ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

CENTRO INTERDIPARTIMENTALE
ALMA MATER INSTITUTE ON HEALTHY PLANET

AZIONI NAZIONALI E DELL'UNIVERSITÀ DI BOLOGNA A SOSTEGNO DELLA SALUTE DELL'AMBIENTE E DELLE PERSONE

Bologna, 18 Luglio 2022

Sala delle Armi – Palazzo Malvezzi, Via Zamboni, 22. Bologna

La salute e la produttività del pianeta dipendono da complesse interazioni tra gli esseri viventi, gli ecosistemi e l'ambiente in cui vivono e la loro salvaguardia e rafforzamento richiedono una efficace interconnessione dei settori indicati, con partnership trans-disciplinari e multi-attore, come raccomandato dal European Green Deal, dalla Strategia Europea per la Bioeconomia, dallo Europe's Beating Cancer Plan, dal One Health Action Plan e dai Sustainable Development Goals.
Il **Centro Alma Healthy Planet** opera a questo fine, promuovendo la divulgazione delle **attività di ricerca e di innovazione sviluppate dall'Ateneo nei campi distintivi e multidisciplinari della salute dell'uomo e dell'ambiente**, fortemente interconnesse.

Gli argomenti trattati dal Centro comprendono la prevenzione e cura del cancro, la lotta alla resistenza agli antibiotici, la promozione dell'invecchiamento attivo e in salute, la prevenzione di malattie croniche non trasmissibili tramite la dieta e stili di vita salutari, ma anche le sfide annesse alla rigenerazione degli ecosistemi, dei suoli e delle acque, sia marine che interne, e della biodiversità, alla produzione sostenibile di materie prime agroforestali, di cibo sano e di qualità o alla creazione di città smart ma anche verdi e circolari, in grado di salvaguardare e promuovere la salute.

L'obiettivo dell'incontro è presentare alla comunità dell'Università di Bologna il contributo del Centro al sostegno delle attività volte a tutelare la salute dell'uomo e dell'ambiente, attraverso la discussione di iniziative messe in campo dal Paese e dall'Università di Bologna.

Moderatori:
Andrea PESSION, Università di Bologna, Vice Direttore Centro Alma Healthy Planet; Patrizia BRIGIDI, Università di Bologna, Referente ricerca Centro Alma Healthy Planet

9,00 - Saluti di Benvenuto
Luca FONTANESI, Università di Bologna, Delegato del Rettore alla Ricerca competitiva

9,15 - Il Centro Healthy Planet, sue competenze e potenzialità per il public engagement
Fabio FAVA, Università di Bologna, Direttore Centro Alma Healthy Planet

9,30 - **I Cluster Tecnologici Nazionali e le loro azioni per la promozione e diffusione della Ricerca e dell'Innovazione nei settori della salute dell'uomo e dell'ambiente**

Cluster Advanced Life Sciences ALISEI: Silva Bortolussi, Università di Pavia - Commissaria espressione degli Enti Nazionali di Ricerca

Cluster Crescita Blue BIG: Roberto Cimino, Vice Presidente Cluster Tecnologico Nazionale Crescita Blue Big

Cluster Circular Bioeconomy SPRING: Lucia Gardossi, Università di Trieste, Presidente comitato scientifico

Cluster Agroalimentare CLAN: Massimo Iannetta, ENEA, Presidente comitato Scientifico

10,30 - **Il Comitato Nazionale Biosicurezza, Biotecnologie e Scienza della Vita (CNBBSV) della Presidenza del Consiglio e le sue azioni a sostegno della salute dell'uomo e dell'ambiente**

Il Comitato Nazionale Biosicurezza, Biotecnologie e Scienza della Vita (CNBBSV) e il Health City Institute (HCI)
Andrea LENZI, Università di Roma "La Sapienza", Presidente di CNBBSV e HCI, Presidenza del Consiglio dei Ministri

Le strategie nazionali per la Bioeconomia e il Microbioma
Fabio FAVA, Università di Bologna, Coordinatore Gruppo Coordinamento Nazionale Bioeconomia, CNBBSV, Presidenza del Consiglio dei Ministri

11,00 - **Coffee break**

11,15 - **Attività progettuali dell'Università di Bologna finanziate dal PNRR a sostegno della salute dell'uomo e dell'ambiente**

Le opportunita' offerte dal PNRR
Maurizio SOBRERO, Università di Bologna, Coordinatore Commissione PNRR

Il Centro Nazionale Bio-Diversità
Alessandro CHIARUCCI, Università di Bologna

Il Centro Nazionale Tecnologie dell'Agricoltura
Attilio TOSCANO, Università di Bologna

Il Centro Nazionale Sviluppo di Terapia Genica e Farmaci con Tecnologia a RNA
Federico PEA, Università di Bologna

Il Centro Nazionale Mobilità Sostenibile
Nicolò CAVINA, Università di Bologna

Il Centro Nazionale Simulazioni, Calcolo e Analisi dei Dati ad Alte Prestazioni
Daniele BONACORSI, Università di Bologna

12,45 **Discussione**

13.00 **Conclusioni e azioni future**
Valerio CARELLI, Università di Bologna, Referente Pilastro Salute del Centro Alma Healthy Planet
Attilio TOSCANO, Università di Bologna, Referente Pilastro Bioeconomia del Centro Alma Healthy Planet
Fabio FAVA, Università di Bologna, Direttore Centro Alma Healthy Planet

9.15 – 9.30

Il Centro Healthy Planet, sue competenze e potenzialità per il public engagement

Fabio Fava

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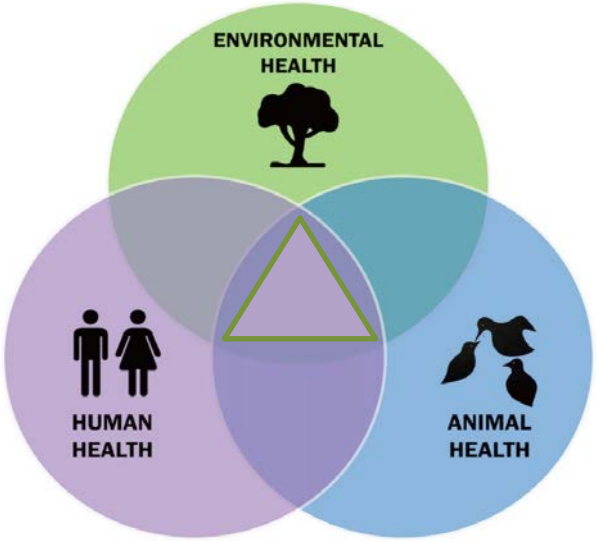
The need for a healthier planet and the mission of the Center *Alma Healthy Planet*

Fabio Fava

Alma Healthy Planet & DICAM, UNIBO

(fabio.fava@unibo.it)

A healthier Environment for healthier people



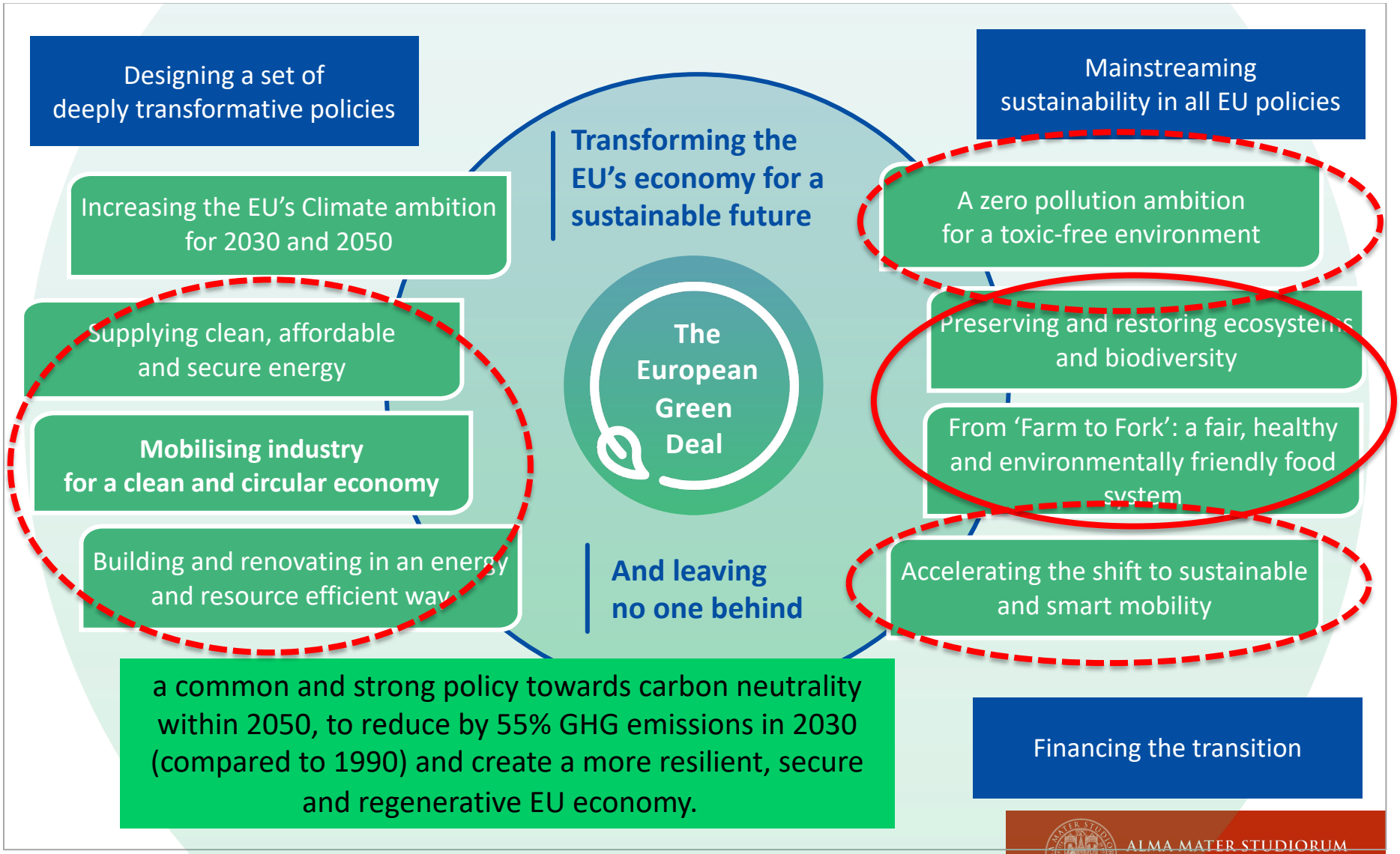
The ecosystem health and the human and animal health are inextricably linked. Environmental factors account for almost 20% of all deaths in Europe.

The quality of clima, air, water, food and nature-based services are impacting on human health and on the outbreak of a number of non communicable chronic and transmissible diseases.

Priority actions:

- prevent/reduce the release of hazardous chemicals, pesticides, antibiotics, etc and to provide citizens with nutritious, affordable and safe food;
- restore polluted soils, sediments and wasters via regenerative biobased solutions;
- prevent/reduce gas emissions, deforestation, land/soil degradation use changes ;
- regenerate biodiversity, ecosystems and the associated services in forest, rural, coastal and urban areas (where 55% of the world's population is living);
- better understanding of environmental determinants of health, to design and built more effective health-promoting living and working environments, lifestyles, behaviors, and diets, improve prevention, diagnosis, treatment and aftercare of env. associated diseases.

The European Green Deal



https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

Nature-Based Solutions and citizens' health and wellbeing

Nature based solutions and green areas in cites

- Parks
- Urban Forest
- Green Roofs and walls
- Urban farming and horticulture
- Rain Gardens
- Sustainable Urban Drainage Systems
- Constructed wetland

Related services and functions

Regulating services by nature

- Cooling effect and microclimate regulation
- Air filtering
- Water management

Cultural services by nature

- Physical recreation and activities
- Cultural and experiential recreation
- Social cohesion
- education

Health and wellbeing benefits

Health & wellbeing benefits

Direct benefits

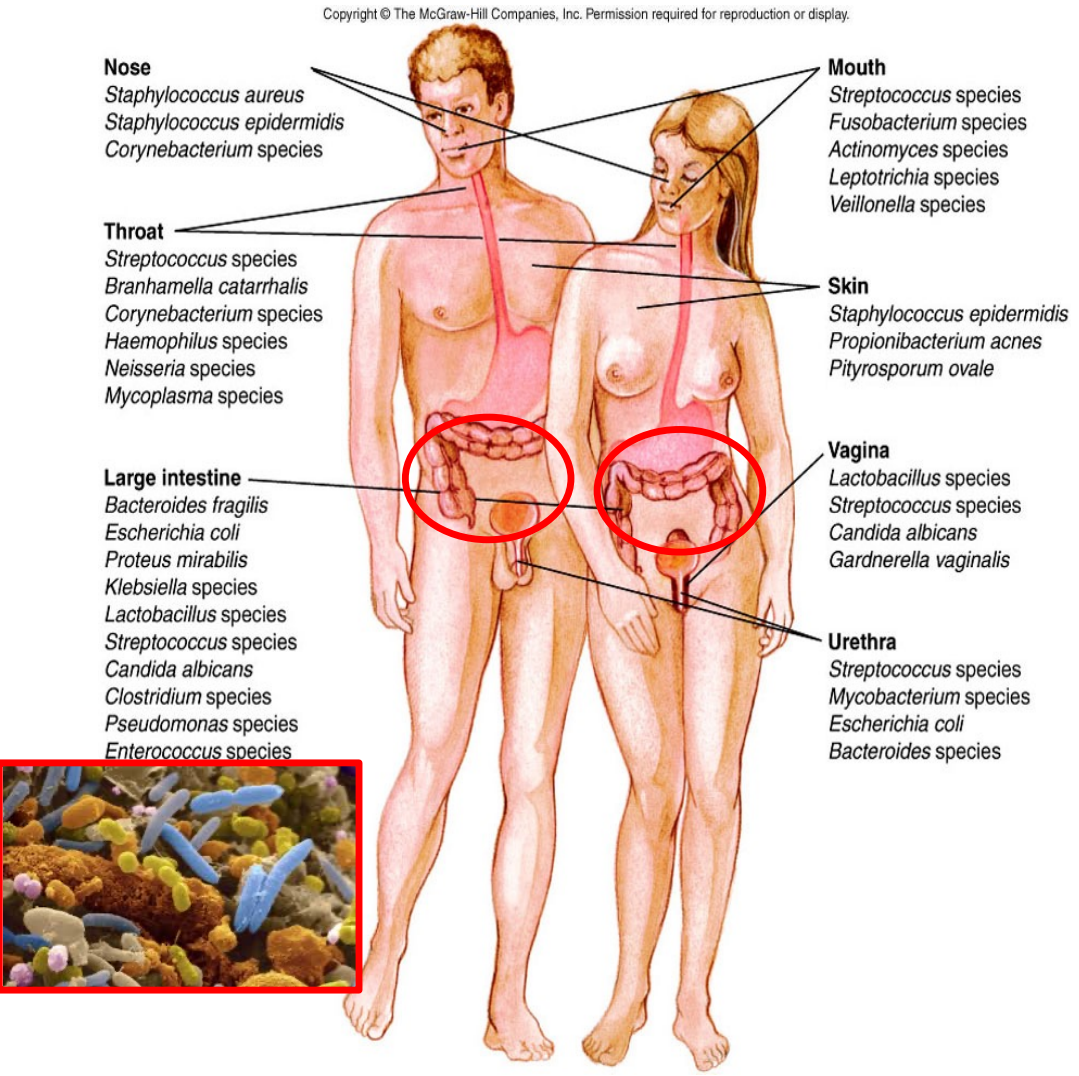
- Respiratory symptoms incidence
- Cancer incidence reduction
- Stroke reduction and Cardiovascular disease

Indirect benefits – need interaction and use of the space

- Metabolic disease (i.e obesity)
- Stress release
- Anxiety
- Depression
- Children cognitive development
- Self-esteem

Microbiomes in human

Microbiomes (i.e. Bacteria, Archaea, Eukarya and viruses) habit our body mainly the gastrointestinal tract (at 10^{12} CFU/g ,up to 1.5 kg)

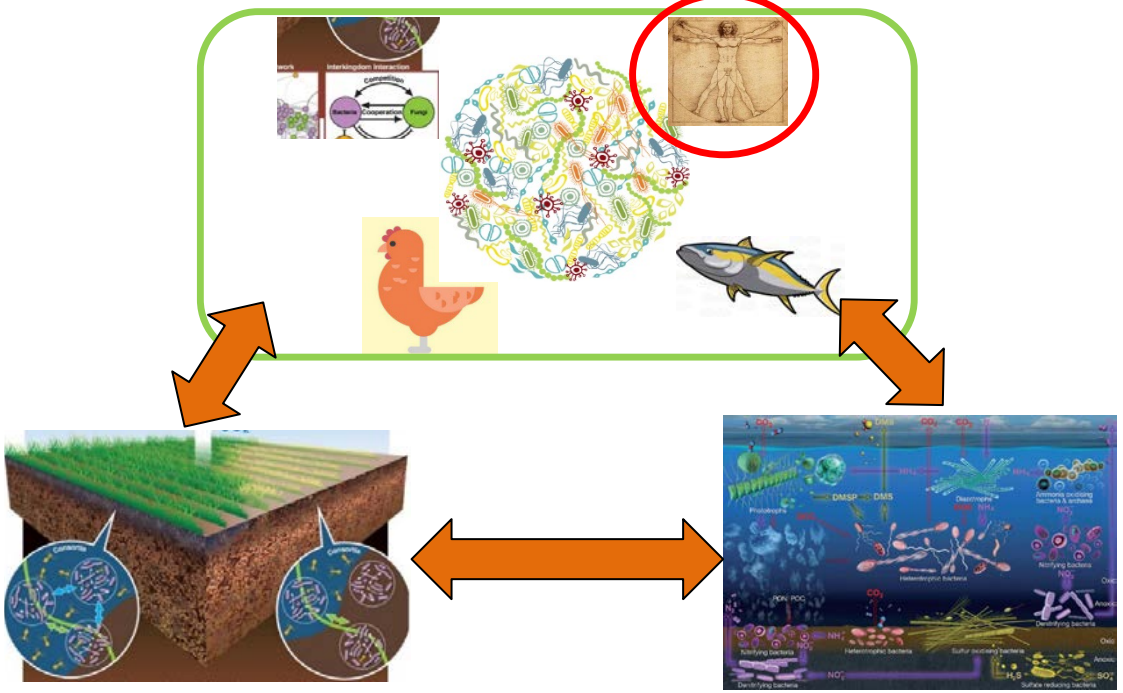


Health promoting functions :

- enhancement of the digestive efficiency and modulation of energetic homeostasis
- strengthening of the gastro-intestinal epithelium impermeability
- competitive barrier against colonization/invasion
- detoxification of xenobiotics
- vitamin synthesis
- central nervous system modulation
- endocrine system modulation
- development, education and function of the immune system

Microbiomes and health along the whole life chain

Microbiomes (i.e. Bacteria, Archaea, Eukarya and viruses) **inhabit humans, plants, animals and the terrestrial and marine environments**, and provide benefits to all living organisms. Microbiomes of different compartments **are apparently interconnected**



→**Microbiome-based approaches can promote human health and a higher, healthier, and more sustainable productivity across the whole food system.**

BUT R&I are needed to **clarify the interplay between microbiomes and environment, nutrition and host variables and to to better design microbiome-based interventions.**

The Healthy Planet needs and the role of the Center

The implementation of the healthier planet priorities asks **for multidisciplinary, cross-sectorial approaches and partnerships, jointly designed actions** among medical doctors, veterinarians, environmentalists, economists, sociologists etc with the **exploitation of infrastructures, research & innovation, and education projects/programs on health and bioeconomy domains**. **Citizens, consumers, health care professionals, providers and payers, public health authorities and regulators, and communities have to be also engaged** in the co-designing and the implementation of the actions, to ensure their full impacts.

The **Center *Alma Healthy Planet* originated from the "Center on Cancer"** developed by Prof. Giorgio Prodi (in 1984) to promote synergies between the UNIBO health institutes working on preclinical and clinical oncology; **it is now combining the former center patrimony of strategic expertise, infrastructures and partnerships with the ones provided by 22 UNIBO Departments of the scientific, technical and social-economical and humanities domains, active in co-designing and implementing R&I, MS and PhD education, communication and engagement initiatives** in the wide **areas of health and bioeconomy**.

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The Center Alma Healthy Planet: available expertise

Expertise available in the multidisciplinary fields of Health and Bioeconomy **are, among others**:

a) the global challenges related to **safeguarding human health** in relation to an **increasingly polluted and degraded environment (esposoma)**;

b) the **prevention and treatment of cancer**;

c) the **prevention and management of antibiotic resistance**;

d) the **promotion of active and healthy ageing**;

e) the **prevention of chronic diseases that cannot be transmitted through diet and healthy lifestyles**;

f) the **development of innovative and interconnected healthcare systems**;

g) the protection and s**ustainable regeneration of soil, marine and inland water, biodiversity and ecosystems**;

h) the **sustainable production of healthy and high quality food, feeds and biobased products**;

i) the **co-designing, implementation of smart, circular and healthy cities**;

l) **infections agents spreading in/via the environment, monitoring, management and adaptation**

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Expertise recognised in EU and connected with prominent national initiatives….

- **Ranking UNIBO in H2020 SC1 (health)**

31 participations for a total EC Grant € 14.339.674:

- **3° in Italy, 1° Italian University**

- **Ranking UNIBO in H2020 SC2 (Bioeconomy)**

53 participations for a total EC Grant € 21.826.952:

- **1 ° in Italy**

EU institutions: JRC, EC; EIT Food, Climate-KIC, EIT Raw Materials, BIC, The Guild Initiative, The "LIFETIME" Technology platform initiative, The European Large Scale Research Initiative "RESTORE", UNAEUROPA, EU Bioeconomy University, etc

- **The National Technology Clusters** on Health (ALISEI), Agrifood (CL.A.N.), Biobased industry (SPRING) and Blue Growth (BIG), **etc**
- **the National Committee of Biosafety, Biotechnology and Life Science (CNBBSV) of the Presidency of the Council of Ministers,** and its "National Coordination Group for the Bioeconomy" and the Italian Microbioma Initiative, **the Health City Institute, and the Italian network Cities Changing Diabetes;**
- **Etc.**

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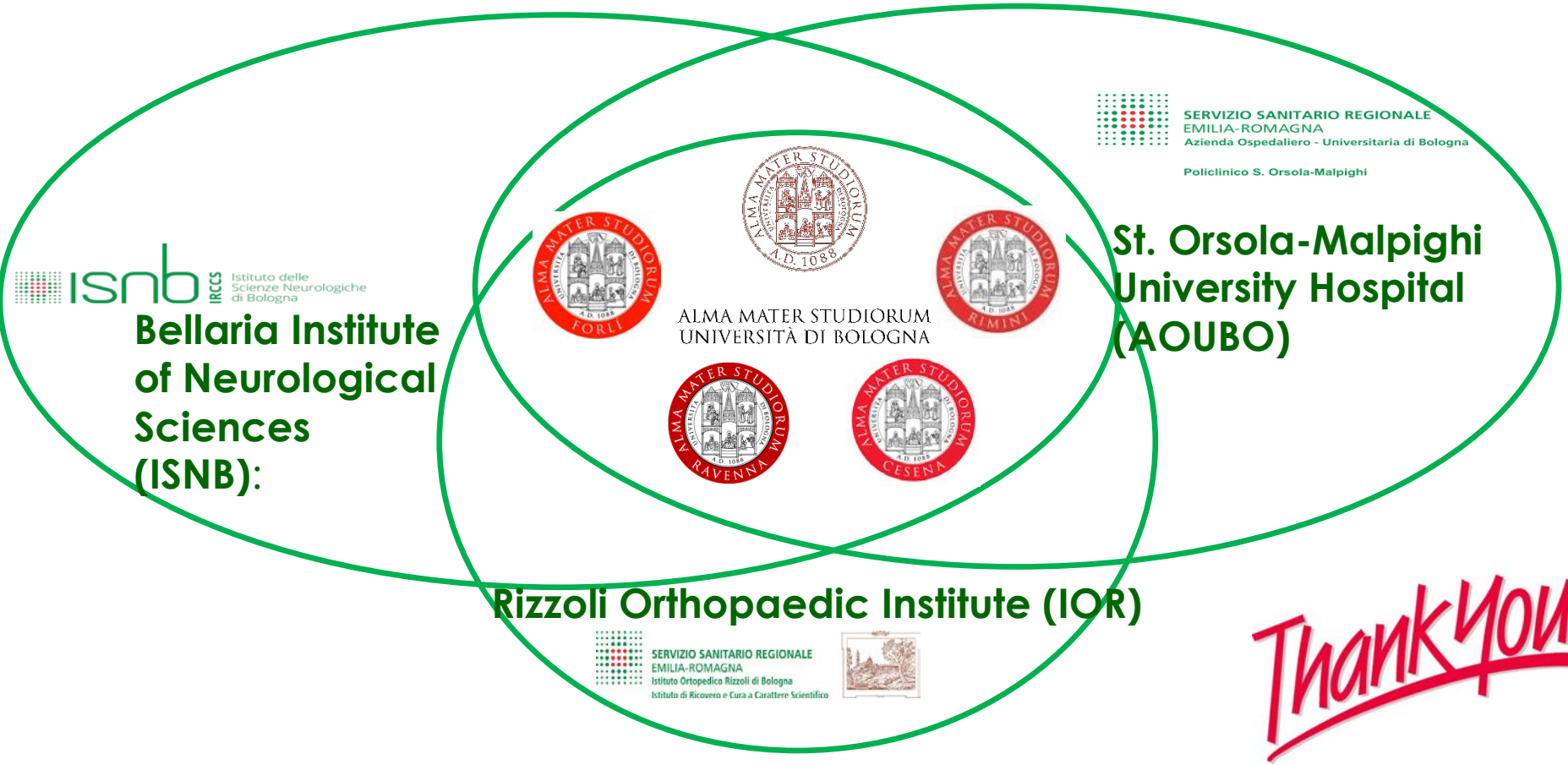
….an ecosystem integrated with the Research Hospitals (IRCCS) of the Bologna Metropolitan area and the UNIBO InterDepartmental Centers



Thank You!

- **The other UNIBO interdepartmental Centers**
- **The UNIBO interdepartmental Centers for Industrial Research** (e.g. Agrifood; Health; Environmental, Energy and Sea; etc)

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9.30-10.30

Cluster Advanced Life Sciences ALISEI

Silva Bortolussi

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ALISEI

Advanced Life Sciences in Italy

I Cluster Tecnologici Nazionali e le loro azioni per la promozione e diffusione della Ricerca e dell'Innovazione nei settori della salute dell'uomo e dell'ambiente

Il Centro Healthy Planet, sue competenze e potenzialità per il public engagement

18 luglio 2022

SILVA BORTOLUSSI Commissaria espressione degli Enti Nazionali di Ricerca – ALISEI

Ministero dell'Università e della Ricerca

I cluster tecnologici nazionali sono reti di soggetti pubblici e privati che operano sul territorio nazionale in settori quali la **ricerca industriale**, la **formazione** e il **trasferimento tecnologico**. Funzionano da **catalizzatori di risorse** per rispondere alle esigenze del territorio e del mercato, **coordinare e rafforzare il collegamento tra il mondo della ricerca e quello delle imprese**.

ALISEI

Advanced Life Sciences in Italy

5 Associazioni Imprenditoriali

14 Rappresentanze Territoriali

4 Enti Nazionali di Ricerca

ALISEI

Advanced Life Sciences in Italy

Rappresenta il settore italiano di Scienze della Vita

INCORAGGIARE

L'interazione tra ricerca, industrie e settore della salute pubblica

MIGLIORARE

Ricerca, innovazione, TT e partnership

ATTIVARE

un dialogo tra le Istituzioni e i protagonisti del settore

SUPPORTARE

La collaborazione fra i soci

RAFFORZARE

L'attrattività dell'innovazione italiana a livello internazionale

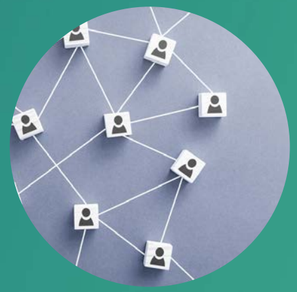
DALLA RICERCA ALL'INDUSTRIA

SUPPORTO AI *POLICY MAKERS*

- Incontri Istituzionali
- *Position paper* sul TT

MIGLIORAMENTO DI R&S E TT

- Participazione a eventi e attrazione di investmenti
- Meet in Italy for Life Sciences
- Supervisione delle attività finanziarie sul TT



NETWORKING

- Costante aggiornamento e pianificazione con i soci
- Collaborazione con i principali attori nazionali del TT
- Mappatura italiana del TT

PIANO DI AZIONE TRIENNALE

ROADMAP TECNOLOGICA

PROGRAMMA DI LAVORO

PIANO STRATEGICO PER IL SUD

PIANO DI AZIONE TRIENNALE

NEW

PROGRAMMA DI LAVORO

- Compagine sociale e rapporti coi Soci
- Incontri istituzionali
- Gestione economica
- Comunicazione
- Personale
- Strumenti informatici
- Manifestazioni e congressi
- Internazionalizzazione
- CTS
- TT
- CENTRO STUDI

ROADMAP TECNOLOGICA

PIANO STRATEGICO PER IL SUD

PIANO DI AZIONE TRIENNALE

ROADMAP TECNOLOGICA

PROGRAMMA DI LAVORO

PIANO STRATEGICO PER IL SUD

- Scienze della Vita come motore di sviluppo economico, sociale e sanitario
- Attrazione degli investimenti
- Aumento di interazione tra diverse realtà italiane

PIANO DI AZIONE TRIENNALE

ROADMAP TECNOLOGICA

Identificare le tecnologie chiave alla base dello sviluppo di soluzioni sostenibili in termini di prodotti e servizi ai cittadini, focalizzati sulla persona e i suoi bisogni, sostenibili, capaci di reagire ai cambiamenti, di garantire trattamenti personalizzati e accessibili a tutti e basati sui dati e le informazioni accumulati.

PROGRAMMA DI LAVORO

PIANO STRATEGICO PER IL SUD

meet in italy FOR LIFE SCIENCES

L’appuntamento nazionale di matchmaking e di aggiornamento nell’ambito delle scienze della vita.

MIT4LS quest’anno prevede un percorso dedicato alle start-up – StartUp Breeding 2022 (SUB2022) che si concretizzerà con un evento finale in programma per il 19 ottobre a Milano.

Il cuore di MIT, i b2b, quest’anno si svolgono in modalità virtuale dal 17 al 19 ottobre 2022

https://meetinitalylifesciences.eu/

CENTRO STUDI

Analisi del settore Scienze della Vita italiano all’interno del contesto internazionale

Proiezioni e previsioni delle dinamiche del settore

Creazione di dati a supporto della promozione del valore del comparto

TECHNOLOGY TRANSFER

Mappatura e analisi delle realtà del TT in Italia

Istituzione di un Tavolo Tecnico Nazionale per TT che rappresenti tutte le realtà mappate

Sviluppo, attraverso il Tavolo Tecnico, di documenti di indirizzo mirati a favorire l'adozione di politiche a supporto del Trasferimento Tecnologico e della relazione tra ricerca e impresa;

Partecipare a progettualità di sistema legate al TT.

ALISEI

Advanced Life Sciences in Italy

SEDE LEGALE
Piazza Città di Lombardia 1
20124 Milano

Tel. 02 82950723
segreteria@clusteralisei.it
www.clusteralisei.it

9.30-10.30

Cluster Crescita Blue BIG

Roberto Cimino

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

THE BLUE ITALIAN GROWTH TECHNOLOGY CLUSTER

Centro Interdipartimentale Alma Mater Institute on Healthy Planet- WORKSHOP

BOLOGNA, 18 JULY 11-12 MAY 2022

Roberto Cimino
Vice President

BIG
Blue Italian Growth
Technology Cluster

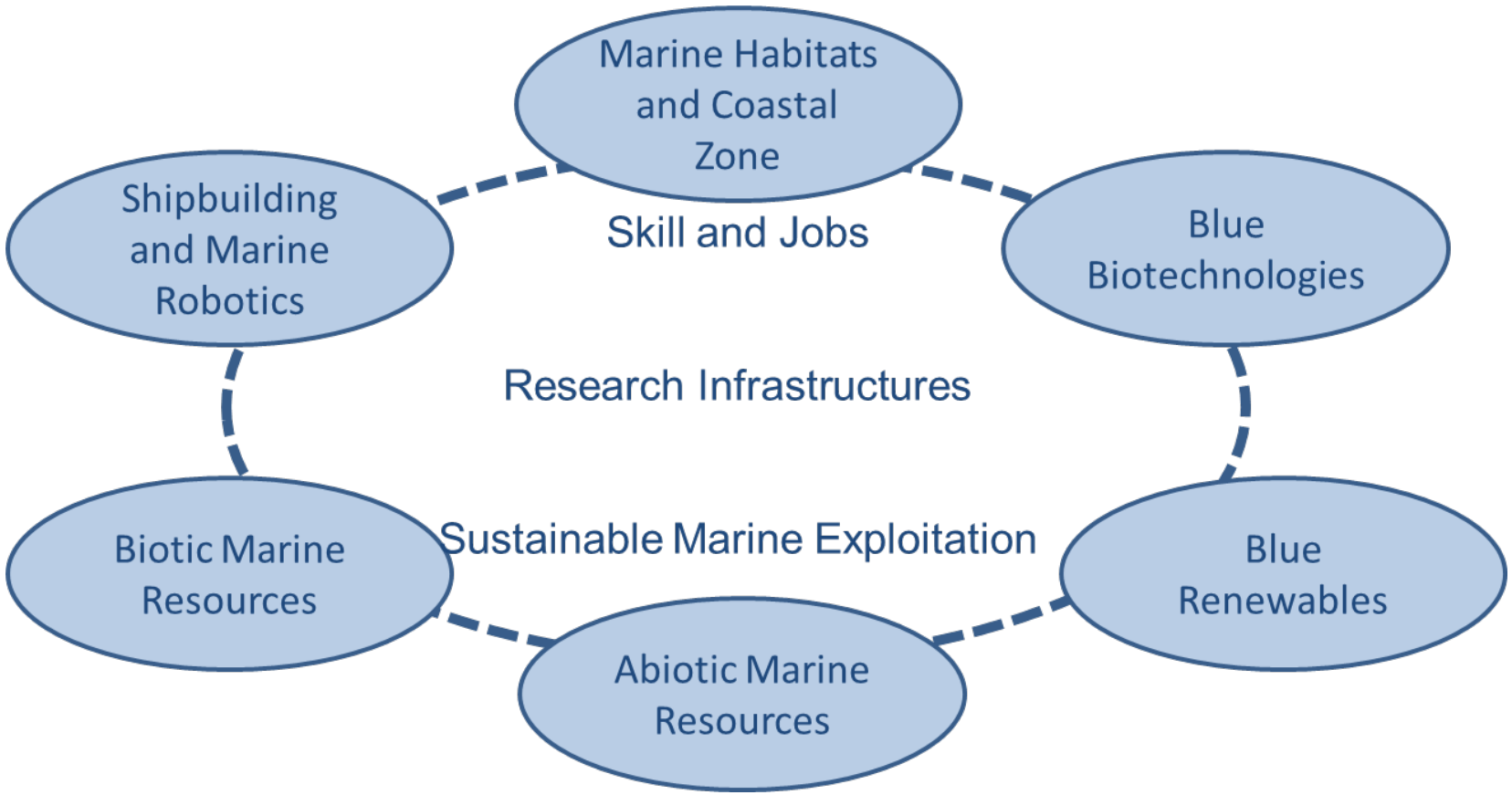
CLUSTER BIG'S FINGERPRINT

Headquarters: Naples (Italy)

- Public-private partnership, aimed at accelerating Technology Transfer;
- 90 members: Universities, Research Centers, Regional Districts, Large-Medium-Small Enterprises, Business Consortia;
- Recognized and co-financed by the Italian Ministry of Research (MUR);

BiG
Blue Italian Growth
Technology Cluster

CLUSTER BIG'S STRATEGIC TRAJECTORIES



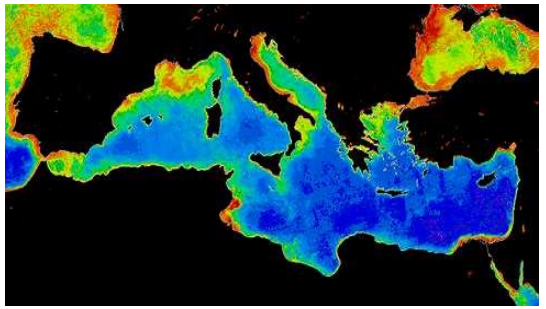
BiG
Blue Italian Growth
Technology Cluster

STRATEGIC TRAJECTORIES: DETAIL

- **MARINE HABITAT & COASTAL ZONE**: ocean observing systems adapted to the reality of the Mediterranean, digitization (sensor webs and artificial intelligence);

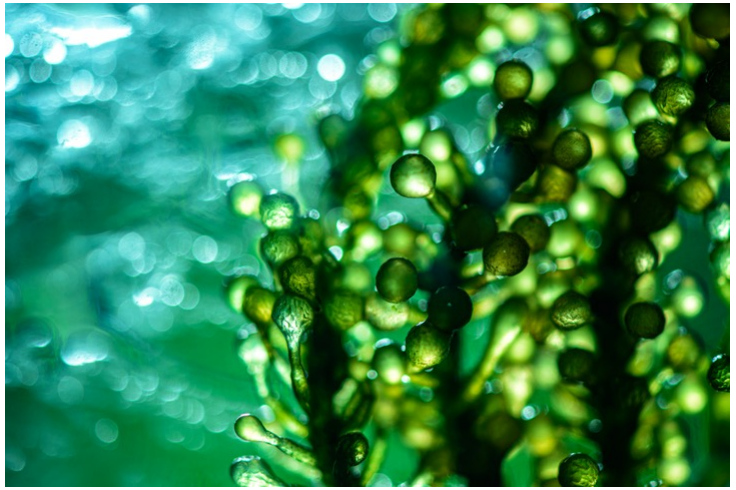
- **BIOTIC MARINE RESOURCES**: fisheries and aquaculture. ICT for food safety and monitoring of fishing activities, digital technologies for monitoring smart management of aquaculture plants, new sustainable feeds for aquaculture, multitrophic aquaculture, conversion of wastes from fisheries to a high-value product, integration of aquaculture plants into multi-use platforms

- **ABIOTIC MARINE RESOURCES**: aimed at the development of innovative modular offshore platforms for the colocation of diverse technologies (renewables, aquaculture, hydrogen production, seawater desalination: multi-use platforms); it focuses also the reuse of end-of-life offshore platforms (marine research labs, CO2 underground storage, renewables, aquaculture).



