

Organizes



Execute



Leads



BioenergyTech Challenges

Terms of Reference

July 2026

Terms of Reference

**Call for technology solutions 01 of
2026**

BioEnergyTech Challenges Valle del Cauca

July 2026

Table of Contents

Table of Contents	3
Introduction	6
Context	6
1. Entities involved	7
1.1	7
1.2	7
1.3	7
1.4	8
2.	8
2.1	8
2.2	8
2.3	11
2.4	11
2.5	11
2.6	12
2.7	12
3.	12
4.	13
5.	14
5.1	15
5.2	16
5.3	17
6.	18
6.1	19
6.1.1. Qualifying procedure of requirements application	19
6.2	21
6.2.1	21
6.2.2	23

6.2.3	25
6.3	25
6.3.1	25
6.3.2	25
6.3.3	26
6.4	26
6.4.1	26
6.4.2	26
6.4.3	27
6.5	28
7.	28
8.	29
9.	30
10.	31
11.	31
11.1	32
11.2	32
12.	33
13.	35
14.	36
15.	37
16.	39
16.1	39
16.2	39
16.3	41
17.	42
17.1	43
17.2	43
17.2.1	43

17.2.2	44
17.2.3	45
17.3	46
17.4	46
18.	49
19.	49

Introduction

BioEnergyTech Challenges is an initiative of the Cámara de Comercio de Cali and Ecopetrol S.A., implemented by Reddi Colombia, Technology Development and Innovation Agency. It is designed to energize the regional innovation ecosystem through the identification, validation, and scaling of technology solution applicable to the use of by-products from the bioenergy and agricultural sectors of Valle del Cauca, such as filter cake, vinasse, and livestock waste (swine, poultry, and agricultural waste), through the implementation of an open innovation strategy. The initiative invites companies, *startups*, Higher Education Institutions (HEIs), Research Centers or Institutes, and Technology Development Centers with innovative technology solutions that enable the development of technological pilots in bioenergy, contributing to the strengthening of regional sustainability and competitiveness.

Context

Ecopetrol S.A., within the framework of its 2040 Strategy “Energy that Transforms,” promotes the generation of sustainable value by strengthening innovation, sustainability, and business competitiveness in response to environmental, social, and governance challenges.

As part of this strategy, Ecopetrol S.A. leads open innovation initiatives and connects ecosystems through its Econova Innovation Network, aimed at strengthening the Science, Technology, and Innovation (STI) capabilities of the Ecopetrol Group and ecosystem territories, while promoting the energy transition, decarbonization, and diversification of sources of value.

The Econova Innovation Centers consolidate an EnergyTech ecosystem that promotes safe spaces for open and collaborative innovation, focused on the development of technological solutions, business acceleration, knowledge transfer, exchange of experiences, and capacity building, as well as the generation of innovation initiatives with social and territorial impact.

1. Entities involved

1.1 Principal entity and sponsor of the challenge

Ecopetrol S.A.

Ecopetrol is Colombia's leading energy company and one of the largest in Latin America, engaged in the exploration, production, transportation, refining, and commercialization of hydrocarbons and low-carbon energies. Through its Econova Innovation Network, Ecopetrol S.A. promotes the development of new technologies, the energy transition, process digitalization, and research in hydrogen, renewable energies, and carbon capture.

As the leader of the challenges, it seeks to generate technological solutions aimed at using by-products from the bioenergy and agricultural sector of Valle del Cauca, enabling biogas production projects to diversify and complement the national natural gas supply matrix.

1.2 Challenge host

Host: Company within the ecosystem located in the department of Valle del Cauca that provides a safe space for the technical validation of the test, experiment, or simulation of the innovative idea, as well as support and/or delivery of the necessary inputs for the development of the prototype or pilot that will enable the creation of the solution for the proposed challenge.

1.3 Organizing entity

Cámara de Comercio de Cali

Cámara de Comercio de Cali is a private-law, corporate, business association, and nonprofit entity that provides services to the business sector and the community at large. In carrying out the public functions delegated to it by the State, pursuant to the provisions of Single Regulatory Decree 1074 of 2015, it promotes business formalization, strengthening, and innovation, as well as regional development and improved competitiveness.

In the field of innovation and business development, Cámara de Comercio de Cali actively participates in programs and projects aimed at strengthening the productive fabric, energizing the regional innovation ecosystem, and coordinating public and private

stakeholders in initiatives that promote technological solutions, entrepreneurship, and sustainable growth in Valle del Cauca.

1.4 Implementing entity

Reddi – Technology Development Agency

Reddi is a Technology Development Agency created to strengthen the regional Science, Technology, and Innovation (STI) ecosystem. Its work focuses on coordinating stakeholders from the business sector, academia, and other ecosystem organizations in order to identify opportunities, challenges, and technological solutions that drive regional competitiveness.

Through the promotion of open innovation schemes, technology transfer, and the development of solutions based on specialized knowledge, Reddi acts as a strategic ally for companies, connecting their challenges with the scientific and technological capabilities of higher education institutions, technology development centers, and other relevant stakeholders. Its approach is aimed at generating value, credibility, and concrete results that contribute to strengthening the productive fabric, business innovation, and sustainable development in Valle del Cauca.

2. Definitions

The key definitions that will guide the purpose of this call are presented below:

2.1 Collaboration and open innovation

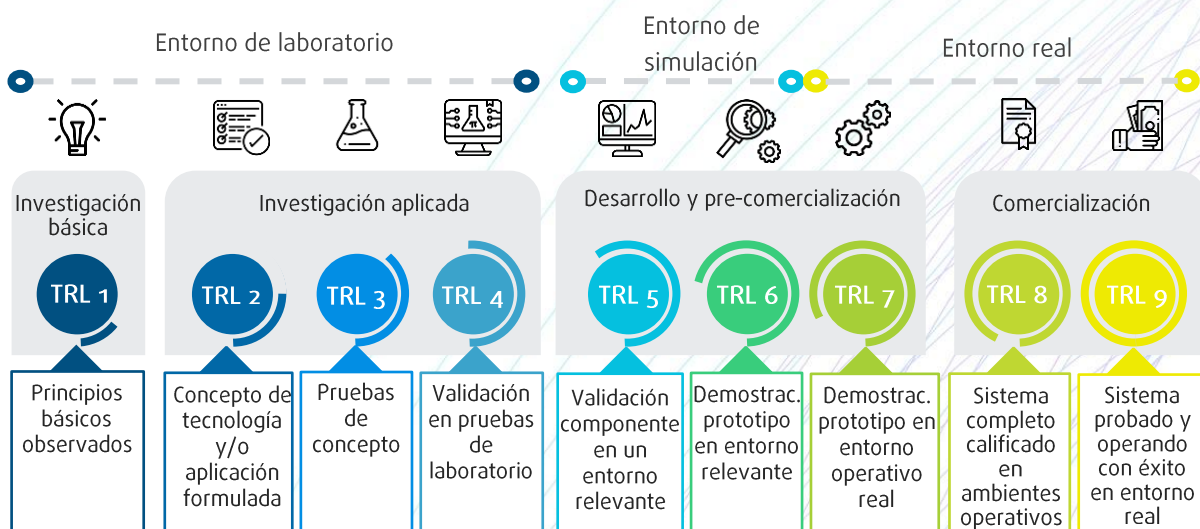
Spaces and mechanisms for dialogue with value groups, with the sole purpose of identifying the problems and needs of a specific population, as input for the generation and selection of opinions and viable technology solutions to address them.

2.2 Technology Readiness Level (TRL)

The TRL scale is adopted to identify the degree of development of a technology, from its initial research stages through to commercial implementation. Figure 1 presents the TRLs

and their relationship with activities associated with Research, Development, and Innovation (R&D&I).

Figure 1. Technology Readiness Levels (TRL)



Source: Prepared by Reddi (2026), adapted from Minciencias (2025).

To facilitate identification of the maturity level of the proposed technological solution, **Annex 1 – Checklist guide for TRL identification** serves as a guide to determine the corresponding maturity level.

The description of each TRL is presented below:

TRL 1 – Basic principles observed and reported. This corresponds to the lowest level of technological maturity. Basic scientific research begins, along with a transition toward applied research. At this stage of development, there is still no degree of commercial application.

