statistical and probabilistic methods to understand and represent these relationships. This work will feed into a flexible framework for generating realistic, hour by hour scenarios of the GB system from 2035 to 2050. The framework will cover both normal operating conditions and rare, high impact events, using methods that keep the number of scenarios manageable.

These scenarios will form the basis for new transmission planning models that properly account for uncertainty and the timing of investment decisions. The postholder will apply optimisation approaches suited to different types of uncertainty, such as stochastic and robust optimisation, to identify investment plans that stay flexible and can adapt as new information comes in, rather than fixing a single plan too early. To ensure these methods work on real, large-scale networks, the postholder will also develop ways to simplify the models so they remain solvable without losing accuracy.

The role therefore calls for a blend of experience and skills: knowledge of power systems plus the ability to characterise and model uncertainty using statistical and probabilistic techniques, alongside the ability to formulate and solve optimisation problems that incorporate that uncertainty. Experience with methods such as copulas, Bayesian networks or scenario generation is valuable for the first, while experience with stochastic, robust or distributionally robust optimisation is valuable for the second.

The postholder will join the research team at the University of Strathclyde, led by Professor Keith Bell, holder of the ScottishPower Chair in Future Power Systems. The group is well established, with several related research projects ongoing at PhD and postdoctoral level. The postholder will work closely with Dr Waqquas Bukhsh and Prof Bell within the group, supporting and learning from this wider research effort, so the ability to work well as part of a team is highly valued. The successful candidate will also work closely with NextNet's industry partners and the project's advisory board, with the research directly informing related studies on system operability and stability. This is a strong opportunity to help shape how uncertainty is built into GB transmission network planning, with a clear path towards use in industry.

Job Description

Brief Outline of Job:

The postholder will develop new methods for planning Great Britain's future electricity transmission network under uncertainty. The role involves developing future system scenarios and advanced planning models to support robust, flexible investment decisions, working closely with industry to deliver practical impact.

Main Activities/Responsibilities:

1.	Conduct a structured literature and industry review of uncertainty sources in power systems, distinguishing short-term operational and long-term planning timescales.
2.	Develop and apply statistical/probabilistic tools (e.g. copula theory, Bayesian networks, decision trees) to characterise how uncertainties propagate spatially and temporally and how they interact.
3.	Design and implement a scenario-generation framework that takes user-specified inputs (time horizon, spatial resolution, data sources, confidence level) and produces probabilistic operational scenarios, applying dimensionality reduction (e.g. PCA) to manage complexity.

4.	Generate exemplar high-resolution (e.g. hourly) time series of exogenous variables for the GB system (2035 – 2050), capturing both typical conditions and rare, high-impact events.
5.	Formulate and solve multi-stage transmission expansion planning models under uncertainty, comparing stochastic programming, robust optimisation, distributionally robust optimisation and chance-constrained approaches. Investigate the scalability limits of these optimisation models and develop surrogate models to improve computational tractability.
6.	Act as lead author of technical reports, academic papers, and accessible outputs for industrial partners documenting methods, results and recommendations; present findings to the industrial advisory board and at project meetings/conferences.
7.	Collaborate with project partners at Strathclyde, Manchester and Imperial and engage with industrial partners, taking a lead role in developing, articulating and sharing approaches to management of risk on power systems.
8.	Manage and prioritise own workload within agreed objectives to ensure that all activities are completed to deadlines.
9.	Supervise student projects, provide advice to students and contribute to teaching as required by, for example, running tutorials and supervising practical work.
10.	Identify sources of funding and contribute to the securing of funds for new or follow-up research, including drafting grant proposals and planning for future proposals
11.	Engage in continuous professional development.

Person Specification

Educational and/or Professional Qualifications

(E=Essential, i.e. a candidate must meet all essential criteria to be considered for selection, D=Desirable)

E1	Honours degree in a cognate discipline.
E2	A PhD (or near completion) in Operational Research, Electrical Engineering, Applied Mathematics, Statistics or a closely related field, or equivalent research and development experience.