BiG
Blue Italian Growth
Technology Cluster

BLUE BIOTECHNOLOGIES: BIOSEARCH



Pharmaceutical products from microalgae:

- Vaccines components;
- Antioxidizing molecules for skin protection;
- Oncological medicine

Stazione Zoologica Anton Dohrn Napoli

Consiglio Nazionale delle Ricerche

CIRCULARITY IN AQUACULTURE: GARGANO PESCA

- From fish waste to valuable products;
- From clam shells to animal feeds;
- Form algae to fertilizers;
- Educational farm

SEA FARM
fattoria del mare

FOCUS ON THE MEDITERRANEAN

- MoU with Federazione del Mare;
- MoU with Cluster Maritime Tunisien ;
- MoU with Blue Greek Cluster Strategis (2021);
- Founding Member of the WESTMED MARITIME CLUSTER ALLIANCE (WCMA): BIG, POLMER, FORUM OCEANO, CMT (June 2021);
- Partecipation to EU-funded projects (INTERREG): B-Blue, InnoBlueGrowth plus cooperation with MISTRAL;
- Partecipation in COSME MEDBAN (WMCA) and IKAT projects;

FORTHCOMING ACTIVITIES (HIGHLIGHTS)

FIRST INTERNATIONAL CONFERENCE MEDBLEU 2022 (September 29 & 30, Tunis):

- The perspectives of the Blue Economy across the Mediterranean;
- The blue Mediterranean challenges;
- Investment opportunities: funding the Blue Economy;
- Young and women entrepreneurship;

ECOMONDO (Circular Blue Economy in the Mediterranean, November 10 Rimini)

We are always open to new collaboration!

Write at: info@clusterbig.it

http://www.clusterbig.it/

https://www.linkedin.com/company/cluster-blue-italian-growth/

9.30 – 10.30

Cluster Circular Bioeconomy SPRING

Lucia Gardossi

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

SPRING

Italian Circular Bioeconomy Cluster

Il Cluster Tecnologico Nazionale SPRING: azioni per la promozione e diffusione della Ricerca e dell'Innovazione nei settori della salute dell'uomo e dell'ambiente

Lucia Gardossi

Componente del Direttivo del Cluster SPRING

Coordinatrice Comitato Tecnico Scientifico del Cluster SPRING

UNIVERSITÀ DEGLI STUDI DI TRIESTE

Dipartimento di

Scienze Chimiche e Farmaceutiche

Il Cluster Tecnologico Nazionale

SPRING
Cluster italiano della Bioeconomia circolare

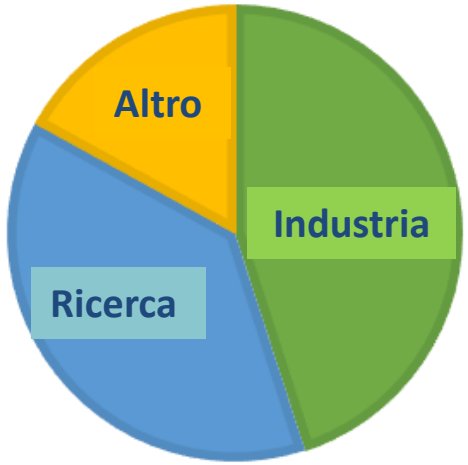
MINISTERO DELL'ISTRUZIONE, DELL'UNIVERSITÀ E DELLA RICERCA

SOCI FONDATORI (2014)

Cluster Nazionale Chimica Verde

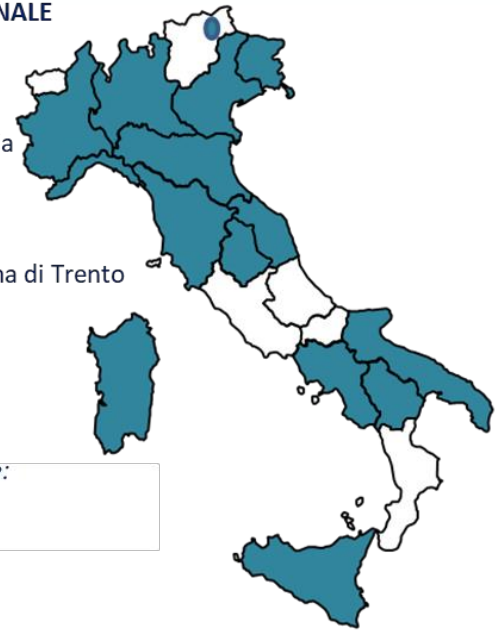
biochemtex
FEDERCHIMICA
NOVAMONT
eni versalis

123 SOCI



PRESENZA REGIONALE

Basilicata
Campania
Emilia Romagna
Friuli Venezia Giulia
Liguria
Lombardia
Piemonte
Provincia autonoma di Trento
Puglia
Sardegna
Umbria
Toscana
Veneto
In fase di adesione:
Sicilia
Lazio
Marche
Abruzzo

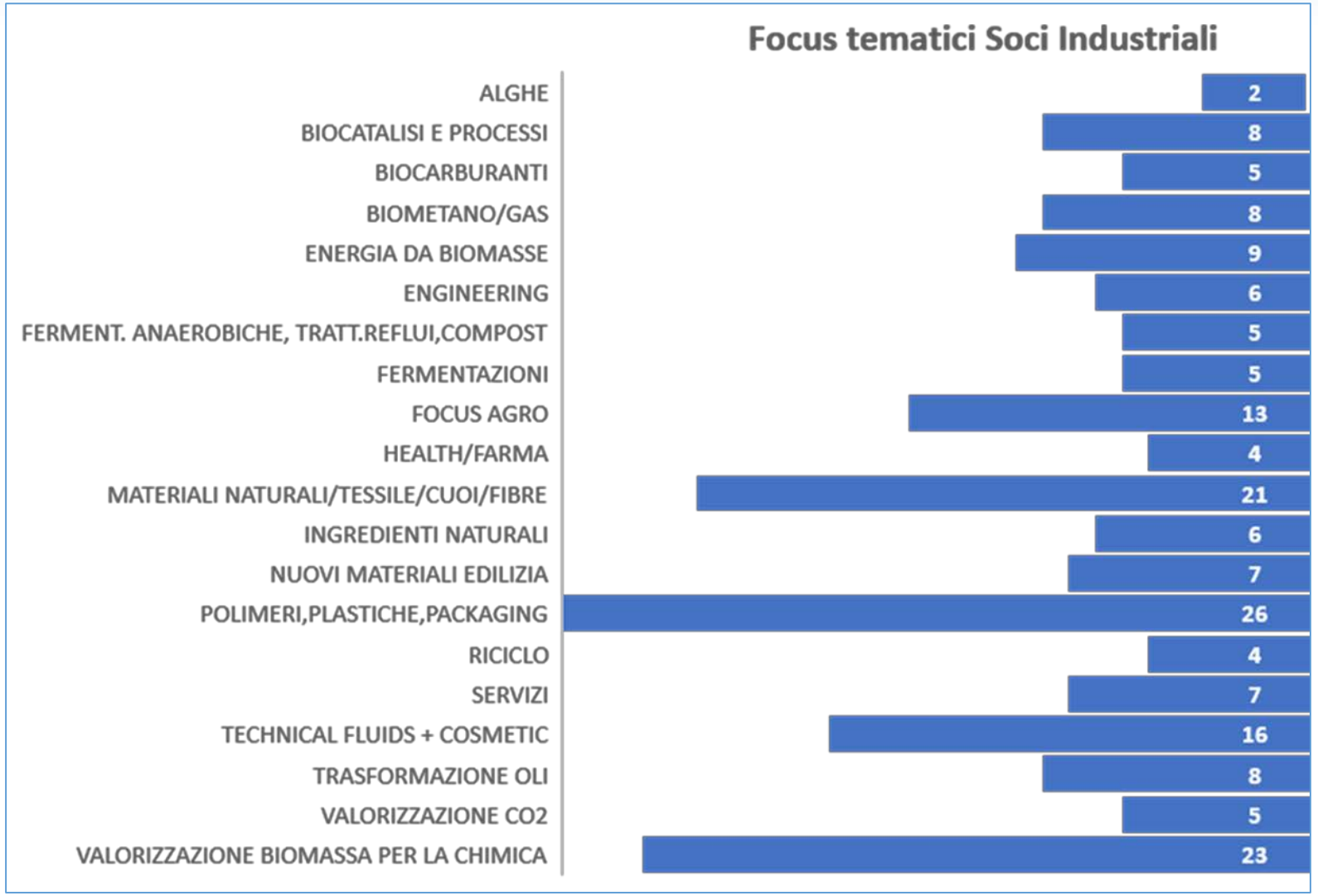


Chimica verde - Innovazioni di prodotto e di processo relative alle **bioraffinerie**, alla produzione e all'utilizzo di prodotti **biobased**, biomateriali e combustibili nuovi o innovativi da **biomasse** forestali o agricole dedicate e da sottoprodotti e **scarti** della loro produzione, nonché da **sottoprodotti** e scarti della produzione e lavorazione della filiera animale

Tavolo Permanente delle Regioni sostenitrici come piattaforma per definire posizioni condivise e linee di intervento coordinate su molteplici fronti.

Gli attori della Bioeconomia circolare

SPRING
Cluster italiano della Bioeconomia circolare



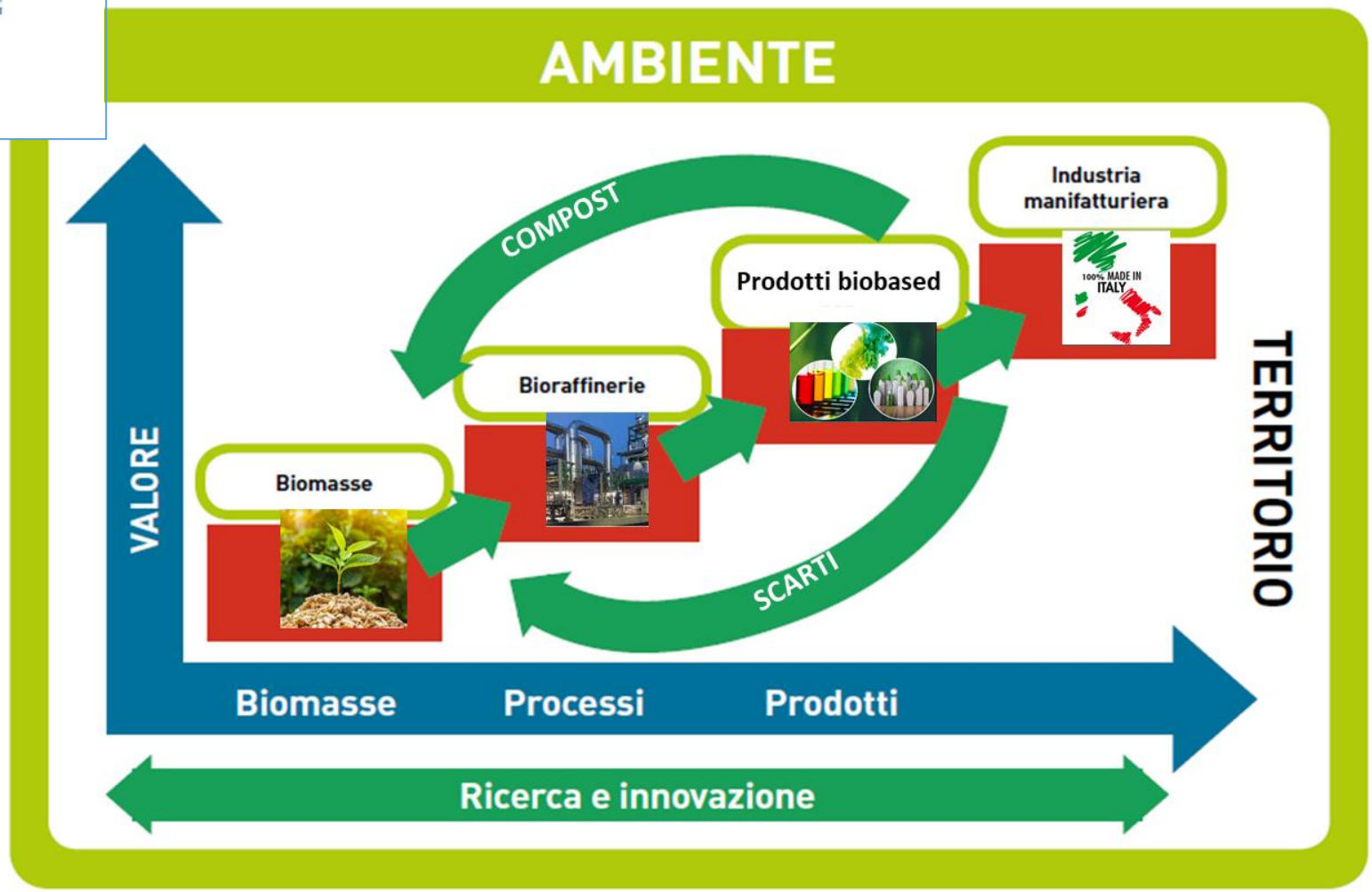
SPRING

Cluster italiano della Bioeconomia circolare

SPRING
Sustainable Processes and Resources for Innovation and Natural Growth
Italian Cluster of Green Chemistry

Piano di Azione Triennale

Cluster Tecnologico Nazionale della Chimica Verde SPRING



4 roadmaps strategiche per rispondere ai fabbisogni di innovazione

SPRING
Cluster italiano della Bioeconomia circolare

Roadmap 1: Ricerca, attività dimostrative e sperimentali per la messa a punto di **prodotti e processi innovativi, efficienti nell'uso delle risorse e dell'energia**, attraverso lo sviluppo, produzione e **valorizzazione di biomasse agricole, forestali e marine non alimentari dei territori.**

Roadmap 2: **Rivalutazione dei territori e delle aree marginali** da un punto di vista economico, sociale, ambientale e occupazionale, partendo dalle loro criticità e attraverso un **approccio circolare alla bioeconomia, attraverso le attività di ricerca e sviluppo** finalizzate all'ottimizzazione della **valorizzazione a cascata di biomasse, sottoprodotti, rifiuti e reflui in prodotti e processi (p.es. bioraffinerie) che integrino trasversalmente i diversi settori produttivi del territorio.**

Roadmap 3: Sviluppo di una "**cultura della bioeconomia**" che coinvolga tutti gli *stakeholder*.

Roadmap 4: Attività di ricerca e sviluppo sperimentali per la **raccolta di dati funzionali ad attività di standardizzazione e pre-normative** al fine di creare le condizioni opportune per la diffusione nel mercato dei **nuovi prodotti biobased**.

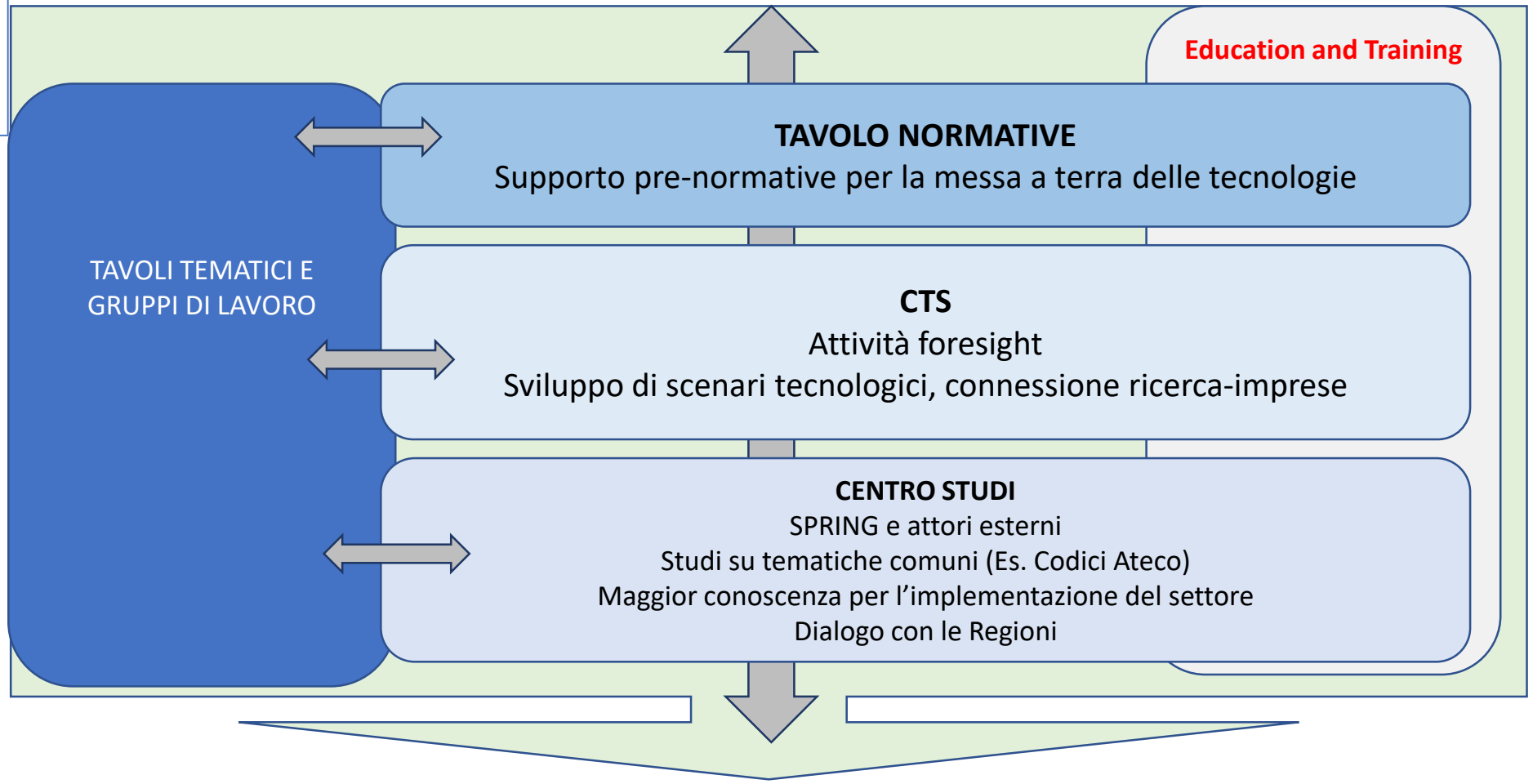
SPRING
Sustainable Processes and Resources for Innovation and National Growth
Italian Cluster of Green Chemistry

Piano di Azione Triennale

Cluster Tecnologico Nazionale della Chimica Verde SPRING

SPRING
Cluster italiano della Bioeconomia circolare

MASTER BIOCIRCE



Supporto allo sviluppo di progettualità condivise e alla crescita della bioeconomia circolare

SPRING

Cluster italiano della Bioeconomia circolare

Comitato tecnico-scientifico

Mappatura Soci Industriali

Mappatura enti di ricerca

Approvvigionamento e trattamento per valorizzazione biomasse (compresi gli scarti)	Biofuel e Bioenergia (Biogas, idrogeno, pirolisi)	Trattamento e valorizzazione Fanghi/FORSU	Bioplastiche	Valorizzazione CO2	Bio-based products (compresa oleochimica bio-based)

Sviluppo, industrializzazione e ottimizzazione di processi

Tematiche

Individuate sei macro-aree di interesse, a cui si aggiunge una tematica trasversale relativa alle attività di sviluppo, ottimizzazione e industrializzazione dei processi

Relazioni con gli interlocutori istituzionali nazionali

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Presidenza del Consiglio dei Ministri

CNBBSV
COMITATO NAZIONALE PER LA BIOSICUREZZA LE BIOTECNOLOGIE E LE SCIENZE DELLA VITA

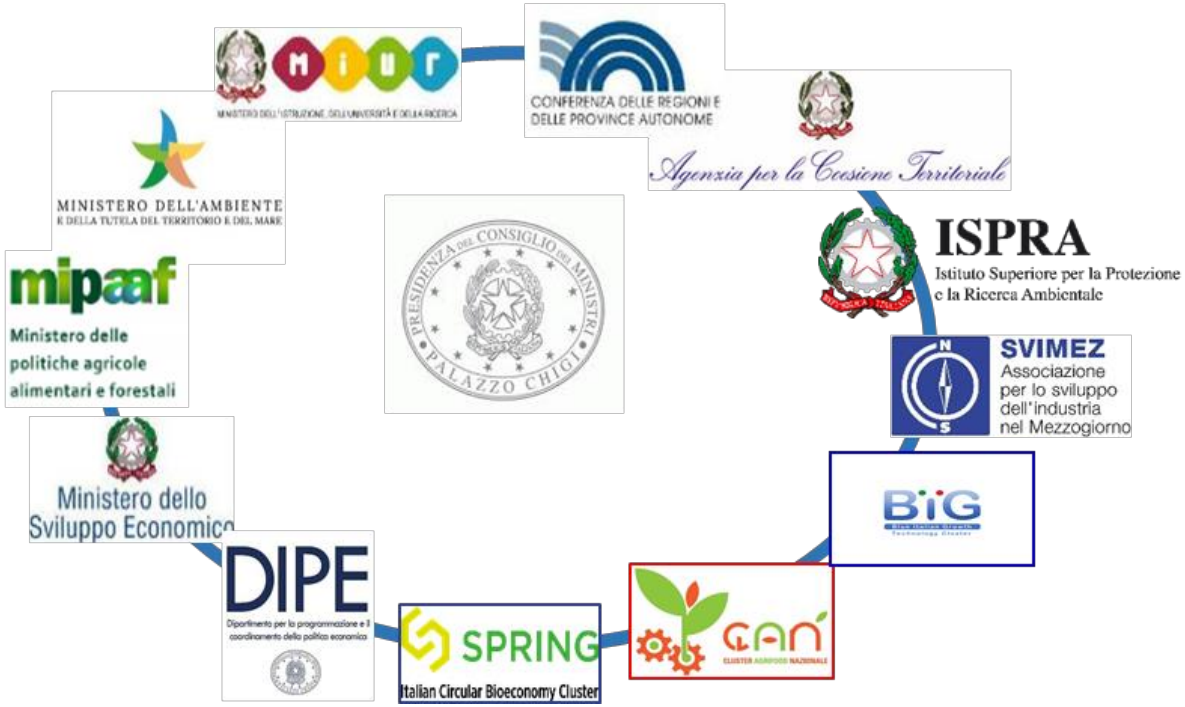
BIT
Bioeconomy in Italy

IMPLEMENTATION ACTION PLAN (2020-2025) FOR THE ITALIAN BIOECONOMY STRATEGY BIT II

National Bioeconomy Coordination Board

Gruppi di lavoro attivati:

- Codici Ateco e End of Waste
- Tassonomia Bioeconomia
- Cluster Tecnologico Nazionale sul Legno
- Monitoraggio ed indicatori



Allineamento con le stretegie Europee e globali

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Bio-based Industries Consortium

A European Green Deal

Striving to be the first climate-neutral continent

New growth strategy that will transform the Union into a modern, resource-efficient and competitive economy, where

- **there are no net emissions of greenhouse gases by 2050**
- **economic growth is decoupled from resource use**
- **no person and no place is left behind**

Actions

- boost **circular economy**
- restore **biodiversity**
- cut pollution,
- **investing** in environmentally-friendly technologies
- cleaner **transport**
- **decarbonising** the energy sector
- **buildings** more energy efficient
- global environmental **standards**

mobilise at least €100 billion over the period 2021-2027

SPRING è *associate member* del Bio-based Industries Consortium

About the Bio-based Industries Consortium (BIC)

The Bio-based Industries Consortium (BIC) is a leading membership-based association pioneering a sustainable circular bioeconomy in Europe.

BIC's mission is to connect industry, academia, regions and citizens to transform bio-based feedstocks into novel sustainable products and applications, and to create circular bioeconomy ecosystems through investments, innovation and know-how.

Bio Based Industry Joint Undertaking

Public-Private Partnership on Bio-Based Industries in Horizon 2020

Struttura del programma quadro di finanziamento EU 2021-27

EXCELLENT SCIENCE	GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS	INNOVATIVE EUROPE
European Research Council	Health	European Innovation Council
Marie Sklodowska-Curie	Culture cretivity & inclusive society	European Innovation ecosystems
Research Infrastructure	Civil security for Society	European Institute of Innovation & Technology
	Digital, Industry and Space	
	Climate, Energy & Mobility	
	Food, Bioeconomy, Natural Resources, Agriculture & Environment	

Circular Bio-based Europe Joint Undertaking

CIRCULAR BIO-BASED EUROPE JOINT UNDERTAKING (CBE JU)

Circular Bio-based Europe Joint Undertaking

The **Circular Bio-based Europe Joint Undertaking (CBE JU)** is a €2 billion partnership between the European Union and the Bio-based Industries Consortium (BIC) that funds projects advancing competitive circular bio-based industries in Europe.

CBE JU is operating under the rules of Horizon Europe, the EU's research and innovation programme, for the 2021-2031 period. The partnership is building on the success of its predecessor, the Bio-based Industries Joint Undertaking (BBI JU), while addressing the current challenges facing the industry. The CBE JU is the legal and universal successor of BBI JU in respect of all contracts, grant agreements and liabilities.

Consolidamento delle relazioni internazionali

Analisi e condivisione di **possibili azioni di finanziamento UE a favore del Cluster e/o di partenariati favoriti da Cluster;**
Partecipazione a **consultazioni su paper di interesse strategico;**

Concluso a marzo 2021 il progetto **POWER4BIO**,presentato in risposta alla call H2020 **RUR-09-2018**: "*Realising the potential of regional and local bio-based economies*". Coordination and Support Action;

SPRING è partner del **progetto demo** BBI-JU **GRACE** (GRowing Advanced industrial Crops on marginal lands for biorEfineries) nel quale coordina il Panel industriale e svolge attività di comunicazione e disseminazione;

Progetti europei in fase di avvio:

UE – BIOMODELSFORREGIONS
UE – BIORECER
UE – BIOLOC
UE – RURALBIOHUP
UE - HEMP CLUB

SPRING

Cluster italiano della Bioeconomia circolare

Sustainable Processes and Resources for Innovation and National Growth

Grazie per l'attenzione!

www.clusterspring.it

comunicazione@clusterspring.it

@Cluster_Spring

9.30 – 10.30

Cluster Agroalimentare CLAN

Massimo Iannetta

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Il Cluster Agrifood Nazionale «CL.A.N.»

Massimo Iannetta - Presidente del C.T.S. CL.A.N.

18 Luglio 2022

Il Cluster CL.A.N.: chi siamo

Il Cluster CL.A.N. è nato il 2 ottobre 2013 come Associazione non riconosciuta e dal **5 febbraio 2018 è un'Associazione riconosciuta**, di imprese alimentari, università e istituti pubblici o privati di ricerca con elevate competenze in campo agroalimentare, rappresentanze territoriali e altri soggetti attivi nel settore food.

E' la cabina di regia per la ricerca e l'innovazione nel settore agroalimentare per suggerire al MUR e alle altre Istituzioni nazionali e regionali competenti **le priorità di R&I del settore e le relative necessità di investimento in ricerca e formazione.**

Soci del Cluster CL.A.N. per «categorie»

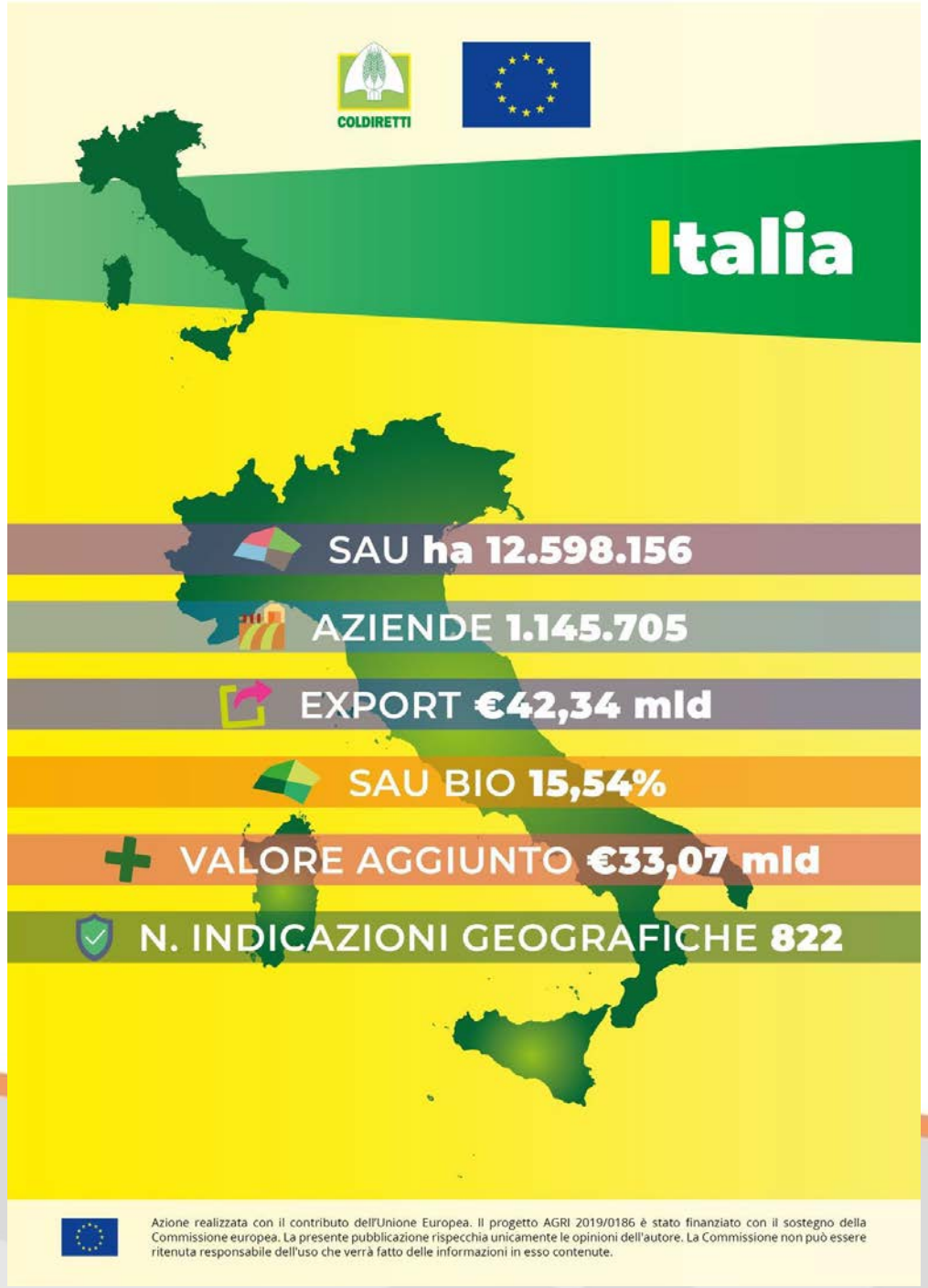
TOTALE SOCI: 113

Rappresentanze Territoriali: 14

Rappresentanze Imprenditoriali: 44

Rappresentanze della Ricerca: 55

CLUSTER AGRIFOOD NAZIONALE



Azione realizzata con il contributo dell'Unione Europea. Il progetto AGRI 2019/0186 è stato finanziato con il sostegno della Commissione europea. La presente pubblicazione rispecchia unicamente le opinioni dell'autore. La Commissione non può essere ritenuta responsabile dell'uso che verrà fatto delle informazioni in esso contenute.

CLUSTER AGRIFOOD NAZIONALE

Industria Alimentare e delle bevande italiana: i macro-dati

(2021 su 2020)

Fatturato

155 mld € (+8,4%)

Produzione

6,1%

Addetti

385.000 addetti

850.000 (con agricoltura)

Aziende

58.000

6.850 con più di nove addetti

Consumi*

240 mld €

***Consumi totali**
(mercato interno ed estero)

Export

40,8 mld €
(+10,9%)

nel 2021, l'Industria alimentare e delle bevande italiana si conferma secondo settore manifatturiero nazionale dopo il metalmeccanico

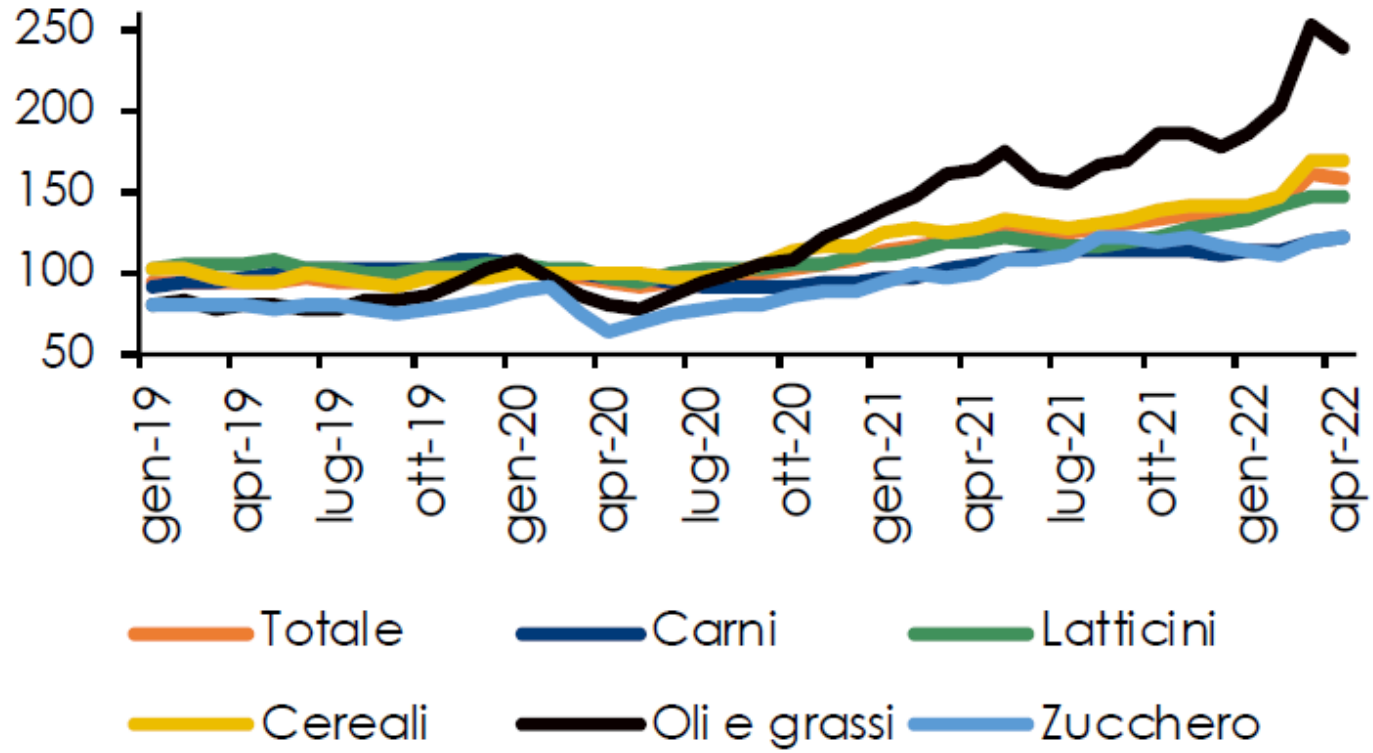
FEDERALIMENTARE
Federazione Italiana dell'Industria Alimentare

La Crisi


PIL
+6,6%
crescita Pil nel 2021 +2,6% la crescita acquisita al primo trimestre 2022
CRISI INFLATTIVA
+8,5%
indice dei prezzi al consumo armonizzato (Uem +8,6%)
(giugno 2022-giugno 2021)
CRISI ENERGETICA
+49,1%
prodotti energetici (Uem +41,9%)
(giugno 2022-giugno 2021)
CRISI CLIMATICA
-35,0%
precipitazioni nei primi 5 mesi dell'anno rispetto alla media 1981-2010
(anno 2022)
PNRR
85 miliardi di euro
per la transizione ecologica: 9,7 miliardi di euro per modernizzare la PA
Istat
Istituto Nazionale di Statistica
La crescita dell'economia frenata dal deterioramento del contesto globale
RAPPORTO ANNUALE 2022
La situazione del Paese
CAPITOLO 1 · LE PROSPETTIVE DI RIPRESA TRA OSTACOLI E INCERTEZZA

SCENARIO ATTUALE

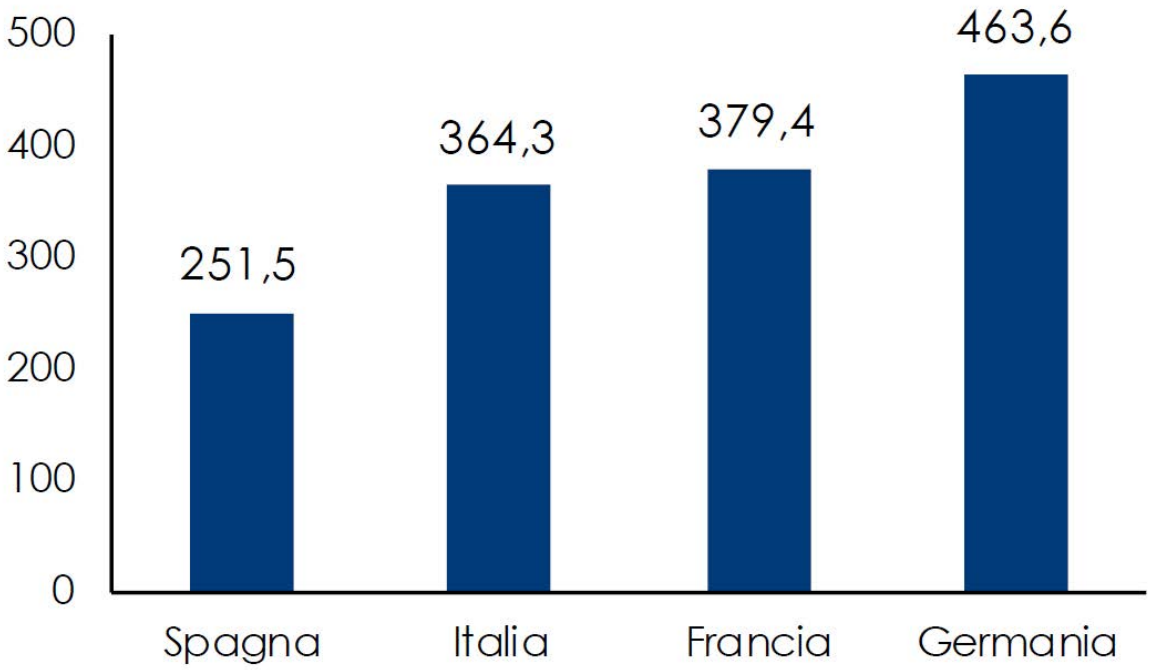
Food FAO Index - Indice dei prezzi dei prodotti alimentari (2014-2016=100)



Fonte: FAO

SCENARIO ATTUALE

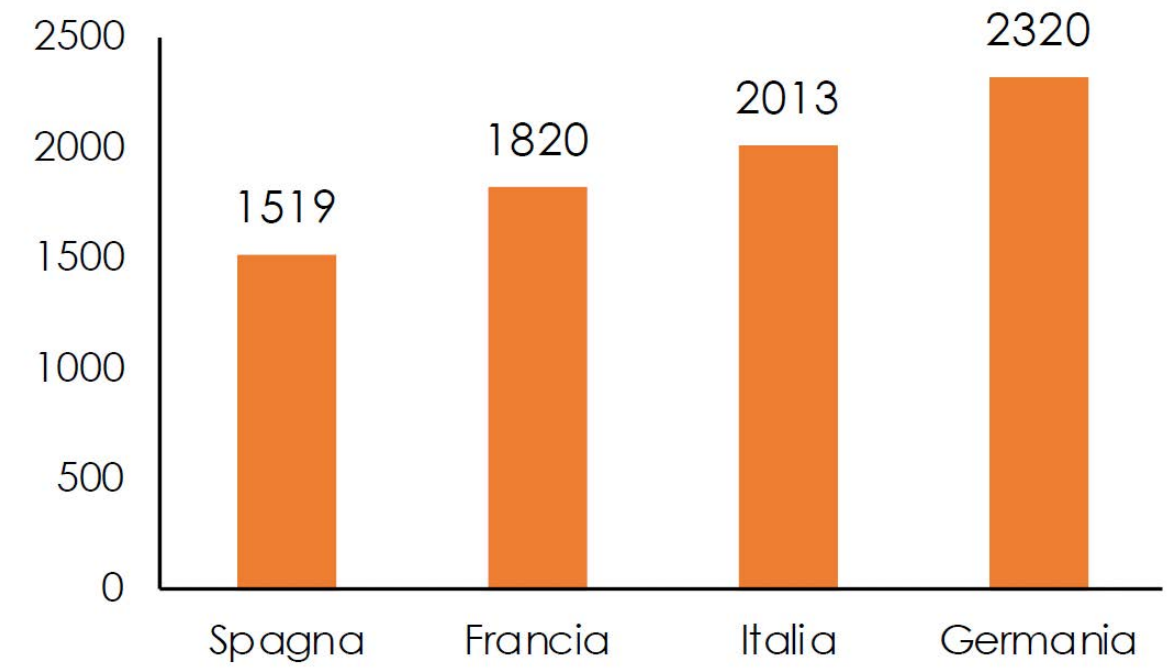
Valore della produzione della Bioeconomia nel 2021 nei principali paesi europei (miliardi di euro)



Fonte: elaborazioni Intesa Sanpaolo su fonti varie

SCENARIO ATTUALE

Occupazione della Bioeconomia nel 2021 nei principali paesi europei (migliaia di occupati)



Fonte: elaborazioni Intesa Sanpaolo su fonti varie

Piano di Azione Triennale e Roadmap

Priorità 1: **SOSTENIBILITÀ**	Priorità 2: **QUALITÀ E SICUREZZA**	Priorità 3: **NUTRIZIONE E SALUTE**
AGRIFOOD «SUSTAINABLE»	**AGRIFOOD «MADE IN»**	**AGRIFOOD «HEALTHY»**

Priorità trasversale:

AGRIFOOD «SMART»

Roadmap Tecnologica

Priorità 1
Agrifood *Sustainable*

SOSTENIBILITA'

1	Aumentare la profittabilità della produzione primaria
2	Incrementare la sostenibilità ambientale della produzione primaria
3	Rafforzare la resilienza dell'agroecosistema ridurre l'impatto ambientale dello stesso
4	Accrescere la consapevolezza del consumatore
5	Incrementare la circolarità e la sostenibilità ambientale dei processi di trasformazione e la loro circolarità
6	Analizzare e sviluppare modelli rurali nuovi e integrati

Roadmap Tecnologica

Priorità 2

Agrifood *Made In*

QUALITA' E SICUREZZA

1	Dotare il sistema agroindustriale di strumenti avanzati per promuovere l'internazionalizzazione e valorizzare le produzioni di qualità
2	Promuovere la cooperazione, la gestione condivisa della conoscenza e le tecnologie Internet of Things.
3	Rafforzare il legame tra produzioni e territorio, tutelare la biodiversità
4	Sviluppare nuove strategie di comunicazione ed educazione alimentare sui temi della qualità, sicurezza e autenticità.

