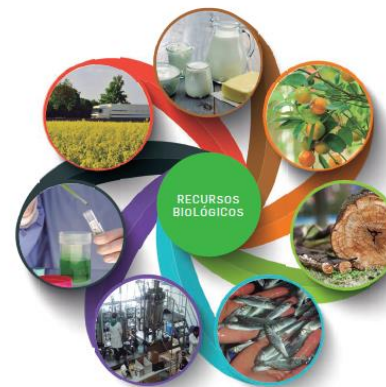




casa

Common Agricultural
and wider bioeconomy
research Agenda



Estrategia española
de Bioeconomía
Horizonte 2030

THE SPANISH STRATEGY ON BIOECONOMY

Madrid, 10th may 2017

Dr. Manuel Lainez
Director del INIA

The current economic activities

Estimated: 6,5% GDP and 9% working population

Agrifood Sector 5,59% GDP (2015)

- 2,42 % GDP primary production:: 890.000 farms
- 0,20 % GDP Fisheries: 5.025 operations
- 2,97 % GDP, food processing industry: 28.800 companies



17% of Spanish sales abroad



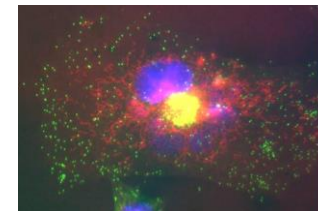
Forestry Sector 0,60% GDP (2015)

- 0,18 % GDP timber and cork
- 0,34 % GDP paper
- 0,08 % GDP other

Non-health biotechnology sector:((INE, 2015)
2.831 companies

Biomass for energy 0,34% GDP (APPA2015)

- 176 biomass companies for energy and other purposes
- 47 Companies devoted to biotech



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

Research in Bioeconomy

World position in:

- * Agr. & Biol Sciences: 7º
- * Environm Sciences: 8º
- * Biotech & Biochem: 9º

2.780 research projects in 2015

Articles in journals (2015)

- * 8.786 in Agr. & Biol Sc
- * 5.162 in Environm Sc
- * 3.499 in Biotech & Bioch



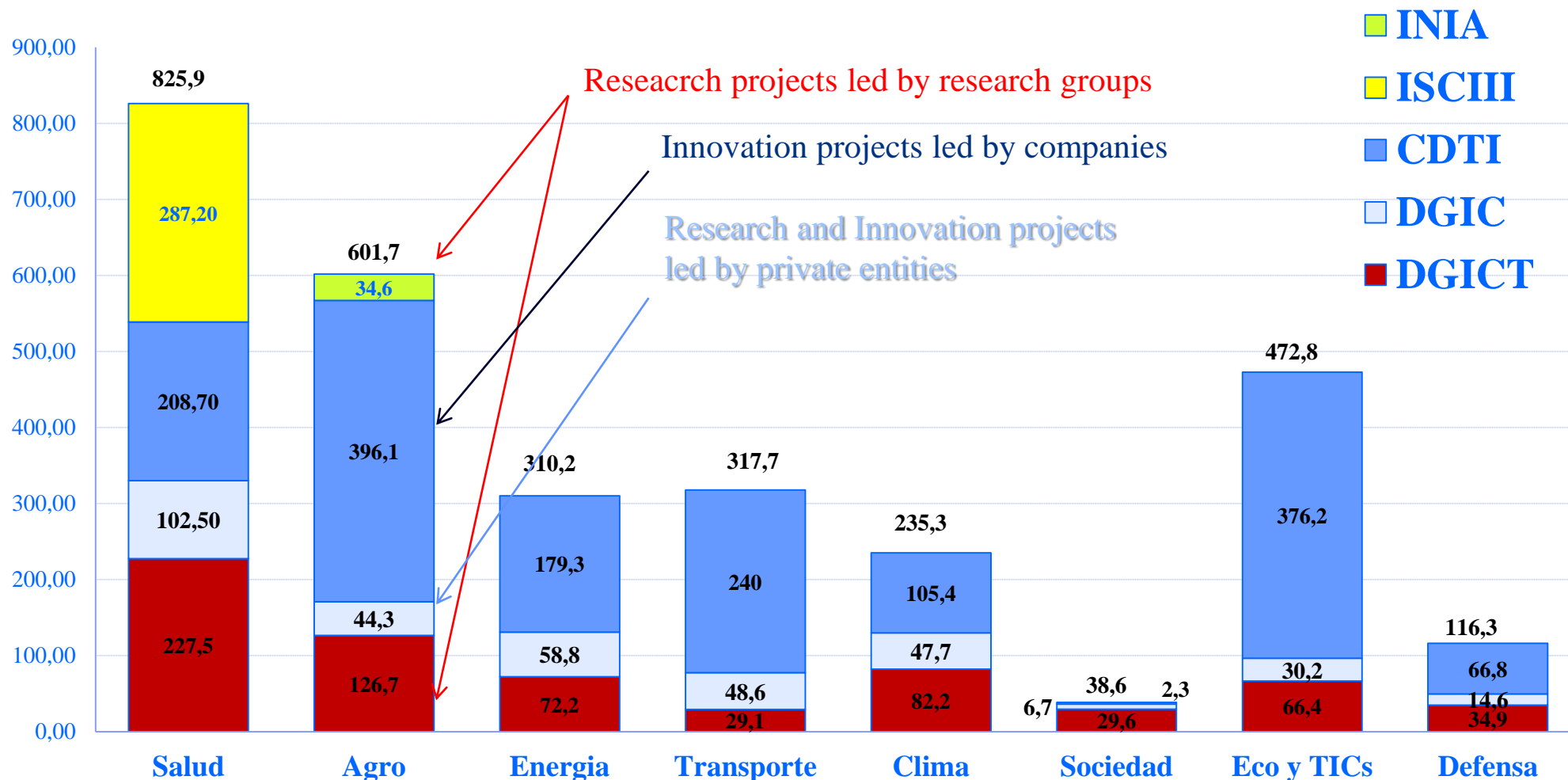
Innovation

22% of the agrifood companies invested in innovation in 2014

Great collaboration between companies, universities and OPIs



Spanish R+D+I State Plan 2013-2015: Distribution of funding by challenges and funders (2.918,6 M€)



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD



The opportunities for bioeconomy in Spain

Theoretically:

Scenarios of the bioeconomy in 2030 (OECD, 2009)

“business as usual” estimate is that biotechnology could contribute up to approximately 2.7% of GDP in the OECD by 2030.