TRL 2 – Technology concept and/or application formulated. Applied research. At this stage, potential applications of the technologies and analytical tools for simulation or

analysis of the application may begin to be formulated. However, there are still no tests or analyses available to validate such application.

TRL 3 – Proof of concept of analytical and experimental characteristics. This phase includes research and development (R&D) activities, such as analytical testing and laboratory-scale testing aimed at demonstrating the technical feasibility of technological concepts. This phase involves the validation of the components of a specific technology, although this does not necessarily result in the integration of all components into a complete system.

TRL 4 – Validation of components/subsystems in laboratory tests. At this stage, the components that make up a given technology have been identified, and the objective is to establish whether these individual components have the capabilities to operate in an integrated manner, functioning together as a system.

TRL 5 – Validation of system/subsystem or component in a relevant environment (or industrially relevant environment in the case of key enabling technologies). The basic elements of a given technology are integrated so that the final configuration is similar to its intended final application. However, operation of the system and technologies still takes place at the laboratory level.

TRL 6 – Validation of system, subsystem, model, or prototype under conditions close to real-life conditions. At this stage, pilot prototypes capable of performing all necessary functions within a given system may be available, having passed feasibility tests under real operating or functioning conditions. Components and processes may have been scaled up to demonstrate their industrial potential in real systems.

TRL 7 – Demonstration of system or prototype validated in the real operating environment. The system is operating, or close to operating, at a pre-commercial scale. It is possible to carry out the phase for identifying aspects related to manufacturing, life-cycle assessment, and economic evaluation of the technologies, with most functions available and tested.

TRL 8 – Complete and qualified system through testing and demonstrations in operational environments. At this stage, systems are integrated, technologies have been tested in their final form and under assumed conditions, and in many cases the end of system development has been reached.

TRL 9 – System proven and operating successfully in a real environment. Technology/system in its final stage, tested and available for commercialization and/or production.

2.3 Technical validation

Technical validation is the process of systematically evaluating a technology through tests, experiments, or simulations in order to verify its operation, performance, and reliability against the stated objectives. It is mainly carried out during the prototype and pilot phases, before industrial-scale deployment, and seeks to reduce the technical and operational uncertainty of the solution.

This process constitutes a critical step within the Technology Readiness Levels (TRL), as it makes it possible to demonstrate the technical feasibility of the innovation and marks the transition between experimental research and practical application, bringing it closer to real-use conditions and the market.

2.4 Pre-commercial validation

Pre-commercial validation applies to research results that have completed their laboratory-level development stage (TRL 4). It consists of building a functional prototype of the product/service, evaluated under real operating conditions at pilot scale. In addition, validation is obtained from potential users or end customers, on whom sufficient tests are carried out to verify the benefits and areas for improvement of the product or its derived applications (TRL 6), so that it may enter the market.

2.5 Commercial validation

Commercial validation applies to research results that are at the functional prototype level and have been validated by users and end customers (TRL 7). It consists of improving

and/or scaling the initial technology prototype in order to test it in a real commercial operating context. In addition, all activities required to bring the product/service to market are carried out (TRL 9).

In general terms, these key concepts constitute the core of the methodological strategy, guiding activities toward the generation and implementation of innovative solutions that respond to the challenges posed by Ecopetrol S.A.

2.6 Pilot

A preliminary, limited, and controlled implementation of a solution, technology, methodology, or model, developed in a real or near-real environment, whose main purpose is to validate its operation, performance, relevance, and results before implementation at a larger scale. The pilot makes it possible to gain operational experience and generate technical, economic, and/or functional evidence to support decision-making regarding adjustments, continuity, scaling, or replication of the solution.

2.7 Alliance

Alliance shall mean the voluntary association between two (2) or more entities that express their interest in jointly participating in this call, for the purpose of coordinating, integrating, and complementing their technical, intellectual, operational, and/or financial capacities for the formulation, development, and execution of the proposed solution within the framework of the BioEnergyTech Challenges call, under a collaborative scheme that does not imply the creation of a separate legal entity, unless expressly agreed otherwise.

3. Purpose of the call

Promote the identification, validation, and selection of up to three (3) innovative technological solutions aimed at using by-products from the bioenergy and agricultural sectors of Valle del Cauca, through an open innovation scheme that enables the development of technological pilots in bioenergy, contributing to decarbonization, operational and energy efficiency, regional competitiveness, and the strengthening of the national innovation ecosystem.

4. Entities eligible to participate and funding

This call is addressed to legally constituted legal entities, with a valid commercial registration, at a national or international level, with a minimum age of one (1) year, that have solutions at a technological maturity level between TRL 5 and TRL 9, and with technical, scientific, and operational capabilities to address the open innovation challenges focused on the use of by-products from the bioenergy and agricultural sector of Valle del Cauca, particularly those related to filter cake, vinasse, and livestock, poultry, and agricultural waste. These entities will be considered as solvers within the call.

The following types of organizations may participate:

- **Companies:** Legally constituted legal entities whose purpose or business strategy contemplates the development and implementation of solutions aligned with the challenges posed.
- **Startups:** Recently created companies with high innovative and technological potential, whose business model is scalable and with perspectives of accelerated growth.
- **Higher Education Institutions (HEIs):** Universities, technical and technological institutes, academies, and specialized schools, and other institutions authorized to grant higher-level degrees. Research groups or centers may apply with the endorsement of their Institution.
- **Research Centers or Institutes:** Public, private, or mixed organizations dedicated to generating fundamental knowledge for the country through basic and/or applied scientific research projects in specific lines of research, having legal personality.
- **Technology Development Centers:** Public or private organizations dedicated to the development of applied research projects, the development of own technology, and transfer activities that respond to needs or opportunities for social and economic development of the country, its regions, and/or cities.

Each solver may submit a single technology solution per challenge. In case of applying to more than one challenge, the technology solutions must be presented independently and demonstrate that they are technically distinct, that they comply with the objectives and terms of each challenge, and that the solver has the technical and operational capacity for the execution of the selected technological pilots.

In the case of submitting under the alliance modality, the participating entities must expressly manifest their will to participate jointly in the call and define a lead entity or representative, which will be in charge of presenting the technology solution and acting as the main interlocutor before Cámara de Comercio de Cali, Ecopetrol S.A., and Reddi Colombia during the selection process.

In case the application is presented under the alliance modality, each of the entities that comprise it must comply with the conditions established for the solvers in section 4, "Targeted at," as well as with the qualifying requirements defined in section 6.1.1, "Qualifying requirements for application."

5. Innovation Challenges

Within the framework of this call, solvers must propose technological solutions aimed at using by-products from the bioenergy and agricultural sector of Valle del Cauca, such as vinasse, filter cake, and livestock (swine, poultry, and agricultural) waste, contributing to the strengthening of regional sustainability and competitiveness.

Likewise, the selected solutions will be implemented and validated through pilots in companies of the ecosystem that will act as Host Allies of the challenge. These companies will facilitate the spaces, operational conditions, and necessary accompaniment for the execution of the pilot tests aimed at validating the proposed solutions technically and operationally against the posed innovation challenges.

Solutions must focus on one (1) of the following technological challenges:

5.1 Challenge 1: How could we maximize biomethane production through a technology that allows optimizing **Capital Expenditures** and **Operating Expenditures** (CapEx and OpEx)?

The country's agricultural industry generates significant volumes of concentrated liquid waste associated with animal excreta and agricultural processes. To comply with environmental regulations, anaerobic treatment systems are used in processing plants to handle these effluents, which allows for the generation of biogas as a surplus product. While this already represents an advance in waste management, raw biogas has an average composition of between 52 - 60% methane, with the remaining 40% corresponding to CO₂ and traces of other gases. In this sense, the commercial applicability of biogas has been limited, restricting access to more profitable energy markets.

Given the above, the implementation of biogas purification technologies is crucial as it allows companies to access higher-value markets, such as injection into the natural gas grid or the supply of fuel to transport fleets that use Vehicular Natural Gas (VNG). This improvement allows for a faster return on investment (ROI) for projects with anaerobic biomethane-producing systems, by allowing access to higher-value markets (higher product price) and stability (long-term contracts), as well as increasing the profitability of the bioenergy project, thus transforming a by-product into a high-quality commercializable energy source at both national and international levels.

