



Results-Oriented Report

Author: DiBiCoo Consortium
Editors: Dr. Johannes Anhorn & Ann-Kathrin van Laere (GIZ)
Date: 30.06.2022
Deliverable: D 1.2

DiBiCoo – Digital Global Biogas Cooperation
Grant Agreement N°857804



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 857804. The sole responsibility for the content of this document lies with the authors. It does not necessarily reflect the opinion of the EU.

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Executive Summary

The result-oriented report (D1.2) is a summary of the main findings and learnings of the EU-funded Project “Digital global Biogas Cooperation (DiBiCoo)”.

The overall objective of the project was to support the European biogas/biomethane/gasification industry by preparing markets for the export of sustainable biogas/biomethane/gasification technologies from Europe to developing and emerging countries, specifically to South Africa, Ethiopia, Ghana, Indonesia, and Argentina as the five selected target countries of DiBiCoo. Therefore, the development and application of innovative digital and non-digital support tools and actions, knowledge transfer and capacity building as well as the preparation of demo cases was implemented.

The specific objectives of the DiBiCoo project achieved are:

- The facilitation of cooperation between relevant biogas stakeholders from Europe with stakeholders from developing and emerging countries.
- The compilation and provision of information for all stakeholders on available European biogas technologies as well as on the framework conditions, market opportunities, research needs, financing opportunities and project opportunities from the biogas sectors in importing countries.
- The implementation of the “DiBiCoo Capacity Building and Networking Programme” which included matchmaking events, study tours, business design trainings and capacity building trainings on biogas related topics. All in all, 146 stakeholders participated in the study tours, 475 attended the capacity building trainings combined, 642 attended the web seminars in total and more than 50 joined the business design trainings.
- The development of the digital, open-source, and free [Biogas and Gasification Matchmaking Platform](#). Enabling stakeholders to identify suitable business partners and business opportunities from the biogas sectors worldwide. As of today, more than 200 company profiles updated to the database. In addition, an extensive knowledge base has been established, providing valuable reports, virtual study tours and factsheets on various aspects of biogas project development.
- Supporting the development of at least five biogas projects in target countries as “demo cases” with technical concepts and elaborating on social, economic and environmental sustainability. The five demo projects trigger an estimate of 30.5 Mio EUR investment and have an installed capacity of 18.3 MW (total energy generated 121.7 GWh), leading to 313.5 kt/year waste treated and over 100.000 t/year GHG emissions reduced.
- The additional 20 follower cases with an estimated installed capacity of 34.8 MW (463.5 GWh energy generated) would additionally trigger more than 85 Mio. EUR investment.
- The exchange on national, regional and local policies supporting further biogas market uptake in the target countries by means of developing and disseminating best practices i.a. from the demo cases. In many events policy makers participated and key documents on legal and financial aspects, as well as market conditions in all target countries were discussed.

This document will showcase how the objectives of the project were reached, what obstacles the project had to face and what conclusions made and lessons learned. Furthermore, this report addresses the impact of the project’s activities and efforts.

To assess this, an extensive ex-post survey was distributed to biogas and gasification stakeholders in Europe and the five target countries. The results of this ex-post survey are presented in this report as well.



The DiBiCoo Project

The **Digital Global Biogas Cooperation (DiBiCoo)** project is part of the EU's Horizon 2020 Societal Challenge 'Secure, clean and efficient energy', under the call 'Market Uptake Support'. DiBiCoo successfully connects 13 organizations from Europe, Argentina, Ethiopia, Ghana, Indonesia, and South Africa.

The target importing emerging and developing countries are Argentina, Ethiopia, Ghana, South Africa and Indonesia. Additionally, the project involves partners from Germany, Austria, Belgium and Latvia. The project started in October 2019 with a 33 months-timeline and a budget of 3 million Euros. It is implemented by the consortium and coordinated by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

The overall objective of the project is to prepare markets in developing and emerging countries for the import of sustainable biogas/biomethane/gasification technologies from Europe. DiBiCoo aims to mutually benefit importing and exporting countries through facilitating dialogue and collaboration between European biogas industries and biogas stakeholders or developers from emerging and developing markets. The consortium works to advance knowledge transfer and experience sharing to improve local policies that allow increased market uptake by target countries. This is achieved through the development and application of innovative digital and non-digital support tools, knowledge exchange as well as capacity building through (virtual) study tours, web seminars and diverse trainings. Explicitly, DiBiCoo facilitated a digital matchmaking platform and classical capacity development mechanisms for improved networking, information sharing, and technical/financial competences. Furthermore, DiBiCoo identified five demo cases up to investment stages in the 5 importing countries. Thus, the project helped to mitigate GHG emissions and increase the share of global renewable energy generation. The project also contributes to the UN Sustainable Development Goals (SDG 7) for 'Affordable and clean energy', among others.

Further information can be found on the DiBiCoo website: www.dibicoo.org



1. Introduction

The **Digital Global Biogas Cooperation Project (DiBiCoo)** has been working together with 13 organisations from Europe, Argentina, Ethiopia, Ghana, Indonesia, and South Africa to **build a collaborative bridge** between European biogas/gasification industries and stakeholders from emerging and developing markets. The overall approach of the DiBiCoo project is based on the cooperation **between stakeholders from exporting countries (Europe) and from importing countries (Argentina, Ethiopia, Ghana, Indonesia, South Africa, and others)**.

To meet the growing demand for heating, power and fuel, **biogas/biomethane has already proved its potential** as a versatile energy carrier. Thanks to favourable regulation and energy policy, the number of biogas plants in operation in the European Union has constantly increased over the past decades. The total biogas production in 2019 was 167 TWh or 15.8 bcm. The total biogas production capacity in Europe had reached 29.2 GW by the end of 2019. 830 new plants started operation in 2019, bringing the total number of plants in Europe's biogas sector to 18,943. The biomethane market continues to grow significantly, with a 16% increase in new installations over the course of 2019. There were 725 active biomethane-producing plants in Europe in 2019. Biomethane production in 2019 increased by 15% relative to the previous year; a total of 26 TWh or 2.43 bcm of biomethane was produced in 2019. Europe has seen a rapid year on year increase in biomethane production capacity. In 2019, the largest increase since 2014 was reported, with an additional 0.39 GW or 0.32 bcm for that year (EBA, 2019).

Thereby, the key challenges in Europe are the currently decreasing numbers of new installed biogas plants in Europe as well as the European commitments to support emerging and developing countries. Besides the improvement of biogas technologies, support structures and favourable energy policies **in Europe, the sector needs to become more competitive in relation to other renewable energy sources**, e.g. solar and photovoltaic. In addition, market penetration in high potential emerging economies globally is still underutilised.

In **developing and emerging countries**, the project addresses two main challenges, namely the management and **treatment of organic wastes and the increasing energy demand**. DiBiCoo promotes technologies and concepts for the collection and treatment of organic wastes (e.g. bio-waste, food processing waste, agro-industrial waste, catering waste) as well as of biogas conversion technologies (anaerobic digestion and small-scale gasification) and its use (for upgrading, CHP, industrial processes, transport, etc.).

The partner countries have been selected because of their high market potential for biogas projects, along with diverse regulatory environment and support schemes in each of these countries.

DiBiCoo aims to support the European biogas industry in diversifying its sales market and therefore increasing the deployment of biogas technologies in emerging markets across Latin America, Africa and Southeast Asia, helping mitigate GHG emissions and increasing the share of global renewable energy generation.

By this means, DiBiCoo contributes to the UN Sustainable Development Goals (SDGs), especially to the SDGs No 7 "Affordable and clean energy", No 9 "Industry, innovation and infrastructure", and No 17 "Partnerships for the goals".

The **main strategy of the DiBiCoo project** is to trigger market uptake of biogas/biomethane and gasification projects through the initialisation of demo cases for the application of such technologies in developing and emerging countries providing high biogas potential. This will be supported by interconnected digital and non-digital support tools and stakeholder



involvement. In the DiBiCoo project, the main focus is on biogas and biomethane value chains which are based on anaerobic digestion (AD) technologies. The value chains include feedstock sourcing (waste/residues management and logistics), conversion processes, use of the biogas/biomethane and of the digestate. Solid wastes and residues that cannot be treated by AD as a potential feedstock source, are also considered in DiBiCoo through small-scale gasification technologies for syngas production followed by combined heat and power generation.

The project is **EU-funded** under the Horizon 2020 Societal Challenge “Secure, clean and efficient energy”, in the call “Market uptake support” (SC3-RES-28). Grant Number 857804.

