

Business Case Assessment of Protein Fraction Production Technology for Bio-Based Fertilisers at Industrial Scale

Main results / outcomes

The Atlantic pilot demonstrates a practical and scalable method for converting fish by-products into valuable agricultural products, supporting circular economy goals through zero-waste and high-efficiency processes. It produces nutrient-rich fertilizers suitable for sustainable farming. Financially, the model shows results with an 8-year payback period and a 12.41% return on investment under favorable conditions. However, profitability depends heavily on stable product pricing and operational costs, highlighting the importance of reliable supply chains and long-term agreements. Despite significant initial investment, the production plant's environmental benefits and scalability make it a strong and viable solution.

Practical recommendations

Adopting zero-waste, high-efficiency processes and targeting markets for nutrient-rich fertilizers can enhance sustainability and market appeal. Although the model requires significant initial investment, it offers strong long-term returns, with an estimated 8-year payback period and a 12.41% ROI under favorable conditions. To ensure profitability, users should focus on stabilizing product pricing and operational costs through long-term purchase agreements and robust supply chains. Investing in proven, scalable technologies will further support the project's viability and impact.



Figure 1. Production technology - extruder

	ATLANTIC
	industrial
CAPEX in eur	10.745.000,00
OPEX in eur/y	2.722.096,75
PAYBACK in years	8,06
ENERGY EFFICIENCY in MJ/kg	4,03
TOTAL ANNUAL ENERGY CONSUMPTION in MJ	13.513.319,00
MASS EFFICIENCY in%	76,50
AMOUNT OF PRODUCTS yearly produced in t	3.351,00
AMOUNT OF RAW MATERIALS per year in t	3.600,00 t
Products	protein fraction-BBF1, protein fraction upgraded-BBF2
BBF quantity in t/year	BBF1: 753, BBF2: 2.205
BBF price in eur/t	BBF1: 2.000, BBF2: 800
Description raw material	fish by-products (3.600t)
Wastes	not expected
By-product	Oil (393t/y, 2.000 eur/t)

Figure 2. Economic variables of production technology

Further information

SEA2LAND project website - <https://sea2landproject.eu/>

About this abstract

Authors: IPS Konzalting d.o.o. za poslovne usluge

Date: May 2025

SEA2LAND project is a collaborative Innovation Action (IA) funded by the EU in the frame of the Horizon 2020 programme. The project aims to provide solutions to help overcome challenges related to food production, climate change and waste reuse. Based on the circular economy model, SEA2LAND promotes the production of large-scale fertilisers in the EU from own raw materials. This solution is expected to reduce the soil nutrient imbalance in Europe. The project is running from January 2021 to June 2025.

Website: www.sea2landproject.eu



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Ekonomska procjena tehnologije proizvodnje proteinskih frakcija ribljih ostataka biognojiva

Glavni rezultati/ishodi

Proizvodno postrojenje proteinskih frakcija ribljih ostataka demonstrira praktičnu tehnologiju za pretvaranje ribljih nusproizvoda u vrijedna poljoprivredna biognojiva, podržavajući ciljeve kružnog gospodarstva kroz procese bez otpada i visoke učinkovitosti. Proizvodi gnojiva bogata hranjivim tvarima prikladna za održivu poljoprivredu. Financijski gledano, model prikazuje rok povrata od 8 godina i povrat ulaganja (ROI) od 12,41% pod povoljnim uvjetima. Međutim, profitabilnost uvelike ovisi o stabilnim cijenama i operativnim troškovima, naglašavajući važnost pouzdanih opskrbnih lanaca i dugoročnih ugovora. Unatoč značajnom početnom ulaganju, ekološke prednosti i proizvodnja značajnih količina čine ga snažnim i održivim rješenjem.

Preporuke

Usvajanje visokoučinkovitih procesa bez otpada i ciljanje tržišta koja imaju potrebu za gnojivima bogata hranjivim tvarima može poboljšati održivost i tržišnu privlačnost. Iako model zahtijeva značajna početna ulaganja, ekonomska isplativost je prihvatljiva, s procijenjenim 8-godišnjim razdobljem povrata i 12,41% ROI pod povoljnim uvjetima. Kako bi osigurali profitabilnost, potencijalni ulagači bi se trebali usredotočiti na stabilizaciju cijena proizvoda i operativnih troškova putem dugoročnih ugovora o kupnji i robusnih opskrbnih lanaca. Ulaganje u dokazane, isplative tehnologije dodatno će podržati održivost i učinak projekta.



Slika 1. Proizvodna tehnologija - ekstruder

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Slika 2. Ekonomske varijable proizvodnje proteinskih frakcija kao biognojiva

Više informacija

SEA2LAND projektna stranica - <https://sea2landproject.eu/>

Opširnije o praktičnom sažetku

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Datum: Svibanj 2025

SEA2LAND projekt je suradnička inovacijska akcija (IA) koju financira EU u okviru programa Horizon 2020. Cilj projekta je pružiti rješenja koja će pomoći u prevladavanju izazova povezanih s proizvodnjom hrane, klimatskim promjenama i ponovnom uporabom otpada. Na temelju modela kružnog gospodarstva, SEA2LAND promiče proizvodnju velikih količina gnojiva u EU iz vlastitih sirovina. Očekuje se da će ovo rješenje smanjiti neravnotežu hranjivih tvari u tlu u Europi. Projekt traje od siječnja 2021. do lipnja 2025. godine. Web stranica: www.sea2landproject.eu



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