Validation of a technological solution tested in a real environment is expected to maximize biomethane production in the operating processes of the region's agricultural, poultry, and swine plants, as well as sugar mills that carry out anaerobic digestion processes. This prototype must maximize biomethane production at the lowest possible cost. The pilot must guarantee energy efficiency in the process, protect the integrity of the assets, and advance the technology toward scalability through a differentiated technology solution. The technology solution must strengthen Ecopetrol S.A.'s current technical knowledge capabilities to diversify the natural gas matrix.

To expand information on the challenge, its technical sheet and pitch must be consulted, available on the website: <https://reddicolombia.com/bioenergytech/>.

5.2 Challenge 2: How could we enhance biogas production in the digestion of vinasse/cachaza residues from cane processing factories?

The sugarcane agro-industry generates large volumes of cachaza from the clarification process, and vinasse as waste from ethanol production in distilleries. Both substrates are rich in organic matter, but their individual management presents challenges: vinasse is acidic and has a high Chemical Oxygen Demand (COD), while cachaza has a high proportion of volatile solids and a fibrous texture that hinders its pumping, mixing, and homogeneous digestion. There are still no large-scale systems that efficiently integrate these two residual flows through co-digestion.

This lack of integration limits the capacity to stabilize the anaerobic process, improve methanogenesis kinetics, and reach the commercial-scale biogas production necessary to justify investment in infrastructure.

Successful physicochemical modifications of the raw material (cachaza and vinasse) can generate digestion stability and maximize biogas production and the sustainability of the distillery effluent treatment process, improving the environmental profile of the regional sugarcane agro-industry.

Validation of a technological solution tested in a relevant environment is expected to maximize biogas production in the operating processes of the region's sugar mills that perform anaerobic digestion processes. This prototype must optimize biogas production from vinasse and cachaza, maximizing methane generation, ensuring the stability of the biodigester, and reducing the carbon footprint involved in the anaerobic digestion process. The pilot will improve energy efficiency, generate real data to evaluate profitability and scalability, and facilitate decision-making for its future large-scale implementation.

In addition, it will strengthen the technical capabilities of Ecopetrol S.A. and the Host Company, drive the valorization of agricultural waste, and support the energy transition in order to diversify and complement the national energy matrix.

To expand information on the challenge, its technical sheet and pitch must be consulted, available on the website: <https://reddicolombia.com/bioenergytech/>.

5.3 Challenge 3: How could we demonstrate the gasification processes of rice cultivation and processing waste with high ash content to obtain a technical-economic analysis of its use for electric energy generation?

Rice represents one of the most relevant agricultural crops in Colombia, both for its importance in food security and for its contribution to the development of the rural sector. In 2024, Colombia recorded a mechanized rice sown area of 631,071 hectares, with a total production of 3,501,847 tons of green paddy rice, representing an increase of 7.0% in area and 3.3% in production compared to the previous year. The national average yield was 5.58 t/Ha, with departments such as Huila (7.37 t/ha) and Tolima (6.94 t/ha) standing out above the average, thanks to their high technical level and irrigation infrastructure. The main producing regions were Casanare (35.6%), Tolima (20.6%), and Meta (14.0%), which together concentrate more than 70% of national production.

In terms of comparative productivity, Colombia is below the world benchmark represented by China, the largest rice producer globally, with a production of 207.5 million tons in 2024 and yields exceeding 7.0 t/ha. This gap evidences the potential for productive improvement in the Colombian rice sector through the adoption of high-yield varieties, optimization of agronomic management, and expansion of irrigation infrastructure.

Industrial rice processing generates two main types of biomass waste with high potential for energy valorization: rice straw and husk. Applying the generation factors established in technical literature, -with a straw/grain ratio- of 1.35 tons of straw for every ton of paddy rice, and -husk/grain ratio- of 0.20 tons of husk per ton of paddy rice. Based on the 2024 national production, an annual generation of 4.72 million tons of straw and more than 700 thousand tons of husk is estimated. These volumes position Colombia as a relevant generator of residual lignocellulosic biomass in the Latin American context.

Technology solution for the gasification of biomass with high ash content in Colombia, such as the straw and husk resulting from rice processing, are required. This gasification technology must allow validating, in a relevant environment, syngas production and performing a technical-economic analysis of said process. With this, it is sought to facilitate decision-making based on this alternative regarding the scaling and valorization of syngas

for electric energy generation, in order to diversify and complement the national energy matrix.

Solutions must increase the yield of the gasification process for syngas production at the lowest operating expenditures (OpEx) through the use of a gasification technology for rice cultivation and processing waste with high ash content, guaranteeing high energy content, associated with a syngas composition with a higher composition of hydrogen and carbon monoxide. Robust technologies with high industrial scaling potential are expected, strengthening electric energy generation alternatives in industrial processes, contributing to the fulfillment of ECOPETROL S.A.'s decarbonization and operational efficiency goals.

To expand the information associated with each challenge, interested parties can consult the corresponding technical sheets and pitch, available on the website: <https://reddicolombia.com/bioenergytech/>.

6. Procedure

To participate in this call, solvers must take into account the innovation challenges described in section 5 - Innovation Challenges of these Terms of Reference, adhere to the established times and the selection process, and comply with the requirements defined for the application of solutions.

The call is structured in five (5) stages. Cámara de Comercio de Cali, Ecopetrol S.A., and Reddi Colombia will adopt the measures they consider pertinent to prevent fraudulent conduct or actions that contravene these terms of reference. In case of non-compliance, they may exclude the solver from the process, as well as revoke the benefits granted, without any place for claim or recognition of any compensation.

6.1 Stage 1. Open call for technology solutions to solvers

Stage open and directed to all solvers, both national and international, interested in presenting a technology solution that responds to any of the three (3) challenges defined by Ecopetrol S.A. Applications must be registered through the [Fusióni360](#) platform, following the instructions in **Annex 2 – Instructions for registering solutions on the Fusióni360 platform**.

In this stage, the same solver may submit several solutions related to the identified challenges, provided they make an independent registration on the [Fusióni360](#) platform for each technology solution.

To advance to Stage 2, technology solutions must meet the following qualifying requirements:

6.1.1. Qualifying procedure of requirements application

Table 1. Qualifying requirements for application

No	Requirements	Description	Verification Instrument
1	Compliance with the target audience of the call	The applicant must comply with the specifications established in the "Targeted at" section of this call.	Registration in Fusióni360 and Annex 3
2	Complete application	The solution and the application must be properly registered and published by the solver on the Fusióni360 platform, within the deadlines defined in section 13 - Schedule.	Registration in Fusióni360
3	Complete presentation of documentation	The application must include the totality of the required documents, duly completed and uploaded to the Fusióni360 platform (Annexes 3, 4, 5, and 6).	Annexes 3, 4, 5, and 6
4	No incursion into grounds for disqualification	The solver must not be involved in any of the Disqualifying Conditions established in section 11 of these Terms of Reference.	Annexes 3, 4, 5, and 6

No	Requirements	Description	Verification Instrument
5	Proper use of requested Funds	The requested Funds must be destined exclusively for the Fundable Activities and headings defined in section 8 of this document.	Annex 4 and 5
6	Technology maturity level	The applied solution must have a technological maturity level between TRL 5 and TRL 9, in accordance with the challenges defined in section 5 – Innovation challenges, which implies validation in controlled environments or close to real application.	Annex 4
7	Technology solution description	The applicant must present a clear and coherent description of the technology solution, indicating how it responds to the selected innovation challenge.	Annex 4
8	Solver experience and solution trajectory	The solver must accredit experience in the field of the proposed solution and the trajectory of the technology.	Annex 6
9	Minimum legal constitution	Applying entities must be legally constituted with a minimum age of one (1) year prior to the start of the call, for both national and international solvers.	• Certificate of existence and legal representation (Cámara de Comercio de Cali) or equivalent from their country of origin, with an issuance date no more than 30 days old. • Have their commercial registration renewed as of the technology solution submission date. • Single Tax Registry (RUT), or equivalent from their country of origin.
10	Non-inclusion in restrictive lists	The solver, its partners, shareholders, or administrators must not appear on national or international restrictive control lists.	
11	Mandatory legal documentation	The applicant must provide the legal documentation required for the application.	

No	Requirements	Description	Verification Instrument
			Identity document of the legal representative.

The application must include all documents supporting compliance with the selection process requirements, and may include other supports such as catalogs, technical sheets, and video links, when considered appropriate. All documentation must be submitted exclusively by electronic means through the [Fusióni360](#) platform.