In this Results-Oriented Report, we illustrate the journey of the DiBiCoo Project: explain the main objectives and impacts achieved, as well as dive into the main results and findings. We also shed light on lessons learned and provide an outlook, informing further collaboration projects.



2. Specific Objectives and Expected Impacts

To build a collaborative bridge between European industries and stakeholders from emerging and developing markets a set of specific objectives and expected impacts have been agreed among the project consortium and the funding organisation.

The **specific objectives** of the DiBiCoo project are:

- To facilitate cooperation between relevant stakeholders from Europe, such as the biogas industry, with stakeholders from developing and emerging countries, such as potential biogas plant operators, developers, and agro-industries.
- To provide information for the stakeholders on available European technologies as well as on the framework conditions, market opportunities, research needs, financing opportunities and project ideas in the potential importing countries.
- To develop a “DiBiCoo Capacity Building and Networking Programme” and a digital, open-source, and free online “Information and Matchmaking Platform”. Enabling stakeholders to identify suitable business partners and business opportunities from the biogas sectors worldwide. These tools will be designed to facilitate the export of European biogas technologies to markets of five developing and emerging countries.
- To support the development of at least five biogas projects in target countries as “demo cases” up to, or close to the investment stage. Technical concepts will be elaborated while considering country specific technologies and solutions and adapting existing ones, considering local aspects of social, economic and environmental sustainability. The impacts of the potential projects will be assessed, as well as their business models and potential financing will be developed. The success of these projects will be demonstrated by proofs of commitment on the cooperation between importers and exporters. Further market uptake will be reinforced by the support of additional follower projects.
- To promote and improvement of national, regional, and local policies supporting further market uptake in the target countries by means of developing and disseminating best practices (e. g. standards across the technical, environmental, financial regulatory and social paradigms). To communicate and lobby with local authorities on how to remove political and administrative market uptake barriers. In addition to taking part in the activities with other stakeholders, the partners will communicate directly with local and regional authorities as those are responsible for the local decision-making process laying the ground for the setup and development of bioenergy value chains. This includes the presentation and discussion of DiBiCoo project activities and results to local, regional and national regional authorities.

The three **expected impacts** of the DiBiCoo project are:

1. Facilitate the introduction of biogas technologies and increase the share of renewable energy in the final energy consumption.
2. Lead to substantial and measurable reductions for project developments, whilst still fully addressing the needs for environmental impact assessments and public engagement.
3. Develop more informed policy, market support and financial frameworks, notably at national, regional, and local level, leading to more cost-effective support schemes and lower financing costs for renewable energy facilities.



3. Project Strategy

The project is a Coordination and Support Actions under the RES-28-2019 call. To achieve the expected impacts a **multi-tier project strategy** was developed and implemented in **eight interrelated work packages**. Impacts have been achieved in the following fields:

- Facilitating international cooperation
- Developing coordination and support tools
- Support enabling policy
- Preparing the ground for investment
- Building capacities and skills



Figure 1: DiBiCoo project strategy (schematic).

DiBiCoo facilitated the cooperation between relevant stakeholders from Europe, with stakeholders from developing and emerging countries. We provided information for the stakeholders on available European technologies as well as on the framework conditions, market opportunities, research needs, financing opportunities and project ideas in the potential importing countries.

In an iterative manner the digital “Biogas and Gasification Matchmaking Platform” was developed, and the real-life “Capacity Building and Networking Programme” implemented. Both tools aim to facilitate the export of European biogas technologies to new markets. We used modern digital online services, as well as common real-life actions such as matchmaking events, study tours or capacity building training courses. Those events also include dialogs about successful but also failed projects in order to foster learning.

Together we tried to remove governance barriers and support the development and implementation of sustainable energy policies and legislation in the target countries. This was mainly facilitated through the involvement of relevant stakeholders in the target countries in local stakeholder discussion workshops. Regular discussions on best-practice, providing insights to existing favorable regulatory frameworks, and knowledge exchange (web seminar, factsheets) about standards for reliable, safe, profitable, and sustainable biogas projects accompanied the project implementation.



A core activity of the DiBiCoo project was to prepare the ground for new investments through the identification of 5 demo cases and 20 follower cases. Providing the demo case projects with technical assessments for pre-feasibility studies, analyzing their business models and providing a systematic view on financing options. The impacts of the potential projects were assessed, and the success of these projects demonstrated by proofs of commitment on the cooperation between importers and exporters.

All actions were accompanied by dissemination and communication activities.



4. Key Impacts

The DiBiCoo Project has **three dedicated expected impacts with defined Performance Indicators**.

First: **DiBiCoo facilitates the introduction of biogas technologies and increase the share of renewable energy in the final energy consumption.**

Performance Indicators per GA define, the project will identify 1 demo and 3 follower cases per target country thus 20 new projects in total ([1 demo + 3 follower] * 5 countries = 20 demo/follower cases).

Achievements: In total 5 demo cases and 20 follower cases have been identified and supported through the action. Exceeding the key performance indicators from the GA.

The five demo projects trigger an estimate of 30.5 Mio EUR investment and have an installed capacity of 18.3 MW (total energy generated 121.7 GWh), leading to 313.5 kt/year waste treated and over 100.000 t/year GHG emissions reduced.

The additional 20 follower cases with an estimated installed capacity of 34.8 MW (463.5 GWh energy generated) would additionally trigger more than 85 Mio. EUR investment.

Target country	No. of demo cases	No. of follower cases	Installed capacity ^[1] [MW]	Total energy generated [GWh]	Waste treated ^[2] [kt/year]	GHG emission reductions ^[3] [t/year]	New investment [Mio. EUR]
Argentina	1	7	6,5	75	77	33 000	12,3
Ethiopia	1	3	6,6	116	158	-40	21,7
Ghana	1	5	27,0	298	434	106 000	60,7
Indonesia	1	2	10,2	62	255	36 000	14,4
South Africa	1	3	2,8	33	114	29 000	7,6
Total	5	20	53	585	1 036	203 700	116,7
Performance Indicator	5	15	21,0	168	280	60 000	42,0
Fulfilment	100%	133%	253%	348%	370%	340%	278%

[1] It is the total capacity of the CHPs, not just electrical. In case of direct biogas utilization via grid or bottling, the installed capacity is the thermal energy of the biogas by 8760 h.

[2] This is a sum over all utilized feedstocks and does not allow any conclusions to be drawn about the type and quality of feedstock

[3] For the follower projects just the substitution of the national electricity mix was considered, for the demo projects a GHG balance was elaborated in D6.3

Second: **DiBiCoo leads to substantial and measurable reductions for project developments, whilst still fully addressing the needs for environmental impact assessments and public engagement.**

Performance Indicators per GA read: The DiBiCoo project will considerably contribute to substantial and measurable reductions for project developments (time, costs) through capacity building, information spreading and the initiation of the demo and follower cases.

Achievements: Almost half of the ex-post evaluation participants (46%) state, that the time needed to initiate and set up new projects in the biogas sector was reduced. Additionally, 43% believe the use of the Biogas and Gasification Matchmaking Platform will reduce their time needed in the future. Just below 70 % said that they saved more than 50% of their usually



spent time for general project development (i.e. to identify suitable business partners or to find new project opportunities) compared to your regular processes by using the DiBiCoo platform.

Almost 90% of the survey participants from developing and emerging economies believe that the platform helps or will help them to reduce their costs spent and their time spent to identify European technologies or partners for their biogas or gasification project. 40% of people say they save 80% or more on costs by using the Biogas and Gasification Matchmaking Platform in order to identify European technologies or partners for your project(s), compared to their regular processes. Over 60% of the respondents say they are saving 60% or more of their time to identify European technology partners. 35% say they even save more than 80%.

In general, 96% of those who participated in DiBiCoo activities state, that the activity helped them to learn about sustainable European biogas/gasification technologies. And 55% of the survey participants from Europe state, that they have gained knowledge about the potentials and opportunities of biogas/gasification projects as a waste treatment and energy generation technology in emerging markets.

Third: Develop more informed policy, market support and financial frameworks, notably at national, regional, and local level, leading to more cost-effective support schemes and lower financing costs for RES facilities.

Performance Indicators per GA required:

- minimum 75 policy makers will be informed in the importing countries about the need to set-up biogas/biomethane/gasification projects as a waste treatment and energy generation technology.
- minimum 20 European policy makers will be informed about the deed of international cooperation in the field of renewable energies.
- 75 representatives of the financial sectors in the target countries as well as international financial institutes about the opportunities of biogas/biomethane/gasification projects.