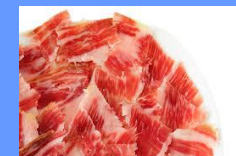
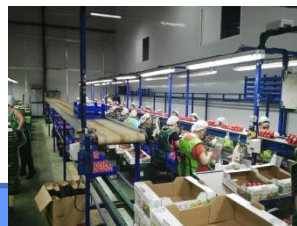
How to put in practice:

Trough Value chain creation and strengthening

- **Classical value chains**
- **New value chains**

Traditional value chains: strengthening

FOOD Value Chain



Sustainable

Efficient



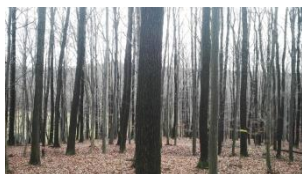
GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

Traditional value chains: strengthening

FOREST Value Chain

FORESTRY

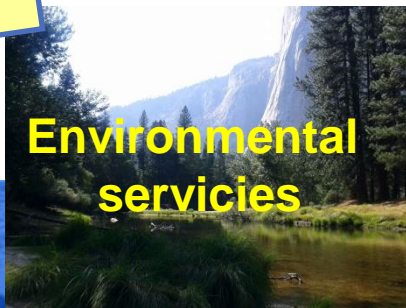


**Sustainable
management**

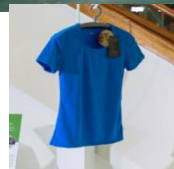
**WOOD
Efficiency**



**Environmental
servicies**



**Building
materials**



Textiles



Paper



**Biomass:
bioproducts**



Heat / Energy



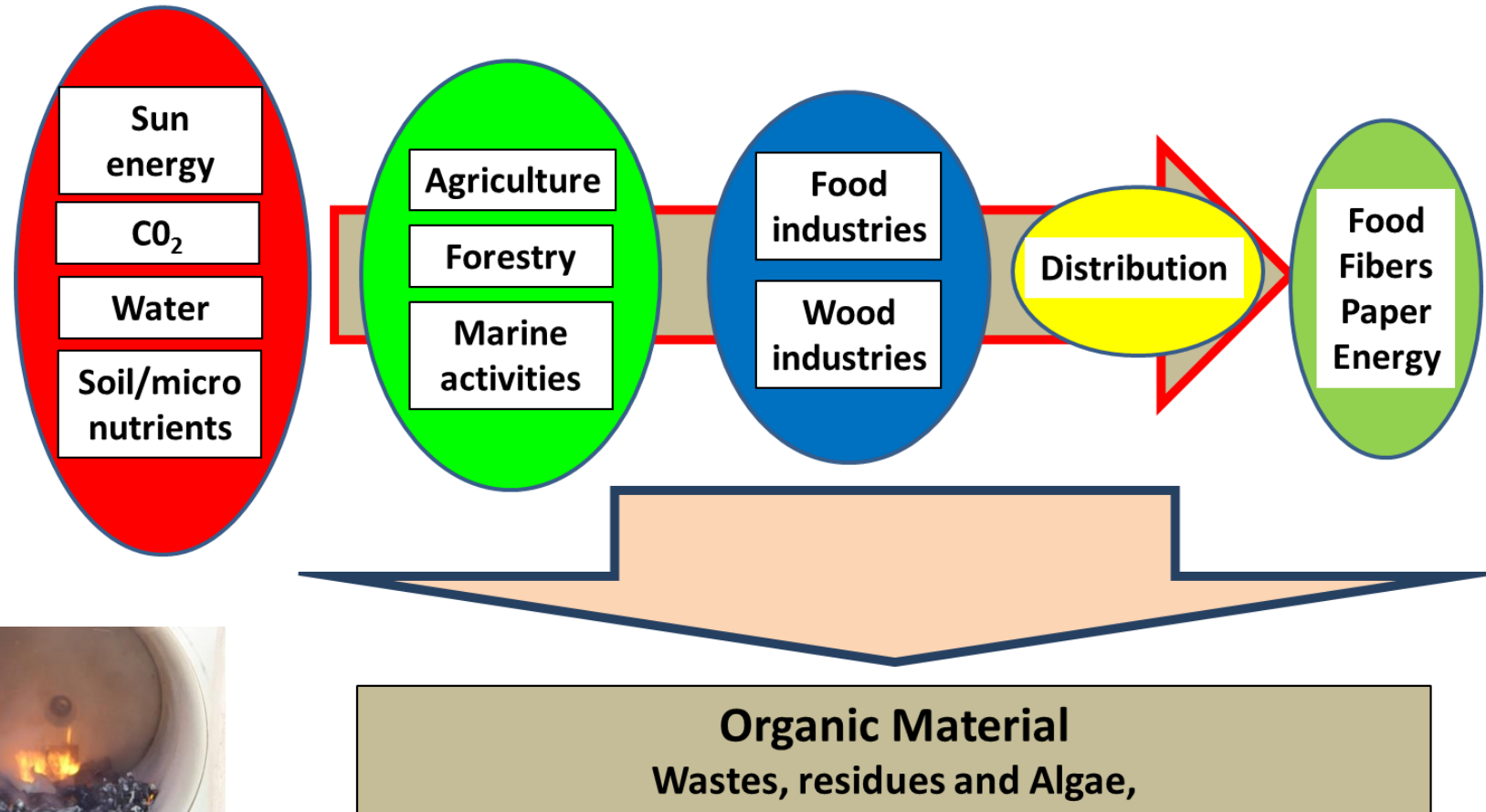
GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

Non food biomass available in Spain

Water scarcity

Residues from food / wood chain



What type of biomass can be produced in Spain?