The interested solver must present their technology solution clearly, legibly, and coherently, strictly complying with the conditions established in these Terms of Reference. In no case can conditions other than those provided here be incorporated into the technology solution, and only the variables expressly indicated in this document will be taken into account for the evaluation. Failure to comply with the above may lead to the rejection of the solution Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia.

Solutions registered in [Fusióni360](#) will be verified to confirm compliance with the qualifying requirements. Those that present observations may remedy them within the term defined in section 13 – Schedule. If, at the end of said period, the observations have not been fully addressed, the technology solution will be declared ineligible and will not advance to Stage 2.

6.2 Stage 2. Evaluation procedure and ranking

6.2.1 Technical evaluation of technology solutions

The admissible and eligible technology solutions registered on the [Fusióni360](#) platform will be evaluated and ranked against the following award criteria presented in Table 2:

Table 2. Stage 2 technical evaluation criteria

No	Criterion	Description	Maximum Score
1	Alignment of the solution with the innovation challenge	The coherence between the stated challenge and the proposed solution will be evaluated, considering the clarity of the methodological approach, the expected results, the consistency of the budget, and the feasibility of the proposed schedule.	15
2	Technical quality and coherence of the solution	The technical quality of the proposed solution and the coherence of the solution will be evaluated, considering the clarity, feasibility, and connection of the objectives, as well as the articulation between the proposed activities, expected results, and the budget destined for its execution.	15
3	Innovation level of the proposed solution	The innovation level of the technology solution will be evaluated, considering its differentiating elements compared to existing solutions on the market and the state of the art, as well as the degree of novelty and added value it brings.	10
4	Proponent experience	The proponent's verifiable experience in activities specific to the sector and the specific experience of the technology to be evaluated in the pilot will be analyzed.	10
5	Technology development level	The degree of technological maturity of the proposed solution will be evaluated, considering its implementation and validation in operational or real environments, according to TRL 5 to TRL 9 levels.	10
6	Scalability and replicability	The solution's capacity to increase its level of operation, processing volume, or functional scope will be evaluated, as well as its ability to be implemented or adapted in different contexts, sectors, or operating environments, maintaining its performance, stability, and technical and economic viability, without requiring significant structural changes in its design or architecture.	30
7	Job creation	The solution's potential to generate direct or indirect employment associated with its implementation, operation, or scaling will be evaluated.	5
8	Contribution to the STI ecosystem	The solution's contribution to strengthening the Science, Technology, and Innovation (STI) ecosystem will be evaluated, evidenced by technological development or maturation, effective knowledge transfer, generation of installed capacities, or the creation of new collaboration dynamics between system stakeholders.	3

No	Criterion	Description	Maximum Score
9	Alliance coordination	The proponent's ability to coordinate with other ecosystem stakeholders (companies; research, technological development, or productivity centers; universities, among others) will be evaluated, demonstrating technical complementarity, defined roles, verifiable commitments, and a concrete contribution to the development, validation, or implementation of the solution.	2
Total			100

The technology solutions with the highest scores, with at least one (1) technology solution per challenge, will advance to the Financial and business model evaluation process (section 6.2.2). In the event of a tie, the following tie-breaking criteria will be applied in the established order:

- Highest score in criterion 1 “Alignment of the solution with the innovation challenge”.
- If the tie persists, the highest score in criterion 2 “Technical quality and coherence of the solution” will be considered.
- Should the tie continue, the other evaluation criteria established in Table 2 will be reviewed successively, prioritizing the solution that obtains the highest score in said criteria.
- If after applying the above criteria the tie remains, both solutions may be selected to advance to the next stage of the process.

6.2.2 Financial and business model evaluation

In this stage, technology solution will be evaluated and selected to advance to Stage 3: Pitch preparation workshop. This process seeks to ensure that the technology solution exhibit coherence between the identified problem, the technology solution offered, and the proposing team's capabilities for its implementation.

Table 3 presents the Financial and business model evaluation criteria that will be applied in this stage.

Table 3. Financial and business model evaluation criteria

No	Criterion	Description	Maximum Score
1	Business model and financial viability	Clarity and coherence of the business model, as well as a differentiated and relevant value proposition for Ecopetrol S.A. and the sector. Analyzing the long-term financial viability of the solution. It seeks to understand if the business model is sustainable and if there is a clear path towards profitability.	50
2	Potential impact	The expected economic and strategic impact of the solution will be evaluated, considering its contribution of value to Ecopetrol S.A. and the sector, in terms of efficiency, sustainability, and value generation.	50
Total			100

The Cámara de Comercio de Cali, Ecopetrol S.A., and Reddi Colombia may request from the solver any additional documentation they consider necessary to complement, validate, or verify the information presented. Likewise, they may convene the solver for interviews, meetings, or technical consultations with the evaluation team when it is required to expand, clarify, or verify the information presented.

Each technology solution will be evaluated by two (2) peer evaluators. Selection will be made in strict descending order according to the score obtained. The technology solution with the highest scores in the Financial and business model evaluation stage will be preselected and will advance to Stage 3: Training and preparation of solvers.

In the event of a tie in the score, the following tie-breaking criteria will be applied in order:

- Highest score in criterion 1: Business model and financial viability.
- If the tie persists, highest score in criterion 2: Potential impact.
- If the tie continues, highest score in criterion 3: Scalability.

It is clarified that, by the invitation to submit an offer, Cámara de Comercio de Cali, Ecopetrol S.A., and Reddi Colombia are not obliged to select any solution, nor to accept the offers presented, being able at any time to terminate the selection process at any stage. In this

latter case, Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia are not obliged to motivate or explain their decision to terminate the selection process.

6.2.3 Benefits for selected technology solutions in Stage 2

- *Workshops* and specialized mentoring in the preparation and strengthening of the solution's pitch, aimed at maximizing its impact.
- Connection with Ecopetrol S.A., challenge host entities, and ecosystem actors.

6.3 Stage 3. Training and preparation of solvers

In this stage, preselected technology solution during the financial and business model evaluation stage will participate. These will move to a training and preparation process for their presentation at the Demo Day.

Solvers will be convened to virtual pitch orientation sessions, aimed at strengthening the structure, clarity, and effectiveness of their solution presentations.

During the workshops, solvers will receive methodological guidelines for building the pitch and feedback on their presentations, in order to optimize their value communication facing the Demo Day, according to the dates established in section 13 – Schedule.

6.3.1 Pitch preparation module and presentation strategies

Objective: Strengthen solver capabilities in structuring clear, persuasive pitches aligned with evaluation criteria, maximizing the impact of solutions at the Demo Day.

Results: Structured and adjusted pitches.

6.3.2 Stage 3 qualifying requirement

- Participate in the pitch preparation workshops.

6.3.3 Benefits for selected technology solutions in Stage 3

Visibility and validation of the proposed solution in the bioenergy and agro-industry ecosystem of Valle del Cauca through the Demo Day event.

6.4 Stage 4. Demo Day

In this stage, finalists will participate in a LIVE type event, in which they will present their pitches before an evaluation jury for each challenge. Each solver will have a maximum time of ten (10) minutes for the presentation of their technology solution, followed by five (5) additional minutes for resolving questions formulated by the jury. Once each presentation is finished, the evaluation jury can formulate questions or comments to the solver. Subsequently, it will evaluate the technology solution according to the criteria defined in this call and select three (3) winning solutions, one for each challenge.

The evaluation jury will be composed of technical and strategic representatives from Cámara de Comercio de Cali, Ecopetrol S.A., and Reddi Colombia, who may rely, when the technical nature of the challenge requires it, on external experts. In case of participation by external evaluators, they must previously sign the corresponding confidentiality commitments. Likewise, the jury's evaluation and deliberation process will be confidential to guarantee transparency and integrity of the process.

6.4.1 Stage 4 qualifying requirements

- Participate in the Demo Day in the format and date defined by the call.
- Present the solution pitch within the maximum established time before the evaluation jury.

6.4.2 Benefits for selected technology solutions in Stage 4

Solutions selected in stage 4 will be able to access to to funding described in Table 4:

Table 4. Funding for selected solutions by challenge

Challenge	Fffunding
Challenge 1	\$221,000,000
Challenge 2	\$221,000,000
Challenge 3	\$210,000,000
Total pool	\$652,000,000

The financing resources for each challenge will be allocated to the implementation, validation, and optimization of the technological solution through pilots in real environments, without exceeding the maximum total available pool of SIX HUNDRED FIFTY-TWO MILLION PESOS (\$652,000,000 COP) for the implementation of up to three (3) winning technology solutions. In any case, the budget allocated to each challenge is defined in the table below.