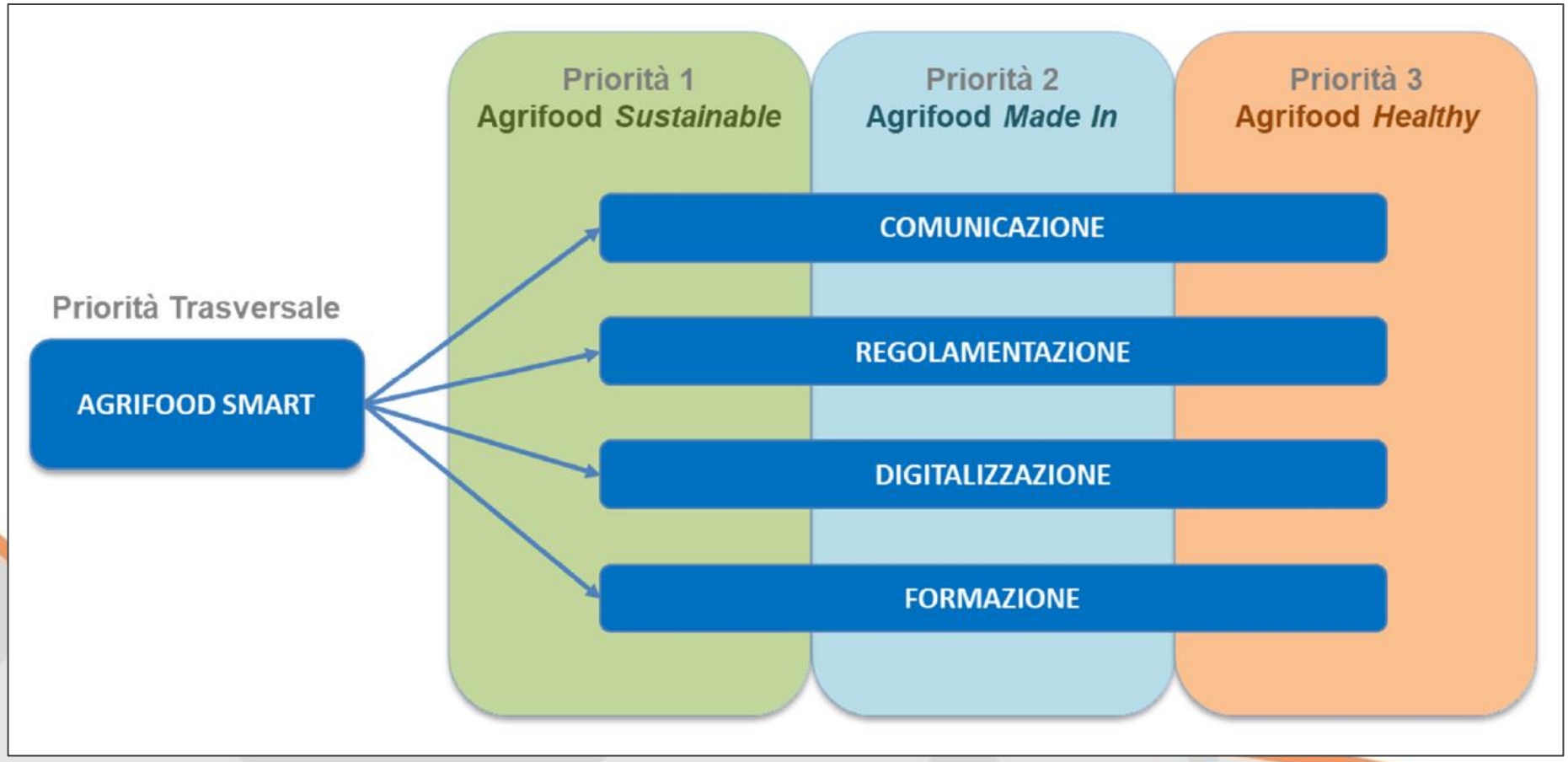
Roadmap Tecnologica

Priorità 3
Agrifood *Healthy*

NUTRIZIONE E SALUTE

1	Caratterizzazione delle diverse sostanze bioattive contenute nei prodotti della Dieta Mediterranea al fine di definirne il profilo nutrizionale salutistico
2	Produzione di prodotti nutraceutici, con claim salutistici e nutrizionali, a costi controllati
3	Produzione di nuovi alimenti basati sulla Dieta Mediterranea formulati o fortificati con molecole bioattive salutistiche e microrganismi benefici
4	Sviluppo di nuovi alimenti calibrati sulle esigenze nutrizionali specifiche di sottogruppi di popolazione
5	Identificazione, caratterizzazione e validazione di nuove fonti di proteine da utilizzare per lo sviluppo di nuovi alimenti/ingredienti con elevato valore nutrizionale
6	Valorizzazione dell'uso delle fermentazioni microbiche per migliorare le caratteristiche nutrizionali degli alimenti
7	Incremento delle conoscenze sulle relazioni tra dieta e patologie correlate
8	Sviluppo di alimenti e diete studiate per ridurre le DRD e contrastare la malnutrizione

Roadmap Tecnologica



Priorità strategiche per il Mezzogiorno

Trend Tecnologici e P.N.R.R.

Decarbonizzazione dei sistemi agroalimentari
Missione 2: rivoluzione verde e transizione ecologica

Tracciabilità dei prodotti agroalimentari ,logistica e piattaforme fisiche e digitali
Missione 1: digitalizzazione, innovazione, competitività e cultura

Made in Italy e One health
Missione 2, 1 e 6 (Salute)

Valorizzazione dei foods by product e riduzione degli sprechi
Missione 2: rivoluzione verde e transizione ecologica

ENDORSEMENT

- **Bando per i 5 Centri Nazionali.** Il Cluster ha presentato la propria manifestazione di interesse ad aderire alla proposta “Tecnologie dell’Agricoltura – Agritech” della Federico II come “partner sostenitore”;
- **Bando per le Infrastrutture di ricerca.** Il Cluster ha dato il proprio endorsement alle due proposte di Infrastrutture di Ricerca METROFOOD – IT e MIRRI – IT di ENEA;
- **Bando per gli ecosistemi dell’innovazione territoriali.** Il Cluster ha presentato la propria manifestazione di interesse alle proposte iNEST nord – est dell’Università di Padova e NODES del POLITO;
- **Bando per le infrastrutture tecnologiche di innovazione.** Il Cluster ha dato il proprio endorsement alla proposta INFRAGRI della Federico II.

POSITION PAPER

TREND TECNOLOGICI	• PRESENTATO A CIBUS PARMA IL 4 MAGGIO 2022
GENOME EDITING	• PRESENTATO A ROMA IL 23 GIUGNO 2022
FRONT OF PACK	• IN VIA DI DEFINIZIONE

Bioeconomia nel Cluster

- partecipa al **Master "Bioeconomy in the Circular Economy – Biocirce" primo master in Italia interamente dedicato alla Bio-economia;**
- aderisce **all'EIT-Food e alla Piattaforma Food for Life**, fornendo contributi sui temi della Bioeconomia;
- partecipa al **GdL trasversale del Cluster 6 "Food, Bioeconomy, Natural Resources, Agriculture and Environment" di Horizon Europe"**, fornendo contributi sul tema della Bioeconomia e dell'Economia Circolare;
- **è membro del Comitato Tecnico Scientifico di Ecomondo**, appuntamento particolarmente strategico, ormai divenuto un momento fisso nella programmazione annuale delle attività del Cluster;
- aderisce alla **Piattaforma ICESP** e ha contribuito alla **redazione del PP** volto ad identificare lo stato dell'arte del settore a livello nazionale **e Buone Pratiche di Economia Circolare relative alla filiera.**

Gruppo Coordinamento Nazionale Bioeconomia (Comitato Nazionale per la Biosicurezza, Biotecnologie e Scienze della Vita - PCM)

Il Cluster è membro del GdL ed ha:

- contribuito alla redazione della **Strategia nazionale per la Bioeconomia** e al suo aggiornamento;
- partecipato attivamente alla redazione del **Piano di Implementazione**, per un'attuazione della Strategia, anche alla luce della recente ed attuale emergenza sanitaria e dell'adozione del Green Deal Europeo;
- **elaborato il progetto Flagship "Filiere agroalimentari Circolari e Sostenibili. Un modello di sostenibilità del sistema agroalimentare italiano".**

Grazie per l'attenzione

CL.USTER A.GRIFOOD N.AZIONALE - CL.A.N.

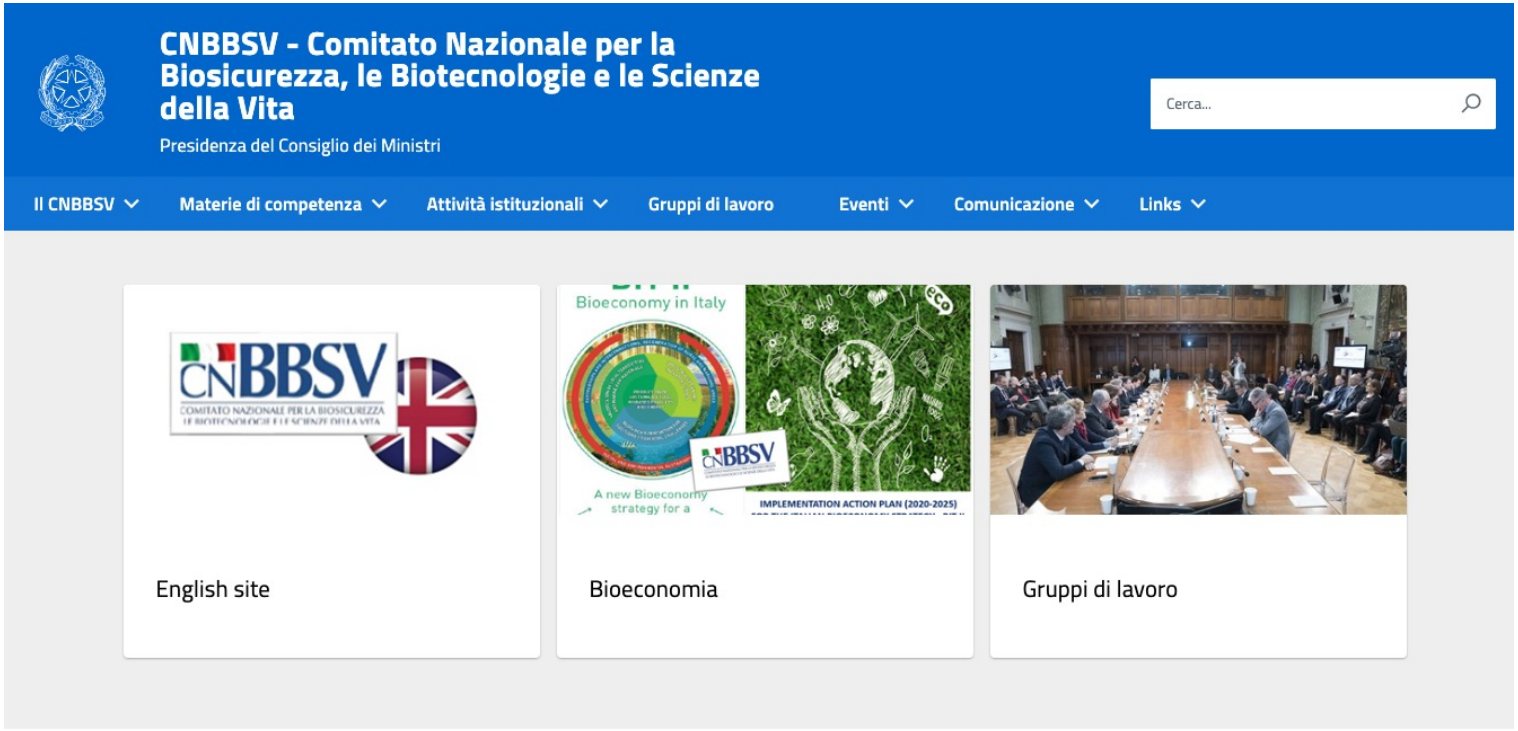
clusteragrifood@gmail.com - www.clusteragrifood.it

10.30 – 11

Il Comitato Nazionale Biosicurezza, Biotecnologie e Scienza della Vita (CNBBSV) e il Health City Institute (HCI)

Andrea Lenzi

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



Presentazione

Il CNBBSV è un organismo di supporto del Governo per l'elaborazione di linee di indirizzo scientifico, produttivo, di sicurezza sociale e di consulenza in ambito nazionale e comunitario sulle problematiche più attuali riguardanti la biosicurezza, le biotecnologie e le scienze della vita.

Il Presidente del CNBBSV– Prof. Andrea Lenzi

[Qui il link al sito del CNBBSV](), presentato dal Prof. durante l'evento

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

HCI
HEALTH CITY INSTITUTE
Improve quality of life in cities

HOME | Chi siamo | Mission | Progetti | Eventi | Pubblicazioni | Partners | Network | Contatti

Il principio ispiratore: la salute nelle città come bene comune

"L'Organizzazione Mondiale della Sanità, coerentemente con l'art.32 della nostra Costituzione, considera la salute diritto fondamentale dell'individuo e interesse della collettività, ritenendola anche un formidabile fattore competitivo per il Paese. In questo senso la salute è considerata indissolubilmente legata alla sanità di cui rappresenta un fondamentale, ancorché ovviamente non unico, determinante." *Andrea Lenzi, Presidente Health City Institute*

[Qui il link al sito](#) di HEALTH CITY INSTITUTE

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

10.30 - 11

Le strategie nazionali per la Bioeconomia e il Microbioma

Fabio Fava

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

AZIONI NAZIONALI E DELL'UNIVERSITÀ DI BOLOGNA A SOSTEGNO DELLA SALUTE DELL'AMBIENTE E DELLE PERSONE

Bologna, 18 Luglio 2022

Italian Microbiome initiative and its industrial Implementation Action Plan

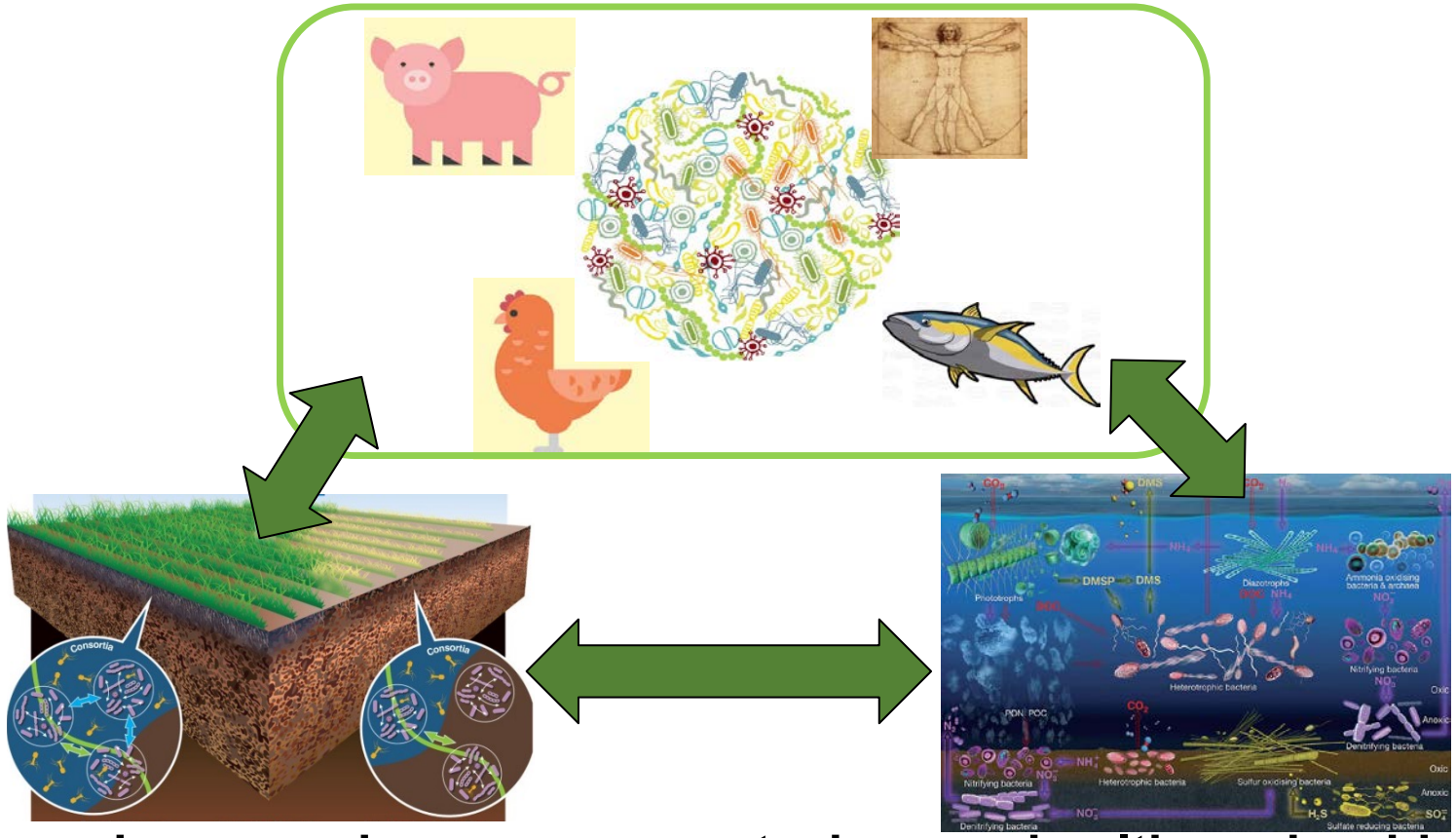
Fabio Fava & Andrea Lenzi

On behalf of the National Committee for Biosafety, Biotechnology and Life Sciences (CNBBSV) of the Italian Presidency of Council of Ministers and its «Microbiome initiative» Working Group.

Rome, Italy. Email: fabio.fava@unibo.it

Microbiomes and the health of humans and of the food systems

Microbiomes (i.e. Bacteria, Archaea, Eukarya and viruses) inhabit humans, plants, animals and the terrestrial and marine environments, and provide benefits to all living organisms. Microbiomes of different organisms/compartments are apparently interconnected ("*One Health" view)*



→ **Microbiome-based approaches can promote human health and a higher, healthier, and more sustainable productivity across the whole food system.**

BUT R&I are needed to **clarify the interplay between microbiomes and environment, nutrition and host variables and to to better design microbiome-based interventions.**

Italian expertise and R&I potential in the Microbiome domains

EXPERTISES AND KNOW-HOW relevant expertise and know-how on human microbiome and virome (at preclinical and clinical levels) **and on microbiomes in foods, plants, terrestrial and aquatic animals, soils and sediments but are exploited in parallel**. **IT researchers are present in a large number of prominent international publications and in about 26 funded FP7 and Horizon2020 projects** in the microbiome domains. **However,** such EU projects **are only 5% of those funded** as part of FP7 and H2020 programmes (more than 600 projects).

INFRASTRUCTURES: IT also possesses **relevant and complementary infrastructures in the biomedical and the main domains of the food systems**, like advanced NGS, proteomic and metabolomics platforms, Simulator of Human Intestinal Microbial Ecosystem (SHIME), animal facilities, databases and bioinformatics pipelines, Human and animal model phenotyping, etc.. **But we are missing others (germ free facility, data storage, etc) and have difficulties in maintaining/updating/renewing the existing ones.**

THE PRIVATE SECTOR: Some **national industries of the biotechnology, pharmaceutical, food and agriculture domains are interested in the microbiome opportunities but they need to be better engaged to allow them to know** and to responsibly **exploit microbiome knowledge**.

→ **the Italian Microbiome initiative**, **to integrate expertise, public and private actors, infrastructures, investments,** for a wide **national innovation action** in the sector.

Presidenza del Consiglio dei Ministri

Comitato Nazionale per la Biosicurezza, le Biotecnologie e le Scienze della Vita

CNBBSV
COMITATO NAZIONALE PER LA BIOSICUREZZA LE BIOTECNOLOGIE E LE SCIENZE DELLA VITA

CONCEPT PAPER

January 2019

ITALIAN MICROBIOME INITIATIVE FOR IMPROVED HUMAN HEALTH AND AGRI-FOOD PRODUCTION

http://cnbbsv.palazzochigi.it/media/1859/microbioma-2019.pdf

MAIN AUTHORS:

Andrea Lenzi, Università Roma La Sapienza & President of CNBBSV (Coordinator)
Fabio Fava, Università di Bologna & IT Representative for Horizon2020 (Coordinator)
Patrizia Brigidi, Alma Mater Studiorum-Università di Bologna;
Lorenzo Maria Donini, Università di Roma La Sapienza;
Massimo Federici, Università di Roma Tor Vergata;
Marco Gobbetti, Università di Bolzano & CNBBSV;
Andrea Isidori, Università di Roma La Sapienza;
Silvia Migliaccio, Università di Roma "Foro Italico";
Annateresa Palamara, Università di Roma La Sapienza;
Paolo Trevisi, Alma Mater Studiorum-Università di Bologna;
Paolo Visca, Università di Roma Tre & CNBBSV

SCIENTIFIC/INDUSTRIAL ASSOCIATIONS INVOLVED IN THE CONSULTATION:

ACCADEMIA DEI GEORGOFILI; ACCADEMIA DEI LINCEI; AISF (*Associazione Italiana Studio del Fegato*); **AISSA** (*Associazione Italiana Società Scientifiche Agrarie*); **AMCLI** (*Associazione Microbiologi Clinici Italiani*); **AMD** (*Associazione Medici Diabetologi*); **AME** (*Associazione Medici Endocrinologi*); **ASSOBIOTEC** (*Associazione Nazionale sviluppo delle biotecnologie*); **API** (*Associazione Piscicolturi Italiani*); **CDUO** (*Collegio Universitario Odontostomatologia*); **Cluster CLAN** (*Cluster agrifood nazionale*); **CNBBSV** (*Comitato Nazionale Biosicurezza, Biotecnologie e Scienze per la Vita);* **CONFAGRICOLTURA** (*Confederazione Generale dell'Agricoltura Italiana*); **FARMINDUSTRIA** (*Associazione imprese del Farmaco*); **FEDERALIMENTARI** (*Federazione aziende industria alimentare*); **FEDERSALUS** (*Associazione Nazionale Produttori Distributori Prodotti Salutistici*); **FIVS** (*Federazione Italiana Scienze della Vita*); **SIAMS** (*Società Italiana Andrologia e Medicina della sessualità*); **SIB** (*Società Italiana di Biochimica e Biologia Molecolare*); **SIBIOC** (*Società Italiana Biochimica Clinica e Biologia Molecolare*); **SID** (*Società Italiana di Diabetologia*); **SIE** (*Società Italiana Endocrinologia*); **SIEDP** (*Società Italiana Endocrinologia e Diabetologia Pediatrica*); **SIGE** (*Società Italiana di Gastroenterologia ed Endoscopia Digestiva*); **SIGG** (*Società Italiana di Gerontologia e Geriatria*); **SIM** (*Società Italiana Microbiologia*); **SIMGBM** (*Società Italiana Microbiologia Generale e Biotecnologie Microbiche*); **SIMTREA** (*Società Italiana di Microbiologia Agraria, Alimentare e Ambientale*); **SINUC** (*Società Italiana Nutrizione Clinica*); **SIO** (*Società Italiana dell'Obesità*); **UNASA** (*Unione Nazionale delle Accademie per le Scienze Applicate allo Sviluppo dell'Agricoltura, Sicurezza Alimentare ed alla Tutela Ambientale*.

Italian Microbiome Implementation Action Plan (IAP)

Presidenza del Consiglio dei Ministri

CNBBSV
COMITATO NAZIONALE PER LA BIOSICUREZZA LE BIOTECNOLOGIE E LE SCIENZE DELLA VITA

IMPLEMENTATION ACTION PLAN

(2020-2025)

FOR THE ITALIAN MICROBIOME INITIATIVE

July 2020

http://cnbbsv.palazzochigi.it/en/areas-of-work/bioeconomy/microbiome/

MAIN AUTHORS

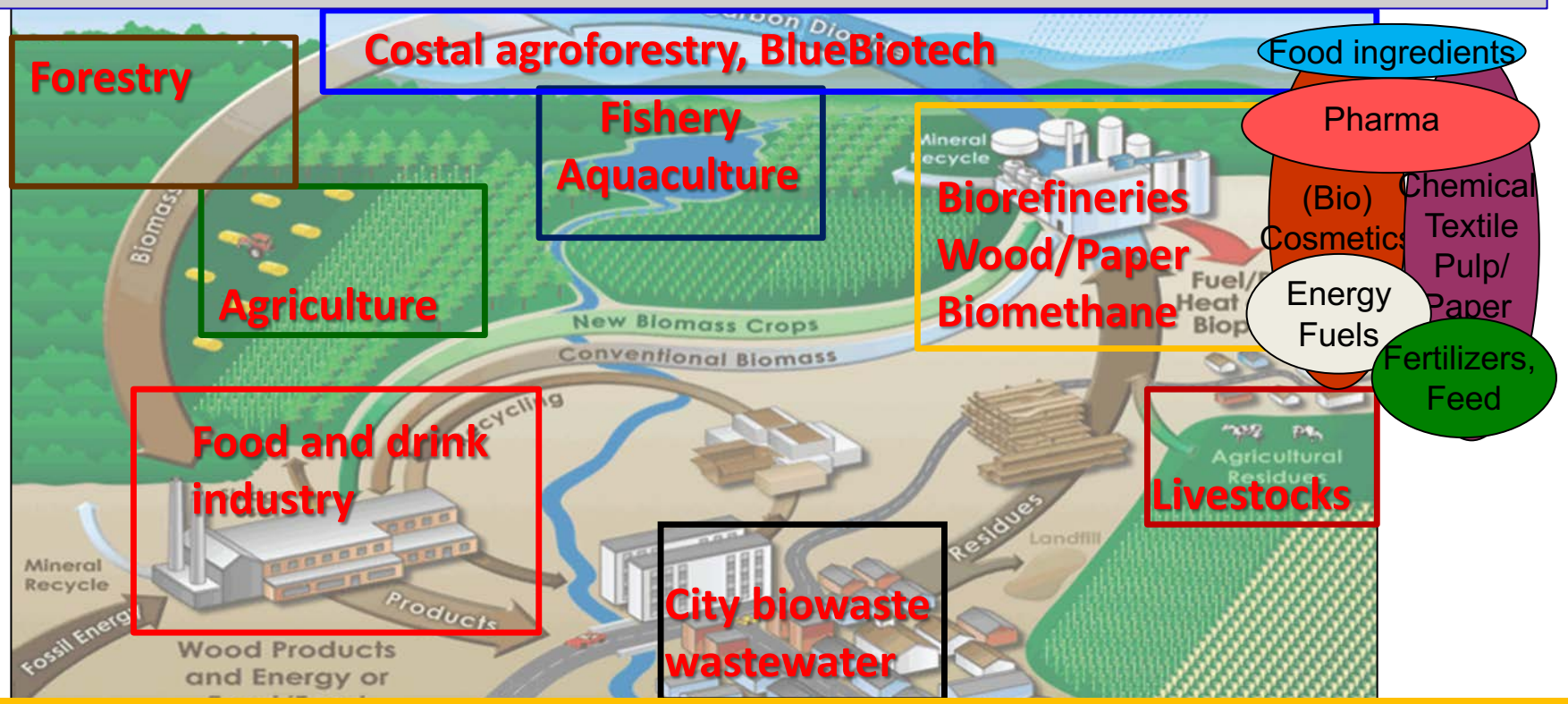
Andrea Lenzi, Università Roma La Sapienza & President of CNBBSV (Coordinator)
Fabio Fava, Università di Bologna & CNBBSV (Coordinator)
Lorenzo Maria Donini, Università di Roma La Sapienza;
Massimo Federici, Università di Roma Tor Vergata;
Marco Gobbetti, Università di Bolzano & CNBBSV;
Andrea Isidori, Università di Roma La Sapienza;
Silvia Migliaccio, Università di Roma "Foro Italico";
Annateresa Palamara, Università di Roma La Sapienza;
Paolo Trevisi, Università di Bologna;
Paolo Visca, Università di Roma Tre & CNBBSV
Patrizia Brigidi, **IT TECHNOLOGY CLUSTER AGRIFOOD**
Enzo Grossi, **IT TECHNOLOGY CLUSTER HEALTH**
Alessandro Perra, **GUNA SpA**
Andrea Costa, **SIIT SpA**
Enzo Grossi, **BRACCO SpA**
Pietro Grossi, **ALFASIGMA SpA**
Polenzani Lorenzo, **ANGELINI PHARMA SpA**
Fabio Rinaldi, **GIULIANI PHARMA SpA**
Longo Valeria, **INDENA SpA**
Luca de Laude, **GRANAROLO SpA**
Cecilia Giardi, **NOVAMONT SpA**
Rosa Prati, **CAVIRO, SpA**
Gilberto Litta, **DSM, SpA**
Silver Giorgini, **OROGEL SpA**
Marco Alghisi, **NESTLE SpA**
Giovanni Ortali, **VERONESI SpA**
Mauro Fontana, **FERRERO SpA**
Marco Trezzi, **BAULI SpA**

25 NATIONAL INDUSTRIAL ASSOCIATIONS WERE INVOLVED IN THE IAP CONSULTATION

“National Bioeconomy Coordination Board”, CNBBSV, and its contribution to the implementation of a Sustainable Bioeconomy in Italy and in EU

The Bioeconomy landscape

Agriculture, 13M ha, 90% in rural areas; Abandoned lands, 2M ha; **Forestry,** 12M ha, poorly exploited**; Food&Drink companies,** 58,000, 88% with < 9 employees; **Coastline,** 8,000 km, poorly exploited**; Cities,** 8,000…



In Europe: about 2,400 Bil €/y and 18,5 Mil of jobs (2018)

In Italy: about 330 Bil €/y, 2.0 Mil of jobs (2017) +1.8% (2018, 2019) -6.5% (2020)
In EU: 3rd turnover/jobs, 2nd as presence in H2020SC2 & BBIJU funded projects,
1st Biodiversity richness and number of quality products (DOP, IGP, etc)

Environmental and social benefits, for sustainable/regenerative/inclusive growth

IT Bioeconomy strategy (BIT II, 2019), Implementation Action Plan (2021)

http://cnbbsv.palazzochigi.it/media/1774/bit_en_2019_02.pdf

"National Bioeconomy Coordination Board" CNBBSV, Presidency Council Ministers, Rome

Composition (PdC decree 2021):

- Ministry Agriculture, Food, Forestry Policies;
- Ministry University & Research;
- Ministry Economical Dev;
- Ministry Ecological Transition;
- Ministry Education.
- X and XI Conferences of Regions & autonom. Provinces;
- Italian Agency territorial cohesion; SVIMEZ;
- Institute for Environmental Protection and Research;
- Italian Technology Clusters: Circular Bioeonomy (SPRING) , AgriFood (CLAN), BlueGrowth (BIG).

http://cnbbsv.palazzochigi.it/en/areas-of-work/bioeconomy/strategies-and-implementation-action-plan/

http://cnbbsv.palazzochigi.it/en/areas-of-work/bioeconomy/

Promotion of IT Bioeconomy in the Country: some of the ongoing initiatives

Working Group «National Cluster on forestry and wood». Coordination: Ministry of Agriculture, Food, and Forestry Policies;

Working Group «Codes ATECO (EU NACE codes), Eer and Carbon farming», «end of waste issues». Coordination: National Technology Clusters SPRING e Cluster CLAN;

Working Group «Bioeconomy taxonomy», for **PON, POR, S3 regional and national programming**. Coordination: Agency of Territorial Cohesion

Working Group «indicators for measuring bioeconomy implementation on the territories» Coordination: Proff. L. Gardossi, A. Zezza

Working Group «Education in Bioeconomy». Coordination: Ministry of Education

Working Group «implementation of the innovation generated by H2020 and BBI JU programmes on the territories » in cooperation with APRE and the Clusters SPRING, CLAN e BIG, the Agency of Cohesion, Committees of the Regions and authonomous provinces;

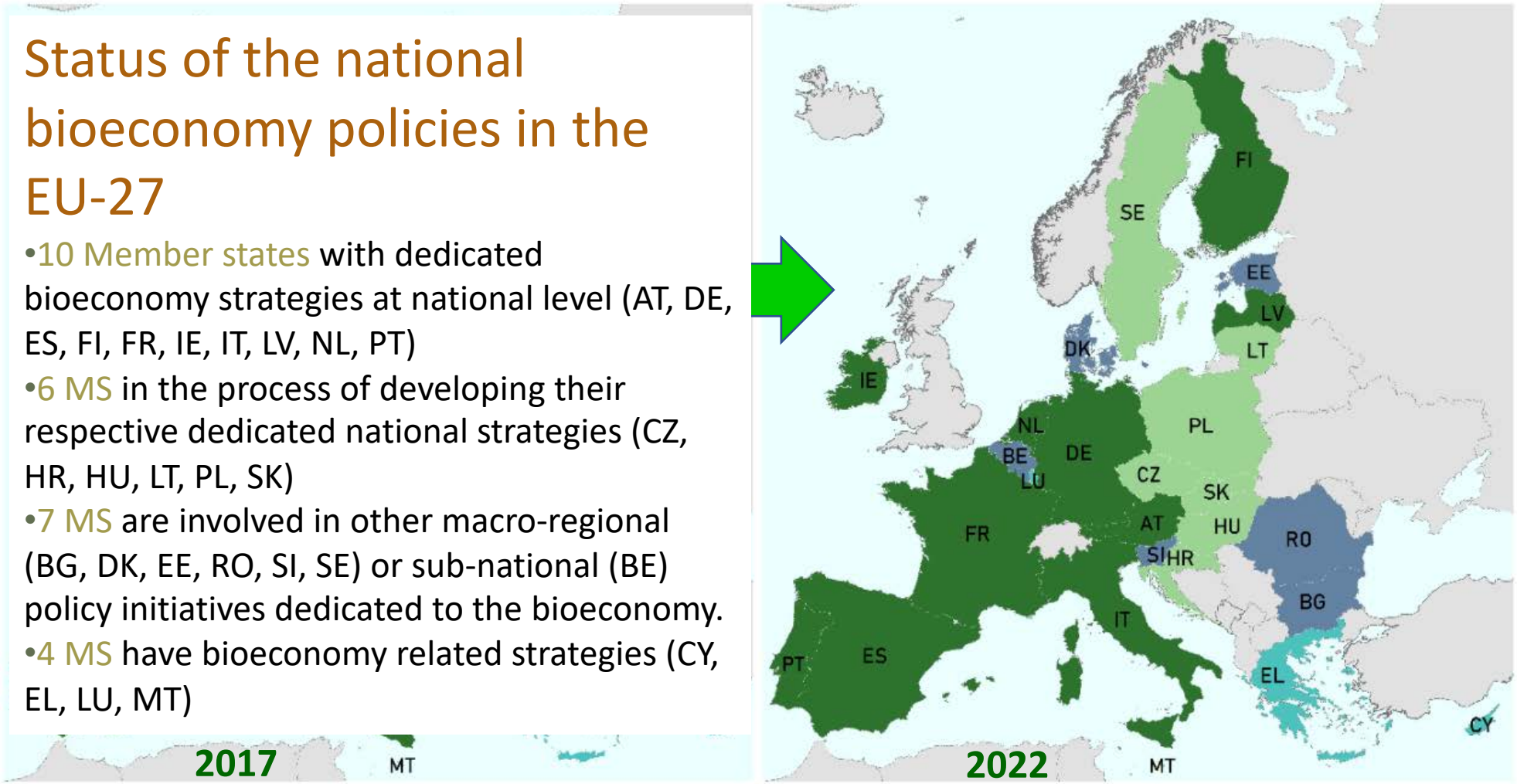
Promotion of IT Bioeconomy in EU (a)

All MSs, EC DGs, EP, CoR, EESC (high and expert-level) **2020**

Promotion of IT Bioeconomy in EU (b)

Status of the national bioeconomy policies in the EU-27

- 10 Member states with dedicated bioeconomy strategies at national level (AT, DE, ES, FI, FR, IE, IT, LV, NL, PT)
- 6 MS in the process of developing their respective dedicated national strategies (CZ, HR, HU, LT, PL, SK)
- 7 MS are involved in other macro-regional (BG, DK, EE, RO, SI, SE) or sub-national (BE) policy initiatives dedicated to the bioeconomy.
- 4 MS have bioeconomy related strategies (CY, EL, LU, MT)



Status before the adoption of the European Bioeconomy Strategy (left side) and in February 2022 (right side)

Source: European Commission's Knowledge Centre for Bioeconomy
Administrative Boundaries: © EuroGeographics © UN-FAO © Turkstat

Promotion of IT Bioeconomy in EU (c)

MISSIONS: Restore our Ocean and Waters by 2030; A Soil Deal for Europe;

PARTNERSHIPS: biodiversity, agro-ecology & living-labs, agro-digitalization, water4all, animal health, sustainable food systems, sustainable blue economy, CircularBioIndustryEU

Promotion of IT Bioeconomy in the frame G20, OECD and FAO

Bioeconomy in the G20 and OECD countries: sharing and comparing the existing national strategies and policies for co-designing more effective Bioeconomy governance mechanisms and monitoring systems.