Water scarcity

Estimated Wastes and Residues in Spain

(PER 2020, 2011, Probiogas 2010)

	M t/y	
• Biomass		Estimated Availability 60% collected and stored 96 M t/y
• Forestry residues	18	
• Arable and permanent (trees) crop residues	30	
• such as straw or husks, grass silage,		
• brash and arboricultural arising		
• Agro food wastes	31	
• Inedible components: peel, skin, husks, cores, fish heads, pulps		
• Organic material from excess production or insufficient market		
• Wasted materials from food and drinks: wine, beer, cheese,		
• Food preparation: fat, cooking oils, food disposed of for safety reasons		
• Woody wastes, paper pulp, textiles, etc	6	
• Animal residues	48	
• Manures and slurries		
• Animal bedding such as poultry litter		
• MSW (municipal solid waste) and Sewage sludge	26	
	<hr/> 159	



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

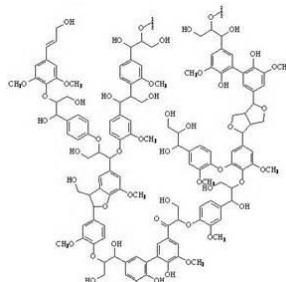
New value chains: creation

RESIDUAL BIOMASS TRANSFORMATION

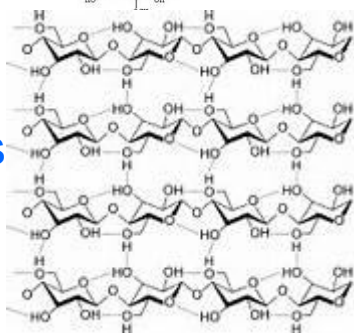
BIOMAS
Biological
byproducts



lignin

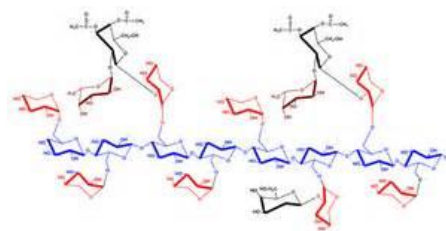


Cellulose



Hemicellulos

Proteins



Food products:

Feed products

Biomaterials:: composites,
binders,phenols

Bioproducts: sugars
and biomaterials,

Biofuels

Energy



CASCADING USE BIOMASS



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

New value chains: creation

BIOMAS
Yellow (straw,
wood, paper
pulp)



pretreatment



Enzimatic
treatment



Microorganism
cultivated
on sugars



Bioethanol



Biochemical



bioplastics



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

The importance of Value chains

New value chains: creation

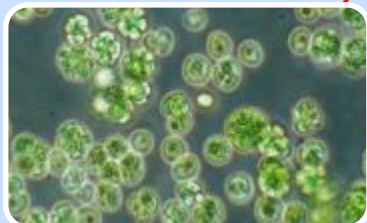


The importance of Value chains

New value chains: creation

BLUE BIOMASS

Seaweed and
non food fish,



Bycatch
Wastes from
fish industries



pretreatment



Enzymatic
treatment



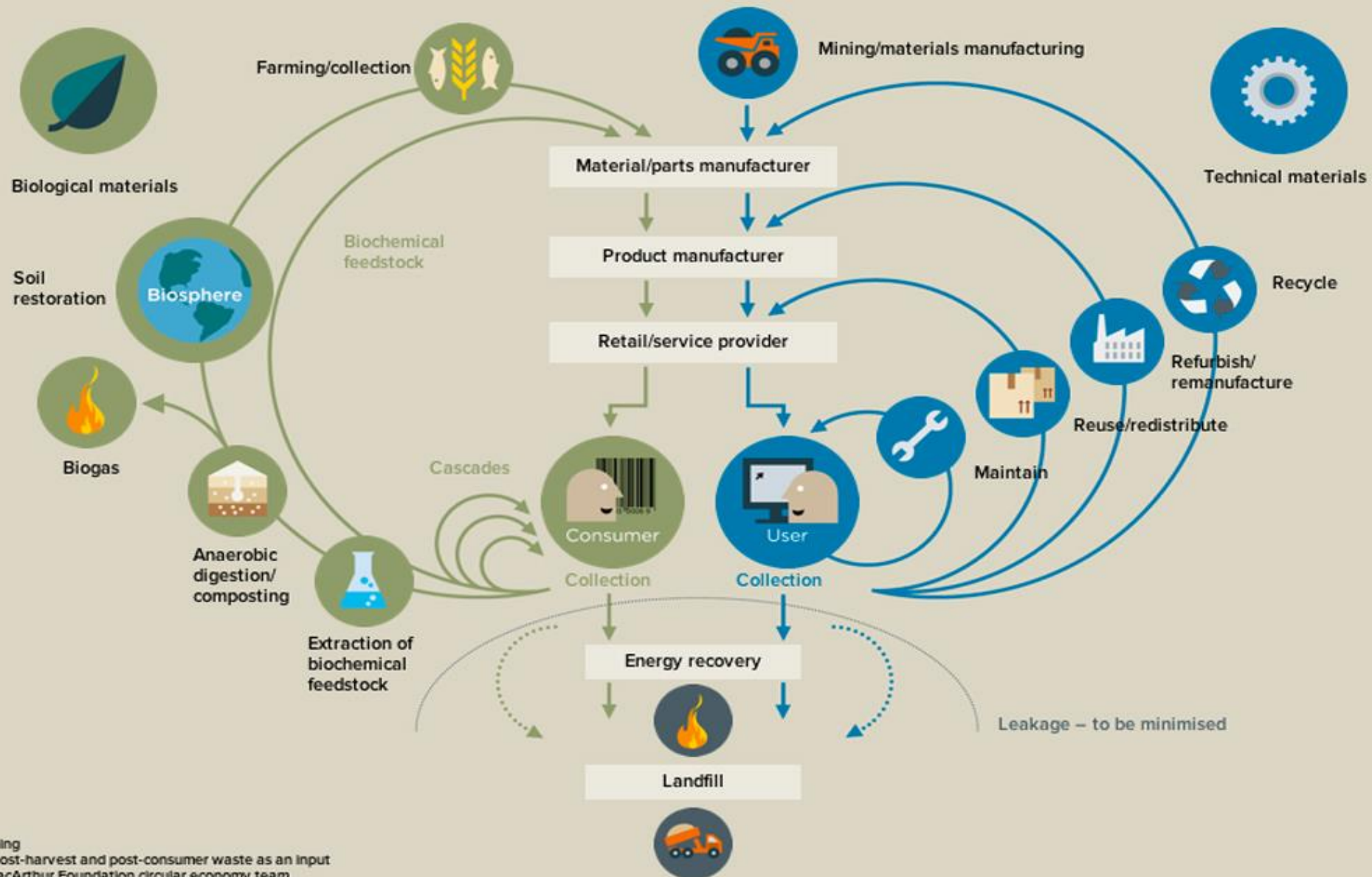
- Food components
- Health promoting substances
- Feed protein
- Skin care
- Cosmetics
- Other bioproducts