Achievements: In total 141 policy makers have been engaged and/or participated in the Local Stakeholder Workshops (either virtually or on-site/hybrid). Other DiBiCoo activities also attracted policy makers: 10 policy makers attended the matchmaking event in Indonesia, 1 policy maker from Ethiopia participated in the Study Tour in Germany, 4 policy makers participated in the Study Tour in South Africa, and 16 policy makers attended the Capacity Building (8 in South Africa, 4 in Argentina, 2 in Ghana and Ethiopia each). Particularly the web seminar on policy frameworks in Europe attracted their interest. 64% of the ex-post survey participants rate their learnings “about the importance of international cooperation in the field of biogas/gasification” above average on a scale from 1 (“very little”) to 10 (“very much”), with 5 being “average”.



In total 38 persons representing the policy makers from the EU have been engaged and many more informed through notification. Out of those, 18 have been engaged and/or participated in



Local Stakeholder Workshops and 20 representatives have been directly informed about the Market and Framework Analysis performed.

In total 81 representatives of the financial sector have been engaged and/or participated in DiBiCoo activities. Thereof, 29 participated in Local Stakeholder Workshops (10 in Argentina and South Africa each, 2 in Indonesia and Ethiopia each, and 5 in Ghana). 52 persons were part of the stakeholder mapping in importing and exporting countries.



5. Main Results and Findings per Work Package

5.1 Exporting Markets (WP 2)

This WP started at the beginning of the project with the mapping of European stakeholders involved in the biogas and gasification sectors. Although the target of replies was reached, collecting input from the stakeholders proved challenging. Not only due to time constraint, but as there were no DiBiCoo outputs available yet to raise interest in the project. Addressing industry stakeholders often requires a results-driven approach, but no preliminary results or analyses were available in such early stages of the project. This was even more true when targeting gasification stakeholders, as this technology has not yet reached broad market uptake and the number of stakeholders using this technology is quite limited. The analysis of the export opportunities was carried out with similar challenges ([D2.3 Export opportunities for European biogas technologies and services from the industry perspective](#)).

Despite the strains, the targets to map European stakeholders and analyse export opportunities were reached and the preparation of the deliverables in this WP was done considering input from other partners and WPs. This proved useful for the development of the Biogas and Gasification Matchmaking platform in WP 4, and the capacity building activities in WP 5. It also incorporated an analysis on stakeholders and technologies based on the needs of importing countries, introducing for instance lagoon biogas systems or household biogas systems, which are more commonly used outside Europe, in the mapping and analysis of European stakeholders. This was a positive example of the spirit of mutual understanding and cooperation between DiBiCoo partners, coming from different countries and realities across the globe.

The analysis of the European regulatory framework helped importing countries to understand the European biogas market better and to consider potential drivers and stoppers for the development of the biogas sector in their own territories. Thus, the report was presented and used during the local stakeholder discussion workshops and capacity building events in the importing countries to showcase lessons learned from the European market on drivers and stoppers of biogas project development. The recent evolution of the European energy context with the Ukraine crisis were unfortunately not incorporated in this report, which was finalised in 2020, but this will be further addressed in the DiBiCoo Final Conference. Biogas, particularly biomethane, are getting increasing attention in Europe in the current context and this could have been positive to further engage with financial and political stakeholders within the DiBiCoo project ([D2.4 European legal institutional and political frameworks](#)).

Finally, the elaboration of the factsheets and the 2 final publications on the 'Overview and Categorization of European Biogas and Gasification Technologies' experienced some delays. This was partly due to the length and the technical nature of the publications, as well as to the partners willingness to prepare a professional publication aimed at showcasing European biogas technologies worldwide. The launch of these publications acquired relative popularity within specialised media and have reached the interest of stakeholders looking for information on existing European biogas technologies. They have been incorporated into the DiBiCoo Biogas and Gasification Matchmaking Platform and will remain online as reference publications also after the end of the project. The structure of the publication follows the biogas processing logic: from feedstock storage on site and necessary pre-treatment to the various digester technologies. Special chapters on important elements of any biogas plant are elaborated in detail (e. g., on measurement, control, and regulation technologies). Upgrading biogas to biomethane quality as well as various application of biogas are introduced (e. g. its GHG mitigation potential, as Combined Heat & Power (CHP) plants). Thus, the report gives a good overview of the existing European biogas technologies and is a good starting point for



stakeholders from emerging markets who are interested in biogas project development in their respective countries ([D2.2 Overview and Categorization of European Biogas Technologies](#)).



5.2 Importing Markets (WP 3)

Work Package 3 mainly covered activities that aim to approach and engage local stakeholders and knowing more about the potential and market characteristic of biogas in the target countries Ethiopia, South Africa, Ghana, Indonesia, and Argentina. These goals were achieved through local stakeholder discussion workshops, bilateral meetings, and desk reviews in each country resulting in a biogas stakeholders mapping analysis; biogas market and policy framework report; biogas financing opportunity analysis; report on research needs related to the biogas sectors; and the identification of potential biogas project ideas from the five target countries.



Figure 2: The first Local Stakeholder Discussion Workshop in Ethiopia was held physically in 2020 (left) and in Indonesia virtually in 2021 (right)

At the beginning of the project, 311 stakeholders from five target countries were identified and mapped. Information collection during this period was more than sufficient, providing a rich information base for each of the target countries including operational scope and functions of the stakeholders mapped, stakeholders' needs in terms of information systems and capacity improvement, list of strategic and operational issues faced by each of the local biogas stakeholders, as well as the perceived barriers experienced by the local stakeholders in terms of biogas market development and project financing. Based on input received from the identified local stakeholders, various extensive reports were compiled within DiBiCoo such as:

- D3.2 Report on the stakeholder workshops
- [D3.3 Biogas Markets and Frameworks in Argentina, Ethiopia, Ghana, Indonesia, and South-Africa](#)
- [D3.4 Biogas Financing Options in Argentina, Ethiopia, Ghana, Indonesia, and South-Africa](#)
- [D3.5 Identification of Research Needs](#)

An important conclusion drawn from those reports is that biogas projects that have been developed in those five target countries are predominantly small-scale projects because large-scale projects tend to have high risks and capital costs while investment sources are still limited, and financing schemes are not yet mature. In the meantime, the slow development of the biogas market there is influenced by other renewable sources which are more prioritized over biogas. In terms of project financing, public funding from government in Argentina and Indonesia has started to look at the biogas as a promising sector, while African countries still must rely mostly on private financing. Through the set of DiBiCoo activities within WP 3, potential gaps and opportunities in the biogas markets from the five target countries were identified and tailored approaches taken to address them. Yet, it is vital to keep encouraging the countries to legally support the biogas sector – even after the DiBiCoo project ends.



Another implemented action within this WP were the local stakeholder discussion workshops (LSWs) in each target country: they were important to maintain communication and building trust between DiBiCoo local partners and local stakeholders, to disseminate DiBiCoo activities, and to provide room to facilitate local needs through sharing and discussion with European biogas experts and technology providers. The Covid-19 pandemic has postponed the implementation of LSWs due to activities and travel restriction globally applied. Mitigation measures were taken quickly by consortium members and forced the LSWs implementation to change its format to online or hybrid. However, the change in format and delay in implementation did not make the impact target of this WP unattainable. Through nine workshops implemented in five target countries, more than 600 local biogas stakeholders were reached and informed. In addition to the engagement done through the LSWs, virtual bilateral meetings, phone-calls, and emails were also the paths taken by local partners to attract the involvement of local stakeholders and to inform them especially also about the DiBiCoo Market Uptake Program (see also the chapter on WP 6) despite all the limitations during the pandemic. In total, the local partners in the target countries have successfully identified 52 local biogas project proposals.

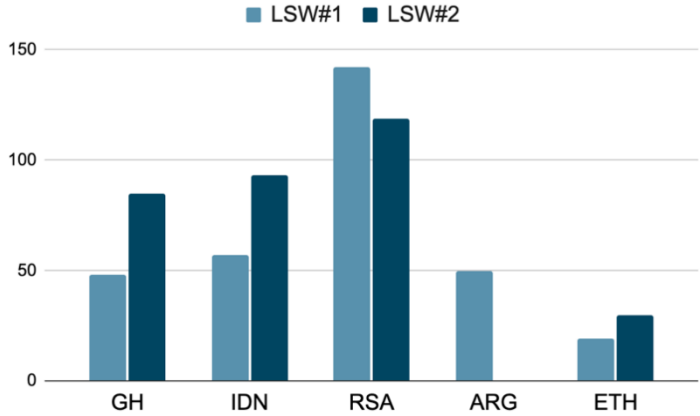


Figure 3: Number of participants of LSWs in importing countries

Seeing the accountable achievements of this WP which always exceeded the target, we could admit that the global crisis due to the Covid-19 outbreak might be a big factor in the slow movement of biogas markets in the five target countries but not with the spirit of the stakeholders to always seek and take as much as possible the advantage of the opportunities in adversity, such as through all facilitation given by DiBiCoo. The virtual and hybrid event format have been also proven in increasing the number of attendees, given its efficiency in time and flexibility in access. However, getting attention and involvement from participants in online implementation is indeed challenging. Therefore, breakout room discussion and serial workshops were important means in imposing policy makers and financial institutions' commitment, readiness, and willingness to support the biogas development.



