

**Senior Officials Working Group on
Bioeconomy**

Thematic Report

Elaborated by MINCYT- Argentina & France

V EU-CELAC Senior Officials Meeting

25-26 November, 2015

Brussels, Belgium

Contents

1	Objective of the thematic report.....	3
2	Bi-regional Cooperation Activities in the Bioeconomy area	4
2.1	Description of activities	6
	CELAC Bioeconomy Observatory or Technology Watch (BIO-CELAC)	6
	Synergies with other relevant initiatives	8
	Scientific areas/topics identification	9
3	Cooperation Actions and instruments: Road Map for implementation	10
4	Summary of EU-CELAC SOM decisions-making issues	12
5	Annex I: Participants at the Bioeconomy SOM WG activities.	13
6	Annex II: CELAC Bioeconomy Obervatory	17
7	Annex III: Policy Note	30
8	Annex IV: Bi Regional Topic Profile	35

1 Objective of the thematic report

- To inform about progress of activities on each Thematic Senior Officials Working Group (SOM WGs), underlining the strategic contribution to the JIRI Roadmap and the EU-CELAC Common Research Area
- To present concrete proposals to be implemented by the WGs in synergy with ongoing related projects and initiatives.
- To forward recommendations for SOM deliberations: i) Ideas to enhance biregional cooperation on R&I and future sustainability beyond lifetime of ongoing supporting projects and initiatives; ii) Reflections towards HORIZON 2020, focused on calls, participant rules & new instruments and opportunities.
- To define next Activity Plan 2016-2017, including concrete actions and resources to be committed.

2 Bi-regional Cooperation Activities in the Bioeconomy area

Regional approach: the CELAC potential

The Latin American and Caribbean region is particularly well placed to contribute and benefit from the emerging bioeconomy. Its extensive and diverse natural resources paired with a dynamic economy and growing human resources offer a good foundation for a robust future bioeconomy. The region has over 50% of its lands classified as having agricultural potential, with projections for 2050 highlighting that more than 300 million has could be brought into production, offering a basis for a strong bioeconomy contributing both to food security and energy objectives, and with important social opportunities. Biodiversity resources in the region are also significant, with some of the world's most important biodiversity hotspots.

These resources are already supporting an emerging biobased economy. There already are substantial inroads in the biofuels sector as well as in key technologies such as biotechnological applications and eco-intensification practices. Brazil practically dominates the international ethanol trade market and countries like Argentina are key players in the biodiesel markets. CELAC is the only region in the world that would be able to meet its energy requirements based on "bio" alternatives.

The region is also a prominent player in biotechnology exploitation. Ten of the 28 countries in the world that are using GM technologies in 2014, are in Latin-America, with four of them - Brazil, Argentina, Paraguay and Uruguay – accounting for more than a third of the world's GMO cropping area. Latin American countries are strong in some of the ecological intensification practices, especially "zero-tillage", with more than 45 million has, under this form of cultivation.

These resources and experiences highlight the importance of bioeconomy pathways for the CELAC region and the contributions that they can make both to global equilibriums and to regional challenges. It is clear that whatever future scenario one anticipates for the global bioeconomy, CELAC has a distinctive role to play. At the same time, the region has a challenge of its own. At the global level, the region has a critical role in contributing to global food, fiber and energy balances, while improving environmental sustainability. Within the region's boundaries, the emerging bioeconomy is a new source of opportunities for equitable growth through improved agricultural and biomass production.

The Bioeconomy concept

The bioeconomy can be defined as an economy in which consumption and production of goods and services are based on the direct use and sustainable transformation of biological resources and the productive use of wastes generated in processes of, transformation and consumption. The bioeconomy includes —conventional and modern— technologies that are used to transform biological resources, especially those related to biotechnology.

The incorporation of the concept within development and innovation policies originated in Europe during the nineties and consolidated in 2010 with the publication of the white paper "The European bioeconomy

in 2030" and the launching of the "European bioeconomy Strategy" in February 2012 under the title "Innovating for Sustainable growth: a bioeconomy for Europe". Over the last five years several non-European countries have also developed strategies aimed at the development of the bioeconomy, including the United States and Canada, and emerging countries such as China, India, South Africa, Russia and Malaysia.

Despite its potential for Latin America and the Caribbean, the concept of bioeconomy has received little attention in public policies in the countries of the region. The closer are strategies on bioenergy and biotechnology in Brazil and Argentina.

At the political level, the LAC bioeconomy concept has found increasing recognition and active support through the EU-CELAC Bi-regional Summit and subsequent Senior Officials Meetings on Science and Technology that resulted in the adoption of the Bioeconomy as one of the proposed Joint Initiatives for Research & Innovation (JIRI), on which to implement the bi-regional S&T cooperation.

To support the SOM strategic initiative, the biregional ALCUE NET¹ project helped to establish an EU- CELAC platform as the basis for a political and institutional framework that encourages sustainable (non-carbon) and competitive development and strengthens the knowledge based bioeconomy concept in the CELAC region.

The Bioeconomy SOM Working Group

The specific objectives of the Bioeconomy working group are to contribute to the policy dialogue between the two regions that is aimed at advancing the bioeconomy as a working model for S&T cooperation. As such the Working Group can be seen as an organizational model and/or biregional thematic network that acts between scientific/technical/organizational projects on the one hand, and country representation national policy and decision making, on the other hand.

As such, the working group targets the integration or association of funded CELAC and EU research teams with national and or regional policy agendas. The WG defines and prioritizes scientific research areas for Joint biregional research and innovation projects in H2020 aligned to EU programs, involving CELAC countries as a target region and also with the aim to explore joint calls implementation (hence via ERA net LAC).

The WG (taking results from past and ongoing pertinent R+D+I projects) also suggest and develops proposals regarding Capacity Development and to Raise Awareness, forming essential parts of bioeconomy monitoring through the establishment of a CELAC Observatory (technology watch) on the Bioeconomy.

Ten (10) Bioeconomy Senior Officials Meetings were held since June 2011 until October 2015 (*see participants list in Annex I*)

¹ ALCUE NET is a four and a half year project funded by the 7th Framework Programme of the European Union.

2.1 Description of activities

The following report intends to present the progress made by the Bioeconomy SOM Working Group since the last SOM held in San Jose, Costa Rica on April 2014.

Two bioregional workshops have been organized in United Kingdom in the framework of the 11th International Conference on Renewable Resources & Biorefineries (RRB11) and in Chile together with the Economic Commission for Latin America and the Caribbean (ECLAC); the project document on the CELAC Bioeconomy Observatory has been finalized and a more detailed concept of a Bioeconomy observatory is being analyzed and discussed w key potential partners; new scientific bi regional cooperation topics were identified and old priority topics were reformulated and updated.

Synergies with the European Observatory organized by the Bioeconomy Information System and Observatory Project (BISO) were generated. A joint event was organized with CEPAL/ECLAC that aimed at strengthening the awareness raising in the region, both at the private and public sector levels.

The main activities are described below.

CELAC Bioeconomy Observatory or Technology Watch (BIO-CELAC)

By recommendation of the Bioeconomy SOM Working Group, a *project observatory document* was elaborated, in the framework of the ALCUE NET project, with the intention to prepare the ground for the future CELAC Bioeconomy Observatory. The document informs the design of the structure and monitoring activities, which will be undertaken within the CELAC observatory. *See the complete document in annex II.*

The document was elaborated to inform and to put for consideration of the CELAC representatives during the EU-CELAC Senior Officials Meeting on November 2015 in Brussels.

The creation of an Observatory will intend to develop a regional strategy with the aim to emphasize the importance of the bioeconomy for CELAC in addressing major societal and economic challenges and to create a more favorable environment for its realization as well as to support the monitoring of relevant indicators and trends and help anticipate new and emerging issues delineating future opportunities.

In this context, the observatory, will be an instrument to:

- Promote Bioeconomy in CELAC by facilitating its knowledge to the general public and stakeholders
- Provide specific information to those actors who drive bioeconomy development within the region
- Establish a one-point entry to the CELAC Bioeconomy and EU CELAC cooperation
- Provide information support for decision making and policy development
- Promote business development and support investment decisions in the related sectors
- Provide a promotion tool to increase the levels of social acceptance of the Bioeconomy principles, sectors and products
- Offer a platform for EU-CELAC Bioeconomy stakeholders to exchange information

By the establishment of this Observatory, it will aim at stimulating the creation of a community of agents related to the development of Bioeconomy in the region and position this community in other regions.

The platform will cover different types of instruments, ranging from information desks, news services, databases, to scientific, market and political support centers on the Bioeconomy framework. The observatory also will allow countries to create their own Bioeconomy country profile to be able to communicate and collaborate with others countries around the world more effectively.

Observatory main actions

- To generate and collect systematically specific information related to Bioeconomy
- To Support policy making
- To Plan, develop & monitor bi-regional cooperation in Bioeconomy
- To establish mechanisms to facilitate access & up-dating of information of strategic value to the Bioeconomy
- To serve as a Link to already sources of qualitative-quantitative knowledge resources on selected topics
- To create an inventory of Bioeconomy related EC co-funded RTD bi-regional projects
- To monitor specific indicators of Bioeconomy in CELAC and compare the performance of this sector with others located
- To provide information on access to Bioeconomy “success-stories” in the EU and CELAC regions
- To provide information on access to CELAC and EU key Bioeconomy stakeholder profiles
- To generate new information on themes identified as of strategic value

Coverage areas

The initial coverage of the observatory will focus on three bioeconomy pathways identified as bi regional interest by the EU-CELAC Senior Officials Working Group on Bioeconomy: (i) eco-intensification, (ii) biotechnology products and processes, and (iii) biorefineries and bio-products.