In case no applications are received for any of the challenges, none of the technology solution comply with the established requirements, do not reach the minimum evaluation criteria, or the selection process is declared desert, Ecopetrol S.A. and Cámara de Comercio de Cali reserve the right not to select solutions for said challenge, without this generating an obligation to assign said resources to other participants or challenges.

In these events, uncommitted or unexecuted resources will remain attached to the Cooperation Agreement and their eventual destination will be subject to the decisions adopted by the parties, prior fulfillment of the applicable administrative, technical, financial, and legal validations, without the existence of an obligation to execute the totality of the initially planned resources.

6.4.3 contractual conditions

If as result of this process any of the presented solutions is selected, the corresponding proponent (solver) will be informed in writing to start the procedures for signing the Cooperation Agreement with Cámara de Comercio de Cali . In any case, the Cooperation Agreement celebrated as a result of this selection process will be conditioned on compliance with the established requirements, as well as the refinement and legalization requirements demanded by Cámara de Comercio de Cali , the leader and host of the challenge, in addition to authorization from the corresponding competent bodies.

Cámara de Comercio de Cali will proceed to consult restrictive lists and backgrounds in the databases of the National Police of Colombia, General Prosecutor's Office, and General Comptroller's Office, regarding whoever is located in the first order of eligibility, and the positive result of such consultations will be a requirement for signing the Cooperation Agreement.

In the event that for some reason it is not possible to sign the Cooperation Agreement with the proponent located in the first order of eligibility, it may proceed with the next proponent in order of eligibility and so on, as long as Cámara de Comercio de Cali considers it pertinent.

6.5 Stage 5. Scaling funds and pilots

The pilot implementation phase will be focused on technological validation and testing of prototypes or minimum viable products. This stage will have a total duration of eight (8) months, counted from its legalization or signature. This period includes up to one (1) month for technology implantation in the Host company's capabilities, six (6) months of pilot execution, and one (1) final month for the technical, administrative, and operational closure of the project.

For the development of this stage, solvers will have the support of Cámara de Comercio de Cali and Reddi Colombia, as well as the technical accompaniment of Ecopetrol S.A., the challenge leader designated by this organization for each challenge, and the challenge hosts, in whose facilities the pilots will be implemented.

During the implementation of the pilots, monitoring of the execution of activities, budgetary execution, and progress towards fulfilling the objectives established for each pilot will be carried out.

7. Financing and project duration

The total budget assigned for the Scaling Fund and Pilots will be SIX HUNDRED FIFTY-TWO MILLION PESOS (\$652,000,000 COP) including VAT, for the three (3) selected solutions.

The project will have up to one (1) month for the purpose of implanting the technology into the Host company's capabilities. The maximum term for the execution of the solution will be up to six (6) months. Subsequently, there will be an additional period of up to one (1) month for the delivery of the final report and the public presentation of the results.

8. Fundable activities and headings

The following activities are fundable, without limiting others that are technically and strategically justified for the solution's maturation process:

- Functional prototype improvement.
- Development of initial tests (operation, integration).
- Product quality trials.
- Validations with users or focus groups.
- Scaling the prototype for pre-commercial or commercial use.
- Hiring of specialized services.

The budget must be presented broken down into the following headings:

- **Equipment:** Those necessary for the solution's maturation and supported by their strict necessity. Installation, related services, and putting into operation are included when required.
- **Materials and supplies:** Elements necessary for the development of maturation activities, such as laboratory supplies, ingredients, additives, hardware, etc.
- **Specialized software:** Acquisition of specialized software licenses for the Science, Technology, and Innovation (STI) activities of the solution's development.
- **Registrations and certifications:** Costs of registration and quality, safety, good manufacturing practices, good agricultural practices, biosafety, and environmental sustainability certifications of the technology.
- **Field outputs:** Applies to expenses for means of transport and/or displacement for travel to sampling areas and execution of field work proper to the research.

- **Technical and technological services:** Provision of specialized services such as trials, tests, analysis, simulations, characterizations, software development, translations, design, prototype.
- **Specialized services:** Refers to the payment for services to perform scientific, technological, or commercial activities relevant to the solution's development. This includes, among others, sample or statistical data analysis, prototyping services, user validation, specialized technical advice, technical or legal advice on intellectual property matters, brand design or commercial image, as well as costs associated with intellectual property protection, such as patents, industrial registrations, brands, etc.
- **Others:** Goods, activities, and/or services to evaluate, protect, value, develop, promote, and commercialize the technology in the market.

The evaluation of the need for these headings will be carried out considering the requirements of coherence, articulation, and fulfillment of the presented activities, and the Funds must be applied exclusively to the approved headings.

Note: Equipment, materials, or supplies that require importation will not be fundable.

9. Non-fundable headings

The following will not be financed with Fund resources:

- Purchase of movable goods that are NOT related to the solution's maturation.
- Real estate, adaptations, or remodeling not indispensable for maturing the solution.
- Maintenance of non-essential equipment.
- Insurance of any type.
- Acquisition of motor vehicles.
- Payments of liabilities, royalties, taxes, or dividends.
- Capital recoveries.
- Purchase of shares, company rights, bonds, and other movable securities.
- Payment of fees or registrations to participate in national or international commercial events.

- Travel and displacement expenses not related to field outputs.
- Purchase of premiums or commercial premises.
- Administrative or organizational operating costs.
- Salaries, social benefits, parafiscal, social security, or special bonuses for payroll personnel of entities belonging to the alliance.
- Those that, by criteria of Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia, are not considered decisive for the execution of the solution.

10. Prioritization of technology solutions for financing

Solutions presented by the up to three (3) winning solvers of the BioEnergyTech Challenges Demo Day, selected by the evaluation jury according to the criteria established in this call, will have priority to access the Fund's resources.

Nonetheless, this prioritization does not restrict the participation of the other Stage 4 finalists. Demo Day. In the event that any of the winning solutions cannot advance to the financing process for reasons associated with compliance with qualifying requirements, legal validations, signing the Cooperation Agreement, or other conditions established in these Terms of Reference, the next solutions may be considered according to the qualification order obtained in the Demo Day.

In this case, Cámara de Comercio de Cali, Ecopetrol S.A., and Reddi Colombia can convene solvers who have obtained the next highest scores in the Demo Day (fourth, fifth place, and so on), in order to have a beneficiary solution per challenge.

11. Exclusions

Technology solutions or solvers that fall into any of the following situations will be considered disqualified:

11.1 Exclusion situations associated with the technology solution

The technology solution will be considered disqualified when:

- It does not comply with the requirements and conditions established in these Terms of Reference and its annexes, or when said requirements are not remedied within the established deadlines.
- The application is presented by a medium other than that defined in these Terms of Reference or outside the date and time established in the schedule.
- Inconsistencies, omissions, or incorrect or untruthful information are identified in the presented documentation. In these cases, Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia can deny application or adjudication, without prejudice to the corresponding legal actions.
- Activities are proposed that already have total or partial financing from other calls or financing sources, whether public (for example, Minciencias, General Royalty System – SGR or other State entities) or private (foundations, corporate innovation programs, investors, among others), when said financing covers the same activities contemplated in the technology solution.
- The technology solution does not address the minimum requirements established in the PDS – Product Design Specifications and the restrictions defined in the characterization technical sheet of the corresponding challenge.
- The value of the funds destined for each challenge is defined in the table in section 7.4.2 "Benefits for solutions selected in stage 4."
- The technology proposed as an innovative solution is below the required TRL level, TRL 5 to TRL 9, defined in these Terms of Reference.

11.2 Exclusion situations associated with the solver

The solver will be considered disqualified when:

- The solver does not remedy or clarify information requested by Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia within the deadline granted for it.
- The solver does not accredit the qualifying requirements established in this document.