5.3 Digital Information, Networking and Matchmaking Tool (WP 4)

The objective of WP 4 was to develop an Online Information System for convenient networking and matchmaking between actors of exporting and importing markets for biogas technologies. The idea was to use the already existing online “Marketplace 38” hosted by FVB to develop an Online Information System by DiBiCoo which will be applied at European wide scale for exporters and at international scale for biogas technology importers. DiBiCoo partner FVB will host the tool and maintain it beyond the lifetime of the project.

During the project period DiBiCoo developed a digital tool to connect the biogas and gasification sector worldwide. The Biogas and Gasification Matchmaking Platform was successfully developed, and it is available online (<https://biogasplatform.eu/>) for any interested company and other stakeholders. It was officially released at the European Biogas Conference in Brussels on the 26th and 27th of October 2021.

The Biogas and Gasification Matchmaking platform is an online and free platform which facilitates worldwide networking and is considered as an additional marketing option for EU companies and for stakeholders in emerging and developing countries to get in contact and connect with each other.

The platform acts as a database and collects related stakeholder profiles of biogas and gasification in the section “Company Profiles”; in addition, there is a marketplace feature for the promotion of biogas business opportunities. Within the platform there is a section “Business Opportunities” which is a feature for B2B matchmaking like platform notifications to inform the user about suitable matchmaking results and view statistics of the company profiles and business opportunities. Additionally, the “Knowledge Base” of the platform serves as an information hub on available biogas and gasification technologies and services.

The Biogas and Gasification Matchmaking Platform is developed by using an open-source approach, thus making it available for further development and application by any interested party and stakeholder. One of the advantages of the open-source approach for the Biogas and Gasification Matchmaking Platform lies in its general applicability to other renewable energy technologies besides biogas, such as hydropower, geothermal, heat pumps, solar energy, wind power, and solid biomass conversion. They were offered the source code for free along with a technical manual and technical guidance on how to adapt the matchmaking platform.

During the DiBiCoo project life-time European project partners (GIZ, EBA, AEA, WIP) therefore promoted the developed Matchmaking and Gasification Matchmaking Platform to other institutions and associations. For general promotion of the platform according to T4.7, information about the platform and its functions was sent out especially to biogas stakeholders and informed specifically the European renewable energy associations about the open-source character of the Biogas and Gasification Matchmaking Platform and its adaptability to other RE sectors. The platform and its adaptability to other RE sectors has also been promoted to multiplier organizations with similar interest in transfer of biogas technologies such as business associations, trade chambers, development agencies and renewable energy associations in a variety of other countries. DiBiCoo also reached out to organizations in the sector of solar PV, solar thermal and Bioenergy in Europe such as ETIP Bioenergy, ETIP RHC, ETIP PV, EUREC, Euroheat and Power, EHPA and EUBA. In total 48 organizations were contacted.

The development of such a platform is an infinite process, as new features are requested continuously. The development process was done in close collaboration with all DiBiCoo project partners, considering remarks and suggestions for the platform operation, design and functionality. Comments and evaluations from stakeholders were collected using the feedback surveys and individual conversations.



At present (June 2022) there are more than 200 company profiles of the leading biogas stakeholders present on the platform and this number is growing. Furthermore, more than 400 users are registered on the platform and have thus access to exclusive features such as the notification feature.

Many promotional materials were developed to inform the public about the platform:

- A promotional video was created with subtitle versions in Bahasa, Amharic and Spanish:
https://www.youtube.com/watch?v=QSV_WaTVpLw
- A podcast with DiBiCoo representatives was recorded (in German language):
<https://petajouleprojects.podigee.io/2-biogas-dibicoo>
- Presentations at international biogas conferences & trade fairs were held

Based on the work related to the Biogas and Gasification Matchmaking Platform various extensive reports were compiled within DiBiCoo such as:

- D4.2 [DiBiCoo Online Information System Report on Version 1.0](#)
- D4.3 [Evaluation of the tool](#)
- D4.4 [Follow-up strategy continuous use of the tool](#)
- D4.5 [Follow-up strategy extension of the tool](#)
- D4.6 [Training on the use and maintenance](#)
- D4.7 [Report on the promotion of the tool](#)

Also, the Biogas and Gasification Matchmaking Platform was nominated at the [AD and Biogas Industries Awards 2022](#) for the Best Anaerobic Digestion/Biogas and highly commended! This shows that the developed platform is a successful new tool for the biogas sector and enables new matchmaking opportunities globally and virtually.

One of the main lessons learned was, that the agile development methodology worked well, when the platform is not developed from the start to the end but is implemented feature by feature allowing users to start using it earlier and participate in a further platform development. One additional important aspect is that it is required to have separate persons responsible for the design of the platform, as unfortunately it was a more complicated part, as it was hard to find the solution (colours, elements locations, etc.) that would be accepted and liked by everyone.

To achieve the continuous use of the platform after the DiBiCoo project ends it will be managed and maintained by the German Biogas Association (FvB).



5.4 Market Development and Capacity Building (WP 5)

In parallel to the development of the DiBiCoo Biogas and Gasification Matchmaking Platform, a capacity building and networking programme was implemented in order to prepare importing markets for the market uptake of biogas and to build and enhance capacities and skills in the 5 target countries. To achieve this, it was initially planned to organize various physical and face-to-face events such as matchmaking events, capacity building training courses, and study tours for business delegations and stakeholders. However, due to the COVID limitations for international travels, parts of the activities were shifted towards an online format.

In summary, the consortium managed to hold 5 matchmaking events to bring biogas industry stakeholders from exporting and importing countries together. Three matchmaking events were organised as online events, either as stand-alone events or attached to other larger events and conferences in the sector. However, although very well promoted, the impact of those online matchmaking events was limited, and it was shown that the impact of physical matchmaking events is much higher. Therefore, two additional physical matchmaking events were organised with success. The number of bi-lateral meetings was estimated to be about 150 in total (100 of those with external stakeholders).

Furthermore, a great achievement of the project was the organisation of 5 study tours for business delegations with the focus on Germany, Austria, Indonesia, South Africa, and Argentina. Again, some events were organised in a virtual format where the study tours were recorded and (live) streamed through various online channels. This was very successful in reaching a broader audience. Three study tours could be organised in a physical or hybrid format in Germany, South Africa, and Indonesia.

In each of the target countries, two capacity building training courses with biogas experts from Europe and emerging markets as speakers on different thematic topics related to biogas project development were organised, as well as business design training courses. Important topics were, besides a general overview on biogas, issues related to the economy of biogas projects, feedstock mobilisation and digestate management. This training series with the focus on local aspects of the target countries was complemented by 11 web seminars on biogas related topics along the biogas and biomethane value chain.

Finally, the consortium has implemented some activities to extend the activities to other high biogas potential countries. Therefore, 21 further countries were selected to which DiBiCoo activities and results – such as the Biogas and Gasification Matchmaking Platform – were disseminated. In addition, multiplier organisations such as business associations, trade chambers and organisations from other renewable energy sectors were contacted and provided with information and results from DiBiCoo that could be of valuable for their sectors.

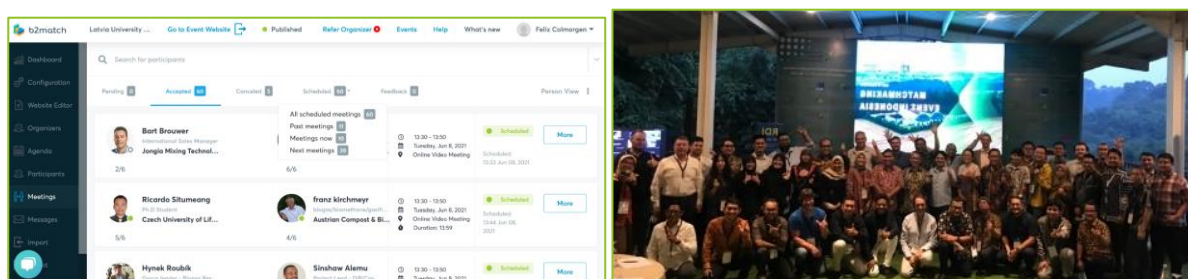


Figure 4: Online matchmaking event and physical matchmaking event in Indonesia





Figure 5: Biogas study tour in South Africa

All in all, 146 stakeholders participated in the study tours, 475 attended the capacity building trainings combined, 642 attended the web seminars in total and more than 50 joined the business design trainings.