The international dimension: EU-CELAC

Beside of the specific CELAC approach, the observatory will also be partly addressed with collection of EU data and information on bioeconomy. In this frame, the Bioeconomy Observatory will also work in synergy with BISO Project (Bioeconomy Information System and Observatory Project), the Research and Innovation (R&I) Observatory of JRC, which also acts as information system, and the EU-CELAC policy dialogue on C&T, particularly, in the framework of the Senior Officials Meetings.

Observatory Structure

A first set-up will seek to cover, at the general bioeconomy level, the following fields & topics:

- Three pillars structure:
 - Research pillar Section: will include information on investments in Research, Innovation and Skills
 - Policy pillar Section: will offers a comprehensive policy mapping of Bioeconomy-related policy initiatives and will reinforce policy interaction and stakeholder engagement
 - Markets pillar Section: will provide data on Bioeconomy markets in order to reach the enhancement of markets and competitiveness in bioeconomy

- Capacity Development and Raise Awareness Section will provide raising awareness initiatives about the bioeconomy potential for the region and capacity development for the development of the bioeconomy in the region, including human resources development and on line courses and training
- Country Section will consist in a “who is who” specific section in the CELAC bioeconomy map and will incorporate success stories
- Bioeconomy R&I Community of stakeholders will be an intranet platform section under the observatory for professional networking and sharing of information and knowledge in Bioeconomy, dedicated to the creation of a this community of stakeholders.
- Other sections: News, Events, Link of interest, funding opportunities, case of studies

Implementation in the framework of ALCUE NET Project

The Project supports the Policy Dialogue process on STI to consolidate EU-CELAC cooperation by contributing to the implementation of the Joint Initiative for Research and Innovation in the Senior Officials Meetings and contributes to the definition and implementation of joint strategic agendas for research, development and innovation on the following priorities: Energy; Information and Communications Technology; Bioeconomy; Biodiversity & Climate change.

For the purpose of ALCUE NET project, the idea of creating an observatory, as a tool to support the development of the CELAC Bioeconomy, is taken to be that of an instrument aimed at the systematic and “permanent” development of specific information to support policy making, program development and monitoring of the different dimensions of bi-regional cooperation on the JIRI priority themes, by focusing on Bioeconomy.

In this sense ALCUE NET project has a specific task to develop a Bioeconomy Observatory in close collaboration with existing regional and national information systems to regularly assess the progress and impact of the bioeconomy and develop forward-looking and modeling tools for cooperation activities especially in but not restricted to R&I.

The strategy for instance, will seek to optimize synergies by investing ALCUE NET efforts and resources in filling the “information gaps” and building the information shell through which all relevant information can be easily accessed by interested parties.

Contact management information (Project Team)

- Ministry of Science, Technology and Productive Innovation (MINCYT) Argentina
- Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)
France

Synergies with other relevant initiatives

Synergies with other relevant initiatives: Synergies with the European Observatory setting up by the Bioeconomy Information System and Observatory Project (BISO). A jointly event was organized with

CEPAL/ECLAC². In this later context a number of key issues have been identified for future work in the development of the LAC bioeconomy in cooperation with Europe. These include, among others the need for (a) adequate regulatory frameworks, in fields such as bio-safety/bio-risk regulation, biodiversity protection, access to genetic resources, regulation of GMOs, protection of property rights and patenting requirements. (b) articulation of the policy initiatives already in place, especially regarding R&D and innovation policies in fields such as clean non-fossil energy, biotechnology developments in agriculture, human and animal health, non-carbon agricultural development, payments for ecosystem services, and improvements in the efficiency and sustainability of the food system. (c) better coordination of the technical and technological capacities that already exist in the countries; (d) policies for bioeconomy SMEs aimed at creating capacities, facilitating entry to concentrated markets and providing adequate financing for innovative start-ups. *(To see the Policy Note see annex III).*

Scientific areas/topics identification

Identification of research bi regional topics and preparation of profiles for consideration to the Horizon 2020 program and to the 2nd Joint Transnational Call in ERANet-LAC project in the following thematic fields:

BIOTECHNOLOGY

- Energetic crops: genetic improvement and efficient use of resources
- Artificial seeds for wood production
- Design and screening for multipurpose crops

BIOREFINARY

- Fractionation and valorisation of residual biomass to intermediate and/or final high added value bioproducts
- Lignocellulosic biorefinery platform: production of high-value bio-based products
- Precursors development for advanced materials from biomass

For a description of topics see annex IV.

The following topics on Biorefinery were selected during the Funding Agencies Meeting held in Buenos Aires on September 2015 for recommendation for the ERANet-LAC 2nd Joint Cal:

- Fractionation and valorisation of residual biomass to intermediate and/or final high added value bioproducts
- Lignocellulosic biorefinery platform: production of high-value bio-based products

² On 7 & 8 October the International Conference Latin America and Caribbean Bioeconomy 2015 was held in ECLAC (Santiago, Chile), organized jointly by ECLAC and ALCUE-NET. The conference had participants from public, private and science and technology institutions in Argentina (MINCYT and Province of Córdoba), Brazil (CGEE), Chile (INIA, UFRO and CORFO), Colombia (CIAT, Javeriana University, Suricata S.A), Costa Rica (MICITT), Cuba (CIGB), Mexico (UNAM) and Uruguay (Directorate of Planning / National Office of Budget and Planning). There was also participation of experts involved in bioeconomy initiatives in Spain (INIA), France, Portugal, Germany, Austria, Finland, Belgium, and South Africa.

3 Cooperation Actions and instruments: Road Map for implementation

Activity	Concrete Actions	Work progress	Instruments & resources	Indicators + Impact	Timeline
Official nomination of EU-CELAC representatives to join the SOM WG	Promotion and call for participants to be involved in the SOM WG on Bioeconomy	Ongoing	At EU-CELAC SOM meeting	CELAC and EU countries will join the WG	Before and during the EU-CELAC SOM 2015
Synergies with other relevant initiatives	Establish dialogue with thematic initiatives	Ongoing Meetings with EU Observatory coordinator/ with CEPAL representatives/ Others: ERANET Co fund projects/JPI/Global Alliances	email, VC, calls, with Initiatives coordinators	Input of new initiatives on identified needs in both regions	First half of 2016
Support by the Cross cutting issues SOM WG	Establish dialogue with the sub group EU-CELAC collaboration on International Early Stage Researchers Career Development		email, VC calls with WG coordinator	Identification of career development needs in both regions and support by the Cross Cutting WG	First half of 2016
Establishment of the CELAC observatory	Elaboration of the project observatory document	Document presented at EU-CELAC SOM 2015	Preparation of draft document describing objectives, action and structure of the observatory	Observatory Set up	ongoing
	Promoting CELAC observatory among	Presented at EU CELAC	Distribution of	Interest countries	First half of

	Senior Officials	SOM 2015	observatory document and country profile templates to be completed by interest countries	nominates national representatives/ Country profiles completed	2016
Implementation of the CELAC Observatory	Create the CELAC Observatory portal	ongoing	Observatory implement by MINCYT as ALCUE NET coordinator		Implementation by mid-2016.
	Generate country sections		Discussion with country representatives nominated	Country profile sections completed	Implementation by mid-2016.
Joint Call under ERANet-LAC Project	Identification of common topics for the 2 nd Joint Call	Submission of topics to the ERANET LAC (2015 – 2016 joint call)	ALCUE NET/ ERANet-LAC projects	EULAC research projects funded	2016
Bi regional areas and Topics for H2020 and joint calls	Identification of common research and innovation areas and topics during ALCUE NET meetings and back to back other related initiatives	Revision of identified topics	ALCUE NET bi regional meetings on Bioeconomy	New calls launched targeting CELAC region	End-2016
Bi Regional collaborative projects	Identification of calls under H2020 to develop bi regional projects/consortia building	Calls already identified	ALCUE NET bi regional meetings on Bioeconomy	New projects under H2020	End-2016
Pilot programs	Explore the possibility to combine bioeconomy related project and programs among countries (co funded)		ALCUE NET bi regional meetings on Bioeconomy	Pilot programs launched	End-2016
Upcoming Events	Bi Regional Workshop on Bioeconomy: Official launching of the observatory & elaboration of strategic bi regional Agenda. Argentina (TBC)		ALCUE NET & SOM WG	Observatory launched & Strategic Agenda circulated	Mid-2016
	Working group meeting at the occasion of the Colombian Bioeconomy Forum in Colombia (TBC)		ALCUE NET & SOM WG		Mid-2016

4 Summary of EU-CELAC SOM decisions-making issues

- *To forward recommendations for SOM deliberations: i) Ideas to enhance biregional cooperation on R&I and future sustainability beyond lifetime of ongoing supporting projects and initiatives; ii) Reflections towards HORIZON 2020, focused on calls, participant rules & new instruments and opportunities.*
- Official nomination of EU-CELAC representatives to be included on the Bioeconomy Working Group
- Establish dialogue with the EU-CELAC SOM cross cutting working group to inform on the priorities the Bioeconomy WG has identified for the observatory activities regarding Capacity Building and Raise awareness, in order to ask for support to priority setting in definition of schemes for joint use of infrastructure and pilot schemes for early career researchers mobility support.

CELAC OBSERVATORY

- Bioeconomy Observatory document analyzed and supported by interest countries who wish to have a specific country section under the CELAC observatory.
- Promote the development of the CELAC Observatory by expanding to other CELAC countries. Nomination of national representatives.
- Selection of main institutions (National/Regional/International) collaborating on each observatory pillar (Research, Policy, Market)
- County commitments for future funding requirements beyond ALCUE NET project for the observatory sustainability.

COOPERATION OPPORTUNITIES

- It is highlighted that cooperation opportunities should focus specifically on the main following issues identified in LAC for cooperation with Europe: (a) adequate regulatory frameworks, in fields such as bio-safety/bio-risk regulation, biodiversity protection, access to genetic resources, regulation of GMOs, protection of property rights and patenting requirements. (b) articulation of the policy initiatives already in place, especially regarding R&D and innovation policies in fields such as clean non-fossil energy, biotechnology developments in agriculture, human and animal health, non-carbon agricultural development, payments for ecosystem services, and improvements in the efficiency and sustainability of the food system. (c) better coordination of the technical and technological capacities that already exist in the countries; (d) policies for bioeconomy SMEs aimed at creating capacities, facilitating entry to concentrated markets and providing adequate financing for innovative start-ups.

