

Technology for 2G biofuel and biosolvents production verified in a pilot plant

Reporting

Project information

BIO2G

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[Project website](#)


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HOLIG GROUP AS
 Slovakia

Periodic Reporting for period 1 - BIO2G (Technology for 2G biofuel and biosolvents production verified in a pilot plant)

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Summary of the context and overall objectives of the project

In recent years, bioethanol has acquired a lot of attention of the transportation industry as the current commercially available liquid fuel additive in transportation sector. It has become a bio-additive in gasoline and fatty acid methyl esters (FAME) are added in the diesel fuel. The main problem in application of these bio-additives is that their raw materials are of the food and feed origin- they belong to the first generation (1G) of biofuels. A new technology of bioethanol production from lignocellulose biomass was developed for gasoline, but the adequate substitution of FAME, does not exist yet. This development is clearly supported by the recently adopted RED II, which has created a legal framework and set targets for the use of advanced biofuels (2G) up to year 2030. In BIO2G project we have developed a breakthrough technology for the production of biobutanol. Produced biobutanol is an advanced (second-generation) biofuel, superior to bioethanol, due to higher energy content, lower vapor pressure, easy blending with gasoline at any ratio and has no particular demands for transportation. The innovative technology produces it from non-food crop feedstock (lignocellulose raw material). Deployment of the innovative technology of BIO2G project on the market will start the new 2G

generation of biofuel production from lignocellulose biomass without the use of any auxiliary chemicals fossil fuels, as it will produce its own biofuels from input feedstock. The efficiency of the input raw material will reach more than 90 %! The BIO2G biorefinery can deliver also bioacetone and bioethanol to the markets. The new employment opportunities in chemical, pharmaceutical /cosmetic and agricultural industry are expected to be an outcome of the application of BIO2G technology. The three key objectives and deliverables of the project are : I. Detailed development of the proposed BIO2G technology for biofuels and biosolvents production updated by the verification result. II. Practical verification of the feasibility and sustainability of the BIO2G technology in a pilot plant in different processing scenarios (by raw material type, process parameters, cost of operations). III. Transfer of know-how and technical assistance for multiple deployment of BIO2G in other regions of the EU and the formation of BIO2G international research and business partner network.

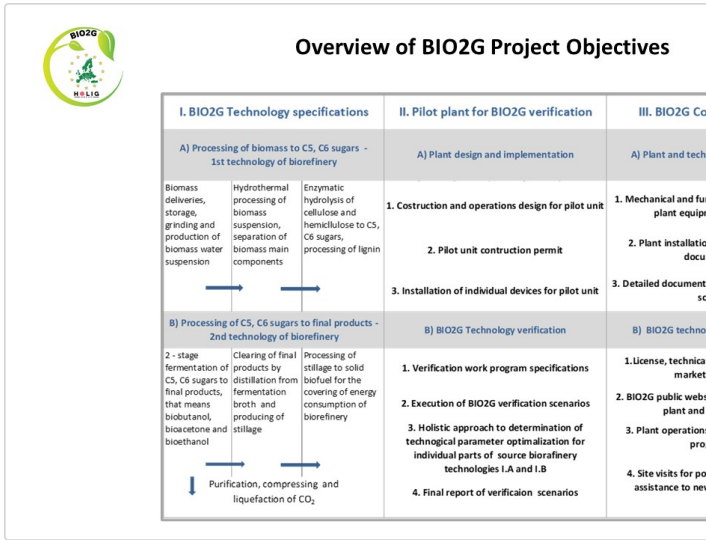
Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

The Kick-off meeting took place in Košice, on 7 February 2019. During the meeting the general methodology of the Feasibility Study preparation was agreed on as well as the communication and dissemination approach. Further meetings were held in Šaľa (SK) on 12 February 2019, in Brno(CZ) on 25 February 2019 and further on on regular basis. Regular skype meetings were established as well. Based on the approved FS structure(FS was divided in 4 main parts- the technical, market, financial and organisational feasibility), the tasks for the elaboration of separate parts were attributed to individual partners under the coordination of Holig group a.s. On 23.-26.4. 2019, a training and coaching session was held for project partners in Košice. The coaching was led by Mr. Andreas Preuss. The coaching helped partners to better understand the European and world market and commercialization challenge of the new BIO2G technology. Communication/Dissemination activities: In order to improve the visibility and the visual identity of the project, a logo of the BIO2G project was designed. The information of the project BIO2G was published on the website of the coordinator - holig.sk. An article about the project was published in the newsletter of the Slovak Chamber of Commerce and the press release was published by the Slovak information and press agency (SITA). Project brochures, pens and notebooks were prepared by the coordinator as well. Based on the positive results of the BIO2G Feasibility Study, the project partners have

Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

The BIO2G project provides a new unique solution for production of the 2nd generation environmental-friendly biofuel (biobutanol) and biosolvents (bioacetone, bioethanol) from lignocellulose raw materials. The BIO2G biorefinery technology is innovative combination of two existing technologies, where the first is pre-treatment of biomass with follow-up production of sugars and second one is ABE technology, for production of biobutanol, bioacetone and bioethanol, where raw materials are C5 and C6 sugars. The new BIO2G technology process is a result of research of the Consortium and is verified on a laboratory