Experience

E3	Evident ability to design and conduct research work.
E4	Strong understanding of power system planning and/or operation, including key sources of uncertainty (e.g. demand, renewable generation, weather, market prices, outages).
D1	Demonstrable experience with optimisation methods relevant to power systems, e.g. linear/mixed-integer programming, stochastic programming, robust or distributionally robust optimisation, or chance-constrained optimisation.
D2	Solid grounding in probability and statistics, with experience applying Bayesian networks, Monte Carlo simulation, or scenario generation techniques.
D3	Experience handling and analyzing large, high-resolution time series datasets.

Job Related Skills and Achievements

E5	Proficiency in a scientific programming language (e.g. Python or Julia) and experience using optimisation solvers/AML (e.g. Gurobi/CPLEX, JuMP/Pyomo).
E6	Ability to structure reports or academic papers in a clear and coherent manner and to clearly communicate engineering and energy policy ideas.

E7	Ability to pick up, assimilate and apply relevant information from a variety of sources.
E8	Excellent interpersonal and communication skills, with the ability to listen, learn, engage and collaborate as part of a research team.

Personal Attributes

E9	Ability to plan and organise own workload effectively, with evidence of having successfully completed research projects to interim milestones and completion.
E10	Enthusiasm, and keenness and ability to embrace and work constructively within a team environment.
E11	Creativity, initiative and rigour in framing and solving engineering problems and generating and communicating evidence on potential solutions.

Application Procedure

Applicants should visit Strathclyde's vacancies portal and complete an online application form including the name of three referees who will be contacted without further permission, unless you indicate you would prefer otherwise. Applicants should also submit a Curriculum Vitae and a covering letter detailing the knowledge, skills and experience you think make you the right candidate for the job. Applicants should also complete the Equal Opportunities Monitoring Form.

The University of Strathclyde encourages the recruitment of disabled and neurodivergent candidates. If you require any reasonable adjustments or support at any stage of the recruitment or application process, please contact us at humanresources@strath.ac.uk, and we will be happy to assist you. This includes supporting you with the option to submit a paper application or a CV instead of completing the online application form.

Interviews

Formal Interviews for this post are expected to take place during the week commencing 14 December 2026.

The University is a Disability Confident Employer and operates a guaranteed interview scheme for disabled candidates who meet all the essential criteria for the post that they are applying for.

Other Information

Further information on the application process and working at Strathclyde can be found on our website (http://www.strath.ac.uk/hr/workforus).

Informal enquiries about the post can be directed to Dr Waqquas Bukhsh (waqquas.bukhsh@strath.ac.uk) and/or Prof Keith Bell, Scottish Power Professor of Future Power Systems (keith.bell@strath.c.uk).

Conditions of Employment

Conditions of employment relating to the Research staff category can be found at: Conditions of Employment.

Rewards and Benefits

Our comprehensive benefits package, including generous annual leave, family-friendly benefits, flexible work options, and a commitment to continuous learning, reflects our appreciation for the valuable contributions of our colleagues.

We understand that each staff member has unique priorities and lifestyles, so our diverse benefits ensure there is something for everyone, details of which can be found on our Rewards and Benefits webpage.

- **Financial Rewards:** We provide attractive financial packages, including competitive salaries, relocation support for employees and a generous pension scheme, with university contributions of 14.5%.

- **Work-Life Balance:** We are dedicated to enhancing healthy work-life balance for our employees. We offer generous annual leave, an additional annual leave purchase option, flexible and agile work arrangements.
    - Annual Leave: Generous entitlement of 27 days (Grade 5 and below) or 31 days (Grade 6 and above), in addition to 11 public holidays and University closure days.
    - Additional annual leave purchase: Option to request purchase of 2 weeks' additional annual leave per year.
    - Flexible and agile working: The University provides flexible work arrangements. You can request arrangements that fit you and your role, such as hybrid, part-time, compressed hours, term-time, adjusted shifts, staggered hours. These requests can be made from the first day of your employment.
- **Family Friendly Benefits:** We offer a variety of enhanced family-friendly benefits to support our employees in balancing work and family responsibilities. These include Maternity Leave, Paternity/Maternity Support, Adoption Leave, Shared Parental Leave, Parental Leave, Carers Leave and support, Family Friendly Research & Scholarship Leave, and access to our on-campus nursery.
- **Career Development:** Our commitment to personal development is reflected in initiatives such as professional courses, subsidised educational programs, coaching and mentoring, leadership development, secondment opportunities, and access to our library.
- **Health & Wellbeing:** We place high importance on the safety, wellbeing, and health of all our staff and offer discounted Strathclyde Sport membership, an Employee Assistance Programme (EAP), Occupational Health Service, and Cycle to Work scheme.
- **Recognition Awards:** At Strathclyde, we place a strong emphasis on acknowledging and rewarding our staff's commitment and exceptional contributions. This is demonstrated through our Long-Service Awards and our Values-based Strathclyde Medals.