In conclusion it can be said that the approach to focus activities on the core target groups, such as plant operators, project developers, and technology companies was successful, however, the cooperation with NGOs, advisors and policy makers was also important. Although the shift from some physical to online events resulted in some cases in a lower impact, the overall achievement of the consortium to facilitate the international cooperation in the biogas field was achieved and surpassed the expectations, as online formats attracted more participants from all over the world. Some of the virtual events and recordings will even remain online after the end of the project and be of high value as an extensive knowledge source on biogas.

Nevertheless, further support programmes are needed to continue the international cooperation and knowledge sharing between countries with developed biogas markets and those countries that have so far less biogas development. This is important, not only as biogas is a renewable energy source, but as it is seen more and more, besides many other advantages, as a technology for proper waste treatment, especially in emerging and developing countries.

All activities within the market development and capacity building were monitored and the results are written down in several extensive project reports:

- D5.2 Report on study tours
- D5.3 Report on capacity building on biogas project development
- [D5.4 Report on the Webinars](#)
- D5.5 Report on business design trainings design and manager trainings



Figure 6: Capacity building training 1 in Ethiopia





Figure 7: Capacity building training 2 in Indonesia



Figure 8: Web seminar no 2



5.5 DiBiCoo Market Uptake Programme (WP 6)

The main goals of the DiBiCoo Market uptake programme were to support the market uptake in the five emerging countries Argentina, Ethiopia, Ghana, Indonesia and South Africa. To achieve this, a minimum of 5 so called *demo projects* as well as 15 follower projects were guided within DiBiCoo. It was intended that they will then serve as lighthouse projects within their countries and beyond, thereby showcasing the potential of biogas projects in importing countries. The programme started with the collection of business opportunities in the five countries. The local partners spread the call for application via their networks, including a questionnaire about the project ideas. In total, 52 business opportunities were collected. In parallel, a biogas model was elaborated to assess the technical and financial performance of the biogas projects and beside other factors to select the one, most promising projects per country (=demo project). It was important for the selection of the demo projects and for the cooperation with project developers in general, that just waste, and residues would be utilized, in order to exclude a conflict of use with food and feed production.

In close cooperation between the local partners, the demo project developers and AEA, pre-feasibility studies (Pre-FS) and impact analysis for those 5 demo projects were then elaborated. To support the process, contacts between the demo project developers and technology provider were fostered and the obtained information incorporated in the pre-FSs to reduce the effort for project development and search for suitable technologies for the developers. 20 follower projects were closely informed about and included into DiBiCoo activities such as capacity building and matchmaking activities as well as study tours and local stakeholder workshops. Furthermore, they were supported in collection of information to elaborate project concepts, which were provided where possible and feedback meetings were held to discuss the follower projects in detail.

As result of the Market uptake programme, five Pre-Feasibility studies were elaborated. The following table shows the main impacts of the demo projects:

Country	Total invest	Gross energy production	Electricity production	Heat production	Self consumption	Net energy prod
	[EUR]	[MWh/a]	[MWhe/a]	[MWhth/a]	[MWh/a]	[MWh/a]
Argentina	7 700 000	31 000	14 000	14 000	8 000	23 000
Ethiopia	3 500 000	11 000	4 000	5 000	3 000	8 000
Ghana	5 400 000	24 000	10 000	11 000	9 000	15 000
Indonesia	10 200 000	39 000	17 000	18 000	9 000	30 000
South Africa	3 600 000	18 000	-	-	-	13 270
Sum	30 500 000	122 000	45 000	49 000	33 000	89 000

Figure 9: Main impacts from the demo projects

As social impact it was assessed that at least 35 jobs in total (as fulltime equivalent) can be created just with the operation of the 5 biogas plants. In addition, the greenhouse-gas balance for each demo project was assessed to show the positive environmental impacts:



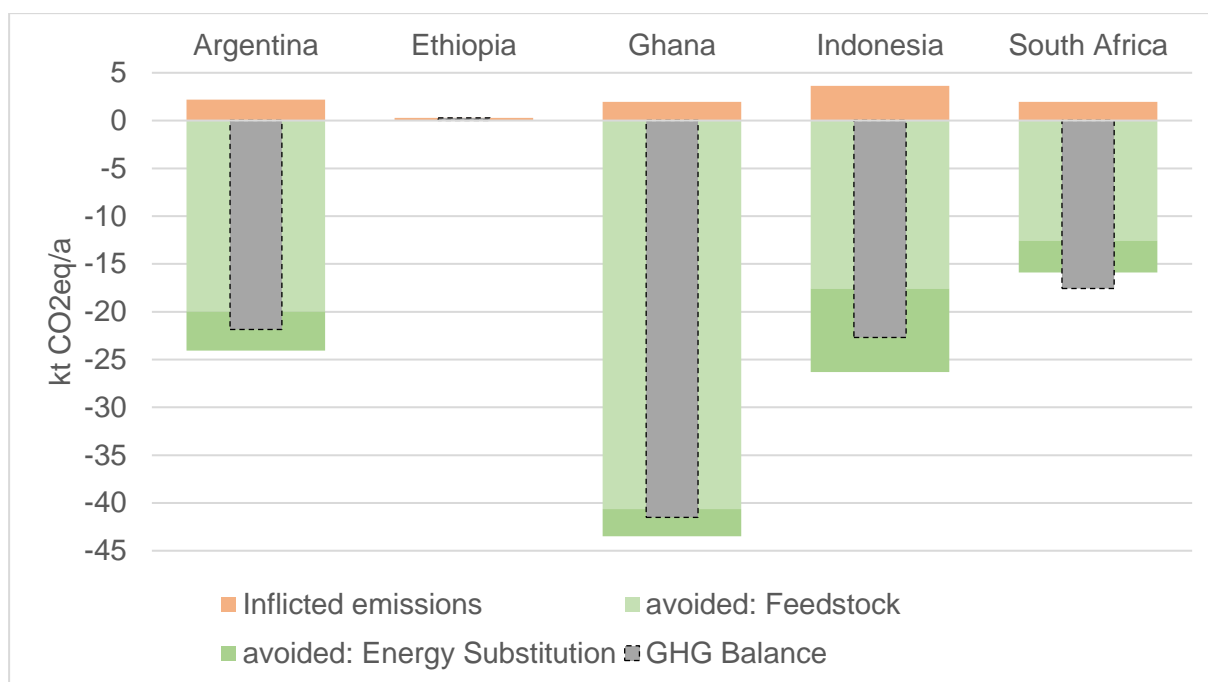


Figure 10: Greenhouse gas balance of the five demo projects (Negative CO₂-avoidance means that the respective amounts are reduced)

During the intensive, international collaboration with many different actors, project ideas and environments, some key insights were gained:

- Every biogas project is unique – the focus must be rather on finding solutions for individual use cases than on certain technologies
- Comprehensive analysis of project concepts is crucial for implementation
- Reliable and transparent cooperation between stakeholder helps to overcome previous mistakes/implementation challenges
- Cooperation with high-quality service- and technology provider significantly supports the project progress
- The market for renewable electricity is very challenging due to cheap (fossil) alternatives. Therefore, the substitution of expensive fuels such as diesel, LPG, etc., makes biogas more competitive.
- Biogas can offer multiple other valuable services/by-products than energy supply, e. g. organic fertilizer, ecosystem-services, waste management, etc. Markets for those services/side-products are not established and need dedicated support for their development.
- The social and environmental impacts of biogas projects are important to be considered/monetized.
- Standards need to be elaborated and implemented locally for a safe, reliable, efficient, and environmentally friendly biogas operation.
- The dedication, support and cooperation of political stakeholders is crucial for building a healthy biogas market



Demo project

supported by 

Lanseria BioGas Project

The biogas plant will utilize organic municipal waste and wastewater to produce biomethane and inject it into a local micro gas grid supplying sustainable, green gas to the surrounding areas.