TOPIC SELECTION

- Topics proposal targeting CELAC countries for consideration to H2020 upcoming Working Program/develop Joint Call among specific interest countries.
- Promoting common priority topics identified to develop collaborative projects and integrating initiatives

5 Annex I: Participants at the Bioeconomy SOM WG activities.

SOM WG official representatives

CELAC members	EU members
Argentina - MINCYT	France – MENESR / CIRAD
Bolivia - MINEDU	Belgium- Universiteit Gent/ VITO
Mexico - CONACYT	Finland- AKA /VTT
Chile - CONICYT	Germany - BMBF
Costa Rica - MICITT	Spain - MINECO
Panama - SENACYT	Malta - MCST
Peru - CONCYTEC	Austria – BMWFV
Guatemala - CONCYT/SENACYT	Holland- WUR
Nicaragua - CONICYT	
Uruguay – MEC	
Colombia- COLCIENCIAS	
Trinidad and Tobago- UWI	European Commission

Participants that contribute to the SOM WG activities

Last Name	Name	Institution	Country
Ábrego	Julio	IDIAP	Panama
Alemán	Freddy	Universidad Agraria de Nicaragua	Nicaragua
Arango	Jimena	ENLACE	Belgium
Araujo	Sara	COLCIENCIAS	Colombia
Arguello	Silvia	MICITT	Costa Rica
Arias	Esther	INTER-AMERICAN DEVELOPMENT BANK	BID
Arias Dipré	Juan José	MESCYT	Dominican Rep
Ayciriex	Luciana	Ministry of Science, Technology and Productive Innovation	Argentina
Bacchetta	Loretta	ENEA	Italy
Baena	Sandra	Pontificia Universidad Javeriana	Colombia
Ballesteros	Mercedes	CIEMAT	Spain
Barbas	Julio	MINECO	Spain
Barbosa Lima	María	VTT	Finland
Berg	Alex	Concepcion University	Chile
Bonfim	Jose	FCT	Portugal
Borio	Daniel	Planta Piloto de Ingeniería Química (PlAPIQui)	Argentina
Braconnier	Serge	CIRAD	France
Broce	Kathia	ARAP Autoridad de Recursos Acuáticos de Panamá	Panama
Bruins	Marieke	WAGENINGEN UNIVERSITY	Netherlands
Buritica Ospina	Simón	COLCIENCIAS	Colombia
Bursens	Sylvia	UGHENT	Belgium

Caballero	Catherina	SENACYT	Panama
Cabrera	Lorena	SENACYT	Guatemala
Cano	Carlos	Banco de la República – BANREP	Colombia
Capdevielle	Fabián	INIA	Uruguay
Castagnaro	Atilio	Estación Experimental Agroindustrial Obispo Colombres	Argentina
Castellanos	Lucia	PROIMI	Argentina
Cespedes	Mauricio	Ministerio de Educación	Bolivia
Chavarriaga	Paul	CIAT	Colombia
Clark	James	University of York	United Kingdom
Climent	Juan	Ministerio de Economía y Competitividad	Spain
Corley	Esteban	Ministry of Science, Technology and Productive Innovation	Argentina
Costa	Ramiro	Bolsa de Cereales	Argentina
Da Silva	Carolina	Ministerio de Industria, Energía y Minería	Uruguay
De Courville	André	CIRAD, Montpellier	France
Delgado	Maria José	INIA	Spain
Deroy	Xavier	Neoma Business School	France
Diels	Ludo	VITO	Belgium
Duarte	Luis	LNEG	Portugal
Durán Vila	Nuria	INIA	Spain
Estrella	Jaime	SENACYT	Panama
Fallot	Abigail	CIRAD	France
Farias	Andrea	CINVESTAV	Mexico
Flavio	Avila	EMBRAPA/ CIAT	Colombia
Galeffi	Patrizia	ENEA	Italy
Galvez	Amanda	UNAM	Mexico
Gamiette	Franciane	GAGE	Guadeloupe
Garayoa	Ramon	DBA Center - ETSEA	Spain
Garcia	Jesus	CENIPALMA	Colombia
Gerschenson	Lia	Univerity of Buenos Aires	Argentina
Gidekel	Manuel	Universidad Adolfo Ibáñez	Chile
Giron	Olivier	Ministry of Higher Education and Research	France
Godínez	Guillermo	Secretaría Nacional de Ciencia y Tecnología CONCYT/SENACYT	Guatemala
Gonzales	Carolina	CIAT	Colombia
Grasso	Daniel	INTA	Argentina
Guasch	Luis	MINECO	Spain
Guerrero M.	Claudia	SENACYT	Panama
Gutierrez	Arnulfo	IDIAP	Panama
Henry	Guy	CIRAD / International Center for Tropical Agriculture - CIAT	France
Hernandez	Nayeli	UNAM	Mexico
Herrero Davila	Lorenzo	University of York	United Kingdom
Hilbert	Jorge	INTA	Argentina
Hodson	Elizabeth	Pontificia Universidad Javeriana	Colombia
Hughes	David	Traulenco	Argentina
Huttunen	Markku	University of Eastern Finland	Finland
Ingelbrecht	Ivan	Universiteit Gent	Belgium
Jablonowski	Nicolai	Jülich Research Center (FZJ)	Germany

Jager	Matthias	Biodiversity International	Germany
Jeison	David	Universidad de la Frontera	Chile
Karosuo	Moira	Consejo Nacional de Ciencia y Tecnología	Mexico
Kuhn	Arnd	JULICH	Germany
Langeveld	Hans	BIOMASSRESEARCH	Netherlands
Lapeyrie	Frédéric	Ministry of Higher Education and Research	France
Lavell	Patrick	Institut de Recherche pour le Developpement– IRD	France
Lentini	Zaida	ICESI University	Colombia
Linders	Hubert	Consumer Int. Chile	Chile
Llamas	Bernardo	Algaenergy	Spain
Marques	Nicolas	Ministry of Higher Education and Research	France
Martin	Mariano	UNIVERSITY OF SALAMANCA	Spain
Martinez	Guadalupe	CONICYT	Nicaragua
Martins	Maria Joao	Ambisys, Grupo Monte Adriano	Portugal
Matzer	Clemens	Ecosocial Forum	Austria
Mentaberry	Alejandro	UBA/ INDEAR	Argentina
Menvielle	Agueda	Ministry of Science, Technology and Productive Innovation	Argentina
Mesonero	María	CONICYT	Chile
Minguez	Inés	Universidad Politécnica de Madrid (ETSI Agrónomos)	Spain
Montero	Andrés	INIA	Spain
Montoya	Guillermo	ICESI University	Colombia
Moretti	Enrique	Laboratorios BIAGRO	Argentina
Mungia	Viviana	Pontificia Universidad Católica del Perú	Peru
Musselli	Veronica	INIA	Uruguay
Navia	Rodrigo	Universidad de la Frontera	Chile
Nendel	Claas	Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF)	Germany
Nunes	Maria	University of Aveiro	Portugal
O'Donohue	Michael	INSA Toulouse	France
Onoyoma	Marcia	EMBRAPA AgroEnergy	Brazil
Orozco	Carlos	CIRAD/ICESI University	Colombia
Osorio	Carlos	FEDEPALMA	Colombia
Pareda	Selva	PLAPIQUI	Argentina
Paula Oliveira	Antonio	Centre for Strategic Studies and Management	Brazil
Peresin	Soledad	Technical Research Centre of Finland	Finland
Perez-Lopez	Clara	Ministry of Higher Education and Research	France
Pioch	Daniel	CIRAD	France
Pittaluga	Lucía	MEC	Uruguay
Plan	Damien	EC DIRECTORATE-GENERAL JRC	EU
Pralong	Hector	MINCYT	Argentina
Quirós	Roberto	School of Industrial Engineering	Costa Rica
Ramirez	María	CONICYT	Chile
Ramos	Luiz	Parana University	Brazil
Reis	Alberto	LNEG	Portugal
Revel	Clara	CIRAD	France
Riegelhaupt	Enrique	UNAM	Mexico
Rocha	Pedro	IICA	Costa Rica

Rocha	Priscila	MCTI	Brazil
Rodrigues	Alírio	Faculty of Engineering, Oporto University	Portugal
Rodríguez	Mauricio	COLCIENCIAS	Colombia
Rodríguez	Adrian	CEPAL	Chile
Rodriguez-Peña	Angeles	Ministry of Research and Innovation	Spain
Rogulski	Andrzej	Ministry of Higher Education and Research	France
Rojas	Orlando	Aalto University, School of Chemical Technology	Finland
Rojas Jiménez	Keilor	Ministerio de Ciencia y Tecnología, Costa Rica	Costa Rica
Rojas Jiménez	Giovanni	ICESI University	Colombia
Romero	Hernan	CENIPALMA	Colombia
Rul	Sebastian	OSEO	France
Sadres	Marcelo	Alcoholes del Uruguay S.A.	Uruguay
Sámamo Rocha	Héctor	Consejo Nacional de Ciencia y Tecnología	Mexico
Sánchez	Myriam	International Center for Tropical Agriculture – CIAT	Colombia
Sánchez	Roberto	Viceministerio de Ciencia y Tecnología Ministerio de Educación	Bolivia
Sanders	Johan	Wageningen UR (University & Research centre)	Netherlands
Schurr	Ulrich	Centro de Investigaciones de Jülich (Plant Science)	Germany
Serrano	Joaquin	Ministry of Research and Innovation	Spain
Silenzi	Mónica	Ministry of Science, Technology and Productive Innovation	Argentina
Silva	Tarsilia	Universidad Centroamericana	Nicaragua
Slusarczyk	Heike	Bioeconomy Science Center BioSC	Germany
Spiteri	Diana	Malta Council for Science and Technology	Malta
Splett-Rudolph	Stephanie	DLR	Germany
Tinjacá	Claudia	COLCIENCIAS	Colombia
Tinto	Winston	CSF	Barbados
Torres	Danielle	EMBRAPA	Brazil
Trannois	Nathalie	OSEO	France
Trejos	Rafael	IICA	Costa Rica
Trigo	Eduardo	Ministry of Science, Technology and Productive Innovation	Argentina
Undurraga	Catalina	CONICYT	Chile
Van Hyfte	Cyndy	CIRAD	France
Van Liempt	Henk	Federal Ministry of Education and Research	Germany
Verdelho	Vitor	Algafuel/NECTON	Portugal
Vihma-Purovaara	Tiina	MINEDU	Finland
Villarreal	Federico	MINCYT	Argentina
Warde	Cardinal	Caribbean Science Foundation	Barbados
Welin	Bjorn	EEAOC	Argentina
Winston	Tinto	Caribbean Science Foundation	Barbados
Wint	Sandra	Caribbean Science Foundation	Barbados
Wurbs	Angelika	Leibniz-Instituto ZALF	Germany