Probation

Where applicable, the successful applicant will be required to serve a 9 month probationary period.

Pension

The successful applicant will be eligible to join Universities' Superannuation Scheme. Further information regarding this scheme is available from Payroll and Pensions.

Relocation

Where applicable, the University offers a relocation package to support new employees who meet the eligibility criteria. The relocation package is offered as a contribution towards costs incurred, and is designed to be flexible, allowing staff to use the financial support available in the way that will be most helpful to them. Further details are outlined in the Relocation Policy.

Equality and Diversity

The University of Strathclyde is a socially progressive institution that strives to ensure equality of opportunity and celebrates the diversity of its student and staff community. Strathclyde is people-oriented and collaborative, offering a supportive and flexible working culture with a deep commitment to our equality, diversity and inclusion charters, initiatives, groups and networks.

We strongly encourage applications from Black, Asian and minority ethnicity, women, LGBT+, disabled candidates and candidates from lower socio-economic groups and care-experienced backgrounds.

The University currently holds an Athena Swan **Silver award**, recognising our commitment to advancing women's careers in science, technology, engineering, maths and medicine (STEMM) employment in academia.

University Values

The University's Values capture what we're all about: who we are, what we believe in and what we stand for. Our Values have been derived from how we act and how we expect to be treated as part of Strathclyde.

In delivering **our People Strategy**, we will contribute, act, and make decisions guided by these values.

- **People-oriented:** committed to our staff and students, providing opportunities, and investing in their development.
- **Bold:** confident and challenging in what we do, and supportive of embracing appropriate and managed risk in our decision-making.
- **Innovative:** focused on discovering and applying knowledge with impact and encouraging creative thinking and new ideas.
- **Collaborative:** working together, with our colleagues and external partners, with integrity and in an open, respectful way.
- **Ambitious:** for our institution, staff and students as well as supporting the ambitions of our partners.



Conditions of Employment

Research Staff

1. GENERAL CONDITIONS

Members of staff are subject to the Charter and Statutes and the Ordinances and Regulations of the University, published in the Calendar, and to any amendments or additions thereto approved by the University Court and, in the case of the Charter and Statutes, the Privy Council. Staff are also expected to familiarise themselves with, and adhere to, general University policies and procedures, as published on University web pages.

The University Court recognises Strathclyde Universities and College Union (SUCU) as the sole body with which it will negotiate and consult on all collective issues concerned with the terms and conditions of employment of Research Staff. Such terms and conditions may be varied by the University Court after negotiation and consultation with SUCU.

Each member of staff is responsible for the proper performance of allocated duties to the person or persons specified in the member of staff's letter of appointment and any accompanying papers.

The University is committed to ensuring that its business is conducted in an open and transparent manner and will take all appropriate steps to address risks of bribery or corruption. Members of staff are required at all times to act honestly and with integrity and to safeguard the resources for which they are responsible. The University has in place a robust Public Interest Disclosure (Whistleblowing) Policy to enable concerns to be brought to its attention. This is available at www.strath.ac.uk/policies/. Other relevant policies, e.g. Fraud Prevention and Conflicts of Interests, can also be found on the University's website.

Any member of staff may at any time be exposed to commercially sensitive information, information related to potentially valuable intellectual property or information which may otherwise be of a confidential nature. This information, which could be found anywhere in the University, may be written or disclosed orally, can include information of a commercial or technical nature, and may be owned by the University or by third parties. The University requires all employees to keep any such information confidential in the first instance and not disclose, publish or otherwise disseminate it without prior consent of the University. Such confidentiality obligations are commonplace and in the commercial interests of the University. When in doubt advice should always be sought from Research and Knowledge Exchange Services prior to disclosure.

