How life science research infrastructures contribute to the UN Sustainable Development Goals

Research infrastructures' contribution to SDGs: enabling excellent science in service of society
International Conference on Research Infrastructures (ICRI)
Hybrid side event, Brno, Czechia, 19 October 2022

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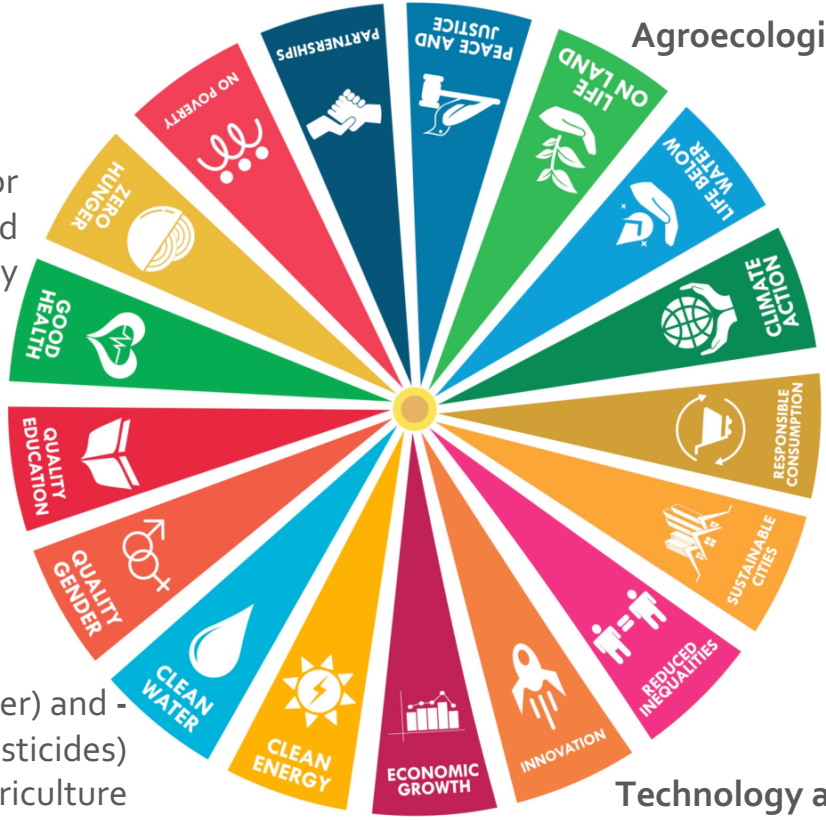
Roland Pieruschka (EMPHASIS)

Life science research infrastructures contribute to ***most*** *UN Sustainable Development Goals*

Worked example #1: EMPHASIS

Plant phenotyping's contribution to the Goals



Agroecological principles in farming systems

Crop productivity for food security & food quality

Reduced carbon emissions from agriculture

Sustainable agriculture **training**

Sustainable rural production systems

Resource-efficient (water) and **-resilient** (nutrients, pesticides) agriculture

Technology and data driven approaches

Bio-based **energy production**

Making **rural** areas attractive

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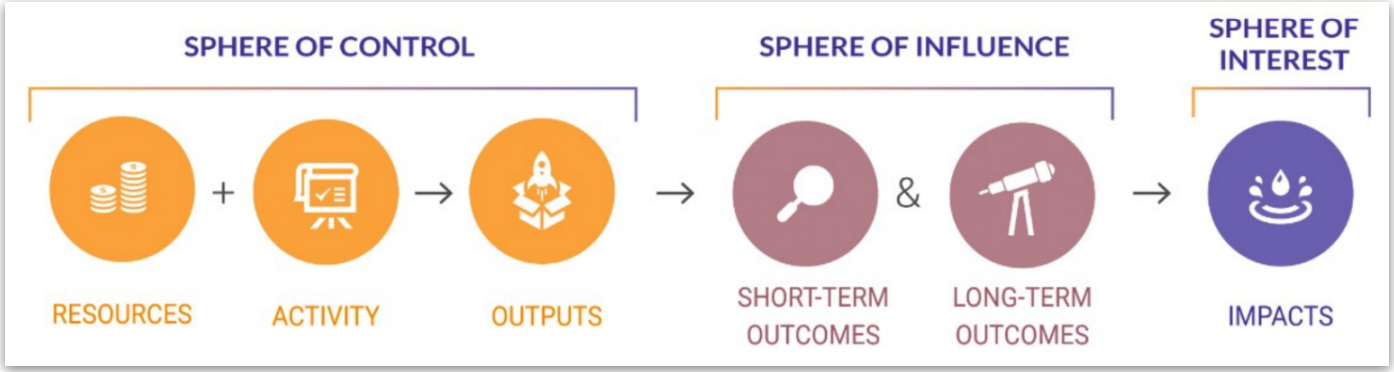
Yes, but… how do you get there?