Country: South Africa

Developing Company:  **CROSSP:INT**
FOREST INVESTMENTS

Biogas Utilization
Gas upgrading

Feedstock
Wastewater
Organic municipal waste

Electricity production (est.)
1.1 mio. m³ bio-methane per year

Operation
Local micro gas grid injection



DIBCOO is an international project supported by the Horizon 2020 programme of the European Commission and implemented by GIZ in cooperation with 12 experienced organizations across four continents with the overall objective to establish closer cooperation between European technology suppliers and biogas stakeholders in the partner countries Argentina, Ethiopia, Ghana, Indonesia, and South Africa. The activities focus on capacity building, support to establish favourable for cooperation in the biogas sector as well as the development of promising biogas projects. These biogas projects will lead to increased energy security, local added value, job creation and the share of renewable energy at local level while reducing greenhouse gas emissions. In each partner country one project idea was selected as demo case to be a show case about development in the biogas sector in its country.

 DIBCOO has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 857804.

Contact:
W: www.dibcoo.org
E: johannes.schorn@giz.de


Figure 11: Info sheet demo project South Africa

Demo project

supported by 

Biogas plant

The biogas plant will utilize residues of palm oil production to substitute fossil fuel for electricity production in a remote area while reducing the environmental impact of the residues.



Country: Indonesia

Developing Company: 

Biogas Utilization
Combined Heat-Power

Feedstock
Palm oil mill residues

Electricity production (est.)
24 GWh per year

Operation
Self Consumption




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Figure 12: Info sheet demo project Indonesia


Demo project

supported by 

Biogas production using water hyacinth (Echiornea crassippus) and other organic wastes

Water hyacinth will be collected from the water body of Lake Tana and utilized, together with agricultural residues - producing electricity paired with environmental protection measures. The project developer wants to save Lake Tana with collaborative efforts and sustainably use this Majestic renewable resource from Generation to Generation.



Country: Ethiopia 

Developing Company: Bahir Dar University and Lake Tana and other water bodies' protection and developmental Agency (Pw: Dr. Negga Tassele and Dr. Ayalew Wondol)
Project Team members: Dr. Solomon Libasa, Dr. Mesfin Ejiyu, Mr. Galu Alemayehu, Mr. Halimariam Zeydu, Mr. Fegedil Mohammed and Mr. Abi Solomon Germany

Biogas Utilization
Combined Heat-Power

Feedstock
Water hyacinth
Manure

Electricity production (est.)
13 GWh per year

Operation
Grid injection





Photo taken by Negga Tassele

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W: www.dibcoo.org
E: johannes.schorn@giz.de

Figure 13: Info sheet demo project Ethiopia

Demo project

supported by 

Let your waste enlighten you

This biogas project utilizes the organic fraction of municipal solid waste in co-digestion with thin stillage from a neighbouring bio-ethanol production



Country: Argentina

Developing Company: 

Biogas Utilization
Combined Heat-Power

Feedstock
Thin stillage
Organic fraction of municipal solid waste

Electricity production (est.)
17 GWh per year

Operation
Public grid injection



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Contact:
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E: johannes.schorn@giz.de

Figure 14: Info sheet demo project Argentina



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Demo project

supported by



BetaBiogasIntegratedSystem Project

The biogas plant will utilize the organic fraction of municipal solid waste together with municipal sludge. It helps to sustainably dispose municipal residues and produce renewable electricity.



Country: Ghana

Developing Company: 

<p>Biogas utilization Combined Heat-Power</p> <p>Feedstock Organic household waste Faecal sludge and septage</p> <p>Electricity production (est.) 24 GWh per year</p> <p>Operation Public grid injection</p>	 <p>Rev. Nana Kwasi Agyemang Honorary Director</p>  <p>Eng. Kwasi Agyemang General Manager</p>  <p>Dr. Richard Anshah Technical Director</p>  <p>Dr. Hilda Agyemang Finance Manager</p>
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 DIBCOO has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 857804.

www.dibcoo.org

Figure 15: Info sheet demo project Ghana

Main Deliverables of WP6:

- [D6.1 Technical concepts for demo case biogas projects](#)
- D6.2 Business models for demo case biogas projects
- D6.3 Impacts of demo case biogas projects
- D6.4 Report on Proofs of Commitment (CONFIDENTIAL)
- D6.5 Report on follower projects (CONFIDENTIAL)



5.6 Communication and Dissemination (WP 7)

The tasks under WP7 were mainly on ensuring that results and processes of the DiBiCoo project would be disseminated in wide circles and reach target audiences in importing and exporting countries. The deliverables and targets set for the tasks under this work package have all been successfully reached; from the number of publications that have been produced by partners and picked by media outlets across the world (30+ publications), the 31 presentations held virtually and on site between 2020-2022 to website traffic which exceeds over 50,000 in the last year alone and brought the overall members of DiBiCoo's social media channels to over 800. Furthermore, 13 press releases were published by partners throughout the past three years. In relation to dissemination work, different promotional items were produced such as flyers, posters, logos, banners and an animation video of the DiBiCoo project; in addition, several promotional items such as flyers and an animation video were produced and distributed specifically promoting the developed Biogas and Gasification Matchmaking Platform.

Part of the work intended to bring the DiBiCoo Project to the larger public in Europe as well as the 5 target countries and beyond. Thus, there has been a series of posts published on DiBiCoo's social media channels ([Twitter](#), [Facebook](#), [LinkedIn](#)) highlighting the project's major milestones, events, conferences, webinars as well as the developed Biogas and Gasification Matchmaking Platform. Though the milestones here have also been met – with an average of 2 posts per week – utilizing a professional (paid) analytics for all the project's social media handles at the onset of the project could have helped obtain better/finer results in the reach of the project online. In addition, the official DiBiCoo website receives all important information about the activities of the consortium. An overview of the [project results](#) with all reports, publications and press releases is provided. The website also informs about relevant [news](#), announces [upcoming events](#) and covers [past events](#).

Overall, the cooperation of partners was necessary for the success of dissemination and communications tasks and here a closer follow-up throughout the various stages of the project could have made a more detailed reporting on overall communications tasks and impact easier. This in turn could have better facilitated a timelier update of the project website with the latest news and publications featuring DiBiCoo.

- D7.1 Report on the website
- [D7.2 Project Video](#)
- [D7.3 Dissemination materials](#)
- [D7.4 DiBiCoo Poster](#)
- D7.5 Publications of the DiBiCoo project
- D7.6 Presentations of the DiBiCoo project
- D7.7 Report on the final conference
- D7.8 Report on social media
- [D7.9 Communications Plan](#)

With WP 7 DiBiCoo was reaching out to their target audience which includes several groups such as European biogas/biomethane/gasification technology providers, manufacturers and industry, European trade chambers, European biogas/biomethane/gasification (and renewable energy) associations, African, Asian and Latin American bio-waste producing industries (food, feed, biofuel processing industries etc.), source separated biowaste from house-holds, wastewater etc., African, Asian and Latin American project developers, biogas companies and planners, African, Asian and Latin American authorities and policy makers, Policy makers in Europe, financial organizations (including banks) in the target countries, but also in Europe and on an international level.



The specific objectives of Communication and Dissemination was, firstly aiming to establish a cooperation with the target groups/stakeholders. Also, DiBiCoo was effectively sharing information among interested parties and ensuring high level outreach within the community and maintain strong collaborative arrangements among the project key stakeholders. The communication efforts also ensured that the DiBiCoo vision, objectives, activities and results become as widely known and understood as possible and encourage an innovative take-up of the results by citizens and communities & by project implementers.



Figure 16: Logo of the Biogas and Gasification Matchmaking Platform



Figure 17: Poster to promote the Biogas and Gasification Matchmaking Platform



6. Lessons Learned & Outlook

Lessons learned

From all the activities implemented and the exchange with many international experts, the consortium and stakeholders, the following key lessons learned can be summarized:

- Streamlined and favorable regulatory frameworks and policies are elementary for successful market uptake. Still posing a major obstacle particularly for international projects.
- Biogas provides a versatile solution to a huge variety of pressing challenges. Lobbying for tailored solutions is key.
- Therefore, knowledge sharing, training and capacity building for different stakeholders from policy level to the technical level is essential in order to understand the manifold use cases of biogas/biomethane and gasification technologies beyond energy production.
- Speaking about failed project cases is highly beneficial and needs to be part of all learning activities.
- Matchmaking formats require trust, which -even as of today- requires culturally accepted forms of interaction. Virtual formats do not replace traditional B2B formats completely.
- External stressors, like for example the global pandemic, raising tensions on energy security in Europe, the accelerating economic crisis in Argentina, political unrest in Ethiopia, impact Small- and Medium Enterprises in Europe and developing/emerging market equally negative.
- SMEs tend to refocus currently on their “home-market” rather than implementing their expansion strategy.