The University operates probationary periods for new staff, the duration of which will be specified in individual letters of appointment. The normal probation period for posts in this staff category is 9 months for those at grades 6 and 7, and 12 months for grades 8 and above. Further guidance on probationary procedures is published at www.strath.ac.uk/staff/policies/hr.

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Further information on the terms and conditions specified in this document and other staffing policies and procedures can also be found at www.strath.ac.uk/staff/policies/hr.

2. SALARY

Appointments are made at an appropriate salary point on the University's grading structure, with initial placing determined according to qualifications and experience. Increments are paid to staff on the 12 month anniversary of their appointment. Where this is not the first of the month, the increment will be paid on the first of the month directly after the 12 month anniversary. This allows 1 progression to the next point on the salary scale until the top guaranteed point of the scale is reached.

Salaries are paid directly to staff members nominated bank account, normally on the second last working day of the month.

3. HOURS OF WORK

Working time is that required to fulfil the duties of the post. The University Court recognises that research staff carry out these duties in a variety of ways appropriate to the nature of the research activity, but expects regular contact to take place between the research staff employee and the supervisor/grantholder (where these positions are occupied by different individuals) during normal working hours on week days. There are exceptions to this pattern which may involve contact at other locations or in the evenings, or at weekends, but these arrangement will be made with the agreement of the member of staff concerned.

Duties may, by arrangement with Head of Department/School/Director, include some teaching associated with the post (up to a maximum of 40 hours per semester) for which no additional payment will be made.

Additional work which does not fall within the scope of that described above may by arrangement attract payment which must be authorised and processed through the payroll.

4. HOLIDAYS

Annual leave entitlement is 31 days per year to be taken by agreement with the line manager. For staff members working on a part-time basis, holidays will be calculated on a pro-rata basis.

In addition to annual leave there is an entitlement to 11 public holidays per year which should be taken on days that the University is closed for this purpose. The University presently closes for 4 additional days over the Christmas and New Year period. **These additional days count against the annual leave entitlement.**

For staff members working on a part-time basis, public holiday entitlement will be calculated on a pro-rata basis.

Annual leave and public holiday entitlements should be taken in the leave year to which they relate. Up to 5 days leave can be carried forward into the new leave year subject to line management agreement. In exceptional circumstances, Heads of Department/School/Director may approve carry forward of accrued annual leave in excess of 5 days.

The University's expectation is that staff take all accrued holidays prior to their termination date. If staff have exceeded their entitlement the University will deduct an equivalent number of days pay from final salary payments.

5. SICKNESS ABSENCE

During any period of absence through illness or injury provided the appropriate notification and certification procedures have been followed the University will pay a member of staff (having taken account of the aggregate of all periods of absence due to illness during the twelve months immediately preceding the first day of the current absence) as follows:

Period of Continuous Employment at start of absence from work	**Full Pay**	**Half Pay**
Less than 1 year	1 month	1 month
1 year but less than 2 years	2 months	2 months
2 years but less than 3 years	4 months	4 months
3 years but less than 5 years	5 months	5 months
5 years or more	6 months	6 months

In order to manage the University's sick pay scheme the University requires to maintain sickness absence records on individual members of staff. When making payments after the expiry of statutory sick pay the University will deduct an amount equivalent to any benefit normally payable by the Department of Work and Pensions. For full details on the general University policy in this area please refer to the Sickness Absence Management Policy at www.strath.ac.uk/staff/policies/hr.

6. PENSIONS

If you are under age 75 at the date your appointment commences you will automatically become a member of the pension scheme operated by the University — the Universities Superannuation Scheme (USS). You will be admitted to the career revalued benefits scheme called the USS Retirement Income Builder; the contribution rate that currently applies is 6.1% of pensionable salary. A threshold applies to the maximum salary that counts towards the USS Retirement Income Builder. The current threshold from 1 April 2026 is £74,208 per year. Contributions based on salary above the monthly equivalent rate of the threshold are paid to the defined contribution section of the scheme called the USS Investment Builder. Please use the following link to access information, including the USS Member Guide: https://www.uss.co.uk/for-members/youre-a-new-joiner. The scheme booklet is called 'Your Guide to the Universities Superannuation Scheme'.