The pathway to impact is long…

RI PATHS



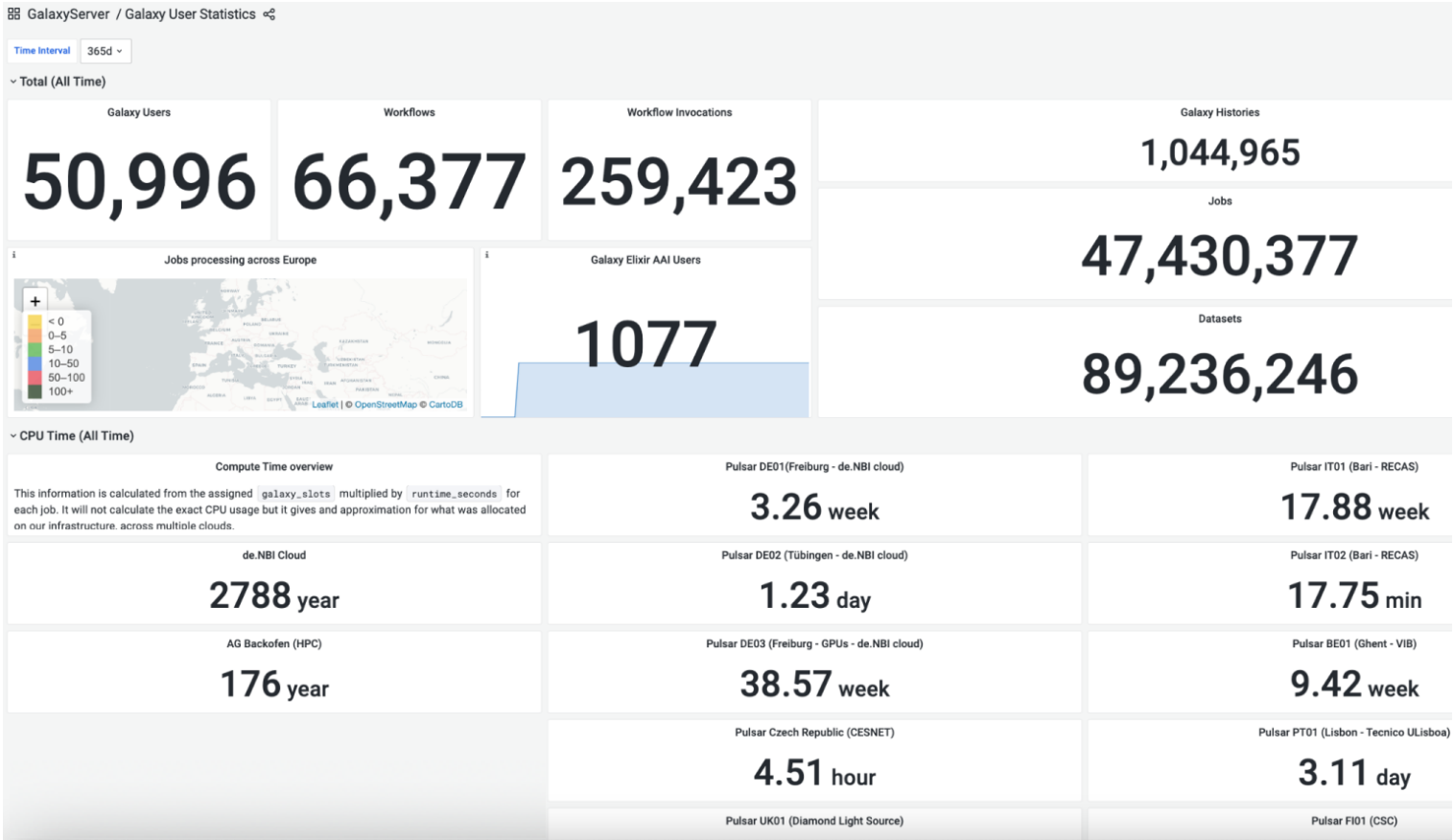
Research infrastructures *develop, operate, maintain* services (eg database, software, training, compute, instruments, facilities, …)

Users* make use of the services

Citizens and the planet benefit… much later!

