This project is co-financed by the European Union and the Republic of Turkey

TurKey 2012 Enabling Technologies

BioGenReFlex

Biotechnology for Value **Gen**eration from **Re**newables and Biorefinery Waste Materials employing **Flex**ible Manufacturing Networks

Jan Rogut

rogutjan@yahoo.com

GIG – Glowny Instytut Gornictwa

(Central Mining Institute)

Katowice, Poland

Description of the Organisation

The Central Mining Institute (in Polish: Główny Instytut Górnictwa, acronym: GIG http://www.gig.eu) is a scientific and development organization, subordinated to the Minister of Economy. Major activities are addressed to small and medium enterprises in joint development of eco-efficient production technologies, excellence of environmental engineering , waste management, raw materials recycling, energy audits, optimization of water supply and sewage disposal, elaboration of Cleaner Production programmes of sustainable development of rural districts, municipalities and regions. As the only one firm in Poland we offer assistance in the implementation of the Integrated Management System, according to the PN-EN ISO 14001 standard. GIG is highly active in EU supported innovative and strategic research. Offered project idea will consume the advantages of participation of GIG in ***ENERO*** (European Network of Environmental Research Organisation http://www.enero.eu/page.asp?id=2&langue=EN) through constructing the major Consortium from the Members of the Network. It will also engage the Participants of BIOIMMERSE Project, especially its Industrial and SMEs Partners.

The consortium is open and welcomes new Partners from outside the Europe, especially with achievements in processing unique local bio-resources.

Description of your research interest

The ***Coordinator*** and his ***Research Team*** is active and experienced in co-supported by the European Commission collaborative research focused on development of clean energy technologies, environmental protection measures and waste management technologies. In last 10 years the Team participated in several European Projects, aimed on clean coal energy (***ISCC, C3, HUGE*** and ***HUGE2***), effective use of bio-resources (***BIOSYNERGY IP, Energy Forest, Efonet***) on development of backgrounds of hydrogen economy (***HyWays2***). The Coordinator is leading the ***BIOIMMERSE*** project aimed on demonstration of European version of innovative technology of ethanol production by fermentation of biomass derived syngas. This is the new European R&D exercise supported by EIT and KIC Innoenergy+. The ***BioGenReFlex*** project proposal will be focused on radical improvement of economy of Biorefineries of 2nd Generation by integration of production of green bio-fuels with ***flexible*** (optional) production of various products from various raw materials using the same installation. The market ready bio-chemicals (biocatalysts, solvents, surfactants, reagents) bio-materials (bacterial cellulose, PAH, functionalized nanostructured sorbents, unique biopolymers) and biomimetic structures of high added value belongs to such a products. The project assumes development of networks of SMEs as the major production infrastructure of target goods.

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- Objectives:
  - Excellence of existing and elaboration of new innovative processes and construction of modular elements and installations for flexible production of various, high added value chemicals and bio-materials from renewable and waste bioresources
  - Reduction of energy consumption and increase productivity of advanced manufacturing chains of high quality, market ready bio-products to be implemented by networks of SMEs
- Expected results
  - New technologies and elements of installation's for green production of high added value bio-products from biorefinery derived bio-wastes and local bioresources
  - Development, manufacturing and presentation to markets new "green" products from bio-wastes and bio-resources (biopolymers, unique chemicals and solvents, biocatalysts, structured and functionalized bio-reagents and bio-sorbents)

Consortium - profile of known partners

Nr	Partner	Type	Country	Role
1	GIG	RTD	PL	Coordination – Technology development
2	KTH	RTD	Sweden	Technology development
3	Mchem	SME	Poland	Demo
4	Malex	SME	Sweden	Demo
5	SynGas	SME	Poland	Demo
6	KIT	RTD	Germany	Technology Development
7	ISSeP	SME	Belgium	Technology Development
8	NILU	RTD	Norway	Environmental Assessment
9	INERIS	RTD	France	Risk Assesment
10	TNO	RTD	NL	Technology Development/IPV
11	VTT	RTD	Finland	Technology Development/Demo
12	Tecnalia	SME	Spain	Economic and social assessment
13	JSI	RTD	Slovenia	Technology Development
14	EERC	RTD	Estonia	Emission Control
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Consortium - required partners

The Partners with RTD competences or demonstration expertise at least in one from the following science or engineering areas are highly welcomed:

1. Electricity generation from renewable (Wind, PV) to be integrated with Biorefinery
2. Microbiology and/or biotechnology and bioreactor modelling in gas-liquid fermentation operations (bacterial cellulose production, hydrogen biological generation, syngas fermentation)
3. Backgrounds in nano-biotechnology of biological conversions and in material performance control
4. Advanced methods of separations for multi-component multi-phase mixtures
5. Economic and environmental assessment of biotechnology related raw materials, products and production chains
6. Biomass based product delivery organisations familiar with balancing agriculture biological resources, municipal waste management and food chains servicing

The role of new Partners of the BioGenReFlex is the fully open question and will be defined after the bilateral discussions of their competences

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GIG

Tel: + 48 322592282

Web: http://www.gig.eu/