Statement of Purpose

Having majored in Nano-Electronics and Photonics (Nanotechnology) as a postgraduate, I would now like to concentrate on renewable Energy storage devices that power future electronics.  
 I am especially interested in Nanotechnology because one can tailor the structure of the materials/matter at an extremely minute scale to achieve specific kind of properties. This is because, materials at nanoscale size exhibit unusual electrical, optical and mechanical properties when correlated with bulk level because of increase in the surface to volume ratio and also due to the peculiar quantum effects at the nanoscale. These interesting properties became the subject for my Master’s dissertation, where I synthesized and developed different types of graphene-based metal oxide/polymer nanocomposites and examined their electrochemical properties for supercapacitor application. I plan to work further in this field, exploring other kind of novel nanomaterials and perhaps preparing a paper suitable for publication  
 In my studies toward a Doctoral (PhD) degree, I would like to carry out my research in developing nanomaterials as electrodes for batteries and other energy storage devices such as supercapacitors and fuel cells and also testing the electrochemical  
performance of the electrodes using three-electrode cells configuration employing cyclic  
voltammetry, linear sweep voltammetry, electrochemical impedance spectroscopy, pulse voltammetry, chronoamperometry, galvanostatic charging and discharging experiments. Also, the morphological properties of the electrodes will be analyzed using characterisation  
techniques using XRD, SEM, TEM, XPS, FTIR and RAMAN spectroscopic techniques. With the facilities available in Waterford Institute of Technology, I would like to utilize and  
carry out my research studies in the batteries with the utmost care and attention towards my research.  
 Writing research papers also figures prominently in my academic/research and professional course. I have just begun submitting my manuscripts to the smaller journals with little success and am gradually building my skills towards writing a good manuscript. My research  
draws from and influences of my academic studies which I studied and implemented during my Masters. At the same time, I study the literature by considering part of the creativity, experimenting with the tools used by other authors in their work.  
 In terms of a career, I see myself in the academic/research position by teaching and guiding students in their research activities. Doctoral studies would be valuable to me in several ways. First, your doctoral/research assistantship program would provide me with the practical research experience I am eager to acquire. Further, earning a PhD in Vanadium-Iron Flow Batteries for Storage of Renewable Energy from Waterford Institute of Technology would  
advance my other two career goals by adding to my skills, both critical and creative, by  
working with your research team. Also, I am looking forward to working with the eminent supervisors improving my research and analytical skills. Ultimately, I see the PhD as an end in itself, as well as a  
professional stepping stone; I enjoy doing my research very sincerely and would like to  
continue my studies on the level demanded by the PhD programme.