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

Bioeconomy: the tool for the circular economy in biological resources

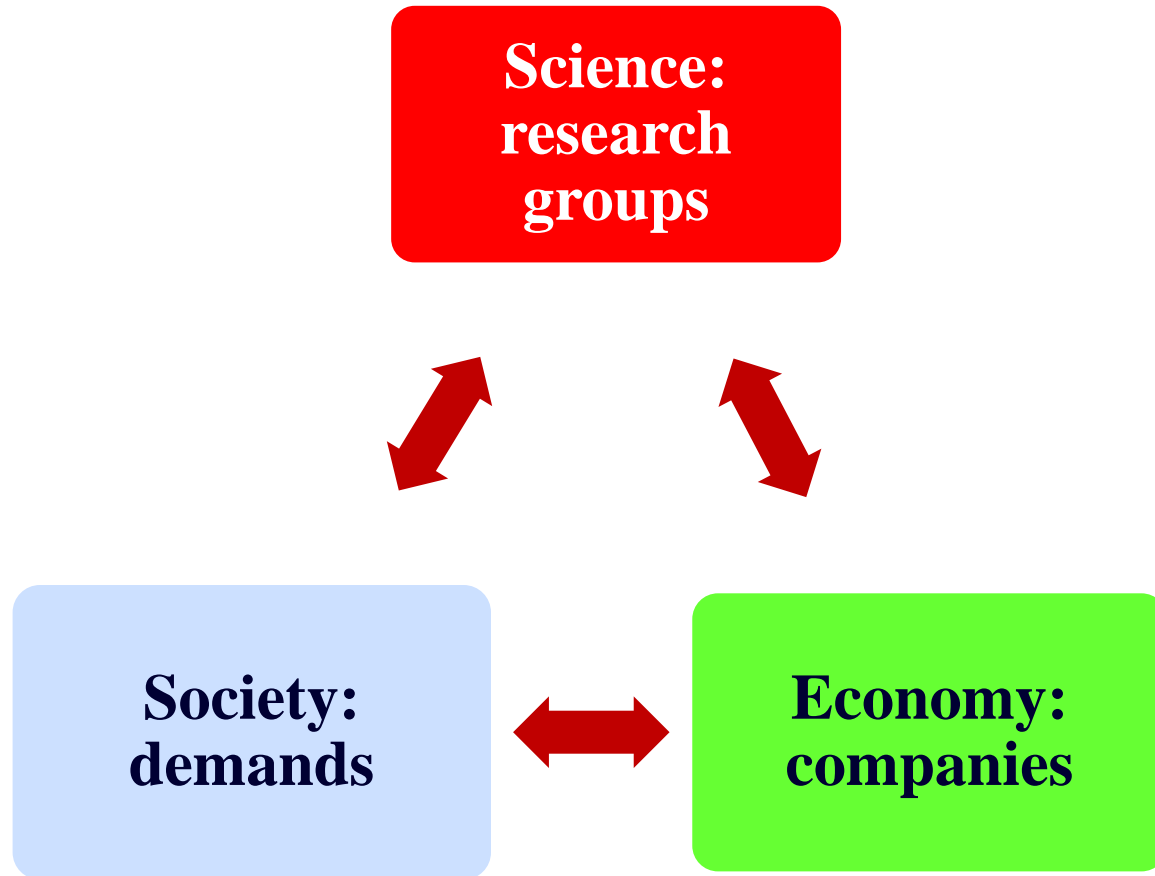


1 Hunting and fishing

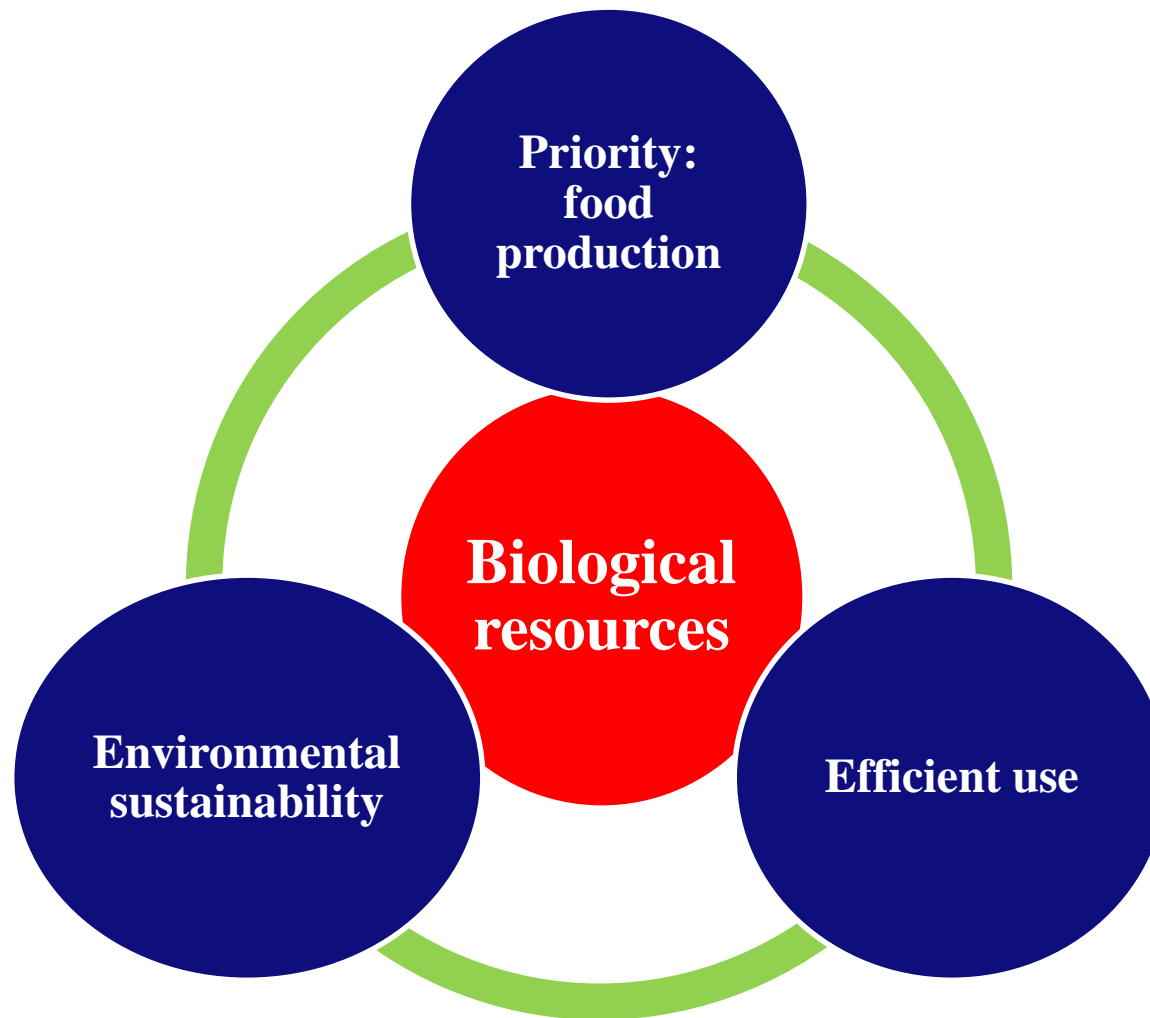
2 Can take both post-harvest and post-consumer waste as an input

SOURCE: Ellen MacArthur Foundation circular economy team

What is necessary for new value chain



What is the basics for the Spanish bioeconomy



GOBIERNO
DE ESPAÑA

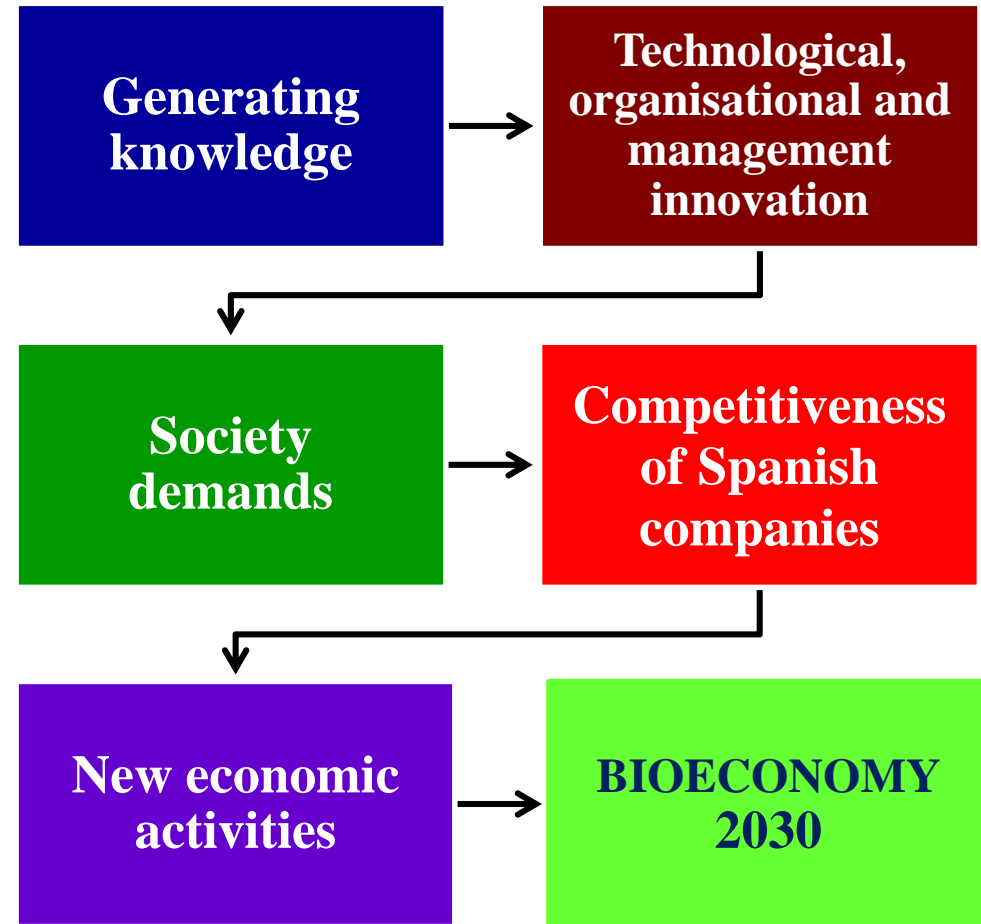
MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

Strategic Targets

The Objectives of the Spanish Bioeconomy Strategy



Estrategia española
de Bioeconomía
Horizonte 2030



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

Set of economic activities

- Products
- Services

Use of resources of biological origin

- Efficiency
- Sustainability

For the production and merchandising

- Market food
- Forestry products
- Bioproducts
- Bioenergy

**which are respectful of the environment,
along with the development of rural areas**

1. Collaboration between the Spanish administrations and the productive sectors

2. Interaction between the public and private Spanish and International science and technology systems and the productive sectors and their companies, stimulating the creation of multidisciplinary teams

3. Application of scientific know-how to the market and innovation



Operational Targets

The Objectives of the Spanish
Bioeconomy Strategy

**4. Identify limitations on
bioeconomy expansion**

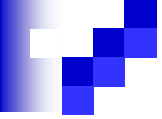
**5. Integrate all the backup tools for
bioeconomy development**

**6. Facilitate the internationalization of
companies, science and innovation**



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD



Operational Targets

The Objectives of the Spanish
Bioeconomy Strategy

7. The generation and development of tools for employee education and training.

8. Knowledge, dialogue and social awareness of the bioeconomy, taking in all the scientific, social, economic and financial players and society in general.

