Proposal for RCE Award Category 1

**Preparing Green Economics**

**Trough Synergy Among Courses**

**in Engineering Physics Gadjah Mada University**

Business activities are encouraged to be more environmental friendly. It requires enterpreneurs having strong commitment to implement principles of green economics. The green economics three basic principles are 1) economic growth, 2) eco-efficiency, and 3) quality of economic growth. Department of Engineering Physics plays important role in preparing students in green economics era.

Learning activity implement Student Centered Learning (SCL) and Research Based Learning (RBL) methods. It brings students into real problems by implementing synergy among several courses (Enterpreneurship, Research Methodology, Integration of Renewable Energy, Introduction to Renewable Energy, Hydropower Engineering, and Quality Insurance). The scheme has been being developed gradualy since 2006. It develops also a learning network involving mainly Department of Engineering Physics, Centre for Energy Studies UGM, Institute for Research and Community Services UGM and Yogyakarta Board for Technology and Innovation Development.

Chosen students are directly involved in real green economics activities within curriculum framework. These are few examples of the activities used also as important tools in building capacity of students in green economics: 1) Comprehensive approach in developing green luxurious rest area in Jakarta. Holistic green concept, architectural and interior design, structural design, mechanical and electrical design, photovoltaics, waste management and landscape design, platform for visual, thermal and accoustical comfort, platform for integrated control room are implemented in the project (2012), 2) Studies and designs for 24 hydro powerplants (up to 4000 kW) in Central Java, West Sumatra, Central Kalimantan, South Kalimantan, Central Sulawesi, Gorontalo, North Sulawesi, East Nusa Tenggara, West Nusa Tenggara, and the Maluku (2006 – 2012), and 3) Developing and distributing PV-based energy supply and recharger unit as a form of emergency response to natural disasters. The model is ready for up-scaling and mass production (2010 – 2012).

This innovative learning approaches encouraged the student’s technopreneurship activity in order to answer the real community’s energy problems. It is also an answer to big challenge in creating green jobs. The main direct output of the synergy schmes are 1) student’s conceptual renewable energy based products/services for Small and Medium Enterprises and 2) basic designs on comprehensive implementation of hydropower technology. They are formulated based on comprehensive analysis on technological, business and economical, social, and environmental aspect in appropriate methodology.

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