6 Annex II: CELAC Bioeconomy Observatory

CELAC Bioeconomy Observatory



Bioeconomy Observatory

In response to the potential of the emerging Bioeconomy for the Latin American and Caribbean region³, the present document intended to prepare the ground for the future CELAC Bioeconomy Observatory. The document informs the design of the structure and monitoring activities, which will be undertaken within the CELAC observatory.

The first steps to set up the observatory will be supported by the bi regional project ALCUE NET⁴, coordinated by Argentina.

The document was elaborated to inform and to put for consideration of the CELAC representatives during the EU-CELAC Senior Officials Meeting on November 2015 in Brussels.

The Bioeconomy concept

The bioeconomy can be defined as an economy in which consumption and production of goods and services are based on the direct use and sustainable transformation of biological resources and the productive use of wastes generated in processes of, transformation and consumption.

The bioeconomy includes —conventional and modern— technologies that are used to transform biological resources, especially those related to biotechnology.

The incorporation of the concept within development and innovation policies originated in Europe during the nineties and consolidated in 2010 with the publication of the white paper "The European bioeconomy in 2030" and the launching of the "European bioeconomy Strategy" in February 2012 under the title "Innovating for Sustainable growth: a bioeconomy for Europe". Over the last five years several non-European countries have also developed strategies aimed at the development of the bioeconomy, including the United States and Canada, and emerging countries such as China, India, South Africa, Russia and Malaysia.

Despite its potential for Latin America and the Caribbean, the concept of bioeconomy has received little attention in public policies in the countries of the region. The closer are strategies on bioenergy and biotechnology in Brazil and Argentina.

Regional approach: the CELAC potential

³ The Latin America and Caribbean region will be referred as "Community of Latin American and Caribbean States" (CELAC). The CELAC (Spanish: Comunidad de Estados Latinoamericanos y Caribeños) is a regional bloc of Latin American and Caribbean states thought out on February 23, 2010, at the Rio Group–Caribbean Community Unity Summit, and created on December 3, 2011, in Caracas, Venezuela, with the signature of The Declaration of Caracas. It consists of 33 sovereign countries in the Americas.

⁴ ALCUE NET: "Latin America, Caribbean and European Union Network on Research and Innovation": A four and a half year project funded by the 7th Framework Programme of the European Union.

The Latin American and Caribbean region is particularly well placed to contribute and benefit from the emerging bioeconomy. Its extensive and diverse natural resources paired with a dynamic economy and growing human resources offer a good foundation for a robust future bioeconomy. The region has over 50% of its lands classified as having agricultural potential, with projections for 2050 highlighting that more than 300 million has could be brought into production, offering a basis for a strong bioeconomy contributing both to food security and energy objectives, and with important social opportunities. Biodiversity resources in the region are also significant, with some of the world's most important biodiversity hotspots.

These resources are already supporting an emerging biobased economy. There already are substantial inroads in the biofuels sector as well as in key technologies such as biotechnological applications and eco-intensification practices. Brazil practically dominates the international ethanol trade market and countries like Argentina are key players in the biodiesel markets. CELAC is the only region in the world that would be able to meet its energy requirements based on "bio" alternatives.

The region is also a prominent player in biotechnology exploitation. Ten of the 28 countries in the world that are using GM technologies in 2014, are in Latin-America, with four of them - Brazil, Argentina, Paraguay and Uruguay – accounting for more than a third of the world's GMO cropping area. Latin American countries are strong in some of the ecological intensification practices, especially "zero-tillage", with more than 45 million has, under this form of cultivation.

These resources and experiences highlight the importance of bioeconomy pathways for the CELAC region and the contributions that they can make both to global equilibriums and to regional challenges. It is clear that whatever future scenario one anticipates for the global bioeconomy, CELAC has a distinctive role to play. At the same time, the region has a challenge of its own. At the global level, the region has a critical role in contributing to global food, fiber and energy balances, while improving environmental sustainability. Within the region's boundaries, the emerging bioeconomy is a new source of opportunities for equitable growth through improved agricultural and biomass production.

Setting the scene: The creation of an observatory

The way to observe and monitor the Bioeconomy as well as trends in the CELAC region is still fragmented.

The creation of an Observatory will intend to develop a regional strategy with the aim to emphasize the importance of the bioeconomy for CELAC in addressing major societal and economic challenges and to create a more favorable environment for its realization as well as to support the monitoring of relevant indicators and trends and help anticipate new and emerging issues delineating future opportunities.

In this context, the observatory, will be an instrument to:

- Promote Bioeconomy in CELAC by facilitating its knowledge to the general public and stakeholders
- Provide specific information to those actors who drive bioeconomy development within the region
- Establish a one-point entry to the CELAC Bioeconomy and EU CELAC cooperation
- Provide information support for decision making and policy development
- Promote business development and support investment decisions in the related sectors
- Provide a promotion tool to increase the levels of social acceptance of the Bioeconomy principles, sectors and products
- Offer a platform for EU-CELAC Bioeconomy stakeholders to exchange information

By the establishment of this Observatory, it will aim at stimulating the creation of a community of agents related to the development of Bioeconomy in the region and position this community in other regions.

The platform will cover different types of instruments, ranging from information desks, news services, databases, to scientific, market and political support centers on the Bioeconomy framework. The observatory also will allow countries to create their own Bioeconomy country profile and to communicate and collaborate with others countries around the world more effectively.

Observatory main actions

- To generate and collect systematically specific information related to Bioeconomy
- To Support policy making
- To Plan, develop & monitor bi-regional cooperation in Bioeconomy
- To establish mechanisms to facilitate access & up-dating of information of strategic value to the Bioeconomy
- To serve as a Link to already sources of qualitative-quantitative knowledge resources on selected topics
- To create an inventory of Bioeconomy related EC co-funded RTD bi-regional projects
- To monitor specific indicators of Bioeconomy in CELAC and compare the performance of this sector with others located
- To provide information on access to Bioeconomy “success-stories” in the EU and CELAC regions
- To provide information on access to CELAC and EU key Bioeconomy stakeholder profiles
- To generate new information on themes identified as of strategic value

Coverage areas

The initial coverage of the observatory will focus on issues related to general aspects of the Bioeconomy. The thematic focus will cover three bioeconomy pathways identified as bi regional interest by the EU-CELAC Senior Officials Working Group on Bioeconomy: eco-intensification, biotechnology products and processes, and biorefineries and bio-products⁵.

These three pathways have been selected as initial entry points for the development of the observatory because their “productivity” orientation.

The international dimension: EU-CELAC

Beside of the specific CELAC approach, the observatory will also be partly addressed with collection of EU data and information on bioeconomy. In this frame, the Bioeconomy Observatory will also work in synergy with BISO Project (Bioeconomy Information System and Observatory Project), the Research and Innovation (R&I) Observatory of JRC, which also acts as information system, and the EU-CELAC policy dialogue on C&T, particularly, in the framework of the Senior Officials Meetings.

Implementation in the framework of ALCUE NET Project

The ALCUE NET Project

ALCUE NET⁶ is a four and a half year project funded by the 7th Framework Programme of the European Union. The consortium is composed of 19 institutions, eight from the European Union and eleven from Latin American and Caribbean countries, representing stakeholders from government and research.

The ALCUE NET objective is to establish a bi-regional European Union, Latin America and the Caribbean (EU-CELAC) platform bringing together actors involved in R&I orientation, funding and implementation, as well as other relevant stakeholders from the public and private sector and the civil society.

⁵ The selected thematic focus will cover three of the six bioeconomy pathways identified by the ALCUE-KBBE project that have served as basis for the discussions of the SOM Working Group on Bioeconomy and the final selection of pathways.

⁶ www.alcuenet.eu

The Project supports the Policy Dialogue process on STI to consolidate EU-CELAC cooperation by contributing to the implementation of the Joint Initiative for Research and Innovation (JIRI) in the Senior Officials Meetings (SOM) and contributes to the definition and implementation of joint strategic agendas for research, development and innovation during 2013-2017 focusing on the following priorities: Energy; Information and Communications Technology; Bioeconomy; Biodiversity & Climate change.

For the purpose of ALCUE NET project, the idea of creating an observatory, as a tool to support the development of the CELAC Bioeconomy, is taken to be that of an instrument aimed at the systematic and “permanent” development of specific information (data collection and value adding, quantitatively & qualitatively) to support policy making, program development and monitoring of the different dimensions of bi-regional cooperation on the JIRI priority themes , by focusing on Bioeconomy.