- Does not comply with the requirements and conditions established in these Terms of Reference.
- Does not comply with the minimum experience requirements established for this call.
- Presents false or inaccurate information, or has open legal processes related to these types of situations.
- Does not comply with the necessary legal requirements for signing the Cooperation Agreement in case of being a beneficiary of the call.
- Attempts to intervene, influence, or gain improper access to information about the selection process.
- Fails to comply with the codes of ethics and conduct applicable to Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia.
- Uses information, developments, or contents without having due legal authorization or without complying with current regulations on intellectual property and copyright.
- Presents police, judicial, or fiscal backgrounds that may compromise participation in the process.
- Breaches rules related to anti-corruption, bribery, prevention of money laundering, or financing of terrorism. It is evident that the solver is violating third-party intellectual property rights.
- Falls into actions that violate the principles of equity, transparency, equality, or free competition that govern this call.
- There is a real, potential, or apparent conflict of interest that has not been timely informed and that may affect the objectivity or transparency of the process.

12. Allocation of Funds

Once the up to three (3) winning solutions are announced at the Demo Day, a Cooperation Agreement will be signed between the solver, the challenge host, and Cámara de Comercio de Cali , along with the start record.

The duration of the Cooperation Agreement signed as a result of this selection process will be eight (8) months from its signature, distributed into one (1) month of implementation, six (6) months of pilot execution, and one (1) month for project closure.

During the six (6) months of experimentation, the beneficiary must carry out the activities defined in the work plan and guarantee fulfillment of the pilot's technical and financial objectives. For monitoring these activities, the beneficiary must submit bimonthly technical and financial progress reports, which must include the respective supports evidencing the development of programmed actions and proper use of approved resources.

The last month will correspond to the closure stage, in which the beneficiary must actively participate in consolidating and delivering results, certification of benefits by the Host company, submission of the final technical and financial report, delivery of developed products, prototypes, or modules, and when applicable, dismantling of technology implemented at the challenge host's facilities. This stage also includes activities necessary for contractual closure and final verification of work plan compliance.

The delivery of Funds will be made through disbursements by Cámara de Comercio de Cali , according to what is established in Annex 5 – work plan and budget, and milestones and deliverables defined in the Cooperation Agreement signed with the beneficiary solver.

The scheme contemplates an initial disbursement for the start of project execution and subsequent disbursements subject to fulfillment and approval of established technical deliverables. Disbursements will be made progressively and will be subject to accreditation of the project's technical, operational, and financial progress, according to the approved schedule and fulfillment of deliverables defined for each stage.

The solver must execute resources according to the headings and concepts approved in their economic technology solution. Any substantial modification in the initially approved budget distribution between headings must have prior and express authorization from Cámara de Comercio de Cali .

Resources that are not executed, destined for unapproved concepts, or that do not have corresponding supports must be returned to Cámara de Comercio de Cali and Ecopetrol in the terms established in the respective agreement.

Cámara de Comercio de Cali and Ecopetrol can request financial supports, budget execution reports, and other documents that allow verifying the proper destination of delivered resources.

Subsequent to the selection of beneficiary solvers, the respective legal instrument regulating technical, operational, financial, and project execution conditions will be signed. In said instrument, the constitution of guarantees may be required to cover fulfillment of obligations assumed by the solver. At a minimum, a performance guarantee may be required and, in cases where early disbursements are contemplated, a guarantee for good handling and correct investment of early delivered resources.

13. Schedule

Table 5 describes activities corresponding to the call and the opening and closing of each selection period:

Table 5. Schedule

Activity	Deadline
Publication of the call directed at solvers	July 22, 2026
Closing of solver application	August 31, 2026
Review period for qualifying requirements of applied solutions	From September 01, 2026 to September 04, 2026
Remediation period for qualifying requirements of applied solutions	From September 05 to 08, 2026
Publication of solvers advancing to Stage 2. Evaluation and selection of technology solutions	September 09, 2026
Technical evaluation period of solutions	From September 10, 2026 to September 16, 2026
Financial and business model evaluation period	From September 10, 2026 to September 16, 2026

Activity	Deadline
Publication of the definitive list of solutions preselected for Stage 3. Training and preparation of solvers	September 17, 2026
Stage 3: Training and preparation of solvers with pitch preparation modules and presentation strategies	From September 23, 2026 to September 28, 2026
Demo Day - Stage 4: solution presentation before the jury for the selection of three (3) Fund winners	From September 30, 2026 to October 02, 2026
Publication of the definitive list of Fund-winning solutions	October 05, 2026
Signing of the Cooperation Agreement and signature of the Start record by the parties	From October 06, 2026 to November 06, 2026

Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia reserve, at any time and at their sole discretion, the right to declare desert, suspend, modify, or terminate early this call or the selection process, as well as to adjust the schedule and terms of reference, or to reject one or all presented solutions, without the existence of an obligation to motivate or justify their decision.

This call does not generate any obligation of selection, adjudication, or conclusion of the process by Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia. Consequently, there will be no place for claim, compensation, nor recognition of indemnity of any type in favor of solvers. With the submission of the solution, the solver expressly accepts this condition and waives any action or claim derived from the decisions provided herein.

Such events will be notified by the Organizing Entities through the website <https://reddicolombia.com/bioenergytech/>.

14. Annexes

- **Annex 1.** Checklist guide for TRL identification
- **Annex 2.** Instructions for registering solutions on the Fusión360 platform
- **Annex 3.** Endorsement letter and institutional commitment
- **Annex 4.** Technical document

- **Annex 5.** Work plan and budget
- **Annex 6.** Solver experience and solution trajectory
- **Annex 7.** HSE (Health, Safety and Environment), cybersecurity, and biosafety requirements for host venue.

15. Obligations of solvers

By participating in this call, solvers commit to:

- Participate in good faith in the open innovation call in order to develop the challenge.
- Have availability according to the schedule set by the program to be part of the open innovation challenge in case of being selected.
- Read carefully these terms of reference, the challenge, and any additional information produced in the framework of this call. They have a duty of diligence to comply with the established conditions.
- Perform the studies and verifications they consider necessary for the formulation of their application, including, among others, technical, accounting, tax studies, and travel. Solvers will assume all expenses, costs, taxes, and risks that this implies, without the possibility of reimbursement under any circumstances.
- Comply with regulations and procedures established by Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia during all stages of the call and execution of pilots.
- Attend all activities, meetings, work sessions, and events scheduled within the process, whether in person or virtual.
- Designate an authorized representative to act as the main interlocutor with Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia during the development of the entire process.
- Provide all information requested by Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia in a truthful, timely, and complete manner.
- Fully accept that the information delivered is NOT of a confidential nature, so in any case, it will keep the organizers harmless from possible future conflicts resulting from the delivery and handling of said information.

- Maintain the confidentiality of shared information, as well as that of any other solver in the process.
- Collaborate actively and constructively with the challenge host, Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia, and any other stakeholder involved in the process.
- Inform Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia of any relevant change in their legal, financial, or operational situation that may affect their participation in the process both for the call and for the execution of the pilots.
- Comply with legal, regulatory, and ethical provisions applicable to their participation in the process, including, but not limited to, those related to intellectual property, data protection, and fair competition.
- Immediately communicate any conflict of interest that may arise during their participation in the call and follow instructions provided by Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia to resolve it.
- Abide by decisions and recommendations from Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia regarding their participation in the process, including, but not limited to, those related to selecting solutions, implementing pilots, and evaluating results.
- Accept that final decisions on selecting solutions, implementing pilots, and any other activity related to the process will be subject to the exclusive criteria of Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia.
- Comply with any other obligation or requirement established by Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia within the framework of this call.
- Execute allocated resources according to approved budget and exclusively for development of activities, deliverables, and objectives defined in selected technology solution. Any modification in distribution of resources between headings must be formally requested for prior review and approval. Said modifications cannot alter object, scope, expected results, nor purpose of approved project. In no case can delivered resources be destined for activities, projects, or concepts different from authorized ones.

16. Intellectual property

16.1 Intellectual property clause

This call and the legal relationships derived from it are developed in execution of the Cooperation Agreement signed between Cámara de Comercio de Cali and Ecopetrol S.A. for the creation and operation of the Econova Valle Innovation Center. Consequently, the intellectual property regime, use of results, and scaling provided herein will be interpreted in a harmonious, complementary, and subordinate manner to what is provided in said Cooperation Agreement. In case of incompatibility or interpretive doubt, the provisions of the Cooperation Agreement will prevail.

