

<b>Department</b>	School of Engineering and the Built Environment
<b>Supervisors</b>	Behrang Vand
<b>Project Title</b>	Technologies Mapping to Achieve Zero Energy and Emissions in Districts
<p><b>PROJECT DESCRIPTION</b></p> <p>Referring to the European Union (EU), energy consumption is even decreasing because of the EU's strict policy about energy conservation and efficiency. However, even if energy efficiency and increasing energy conversion from renewables are interested in great focus, a big effort is still fundamental to reduce global energy needs in order to promote sustainability. In this context, buildings play a crucial role because they are responsible for around one-third of World energy consumption and polluting emissions.</p> <p>In the United Kingdom, as per the case study, over 70% of the existing buildings will exist by 2050 and these buildings belong to various eras. This expresses a demand for solutions to reduce the level of energy consumption and carbon emissions from this portion. To reduce or minimize energy consumption and/or and/or carbon emission on a city scale, this research identifies the different technical solutions that can be triggered depending on the resources and infrastructures available within a city.</p> <p>A comprehensive study of the most common and novel low-carbon energy technologies at the district level will be conducted. These can be, for example, photovoltaic, solar thermal, small wind turbine, ground/air source heat pumps, micro combined heat and power as well as energy storage, for example, hot water storage tank. The integrated technologies are applied at the micro and macro levels of a district, therefore building and community energy modelling and simulation, optimization and analysis are required.</p> <p>Through this study, the best experiences and barriers of the different technologies (functionalities) will be identified, and then it demonstrates a repository of solutions for different types of buildings and communities on how to reduce/minimize energy demand and carbon emissions.</p> <p><b>Academic qualifications</b></p> <p>A first degree (at least a 2.1) ideally in Mechanical, Energy or Sustainable Technologies Engineering areas with a good fundamental knowledge of Engineering.</p> <p><b>English language requirement</b></p> <p>IELTS score must be at least 6.5 (with not less than 6.0 in each of the four components). Other, equivalent qualifications will be accepted. <a href="#">Full details of the University's policy</a> are available online.</p> <p><b>Essential attributes:</b></p> <ul style="list-style-type: none"> <li>• Experience of fundamental Sustainability and Engineering</li> <li>• Competent in Mechanical, Energy or Sustainable Technologies areas</li> <li>• Knowledge of Mathematics, Energy Systems, Zero Visions</li> <li>• Good written and oral communication skills</li> <li>• Strong motivation, with evidence of independent research skills relevant to the project</li> <li>• Good time management</li> </ul> <p><b>Desirable attributes:</b></p> <p>Visible experience in research and development in the the fields of energy and built environment</p>	

<b>Enquiries</b>	For informal enquiries about this PhD project, please contact b.vand@napier.ac.uk
<b>Web page</b>	<a href="https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process">https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process</a>