"National Bioeconomy Coordination Board", Presidency of Council of Ministers, Rome. July 16, 2021

- Wider and more effective national governances, inter-ministerial governances
- Updated regulatory system
- Greater access to risk capital
- Enable rapid commercialisation of biomanufacturing technologies
- New or revised EU NACE codes for biobased products
- More robust, established and harmonized indicators, along with high quality, homogeneous and aggregated data, and monitoring systems tailored for both products and territories (eg site specific).
- Intensify involvement of primary producers and citizens, more education and skills

- Foster the role of Bioeconomy and its relevant technologies in context of the European Green Deal and related policies (from the EU MSs)

11.15 – 12.45

Il Centro Nazionale Bio-Diversità

Alessandro Chiarucci

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

CENTRO INTERDIPARTIMENTALE
ALMA MATER INSTITUTE ON HEALTHY PLANET - ALMA HEALTHY PLANET

IT EN

AZIONI NAZIONALI E DELL'UNIVERSITÀ DI BOLOGNA A SOSTEGNO DELLA SALUTE DELL'AMBIENTE E DELLE PERSONE

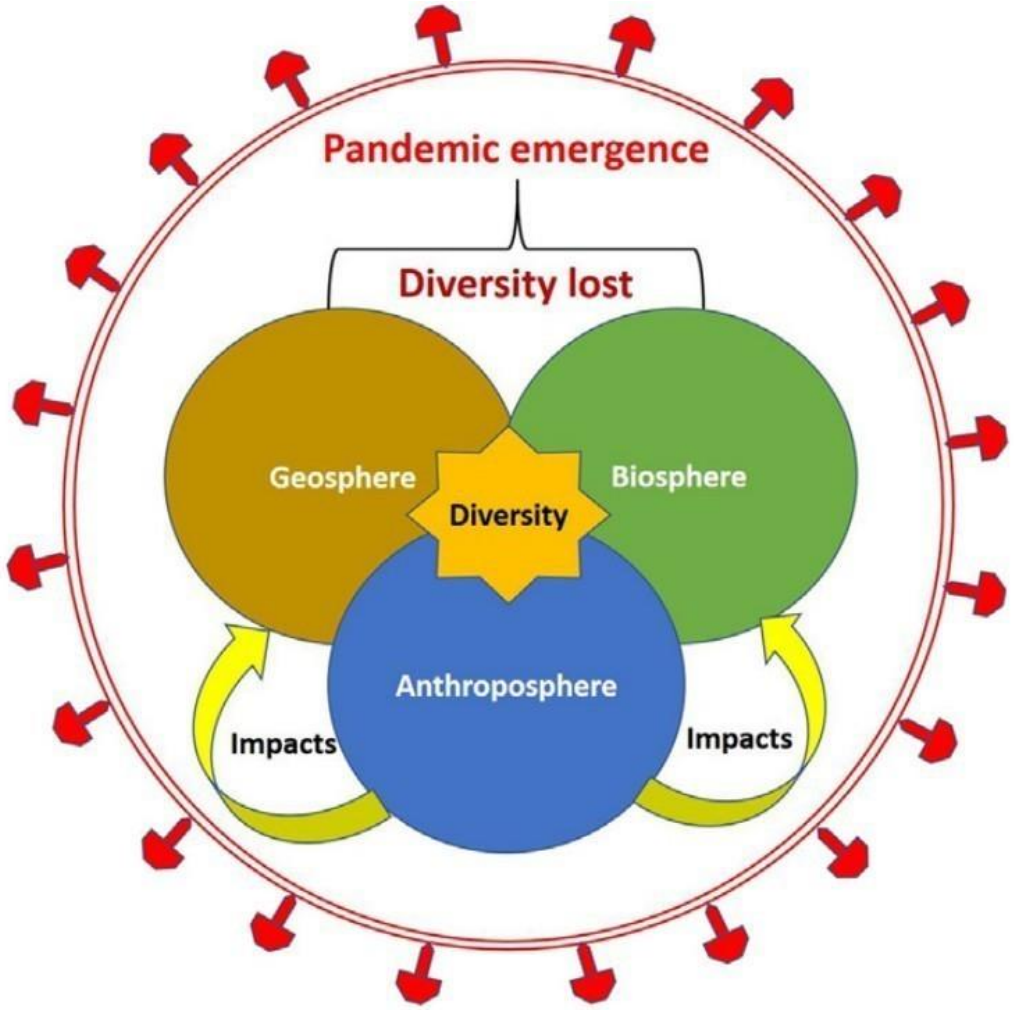
Conferenza promossa dal Centro Interdipartimentale Alma Mater Institute on Healthy Planet

Campione Nazionale Biodiversità

Alessandro Chiarucci – BiGeA
(a nome del GdL di Ateneo sul Centro Nazionale)

18 luglio 2022

Pandemics



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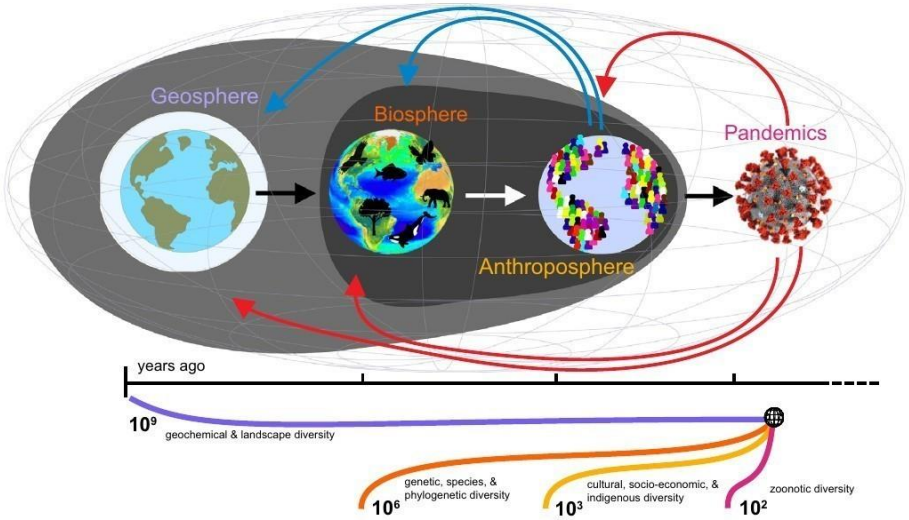
journal homepage: www.elsevier.com/locate/scitotenv

Diversity lost: COVID-19 as a phenomenon of the total environment

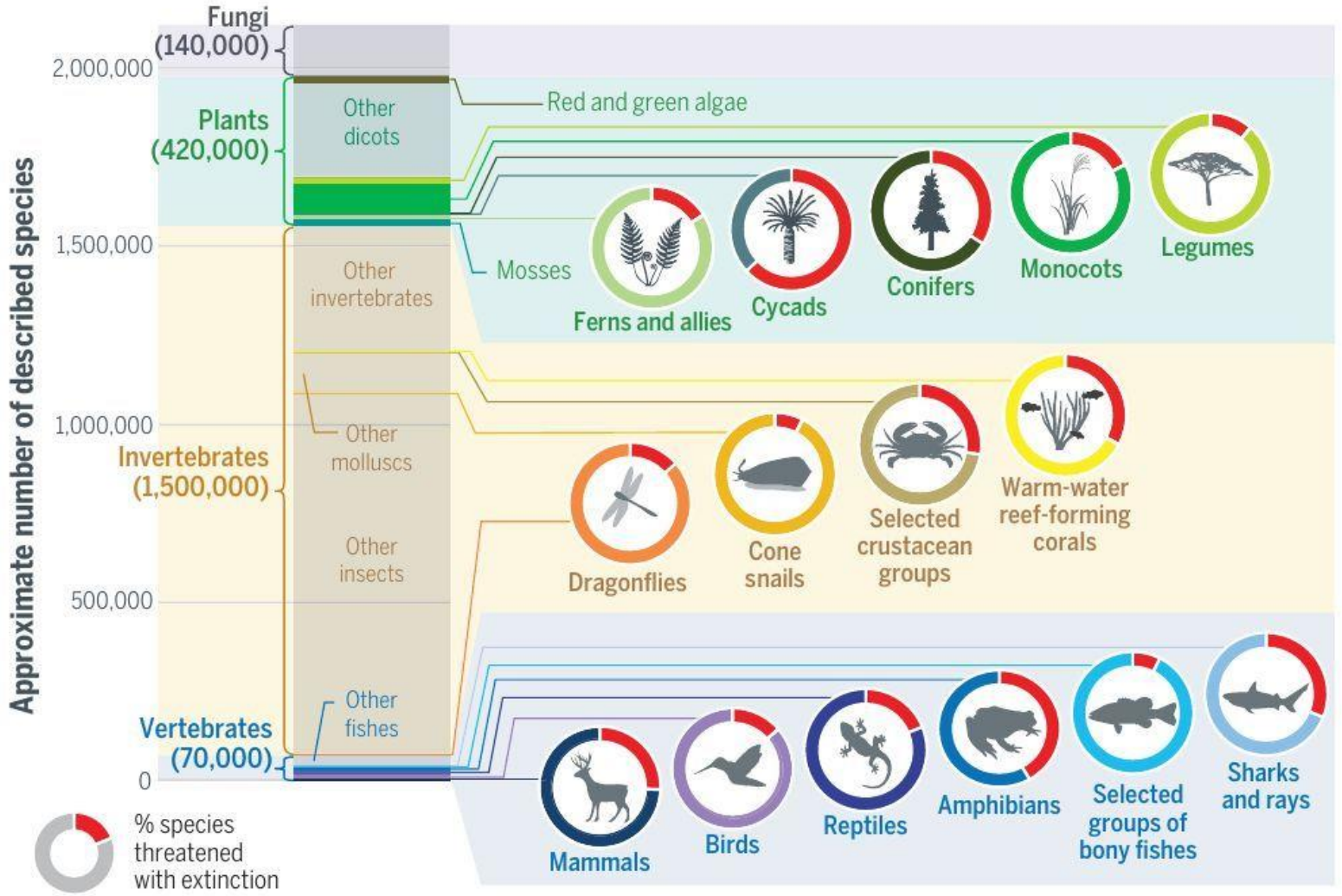
Roberto Cazzolla Gatti [a,b,*], Lumila Paula Menéndez [a,c,1], Alice Laciny [a,d,1], Hernán Bobadilla Rodríguez [a,e,1], Guillermo Bravo Morante [a,f], Esther Carmen [a,g], Christian Dorninger [a], Flavia Fabris [a], Nicole D.S. Grunstra [a,h,i], Stephanie L. Schnorr [a,j], Julia Stuhlträger [a,k], Luis Alejandro Villanueva Hernandez [a], Manuel Jakab [l], Isabella Sarto-Jackson [a], Guido Caniglia [a]



Biodiversity

ipbes
Science and Policy for People and Nature

Media Release:
Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'



REVIEW

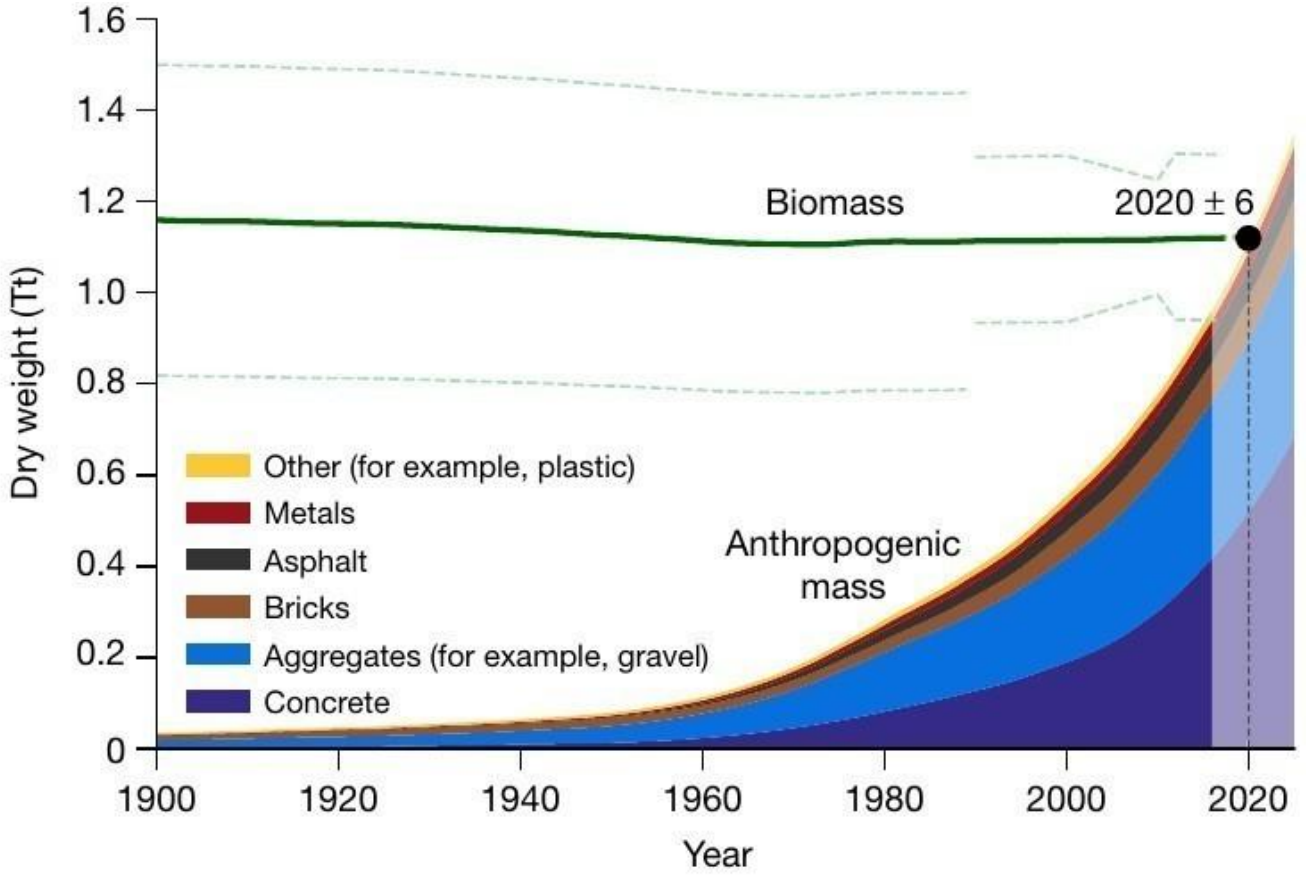
GLOBAL CONSERVATION

Pervasive human-driven decline of life on Earth points to the need for transformative change

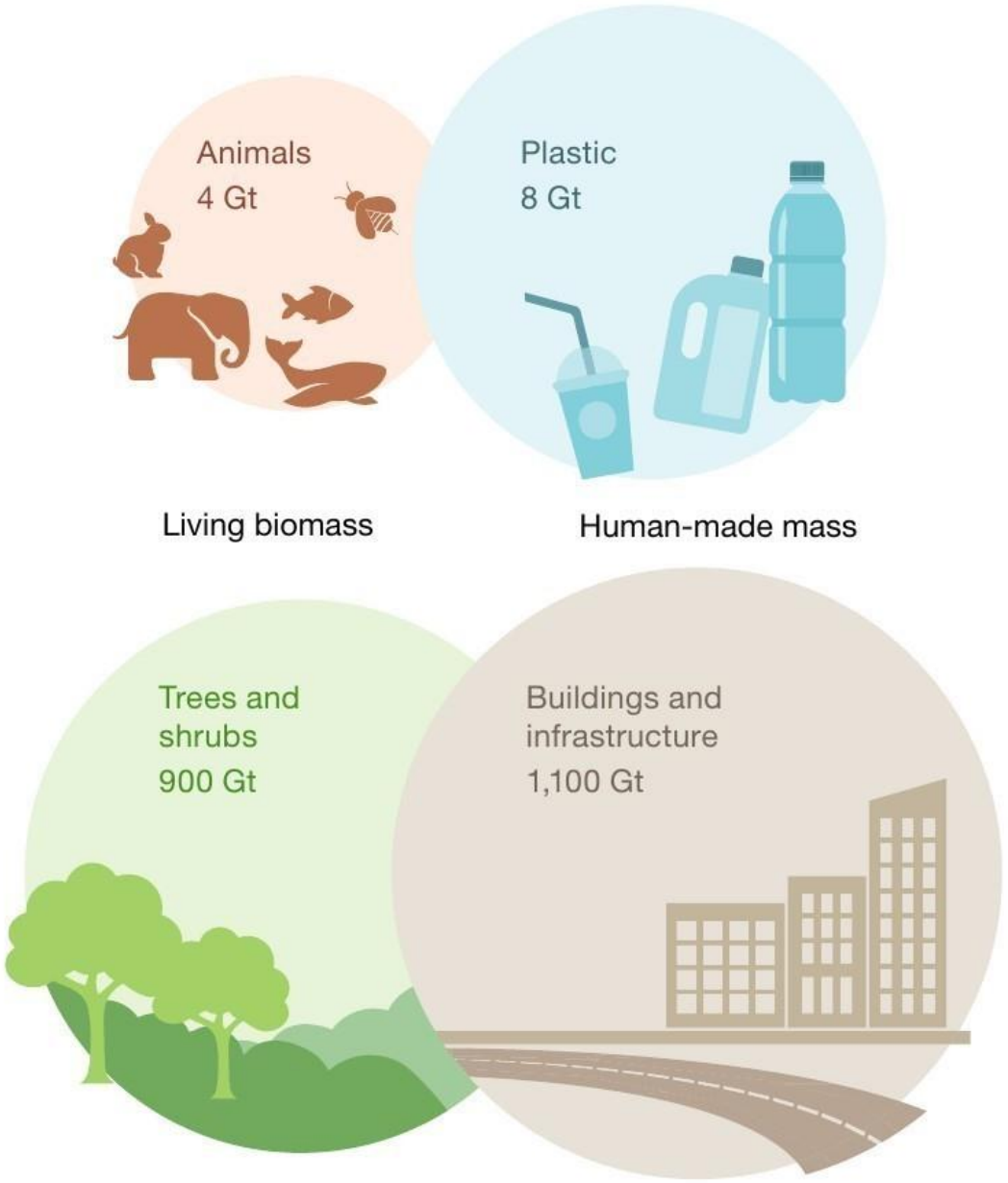
Sandra Díaz[1,2]*, Josef Settele[3,4], Eduardo S. Brondízio[5], Hien T. Ngo[6], John Agard[7], Almut Arneth[8], Patricia Balvanera[9], Kate A. Brauman[10], Stuart H. M. Butchart[11,12], Kai M. A. Chan[13], Lucas A. Garibaldi[14], Kazuhito Ichii[15,16], Jianguo Liu[17], Suneetha M. Subramanian[18,19], Guy F. Midgley[20], Patricia Miloslavich[21,22], Zsolt Molnár[23], David Obura[24,25], Alexander Pfaff[26], Stephen Polasky[27,28], Andy Purvis[29,30], Jona Razzaque[31], Belinda Reyers[32,33], Rinku Roy Chowdhury[34], Yunne-Jai Shin[35,36], Ingrid Visseren-Hamakers[37,38], Katherine J. Willis[39,40], Cynthia N. Zayas[41]

Fig. 2. Extinction risk and diversity in different taxonomic groups. Approximate number of described species of animals, plants, and fungi (bar) and the proportion of species that are threatened with extinction (pie charts) in groups that have been globally assessed for the IUCN Red List (*54*), either comprehensively or (for legumes, monocots, ferns and allies, dragonflies, and reptiles) through a sampled approach. Proportions assume that data deficient species are equally threatened as non–data deficient species. The proportions of data deficient species in each group are mammals, 15%; birds, 0.5%; reptiles, 21%; amphibians, 23%; bony fishes, 12%; sharks and rays, 42%; dragonflies, 35%; cone snails, 14%; crustaceans, 40%; corals, 17%; ferns, 0.4%; cycads, 1%; conifers, 1.2%; monocots, 12.1%; and legumes, 7.9%. The proportions of data deficient species in each realm are terrestrial, 10.7%; freshwater, 20.8%; and marine, 21.9%. [Sources: (*49*, *54*, *107*–*113*).]

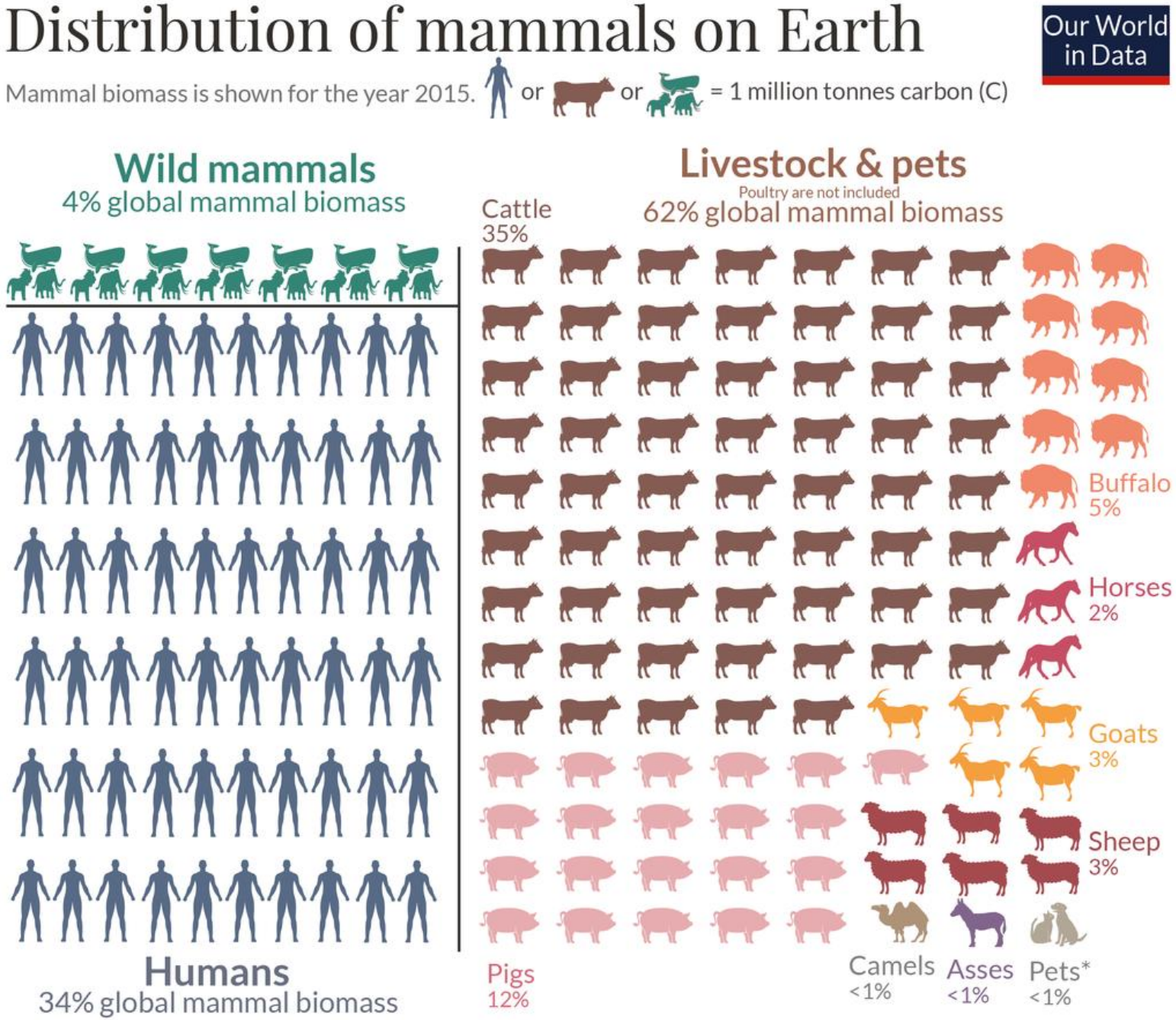
Anthropocene



Biomass and anthropogenic mass estimates since the beginning of the twentieth century on a dry-mass basis.



Elhacham et al. (2020) Global human-made mass exceeds all living biomass. *Nature*, 588, 442–444



Relative biomass on Earth of mammal groups using gigatons of carbon as a common measure of comparison.

Picture: https://ourworldindata.org/mammals, CC BY 4.0, https://commons.wikimedia.org/w/index.php?curid=109431302
Data: Bar-On *et al.* (2018) The biomass distribution on Earth. *Proceedings of the National Academy of Sciences*, 115, 6506-6511

"Making nature healthy again is key to our physical and mental wellbeing and is an ally in the fight against climate change and disease outbreaks. It is at the heart of our growth strategy, the European Green Deal, and is part of a European recovery that gives more back to the planet than it takes away."

Ursula von der Leyen, President of the European Commission

Climate change, the unprecedented loss of biodiversity, and the spread of devastating pandemics are sending a clear message: it is time to fix our broken relationship with nature.

The Biodiversity Strategy will put Europe's biodiversity on the path to recovery by 2030, for the benefit of people, climate and the planet.

Why do we need to protect biodiversity?

Biodiversity is **essential** for life. Our planet and the economy depend on it. When nature is healthy, it protects and provides.

Convention on Biological Diversity

The EU Biodiversity Strategy

ONE VISION

By 2050, all of the world's ecosystems are **restored**, **resilient**, and adequately **protected**

ONE GOAL

Put Europe's biodiversity on the path to recovery by 2030 for the benefit of **people**, the **planet**, the **climate** and our **economy**

FOUR PILLARS

1

Protect Nature

Expand protected areas to 30% of the EU's land and sea, and put a third of these areas under strict protection

2

Restore Nature

Restore nature and ensure its sustainable management across all sectors and ecosystems

3

Enable transformative change

Strengthen the EU biodiversity governance framework, knowledge, research, financing and investments

4

EU action to support biodiversity globally

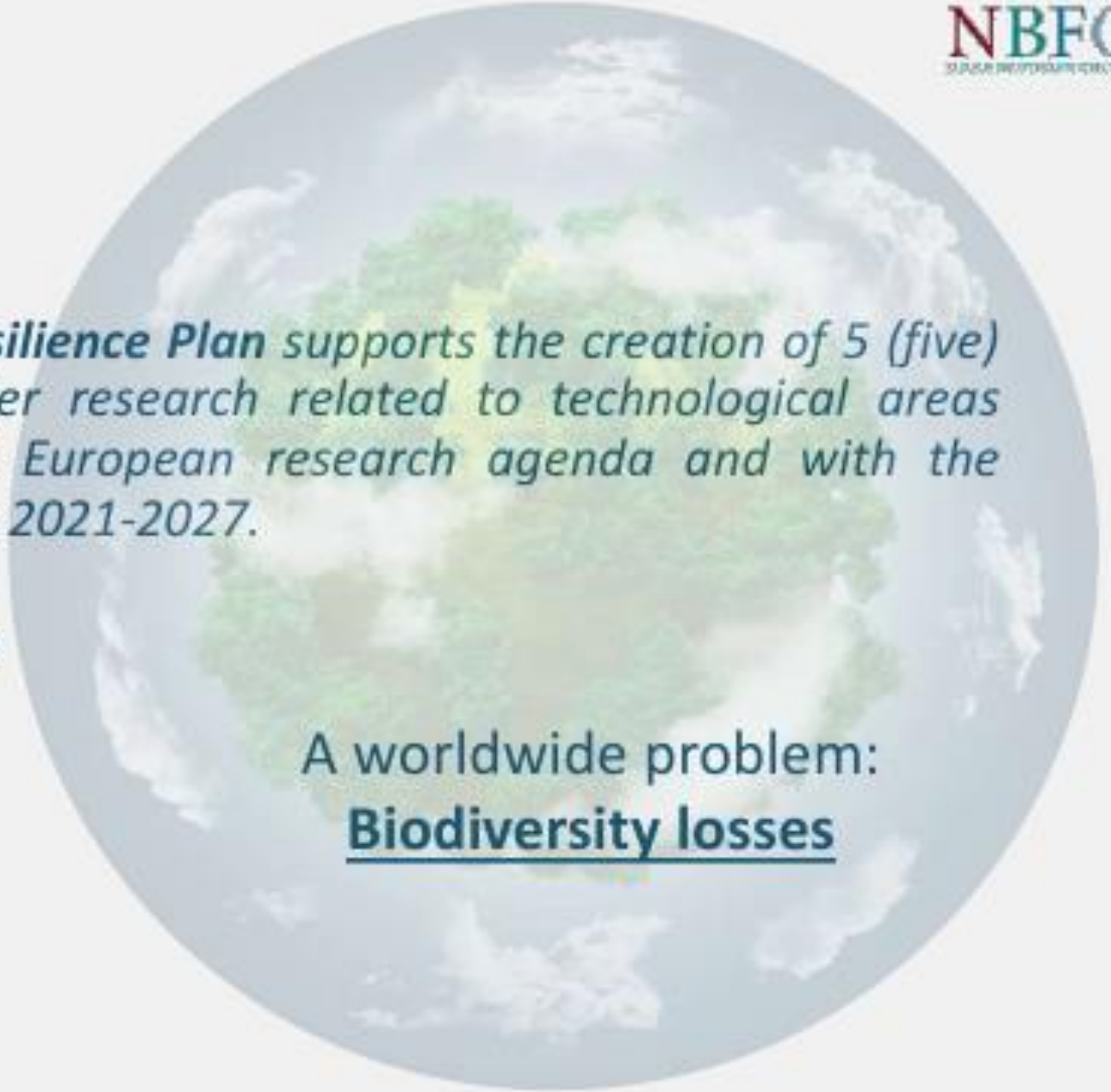
Deploy EU external actions to raise the level of ambition for biodiversity worldwide, reduce the impact of trade and support biodiversity outside Europe

ACTIONS AND COMMITMENTS TO 2030

Biodiversity

*The Italian **National Recovery and Resilience Plan** supports the creation of 5 (five) National Centers dedicated to frontier research related to technological areas consistent with the priorities of the European research agenda and with the contents of the National Research Plan 2021-2027.*

1. High performance simulations, computation and data analysis
2. Agricultural Technologies (Agritech)
3. Development of gene therapy and drugs with RNA technology
4. Sustainable mobility
5. **Biodiversity (Mediterranean *hotspot*)**



A worldwide problem:
Biodiversity losses

Biodiversity

"Biodiversity supports human and societal needs, including food and nutrition security, energy, development of medicines and pharmaceuticals and freshwater, which together underpin good health. It also supports economic opportunities, and leisure activities that contribute to overall wellbeing"

More than half of global GDP – some €40 trillion – depends on nature

Nature restoration will be a central element of the EU's recovery plan from the coronavirus pandemic, providing immediate business and investment opportunities for restoring the EU's economy.

National Biodiversity Future Centre

1

GOAL

Scientists

to educate of a new generation of scientists

2

GOAL

Open Data

to enable future research and development of science and technology through data

3

GOAL

Deployment of KETs

to enable future research and development of science and technology through data

5

GOAL

Biodiversity Gateway

to engage citizens, innovators, display and explain the tangible and intangible value of biodiversity

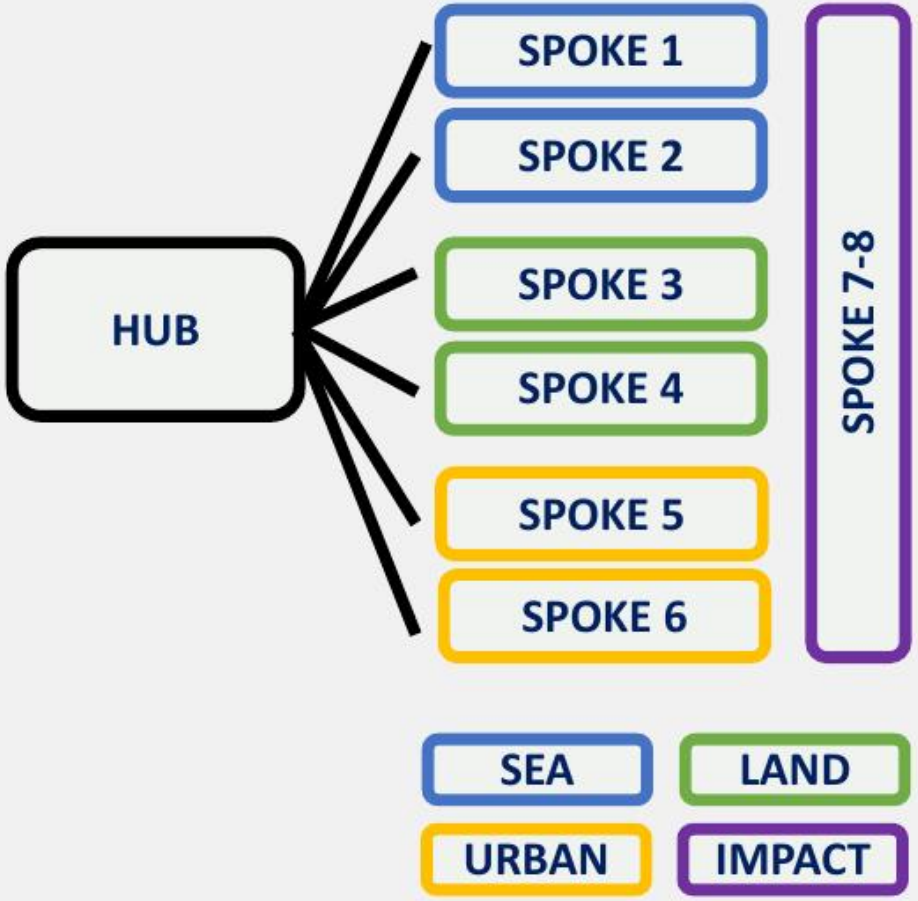
4

GOAL

Go to Market

to exploit the value of new research findings in biodiversity

National Biodiversity Future Centre



Spokes

[SPOKE 1] Mapping and monitoring actions to preserve marine ecosystem biodiversity and functioning

[SPOKE 2] Solutions to reverse marine biodiversity loss and manage marine resources sustainably

[SPOKE 3] Assessing and monitoring terrestrial and freshwater biodiversity and its evolution: from taxonomy to genomics and citizen science

[SPOKE 4] Ecosystem functions, services and solutions

[SPOKE 5] Urban biodiversity

[SPOKE 6] Biodiversity and human wellbeing

[SPOKE 7] Biodiversity and society: communication, education and social impact

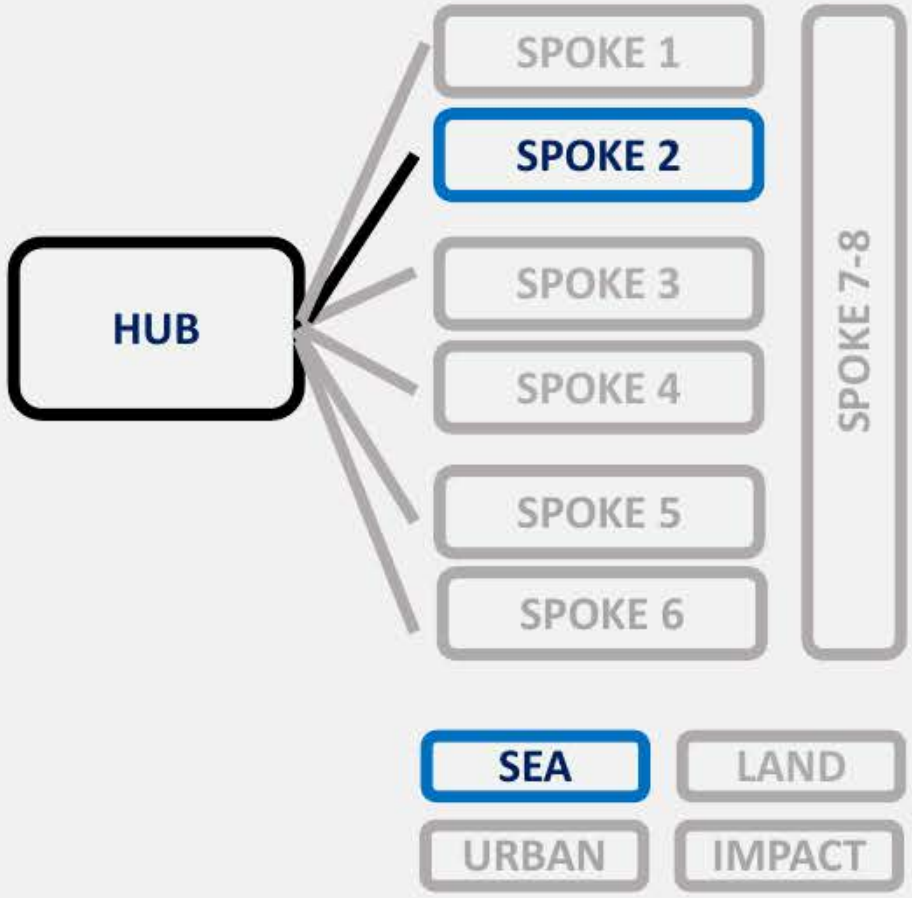
[SPOKE 8] Biodiversity Open Innovation & Development of KETs.

