**University of Leicester**

**Future 50 PhD Scholarship**

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| **Project Reference** | ENG Bagdanavicius |

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| **Additional Supervisor** |  |

**Section 2 – *Project Information***

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| **Project Title** | Development of thermomechanical energy storage systems | |
| **Project Highlights:** | 1. | Innovative use of thermomechanical energy storage system as an energy store and as an energy source |
| 2. | Balancing the overall energy supply and demand using thermomechanical energy storage |
| 3. | University of Leicester technology demonstrator for a more sustainable and reliable energy system |
| **Project Summary** | | |
| The capacity of electricity generation from renewable energy sources has been steadily increasing over the last decade. The intermittent nature of wind and increased penetration of renewable energy sources has an impact on energy systems. Energy storage, including Thermomechanical Energy Storage (TMES), has been identified as a key solution to enhance the reliability of electricity supply.  One distinctive feature of TMES systems compared with other energy storage technologies is generation of large amount of heat during charging or discharging stages. This heat could be a valuable commodity. The use of TMES systems for energy storage and supply offers great benefit. However, the potential of TMES systems remains poorly understood.  The aim of this project is to take a holistic approach to energy storage to evaluate the advantages and disadvantages of different TMES technologies, and understand how this could impact energy systems. This study will focus on analysing how TMES could be used at the small (buildings) and medium (districts, cities) energy supply systems level to meet the overall energy demand. This proposed study will investigate the potential for using TMES for energy storage and supply.  The objectives of this project are:  1. Design and analyse Thermomechanical Energy Storage systems through modelling, simulation and experimentation.  2. Investigate the possibilities of using Thermomechanical Energy Storage as energy storage and as an energy source.  3. Investigate how Thermomechanical Energy Storage systems could be used to balance overall energy supply and demand.  For this project we are looking for an enthusiastic graduate with a 1st or 2.1 degree in physics, mechanical or a relevant engineering discipline, preferably at Masters level. The PhD student will be involved in the project “Sustainable, Affordable and Viable Compressed Air Energy Storage” funded by EPSRC. In addition to institutional support the student will be involved in Energy Research Accelerator (<http://www.era.ac.uk/>) skills academy programme, which is designed to provide students with a solid grounding in their research area during their PhD. The student will be offered: access to additional specialist training modules across ERA partners; specially tailored events, workshops and joint conferences; a network of like-minded researchers and entrepreneurs. | | |