In this sense ALCUE NET project has a specific task to develop a Bioeconomy Observatory in close collaboration with existing regional and national information systems to regularly assess the progress and impact of the bioeconomy and develop forward-looking and modeling tools for cooperation activities especially in but not restricted to R&I.

The strategy for instance, will seek to optimize synergies by investing ALCUE NET efforts and resources in filling the “information gaps” and building the information shell through which all relevant information can be easily accessed by interested parties.

Observatory Structure

A first set-up will seek to cover, at the general bioeconomy level, the following fields & topics:

- Three pillars structure:
 - Research pillar Section: will include information on investments in Research, Innovation and Skills
 - Policy pillar Section: will offers a comprehensive policy mapping of Bioeconomy-related policy initiatives and will reinforce policy interaction and stakeholder engagement
 - Markets pillar Section: will provide data on Bioeconomy markets in order to reach the enhancement of markets and competitiveness in bioeconomy
- Capacity Development and Raise Awareness Section will provide raising awareness initiatives about the bioeconomy potential for the region and capacity development for the development of the bioeconomy in the region, including human resources development and on line courses and training
- Country Section will consist in a “who is who” specific section in the CELAC bioeconomy map and will incorporate success stories
- Bioeconomy R&I Community of stakeholders will be an intranet platform section under the observatory for professional networking and sharing of information and knowledge in Bioeconomy, dedicated to the creation of a this community of stakeholders.
- Other sections: News, Events, Link of interest, funding opportunities, case of studies

1) A three pillars approach

The observatory will be organized around three main information pillars (i) research, development and information, (ii) bioeconomy related policies, and (iii) markets and investment opportunities.

Operationally, the observatory will be developed in a decentralized fashion seeking to take advantage – in as much as possible – of efforts already underway in relation to the collection and dissemination of relevant key information. Following this approach each of the pillars will be developed by an organization (or a group of organizations) already working in that field, with ALCUE NET providing – during the initial

phase – an “umbrella” entry point for all three pillars. This decentralized networking approach will also facilitate (i) to better reflect the diversity existing within the region, and (ii) the long term sustainability of the mechanism.

From the conceptual point of view (basis for the identification of the specific information to be included in each pillar), the organization of the observatory will follow a similar conceptual framework as the one currently being constructed for the development, monitoring and evaluation of the European Bioeconomy Observatory.

The Bioeconomy Observatory will focus then, on data and information related to the three pillars highlighted in the EU bioeconomy strategy: research (investments in research, innovation and skills), policy (reinforced policy interaction and stakeholder engagement) and markets (enhancement of markets and competitiveness in bioeconomy).

The final structure of the observatory will also take into consideration potential synergies with the proposed observatory of the European Bioeconomy.

Data and information will be collected at three levels:

- Regional Level: CELAC
- International Level: EU-CELAC
- Country Level: under Country Section

Policy Pillar

This section will contribute to the preliminary identification of public policies relating to institutional and regulatory measures required to promote the development of the bioeconomy in CELAC.

The Bioeconomy Observatory will collect qualitative information on bioeconomy policy initiatives at CELAC level but also at international level outside the CELAC. This will be done through bilateral interaction with other regions. Specially, bioeconomy policy information will be collected at the EU-CELAC Bi Regional level.

- The Bioeconomy Observatory will collect qualitative information on bioeconomy policy initiatives at CELAC level through close collaboration with Bioeconomy-related initiatives from other Regional institutions, like CEPAL.
- The Bioeconomy Observatory will also aim at collecting information on bioeconomy policy initiatives taken at international level outside the CELAC. This will be done through bilateral interaction with other regions. Specially, bioeconomy policy information will be collected at the EU-CELAC Bi Regional level. Focus for detailed analysis will be given to policy initiatives from Bi regional policy meetings such as Summits and Senior Officials Meetings (SOM) identified through interaction with both communities. On the other hand, some International Organizations active on bioeconomy policy monitoring (for example OECD) will also be bilaterally consulted. Collaboration has already been initiated with the SOM Working Group on Bioeconomy. In the short term collaborations are expected to be created through the annual Bi Regional Senior Officials Meeting.
- The Bioeconomy Observatory will also collect qualitative information on "bioeconomy-relevant" policy initiatives at national level. In order to do so close cooperation between the Bioeconomy Observatory and the CELAC countries will be essential. This cooperation will be built as a result of networking approach and will be included under the “country Section” of the observatory.

Methodology

In short collection of qualitative policy information relevant for the bioeconomy will take place in two ways:

- interaction with policy-makers
- website monitoring

Interaction with policy-makers

The first way consists of interacting with policy-makers belonging to the CELAC Institutions and countries. The aim of these interactions will be to map the various policy initiatives being developed in various "bioeconomy-related policy areas".

Website monitoring

The second way to collect qualitative policy information relevant for the bioeconomy will consist in website monitoring based on a combination of relevant key words and relevant key sources of information. Key words selected will obviously be related to bioeconomy and sources of information will include in particular websites from authorities involved in bioeconomy policy at CELAC, EU and National level (CEPAL, Commission DGs, national Ministries of Agriculture and of Research for instance).

- Mapping of selected regional policy initiatives relevant for the development of the Bioeconomy.
- Mapping of selected international (especially EU) policy initiatives relevant for the development of the Bioeconomy.

The results of the data collection will be a library/database of "CELAC & International bioeconomy-policies" available on-line

Suggested collaborators⁷: CEPAL, CARICOM

Research and Innovation Pillar

The Observatory will collect on a regular basis both quantitative data and qualitative information, primarily at CELAC level, of the most relevant and usual Science, Technology and Innovation (STI) indicators related to the following areas:

- R&D investment (public and private sector)
- R&D Personnel and Human Resources Skills
- Patents
- Research and Innovation programmes

Information concerning Basic research, Applied research, Experimental development, Demonstration and Innovation projects will be collected.

Objectives: under the "research pillar" an overall statistical picture of bioeconomy Research, Innovation and Skills in CELAC will be sought, using the most relevant indicators for Science, Technology and Innovation.

Outcomes: The work will be structured around two main outputs via on-line visualisation tools:

- Dissemination of quantitative data on-line: publication of key facts and figures on Research and Innovation on bioeconomy
- Dissemination of qualitative information on-line: mapping of various programmes on Research and Innovation on bioeconomy (listing and exploitation of available qualitative information)

The methodology chosen for collecting data on bioeconomy research will be flexible enough to address a wide range of sectors.

Suggested collaborators⁸: RICYT

⁷ Others collaboration are being explored

⁸ Others collaboration are being explored

Market Pillar

The Bioeconomy Observatory activities related to "market development and enhanced competitiveness" will address the description, quantification and analysis of the development of sectors in the bioeconomy from a socio-economic point of view.

The research and analytical work in the market pillar will be divided into two parts. The first is related to data management and modeling tools based on existing databases and the second one is related to collection of "missing" information. A possible activity will consist on an online consultation through a bio-based industries survey. In this sense, the survey will aim to collect data on the current status and expected evolution of the bio-based industry within the LAC region, by contributing in the monitoring and analysing developments in the bio-based industry in LAC, specifically addressing gaps in the existing data resources.

A possible section structure should⁹:

- Addresses problems faced by these industries.
- Addresses the LAC added value on research and innovation for the bio-based industries.
- Asks for input with regard to the objectives that LAC actions should address.
- Asks for input with regard to different modes of implementation of the research and innovation activities under Horizon 2020, including different types of public private partnerships.
- For providing additional open comments.

Suggested collaborators¹⁰: CEPAL, IICA, Buenos Aires Grain Exchange, Consumers International, CIAT, FAO, country level commodity associations for the bioeconomy related fields.

2) Capacity Development & Raise Awareness

The observatory also aims to inform and raise awareness young people, professionals, policy makers, civil society and other stakeholders attracted to the knowledge of Bioeconomy related topics.

Raising awareness about the bioeconomy potential for the region and capacity development is central for the development of the bioeconomy in the region. Four target groups are identified: politicians and policy makers, the scientific and academic community, the private sector, and consumers (including NGOs).

The main hurdles to overcome by the Awareness Raising Initiative included at the CELAC Observatory include: (a) politicians and policymakers: overcome the lack of a bioeconomy policy perspective and the lack of institutional recognition of the bioeconomy as a model for sustainable and inclusive sustainable development; (b) scientific and academic community: overcoming the lack of scientific capacities and technical resources; (c) private sector: providing evidence of the market opportunities for profitable business development; and (d) consumers: playing a key role in the acceptance of bio-economy products.

The observatory seeks to raise awareness and capacity among the target groups by communicating relevant information and offering training modules for the development of strong bioeconomy clusters in countries of the region that are policy and scientifically supported, business driven, and socially accepted.

In this sense, the observatory is expected to provide information about:

Raising awareness about the bioeconomy potential for the region

⁹ The online consultation will follow the format of the Survey of the EU bio-based industry elaborated by the JRC.

¹⁰ Others collaboration are being explored

- Organization of events and the development of materials with bioeconomy related information that will improve the uptake, discussion and adoption of the model in the region by industry, government and civil society.

Outcomes:

- Increased public knowledge about the bioeconomy concept, its potentials and requirements.
- Promoted policy dialogue, exchange and understanding among public and private bioeconomy stakeholders.

Capacity development

The observatory will prepare an Inventory of EU and CELAC offer in terms of:

- Funding programs available (i.e. Marie Curie, Erasmus)
- Updated & dynamic data base of Bioeconomy related courses
- Course material - Library of bioeconomy courses

The observatory will also offer on line courses and training to be implemented in cooperation with EU experienced partners.

Outcomes:

- An enabling context for the development of C&T in CELAC region.
- Better informed and trained Bioeconomy related actors

3) Country Section

The observatory aims also to activate the local and national Bioeconomy through research and innovation. Country profile fiches will be developed in order to cover all possible regional countries and to establish national sections as independent "observatories" with linkages to the CELAC one.

