PROJECT SUMMARY

Project number	AR/137/3-170/14
Project Title	Inovative Green Alternative on the Example of Georgia _ determination of Design Performance for Wind and Solar Energy Multipler Power Plants
Research subdirection/ subdirections	3-170 Power Engineering; 3-171 Nontraditional and Renewable Energy Systems Engineering;
Name of the leading organization	Georgian Technical University
Web	gtu.ge
Name of the co-participating organization	
Web	
Name of the co-funding organization	Georgian Technical University
Web	gtu.ge
co-funding	40000
Project Budget (Lari)	238650
Contribution of the Foundation	198650
Contribution of the co-funding	40000
Project duration (in month)	24

Personnel

	Key Personnel Name, Surame	Position in the project	Academic degree	Date of bitrh
1	Vazha Jamarjashvili	Principal Investigator	Doctor	1943-10-31
2	Raul Pataraia	main performer	Doctor	1935-03-27

Project Summary

The objective of the project is justification of the efficiency of the innovative idea. The essence of the project is the synergetic usage of wind, solar and water energy. In particular, the project provides implementation of such energy multipliers that do not violate the principle of the energy storage and at the same time ensures wind and solar energy transformation with the coefficient more than one. Therefore, it is obvious that the project in certain event is unexpected and therefore it is necessary to describe it in detail in the abstract.

The operation principle of the energy multiplier is very simple. In particular, pumping equipment operating on the wind and solar energy takes water from the river or from the lower pool created on it, through the pipeline, to the certain elevation, to the water accumulation pool from where water runs to the lower re-accumulation pool through the pipeline. The value of re-accumulation elevation is several times more than the accumulation elevation and therefore on the account of the fallen water energy, the value of the energy generated in the hydro-turbo-generator exceeds the value of the power totally obtained at the wind and solar units and in certain value of the re-accumulation / accumulation elevation ratio, the wind and solar energy transformation coefficient is more than one.

Georgia is mountainous country rich with water resources. Its geographic environment, presence of waterless ravines and lakes together with the hydro resource containing ravines condition the presence of such units that satisfy the requirement that re-accumulation/accumulation elevation ratio should be more than one. In particular, the units to be considered first of all which have been identified by us are: 1. series of Enguri HPP; 2. Khrami HPP I; 3. Ertso lake; 4. two rivers of Begela ravine of Tianeti region.

Energy transformation factor at the series of Enguri HPP i.e. theoretic value of the wind and solar energy multiplication sequence equals to 4,1; such value at Khrami HPP I equals to 2,48; according to the evaluation calculation real value of the energy multiplication at Ertso lake is 4,27 when in Tianeti region it is 5.

The project is aimed at specifying the main technical and economical values of those units in Georgia that provide the requirements necessary for the wind and solar energy multipliers.