Part 4

GATEWAY

the Gateway is a virtual infrastructure (with some physical bases) able to transform the research into diffused knowledge and companies. It is an Education and Innovation facility and a place where to bring scientific research to society and to the market.

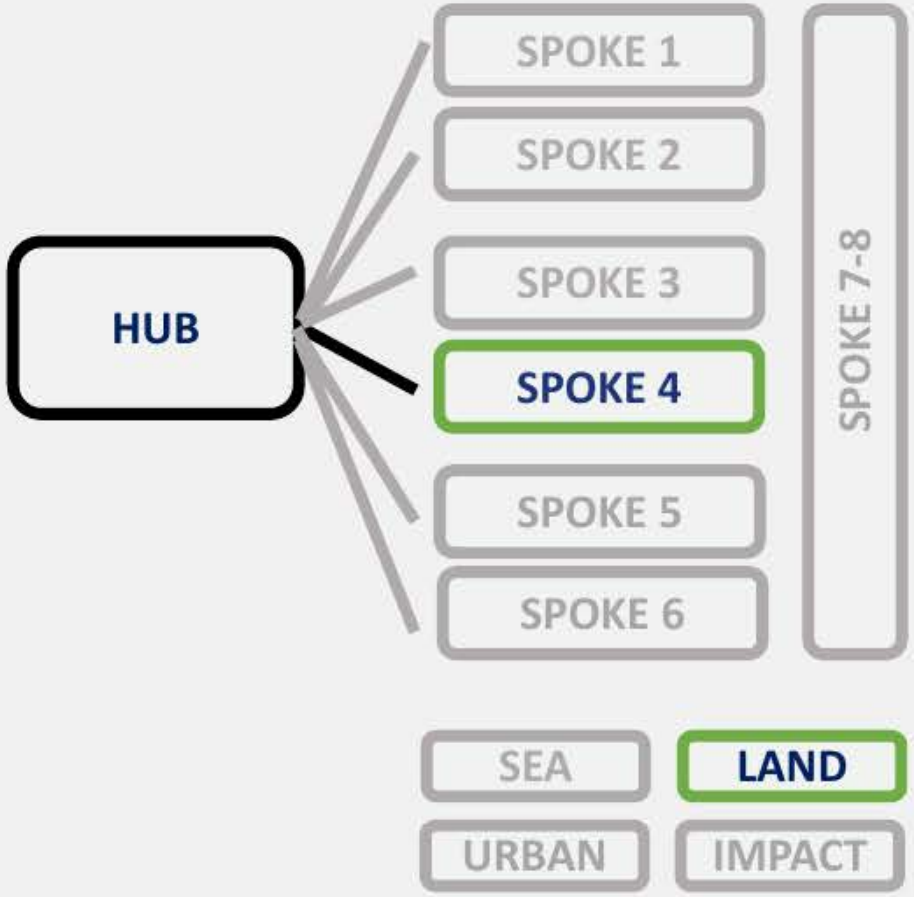
Solutions to reverse marine biodiversity loss and manage marine resources sustainably



- ✓ **Assess** and **mitigate** impacts and threats to marine biodiversity
- ✓ **Restore** biodiversity and ecosystems
- ✓ **Promote** a sustainable valorization of marine resources
- ✓ **Develop** a biodiversity-oriented planning of the human uses of the sea
- ✓ Develop innovative **multi-omics based technologies** to address emergent biodiversity threats

PARTNERS INVOLVED: CNR, UNIGE,UNIVPM, Fond. CIMA, UNIBO, CORILA, OGS, FOND. IMC, UNIPD, ISPRA, UNISI, UNISALENTO, SZN

Ecosystem functions, services and solutions



- ✓ **Advanced systems** for monitoring, studying and managing biodiversity, its organization, the related ecosystem functions and services in relation to natural and anthropic impacts
- ✓ **Adaptation and mitigation** of terrestrial ecosystems to climate change including ecological responses and future forecast scenarios
- ✓ Scenarios of **Area-based conservation** planning and management
- ✓ Conceptual framework and methodological tools of **Nature Based Solution and Restoration Ecology**

Partners involved: CNR, UNITUSCIA, UNISALENTO, UNISS, UNIUDINE, LA SAPIENZA, UNIBO, UNIPV, ENEL, INFRASTRUTTURE SPA, CATTOLICA, CMCC, ISPRA, FONDAZIONE CIMA

NBFC e il Centro Alma Healthy Planet: quali sinergie?

Benessere umano

Rigenerazione ecosistemi

11.15 – 12.45

Centro Nazionale di Ricerca per le Tecnologie dell'Agricoltura (Agritech)

Attilio Toscano

AGRITECH @UNIBO

- Attilio Toscano (Coordinatore)
- Matteo Golfarelli
- Lorenzo Marconi
- Mario Mazzocchi
- Annalisa Tassoni
- Ludovica Mammi

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CENTRO INTERDIPARTIMENTALE
ALMA MATER INSTITUTE ON HEALTHY PLANET

AZIONI NAZIONALI E DELL'UNIVERSITÀ DI BOLOGNA A SOSTEGNO DELLA SALUTE DELL'AMBIENTE E DELLE PERSONE

Conferenza promossa dal

Centro Interdipartimentale Alma Mater Institute on Healthy Planet

Centro Nazionale di Ricerca per le Tecnologie dell'Agricoltura (Agritech)

AGRITECH @UNIBO

- Attilio Toscano (Coordinatore)
- Matteo Golfarelli
- Lorenzo Marconi
- Mario Mazzocchi
- Annalisa Tassoni
- Ludovica Mammi

Bologna, 18/07/2022

Stato di avanzamento PNRR CN AGRITECH

- Manifestazione di interesse presentata il 15/02 e valutata positivamente (1° classificato fra i 5 CN)
- Proposta integrale presentata tenendo conto dei commenti dei valutatori il 30/04
- Negoziazione effettuata a fine maggio / inizio giugno
- Budget complessivo assegnato 320 M€ (richiesti 440 M€)
- Fondazione costituita (UNIBO membro fondatore)
- Decreto MUR di finanziamento in registrazione
- Costituzione organi fondazione entro fine luglio
- Avvio CN Agritech 1 settembre / 1 ottobre ???

List of the institutions participating to Agritech National Center

Abbreviation	Full Name
CNR	Consiglio Nazionale Ricerche
UNIBA	Università degli Studi di Bari
UNIBO	Alma Mater Studiorum – Università di Bologna
UNIMI	Università degli Studi di Milano
UNINA	Università di Napoli Federico II
UNIPD	Università di Padova
UNISI	Università di Siena
UNITO	Università degli Studi di Torino
UNITUS	Università degli Studi della Tuscia
CMCC	Centro Euro-Med sui Cambiamenti Climatici
CREA	Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria
ENEA	New Technologies, Energy and Sustainable Economic Development
FEM	Found Edmund Mach
POLIMI	Politecnico di Milano
POLITO	Politecnico di Torino
SSSA	Scuola Superiore Sant'Anna
UNIBAS	Università degli Studi della Basilicata
UNIBZ	Università di Bolzano
UCBM	Università Campus Bio-Medico di Roma
UCSC	Università Cattolica del Sacro Cuore
UNICT	Università di Catania
UNIFG	Università di Foggia
UNIFI	Università di Firenze
UNIGE	Università degli Studi di Genova
UNIPG	Università di Perugia
UNIPI	Università di Pisa
UNIPR	Università di Parma
UNIRC	Università di Reggio Calabria
UNIROMA	Sapienza Università di Roma
UNISA	Università di Salerno
UNISS	Università di Sassari
UNIUD	Università di Udine
UNIVPM	Università delle Marche
ANT	Antares Vision
CAI	Consorzi Agrari d'Italia
CAS	Casillo
CNH	CNH
DEM	De Matteis
EGE	Egeos
ENG	Enginnering
ENI	Eni
GRA	Graded
IBF	IBF
IRR	Irritech
REL	Relatech
SIS	Società Sementi Italiana
TEL	Telespazio
BF	Bonifiche Ferraresi
FCDP	Fondazione Cassa Depositi e Prestiti
ISP	Intesa San Paolo
NES	Nestlé

Spokes
Affiliates Universities/Research Institutes
Affiliates Private Companies
Private parties only in the Hub

Obiettivi di ricerca

- I -Resilience: Enhancing sustainable productivity and promoting resilience to climatic changes
- II-Low impact: Reducing wastage and environmental impact
- III-Circular: Development of circular economy strategies
- IV-Recovery: Sustainable development of marginal areas
- V-Traceability: Promoting safety, traceability and typical traits in agri-food chains

Centro Nazionale AGRITECH

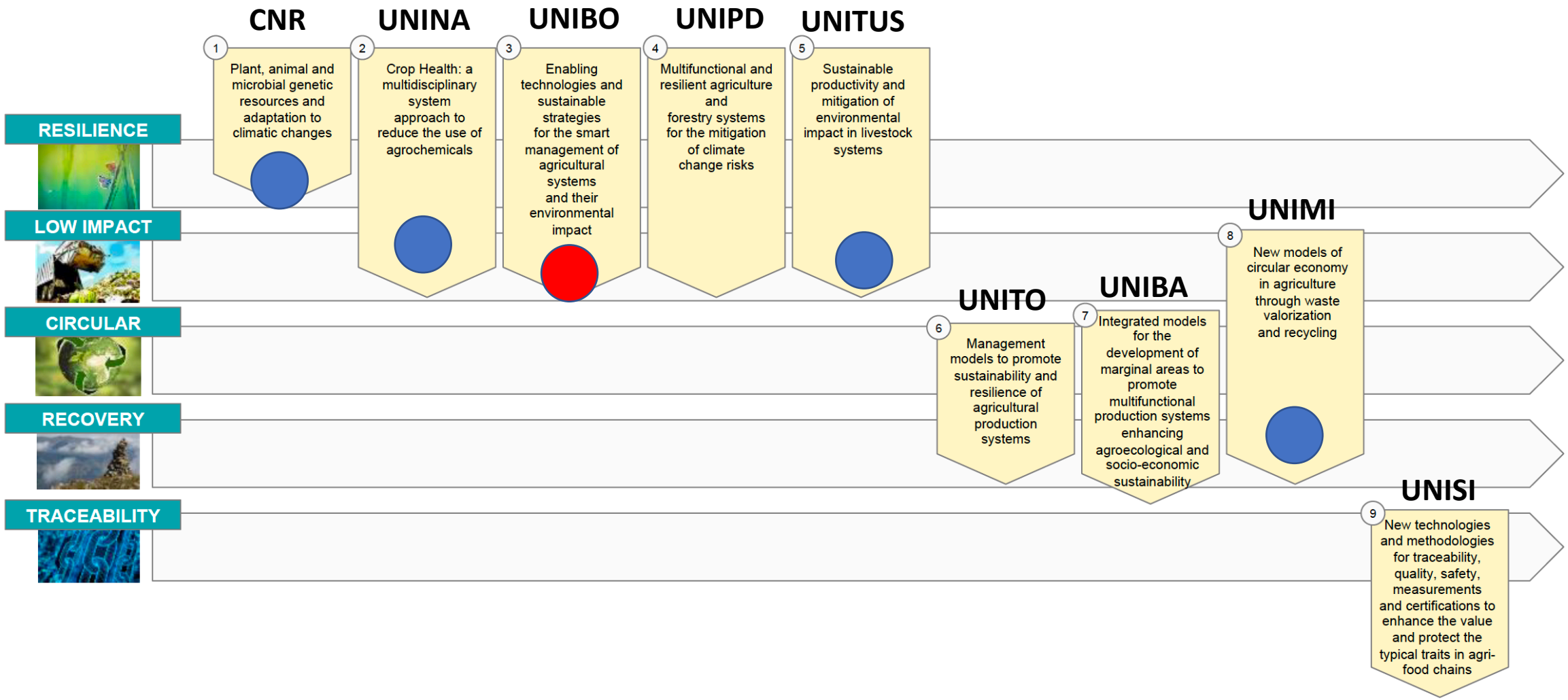


Figure A1 – Agritech thematic areas that will be developed to achieve the 5 overall objectives

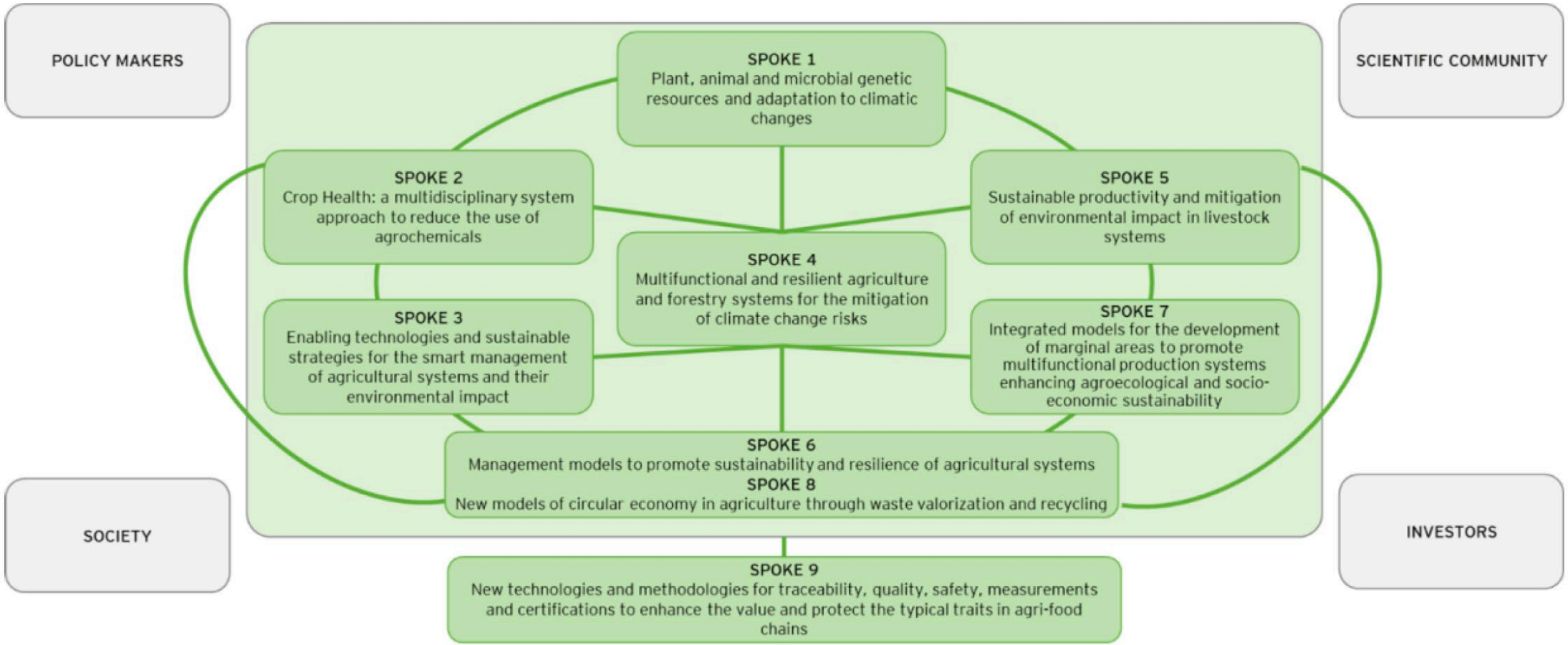


Figure A2 - Interactions among Agritech Spokes.

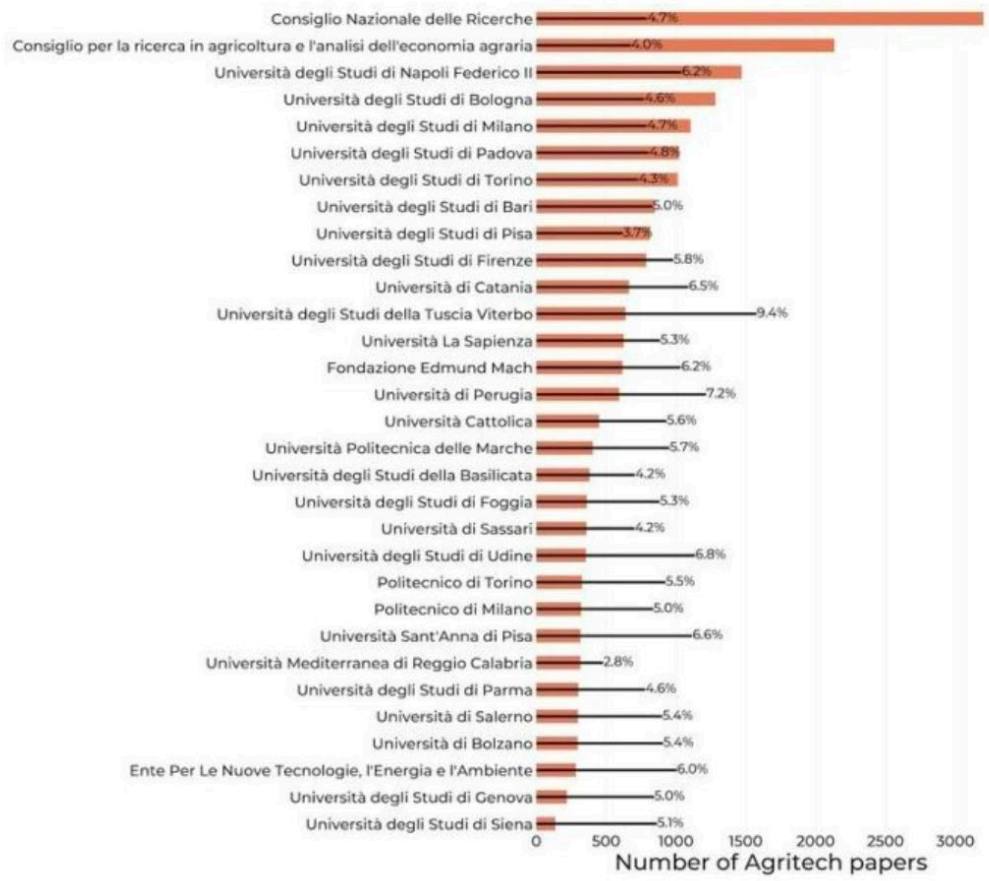
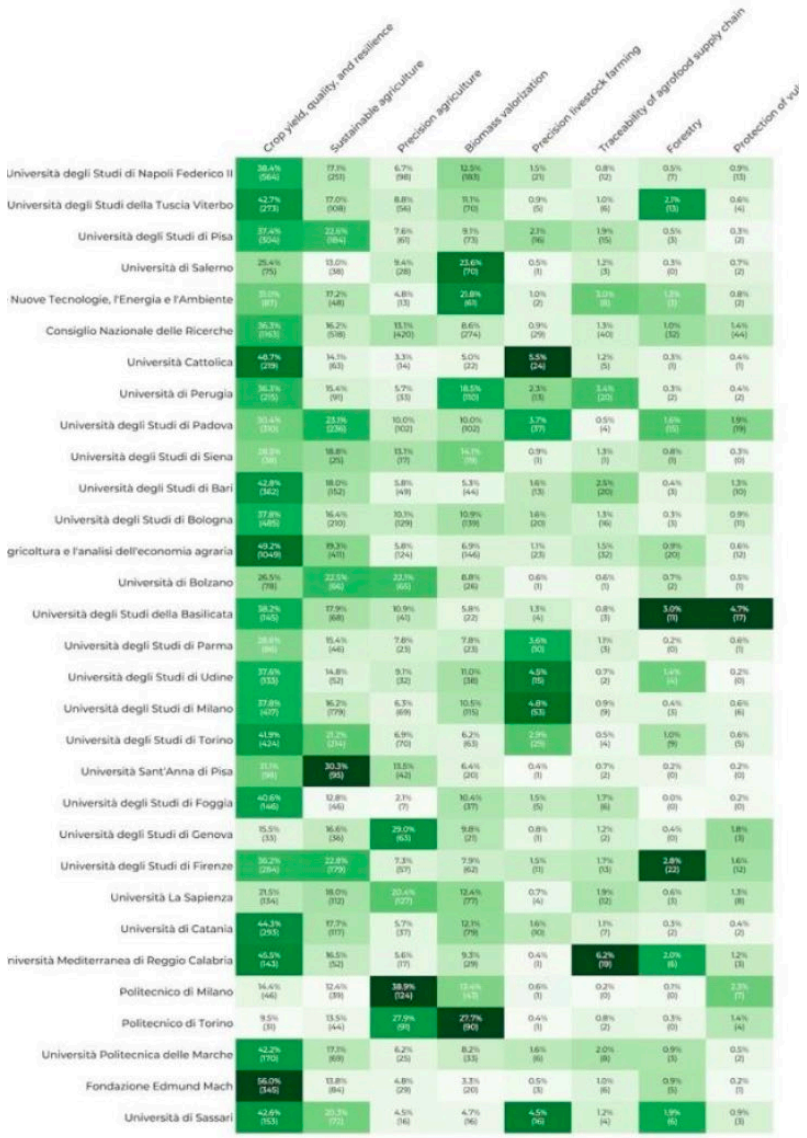


Figure B3 – Number of Agritech papers of the research institutions of the Agritech consortium. The thin black lines represent the percentages of Agritech publications that fall within the top 10% of the most cited publications in Agritech



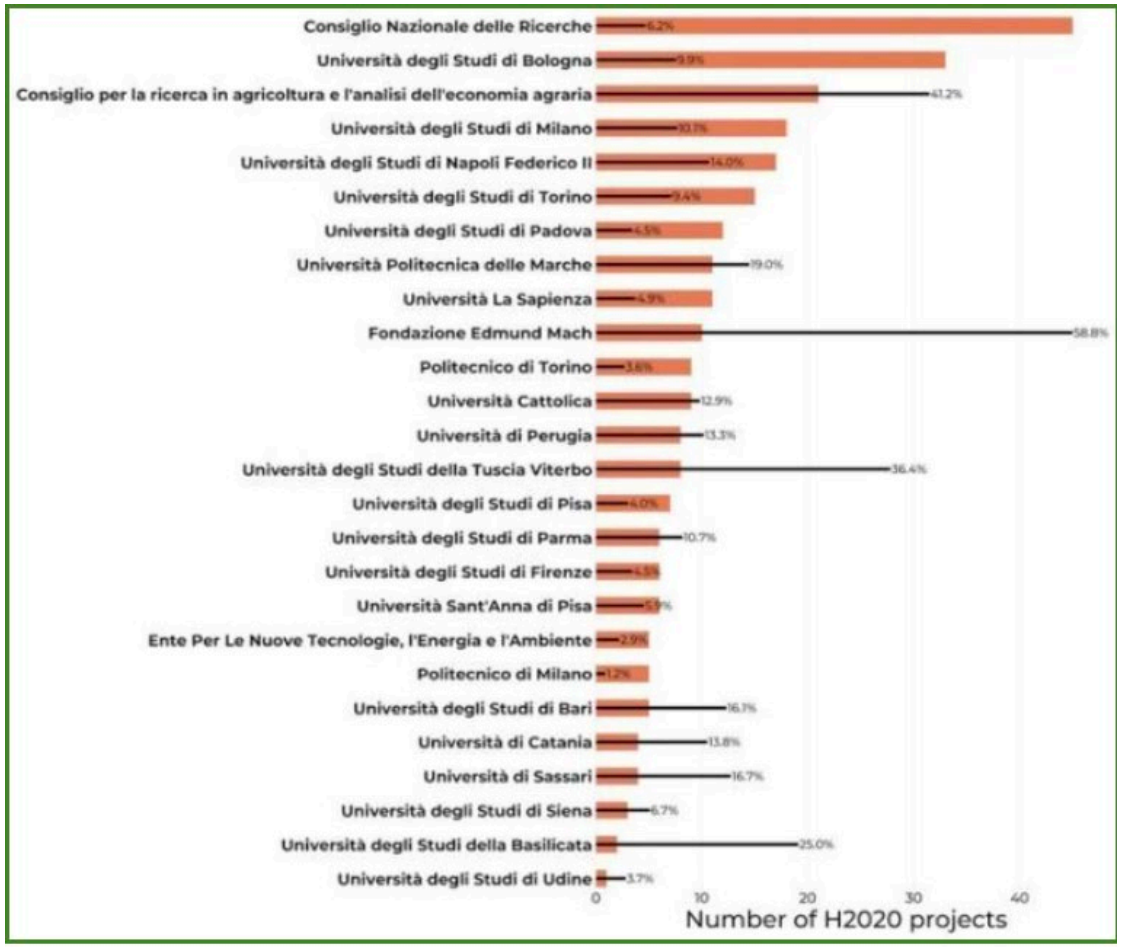


Figure A4 - Number of H2020 Agritech projects awarded to theAgritech institutions. The thin black line measures the percentage of the number of Agritech projects with respect to the total number of H2020 projects awarded to each institution

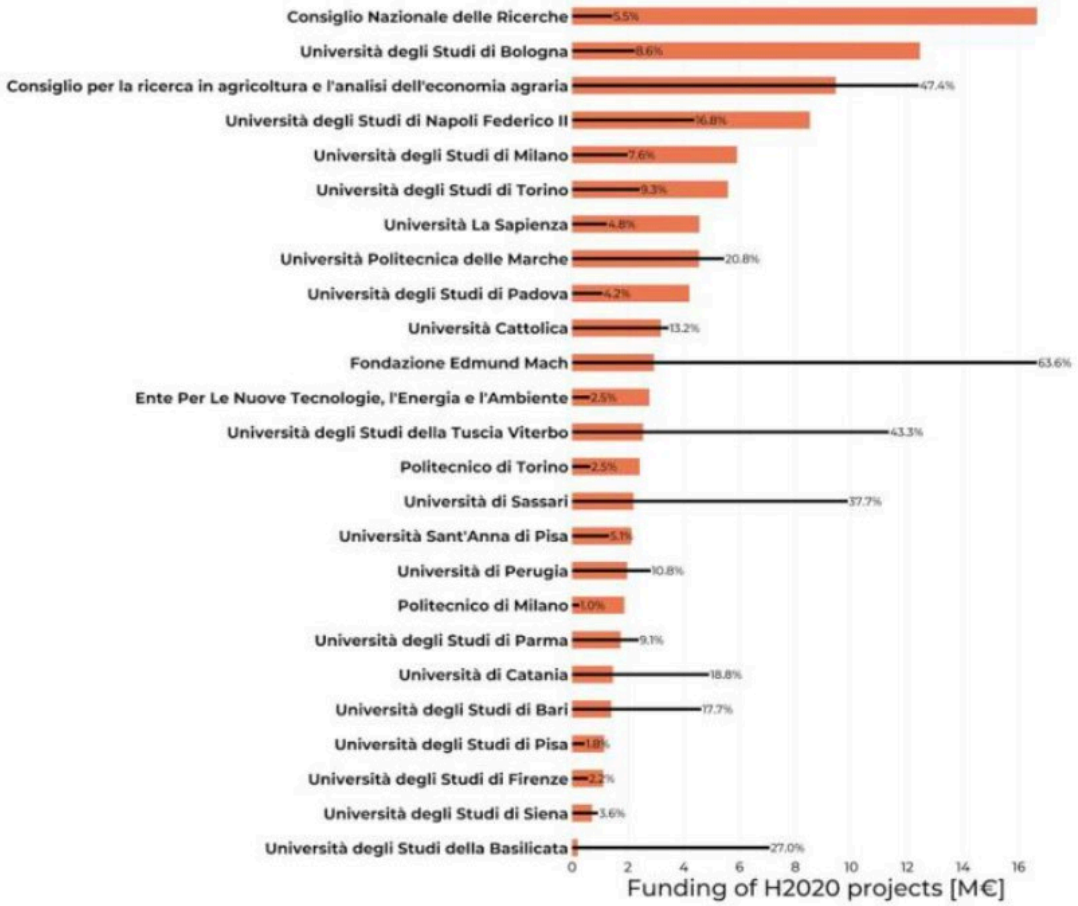


Figure B4 – H2020 funding (M €) for Agritech projects obtained by the institutions of the partnerships. The thin black line measures the percentage of the Agritech funding with respect to the total H2020 funding obtained by each institution.

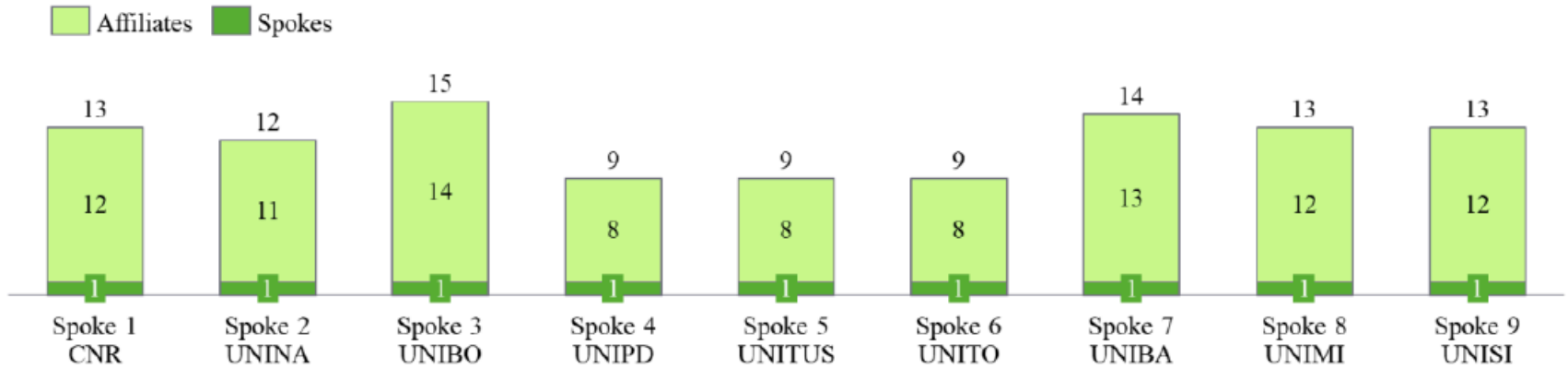


Figure B1 – Number of participant organizations in each Spoke: Spokes' leaders and Affiliates

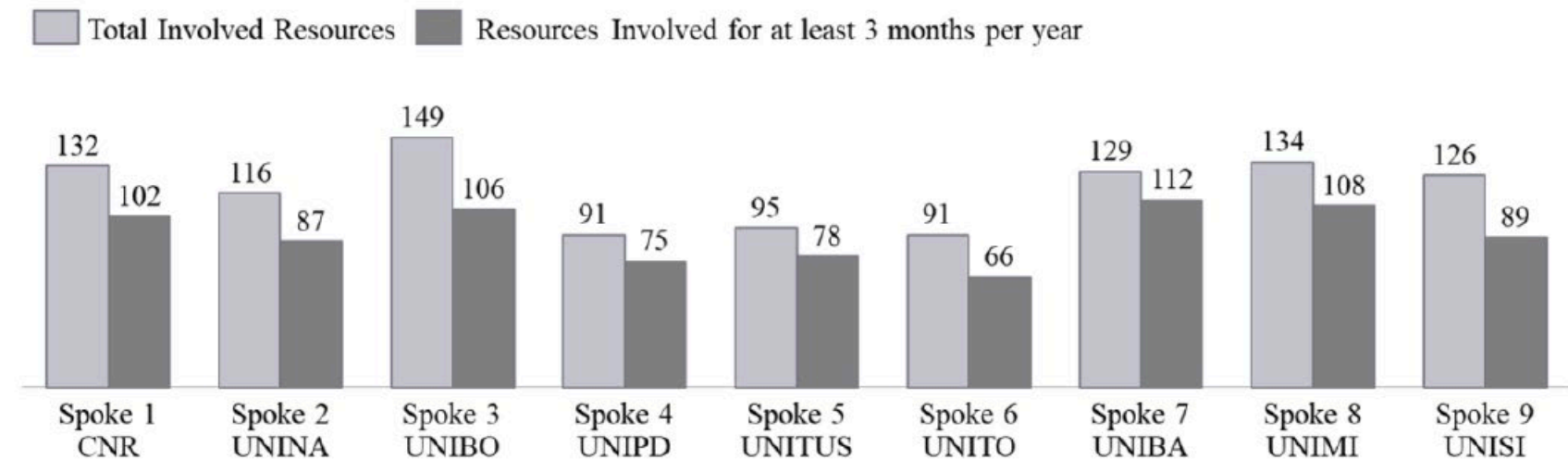


Figure B2 – Total human resources and the number of human resources involved for at least 3 months per year in each Spoke.