9. Rural economic development and productive activities diversification

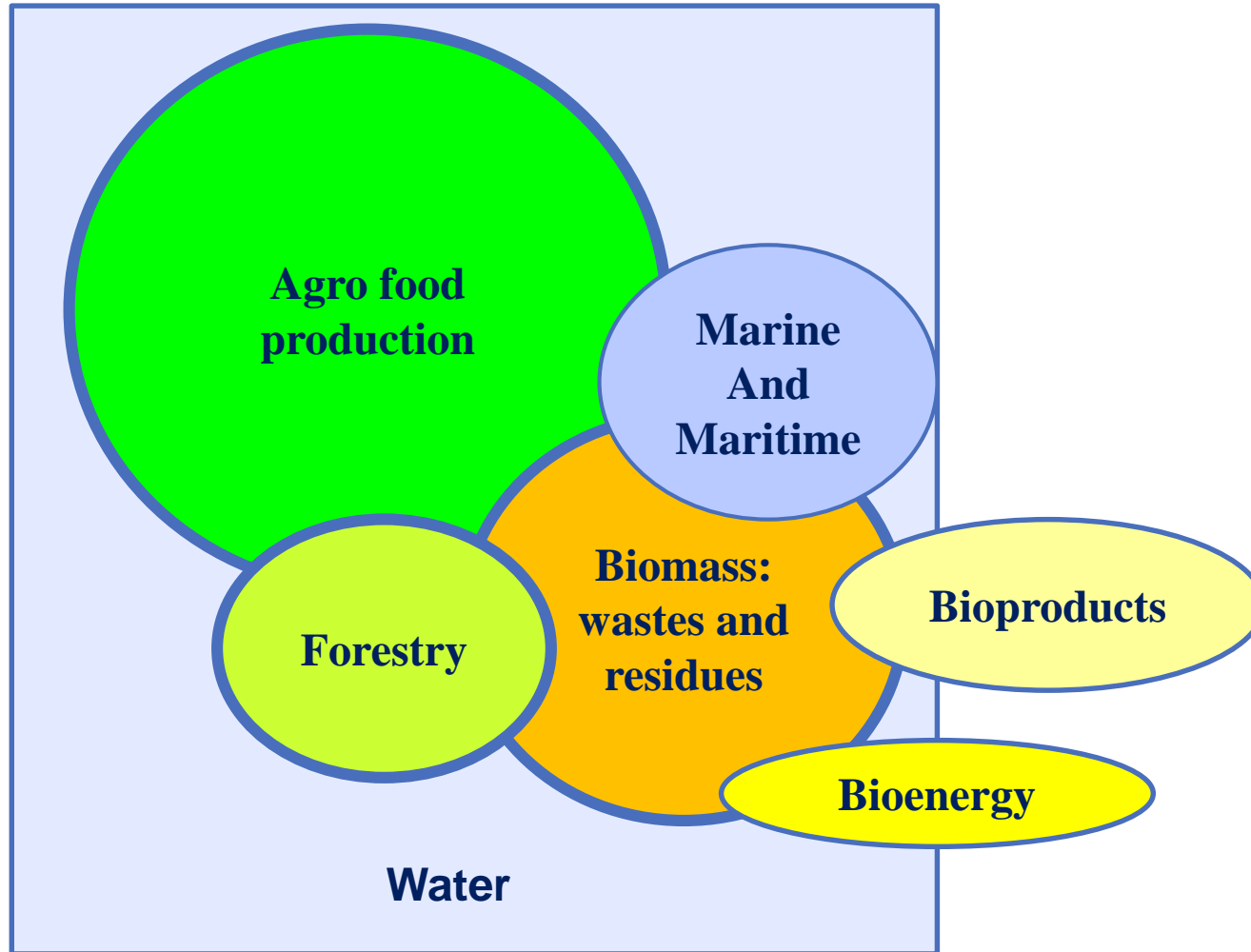
10. Measures to mitigate climate change



GOBIERNO
DE ESPAÑA

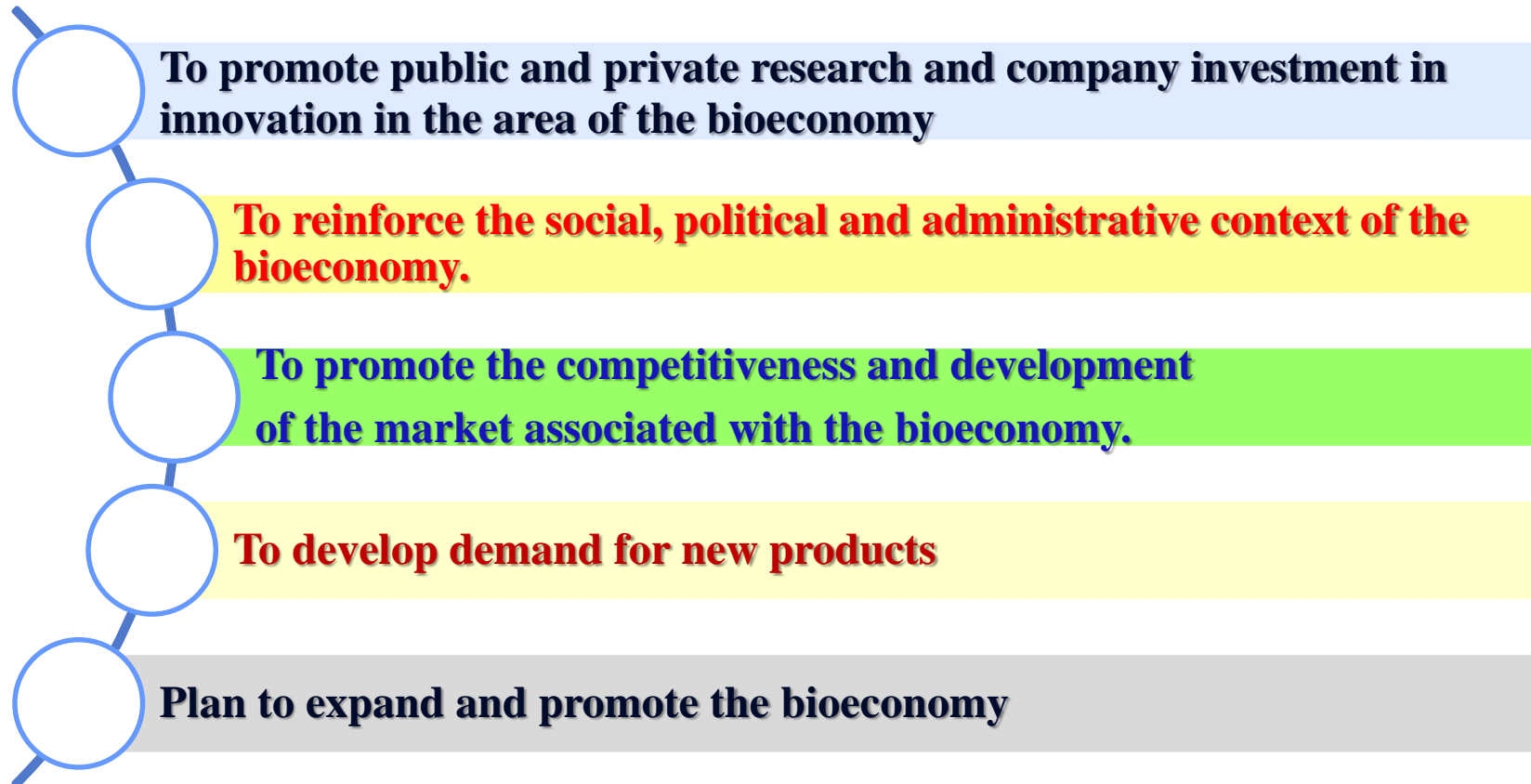
MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

The scope for the spanish strategy on bioeconomy



¿How to promote the bioeconomy development?

The Spanish Bioeconomy Strategy
Strategic Lines



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

1. To promote public and private research and company investment in innovation in the area of the bioeconomy.



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

1. To promote public and private research and company investment in innovation in the area of the bioeconomy

1. Multidisciplinary alliances of researchers and companies, guaranteeing research that targets: H2020, State Plan, PDR, Regional Operating Programmes

2. Operational groups in the European Innovation Partnership (EIP) in rural development programs (PDR).

3. To develop models to facilitate the funding of pilot projects and demonstration plants, combining various public and private financial instruments

4. Aanalyze successful public-private collaboration models in generating business innovation based on public/private research

5. Annual conference on the bioeconomy

6. To promote knowledge of the bioeconomy among private financial institutions and risk-capital companies

7. To develop a repository of raw data on Spanish public research projects in the sphere of bioeconomy

8. To strengthen and enhance interaction between the structures and existing operating networks: technological platforms and campuses of excellence



2. To reinforce the social, political and administrative context of the bioeconomy



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

2. To reinforce the social, political and administrative context of the bioeconomy

Spanish bioeconomy observatory

- ☐ Follow –up group State Administration.
- ☐ Spanish Bioeconomy Strategy Management Committee :
 - Monitoring group.
 - Technical scientific support group.
 - Technological networks group.

Program for social divulgation and dialogue on bioeconomy

- ☐ Exchange of views
- ☐ Dissemination of knowledge
- ☐ Communication strategy. FECYC.
- ☐ Informal Bioeconomy Policy Group.

To generate a broad group of parties interested in bioeconomy matters

Research groups, companies, technological platforms, innovation agents, organizations and NGOs

Training in the bioeconomy field

- ☐ universities,
- ☐ Inside formal education system
- ☐ Outside formal education system.

Cooperation and international exchange



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

3. To promote the competitiveness and development of the market associated with the bioeconomy.



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

3. To promote the competitiveness and development of the market associated with the bioeconomy.

