

Nowadays, cultivation and utilization of microalgae is rapidly expanding area of research. Algae are indicated as particularly prospective for general bioengineering (industrial use of living organisms) due to the comprehensive abilities to production of metabolites that are valuable bioproducts. Among renewable energy sources, one of the most important and widely developed direction is the use of biomass for energy purposes. The issues of the presented project fits in the current researches. In connection with need for realization the policy of care for the quality of the environment, as well as targets for biofuels set by Directive on Renewable Energy Sources (RED) on 2020 year, researches on the development of biocomponents production from oil algal became necessary. According to the criteria of balanced development the effects for society and civilization progress are positive. Aim of the project is to determine the energy efficiency of the biomass of microalgae subjected to integrated energy recovery through Determination of the influence of selected physical factors (ultrasounds, microwaves) on the degree of cell destruction, which affects of efficiency of microalgae oil extraction in the presence of organic solvents and the efficiency of methane fermentation and the amount of biogas obtained. Researches had shown what are the smallest possible energy doses provided by ultrasound or microwaves to make the greatest oil yield. Works which was carried out also will show how the construction of cell walls of different algae species influences on rate of lipid extraction and answer the question if biomass after extraction is valuable product for biogas preparation. In microalgae cells of chosen strains can accumulate a significant amounts of lipids – up to 70%. This substances may be useful only after the successful extraction. Application the method of biomass conditioning significantly improves the rate of lipids recovery. However, the amount of energy that was inputted during the processes must be balanced by the increased result of bio-components, otherwise these actions are pointless. This project aims to maximize using of abilities biomass, so that the amount of the inputted energy during the processes was not only balanced but also gives positive energy balance.