* Users are typically **outside** of the infrastructure

It’s not realistic to investigate each possible pathway



*Life science research infrastructures **contribute*** to the UN Sustainable Development Goals*

* pragmatic nuance: **contribution** versus **attribution**

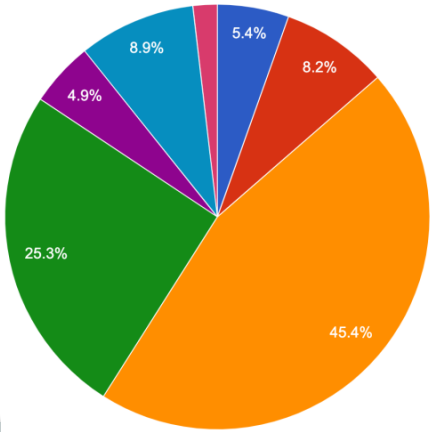
Worked example #2: how do we contribute to…*

Ensure inclusive and equitable quality **education** and promote **lifelong learning** opportunities for all

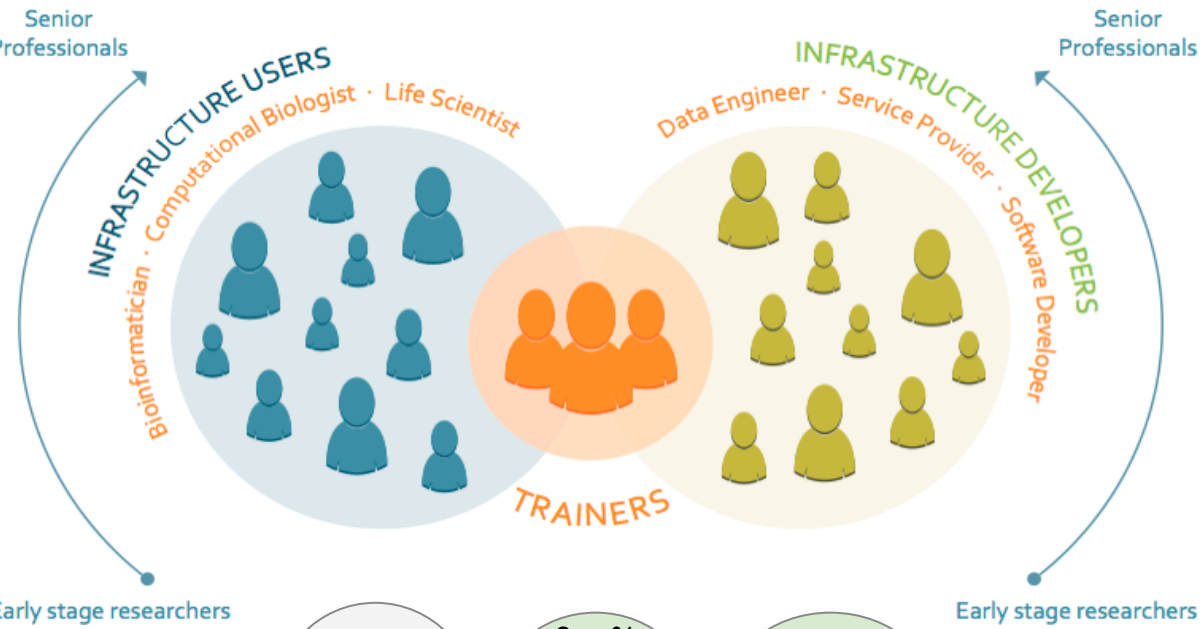
* Life sciences research infrastructures

Providing training to both *users* and *providers* of services

Since 2015:



- Masters student
- Other
- PhD candidate
- Postdoctoral resear
- Research assistant/
- Senior scientist/ Pri investigator
- Undergraduate stud