Spoke Leader: UNIBO

3 – Enabling Technologies and sustainable strategies for the smart management of agricultural system and their environmental impact

WP	**3.1** Smart solutions for precise and sustainable management of agricultural systems	**3.2** Innovative strategies to protect natural resources and reduce agriculture environmental impact	**3.3** Evaluation and demonstration for stakeholder engagement and innovation exploitation
GOAL	Develop a comprehensive portfolio of integrated smart solutions for precision agriculture	Define and implement strategies for sustainable use and protection of water, soil and agroecosystems	Assess and communicate the environmental and socio-economic impact of developed innovations through large demonstrators

Spoke Leader: Università degli Studi di Milano

8 - Circular economy in agriculture through waste valorization and recycling

WP	**8.1** Producing new products to upgrade waste value	**8.2** Agroenergy production from wastes to reduce energy dependence	**8.3** Nutrient and organic matter recovery from wastes to reduce the use of agrochemicals and closing waste cycle	**8.4** Evaluation and assessment of new circular technologies in agriculture
GOAL	Obtain from organic wastes high-value products with biological properties and technological potential	Promote sustainable agroenergy production by waste valorization through biological and thermochemical approaches, not affecting feed/food production	Produce biofertilizers to support soil fertility and mitigate climate change	Develop a holistic approach to promote sustainability, circularity and integration with agricultural systems

Spoke Leader: CNR

1 - Plant, animal and microbial genetic resources and adaptation to climatic changes

WP	**1.1** Plant, animal and microbial genetic resources: mining for resilience	**1.2** Dissecting morpho-physiological and molecular mechanisms of adaptation	**1.3** Developing advanced genotypes with improved resilience
GOAL	Disclose genetic diversity underlying adaptation (CHARACTERIZE)	Identify mechanisms and players of resilience (UNDERSTAND)	Generate and validate improved genotypes (BREED)

Spoke Leader: UNINA

2 - Crop Health: a multidisciplinary system approach to reduce the use of agrochemicals

WP	**2.1** Agroecology and landscape management to reinforce ecosystem services	**2.2** Alternatives tools and strategies to reduce the use of synthetic pesticides and fertilizers	**2.3** Smart technologies towards a sustainable "zero pollution" in agriculture
GOAL	Enhance natural resilience of agroecosystems	Provide new tools for promoting sustainable plant growth and protection	Implement cutting-edge technologies to reduce the use of agrochemicals

Spoke Leader: UNITUS

5 – Sustainable productivity and mitigation of environmental impact in livestock systems

WP	**5.1** Data recording, management and modelling	**5.2** Livestock management for improving resilience to climate change	**5.3** Smart livestock farming technologies to improve sustainability
GOAL	Develop models/tools to enhance resilience and sustainability of livestock systems and to provide breeders with real time DSS	Improve resilience of livestock systems to climate change	Improve sustainability of livestock systems

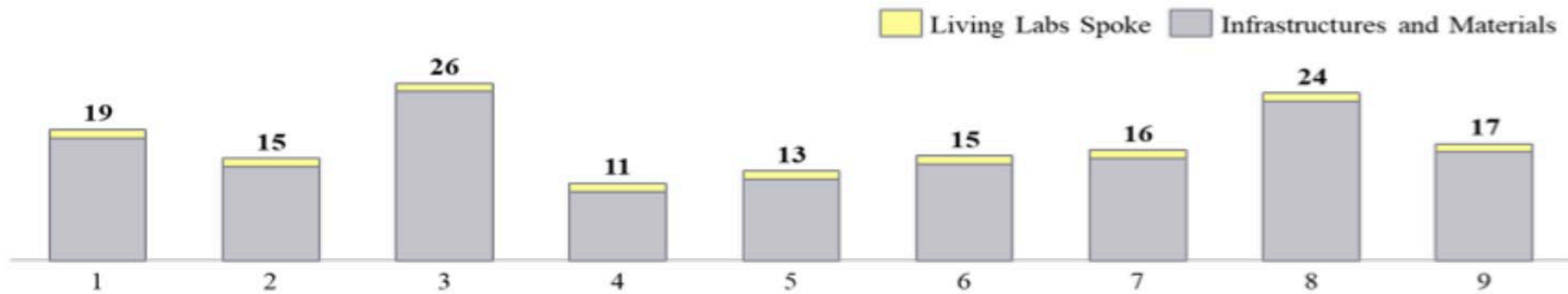
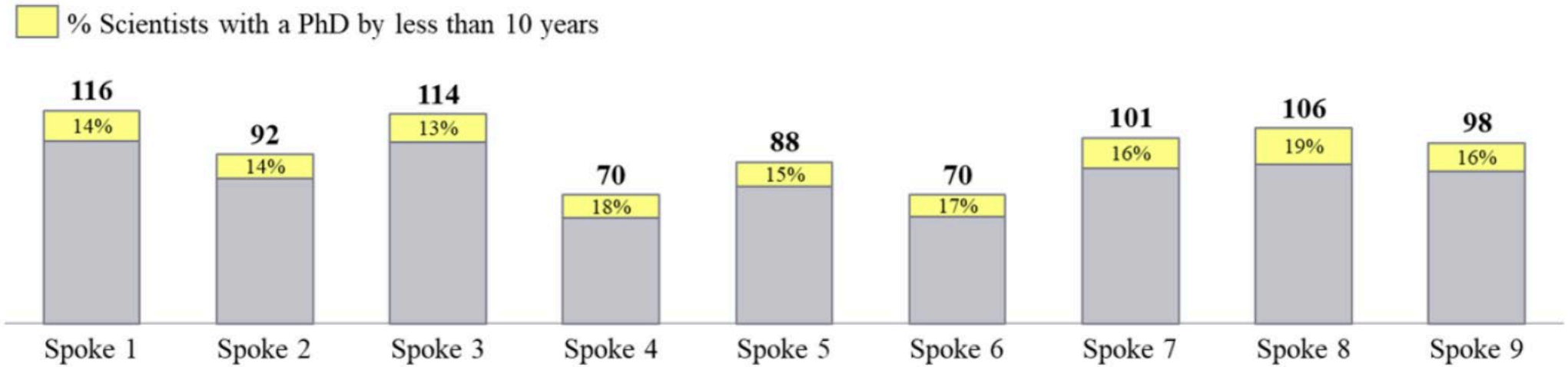
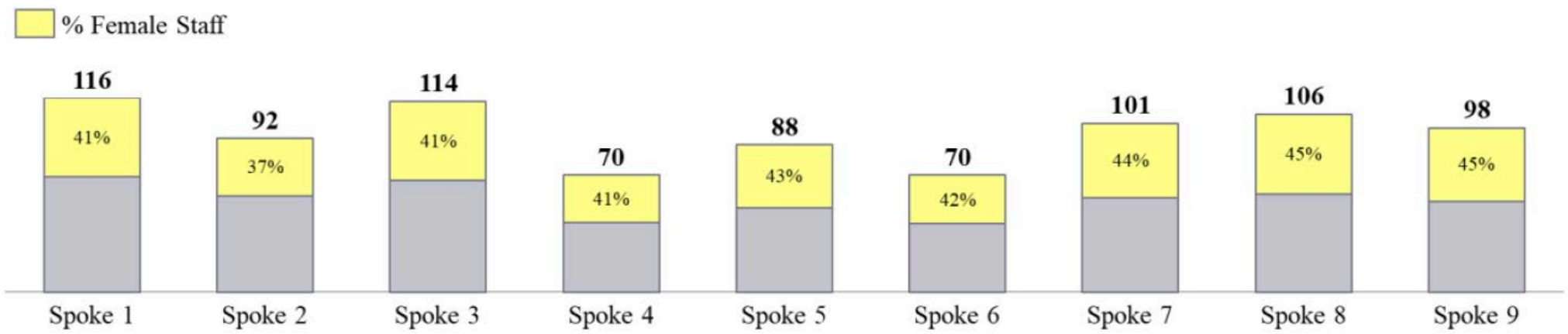


Figure B12 – Infrastructure Equipment, Direct Research Costs and other goods and services M€

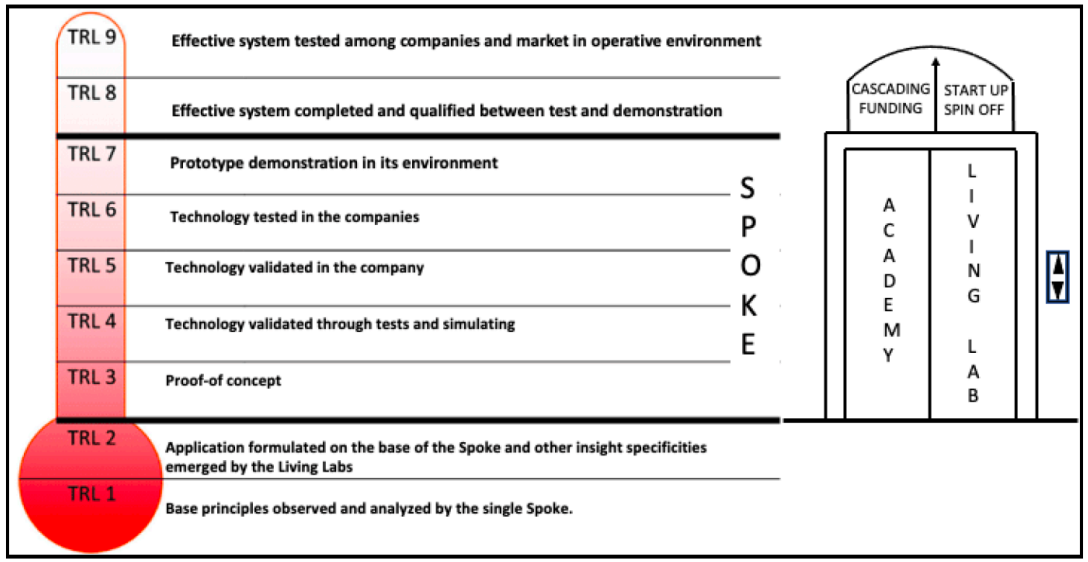

% Scientists with a PhD by less than 10 years
116
14%
92
14%
114
13%
70
18%
88
15%
70
17%
101
16%
106
19%
98
16%
Spoke 1
Spoke 2
Spoke 3
Spoke 4
Spoke 5
Spoke 6
Spoke 7
Spoke 8
Spoke 9

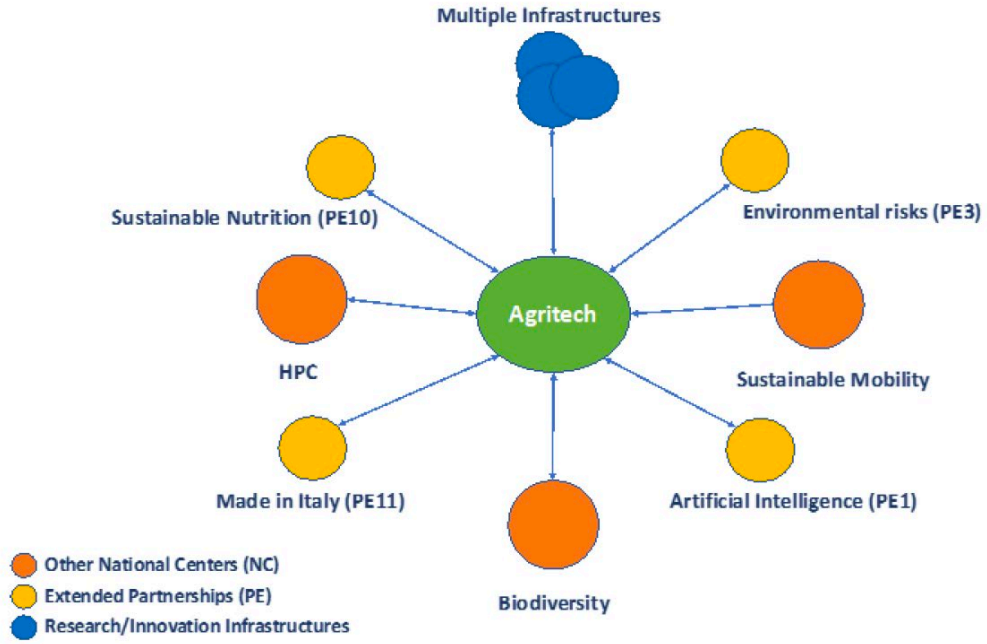

% Female Staff
116
41%
92
37%
114
41%
70
41%
88
43%
70
42%
101
44%
106
45%
98
45%
Spoke 1
Spoke 2
Spoke 3
Spoke 4
Spoke 5
Spoke 6
Spoke 7
Spoke 8
Spoke 9

Budget Recap Table M€	HUB	1	2	3	4	5	6	7	8	9	TOTAL
Permanent Staff		6	6	9	5	5	5	7	7	8	**57**
RTDA		5	3	4	3	3	2	4	3	4	**30**
PhD		1	1	1	1	1	1	1	1	1	**10**
Research Fellows		1	1	1	1	1	0	1	1	1	**6**
Overhead		2	2	2	1	1	1	2	2	2	**16**
Personnel		15	12	17	10	12	10	14	14	16	**119**
Infrastructure Equipment, Direct Research Costs		19	16	26	11	13	15	16	24	17	**157**
Open Call											**35**
Hub Services and Cross-Spokes Activities	45										**45**
TOTAL	**45**										**356**

UNIBO

- Budget 23,2 milioni €
- Personale strutturato UNIBO direttamente coinvolto (espone mesi/uomo): >60 ricercatori di 12 Dipartimenti
- Coordinamento Spoke 3 (circa 47 milioni €)
- Living lab


TRL 9
Effective system tested among companies and market in operative environment
TRL 8
Effective system completed and qualified between test and demonstration
TRL 7
Prototype demonstration in its environment
TRL 6
Technology tested in the companies
TRL 5
Technology validated in the company
TRL 4
Technology validated through tests and simulating
TRL 3
Proof-of concept
TRL 2
Application formulated on the base of the Spoke and other insight specificities emerged by the Living Labs
TRL 1
Base principles observed and analyzed by the single Spoke.
SPOKE
CASCADING FUNDING
START UP SPIN OFF
ACADEMY
LIVING LAB


Multiple Infrastructures
Sustainable Nutrition (PE10)
Environmental risks (PE3)
Agritech
HPC
Sustainable Mobility
Made in Italy (PE11)
Artificial Intelligence (PE1)
Biodiversity
Other National Centers (NC)
Extended Partnerships (PE)
Research/Innovation Infrastructures

11.15 – 12.45

Il Centro Nazionale Sviluppo di Terapia Genica e Farmaci con Tecnologia a RNA

Federico Pea

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

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UNIVERSITÀ DI BOLOGNA

UNIVERSITÀ DI BOLOGNA E PNRR
Centro nazionale mRNA

18 Luglio 2022

CENTRO NAZIONALE mRNA: OBIETTIVI GENERALI

- The research program has **two main goals**: **increasing the technological know-how** necessary **to design and deliver RNA-based and gene therapy medicinal products** and **identifying promising candidate drugs/genes in five major disease areas** (genetic diseases, cancer, metabolic/cardiovascular diseases, neurodegenerative disorders and inflammatory/infectious diseases)
- The National Center for Gene Therapy and Drugs based on RNA Technology sees the involvement of **48 Organizations of which 25 Universities and 7 Research Institutes and 16 Private Companies. Universities and Research Institutes are distributed over 10 spoke.**

Public and Private Founders of the Foundation

State Universities and Research Center MUR supervision

1. Modena - Reggio-Emilia * University
2. Napoli University *
3. Roma1 University *
4. Milano University *
5. Padova University *
6. Siena University *
7. CNR *
8. Bari University *
9. Pavia University
10. Milano-Bicocca UnimiB
11. Brescia University
12. Firenze University
13. Pisa University
14. Torino University
15. Roma Tor Vergata
16. Bologna University
17. Verona University
18. Trieste University
19. Palermo University
20. Salerno University
21. Catania University
22. Vanvitelli University
23. Catanzaro University
24. Cagliari University
25. Chieti University

Foundation – IRCCS – Private University

1. IIT *
2. Bambino Gesù Hospital *
3. Humanitas University
4. RI.MED
5. Telethon (Tigem, Tiget)
6. Vita-Salute University San Raffaele
7. Fondazione Tettamanti

Private Companies

8. Orgenesis
9. Chiesi
10. Novartis
11. Biontech
12. Sanofi
13. CDI
14. Astrazeneca
15. Antares
16. IRBM
17. Takis
18. PBL
19. Innovavector
20. Stevanato
21. Intesa San Paolo
22. Dompè
23. Eurofins

Universities and Research Institute based in South of Italy are underlineds

* Spoke Leader

CN3-Sviluppo di terapia genica e farmaci con tecnologia a RNA

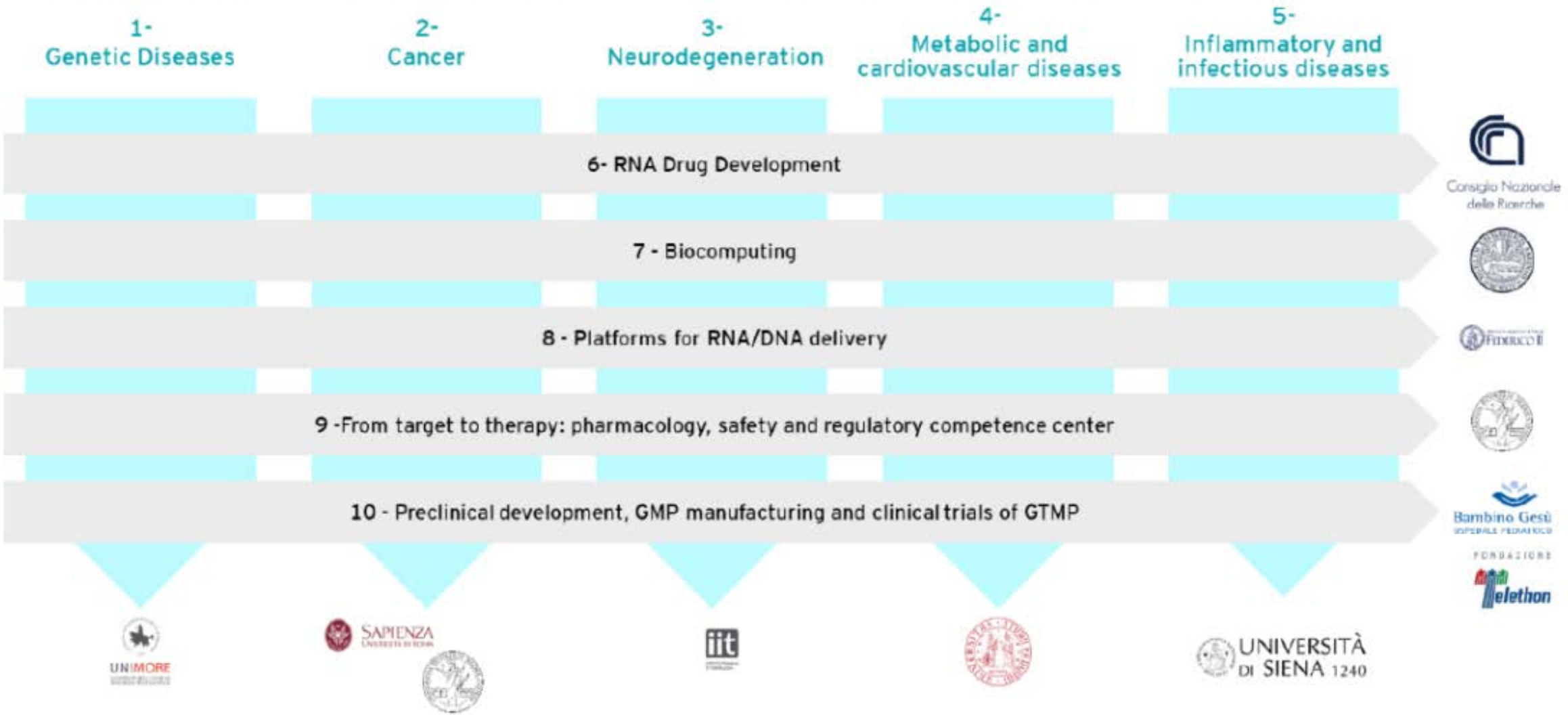
- Spoke 1 Genetic diseases (**Unimore**, Unina)
- Spoke 2 Cancer (**Uniroma1**, Unimi)
- Spoke 3 Neurodegenerative (**IIT)**
- Spoke 4 Metabolic and Cardiovascular (**Unipd**)
- Spoke 5 Inflammatory and Infectious (**Unisi**)

- Spoke 6 RNA drug development (**CNR**)
- Spoke 7 Biocomputing (**Uniba**)
- Spoke 8 Platforms for RNA/DNA delivery (**Unina**)
- Spoke 9 Efficiency, immunoreactivity and biosafety (**Unimi**)
- Spoke 10 Large scale GMP production and clinical trials (**Ospedale Bambino Gesù**)

CENTRO NAZIONALE RNA: Interrelazione tra Spoke

Research activities the executing subjects (Spoke and Affiliates)

The research activities are organized in 10 thematic Spokes as shown in the following figure.



CENTRO NAZIONALE RNA: Risultati attesi

- The **expected outcomes** of the research activities in the "National Center for Gene Therapy and Drugs based on RNA Technology" are based on three pillars:
  1. **Identification and validation of targets for both RNA-based drugs and gene-therapy/genome editing approaches** ("vertical Spokes", from pathogenic insight to pre-clinical testing)
  2. **Technological advancement in the KET**: from RNA drug design to delivery and pharmacology of the new drugs ("horizontal Spokes", providing tools and know-how of general use to all the areas of clinical applications)
  3. **Manufacturing and clinical application**: implementation of core facilities for the production of high-quality RNA ("clinical grade") and a gene therapy center that can provide support to the needs of patients resident in Italy, as well as foster the dissemination of the clinical application of the new technologies.

ORGANIZZAZIONE DI ATENEO: GRUPPO DI LAVORO CAMPIONE NAZIONALE

mRNA

- Federico Pea (Coordinatore)
- Nicola Baldini
- Manuela Bartolini
- Walter Cabri
- Elena Bonora
- Caterina Garone
- Giovanni Perini
- Pier Luigi Zinzani

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UNIVERSITÀ DI BOLOGNA

Sviluppo di terapia genica e farmaci con tecnologia a RNA

0

3

	1	2	3	4	5	6	7	8	9	10
TITOLI SPOKE	Genetic diseases	Cancer	Neurodegenerative	Metabolic and Cardiovascular	Inflammatory and Infectious	RNA / DNA Drug Development	Biocomputing	Platforms for RNA/DNA delivery	From target to therapy: pharmacology, safety and regulatory competence centre	Preclinical development, GMP manufacturing and clinical trials of GTMP
LEADER	UNIMORE	UNIROMA1 UNIMI	IIT	UNIPD	UNISI	CNR	UNIBA	UNINA	UNIMI	BAMBINO GESU'
PARTECIPANTI	UNIPD UNISI UNIBA UNINA UNIMI **UNIBO** UNICA TIGEM	UNIMORE UNIPD UNISI CNR UNIBA UNINA UNIMI UNIBS UNIFI UNIPI UNITO **UNIBO** UNITS UNICT UMG Vanvitelli	UNIPD UNIROMA1 CNR UNIBA UNINA UNIMI UNIFI UNIPI UNITO **UNIBO** UMG	UNIBA UNINA UNIMI UNIPV HUMANITAS UNITS UNISA UMG RI.MED	UNIPD UNINA UNIMI HUMANITAS UNIFI UNIPI UNIROMA2 UNIVR	IIT UNIPD UNISI UNIBA UNINA UNIROMA2 **UNIBO** RI.MED	IIT UNIPD CNR UNINA UNIMI UNIROMA2	IIT UNIPD CNR UNIMI UNIMIB UNIPI UNITO UNIPA UNISA	UNIROMA1 UNIPD CNR UNINA UNIPV HUMANITAS	CNNR Vanvitelli TIGEM Fondazione Tettamanti UD'A SAN RAFFAELE

COINVOLGIMENTO UNIBO SULLE AFFILIAZIONI

- **Spoke #1 - Genetic Diseases**: Caterina Garone, Gloria Ravegnini, Ivana Kurelac,, Luisa Iommarini, Valerio Carelli, Giuseppe Gasparre, Laura Calzà, Marco Seri

- **Spoke #2 - Cancer:** Nicola Baldini, Giovanni Capranico, Manuela Bartolini, Luigi Ricciardiello, Giorgio Milazzo, Pier Luigi Zinzani, Sofia Avnet, Gabriele Matteo D'Uva

- **Spoke #3 – Neurodegeneration:** Elena Bonora, Francesca Massenzio, Emanuele Panza, Duccio Maria Cordelli, Elena Maestrini, Barbara Monti, Santi Mario Spampinato, Patrizia Hrelia

- **Spoke #6 - RNA Drug Development:** Walter Cabri, Maria Laura Bolognesi, Alessandra Tolomelli, Stefano Masiero, Valentina Marassi, Marinella Roberti, Federico Falchi, Angela Abruzzo

Personale Strutturato → CIAMICIAN, DIBINEM, DIMEC, DIMES, FABIT

Spoke	Tipologia	Nome	Cognome	DIP	SSD
1	RTD	Gloria	Ravegnini	FABIT	BIO/14
1	RTD	Ivana	Kurelac	DIMEC	MED/03
1	RTD	Caterina	Garone	DIMEC	MED/03
1	PA	Luisa	Iommarini	FABIT	BIO/10
1	PA	Valerio	Carelli	DIBINEM	MED/26
1	PO	Giuseppe	Gasparre	DIMEC	MED/03
1	PO	Laura	Calza'	FABIT	VET/01
1	PO	Marco	Seri	DIMEC	MED/03
2	PO	Pier Luigi	Zinzani	DIMES	MED/15
2	PO	Nicola	Baldini	DIBINEM	MED/50
2	PO	Giovanni	Capranico	FABIT	BIO/11
2	PA	Manuela	Bartolini	FABIT	CHIM/08
2	PA	Luigi	Ricciardiello	DIMEC	MED/12
2	RTD	Giorgio	Milazzo	FABIT	BIO/18
2	RTD	Sofia	Avnet	DIBINEM	MED/50
2	RTD	Gabriele Matteo	D'Uva	DIMES	BIO/11
3	RTD	Francesca	Massenzio	FABIT	BIO/09
3	RTD	Emanuele	Panza	DIMEC	MED/03
3	PA	Duccio Maria	Cordelli	DIMEC	MED/39
3	PA	Elena	Bonora	DIMEC	MED/03
3	PA	Elena	Maestrini	FABIT	BIO/18
3	PA	Barbara	Monti	FABIT	BIO/09
3	PO	Santi Mario	Spampinato	FABIT	BIO/14
3	PO	Patrizia	Hrelia	FABIT	BIO/14
6	PO	Walter	Cabri	CHIM	CHIM/06
6	PO	Maria Laura	Bolognesi	FABIT	CHIM/08
6	PA	Alessandra	Tolomelli	CHIM	CHIM/06
6	PA	Stefano	Masiero	CHIM	CHIM/06
6	RTD	Valentina	Marassi	CHIM	CHIM/01
6	PA	Marinella	Roberti	FABIT	CHIM/08
6	RTD	Federico	Falchi	FABIT	CHIM/08
6	RTD	Angela	Abruzzo	FABIT	CHIM/09

1-DIBINEM
4-DIMEC
3-FABIT

2-DIBINEM
2-DIMES
1-DIMEC
3-FABIT

3-DIMEC
5-FABIT

4-CHIM
4-FABIT

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Spoke 1 – Genetic diseases – UniBO Project

Title: Tackling genetically inherited neurometabolic disorders by targeting mtDNA quantity and integrity with nucleases-therapy for mtDNA point mutations and novel designed RNA-drug therapies modulating pathways responsible of mtDNA metabolism.

Abstract

Mitochondrial integrity and function are crucial for the proliferation, differentiation, and maintenance of neural stem cells during CNS development. **Genetic and epigenetics defects in proteins** playing role **in mitochondrial dynamics**, **mtDNA metabolism**, and bioenergetics can **compromise OXPHOS function** since the early stage of neurogenesis and consequently cause **Leigh syndrome**, **leukoencephalopathy**, or **other neurodevelopmental disorders**.

Our **research goal** aim to **tackle primary mitochondrial encephalomyopathies** with **RNA-drug therapy targetting mtDNA quantity and integrity**.

Methods: 1. Epigenetic manipulation of previously identified miRNA, lncRNA, and enhancer with novel designed small molecules, RIBOTACs, CRISPR-based technologies modulating proteins in mtDNA metabolism; 2. Development of nucleases targeting mtDNA heteroplasmy. Safety, efficacy and CNS precision delivery systems with systemic or tissue-targeted strategies will be assessed in vitro (iPSc, organoids) and in vivo models.

Leading PI: Caterina Garone, Department of Medical and Surgical Sciences, Alma Mater Studiorum University of Bologna

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Spoke 2 – Cancer – UniBO Project

Title: Targeting metastases from solid tumors and primary extranodal lymphomas by novel RNA therapies

Abstract

The UniBO unit **will develop RNA therapies targeting metastatic disease at different sites** (lung, bone, liver, peritoneum, and brain). Building on a consolidated knowledge of promising therapeutic targets, we will combine basic, translational, and clinical **expertise in different fields of oncology**. Individual settings will be considered, each dealing with a specific target organ/tissue. For each clinical setting, **different tumor histotypes**, including sarcomas (lung), neuroblastoma and GI cancer, ovarian and GI cancer (peritoneum), breast and prostate cancer and neuroblastoma (bone), and lymphomas (brain**) will be considered**, each **exploiting different delivery systems**.

Leading PI: Nicola Baldini, Department of Biomedical and Neuromotor Sciences, Alma Mater Studiorum University of Bologna

Spoke 3 – Neurodegenerative – UniBO Project

Title: Tackling complex neurodevelopmental disorders with RNAzymes targeting common pathway as neuroinflammation and gene-therapy approaches for disease-specific defects

Abstract: Neurodevelopmental disorders (NDDs) are a group of heterogeneous disorders **presenting with impaired cognition, communication, adaptive behavior** (autism, attention deficit disorder), **epilepsy and psychomotor skills**. Copy number variations, large chromatin rearrangement or monogenic **defect in protein playing role in early neurogenesis may be responsible for NDDs**. Treatment are currently limited to symptomatic therapy (eg. seizures) or behavioral/learning training strategies. Therefore, there in unmet need of identifying specific targets and developing therapy for this group of disorders.

UNIBO team will combine a complete **set of basic, translational and clinical expertise** in different fields of cellular, biochemical and molecular biology, biocomputing, genetics and neurology **for tackling NDDs with two main experimental approaches**:

1.Nanostructured RNAzymes targeting specific exosomal miRNAs responsible of neuroinflammation, a common pathway in NDDs;

2.Gene-editing with CRISPR-based technologies for previously characterized monogenic disorders.

Patient-derived iPSc and in vivo disease models for autism spectrum disorders, epileptic encephalopathy and spastic paraplegia and neruoinflammation are already available at UNIBO. Brain organoids with specific CNS signature will be further developed for studying and modulating neuroinflammation in early neurogenesis. Single-cell spatial analysis in 2D and 3D model and genome-wide screening of a large cohort of patients with NDDs, currently followed at our university hospitals, will be analyzed for identifying additional targets.

Leading PI: Elena Bonora, Department of Medical and Surgical Sciences.

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UNIVERSITÀ DI BOLOGNA

Spoke 6 – mRNA drug development – UniBO Project

Title: **Multimodal and multitarget chemical platforms for RNA-targeted therapies**

Abstract

By leveraging on our experience on several modalities and their hybrid, **we aim to develop multiple technological platforms based on small molecule, oligonucleotides, PNA and hybrid conjugates molecules to modulate RNA function** (TRL 6/7). Identification and development of **new key features** to improve druggability **to support drug development for the different RNA vertical spokes** as well as **innovative purification methods** will allow **to patent NCEs** and new technologies that will be functional to start up/spin off/big pharma collaborations. The team has been selected in order to fulfill all the competence necessary in the development of new platform in such a variaty of modalities.

Leading PI: Walter Cabri, Department of Chemistry Giacomo Ciamician", Alma Mater Studiorum-University of Bologna

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

11.15 – 12.45

Il Centro Nazionale Mobilità Sostenibile

Nicolò Cavina

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

AZIONI NAZIONALI E DELL'UNIVERSITÀ DI BOLOGNA A SOSTEGNO DELLA SALUTE DELL'AMBIENTE E DELLE PERSONE

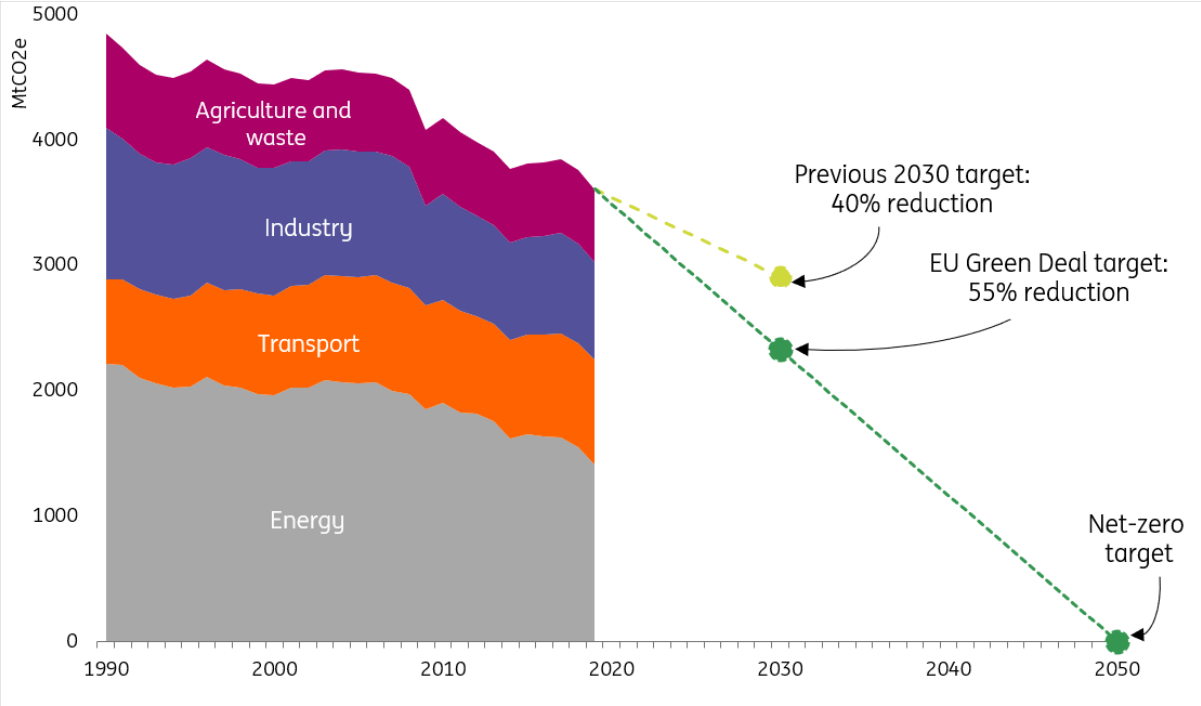
Conferenza promossa dal Centro Interdipartimentale Alma Mater Institute on Healthy Planet

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

UNIVERSITÀ DI BOLOGNA E PNRR

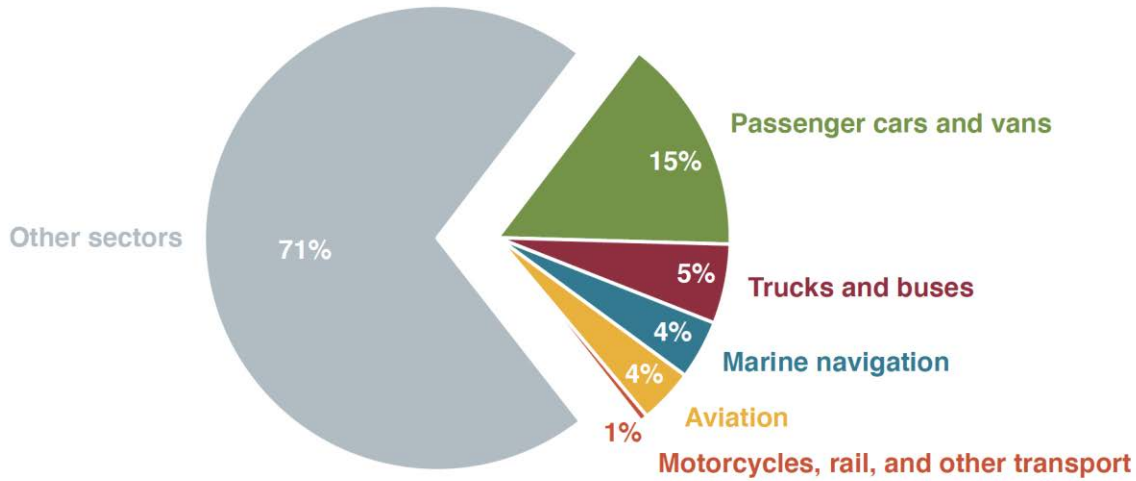
Centro Nazionale per la Mobilità Sostenibile

18 luglio 2022



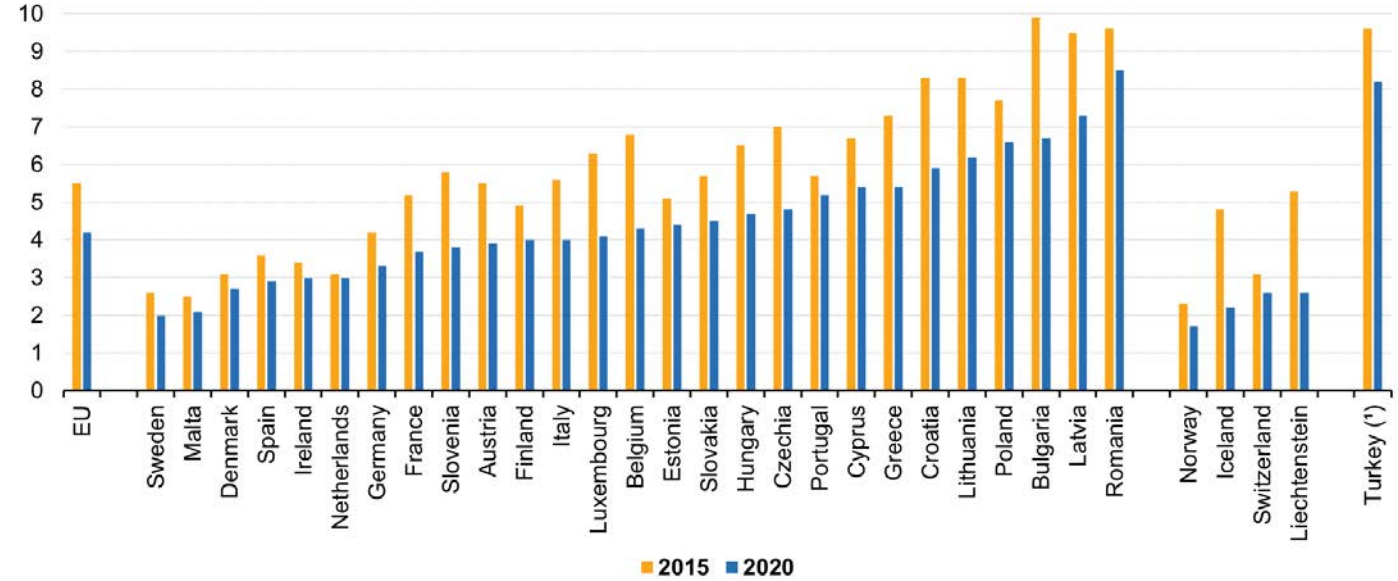
Greenhouse gas emissions in the EU

2018 total: 3.8 Gt CO_2e



Road traffic deaths, by country, 2015 and 2020

(number per 100 000 people)



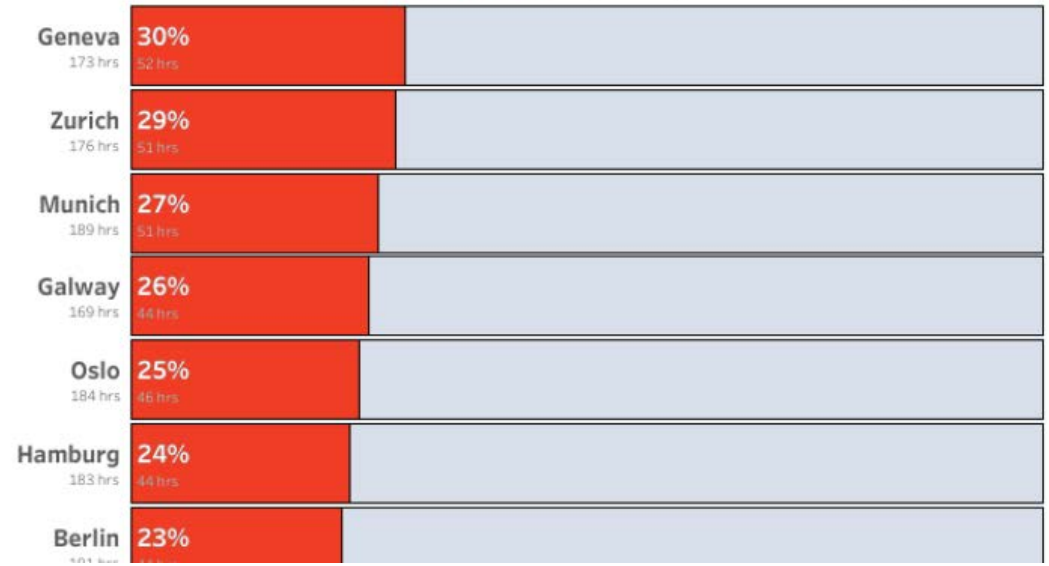
(1) 2018 data (instead of 2020).