Each Solver declares and guarantees that they are legitimate owners, or that they have sufficient authorizations, over intellectual property, technologies, methodologies, models, software, confidential information, and know-how pre-existing that they incorporate into their technology solution or use during pilot execution (hereinafter, Pre-existing IP). Pre-existing IP, including equipment, hardware, and technological assets of Solver, is not transferred nor understood as assigned by sole participation in call nor by pilot execution, Solver retaining full ownership and control over them.

16.2 Intellectual property generated within the framework of the pilot

All intellectual property generated within framework of pilot development, including research projects, studies, technological developments, innovations, adaptations, improvements, incremental results, or new results, will be presumed results of Cooperation Agreement and agreements associated with pilot. Consequently, ownership of patrimonial rights will correspond, as general rule, Cámara de Comercio de Cali and Ecopetrol S.A., proportionally to economic disburseable and non-disburseable contributions made by them, according to intellectual property clause of Cooperation Agreement. In no case will results have public domain character.

Participation of Host Ally through in-kind counter-provisions such as facilities, infrastructure, operation, personnel, access to productive processes, or technical information, will not generate automatic patrimonial rights, nor recognition of co-ownership over generated intellectual property.

When Solver makes effective own contributions for pilot development, including financial resources, in-kind contributions, man-hours, infrastructure, technology, specialized knowledge, or assumption of technological risk, said contributions will not generate automatic rights over intellectual property, but may lead to recognition of patrimonial rights in its favor, proportionally, prior identification, economic valuation, and express acceptance of such contributions, in direct relation to generation of intellectual property and in comparison with contributions made Cámara de Comercio de Cali and Ecopetrol S.A.

The Solver's patrimonial rights will only arise once the pilot has been completed and the participation percentage has been expressly approved and recorded in the pilot closure record. Until that moment, any such right will be considered a mere legal expectation, without patrimonial effects.

Recognition of such rights will be formalized through the pilot closure record and, when necessary, through a specific intellectual property agreement signed between the Solver, Cámara de Comercio de Cali, and Ecopetrol S.A. In the absence of such documents, no patrimonial right shall be deemed to have been recognized in favor of the Solver.

Even when the Solver is recognized as a patrimonial co-owner, the Solver may not exploit, license, assign, encumber, or authorize the use of the intellectual property generated as a direct result of the pilot's development without the prior authorization of the other rights holders.

Intellectual property arising from research projects, studies, technological developments, innovations, adaptations, improvements, incremental results, or new results will, in principle, correspond to the Solver that developed them, insofar as such results constitute the object of validation of its technological solution.

The foregoing does not imply assignment, transfer, nor waiver Cámara de Comercio de Cali or Ecopetrol S.A. regarding rights that could derive from their contributions to pilot, nor limits possibility that said results be object of subsequent agreements on intellectual property matters.

In case parties decide, after pilot finalization, to advance in development, scaling, protection, or commercialization of obtained results, ownership of patrimonial rights over intellectual property assets derived from said evolution will be defined by common agreement, taking into account technical, financial, operational, and strategic contributions made by each party, including Cámara de Comercio de Cali, Ecopetrol S.A., and solver.

For purposes of above, parties must identify, value, and expressly agree on said contributions, as well as their direct relation with generation of protectable asset, without existence of automatic recognition of patrimonial rights in favor of any of them.

Any recognition of joint or individual ownership over intellectual property rights, as well as conditions for protection, exploitation, assignment, or licensing, must consist in writing in specific agreement signed between involved parties. In absence of said agreement, it will be understood that no authorization exists for joint commercial exploitation nor recognition of patrimonial rights different from initially provided ones.

In no case will Host's participation, through facilitation of infrastructure, access to facilities, productive processes, information, or operational accompaniment, generate automatic patrimonial rights over intellectual property generated within framework of pilot.

16.3 Results use and scaling clause

Host ally, in view of pilot executing in its facilities and responding to own needs of its operation, will be empowered to use results obtained during its execution, including technical, operational, and performance information, exclusively for internal purposes of evaluation, validation, and decision-making related to eventual scaling of process within its own plant or business group.

Said use will be understood granted as non-exclusive, free, non-transferable license of use limited to ally's internal scope, and will not imply in any case assignment, transfer, recognition of co-ownership, nor generation of patrimonial rights, present or future, over intellectual property derived from pilot.

Ally will **not** be empowered to commercially exploit, license, assign, transfer, or make available to third parties pilot results or any associated development, nor to replicate, reproduce, or implement solution at industrial scale, totally or partially, outside its own

operation, without prior express written authorization from parties owners of corresponding rights.

Likewise, ally will abstain from performing reverse engineering, reproduction, or derived development of solution in order to elude need for subsequent agreements.

Parties recognize that results obtained within framework of pilot have as main purpose technical and operational validation of proposed solutions, and that any process of definitive implementation, replication, or scaling will require signing of subsequent agreements between involved parties, in which applicable technical, legal, and economic conditions are defined.

In case ally decides to advance in scaling or implementation of solution, whether with solver or with third party, it must previously agree on said conditions, without present agreement granting automatic rights for its extended use or exploitation.

Cámara de Comercio de Cali and Ecopetrol S.A. can use pilot results for purposes of analysis, validation, replication, and development of similar initiatives in other contexts or sectors, in fulfillment of objectives of Econova Valle Innovation Center.

Solver can use pilot results for technical, commercial, and portfolio purposes, subject to obligations of confidentiality, strategic information reserve, and other applicable restrictions.

In no case will ally's participation through facilitation of infrastructure, access to facilities, productive processes, information, or operational accompaniment generate patrimonial rights over intellectual property generated within framework of pilot.

17. Provisions on information treatment, ethics, and confidentiality

17.1 General authorization for treatment of personal data

For all legal effects, presentation, inscription, or registration of application in present call implies, unequivocally and exclusively for purposes associated with this, express authorization of information owner for treatment of their personal data Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia, as responsible and/or in charge of treatment, as corresponds.

The foregoing, by virtue of Statutory Law 1581 of 2012, through which general provisions for personal data protection are dictated, and its Regulatory Decree 1377 of 2013.

Whoever presents, inscribes, or registers application declares having obtained express and prior authorization of all natural and legal persons whose personal data are supplied within framework of application, so that said information be treated according to purposes of present call.

Consequently, applicant commits to respond and keep harmless Cámara de Comercio de Cali , Ecopetrol S.A., Reddi Colombia, and Host Company facing any claim, complaint, demand, litigation, or judicial or extrajudicial action that can be presented by natural or legal persons linked to application, related to treatment of their personal data.

17.2 Personal data treatment by entity

Each of entities linked to call will perform treatment of personal data according to their respective personal data treatment policies, which are available for public consultation.

17.2.1 Ecopetrol S.A.

Personal data will be treated by Ecopetrol S.A. in accordance with its Personal Information Treatment Declaration. Treatment effected by Ecopetrol includes collection, storage, use, consultation, update, circulation (including transmissions and transfers to third parties), and suppression of personal information. Foregoing includes possibility of transmitting information with third allies of Ecopetrol participating in entrepreneurship promotion activities. I recognize treatment is legitimate and also necessary within framework of call. Finality of treatment is associated with registration, organization, update, control,

communication, validation of money laundering and terrorism financing risks, and remission of information of interest. I have rights consecrated in article 8 of Law 1581 of 2012: Knowledge, update, and rectification. Authorization proof. Use report. Present complaints to SIC. Revoke authorization, unless legal or contractual duty exists. I can exercise my rights before Ecopetrol at: Citizen Participation Offices, email participacion.ciudadana@ecopetrol.com.co, information line in Bogotá D.C., (57+1) 234 5000 - option 7; National level, 018000918418, on internet www.ecopetrol.com.co. By activating this box, Proponent declares and guarantees they have authorizations for treatment of personal data of those participating in innovation exercise (for example, in relation to contact data with interlocutor, information for Demo Day, participation in events, communications, among others) By effecting application, proponent declares and guarantees they can transmit or transfer personal information to Ecopetrol for effects of effecting activities associated with call, directly or through third parties. Proponent will keep Ecopetrol harmless for any request or claim on particular.