4,788 days of training

5,595 trainers

84.9% reported a positive outcome at work

93.5% of trainees would recommend

51.8% female participants

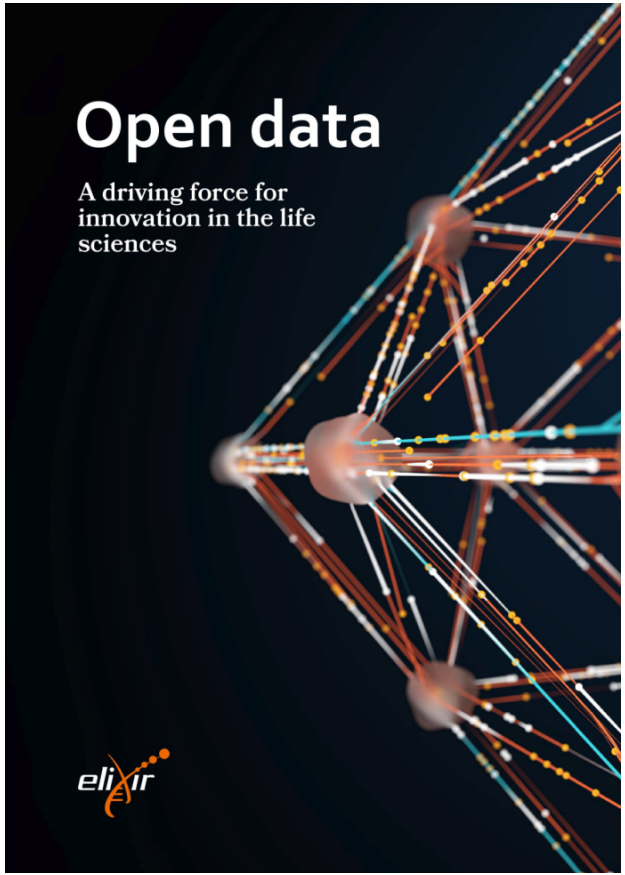
57.9% have further shared their skills

Worked example #3: how do we contribute to…*

Build resilient infrastructure, promote inclusive and sustainable industrialization and **foster innovation**

*Life sciences research infrastructures

Open Data drives innovation in industry



76% of respondents stated that without data shared on open repositories, they would not be able to offer their product or service.

89% of respondents stated that a product or service has more features because of access to data shared on open repositories

63% 63% of respondents stated that without access to registries, ontologies, and dictionaries published on open repositories, they would not be able to offer their product or service.

92% of respondents stated that a product or service has more features because of access to registries, ontologies, and dictionaries shared on open repositories.

Worked example #4: how do we contribute to…*

Conserve and sustainably use the Oceans, seas and marine resources for sustainable development

*Life sciences research infrastructures

EMBRC-ERIC, a community-construct service

- **A core mission promoting** new scientific discoveries and deepen knowledge of marine organisms and ecosystems; the sustainable utilisation of marine biological resources
  - average of 220 projects carried out at EMBRC since 2018 **per year**

- **Implementation of Open Science Principles:**

  Open access to services, scientific results and data; all protocols and procedures published open and online; standardisation of data and metadata, development of standard operating procedures

- **FAIRification of bioresources and data:** Best practices for collections on conforming to Access and Benefit Sharing (ABS) legislation; centralised reporting of bioresource utilisation from genomics observatory; preparing traceability mechanism for all bioresources and data

EMBRC
EUROPEAN MARINE BIOLOGICAL RESOURCE CENTRE

Contributing Directly to SDG14

EMO BON
EUROPEAN MARINE OMICS BIODIVERSITY OBSERVATION NETWORK

- EMBRC has launched EMO BON, a modern biodiversity observatory
- European contribution to global observation: Open access to biodiversity and genomics data, protocols, metadata, and DMP ("best practice observatory")
- Vehicle to develop biological observation & bring biology into decision making
- Embedded in the UN Ocean Decade for Ocean Science community of practices
- Endorsed by IOC-UNESCO in the Ocean Biomolecular Observation Network (OBON)
- Capacity building

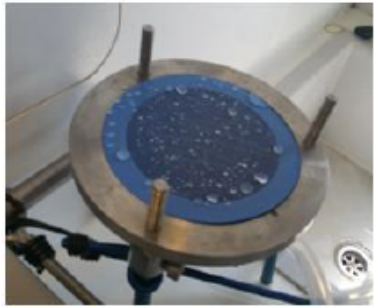


Figure 3: Open filtration tripod and humidified filter holder.

OBON
OCEAN BIOMOLECULAR OBSERVING NETWORK

DECADE CHALLENGES ADDRESSED

CHALLENGE 2: Protect and restore ecosystems and biodiversity

CHALLENGE 6: Increase community resilience to ocean hazards

CHALLENGE 7: Expand the Global Ocean Observing System

CHALLENGE 9: Skills, knowledge and technology for all

Thank you

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