Source: European Commission services, DG Mobility and Transport (Eurostat online data code: sdg_11_40)

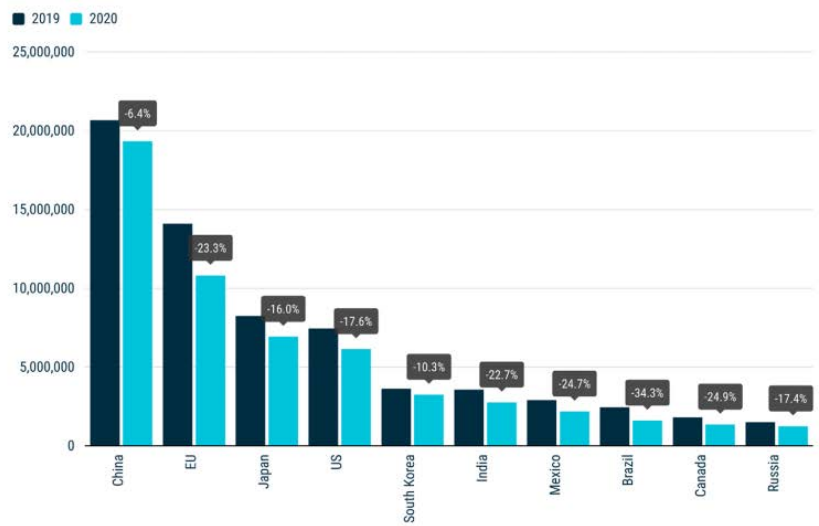
eurostat

Percentage of Time Spent in Congestion in European Cities

Total number of hours commuters spend **stuck in traffic** compared to peak commuting driving hours



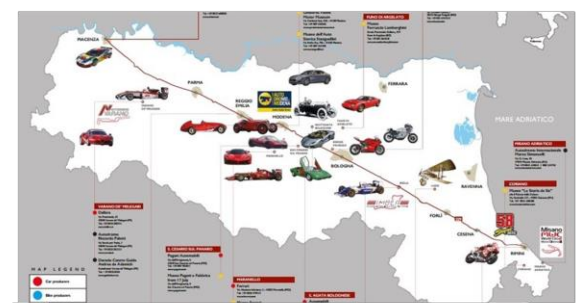
Top 10 – World passenger car production



EMILIA ROMAGNA KEY FACTS

TOP AUTOMOTIVE COMPANIES

Automobili Lamborghini, Dallara, Ducati, Ferrari, HPE Coxa, Maserati, Magneti Marelli, Pagani Automobili, Scuderia AlphaTauri



TOTAL VALUE ADDED

€ 146 BLNS
(13% Of Italian GNP)*

SKILLS

High Concentration of Mechanical Engineers

INNOVATIONS

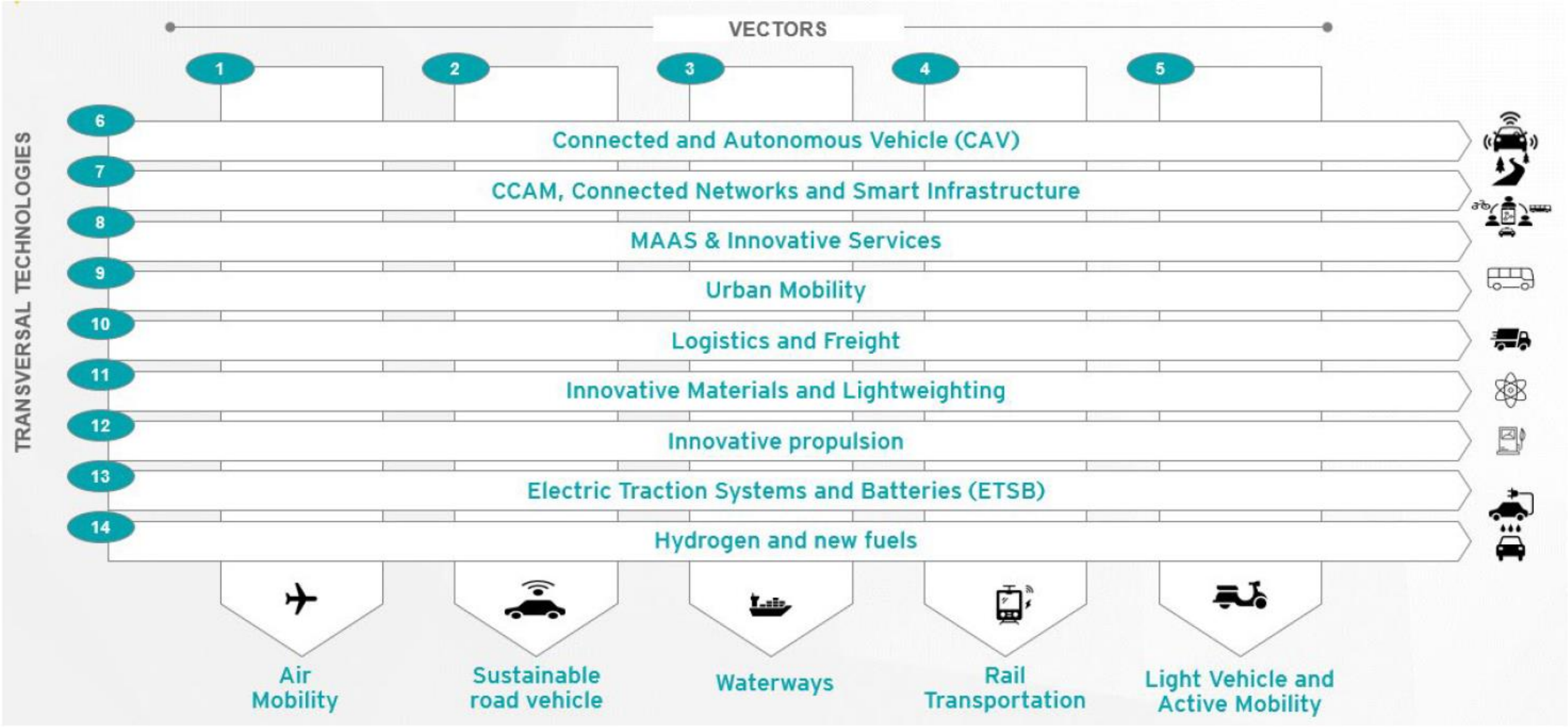
Mechatronics, Self-Driving cars, Electric 4,000 Quality Suppliers, Startups, Aftermarket Companies

MUSEUMS

Ducati Museum, Ferrari Maranello Museum, Enzo Ferrari Museum, Lamborghini Museum, Ferruccio Lamborghini Museum, Horacio Pagani Museum

* Source: Ministero dell'Istruzione dell'Università e della Ricerca, 2018

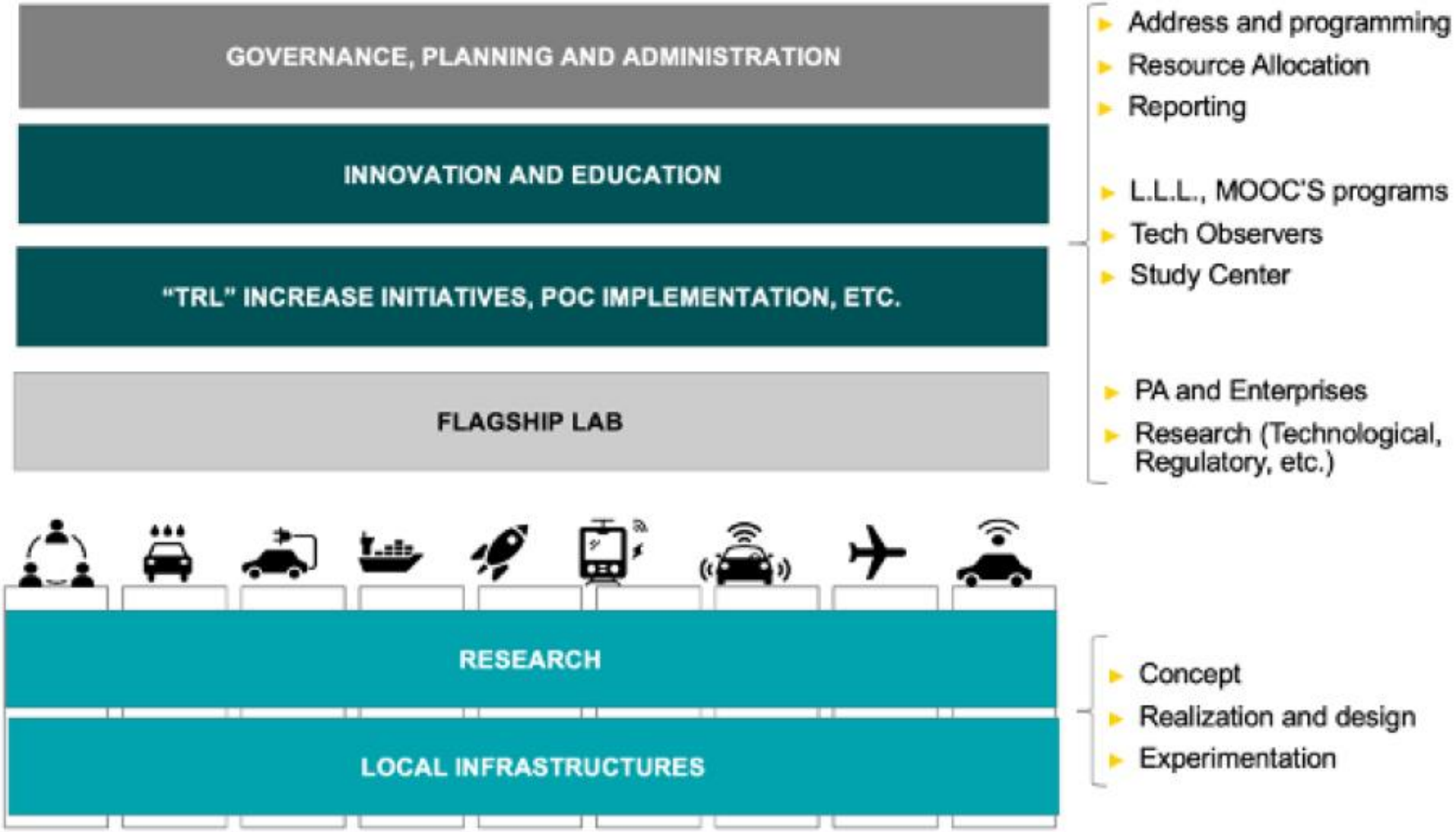
STRUTTURA CNMS – VETTORI E TECNOLOGIE → SPOKES



STRUTTURA CNMS – ATTIVITA'

HUB

POLITECNICO
MILANO 1863



- Address and programming
- Resource Allocation
- Reporting
- L.L.L., MOOC'S programs
- Tech Observers
- Study Center
- PA and Enterprises
- Research (Technological, Regulatory, etc.)

SPOKE

- Concept
- Realization and design
- Experimentation

CNMS PARTECIPANTI – SOCI FONDATORI

- **Membri Pubblici (25):** Politecnico di Milano (proponente), **Alma Mater Studiorum - Università di Bologna**, Centro Nazionale Ricerche, Politecnico di Bari, Politecnico di Torino, Università degli studi di Bergamo, Università degli studi di Modena e Reggio Emilia, Università degli studi di Napoli Federico II, Sapienza Università di Roma, Università degli studi di Brescia, Università degli studi di Cagliari, Università degli studi di Cassino e del Lazio meridionale, Università degli studi di Firenze, Università degli studi di Genova, Università degli studi di Milano Bicocca, Università degli Studi di Napoli Parthenope, Università degli studi di Padova, Università degli studi di Palermo, Università degli studi di Parma, Università degli studi di Salerno, Università degli studi di Torino, Università degli Studi Mediterranea di Reggio Calabria, Università del Salento, Università di Pisa, Università Politecnica delle Marche.

- **Membri Privati (24):** AlmaViva S.p.A., A2A S.p.A., Accenture S.p.A., Angel Holding S.r.l., Atos Italia S.p.A., Autostrade per l'Italia S.p.A., Brembo S.p.A., C.R.F. S.C.p.A., ENI S.p.A., Ferrari S.p.A., Ferrovie dello Stato Italiane S.p.A., Fincantieri S.p.A., FNM S.p.A., GE Avio Aero s.r.l., Hitachi Rail STS S.p.A., Intesa Sanpaolo S.p.A., Iveco Group N.V., Leonardo S.p.A., Pirelli Tire S.p.A., Poste Italiane S.p.A., Snam S.p.A., Teoresi S.p.A., Thales Alenia Space Italia S.p.A., UnipolSai Assicurazioni S.p.A.

CNMS PARTECIPANTI – SPOKES

Soggetti vigilati MUR leader di uno o due spokes

1. Politecnico di Milano
2. **Alma Mater Studiorum - Università di Bologna**
3. Centro Nazionale Ricerche
4. Politecnico di Bari
5. Politecnico di Torino
6. Università degli studi di Bergamo
7. Università degli studi di Modena e Reggio Emilia
8. Università degli studi di Napoli Federico II
9. Sapienza Università di Roma

Tutti gli Spokes sono soci fondatori, fee annua di 100.000€

CNMS PARTECIPANTI – AFFILIATI PUBBLICI

10. Università degli studi di Brescia
11. Università degli studi di Cagliari
12. Università degli studi di Cassino e del Lazio meridionale
13. Università degli studi di Firenze
14. Università degli studi di Genova
15. Università degli studi di Milano Bicocca
16. Università degli Studi di Napoli Parthenope
17. Università degli studi di Padova
18. Università degli studi di Palermo
19. Università degli studi di Parma
20. Università degli studi di Salerno
21. Università degli studi di Torino
22. Università degli Studi Mediterranea di Reggio Calabria
23. Università del Salento
24. Università di Pisa
25. Università Politecnica delle Marche

Cinque affiliati pubblici sono soci fondatori, fee annua di 100.000€; gli altri sono soci partecipanti, fee annua di 25.000€

CNMS PARTECIPANTI – AFFILIATI PRIVATI

1. **Almaviva S.p.A.**
2. **A2A S.p.A.**
3. Accenture S.p.A.
4. **Angel Holding S.r.l.**
5. Atos Italia S.p.A.
6. **Autostrade per l'Italia S.p.A.**
7. Brembo S.p.A.
8. C.R.F. S.C.p.A.
9. **ENI S.p.A.**
10. **Ferrari S.p.A.**
11. **Ferrovie dello Stato Italiane S.p.A.**
12. **Fincantieri S.p.A.**
13. **FNM S.p.A.**
14. GE Avio Aero s.r.l.
15. Hitachi Rail STS S.p.A.
16. Intesa Sanpaolo S.p.A.
17. **Iveco Group N.V.**
18. **Leonardo S.p.A.**
19. **Pirelli Tire S.p.A.**
20. **Poste Italiane S.p.A.**
21. **SNAM S.p.A.**
22. Teoresi S.p.A.
23. Thales Alenia Space Italia S.p.A.
24. **UnipolSai Assicurazioni S.p.A.**

*Alcuni affiliati privati sono **soci fondatori**, fee annua di 400.000€; gli altri sono soci partecipanti, fee annua di 100.000€. Co-finanziamento atteso complessivamente dai partner privati: 7.000.000€ annui*

GRUPPO DI LAVORO "CAMPIONE NAZIONALE MOBILITA' SOSTENIBILE" (CNMS)

MOBILITÀ

- Nicolò Cavina (Coordinatore) → area industriale/automotive
- Silvia Vecchi (task force inter-area)
- Armando Bazzani → area scienze (matematica e fisica)
- Federico Munari → area economico-aziendale
- **Giovanni Pau → area informatica → spoke 6**
- **Claudio Rossi → area elettrica ed elettronica → spoke 13**
- **Andrea Simone → area civile e trasporti → spoke 7**
- Francesca Soavi → area chimica
- Greta Tellarini → area giuridica
- **Lorella Ceschini → materiali/metallurgia → spoke 11**
- **Gian Marco Bianchi → automotive → spoke 2**
- **Alessandro Talamelli → air mobility → spoke 1**

Modalità operative del GdL

- Riunioni periodiche di allineamento (weekly)
- Mappatura competenze Unibo
- Gestione interazioni su 3 livelli:
  - Unibo
  - Spoke in cui Unibo è inserito
  - Centro Nazionale
- Contatti e coinvolgimento partner industriali (in fase di proposta)

STRUTTURA CNMS – SPOKES: LEADER E PARTECIPANTI PUBBLICI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Spoke	Air mobility	Sustainable road vehicle	Watereways	Rail transport ation	Light vehicle and active mobility	Connected and Autonomou s vehicle (CAV)	CCAM: connected networks and smart infra	MaaS and innovative services	Urban mobility	Logistics and freight	Innovative materials and light weighting	Innovative propulsion	Electric traction systems and batteries	Hydrogen and new fuels
Leader	POLITO	POLITO	CNR	POLIMI	UNIBG	UNIMORE	UNINA	POLIBA	UNIROMA	UNINA	UNIBO	CNR	POLIMI	POLIBA
Affiliate	UNIBO UNINA UNIBG POLIMI UNIROMA	UNIBO UNIPA UNICAS UNISA	UNINA UNIPA UNIPART UNIGE	UNINA CNR UNIROMA UNIFI UNIRC UNIPR	POLIMI UNIFI UNIBS	UNIBO CNR POLITO POLIMI UNISA UNIRC	UNIBO POLIBA CNR POLITO UNIROMA UNIBS UNIPI UNIPART UNISA UNIVPM SALENTO	UNINA UNIPD UNICA UNIMIB	POLIMI UNIFI UNICA UNIPA UNICAS UNIPR	POLIMI UNICA UNIPI UNIPART UNIGE	POLIBA CNR POLITO UNIROMA UNIPD UNIBS UNIPI UNIVPM	UNIMORE UNIFI UNIPA	UNIMORE UNIBO POLITO UNIROMA UNIPD UNIMIB UNICAS UNIPI	CNR UNIPD UNITO SALENTO

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UNIVERSITÀ DI BOLOGNA

STRUTTURA CNMS – SPOKES: OBIETTIVI (1)

SPOKE	GOALS
1) Air Mobility	a. To develop new technologies and methodologies to fixed wing and rotary wing b. To identify operational and logistical alternatives c. To design guidelines for autonomous and/or single pilot systems in the Urban Mobility context
2) Sustainable road vehicle	a. To Rethink the architecture of zero emission (electric, hydrogen), CCAM vehicles b. To define new methodologies for the integrated design of zero emission vehicles for passenger and freight transport. c. To define new methodologies for the integrated design of vehicle powertrain
3) Waterways	a. To increase marine vehicle efficiency both while underway and while in port; b. to improve traffic management and navigation safety increasing the level of automation; c. Mitigate the impact of shipping on the environment and marine life;
4) Rail Transportation	a. Digitalization of railway transportation for predictive maintenance b. Hydrogen powered trains for clean railway transportation in non-electrified lines c. strategic transversal connection for improvement of network in southern Italy
5) Light Vehicle and Active Mobility	a. user centric personalized mobility experience including health improvement b. Demonstrate the ability to safely use L vehicles in an extend range of scenarios c. Identify infrastructure solution suitable for a large number of cities (from big to small)
6) Connected and Autonomous Vehicle (CAV)	a. to foster the deployment and adoption of future CAV b. to define proper guidelines for connected infrastructures design c. Facilitate the wide public acceptance
7) CCAM: connected networks and smart infrastructures	a. Improve the resilience of the transportation system with respect to point and network b. fragilities due to natural degradation or to sudden event c. Prepare transportation networks for the advent of CAVs d. Ensure the network elements for the use of new energy carriers (electricity, H2, …)

STRUTTURA CNMS – SPOKES: OBIETTIVI (2)

SPOKE	GOALS
8) MAAS & Innovative Services	a. Identify and integrate innovative services and technologies for mobility able to reduce the use of cars by promoting collective transport and other forms of sustainable mobility b. Identify business models to support collaborative solutions between operators, users and environment c. Define guidelines for the design and real time management of fair, safe and sustainable mobility solutions at the network level to support the 15min city
9) Urban Mobility	a. Demonstrate how new technologies can work to solve real problems in real cities by transporting people, freight and waste in smarter ways b. Implement at new model of urban transport, integrating multiple technologies and different types of vectors (on road, on rail, on water and air)
10) Logistics and Freight	a. To develop and promote technologies able to enable the innovation of organizational systems and operational approaches b. Technologically support synchromodality and rebalance road transport c. Design guidelines for infrastructural and legislative changes to encourage a positive impact on sustainability
11) Innovative Materials and Lightweighting	a. Identify alternatives to traditional materials with a view to vehicles lightweighting, ensuring high standards of safety and reliability, with attention to sustainability, recyclability b. Define more efficient and sustainable production and transformation processes c. Develop design methodologies based on structural optimization aimed at lightweight design in the field of mobility with innovative materials and processes
12) Innovative Propulsion	a. Development of innovative propulsion technologies for the short to medium term, powered by sustainable energy carriers for each sector of the transport system b. Identification of methodologies for the optimal management of energy flows on board vehicles applicable to land, naval and aeronautical mobility c. Development of systems for the reduction of exhaust and non exhaust emissions
13) Electric Traction Systems and Batteries (ETSB)	a. Electrification of the traditional transport systems, considering also Smart Electric Road Systems b. Development of chemical battery for on board and stationary applications (post-lithium technology) c. Control strategies and system interface between different mobility infrastructures with Renewable Energy Sources (RESs) and Battery Electric Storage Systems (BESSs)
14) Hydrogen and new fuels	a. Develop new technologies for the use of hydrogen, sustainable biofuels, ammonia for mass and/or freight transportation. b. Develop smart grids and energy communities that make the production of green hydrogen immediately available at gas stations for low impact transportation systems competitive. c. Evaluate the impact of large-scale deployment of hydrogen and innovative fuels for mobility (sustainability, carbon footprint and Life Cycle Assessment).

SPOKE 1: AIR MOBILITY

The spoke will create a network of research centers and laboratories, large-scale demonstration environments, full-scale prototypal applications to achieve the following goals:

- Development of new technologies for green civil aviation for high efficiency and low carbon footprint, for the medium/short range transport, regional and public utility services.
- Identification logistic alternatives based on airborne and multimodal services with high autonomy and depport infrastructures.
- Outline of the guidelines for the design of autonomous and single pilot systems in aeronautics (with particular emphasis on the Advanced / Urban Air Mobility) and evaluate market opportunities from new technologies.

Activities	Sustainable design and social acceptance for urban air mobility + Demonstration (with industrial partner)
	Disruptive technologies for electric and hybrid propulsion aircraft + Demonstration (with industrial partner)
	Enabling technologies for next generation air mobility + Demonstration (with industrial partner)
	Scalable, Safe and Silent next generation aircraft + Demonstration (with industrial partner)
	Multidisciplinary design optimization and innovative solutions for next generation green aircraft + Demonstration (with industrial partner)
	A challenge for aviation: business models for electric aircraft and digital innovation + Demonstration (with industrial partner)
	Dissemination and Exploitation

Spoke Members	Permanent Staff	Recruitment of Phd and RtDA	Overhead	Local Infrastrucure and Lab.	Private project *(50% co-founding)*	Open Call	Total
POLITO - Leader	596.625 €	710.000 €	195.994 €	6.050.000 €	5.800.000 €	3.000.000 €	**20.671.118 €**
UNINA - Affiliate	337.550 €	436.667 €	116.133 €				
UNIBG - Affiliate	297.750 €	436.667 €	110.163 €				
UNIBO - Affiliate	335.250 €	413.333 €	112.288 €				
POLIMI - Affiliate	268.875 €	436.667 €	105.831 €				
UNIRM Affiliate	379.125 €	413.333 €	118.869 €				
TOTAL	**2.215.175 €**	**2.846.667 €**	**759.276 €**	**6.050.000 €**	**5.800.000 €**	**3.000.000 €**	

SPOKE 2: SUSTAINABLE ROAD VEHICLES

The spoke will create a network of research centers and laboratories, large-scale demonstration environments,

full-scale prototypal applications to achieve the following goals:

- New zero emission vehicle architecture, including assisted and autonomous driving technologies
- Advanced methodologies and tools for integrated design and validation of ZEVs
- Tools for optimization of user experience and integration of vehicle and data grids
- Circular economy for vehicle components.
- Cloud monitoring and predictive maintenance and improve of safety through driver health and attention

Activities
User centered safe and sustainable zero emission vehicle integration
High efficiency, zero emission powertrain
Structural components and subsystems for high efficiency and zero emission connected vehicles
Ergonomics for assisted and autonomous vehicles
Vehicle dynamics and tires for new generation zero emission vehicles
Vehicle level demonstration and testing
Dissemination and Exploitation

Spoke Members	Permanent Staff	Recruitment of Phd and RtDA	Overhead	Local Infrastrucure and Lab.	Private project *(50% co-founding)*	Open Call	Total
POLITO - Leader	634.500 €	663.333 €	194.675 €	4.840.000 €	4.700.000 €	3.000.000 €	17.625.779 €
UNIBO - Affiliate	300.375 €	413.333 €	107.056 €				
UNIPA - Affiliate	344.625 €	460.000 €	120.694 €				
UNICAS - Affiliate	325.875 €	460.000 €	117.881 €				
UNISA - Affiliate	360.375 €	460.000 €	123.056 €				
TOTALE	**1.965.750 €**	**2.456.667 €**	**663.363 €**	**4.840.000 €**	**4.700.000 €**	**3.000.000 €**	

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SPOKE 6: CONNECTED AND AUTONOMOUS VEHICLES

The spoke will create a network of research centers and laboratories, large-scale demonstration environments,

full-scale prototypal applications to achieve the following goals:

- Creation of a network of research labs with interdisciplinary skills and permanent test facilities
- Modernisation of research infrastructures and laboratories for (joint) research activities on CAV technologies.
- Promote technology transfer and exploit research results to exploit CAVs technologies for road, offroad, water railway and aerial vehicles.

Activities	Platform of research labs and advanced testbeds on CAVs
	Simulation Platform adoptend specific models and algorithms
	Vehicle Platform: enhancement of existing vehicle platforms including sensor sets, actuators, ADAS, and interfaces for wireless vehicle-to-everything (V2X) connectivity;
	Standardized Datasets: shared standardised datasets to be reused and exploited for AI solutions;
	Living Labs:including proving grounds to test and experiment innovative CAV technologies in relevant scenarios (urban, intersection, off-road, tunnel, etc..).
	Dissemination and Exploitation

Spoke Members	Permanent Staff	Recruitment of Phd and RtDA	Overhead	Local Infrastrucure and Lab.	Private project *(50% co-founding)*	Open Call	Total
UNIMORE - Spoke Leader	546.000 €	710.000 €	188.400 €	4.800.000 €	4.700.000 €	3.000.000 €	18.921.983 €
UNIBO - Affiliate Spoke	292.500 €	436.667 €	109.375 €				
CNR - Affiliate Spoke	292.500 €	413.333 €	105.875 €				
POLITO - Affiliate Spoke	292.500 €	436.667 €	109.375 €				
POLIMI - Affiliate Spoke	292.500 €	413.333 €	105.875 €				
UNISA - Affiliate Spoke	292.500 €	436.667 €	109.375 €				
UNIRC - Affiliate Spoke	292.500 €	436.667 €	109.375 €				
TOTALE	**2.301.000 €**	**3.283.333 €**	**837.650 €**	**4.800.000 €**	**4.700.000 €**	**3.000.000 €**	

SPOKE 7: CONNECTED NETWORKS AND SMART INFRASTRUCTURE

The spoke "Connected networks and Smart Infrastructure" will create a network of research centers and laboratories, large-scale demonstration environments, full-scale prototypal applications to achieve the following goals:

- Develop an integration layer for exposing smart infrastructures services that are ready4CCAm, and demonstrate its use.
- Develop methodologies and technological solutions that prepare the transportation networks for the advent of cooperative, connected and automated mobility.
- Develop methodologies and technological solutions for real-time and strategic assessment of travel demand and real-time and strategic optimisation of congested mobility networks., for monitoring and controlling the resilience of infrastructures and networks and for the smart application of the new energy paradigms and grid approaches.

Activities
Integration Layes: functional and technical requirements, integration methodsfor all vertical streams.
Smart Infrastructure for CCAM: develops and validates against real-world use cases
Travel Demand and Optimisation of Networks: develops technological solutions and methodologies
Resilience of Networks, structural Health Monitoring and Asset Management
Zero-Carbon Refuelling/Recharging Infrastructures: clean and green energy vectors and on the exploitation of renewable energy sources
Dissemination and Exploitation

Spoke Members	Permanent Staff	Recruitment of Phd and RtDA	Overhead	Local Infrastrucure and Lab.	Private project *(50% co-founding)*	Open Call	Total
UNINA - Spoke Leader	766.500 €	663.333 €	214.475 €	10.000.000 €	9.800.000 €	3.000.000 €	35.154.785 €
UNIBO - Affiliate Spoke	471.375 €	413.333 €	132.706 €				
POLIBA - Affiliate Spoke	376.875 €	413.333 €	118.531 €				
CNR - Affiliate Spoke	357.750 €	460.000 €	122.663 €				
POLITO - Affiliate Spoke	490.500 €	413.333 €	135.575 €				
Sapienza - Affiliate Spoke	392.625 €	436.667 €	124.394 €				
UNIBS - Affiliate Spoke	351.000 €	436.667 €	118.150 €				
UNIPI - Affiliate Spoke	424.125 €	460.000 €	132.619 €				
PARTHENOPE - Affiliate Spoke	418.500 €	436.667 €	128.275 €				
UNISA - Affiliate Spoke	361.125 €	413.333 €	116.169 €				
UNIVPM - Affiliate Spoke	393.375 €	460.000 €	128.006 €				
Salento - Affiliate Spoke	472.875 €	460.000 €	139.931 €				
TOTALE	**5.276.625 €**	**5.466.667 €**	**1.611.494 €**	**10.000.000 €**	**9.800.000 €**	**3.000.000 €**	

SPOKE 11: ADVANCED MATERIALS AND LIGHTWEIGHTING

The spoke will create a network of research centers and laboratories, large-scale demonstration environments,

full-scale prototypal applications to achieve the following goals:

- Identify alternatives to traditional materials with a view to vehicles lightweighting, ensuring high standards of safety and reliability, with attention to sustainability, recyclability and recovery.
- Define more efficient and sustainable production and transformation processes, including additive manufacturing technologies and new joining technologies, as well as integrated assessment modelling.
- Define new heat treatment and surface modification strategies for increased mechanical, tribological, and durability performance.
- Develop design methodologies based on structural optimization aimed at lightweight design.
- Realization of new recycling supply chains in cascade of innovative lightweight materials.

Activities	Lightweight and sustainable design: focus on criteria on sustainability; models and tools and optimization
	Light Metals: optimization of composition (new and recycled alloys), innovative forming and welding process
	Ferrous alloys: optimization od composition and tuning of process parameters, innovative forming and welding process
	Polymers: starting from RESs, preparing of new polymers, development of innovative techniques, innovative ceclycling routes
	Polymer matrix composites: materials development, production and testing, numerical and analytical model, SHM and damge identification, recycling routes
	Dissemination and Exploitation

Spoke Members	Permanent Staff	Recruitment of Phd and RtDA	Overhead	Local Infrastrucure and Lab.	Private project *(50% co-founding)*	Open Call	Total
UNIBO - Spoke Leader	597.000 €	710.000 €	196.050 €	7.615.000 €	7.400.000 €	3.000.000 €	26.248.617 €
UNIBA - Affiliate Spoke	382.500 €	436.667 €	122.875 €				
CNR - Affiliate Spoke	174.375 €	460.000 €	95.156 €				
POLITO - Affiliate Spoke	385.500 €	436.667 €	123.325 €				
Sapienza - Affiliate Spoke	285.375 €	413.333 €	104.806 €				
UNIPD - Affiliate Spoke	319.875 €	413.333 €	109.981 €				
UNIBS - Affiliate Spoke	294.750 €	413.333 €	106.213 €				
UNIPI - Affiliate Spoke	284.625 €	436.667 €	108.194 €				
UNIVPM - Affiliate Spoke	279.000 €	436.667 €	107.350 €				
TOTALE	**3.003.000 €**	**4.156.667 €**	**1.073.950 €**	**7.615.000 €**	**7.400.000 €**	**3.000.000 €**	

SPOKE 13: ELECTRIC TRACTION SYSTEMS AND BATTERIES

The spoke “Electric traction and batteries” will create a network of research centers and laboratories, largescale demonstration environments, full-scale prototypal applications to achieve the following goals:

- Development of equipment for Smart Electric Mobility Systems and Development of power-dense and highly efficient Power Converters and Electrical Machines.
- Development of materials for electrochemical energy storage and conversion.
- Development/production of electrochemical and hybrid cells and battery packs, supercapacitors, and fuel cells: integrated control and diagnostics for improved performance and lifetime
- Development of devices and systems for fast and ultra-fast innovative charging infrastructures and Models for control strategies and system architectures to interface different mobility infrastructures with Renewable Energy Sources (RESs), Battery Electric Storage Systems (BESSs) and grid.

Activities	Battery/supercapacitor technologies development for on board and stationary applications: material fabrication and recycling, cell and module/stack production, implementation in application environment
	Development of electric mobility: drives, infrastructures and grid interface. In particular electric drives and converters and impact on the electric grid considering RESs, BESSs and infrastructure
	Create a network of research centers and laboratories, large-scale demonstration facilities, full-scale pilot applications, Living Labs and computational facilities
	Battery/supercapacitor technologies development for on board and stationary applications: material fabrication and recycling, cell and module/stack production, implementation in application environment
	Dissemination and Exploitation

Spoke Members	Permanent Staff	Recruitment of Phd and RtDA	Overhead	Local Infrastrucure and Lab.	Private project *(50% co-founding)*	Open Call	Total
POLIMI - Spoke Leader	919.500 €	663.333 €	237.425 €	7.547.000 €	7.300.000 €	3.000.000 €	**27.124.290 €**
UNIMORE - Affiliate Spoke	388.125 €	436.667 €	123.719 €				
UNIBO - Affiliate Spoke	319.875 €	413.333 €	109.981 €				
POLITO - Affiliate Spoke	471.375 €	413.333 €	132.706 €				
Sapienza - Affiliate Spoke	417.000 €	413.333 €	124.550 €				
UNIPD - Affiliate Spoke	382.500 €	436.667 €	122.875 €				
UNIMIB - Affiliate Spoke	340.500 €	436.667 €	116.575 €				
UNIPI - Affiliate Spoke	382.500 €	436.667 €	122.875 €				
UNICS - Affiliate Spoke	382.500 €	413.333 €	119.375 €				
TOTALE	4.003.875 €	4.063.333 €	1.210.081 €	7.547.000 €	7.300.000 €	3.000.000 €	

CNMS BUDGET: PANORAMICA

- **COSTO COMPLESSIVO DEL CENTRO:** 433.800.000€
- **FINANZIAMENTO RICHIESTO:** 393.800.000€

- **RIPARTIZIONE COSTO COMPLESSIVO DEL CENTRO:**
  - **SPOKES:** **295.800.000€**
    - ✓ Permanent Staff: 36.284.600€
    - ✓ PhD and RTD-A: 43.306.000€
    - ✓ Overheads: 11.900.000€
    - ✓ Specific Infrastructures: 82.292.000€
    - ✓ Open Calls: 42.000.000€
    - ✓ Private Projects: 80.000.000€
      (co-funded by private partners at about 50%)
  - **ATTIVITA' TRASVERSALI:** **138.000.000€**
    - ✓ Technological Observatory: 6.000.000€
    - ✓ Study Centre: 6.000.000€
    - ✓ MOOCS: 6.000.000€
    - ✓ **Calls for Ideas / Start-ups** **15.000.000€**
    - ✓ 20 PoCs / TRL increase 9.000.000€
    - ✓ 10 Wide ranging programs 15.000.000€
    - ✓ **6-9 Flagship Initiatives** **75.000.000€**
    - ✓ Administrative Expenses: 6.000.000€

CNMS BUDGET: ANALISI TAGLI POST-NEGOZIAZIONE CON MINISTERO

La Proposta di Progetto prevedeva un **investimento pari a 434M€** mentre ora è stato **ridotto a 378M€**

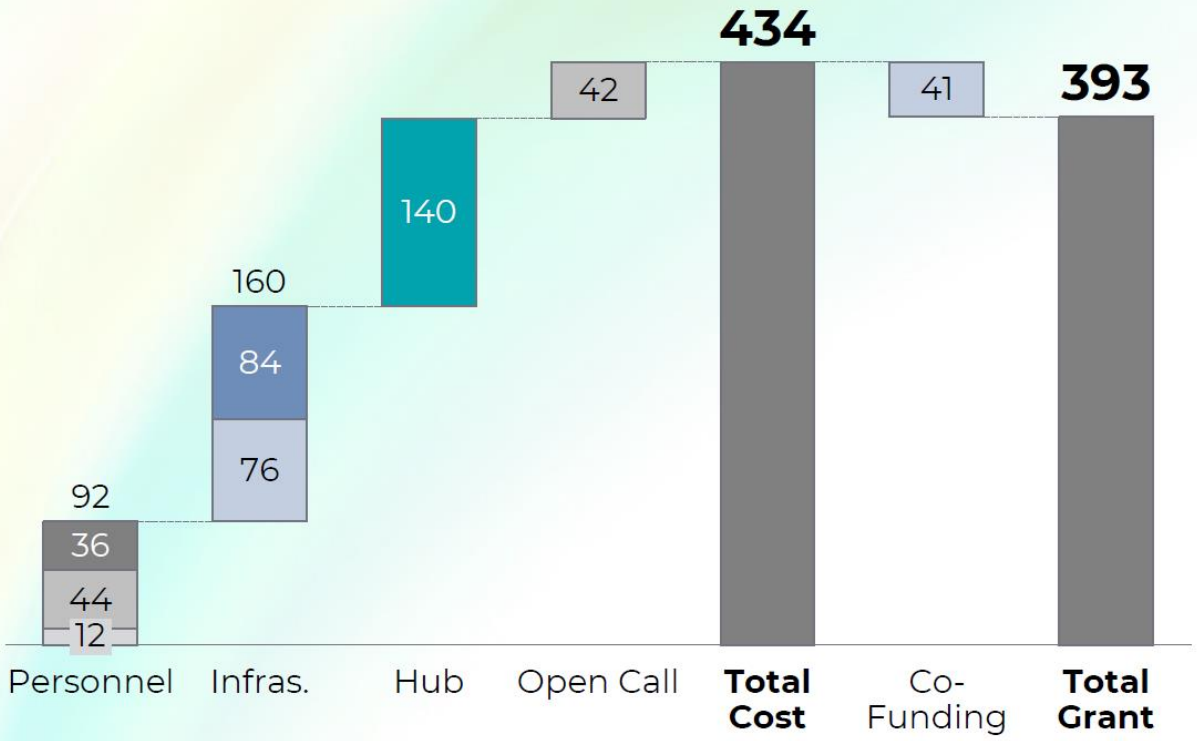
- Il MUR, in fase di negoziazione, ha chiesto a tutti i Centri una rimodulazione del budget in modo tale che **ciascuno presenti un valore dell'agevolazione non superiore a 320M€ cad.**

- **Al CNMS**, con un costo di 434M€ e un'agevolazione richiesta di 393M€ presentato in proposta di progetto durante la fase II, **è stata richiesta una riduzione di ca. 74M€**

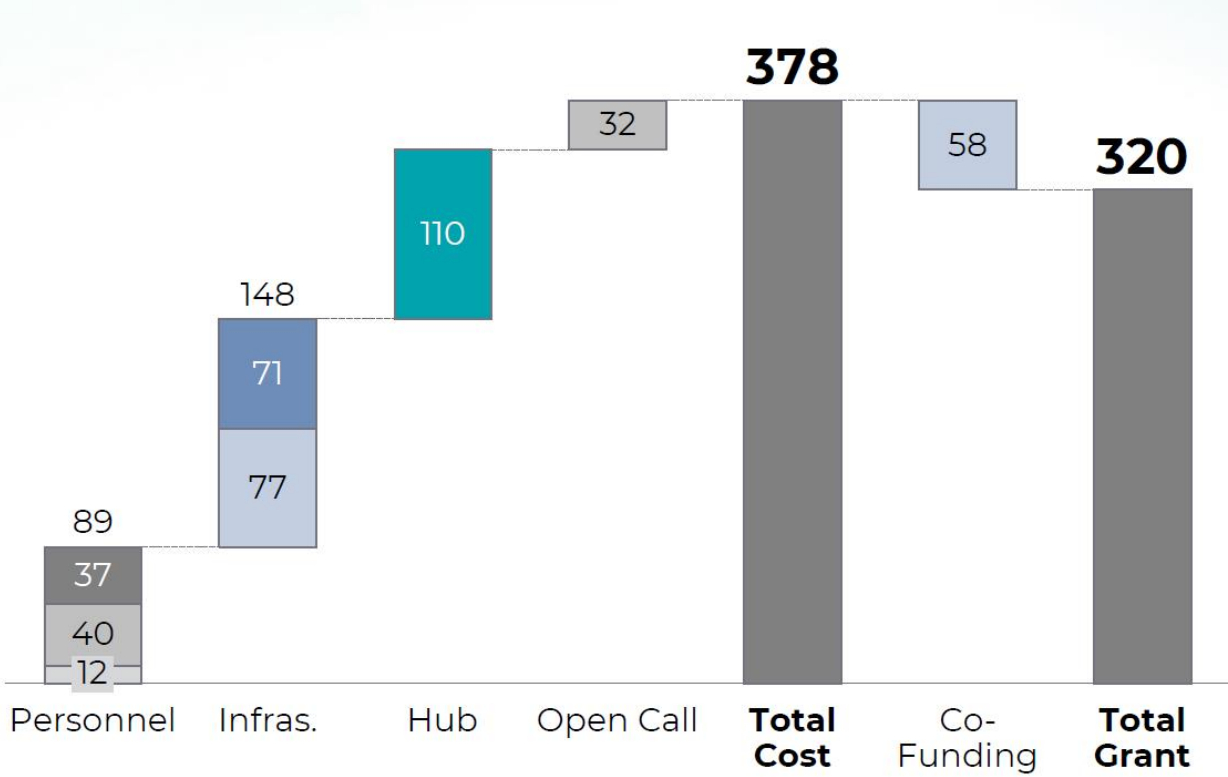
CNMS BUDGET: ANALISI TAGLI POST-NEGOZIAZIONE CON MINISTERO

La Proposta di Progetto prevedeva un **investimento pari a 434M€;**
ora è stato **ridotto a 378M€**