To develop the concept of social and environmental sustainability

To identify legal, administrative or other limitations to bioeconomy development: laws, administratives, etc.

To promote exports and internationalisation in the field of new bioproducts

To promote the development of chains of value

To analyse the standardisation and certification processes

To seek for alternatives to current productive and organizational models



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

4. To develop demand for new products.



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

4. To develop demand for new products.

Identification of products and limitations

- ☐ On technologic
- ☐ On finance
- ☐ In demand

Innovative public procurement

Labelling system for bioproducts



5. Plan to expand and promote the bioeconomy



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

5. Plan to expand and promote the bioeconomy



To compile and explain successes demonstrates the bioeconomy's possibilities.



To promote potential R+D+i programmes related to the bioeconomy:

- **At the national, regional and international levels**
- **Autonomous Communities and locally**



Linking Spanish successes to similar measures articulated in another international sphere.



Action Plan 2016 -2017



1. To promote public and private research and company investment in innovation in the area of the bioeconomy.

**The Spanish strategy
Action Plan 2016-17**

- **To fund research projects through the related calls by the bodies authorized.**
 - Challenge 2. State Plan R+D+I
- **To create a coordinated program of seminars, forums and meetings.**
 - 10 talks all around Spain
 - CONAMA Session: Bioeconomy as a tool for circular economy
- **To develop a course about management and financing of bioeconomy**
 - 1 course Madrid: 40 hours, 250 people
- **To organise a Spanish conference on bioeconomy.**
- **To analyse successful public-private collaboration models.**



Estrategia española
de Bioeconomía
Horizonte 2030

PLAN DE ACTUACIÓN 2016



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

2. To strengthen the bioeconomy's social, political and administrative frame of reference.

- **The Spanish Bioeconomy Observatory:**
 - ☐ Creation of the Spanish Bioeconomy Strategy Monitoring Group.
 - ☐ Establishment of the Spanish Bioeconomy Strategy Management Committee.
- **Promoting the strategy in the Autonomous Communities and Local Bodies**
- **Programme of publicity and social dialogue**
 - ☐ Identifying society's perception of the subject, FECYT, consumidores, medios, ONG, etc,
 - ☐ Exchange of opinions with representatives of the productive sectors, consumers, opinion makers, NGOs, etc.
 - ☐ Making the strategy known with Observatory members
 - ☐ To design a base strategy to foster education in the bioeconomy
- **To identify the IT platform on which to site exchange of opinions.**
- **International cooperation and exchange by the Monitoring Group and Management Committee or their members.**



