

# Early Stage Researcher at Energy Storage Solutions



Energy Storage Solutions is an integrated company appeared on the energy market scene towards the end of 2014 by leveraging our engineering strengths and industrial capabilities and blending the perfect combination of young enthusiastic engineers and long-term experts in solar energy technology, product engineering and construction. As a part of Gransolar Group, E22's professionals have extensive experience in energy storage, and specially in its integration with renewable sources. We offer integrated solutions and a total service: Redox Flow Batteries, Lithium Ion Batteries, Energy Management and Control Systems, as well as complete technical consultancy and integration services. We also have a chemical laboratory and a pilot plant where an expert team of R&D join efforts in the products and services improvement and research and development of new technology. E22 wants to fill at the earliest possible date one position as

### Early Stage Researcher Position

in the EU Horizon 2020 Marie Skłodowska-Curie Project POLYSTORAGE-ETN, Grant Agreement No 860403.

POLYSTORAGE ETN aims to develop high-quality training opportunities for 16 Early-Stage Researchers (ESRs) (one financed with Australian funds) in the area of "Polymers for Next Generation Electrochemical Energy Storage". The final objective is the training of materials scientists, who will be the future scientific leaders, to face some of the upcoming European energy and environmental challenges. Well-balanced combination of fundamental and basic material and polymer science with applied research in advanced energy storage devices is a key aspect of this training network. A comprehensive training programme has been designed at two levels including local activities, such as enrolment in PhD programmes, local courses, etc., and network-wide activities, such as sectorial secondments, six workshops, two schools and one final conference. The goal of the project is the exploitation of the high number of potential synergies between innovative polymers and next-generation energy storage technologies, such as post-lithium batteries, redox flow batteries, and all-polymer batteries. POLYSTORAGE assembles 12 beneficiaries (incl. 2 industries) and 13 partners (incl. 11 industries). POLYSTORAGE academic partners are internationally renowned for their research and training activities in polymer science (University of Jena (Germany), University of the Basque Country (Spain), University of Leuven (Belgium), University of Pau (France), Aalto University (Finland)) and energy storage (Karlsruhe Institute of Technology (Germany), Uppsala University (Sweden), Politecnico di Torino (Italy), Imdea Energy (Spain), National Institute of Chemistry (Slovenia) and Deakin University (Australia)). The 13 industries offering complementary expertise are LITHOPS SRL (Italy), E22 Energy Storage Solutions (Spain), Scania CV AB (Sweden), Toyota Motor Europe (Belgium), Evonic Creavis GmbH (Germany), TCI Europe (Belgium), CALIX – Europe SARL (France), Chemspeed Technologies AG (Switzerland), NETZSCH Gerätebau GmbH (Germany), Solvionic S.A. (France), Repsol S.A. (Spain), Tokyo Chemical Industry Co., Ltd. (Japan) and Calix Limited (Australia). The industrial partners will have an active participation in the training activities and exploitation of the project results.

## Description of Individual ESR project:

**Title:** Title: Polymer-based redox flow battery system and characterisation

**Title Objectives:** The main objective of this PhD study is the development of a battery system (stack, control) optimised for new polymer-based redox flow chemistries. (i) Identification of stack materials, (ii) cell assembly, (iii) development of the control system, and (iv) techno-economic analysis of the solution for product commercialisation.

Expected results: ESR should be able to develop a polymer redox flow battery stack and control system based on the knowledge of the network. ESR should be able to perform electrochemical characterisation and system engineering. ESR should be able to design a redox flow battery prototype optimised for polymer-based chemistries.

Host institution: E22 Energy Storage Solutions (Spain) (<https://www.energystoragesolutions.com/>)

PhD enrolment: University of the Basque Country (Spain) (<http://www.polymat.eu/>)

Main supervisor: Veselin Miroslavov ([vmiroslavov@energystoragesolutions.com](mailto:vmiroslavov@energystoragesolutions.com))

Start of employment: 01.05.2020

Application deadline: 29.02.2020

For any additional information, please contact Veselin Miroslavov ([vmiroslavov@energystoragesolutions.com](mailto:vmiroslavov@energystoragesolutions.com))

## Your tasks:

- To undertake research, e.g., by planning, preparing, setting up, conducting and recording the outcome of experiments, performing data analysis, desktop research etc.
- To conduct experiments by designing and assembling lab-scale RFBs with alternative materials adapted to the polymeric technology. The batteries will be cycled electrochemically by a potentiostat/galvanostat in order to obtain the necessary data to design an industrial automatized prototype.
- To participate in maintaining laboratory facilities and assist other members of the group by sharing knowledge and expertise. To collaborate with others to tackle interdisciplinary problems in close cooperation with experts from adjacent disciplines in chemistry and physics.
- To actively participate within the research group, communicating and presenting research at meetings, through publications and other recognised avenues as appropriate, ensuring information is communicated to internal and external partners.
- To contribute to research publications and presentations as required.
- To analyse and communicate complex ideas, concepts and data using appropriate methods.
- To resolve issues and support senior colleagues in devising procedures required to ensure accurate and timely reporting.
- To generate research output and contribute to the development of independent and original ideas as appropriate.
- To maintain and update area of specialist knowledge, researching and critically appraising relevant literature within the area.
- To undergo personal and professional development that is appropriate and that will enhance performance.
- Any other duties not included above, but consistent with the role.