As a first approach the observatory will incorporate, through this section, the mapping of national policy initiatives relevant for the development of the bioeconomy. For instance, national information collected from the CELAC countries will be produced through a "national bioeconomy country fiche" describing the "bioeconomy profile" for each of CELAC countries.

In order to access and collect information on the mentioned national policy initiatives, cooperation between the Observatory and the CELAC Countries will be crucial. This cooperation will take place both through:

- Interaction with relevant CELAC Committees where the countries are represented and where bioeconomy is discussed
- Bilateral interaction with national countries authorities involved in bioeconomy policy.

This may result progressively in the establishment of a network of bioeconomy "National Contact Point" for the Bioeconomy Observatory, which would supply relevant information on bioeconomy policy developments at national level.

In addition to this interaction with CELAC countries, a second way of collecting qualitative data on national bioeconomy policy developments will be through website monitoring of the websites from relevant national ministries in each country (at a first stage, this national website monitoring will focus mainly on two Ministries: Ministry of Research and Ministry of Agriculture, these two Ministries being most of the time involved in bioeconomy policy decisions at national level).

Country profiles fiche

The Bioeconomy Observatory will produce a "**national bioeconomy country fiche**" (see annex I) for each of the CELAC countries. A template "bioeconomy country fiche" will be designed, aiming at collecting all

qualitative bioeconomy policy data (and including in it some research data collected), including bioeconomy indicators relevant to the main sectors of interest, policy documents as strategies or official communications, and intuitive graphs.

All CELAC Senior Officials Meeting will be invited to complete the country profile during the EU-CELAC SOM in Brussels, November 2015 .

Case studies

The country section will include the following and latest examples and outcomes of Bioeconomy.

4) Funding opportunities

The observatory will provide information on funding sources. Different users can access funding opportunities in other regions of the world, which will be incorporated on the platform.

5) Events section

The section serves for promoting conferences, workshops, seminars, webinars, etc. in order to ensure the highest possible visibility.

As part of the event, images and documents can be uploaded. Additionally, abstracts can be uploaded as separate objects and linked to the event to allow sharing of posters and presentation materials.

6) News section

The News section will be developed to post news, announcements, media coverage and press releases from Bioeconomy related issues.

7) Link of interest

List of interesting websites related to Bioeconomy.

8) Bioeconomy Research and Innovation Community (Intranet)

The Bioeconomy R&I community is an internal platform section under the observatory for professional networking and sharing of information and knowledge in Bioeconomy. The community will act as a driven network of active research and innovation groups within the domain of the Bioeconomy; policy makers and other relevant stakeholders.

In this sense, the community will continuously looking for new partnerships within Bioeconomy related topics of international significance.

The platform allows stakeholders to create their own profile to be able to communicate and collaborate with others countries stakeholders around the world more effectively. Following this, the Community will also strives to network and promote research consortia with close collaboration with research and industrial partners.

Become a member:

- People need to be registered to browse in order to upload of content, posting comments, recommending or rating.
- Simple sign-up procedure by filling one simple form. It is free.
- Each User will be required to protect his/her personal information with a unique password.

User profiles

Members will be asked to create and update their own profiles.

Information collects and stores:

- Personal information: The only personal information (such as information about education, contact details etc.) that the observatory collect and store is the one that the User chooses to enter. The User can

edit or delete any personal information within his/her profile. Certain information (name, e-mail address) is compulsory for registration (sign up). Only reiterated members will have access to the Bioeconomy intranet community. If a User wants to be removed from the database, the User can delete his/her profile.

[Use of e-mail communication](#)

The platform may send e-mails to Users in order to inform them of relevant news, such as updates, new features, activities etc.

[Main useful collaborative tools](#)

Internal news section

The platform will develop the News module to give every user the possibility to easily post news articles, highlights or commentaries.

Like other content, news articles and commentaries can be recommended, commented and shared in social media.

Web conferences

Web conferencing may be used as an umbrella term for various types of online collaborative services including web seminars ("webinars"), webcasts, and peer-level web meetings.

Web Conferencing is conducting live meetings, presentations, and training, via the Internet.

Video conferences

Video conferences will allow two or more locations to communicate by simultaneous two-way video and audio transmissions.

Web traffic of data

User will be able to send and receive high amount of data and files.

Streaming

Streaming will permit to follow conferences, events, meetings, workshops and training in real time. Streaming video is an Internet technology that allows nearly anyone the opportunity to broadcast video to a worldwide audience

Chat

This activity involves messages received in an online conversation. The network is expected to also serve as a communication channel for requests and inquiries.

Contact management information (Project Team)

- Ministry of Science, Technology and Productive Innovation (MINCYT) Argentina
- Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) France

COUNTRY BIOECONOMY PROFILE

POLICY

Structure of the Bioeconomy Institutional system

Responsible National Authorities / Agencies	<i>Name in the language of the country xxx</i>
	<i>Name in English xxx</i>
	<i>Website (www.) xxx</i>

List of "bioeconomy-relevant" policy initiatives

National Bioeconomy Strategy <i>(if applicable)</i>	<i>Name xxx</i>
	<i>Description xxx</i>
	<i>Link to key documents xxx</i>

BIOECONOMY RELATED POLICY INITIATIVES related to:

ECO-INTENSIFICATION	<i>Name xxx</i>
	<i>Description xxx</i>
	<i>Link to key documents xxx</i>

BIOTECHNOLOGY PRODUCTS AND PROCESSES	<i>Name xxx</i>
	<i>Description xxx</i>
	<i>Link to key documents xxx</i>

BIOREFINERIES AND BIO-PRODUCTS	<i>Name xxx</i>
	<i>Description xxx</i>
	<i>Link to key documents xxx</i>

ADDITIONAL POLICY INFORMATION	<i>Name xxx</i>
	<i>Description xxx</i>
	<i>Link to key documents xxx</i>

RESEARCH

Bioeconomy R&D Investments (public and private sector)

PUBLIC R&D INVESTMENT in Bioeconomy

Info source:

ECO-INTENSIFICATION	<i>xx in (specify currency)</i>
BIOTECHNOLOGY PRODUCTS AND PROCESSES	<i>xx in (specify currency)</i>
BIOREFINERIES AND BIO-PRODUCTS	<i>xx in (specify currency)</i>

PRIVATE R&D INVESTMENT in Bioeconomy

Info source:

ECO-INTENSIFICATION	<i>xx in (specify currency)</i>
BIOTECHNOLOGY PRODUCTS AND PROCESSES	<i>xx in (specify currency)</i>
BIOREFINERIES AND BIO-PRODUCTS	<i>xx in (specify currency)</i>

Bioeconomy R&D Programmes

Listing of National Bioeconomy Research Programmes

Xxx

Xxx

Xxx

Xxx

Xxx

Examples of National Bioeconomy Research Projects

Xxx

Xxx

Xxx

Xxx

Xxx

MARKETS

References to existing Market Studies/Forecasts about Bioeconomy in Country X incl. if available key quantitative data about "size" of national bioeconomy (jobs, turn-over)

Name, description, link to key documents

	Enterprises number	Employment number	Turnover (specify currency)	Value added (specify currency)
Eco-intensification	xx	xx	xx	xx
Biotechnology products and processes	xx	xx	xx	xx
Biorefineries and bio-products	xx	xx	xx	xx

GENERAL INFORMATION

(Key Facts & Figures regarding Country X)

DEMOGRAPHY/ POPULATION	xxx
ECONOMY/ GDP	Xxx
ECONOMY STRUCTURE (e.g. Agriculture weight in the economy)	Xxx
SOCIAL/ EMPLOYMENT/ UNEMPLOYMENT	Xxx

7 Annex III: Policy Note

REPORT OF THE INTERNATIONAL CONFERENCE LATIN AMERICA AND CARIBBEAN BIOECONOMY 2015

Adrián Rodríguez¹¹, Eduardo Trigo¹², Guy Henry¹³

On 7 & 8 October the International Conference *Latin America and Caribbean Bioeconomy 2015* was held in ECLAC (Santiago, Chile), organized jointly by ECLAC and ALCUE-NET. The conference had participants from public, private and science and technology institutions in Argentina (MICYT and Province of Córdoba), Brazil (CGEE), Chile (INIA, UFRO and CORFO), Colombia (CIAT, Javeriana University, Suricata S.A), Costa Rica (MICITT), Cuba (CIGB), Mexico (UNAM) and Uruguay (Directorate of Planning / National Office of Budget and Planning). There was also participation of experts involved in bioeconomy initiatives in Austria (University of Natural Resources and Life Sciences), Belgium (University of Gent; VITO), France (IAR), Finland (Finnish Environment Institute), Germany (University of Bonn/ German Bioeconomy Council; Hohenheim University), Portugal (), South Africa (Department of Science and Technology) and Spain (INIA).

The main conclusions of the seminar are summarized in the following paragraphs.

I. The adequacy of the bioeconomy framework for development and innovation policies in Latin America and the Caribbean (LAC).

A. There is significant potential for the development of the bioeconomy in Latin America and the Caribbean (LAC).

LAC is well endowed with biological resources, which are the basis of the bioeconomy. The region is rich in biodiversity, especially in the tropical and subtropical regions, where several mega-diverse countries are located. The region also has a significant potential to produce food and non-food biomass, especially in subtropical and temperate regions in South America. The region also produces significant amounts of waste biomass in agriculture (crops and livestock), agro-industry, and forestry-related activities, which are currently scarcely utilized and in many cases are the cause of pollution. Moreover, several countries have developed agriculture-related biotechnology capabilities (eg. Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba y Mexico), especially in agriculture and agro-industry.

B. There is not a single bioeconomy, but many possible bioeconomies

The development of the bioeconomy depends on the specific biological resources available (natural, cultivated or waste). Considering the diversity of LAC in terms of biodiversity, agricultural activities, forestry resources and potential to produce non-food biomass, there are many possible bioeconomies in the region;

¹¹ Chief Agricultural Development Unit, Division of Production, Productivity and Management, Economic Commission for Latin America and the Caribbean (ECLAC).

