

Research Officer

Project Title: 'Development of Total Energy Solutions for Sustainable Aquaculture'

Funding Agency: Department of Education and Science
TSR Strand III: Core Research Strengths Enhancement Programme

Description: Studies carried out by the Department of Communication, Marine and Natural Resources in 2000 identified that the Irish aquaculture industry had the potential to grow by up to 30% in value over the next 15 years with appropriate innovative diversification. This TESSA Project is crafted to address a significant technical and economic barrier that has since arisen as a result of increasing energy costs, one that currently hampers the expansion of this industry in Ireland.

Aquaculture production in Ireland has begun to shift from "flow-through" to "re-circulation systems" in recent years. Water quality is maintained through a series of filters (biological and mechanical), temperature is controlled using either heaters or chillers and pumps are used to circulate water through the entire system. The combination of all these components requires a high energy demand and profitability is therefore heavily dependent on energy management protocols and unit cost. Alongside labour, energy is one of the most economically draining expenses associated with inland intensive aquaculture. The rapid increase in energy prices that has occurred during the last decades has created the need for increased emphasis on total energy solutions for aquaculture. The energy currently used is from expensive, non-renewable grid based source, and with increasing oil prices globally this is placing an enormous strain on existing aquaculture operators and deterring new entrants. Future development in the sector will require robust and efficient energy solutions and management and TESSA addresses this specific issue.

This experimentally based project will establish a research, development and demonstration facility that investigates the suitability of using renewable energy systems (heat pumps, solar collectors and wind generators) to meet the demands of various water pumping and temperature control scenarios. The economic and energy performance of the renewable energy systems will be assessed and the potential for smart-system designs will be examined using both system modeling tools and the test facility. The Research Officer will manage the project, liaise with the stakeholders in industry and funding body, develop and disseminate the smart system designs that emerge from the project.

Research Environment: This research programme is fully funded for three years and will be undertaken as a collaboration between two GMIT research groups (Sustainable Energy Research Group, SERG and Research for Alternative Culture Enterprise, RACE) with a combined research team of over 10 researchers. This project will benefit from the significant momentum that has already been created by these groups to establish a large database of relevant information, experimental design and hardware.

Requirements/Background: The successful candidate will hold a Postgraduate Degree in Mechanical Engineering, or equivalent, accumulated 3 years experience in industry or a research environment and have experience of mechanical system design, fluid mechanics, sensors, transducers, data acquisition and control systems. Experience of renewable energy systems and web page development, with good written and communication skills are also desirable.

Project Start-Date: June 2007

Project Duration: 3 Year Fixed Term

Conditions: €38,000.00 per annum.

Further Information on the Project: Brendan Allen at brendan.allen@gmit.ie or John Lohan at john.lohan@gmit.ie

Please submit a detailed Curriculum Vitae along with a covering letter clearly indicating the project title to:

**Human Resources Department,
Galway-Mayo Institute of Technology,
Dublin Road, Galway.
Email: hr@gmit.ie
Telephone No.: (091) 742763/742767/742737
Fax No.:(091) 770545**

Latest date for receipt of application is: 12 noon on Friday, 25th May 2007.