The University operates a salary exchange arrangement, Pensions Plus, for members of the USS. Pensions Plus enables pension contributions to be made in a manner so that both employees and the University can benefit from available National Insurance Contribution savings. You will be automatically included in Pensions Plus, provided it does not adversely affect your take-home pay or your ability to claim certain state benefits. If your earnings fall below the Pension Plus pay protection limit you will be opted out of Pension Plus. This will not affect your membership of the USS.

New members of staff may opt out of USS within three months of taking up appointment and will then be treated as if they had never been a member of the scheme. After three months members of staff who wish to withdraw from USS during their employment will be required to give a minimum of 28 days' notice in writing to the University. Any member of staff who wishes to opt out should contact the Pensions Section, Finance, in the first instance (pensions@strath.ac.uk). Please note that if you are a member of Pensions Plus and withdraw from USS with less than two years of membership, or cease employment with the University and have less than two years of USS membership, the option of a refund of pension contributions will not be available to you. Instead, USS must provide you with a pension benefit that is payable from your Normal Pension Age. Regardless of whether you participate in Pensions Plus, if you are a member of the pension scheme for two years or more you are not entitled to a refund of pension contributions on leaving the scheme, you will be entitled to a pension benefit.

The University reserves the right to alter or withdraw Pensions Plus as it sees fit or as required to comply with legislative changes. Withdrawal or amendment of Pensions Plus will not affect your membership of USS. If you do not wish to participate in Pensions Plus but wish to remain in the pension scheme please contact the Pensions Team who will provide you with a non-participation form.

Information regarding pension scheme membership can be found on the Pensions SharePoint (staff login required). Full information regarding USS can be found on the USS website – www.uss.co.uk.

7. PLACE OF WORK AND RESIDENCE

Members of staff will be based on the John Anderson Campus, unless otherwise stated in the letter of appointment. The Department/School in which the post is initially placed will be specified in the letter of appointment although there will be an expectation to work at such other places as required in the course of employment.

If the need arises for members of staff to work outside the UK for a period (or periods) of more than one month then such arrangements will be subject to mutual agreement. Members of staff would then be provided with a statement in advance setting out the terms covering such periods of employment.

The University does not normally place specific restrictions upon the place of residence of members of staff. All staff are, however, expected to reside in a location which is compatible with the satisfactory fulfilment of all the duties associated with their appointment.

8. CONSULTANCY/FURTHER ACTIVITIES

To support the strategic objectives of the University and to facilitate individual professional development, the University encourages staff to engage in professional activities with outside bodies related to their field of work. In many cases, such activity will be approved on the basis that it represents University knowledge exchange activity and should therefore be treated as part of the individual's overall workload and managed through the University's systems. It is also recognised that there will be some cases where an activity is entirely separate from the University and should thus be notified/approved as a personal business activity. For further information please refer to the "University Procedure in relation to Work for Outside Bodies including Consultancies", which forms part of the employment contract and can be accessed at www.strath.ac.uk/staff/policies/hr.

9. DISCIPLINARY AND GRIEVANCE PROCEDURES

Further information on the University's disciplinary and grievance procedure can also be found at www.strath.ac.uk/staff/policies/hr or on request from Human Resources.

10. NOTICE AND TERMINATION

Members of staff are employed on the conditions indicated in individual letters of appointment and any accompanying papers. The University is not obliged to give notice of termination or continue any employment beyond the end of that period. Where the period of the contract of employment is for one year or less it may be terminated short of the fixed term period by one months notice on either side. Where the period of the contract of employment is for more than one year, or where there have been a further contract or series of contracts immediately consecutive, the employment may be terminated short of the fixed term period by three months' notice on either side, except during the probationary period when the notice period is one month.

If the appointment is for a fixed term it will expire at the end of the period without the necessity for notice.

Revised April 2026