

**Prof Sara Walker**  
School of Chemical Engineering  
College of Engineering and Physical Sciences  
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Edgbaston, B15 2TT

13<sup>th</sup> September 2024

Dear EPSRC New Investigator Award Committee,

I am delighted to write in support of Dr. Sheng Wang's application entitled "**Enhancing Resilience of Future Energy Systems with Hydrogen Integration**" for the EPSRC New Investigator Award.

I currently work as a Professor of Energy in the School of Chemical Engineering at the University of Birmingham, and I am Director of the UKRI Hub on Hydrogen Integration for Accelerated Energy Transitions (HI-ACT), and Co-Director of the UKRI Energy Demand Research Centre (EDRC) and the Birmingham Energy Institute.

Dr Wang's application aligns closely with my team's current research focus. Hydrogen integration and resilience are the two pivotal themes of HI-ACT. Our hub aims to showcase the UK as a world leader in a scalable hydrogen economy by using whole systems-based thinking. Dr Wang has developed several innovative modelling and analysis approaches for hydrogen-integrated energy systems from whole energy systems optimisation perspectives (including the mutual support between power and gas systems, and widely distributed flexible resources), as evidenced by his publications.

The novelty of the resilience evaluation and real-time control methodologies in his proposal are contributions that could significantly refine our whole energy system operation and planning schemes with bottom-up details, and optimise the way the UK develops a hydrogen network backbone and hydrogen economy by 2050. As we are developing a map of cross-Europe hydrogen projects, infrastructure and capabilities on the HI-ACT website, Dr Wang's national climate dependant resilience map can add an additional layer to our toolbox, enabling us to inform policy decisions more comprehensively.

As a £12.5m EPSRC-funded national research hub, HI-ACT will connect Dr Wang with national leading experts in this field. Dr Wang will be invited to disseminate his interesting research findings through our social media accounts (including LinkedIn, YouTube, Podcast, etc.) and our workshops to improve the dissemination and impact of his work. HI-ACT's academics, including Prof. Paul Dodds, Prof. Jianzhong Wu, and myself, who are regularly engaged with both political and industry stakeholders, will help Sheng build regular dialogues with governments and ensure his research can inform policymaking. We have wide engagement with industry partners including National Grid, Catapults (Energy, Connected Places, Digital), Northern Gas Networks, and Northern PowerGrid. HI-ACT also provides funding for secondment to industries, which can enhance Dr Wang's connections and understanding of their motivations and financial drivers. Through this cross-sector collaboration, enabled by HI-ACT, Dr Wang will better identify the business model of the hydrogen market and arbitrage opportunities, making his technologies economically feasible.

I am delighted to support this New Investigator Award, which is well-structured, novel, and will generate valuable outcomes. HI-ACT is delighted to support early career researchers, such as Dr Wang. We see the relationship as two-way, and we are excited at the opportunity for HI-ACT to benefit from

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the research which Dr Wang shall undertake. Please do not hesitate to contact me should you require further information.

**Kind regards**

*S.h. Walker*

**Professor Sara Walker SFHEA**

**Director, Birmingham Energy Institute**

**Director, UKRI Hub on Hydrogen Integration for Accelerated Energy Transitions (HI-ACT)**

**Co-Director, UKRI Energy Demand Research Centre (EDRC)**