17.2.2 Cámara de Comercio de Cali

By applying to this call, I authorize freely, consciously, expressly, and informedly the CCC, legal person of private right, with NIT 890,399,001-1, domiciled in Cali at street 8 # 3-14 CCC Building, phone PBX (+57) 602 8861300, in quality of responsible for personal information treatment, to perform treatment of personal data supplied by any medium for one or more of following finalities: 1) Be included and stored in database of Cámara de Comercio de Cali, as well as to send invitations about events, programs, courses, or seminars performed by CCC through any of its business units, to advance inscriptions and pre-inscriptions in events, seminars, and courses, among others. 2) Generate statistics, reports, or studies that can be carried out by different business units of CCC. 3) Advance and carry out programs and activities related to chamber functions in accordance with established in Code of Commerce in its article 86, Single Regulatory Decree 1074 of 2015 article 2.2.2.38.1.4 and other rules that add, modify, or substitute them, with data here supplied. 4) Transfer and/or transmit my data to third parties with which CCC has alliances or agreements for development of its chamber functions in accordance with established in Code of Commerce in its article 86, Single Regulatory Decree 1074 of 2015 article 2.2.2.38.1.4. 4.; 5) Perform capture of biometric data (sensitive data) through photographic, voice, or video records for subsequent use with commercial and publicity purposes through any communication channel. 6) Perform

transfer and/or transmission of data to third parties with which CCC has contracted data processing service. 7) Contact owner by any medium for sending account statements and/or invoices related to any of services offered by Cámara de Comercio de Cali .

Likewise, I authorize CCC, as responsible for treatment, to capture, enroll, store, organize, use, process, suppress, anonymize, dissociate, transmit, and transfer to third parties within and outside national territory and in general treat my biometric data through photographic, voice, or video records, which are considered sensitive type data, to develop finalities mentioned below: Use with commercial and publicity purposes through any communication channel.

I authorize in a prior, express, explicit, and informed manner the treatment of my sensitive personal data for the purposes reported above YES ____ NO ____.

Data treatment policy: [M-AL-0007-POLITICA-DE-TRATAMIENTO-DE-DATOS-PERSONALES-1.pdf](#)

17.2.3 Reddi Colombia

In accordance with disposed in current rules on personal data protection, especially Law 1581 of 2012, applicant authorizes in prior, express, and informed manner Reddi Technological Development Agency (Reddi Colombia) to perform collection, storage, use, circulation, update, and other activities of treatment of personal data supplied within framework of present call.

Personal data will be used for finalities associated with call development, including, among others: management of application process, evaluation and selection of solutions, articulation with strategic allies, execution of activities related to call, generation of statistical information, and sending institutional information related to programs, services, or innovation initiatives.

Supplied personal data will be treated according to Reddi Colombia's Personal Data Treatment Policy.

17.3 Ethics, transparency, and conflicts of interest

Solvers, including their members, legal representatives, partners, or shareholders, or close relatives of these, must evaluate if any conflict of interest, disqualification, or incompatibility may exist that impacts their participation in present open innovation call in case of being selected.

It is solver's duty to reveal timely any potential conflict of interest, disqualification, or incompatibility that can affect process transparency.

No family, labor, commercial, or corporate bond must exist between Cámara de Comercio de Cali, Reddi Colombia, or Ecopetrol S.A. and beneficiary applying company (solver) that compromises process impartiality.

In case of identifying a possible conflict of interest between solver and Cámara de Comercio de Cali, Ecopetrol S.A., or Reddi Colombia, this must be informed to evaluation technical table, which will determine if application can continue in process. If conflict cannot be resolved and a cause is configured that affects process impartiality, application will be rejected.

Organizing entities will act according to their respective codes of ethics, transparency, and integrity.

17.4 Confidentiality

All content, documentation, and information of any type delivered or sent by proponents, whether as Revealing Party or Receiving Party (reciprocally), their representatives, and work teams, within framework of call and pilot execution, may be known, reviewed, analyzed, and treated by Reddi Colombia, Cámara de Comercio de Cali, and Ecopetrol S.A., as well as by their respective authorized teams, exclusively for effects of evaluation, validation, selection, monitoring, and execution of call and pilots. Said information will be treated confidentially and may not be used nor disclosed for finalities different from expressly provided ones in present call.

Confidential Information is considered any information delivered in written, visual, verbal format or by analogous, electronic, or digital media, belonging to Revealing Party or on which some type of right of this is detected. Confidential Information can include, among others, concepts, worksheets, compilations, comparisons, studies, summaries, recordings, and records, whether partial or complete, that have been prepared with information provided by Revealing Party or in benefit of Receiving Party and that contain or reflect said information and states that it is confidential.

Solver teams accept, voluntarily and expressly, that all information delivered and sent for their participation in Call will be used and analyzed with purpose of being selected, participating in process, and generating statistical effects. Received information will be handled under computer security and confidentiality measures to guarantee its integrity and avoid its unauthorized disclosure.

Parties, understanding as solvers, Reddi, Cámara de Comercio de Cali , and Ecopetrol S.A., oblige themselves to maintain strict reserve and not make improper or unauthorized use of Confidential Information, whether documented or not, that they receive reciprocally in development of call. This obligation extends to information that is their property or third parties', unless prior, express, and written authorization of its owner exists.

Solvers will guarantee that during all project execution phases they will only give access to confidential information to work team and in sections where it is indispensable and that they will implement technical and operational measures to ensure confidentiality of information remitted by Reddi, Cámara de Comercio de Cali , and Ecopetrol S.A. These must include signing of confidentiality agreements by all their collaborators. If Cámara de Comercio de Cali and/or Ecopetrol S.A. request it, proponent must accredit fulfillment of these aspects.

Parties understand and accept that obligations established in this clause will be enforceable even after call closure and pilot finalization. Nonetheless, confidentiality obligation will continue in force while Confidential Information continues being considered as such by owner Party, regardless of time elapsed since expiration of force term agreed in this clause or its eventual extensions. If Parties wish to extend force of this obligation, they can do it by common agreement and in writing, notifying it with a minimum of two months in

advance of contract or pilot experimentation agreement finalization, through figure of a contractual addendum.

Failure to comply with this obligation by solvers will lead to their immediate withdrawal as process candidates and to obligation to indemnify for caused damages.

This obligation extends to employees, subcontractors, suppliers, and allies of solvers who have access to information of reserved and confidential character. Receiving Party will be responsible for guaranteeing that subcontractors, employees, suppliers, or allies make proper use of received Confidential Information, for which proponent obliges themselves to have confidentiality agreements signed with said personnel.

Confidential Information can only be revealed or disclosed in following cases:

- With prior and written approval of Revealing Party.
- When revelation and/or disclosure of Confidential Information be required by legal mandate, judicial order, or competent administrative authority in exercise of its functions. In this case, Receiving Party must notify immediately Cámara de Comercio de Cali and Ecopetrol S.A. once they have knowledge of this obligation, so that Revealing Party can take necessary or convenient measures to protect Confidential Information. Likewise, Receiving Party commits to adopt measures to mitigate effects of said disclosure and to limit themselves to reveal only information strictly required by competent authority.
- When Confidential Information already be or comes to be of public domain by a cause different from an act or omission of Receiving Party.
- When Confidential Information has been in possession of Receiving Party before receiving it from Revealing Party, or if they had acquired it from a third party who was obliged to maintain confidentiality with respect to Revealing Party.
- When Parties expressly manifest information has ceased having confidential character.
- Reserve obligation stipulated in this clause will be understood without prejudice to information exchanged between Parties with purpose of being revealed for commercial, administrative, technical, operational, logistical, or publicity purposes inherent to normal fulfillment of process.

18. Withdrawal of a solver from the call

In case a solver wants to withdraw from process, they must communicate in writing Cámara de Comercio de Cali , Ecopetrol S.A., and Reddi Colombia explaining clearly reasons for their withdrawal.

For solvers passing to pilot development phase, they must abide by conditions that will be stipulated in Cooperation Agreement to be signed by parties, before start of Pilot Implementation Phase.

19. Contact

For more information or in case of identifying discrepancies, inconsistencies, omissions, or having doubts regarding these Terms of Reference or its annexes, interested parties must request in writing corresponding clarifications, within deadlines established in section 13 - Schedule.

Requests must be sent to email indicated in present section, with subject "Solver call BioEnergyTech Challenges".

Lizbeth Nathalia Layton Almeida

Project Analyst

llayton@reddicolombia.com

Responses to formulated inquiries will be sent by email, provided requests are presented in form, terms, and dates established in these Terms of Reference.