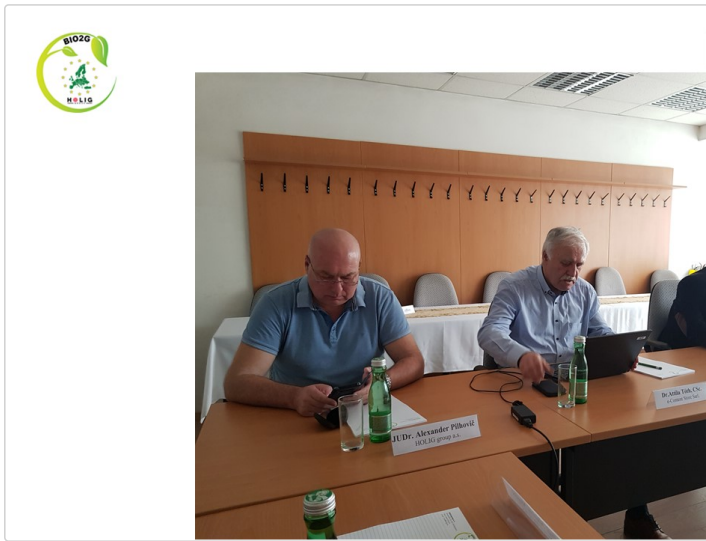
prototype. It addresses following problems of the biofuel market: (a) Reduction of GHG emission from transportation, by using of new advanced (2G) biofuel, (b) Substitution of food or feed origin raw materials for biofuels production, by non-food raw materials, thus, fulfilling of EU legislation criteria set for production and using of 2nd generation biofuels (2G). The commercialization of the BIO2G technology will help to reach the RED II targets for 2030. The proposed process innovation has significant economic and societal impact: (a) it creates a new form of agricultural and forest residuals utilization for industrial production and (b) an opportunity for utilizing polluted and low-grated soil for the cultivation of energy plants used for BIO2G technology. These new opportunities enable the utilization of non-food raw materials for BIO2G and shall create a new era of rural development with new farm job opportunities. The research, market and financial data analysis performed by the experts during the Phase 1 BIO2G project were summarized in the Feasibility Study (deliverable of the project). The technology, market, financial and organizational part of the study has demonstrated, that the project is feasible and has set conditions for its success. One of the condition of its feasibility is access to EU funds for the construction of BIO2G pilot plant, updating and verification of technology and its commercialization (preferably from SME Instrument Phase II). The strategic objective is to commercialize a novel 2nd generation biofuels (non-food advanced biofuels), intermediates (C6 and C5 sugars) and by-products (CO₂ lignin, DDGS). The REDII has set strict targets for use of advanced biofuels, but without new technology developments the production volumes of advanced biofuels needed cannot be achieved. The technology shall dramatically reduce the carbon footprint of the EU in line with the COP 21 agreement and to meet the environmental goals in the transport (10% biofuel in 2030) and heat sector as well as feedstock of the chemical industry (including cosmetic industry). The company will grow from a project company focused on technology development to a company providing services and bio-technologies to its client network throughout the world. The long-term approach of the implementation strategy will be implemented in three phases (8 years in total): A (PHASE 2): Building the pilot technology verification plant and capabilities for commercialization. B (PHASE 3): Gradual scale-up commercialization of services and products of the technology. C (PHASE 4): Extension of BIO2G technology partner and client network. Large-scale commercialization with in two parallel growth dimensions: 1 (Plan 4A): Innovated pilot verification plant. 2 (Plan 4B): Large scale production plant. Phase-1 involves the Initial BIO2G proposal and processing of this feasibility study.



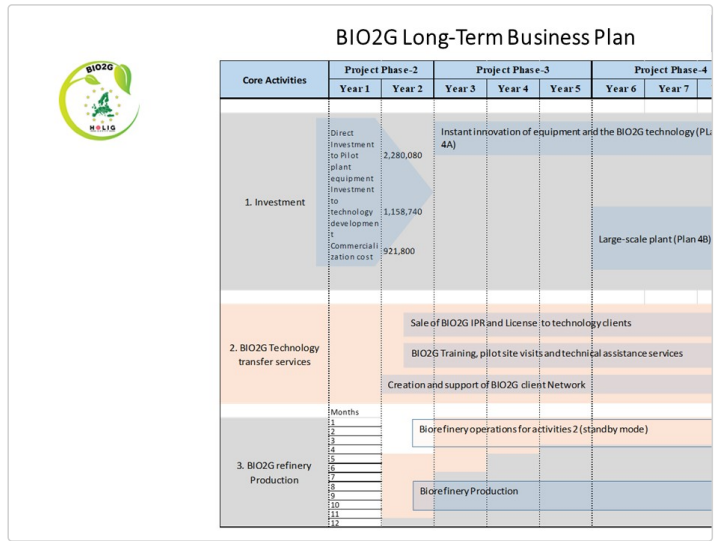
BIO2G Project Objectives



BIO2G Training 2



BIO2G Training



BIO2G Long-Term Business Plan



BIO2G Training 1

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