INVESTIMENTO TOTALE DEL PROGETTO – PROPOSTA



INVESTIMENTO TOTALE DEL PROGETTO – NUOVO



Structured | New Hires | Overhead | Public | Private

CNMS BUDGET: ANALISI TAGLI POST-NEGOZIAZIONE CON MINISTERO

A livello di Spoke, sono stati ridotti gli investimenti per il **reclutamento dei PhD** e le **infrastrutture pubbliche**

ALLOCAZIONE SUGLI SPOKE – NUOVO

	Spokes	Permanent Staff M€	Recruitment of Phd and RtDA M€	Overhead M€	Local Infrastrucure and Lab. M€	Private project *(50% co- founding)* M€	Open Call M€	Total M€
1	Air mobility	2,2	2,7	0,7	5,2	5,5	2,3	**18,6**
2	Sustainable road vehicle	2,0	2,3	0,7	4,1	4,7	2,3	**16,1**
3	Waterways	2,2	2,3	0,7	4,5	3,0	2,3	**15,0**
4	Rail trasportation	3,1	3,1	0,9	5,3	6,1	2,3	**20,8**
5	Light vehicle and active mobility	1,6	1,9	0,5	3,8	5,0	2,3	**15,1**
6	Connected and autonomous vehicle	2,3	3,1	0,8	4,7	5,7	2,3	**18,9**
7	CCAM, connected network and smart infrastructure	5,4	5,1	1,6	8,3	9,8	2,3	**32,5**
8	Maas e innovative services	2,2	2,3	0,7	3,8	3,9	2,3	**15,2**
9	Urban mobility	2,5	3,1	0,8	5,0	5,8	2,3	**19,6**
10	Logistics and Freight	2,4	2,6	0,8	4,3	5,0	2,3	**17,3**
11	Innovative Material and Lightweighting	3,2	3,8	1,1	6,5	6,5	2,3	**23,3**
12	Innovative Propulsion	1,6	1,8	0,5	4,6	4,4	2,3	**15,3**
13	Electric traction systems and batteries	4,0	3,8	1,2	6,3	7,3	2,3	**24,9**
14	Hydrogen and new fuels	2,1	2,3	0,7	4,6	3,8	2,3	**15,7**
	Totale	**36,9**	**40,3**	**11,6**	**71,1**	**76,5**	**32,0**	**268,3**

Rimodulazione delle voci di costo (- 26,3M€)	**- 3.4M€** Reclutamento dei PhD	**- 0,4M€** Overhead dei PhD	**- 12,5M€** Infrastrutture dei pubblici	**- 10M€** Open Call
Modalità di rimodulazione	Riduzione di 1 PhD per affiliazione **attribuendo un totale di 3 PhD per affiliazione** (e non più 4)		**~15% rispetto al peso** di ciascun Spoke sul totale escludendo i privati	Rimodulazione *flat* su tutti gli Spoke

11.15 – 12.45

Il Centro Nazionale Simulazioni, Calcolo e Analisi dei Dati ad Alte Prestazioni

Daniele Bonacorsi

ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Centro Nazionale di Ricerca in High Performance Computing, Big Data and Quantum Computing

Partecipazione UniBO al Centro

18 Luglio 2022

Prof. Daniele Bonacorsi

(a nome del GdL di Ateneo sul Centro Nazionale)

"Centro Nazionale di Ricerca in High Performance Computing, Big Data and Quantum Computing"

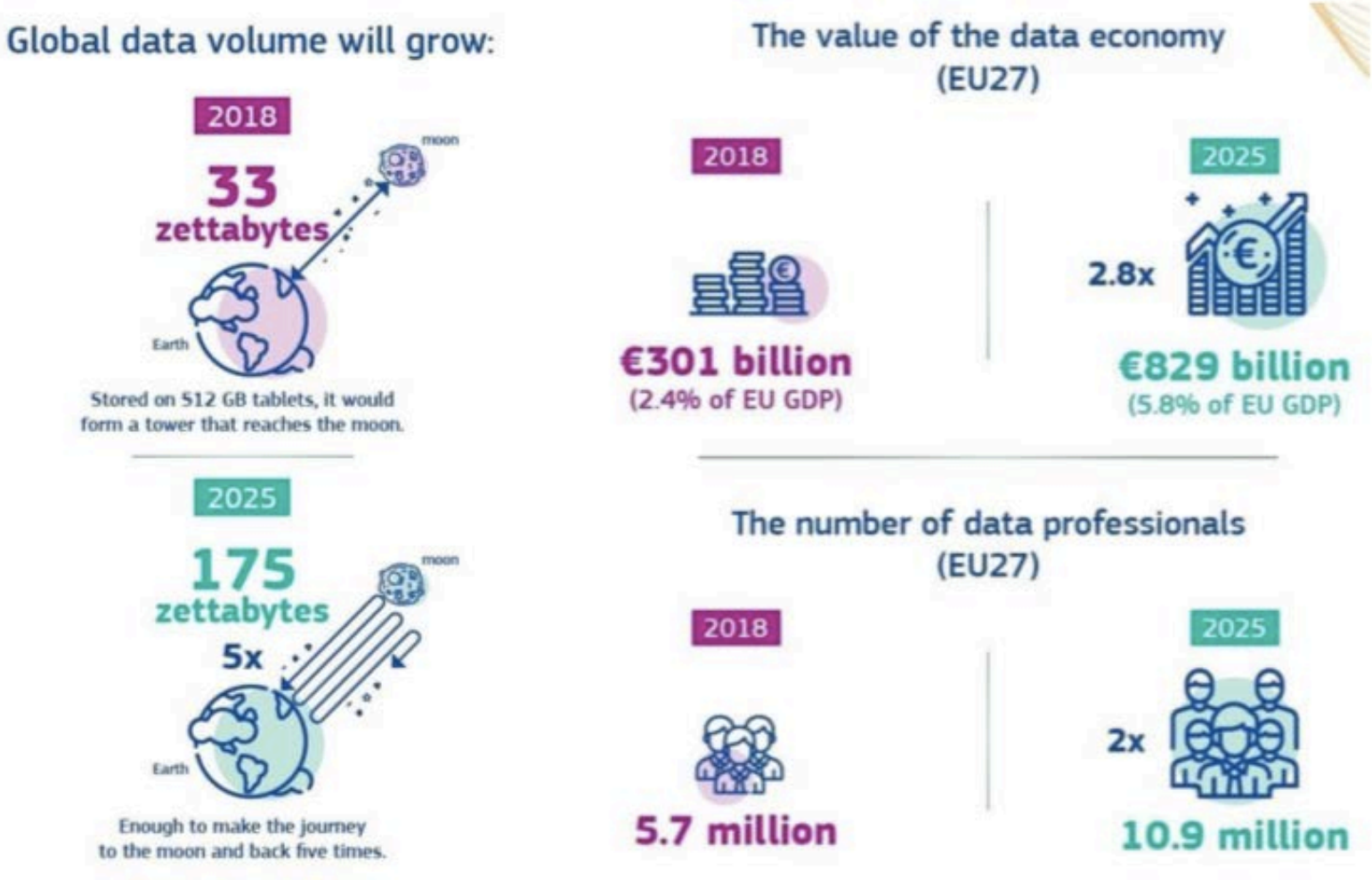
PNRR - Missione 4 - Componente 2 - Investimento 1.4

Proponente: **Istituto Nazionale di Fisica Nucleare (INFN)**

Soggetti partecipanti: **52**

Finanziamento concesso: **319.938.979,26 euro** di cui il 41% al Sud

EU Data Strategy → shaping Europe's digital future

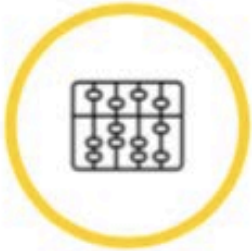


Why a National Research Center on HPC, BD, QC?

With the current Data Explosion…

- An unprecedented amount of data is going to be produced
- The real competitiveness challenge is extracting value from data
- Supercomputing, simulation, AI, high-performance data analytics and Big Data are essential for innovation and growth in a data-driven society

…need for an ambitious Italian strategy…



- Europe has a clear strategy (e.g. EuroHPC, EOSC, EPI, Chip Act, Quantum Flagship) - European Data Strategy
- People, businesses and organisations should be empowered to make better decisions based on insights from data

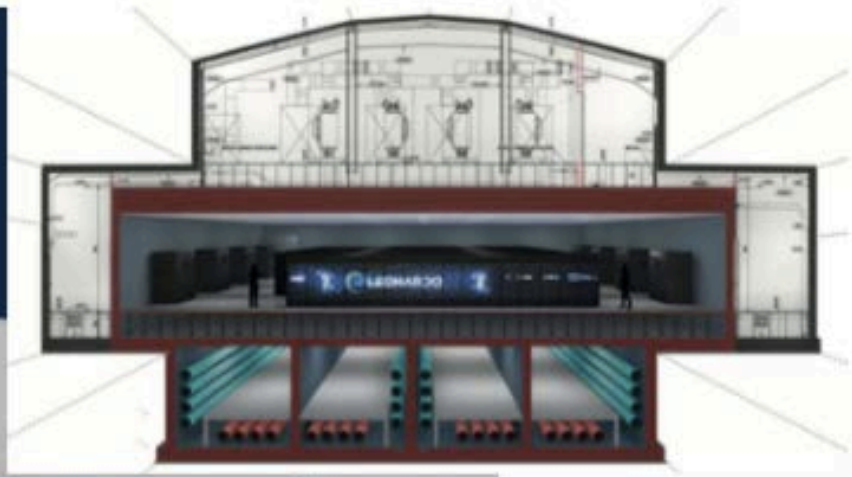
…to "close the gap" with best in class

- First actions from 2015: Bologna's Technopole, ECMWF Data Centre, Leonardo pre-exascale supercomputer
- A step forward based on 5 pillars …

Strong synergy with the EU strategy.

5 pillars in the action plan

The Big Data Technopole – Bologna



ECMWF Data Center

ICSC

CINECA & INFN Exascale Supercomputer Center

Big Data Association and Foundation

Civic Protection and agency for development and innovation

Conference and Education Center

Meteo National Agency

Innovation Center

IFAB - International foundation Big Data

Competence Center Industry 4.0

University Centers

Biobank and Life Science

ENEA Center

Co-funded by the European Union

Regione Emilia-Romagna

Participants

National Institutes

INFN · CINECA · ENEA · Consiglio Nazionale delle Ricerche · INGV · Consortium GARR · INAF

Companies

LEONARDO · INTESA SANPAOLO · FERROVIE DELLO STATO ITALIANE · fondazione innovazione urbana · eni · FINCANTIERI · autostrade per l'Italia · IFAB · UnipolSai · HUMANITAS · ENGINEERING · ThalesAlenia Space · sogei · Terna Driving Energy · UPMC

Hub Only

UNIMORE · UNIVERSITÀ DI PARMA · OGS

Founding members: a public-private partnership

	Istituto Nazionale di Fisica Nucleare		Università degli Studi di Modena e Reggio Emilia
	CINECA		Università degli Studi di Napoli Federico II
	Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici		Università degli Studi di Padova
	Consiglio Nazionale delle Ricerche		Università degli Studi di Pisa
	Centro di Ricerca, Sviluppo e Studi Superiori in Sardegna - CRS4 Srl Uninominale		Università degli Studi di Parma
	ENEA - Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile		Università degli Studi di Pavia
	Fondazione Bruno Kessler		Università del Salento
	Consortium GARR		Università degli Studi di Torino
	Istituto Italiano di Tecnologia		Università degli Studi di Trento
	Istituto Nazionale di Astrofisica		Università degli Studi di Trieste
	Istituto Nazionale di Geofisica e Vulcanologia		Università degli Studi di Firenze
	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale		UNIPOLSAI Assicurazioni S.p.A
	Politecnico di Bari		University of Pittsburg Medical Centre – Italia
	Politecnico di Milano		Intesa Sanpaolo S.p.A.
	Politecnico di Torino		Terna S.p.A. – rete elettrica nazionale società per azioni
	Università degli Studi di Roma Tor Vergata		Sogei Società Generale d'Informatica S.p.A.
	Sapienza Università di Roma		Leonardo S.p.A
	Scuola Internazionale Superiore di Studi Avanzati		IFAB
	Scuola Normale Superiore di Pisa		Humanitas Mirasole S.p.A.
	Università degli Studi dell'Aquila		Fondazione Innovazione Urbana
	Università degli Studi di Bari Aldo Moro		Fincantieri S.p.A.
	Alma Mater Studiorum – Università di Bologna		Ferrovie dello Stato Italiane Group
	Università della Calabria		Eni
	Università degli Studi di Catania		Engineering Ingegneria Informatica S.p.A.
	Università degli Studi di Ferrara		Autostrade per l'Italia S.p.A.
	Università degli Studi di Milano-Bicocca		Thales Alenia Space Italia S.p.A.

Private Founding Members: strategic players for digital transformation

Highly-qualified group of large leading companies covering most of the strategic industrial sectors involved by digital transformation at the national level

fondazione innovazione urbana

Strategic partner to implement and develop the digital twin pilot case of an urban complex system

iFAB INTERNATIONAL FOUNDATION BIG DATA & ARTIFICIAL INTELLIGENCE FOR HUMAN DEVELOPMENT

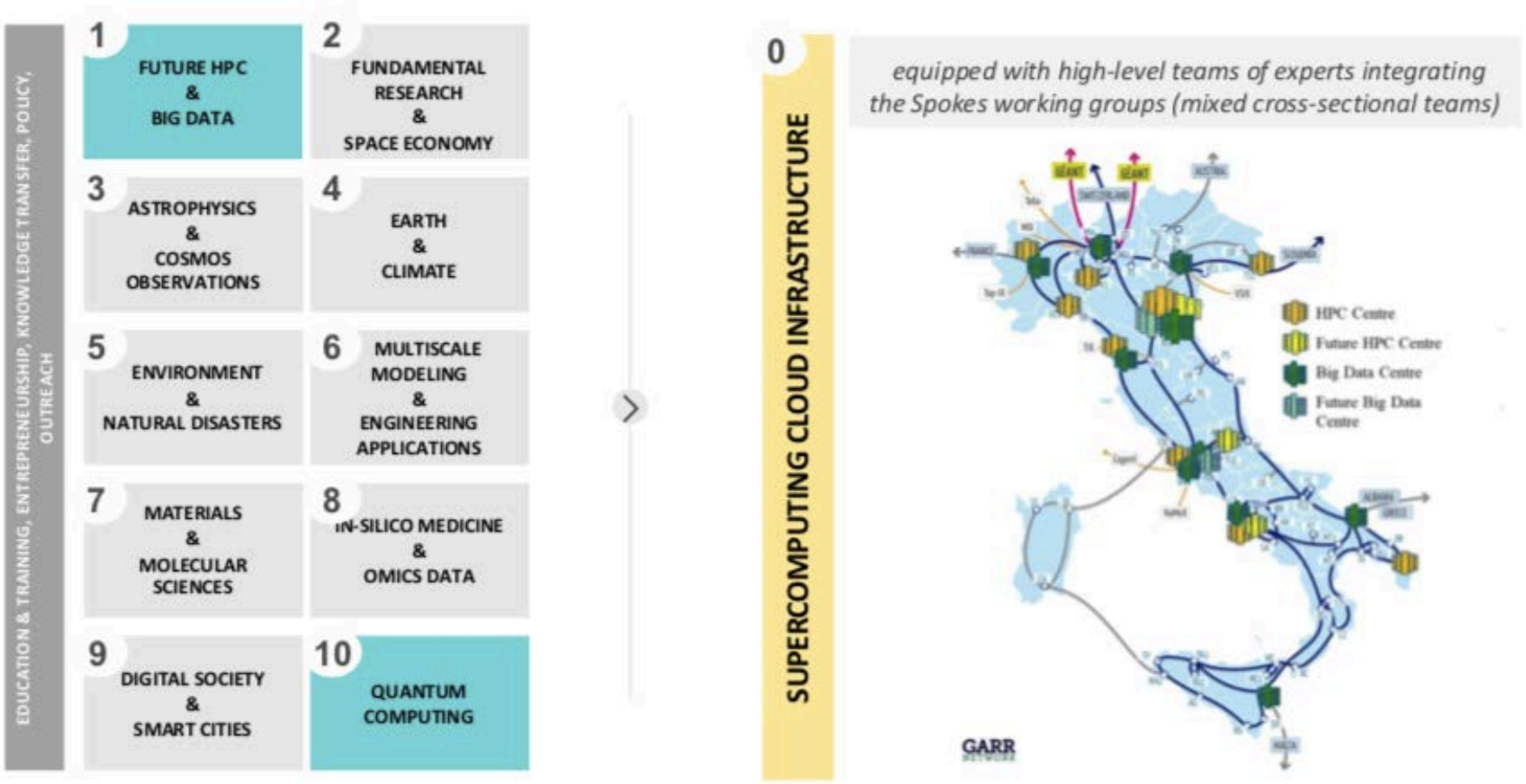
Industry-driven not-for-profit international organization aimed at: (1) aggregating companies, including SMEs, to engage with ICSC through a structured partnership, (2) funding research and innovation projects, (3) promoting the Big Data Technopole

Aims of the Center

The Centre aims to create the **national digital infrastructure for research and innovation**, starting from the existing HPC, HTC and Big Data infrastructures evolving towards a cloud data-lake model accessible by the scientific and industrial communities through flexible and uniform cloud web interfaces, relying on a high-level support team, form a globally attractive ecosystem based on strategic public-private partnerships to fully exploit top level digital infrastructure for scientific and technical computing and promote the development of new computing technologies.

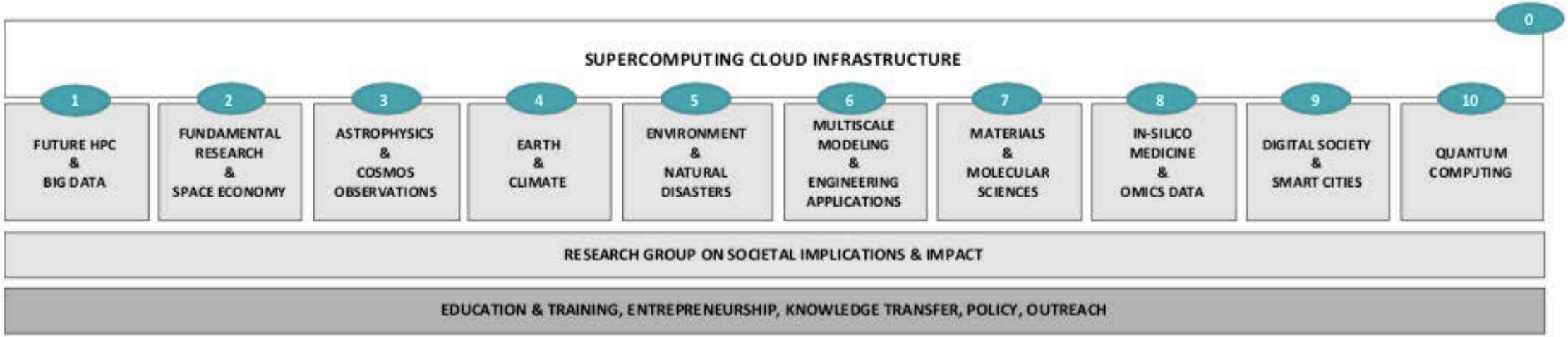
→ the Centre provides a pivotal opportunity for the national scientific, industrial and socio-economic system to address current and upcoming scientific and societal challenges, strengthening and expanding existing competences and infrastructural resources.

"Spokes" of the Centre → Data-Lake

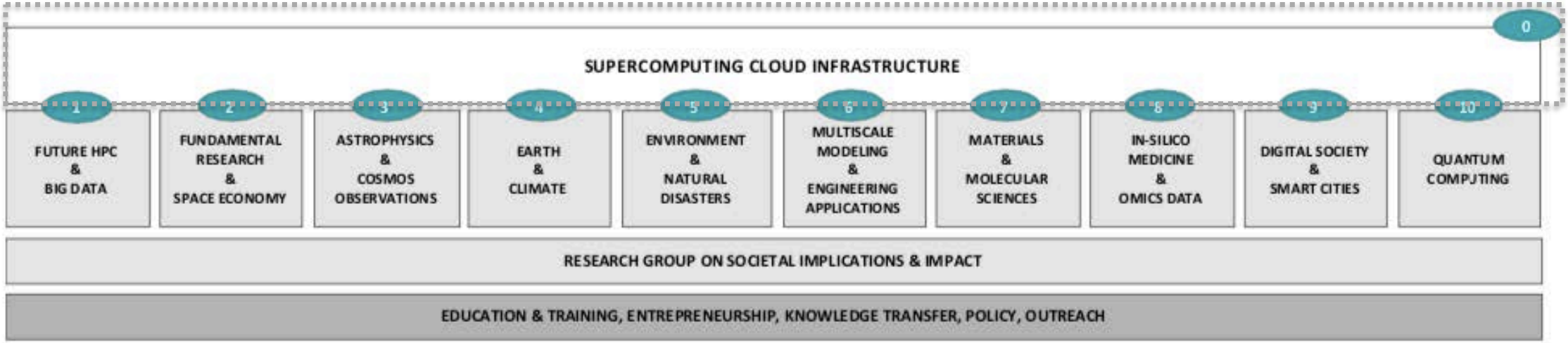


10 thematic spokes (1-10) and **1** Infrastructure spoke (0)

Spokes in the National Centre

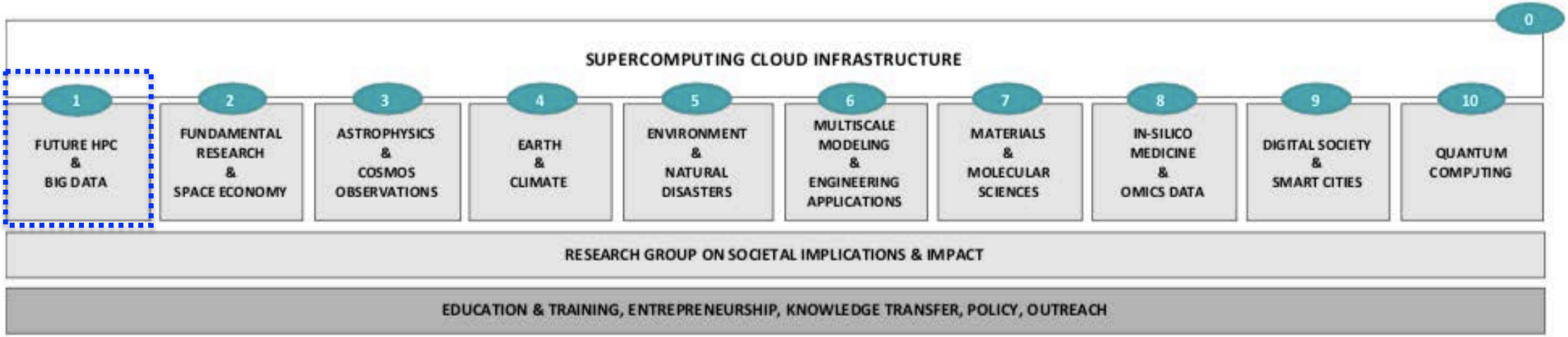


Spoke 0: **Supercomputing Cloud Infrastructure**



The infrastructural Spoke 0 is focused on the objectives of **consolidating the presence in Italy of a federation of supercomputing centres** (from a Tier0 of exascale class to Tier1 and Tier2) **and data intensive facilities** (currently providing storage capacity of ~200 PB and computing power of ~100,000 CPU cores) as well as to ensure appropriate **upgrade of the national research network (GARR)** by bringing the connectivity of the national backbone and of the last mile of the main centres **to the scale of the terabit per second**.

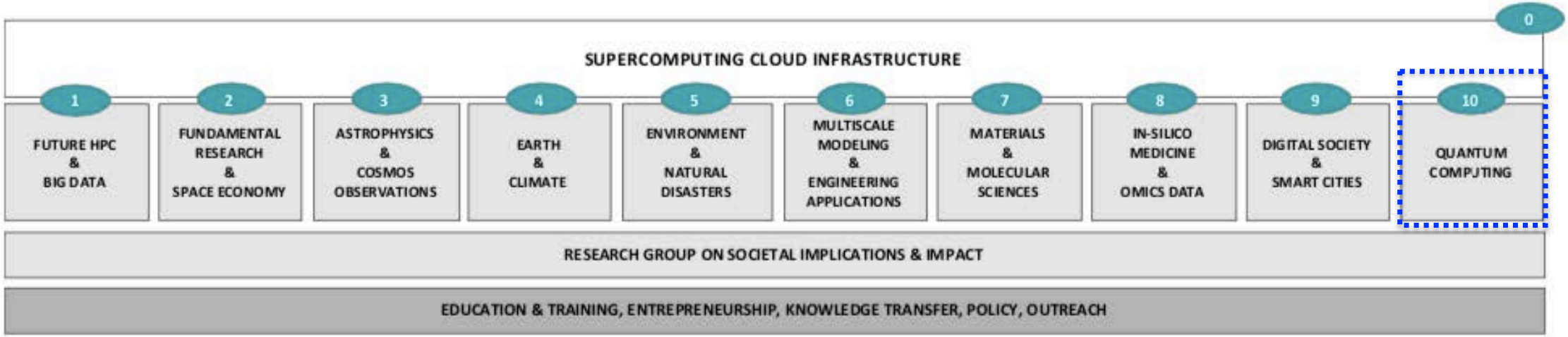
Spoke 1: **Future HPC & Big Data**



Advanced co-design of high-performance and high-throughput hardware and software systems, towards next generation of data center computing resources, in order to strengthen Italy's leadership in the EuroHPC Joint Undertaking and the data infrastructure ecosystem.

UniBO is spoke leader

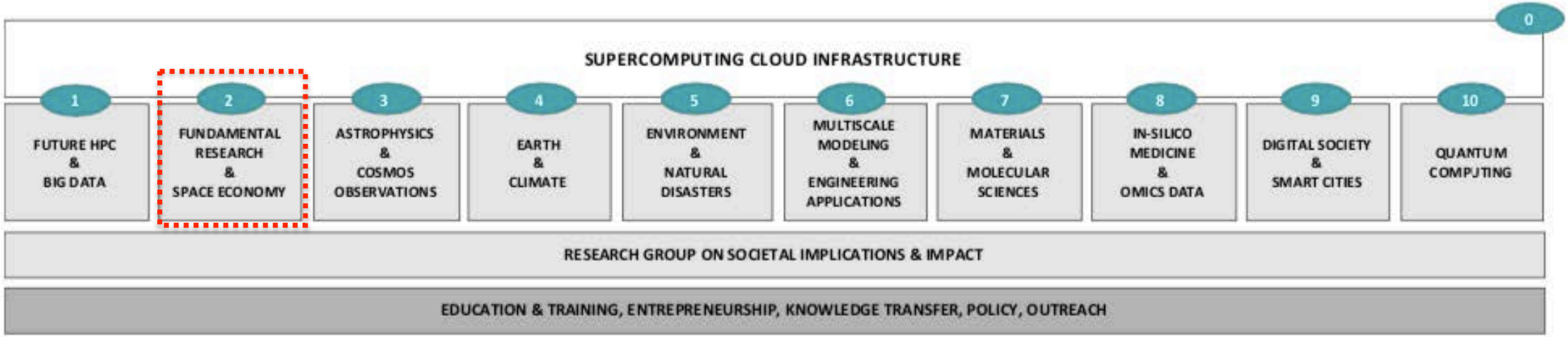
Spoke 10: **Quantum Computing**



Exploitation of Quantum Computing technologies, with a potential to radically transform scientific research and business in every industry. Resolution of complex problems in the field of optimisation, simulation and machine learning. Accelerate research and development efforts (e.g. overcoming technical challenges related to error and system reliability) to create a large and scalable quantum computer, able to support practical use cases.

UniBO is affiliate

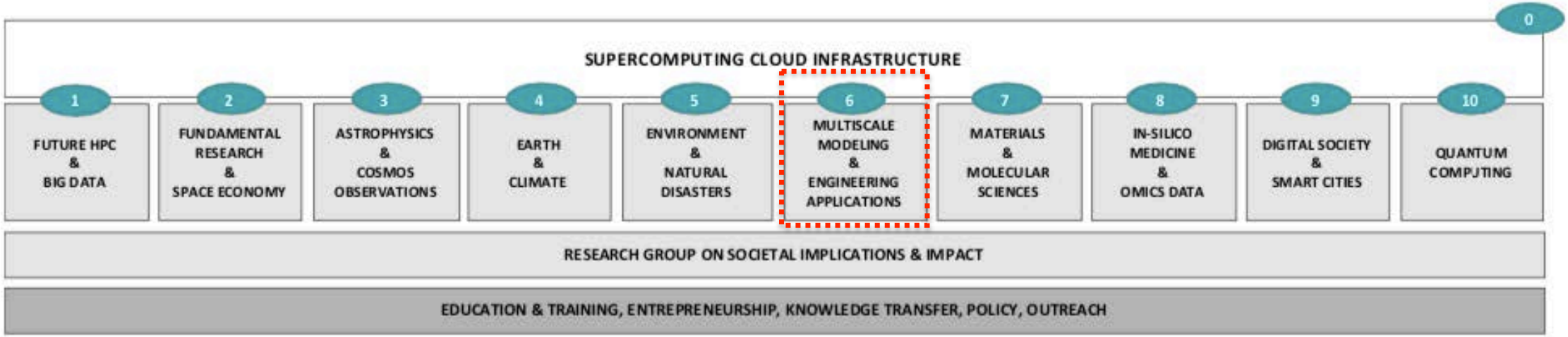
Spoke 2: **Fundamental Research & Space Economy**



Addressing the needs of computing-intensive and data-intensive scientific fundamental research. Optimisation and/or design of sophisticated algorithms and, in general, computing methods (incl. machine learning and deep learning techniques) capable of maximising the science throughput out of massive volumes of either experimental data and theoretical/phenomenological simulated data.

UniBO is affiliate

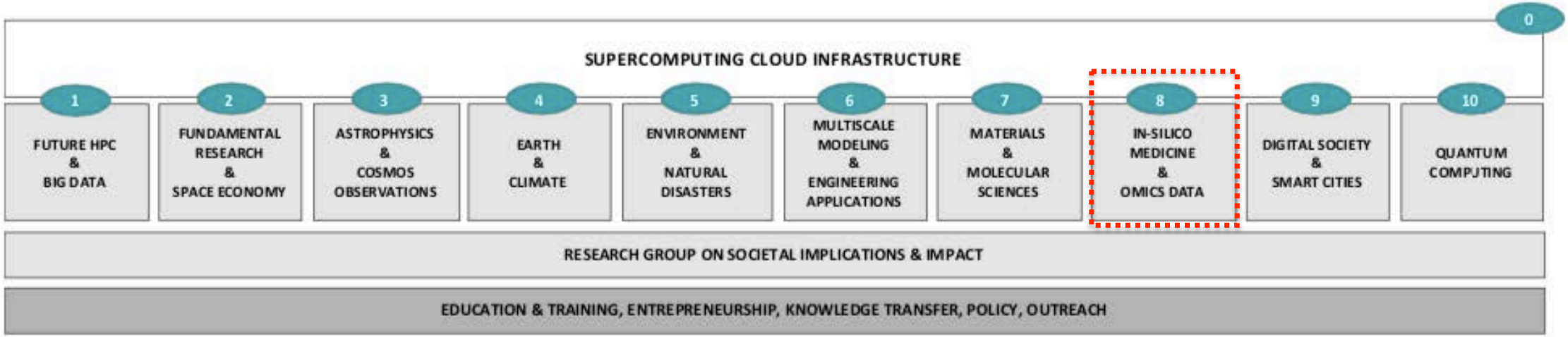
Spoke 6: **Multiscale modelling & Engineering Applications**



Complex multiscale and multiphysics modelling, simulation of large systems via multiscale methods, digital twin modelling and tools for engineering disciplines, methods/tools integration for engineering applications.

UniBO is affiliate

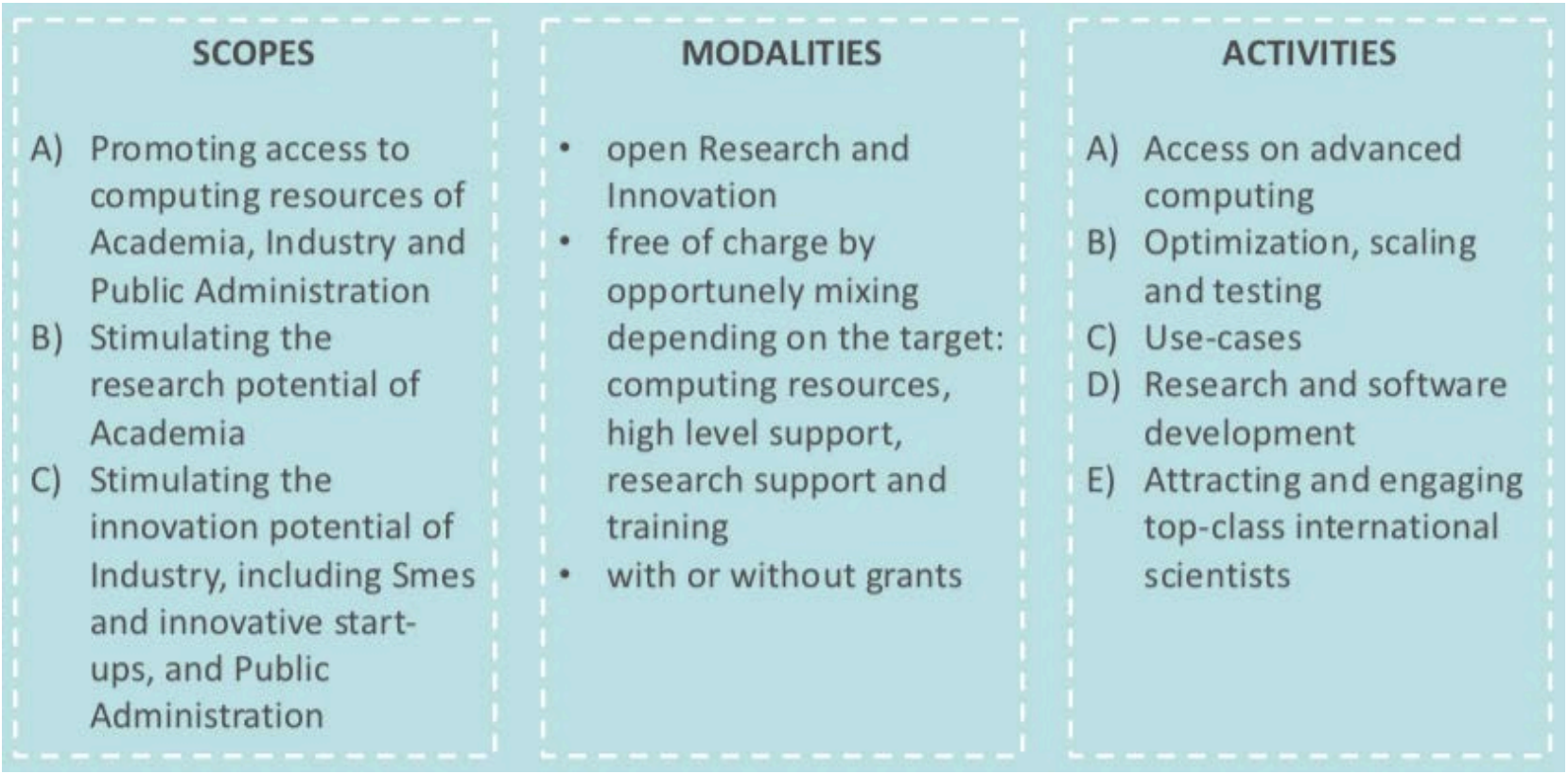
Spoke 8: **In-silico Medicine & Omics Data**



Modelling and simulation technologies in healthcare (digital patient solutions; in-silico trials solutions; personal health forecasting solutions). Precision medicine methods via collection and analysis of "omics" data (from genomics, proteomics, metabolomics, lipidomics, metagenomics, transcriptomics, ..).

UniBO is affiliate

Open calls



40 ME

Involvement of non-partners through **open calls**

Innovation grants: from Research to Innovation

SCOPES	MODALITIES	ACTIVITIES
A) Fostering technology scale-up and transfer B) Supporting new start-ups and spin-offs C) Addressing skill gaps D) Creating ISCS community and promoting entrepreneurial culture	• Exploitation plans • Call for ideas and business plans • Contests and Challenges • Innovation grants	• Deployment of demonstrators • Scale-up grants • Proof fo Concepts • Pilot applications • Pre-seed funds • Life long learning • Training • Industrial PhD projects

40 ME

Grants to involve industry and bring solutions from low-medium TRL to **higher TRL**

Italian Observatory on Supercomputing Trends and Applications

SCOPES

- ✓ Providing evidence on the latest innovative trends and the related potential socio-economic impact
- ✓ Identifying the dynamics of good practices, with a special focus on SMEs
- ✓ Proposing policy tools to overcome the barriers to innovation
- ✓ Pursue 'win-win' relationships between entrepreneurs, policy makers, innovation facilitators and researchers
- ✓ Enhancing awareness of the latest innovation trends and success stories, through case studies, trend reports and workshops/conferences
- ✓ Distributing the ICSC/Spokes findings via the website and social media tools
- ✓ Supporting policy makers