Outlook

The impact of DiBiCoo beyond the project’s lifetime is ensured by various means:

As one of the core outcomes of the project, **the *Biogas and Gasification Matchmaking Platform* will remain freely available after the project’s end for all biogas stakeholders** and the platform will be maintained by the German Biogas Association (FvB). Trainings for (IT) personnel from FvB on the use and maintenance of the platform (see T4.6) as well as the outline of **a follow-up strategy for the continuous use of the tool exists** (see T4.4) and assures the successful transfer of the platform to FvB (incl. all access rights, crucial infrastructure, and codes). Thus, the sustainable development of the platform and the continuous use of it after DiBiCoo’s end is enabled. The development of fair guiding principles (FGP) for steering, registering, and communicating within the Biogas and Gasification Matchmaking Platform as a framework will ensure equal user benefits, non-discriminating accessibility, and visibility, as well as a long-term, positive user experience during and beyond the DiBiCoo project duration.

Furthermore, the **Biogas and Gasification Matchmaking platform was developed by using an open-source approach, thus making it available for further development and application by any interested party or stakeholder**. One of the advantages of the open-source approach for the Biogas and Gasification Matchmaking Platform lies in its general applicability to other renewable energy (RE) technologies besides biogas, such as e.g., hydropower, geothermal, heat pumps, solar energy, wind power, and solid biomass conversion. Details on how to use the developed platform for other RE are described in the Deliverable 4.5 Follow-up strategy for the extension of the tool for other RE technologies. The platform was promoted towards associations and networks of those RE technologies, thereby informing them about the potential to use the general infrastructure to set-up a Matchmaking Platform for their sectors.



Within the **DiBiCoo Capacity Building and Networking Program** several matchmaking events, (virtual) study tours, capacity building trainings, and business design trainings were conducted with participants from Europe and the five target countries. Hence, DiBiCoo successfully built and enhanced capacities and skills among biogas stakeholders especially in the five target countries, thereby supporting the further development of the sector.

The huge interest of stakeholders to join those events proofed the relevance of the topic and the importance to offer further trainings and events in the future.

As many of those events were recorded, **DiBiCoo has created a vast online biogas knowledge base still accessible and freely available** to all after the project's end. Stakeholders can find valuable videos, factsheets and reports developed within DiBiCoo on the DiBiCoo website and social media channels which will remain active also after the project's end and can inform themselves about existing good practices from other countries, learn more about relevant topics along the biogas value chain or explore the variety of European biogas technologies.

Another huge achievement of DiBiCoo was the successful completion of the **DiBiCoo Market Uptake Program**. The objective was to support the development of a healthy biogas sector in developing and emerging countries. To achieve this, **DiBiCoo has identified promising project opportunities**, from which five demo projects and 20 follower projects have been selected as the most promising ones. These projects were then intensively guided within DiBiCoo in order to serve as examples on how to set up reliable biogas projects in cooperation with European technology providers. Together with the project developers of the demo cases, technical concepts and business models were elaborated in form of a pre-feasibility study. Focus of these studies included the following: local market analysis, availability and quality of feedstock, technical concept of the biogas plant, financial performance, business case, risk analysis, and project implementation plan.

Although huge efforts were done by the DiBiCoo consortium, **those biogas project (ideas) will still need further attention in the future in order to reach project realization and investment**. It showed that every biogas project is unique and needs individual solutions and technologies. Furthermore, the market of renewable energy in emerging countries is still very challenging especially due to cheap fossil alternatives and the (policy) preference of other RE sources such as solar and wind over biogas. To tackle these obstacles, one of the aims of the DiBiCoo Market Uptake Program was to showcase that biogas can offer multiple other services and by-products such as organic fertilizer, ecosystem services and waste management in addition to energy. Yet, more support from, involvement of, and cooperation with policy makers in emerging countries is crucial to further develop a healthy biogas market in the five target countries where those biogas projects can be implemented. This directly relates to the DiBiCoo aim of developing more informed policy and financial frameworks at national, regional and/or local level. Through various activities, DiBiCoo worked continuously to achieve this goal. Policy-level stakeholders were actively engaged in various events such as Local Stakeholder Discussion Workshops, Matchmaking Events, Web seminars or the Final Conference which resulted in raising awareness for the potential of biogas in their countries. Despite all efforts taken by the DiBiCoo consortium, **more actions need to be taken in the future to streamline legislation and to set-up or improve (financial) support schemes for future biogas project development**.

DiBiCoo focused its activities mainly on developing the biogas markets in the five target countries of South Africa, Ethiopia, Ghana, Argentina, and Indonesia. Yet, **there are various other countries in Africa, (southeast) Asia and Latin America with high biogas potential that would benefit greatly from support projects such as DiBiCoo**. As a first step, DiBiCoo already actively approached multiplier organisations and biogas stakeholders in other countries to inform them about the project, its activities and results. In the future, more support for the development of the biogas sector in those countries is required and an exchange with the DiBiCoo target countries on lessons learned would surely be beneficial.



Annex

Results of DiBiCoo

- Virtual study tours / Anaerobic Digestions: [Virtual Study Tours: Anaerobic Digestion - YouTube](#)
- Virtual study tours / Biomass Gasification: [Virtual Study Tours: Biomass Gasification - YouTube](#)
- Web Seminars: [Web Seminars - DiBiCoo](#)
- Promotional videos
 - DiBiCoo project: [DiBiCoo Project - YouTube](#)
 - DiBiCoo Biogas and Gasification Matchmaking Platform / English: [DiBiCoo Online Digital Platform Explainer | English - YouTube](#)
 - DiBiCoo Biogas and Gasification Matchmaking Platform / Spanish: [DiBiCoo Online Digital Platform Explainer | Espanol - YouTube](#)
 - DiBiCoo Biogas and Gasification Matchmaking Platform / Amharic: [DiBiCoo Online Digital Platform Explainer | Amharic - YouTube](#)
 - DiBiCoo Biogas and Gasification Matchmaking Platform / Bahasa: [DiBiCoo Online Digital Platform Explainer | Bahasa Indonesia - YouTube](#)
- All public reports (after EU approval): [Project Results - DiBiCoo](#)



Ex-post Evaluation Questionnaire



Impact analysis of DiBiCoo activities

Welcome to the impact analysis of the Digital Global Biogas Cooperation (DiBiCoo)!

You are asked to fill in this questionnaire because you participated in one of the projects activities, are a biogas stakeholder, policy maker or working in the financial sector. With your answers you're significantly supporting DiBiCoo to measure the impact of the project.

Thank you for taking a couple of minutes (max. 10 minutes) to answer the following questions!

Purpose of the survey

- This survey is voluntary.
- This survey is not anonymous. It is maybe possible for the requesting party to establish a link between the participant and a completed questionnaire form.
- You may not enter any data in free text fields that allows conclusions to be drawn about natural persons. If you do so, your questionnaire form will be deleted and will not be evaluated.
- The data will not be passed on to any third parties.
- Please also observe the data protection provisions of askallo.



General questions

1. Which country are you from?

- Argentina
- Indonesia
- Ethiopia
- Ghana
- South Africa
- Europe; please specify:
- Other; please specify:

2. What kind of organization do you work for?

- University / Research / Institute
- Consultancy
- Energy agency
- Biogas / Industry association
- Development organization
- Policy maker / Public sector
- Financial Sector
- Technology provider / Biogas company from EU
- Plant operator / Project developer from an emerging market
- Other; please specify:

3. Did you take part in one or more of the following activities by DiBiCoo? Multiple answers possible.

- Demo case programme
- Follower case programme
- Study tour
- Web seminar
- Business design training
- Matchmaking event
- Local stakeholder workshop
- Capacity building/ trainings
- I did not take part yet, but I am interested in upcoming events.



- None
- Other; please specify:

4. What expectations did you have of the DiBiCoo activities you participated in? Multiple answers possible.

- Finding new partners from the biogas/gasification sector
- Growing the network
- Acquire competencies (technical)
- Acquire competencies (business model)
- Learn something about the biogas markets/ conditions in other countries
- Other; please specify:

5. Were your expectations of the DiBiCoo activities you participated in fulfilled?

- Yes, completely.
- More or less.
- Not so much.

6. Did you make contact through DiBiCoo with a new partner in the biogas/gasification sector?

- Yes, I made contact through DiBiCoo's Biogas and Gasification Matchmaking Platform.
- Yes, through a DiBiCoo activity.
- No, I didn't.

7. Did you know that DiBiCoo offers many valuable reports, studies, factsheets and videos on biogas/gasification technologies and implementation all around the world?

- Yes, I am aware and have used the resources already.
- No, I am not aware yet but am interested.
- I don't need these resources.



Policy makers / representatives of the financial sector

You are a policy maker or a representative of the financial sector:
Please rate your answer from **0 = nothing** to **10 = very much**.