¹² Ministry of Science, Technology and Productive Innovation, Argentina.

¹³ International Center for Tropical Agriculture (CIAT) and CIRAD.

even more, there can be different bioeconomies even within a country. The development of the bioeconomy also depends on the capacities for research and development and innovation (especially in biotechnology and related fields) and the policy context. Therefore, bioeconomies can differ not only in terms of the biological-resource base, but also in terms of technological capabilities.

C. The bioeconomy is an integrative policy approach

A central concept in the bioeconomy is to maximize the use of biomass (or minimize the solid waste, and liquid or thermal discharges into the environment), based on the concept of “cascade value”. It was pointed out that the cascade value approach gives the bioeconomy an integrative nature, around the uses of biomass. This has implications for policy, as it allows to bring into the bioeconomy framework the possibility of integrating science, technology and innovation policies; productive diversification policies (aka industrial policies) intended to increase value added and creation of decent jobs; adaptation and mitigation policies, especially those that create synergies with each other; and green growth strategies .

D. The bioeconomy is consistent with integrative policy approaches

Also, it was pointed out that the bioeconomy framework is consistent with integrative policy approaches that seek to break with silos; for example, the WEF Nexus (Water – Energy – Food Nexus) approach, intended to achieve water, energy and food security; the SFS (Sustainable food systems) approach, intended to produce healthy/nutritious food in a sustainable manner, which mean bringing together the health, agriculture and environmental sectors. Moreover, the bioeconomy is intrinsic to sustainable development, as it aims (i) to achieve sustainable use of biological resources, (ii) create competitive and inclusive business opportunities, especially for SMEs, women and the youth, and (iii) promote social and territorial cohesion and reduction of development gaps.

E. The bioeconomy approach can contribute to the implementation of the 2030 Development Agenda.

It was stressed that the bioeconomy is an integrative framework for strategies to the implementation of the Sustainable Development Goals (SDGs) and to integrate initiatives included in the Intended National Contributions (INDCs) to the UNFCCC. The bioeconomy has direct or indirect relationship with at least 11 of the 17 SDG: SDGs 2 (Hunger) and 3 (Health), through the production of healthy foods; SDG 7 (energy), through the production of clean non-carbon energy; SDGs 8 (employment) and 9 (industry, innovation), through the creation of well paid and decent jobs in new bio-based industries; SDG 11 (cities and communities) and SDG 12 (sustainable production and consumption patterns), through the introduction of bio-design principles in planning of human settlements and the promotion of closed-circle production systems that minimize the generation of waste and discharges into the environment; SDG 13 (climate) through bio-based solutions for adaptation and mitigation; and SDGs 6 (water and sanitation), SDG 14 (oceans) and 15 (terrestrial ecosystems).

The bioeconomy can also provide a framework for the INDCs in the UNFCCC. In fact, various INDCs in Latin America include bioeconomy-related actions; for example, recovery of methane emissions to produce biogas; reduction in the use of synthetic fertilizers or their replacement with bio-fertilizers; promotion of the use of biocides in agriculture; among other.

II. Progress towards the consolidation of a Latin American Bioeconomy

A. Enabling policy frameworks for the bioeconomy are in place or emerging

Many countries have already developed policy frameworks that although not termed as bioeconomy, are totally in line with the needs for the development of national bioeconomy strategies. The most prominent case is Argentina, where there is already a bioeconomy strategy being discussed at the national and regional levels, under the leadership of MINCIT. Also well-known is the case of bioenergy development in Brazil, which is foreseen to provide the basis for the development of the Brazilian bioeconomy.

In Costa Rica the Nation Plan of Science Technology and Innovation 2015-2021 has a strong focus in food and agriculture, clean energy and environment and water. Other relevant public policies include National Agriculture Rural Development Policy 2015-2018; National Energy Plan and intention to become Carbon Neutral. Costa Rica also has a well developed legal framework, which includes the Science and Technology Development Promotion Law, and Laws on Biodiversity, Biosecurity, Forestry, Wildlife Preservation. The Biodiversity Law regulates access to genetic and biomechanical elements and protects their related knowledge. The country also has a well known National Systems of Conservation Areas.

Cuba has a strong biotechnology health sector which emerged out of the need to provide solutions to public health concern. The basis of the sector were created during the 1960s, with the creation of the Scientific Institutes of the Ministry of Health (1963) and the National Center for Scientific Research (1965) and was strengthened in the 1980s with the creation of the Biotechnology Front (1981) and the Centre for Genetic Engineering and Biotechnology (1986). The process was consolidated in 1992 with the creation of the West Havana Scientific Pole, which houses 52 facilities and more than 1500 researchers.

Uruguay is the country that already has the largest bioeconomic component in its exports. It has already in place bioeconomy-related policies in bioenergy, climate change and biotechnology. In biotechnology policy development started with the creation of the Clusters Ciencias de la Vida (2006) and continued with the creation of the Biotech Sector Council (2010) and the design and implementation of the Biotech Strategic Plan (2010-2013). During 2014-2015 the 1st Biotech Forum was held and four strategic areas were agreed: animal health, human health, agriculture and industrial biotech. It currently has in place the 2020 Biotech Strategic Plan, which seeks to improve the bio-business environment.

B. There are already several bio-economy related activities going-on

ALCUE – KBBE¹⁴ identified several pathways for the development of the bioeconomy in the Latin American and Caribbean region, which can be grouped in five categories: (i) biodiversity resources exploitation and ecosystem services; (ii) eco intensification; (iii) biotechnology applications; (iv) bioenergy and bioproducts (biorefineries); (v) value chain improved efficiencies (food system issues).

The conference made it clear that there have been significant advances in bioeconomy-related initiatives in sectors such as agriculture, agro-industry, clean energy and public health. For example, biotechnology in agriculture (e.g. Argentina, Brazil, Cuba, Mexico), agroindustry (e.g. Argentina, Brazil, Chile, Mexico) and the public health sector (Cuba), bioenergy (Brazil, Argentina), bio-products form sustainable use of biodiversity (Colombia, Costa Rica, Mexico), and environmental services (Costa Rica). The health

¹⁴ ALCUE-KBBE was a project co-financed by the European Commission as part of its 7th Framework Program, 2011-13 (Contract No. 264266). See <http://www.bioeconomy-alcue.org/bioeconomy/index.php?lang=en>

biotechnology sector was not considered in ALCUE-KBBE, given its emphasis in agriculture and biomass; however, the participants from Cuba pointed out the importance of considering public-health related biotechnology in bioeconomy discussions in Latin America, given the importance it already has in the Cuban economy.

C. Challenges for the development of the bioeconomy in Latin America and the Caribbean

One of the bioeconomy's main goals is to provide alternatives to the use of fossil-resources by maximizing the use of biomass / minimizing the generation of waste, effluents and emissions, under the concept of "biomass cascade value".

In LAC the portion of biomass used is very low, but important, basically in the production of food, feed and fibers, and energy. The production and processing of food, in particular, is carried-out leaving behind large amounts of waste biomass that can be used to produce energy, inputs for agriculture, bioplastics and other bio-materials, among other. In terms of biomass use, this poses to the region two challenges: first, advancing in the biomass value-added chain, beyond the production of food; and (ii) doing so without diverting land use from the production of food biomass to the production of non-food biomass.

The region is also endowed with large portions of native forests that play significant roles in capturing GHG emissions. Therefore, a third challenge lies in using biomass without compromising the capacity of the region to sequester GHG; moreover, this challenge can be seen in terms of providing alternatives to enhance the capacity of its carbon sinks.

III. Unveiling the potential of the bioeconomy

There was significant agreement around the fact that the potential of the bioeconomy in LAC can be hampered by factors such as (i) lack of adequate regulatory frameworks; (ii) an inadequate and un-articulated policy framework; (iii) insufficient coordination of the technical and technological capacities; (iv) market entry restriction to small bioeconomy firms; and (v) lack of financing for innovative bioeconomy start-ups.

Therefore, unveiling the potential of the bioeconomy in LAC requires actions in several fronts. First there is the need to overcome the hurdles identified, namely, the need for:

- a) adequate regulatory frameworks, in fields such as bio-safety/bio-risk regulation, biodiversity protection, access to genetic resources, regulation of GMOs, protection of property rights and patenting requirements.
- b) articulation of the policy initiatives already in place, especially regarding R&D and innovation policies in fields such as clean non-fossil energy, biotechnology developments in agriculture, human and animal health, non-carbon agricultural development, payments for ecosystem services, and improvements in the efficiency and sustainability of the food system.
- c) better coordination of the technical and technological capacities that already exist in the countries;
- d) policies for bioeconomy SMEs aimed at creating capacities, facilitating entry to concentrated markets and providing adequate financing for innovative start-ups.

Other issues that deserve attention include: (i) promoting a better understanding of the bioeconomy concept; (ii) promoting policy dialogue, exchange and understanding among public and private bioeconomy

stakeholders; (iii) strengthening understanding of the potential of the bioeconomy and bioeconomic growth for inclusive, competitive and sustainable development; (iv) systematizing successful bioeconomy experiences, especially on market and business development, public-private collaboration, university-business collaboration; (v) promoting exchange of successful bioeconomy experiences from the region at local, national and regional levels; (vi) exploring bioeconomy pathways that could be of interest at national levels, in addition to the pathways identified in ALCU-KBBE; and (vii) bringing the bioeconomy to a higher policy level, strengthening its contributions to pave the road to a de-carbonized economy, a better environment and more inclusive societies.

8 Annex IV: Bi Regional Topic Profile

Scientific research on Biotechnology

The rapidly growing global demand for food, feed and fuel will require a combination of an increase in crop yields and an efficient and sustainable use of soil and water resources.