ANÁLISIS SOBRE LA PERCEPCIÓN SOCIAL DE LA BIOECONOMÍA

SIGMADOS





1. OBJECTIVES

The main goal is identify what is the bioeconomy's concept perception between the general population:

1. **KNOW THE MEANINGS ASSOCIATED TO BIOECONOMY IN THE SPANISH POPULATION.**
2. **IDENTIFY RISKS AND BENEFITS IN THE IMPLEMENTATION OF THE STRATEGY.**
3. **BUILD THE KEY IDEAS TO DESIGN EFFICIENT COMMUNICATION MESSAGES ADAPTED TO DIFFERENT STAKEHOLDERS GROUPS.**



2. METHODOLOGY

The methodology applied for this research was **Discussions Groups**. Ten groups were organized taking into consideration the **next variables**:

SEX: MEN and WOMEN, although some groups were only men and only women.

AGE: People aged 18-70 divided by age ranges. Homogeneous representation of ages

ATTITUDE OR RELATIONSHIP WITH THE ECOLOGICAL WORLD:

ACTIVISTS IN NETWORKS: active members in organizations and ecological associations on Facebook, Twitter and other social networks.

Youngers: 18 – 30

Middle ages: 30-40

NGO WORKERS: People linked to environmental organizations.

Youngers: 18 – 35

Middle ages: 35-65

RELATED WITH SOME AREA OF THE SPANISH STRATEGY

- **FARMERS:** from 30-70 years related to areas of the WEB: food, bioenergy
- **RESEARCHERS** 25-65 years linked to different areas of BSE (eg Biotechnology)

2. METHODOLOGY

MADRID	VALENCIA	SEVILLA	MURCIA	BILBAO	VALLADOLID	BCN
FG 1 JOVEN 18-29 (23,57a*) Activista en Redes MUJERES (7M)	FG 4 JOVEN 18-29 (22,42a) Con estudios universitarios MIXTO (3H, 4M)	FG 5 JOVEN 18-29 (22,57a) Sin estudios universitarios MIXTO (3H, 4M)	FG 6 30-70 (33 a) Agricultor - alimentación HOMBRES (6H)	FG 7 JOVEN 18-35 (26a) Trabajador ONG MIXTO (4H, 3M)	FG 8 30-70 (49,85a) Agricultor - bioenergía HOMBRES (7H)	FG 9 MEDIANA EDAD 30-40 (33) Activista en redes MIXTO (3H, 4M)
FG 2 25-65 (48 a) Investigador – diversas áreas MIXTO (7H, 1M)						FG 10 25-65 (36,28a) Investigador – biotecnología y alimentación MIXTO (4H, 3M)
FG 3 RESTO EDADES 36-65 (45,83a) Trabajador ONG MIXTO (3H, 4M)						

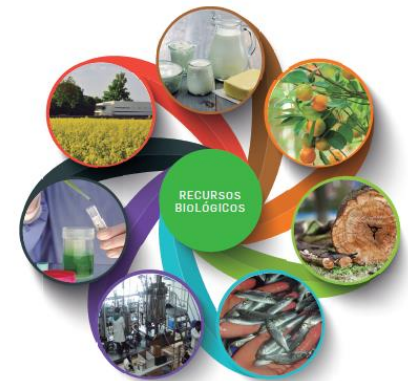
*Edad media de los grupos entre paréntesis

TOTAL: 10 FG

1. SOCIAL PERCEPTION ABOUT BIOECONOMY'S CONCEPT
2. STRATEGIES AND APPLICATIONS ASSOCIATED TO BIOECONOMY. RISKS AND OPPORTUNITIES.
3. INSTITUTIONS IN CHARGE OF PROMOTING TECHNOLOGIES.
4. KEYS TO DESIGN AND EFFECTIVE EEB'S COMMUNICATION STRATEGY
5. CONCLUSIONS

3. In the field of competitiveness and market development

- Compiling the environmental footprints of products
- Encouraging research projects aimed at defining the sustainability indicators applicable to our productive systems.
- The identification of legal, administrative or other limitations which may impair development of the bioeconomy.
- Promoting the development of chains of value



Estrategia española
de Bioeconomía
Horizonte 2030

PLAN DE ACTUACIÓN 2016

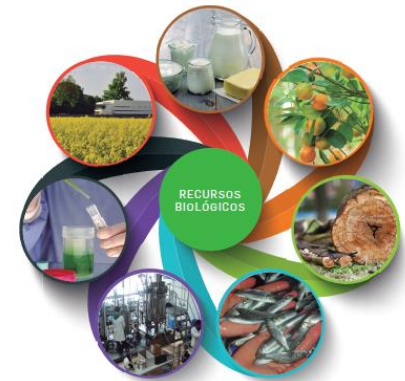


GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

4. In developing demand for new products.

- Cases successfully applied in the bioeconomy field.



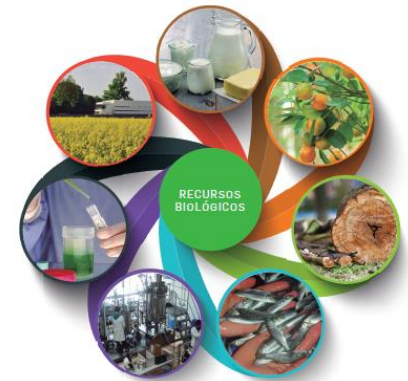
Estrategia española
de Bioeconomía
Horizonte 2030

PLAN DE ACTUACIÓN 2016



5. Plan for the expansion of the bioeconomy

- To create a repository of bioeconomy case study good practices.
- To promote bioeconomy strategies in autonomous regions



Estrategia española
de Bioeconomía
Horizonte 2030

PLAN DE ACTUACIÓN 2016

<http://bioeconomia.agripa.org/>



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD



Muchas gracias