## Requirements:

- Bachelor Degree on Chemical Engineering, Energy Engineering, Industrial Engineering or equivalent discipline.
- A Master's degree (or equivalent) in Chemical Engineering, Energy Engineering, Industrial Engineering, or equivalent relevant research experience. The degree must be obtained before the beginning of the contract but you can apply before.
- Proven experience in laboratory research related to materials, preferably with polymeric compounds.
- Knowledge of research methods and techniques within specialist field.
- Proven ability to analyse complex information and summaries appropriately.
- Proven communication skills, including presentation to various audiences.
- Excellent organisational and team-working skills.
- Proven ability to demonstrate creativity, innovation and accuracy within work.
- Excellent written and oral communication skills in English.
- Knowledge or experience based on flow batteries.
- Knowledge on control and automation of chemical processes

## We offer:

- To become part of a highly motivated, international, dynamic young project team.
- To work in a multidisciplinary project with industrial application.
- To become part of a R&D team with extensive experience in testing materials, cells manufacturing and assembly, control system development and system testing and monitoring, not only at laboratory scale but also at pilot scale.
- To work in Chiva, a municipality of the province of Valencia with a relaxing environment close to the mountains, but very close to Valencia, an opposite environment with dynamic business activities, successful scientific innovation centers and a vibrant cultural scene.
- To benefit from further continuing education, which includes internships and secondments, a variety of training modules as well as transferable skills courses and active participation in workshops and conferences in addition to the individual scientific PhD project.

### Planned secondments:

- In addition to the individual scientific project, the fellow will benefit from further continuing education, which includes secondments. In this project, the following secondments are planned: 2 months at Friedrich Schiller University (Germany) to be trained on Synthesis of redox-active polymers, 4 months at IMDEA Energy (Spain) to conduct research in Development of redox-active colloids/suspensions and 4 months at Deakin University (Australia) to investigate Evaluation of redox-active polymers with redox flow battery setup.

## Additional Information

### ESR eligibility criteria

There are strict eligibility requirements for the ESR PhD positions. Please ensure that you qualify before applying, as ineligible candidates cannot be considered.

#### Researchers

- **MUST** be in the first 4 years (full-time equivalent) of their research careers and not yet have been awarded a doctorate. This 4-year period is measured from the date of obtaining the degree which would formally entitle to embark on a doctorate.
- **MUST NOT** must not have resided or carried out their main activity (work, studies, etc.) in Spain for more than 12 months in the 3 years immediately prior to their start date of the contract. Compulsory national service, short stays, such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.

For more information on MSCA-ITN, visit <https://ec.europa.eu/research/mariecurieactions/>

Applicants must confirm and be prepared to provide evidence that they meet the Marie Skłodowska -Curie eligibility criteria as specified above.

**English language:** It is a requirement that applicants will show that their ability to understand and express themselves in both written and spoken English is sufficient for them to derive the full benefit from the network training, and to embark on a doctorate at a university.

The Marie Skłodowska-Curie programme offers highly competitive and attractive salary and working conditions. The successful candidates will receive a salary in accordance with the Marie Skłodowska -Curie regulations for early stage researchers. Exact salary will be confirmed upon appointment.

The vacant position is limited to 3 years. The position offers the possibility to graduate as a PhD.

E22 is committed to ensuring an environment that provides equal opportunities and promotes diversity.

As an equal opportunity employer, we strive to increase the number of women working in the field advertised.

Disabled persons are explicitly encouraged to apply. They will be given preference if appropriately qualified

Have we piqued your interest? Then please submit your application including the following documents until 29/02/2020 via the application platform at [www.polystorage-etn.eu](http://www.polystorage-etn.eu) (link to the platform) as well as to [vmiroslavov@energystorage-solutions.com](mailto:vmiroslavov@energystorage-solutions.com)

- Application form (can be downloaded from the web page [www.polystorage-etn.eu](http://www.polystorage-etn.eu))
- Motivation letter, preferably together with a short video (3-5 minutes) to present yourself, your experience, interests and expectations.
- Curriculum vitae of at most 3 pages. Europass C.V. format preferred  
([https://europass.cedefop.europa.eu/documents/curriculum vitae](https://europass.cedefop.europa.eu/documents/curriculum-vitae))
- Transcripts and certifications from university:
- Bachelor degree, including class ranking if possible.
- Master degree (or equivalent), including class ranking if possible.
- Names of at least two references who are willing to write a letter of recommendation on the candidate's behalf (they may be contacted by us)
- Any other relevant documents



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