According to the Intergovernmental Panel on Climate Change, 1.28 Gha of world cropland will remain extra after food production in 2050 and will be available for biomass production.

Key issues are the adaptation of crops to climate change and a better tolerance to biotic and abiotic stresses by genetic improvement and by managing diverse cropping systems in a sustainable way. There is also space for further improvement on agricultural practices and the development of sustainable processes for the transformation of biomass in added-value products.

The biomass production must follow the sustainable criteria of addressing all the interlinked environment, economic and social concerns.

Added value of EU-CELAC cooperation in this area

Generation and exchange of scientific and technological knowledge between EU and CELAC will contribute to accelerate the transition to an environmentally friendly bioeconomy, by providing high quality bioproducts through a sustainable use of resources. Adaptation of known biotechnological procedures to new impact regions will expand the frontiers of natural resources. A multidisciplinary approach will provide solutions that cut across research and technological fields, with a strong innovation and market driven approach. Positive changes to society, economy and environment will be achieved through a more efficient use of resources by improving the chain-value of natural species.

Specifically, the improvement of biological raw material for industrial use, the design of energy crops and seeds for wood production are relevant topics to add value to EU-CELAC bioeconomy. The production of this value-added products will promote the establishment of biotechnology-based companies

Expected long-term impact (5-10 years) impact of EU-CELAC cooperation in this area

The development of new resources via biotechnological improvement of genetic traits of multipurpose and energy crops, as well as those of tropical trees, will impact on:

- Valorization of biological raw materials
- Generation of innovative feedstocks for biorefineries.
- Development of optimized crops adapted to industrial needs.
- Satisfaction of market demands with compliance to environmental, social and economic objectives.

- Increased productivity and sustainability in agricultural and forestry practices.

Suggested topics

TOPIC 1: TITLE

Energy crops: genetic improvement and an efficient use of resources

Specific challenge	The current pattern of energy supply cannot be sustained in the future because of the depletion of fuel reserves and also the environmental impacts of using these fuels. As compared to forest biomass production, energy crops offer higher productivity and shorter time span between plantation and harvest. Energy crops grown on surplus land in a sustainable way can serve energy demand and mitigate many environmental, social and economic challenges.
Scope	Proposals should focus on the development of crops with optimized dry matter and energy yield per area of land, through the latest biotechnological routes, with or without genetic modification. Environmental aspects (e.g. soil and water needs) should be addressed.
Expected impact for both regions	<ul style="list-style-type: none"> - Contribute to satisfaction of energy demand with compliance to environmental, social and economic objectives. - Prevention of deforestation. - Reduce pressure on edible crops utilization for energy production - Economic growth via the use of underutilized soils
Type of action suggested	Research projects

TOPIC 2: TITLE

Artificial seed for wood production

Specific challenge	The production of seeds through normal sexual propagation is challenging for many trees, due to long time for flowering and/or poor seed set. In addition, most trees are heterozygous and therefore, clonal propagation is desirable to maintain original identity. Artificial seeds can make a great contribution to the preservation and extension of biodiversity in general, and forests in particular.
---------------------------	--

Scope	The proposals should aim at producing artificial seeds of tropical seeds. A viable clonally technology should be proposed to produce high-quality seeds for establishing new plantations in CELAC. This technology is used in Europe (eg Sweden for pine) and can be adapted to tropical trees for establishing plantations and for multi-location phenotyping. Protocols should be developed for tree species of interest to EU and CELAC.
Expected impact for both regions	<ul style="list-style-type: none"> - Large scale production of plants at low cost. - Germplasm conservation of elite and endangered plant species. - Easy handling of seeds and potential long-term storage - Product uniformity - Trade in exotic timber between CELAC and EU - Use for paper/pulp industry. - Carbon credits
Type of action suggested	Research projects

TOPIC 3: TITLE

Design and screening of multipurpose crops

Specific challenge	Global food, feed and fuel demands have been projected to double in the 21st century, which will further increase the pressure on the use of land, water and nutrients. Multipurpose crops can contribute to an environmentally sound and sustainable use of natural resources, by bringing to the market biodegradable products such as bioplastics, lubricants, paints and/or added value fine chemicals with minimum residue.
Scope	The proposals should aim at developing crops with a comprehensive use, improving the exploitability of the biomass. Research should combine modern molecular tools of plant breeding, metabolic and genetic engineering and advances in agronomic practices in order to develop crops with a comprehensive use. Proposals should also address the economic potential of the residual biomass and asses environmental sustainability
Expected impact for both regions	<ul style="list-style-type: none"> - Valorization of biomass resources. - Use of biomass for multiple purposes. - Knowledge generation on metabolic control, route design, metabolic engineering, domestication, breeding, and improved agricultural practices. - Development of optimized crops adapted to industrial needs.
Type of action suggested	Research projects.

Scientific research on Biorefinery

A biorefinery is, by definition, the integrated production of food, fodder, chemicals, materials, goods, and fuels by means of bio- or physicochemical processing of biomass. In this sense, humans are a good example of biomass processing to recover energy and chemicals to produce materials; however, the atomic efficiency of modern societies is quite low. Even worse, as seen in big cities, the richer the population is, more residues it produces. Losses in the feed chain have not yet been seriously studied. In summary, second-generation biorefineries not only should process non edible biomass, but should also push forward the gain of edible biomass resources. New technologies for biomass recycling and residue processing are needed to enhance the bio-economy matrix. It is imperative that emphasis is placed on assessing the effectiveness of current food processing industrial centers and urban residues.

Added value of EU-CELAC cooperation in this area

Different value chains are competing for biomass feedstocks, not only for energy production but also for other uses. The topics proposed in this area intend to accelerate innovation in biomass supply and logistics, promoting joint research to develop useful technologies for both regions (EU and CELAC). In addition, the proposed topics consider raw materials that do not compete with food production. Recycling of the biomass leftovers after human consumption is also considered as an important material sourcing. The development of these topics, will contribute positively to the bio-economy, in addition to the reduction of negative environmental impacts from human activities

Developments in this area will improve cooperation among scientists, farmers associations and agro-industry, private and public organizations, and policy makers from EU and CELAC regions, making the whole process more sustainable and economically feasible. Moreover, positive results can be applied in cities and countries through political actions to enhance the recovery of added value compounds from organic residues.

Expected long-term impact (5-10 years) impact of EU-CELAC cooperation in this area

- Increase the application of the biorefinery concept in current biomass processing sites
- Boosting of integrated use of the biomass consumed in big cities to produce energy and added-value products
- Expansion of the production of energy and compounds from non-edible renewable sources
- Energy intensification in current biomass processing sites via new self-sustainable processing modules
- Valorization of residual biomass
- Growth of EU/CELAC joint research/business development on biomass to energy/compounds
- Reduction and mitigation of environmental impacts from traditional energy sources (i.e. fossil fuels)

Suggested topics

TOPIC 1: TITLE

Fractionation and valorisation of residual biomass to intermediate and/or final high added value bioproducts

Specific challenge	The development of self-sustainable plants with minimum production of residues and fossil energy consumption is an important economic and environmental challenge. The development of modular units for fractionating and valorising similar multi-feedstock residues (agricultural and agro-industrial residues, and any organic disposable with good valorisation potential) will contribute to the debottlenecking of biorefineries development.
Scope	Proposal should aim at assessing agro-industrial waste, characterizing and evaluating the potential uses of bio-based residues. The call will focus on process intensification and development of new technologies that contribute to the establishment of self-sustainable biomass processing sites. The development of flexible (also multi-feedstock) technologies to be integrated to current processing sites is expected.
Expected impact for both regions	<ul style="list-style-type: none"> - Valorisation of agricultural and agro-industrial residues - Energy intensification through efficient integration in a single site - Environmental benefits at current biomass processing sites - Assessment of losses in the feed and industrial chain, to help establishing regulatory frameworks, - Development of new biotechnology-based businesses
Type of action suggested	Research and innovation projects

TOPIC 2: TITLE

Lignocellulosic biorefinery platform: production of high-value bio-based products

Specific challenge	Lignocellulosic biomass feedstock consists mainly of C6 and C5 sugars (cellulose, hemi-cellulose) and lignin. This renewable feedstock can be used for the production of sugar-based or phenolic-based bulk chemicals. Due to the high stability of lignocellulosic material, economically feasible production of bio-based chemicals is still a major challenge.
---------------------------	---

Scope	Proposals should aim at the conversion of C5 and C6 sugars. The evaluation of lignin chemistry and conversion, as well as the use of lignocellulosic sources to produce chemical building-blocks for the chemical industry, are also important. Proposals should include environmental, economic and social sustainability assessment along the whole value chain (support activity)
Expected impact for both regions	<ul style="list-style-type: none"> - Reduced pressure on edible renewable biomass for energy and chemicals production - Reduced dependency on petrochemical products, such as furfural or phenol resin. - New synthesis routes of renewable chemicals
Type of action suggested	Research and innovation projects

TOPIC 3: TITLE

Precursors development for advanced materials from biomass

Specific challenge	Fibrous bioresources comprise components with different functionalities. Their use in advanced materials and associated applications require isolation, separation or deconstruction. Processing technologies with minimum energy consumption and product valorisation in targeted applications are important challenges, both economic and environmental.
Scope	The aim of this effort is focused on addressing fibre cell wall deconstruction into micro or nano scales, together with other streams, in order to produce precursors for advanced biomaterials. The utilization of agroindustrial and forest-derived feedstock for the extraction of fine chemicals and high-value end products is expected
Expected impact for both regions	<ul style="list-style-type: none"> -Add value to novel biomaterials at different deconstruction levels -Lower the negative environmental impact as outcome of processing technologies and waste management -Introduction of novel advanced material from biomass into the market -Increased use of abandoned biomass -Development of new biotechnology-based businesses
Type of action suggested	Research and innovation projects