8. How much did you learn about the **potentials and opportunities** of biogas/gasification projects as a waste treatment and energy generation technology in **emerging markets e.g. Argentina, Ethiopia, Ghana, Indonesia, South Africa**?

0
 1 = very little
 2
 3
 4
 5 = average
 6
 7
 8
 9
 10 = very much

9. How much did you learn about the importance of **international cooperation** in the field of biogas/gasification?

0
 1 = very little
 2
 3
 4
 5 = average
 6
 7
 8
 9
 10 = very much

Demo or follower case programme

You have participated in the DiBiCoo demo and/or follower case programme.
Please rate the following questions from **0 = nothing** to **10 = very much**.

10. Did this DiBiCoo activity help you to learn about **sustainable European biogas/gasification technologies**?

Yes
 No

11. How much did you learn about **technical aspects** of biogas projects (e.g. feedstock management, suitable technologies, application, digestate use)?

0
 1 = very little
 2
 3
 4
 5 = average
 6
 7
 8
 9
 10 = very much

12. How much did you learn about **business/financial aspects** of biogas projects (e.g. project development, business models, etc.)?

0
 1 = very little
 2
 3
 4
 5 = average
 6
 7
 8
 9
 10 = very much

13. How much did you learn about the **potential of biogas/gasification in your country**?

0
 1 = very little
 2
 3
 4
 5 = average
 6
 7
 8
 9
 10 = very much

14. How much did DiBiCoo help you in **identifying and overcoming obstacles** in biogas project development in your country?

0
 1 = very little
 2
 3
 4
 5 = average
 6
 7
 8
 9
 10 = very much



DiBiCoo events

You have participated in one or more DiBiCoo's events (e.g. study tour, matchmaking event, capacity building, web seminar, business design training, local stakeholder workshop).

Please rate the following questions from 1 = very little to 10 = very much. If you can't answer the question please choose 'not applicable'.

15. How much did you learn about the biogas/gasification sector in **Ghana**?

- not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

16. How much did you learn about the biogas/gasification sector in **Ethiopia**?

- not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

17. How much did you learn about the biogas/gasification sector in **Indonesia**?

- not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

18. How much did you learn about the biogas/gasification sector in **Argentina**?

- not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

19. How much did you learn about the biogas/gasification sector in **South Africa**?

- not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

20. How much did you learn about the biogas/gasification sector in **emerging markets** in general?

- not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

21. How much did you learn about European biogas/gasification **technologies**?



not applic.
 1 = very little
 2
 3
 4
 5 = average
 6
 7
 8
 9
 10 = very much

22. How much did you learn about the European biogas/gasification market **in general** (e.g. legal aspects, etc.)?

not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

23. How much did you learn about the biogas/gasification market **in your country**?

not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

24. How much did you learn about **technical aspects** of biogas/gasification projects (e.g. feedstock management, suitable technologies, application, digestate use)?

not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

25. How much did you learn about **business/financial** aspects of biogas/gasification projects (e.g. project development, business models, etc.)?

not applic.
 very little
 2
 3
 4
 average
 6
 7
 8
 9
 very much

Biogas and Gasification Matchmaking Platform

Link to the Biogas and Gasification Matchmaking Platform:
<https://www.biogasplatform.eu>

26. Are you using the Biogas and Gasification Matchmaking Platform of DiBiCoo already?

- Yes
- Not yet, but I'm interested in using it.
- No



Biogas and Gasification Matchmaking Platform

You are using the Biogas and Gasification Matchmaking Platform of DiBiCoo. Please answer the following questions:

27. How did you hear about the Biogas and Gasification Matchmaking Platform of DiBiCoo? Multiple answers possible.

- From my business partner
- During a DiBiCoo activity
- Online Promotion (Social Media, Websites etc.)
- Other; please specify:

28. What **features** of the platform are you currently using? Multiple answers possible.

- Just browsing
- I have created a company profile
- I have uploaded a business opportunity
- I have received valuable information on the knowledge platform
- I have already contacted a company or project developer
- I received matchmaking suggestions that suit my company's needs
- I have identified companies in the database that are interesting for my business.
- I came across business opportunities/technology provider that I like to follow up on
- Other; please specify:

29. How many **company profiles** did the Biogas and Gasification Matchmaking Platform show that fit your needs?

- 1 to 3
- 4 to 6
- 7 to 10
- more than 10
- none

30. How many **business opportunities** did the Biogas and Gasification Matchmaking Platform show that are interesting to you?

- 1 to 3
- 4 to 6
- 7 to 10



- more than 10
- none

31. How many of those companies / business opportunities did you contact?

- All
- Some
- None

32. Did the Biogas and Gasification Matchmaking Platform reduce your time needed to initiate and set up new projects in the biogas sector (e.g. identifying suitable business partners, learn about business opportunities in other countries etc.)?

- Yes
- No
- Not yet, but potentially in the future

33. Which feature or function did you miss on the Biogas and Gasification Matchmaking Platform? Leave your feedback or comments:

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58%

Biogas and Gasification Matchmaking Platform

You have selected that the Biogas and Gasification Matchmaking Platform has reduced your time needed for project development.

Please answer the following questions and indicate an estimated number according to the question.

34. Estimate the **time saved** (in %) by using the Biogas and Gasification Matchmaking Platform for **general project development** (i.e. to identify suitable business partners or to find new project opportunities) compared to your regular processes.

- not applicable
- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%



Biogas and Gasification Matchmaking Platform

You are not using the Biogas and Gasification Matchmaking Platform. Please tell us the reason:

35. Why are you not using the platform (yet)?

- I didn't know the platform existed
- I had a look at it, but it doesn't offer what I need
- I haven't had the time to look at it
- Other; please specify:

Results of your interaction with the DiBiCoo project

You have participated in some activities of DiBiCoo and/or used the Biogas and Gasification Matchmaking Platform. Please answer the following questions:

36. Did DiBiCoo activities and/or the Biogas and Gasification Matchmaking Platform help you to **reduce your costs** spent to identify European technologies or partners for your current or future biogas/gasification project(s)?

- Yes
- No
- Not yet, but potentially in the future

37. Did DiBiCoo activities and/or the Biogas and Gasification Matchmaking Platform help you to **reduce your time** spent to identify European technologies or partners for your current or future biogas/gasification project(s)?

- Yes
- No
- Not yet, but potentially in the future

38. Estimate the **costs reduced** (in %) through DiBiCoo activities and/or by using the Biogas and Gasification Matchmaking Platform in order to identify European technologies or partners for your project(s), compared to your regular processes.

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%

39. Estimate the **time saved** (in %) through DiBiCoo activities and/or by using the Biogas and Gasification Matchmaking Platform in order to identify European technologies or partners for your project(s), compared to your regular processes.

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%



40. Did DiBiCoo activities and/or the Biogas and Gasification Matchmaking Platform help you to **reduce the costs** to get first-hand information on biogas opportunities in the countries Argentina, Ethiopia, Ghana, Indonesia and/or South Africa?

- Yes
- No
- Not yet, but potentially in the future
- Not applicable (i.e. my company is not interested in those markets)

41. Did DiBiCoo activities and/or the Biogas and Gasification Matchmaking Platform help you to **reduce the time** to get first-hand information on biogas opportunities in the countries Argentina, Ethiopia, Ghana, Indonesia and/or South Africa?

- Yes
- No
- Not yet, but potentially in the future
- Not applicable (i.e. my company is not interested in those markets)

42. Estimate the **costs reduced** (in %) through DiBiCoo activities and/or by using the Biogas and Gasification Matchmaking Platform in order to get first-hand information on biogas opportunities in the countries Argentina, Ethiopia, Ghana, Indonesia and/or South Africa, compared to your regular processes.

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%

43. Estimate the **time saved** (in %) through DiBiCoo activities and/or by using the Biogas and Gasification Matchmaking Platform in order to get first-hand information on biogas opportunities in the countries Argentina, Ethiopia, Ghana, Indonesia and/or South Africa, compared to your regular processes.

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%



DiBiCoo Consortium Partners

Coordinator



Partners from exporting countries



Partners from importing countries





Digital global Biogas Cooperation

Project website: www.dibicoo.org

Project Coordinator contact
Dr. Johannes Anhorn
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
Wielinger Straße 52
82340 Feldafing, Germany
T +49 8157 938 0
F +49 8157 937 777
E johannes.anhorn@giz.de
I www.giz.de

Author

<NAME>, <PLACE>

Photo credits/sources

DiBiCoo consortium if not otherwise stated.
Staff member (<Consortium Member>/name) if not otherwise stated.

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<PLACE>, <YEAR>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 857804.

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