

Projekt PPP aneb „budování“ budoucí eLTER RI*

*eLTER RI = European Long-Term Ecosystem, critical
zone and socio-ecological systems Research
Infrastructure

Na cestě k eLTER RI

- *Rozhodování o tom, „jak to bude fungovat“*: Prozatimní sněm (Interim Council)
- *„Jak to bude fungovat“*, např.:
 - Site Categories
 - Standard Observations, basic and prime methods
 - Integrated Governance
 - Funding model
 - Service Portfolio Development

Získávání názorů na to, jak by to mělo fungovat:

- Site and Platforms Coordinators Forum
- Expert Groups
- National Coordination teams (JH, OV)

Současná situace:



Czech ESFRI Delegation

Ministry of Education, Youth and Sports **Jan Švehla**

CNC chair **Jakub Hruška**

CzeCOS manager **Jiří Kolman**

Interim Council (Prozatimní sněm)

The eLTER Interim Council, IC, is established to discuss and approve strategic issues such as legal, governance and financial matters, eLTER Site and eLTSER Platform labelling and location of Central Services in implementing the integrated European Long-Term Ecosystem, critical zone and socio-ecological systems Research Infrastructure (eLTER RI). The role of the IC is to make decisions for implementing eLTER RI and preparing its legal entity, ERIC (European Research Infrastructure Consortium).

The IC will:

- negotiate and approve the legal model, governance structure and founding documents,
- approve the financial plan and the draft internal financial rules,
- approve policy papers provided by the PPP,
- approve all other necessary founding documents for implementation of eLTER RI,
- approve the selection procedure and appointment of the Interim Director when needed, and
- decide on any other issues deemed necessary by the IC.

• IC_01 10.12.2020

IC_02 29.-30.6.2021

IC_03 27-28.1. 2022

Next IC: **eLTER IC_04**, 28.-29.9.2022

IC material pre-consultation: **15 Aug - 12 Sep 2022**

The final IC material would be sent out on: **18 Sep 2022**

Czech ESFRI
Delegation

Ministry of Education,
Youth and Sports

Jan Švehla

CNC chair

Jakub Hruška

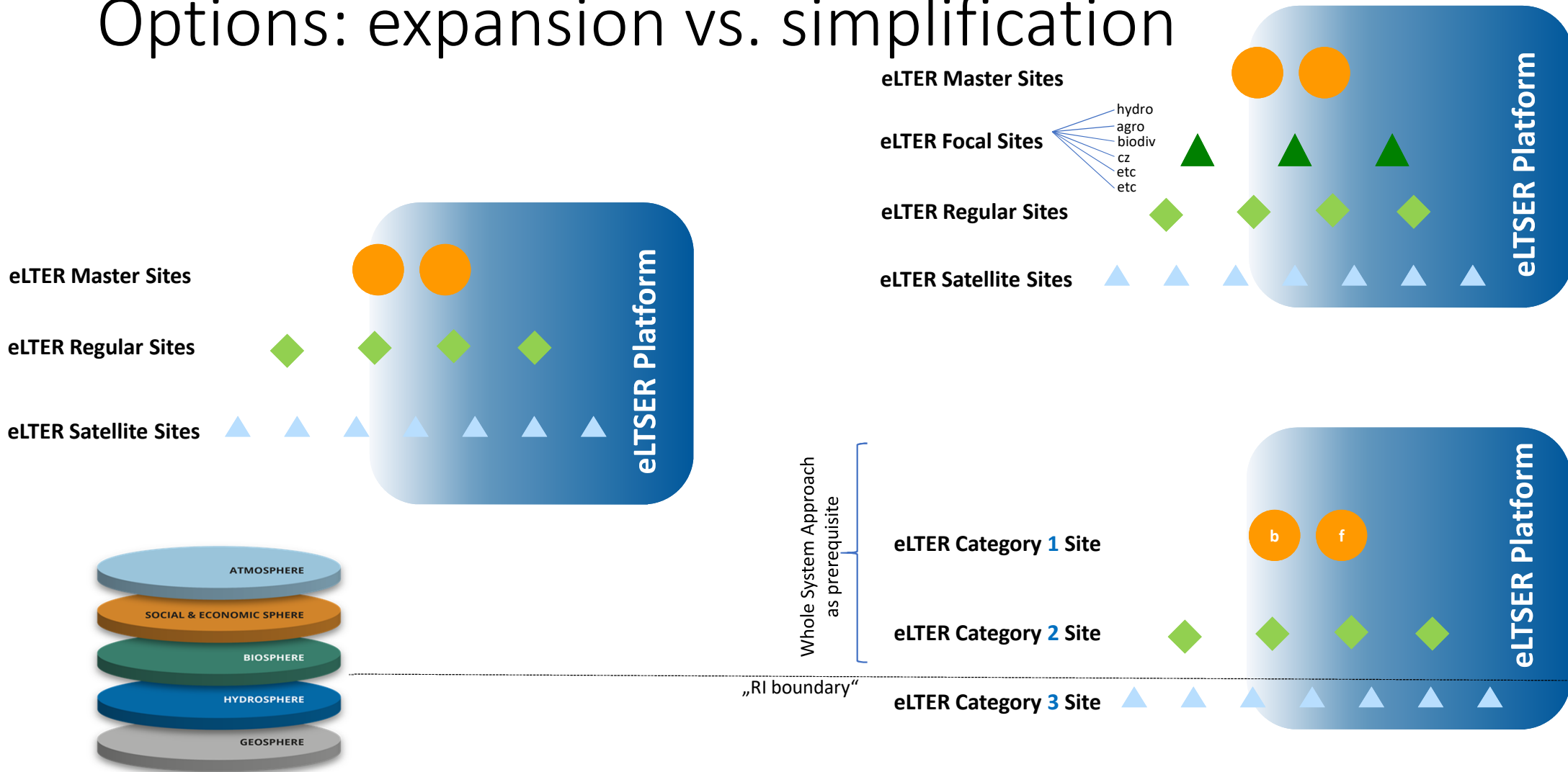
CzeCOS
manager

Jiří Kolman

Kategorie ploch (Site Categories)

- *Jak se určí kategorie plochy?*
- Úzce souvisí s:
 - Standardní pozorování (Standard Observations): *co se bude měřit (co povinně a co volitelně)*
 - basic and prime methods: *jak se to bude (muset) měřit*

Options: expansion vs. simplification



Staged approach for category specification

➤ Hard criteria

- overall purpose: **transparent and quantifiable characteristics** for correct assignment (where no compromises can be made)
- **simple to control** in a labeling process
- enabling **accurate cost assumptions**

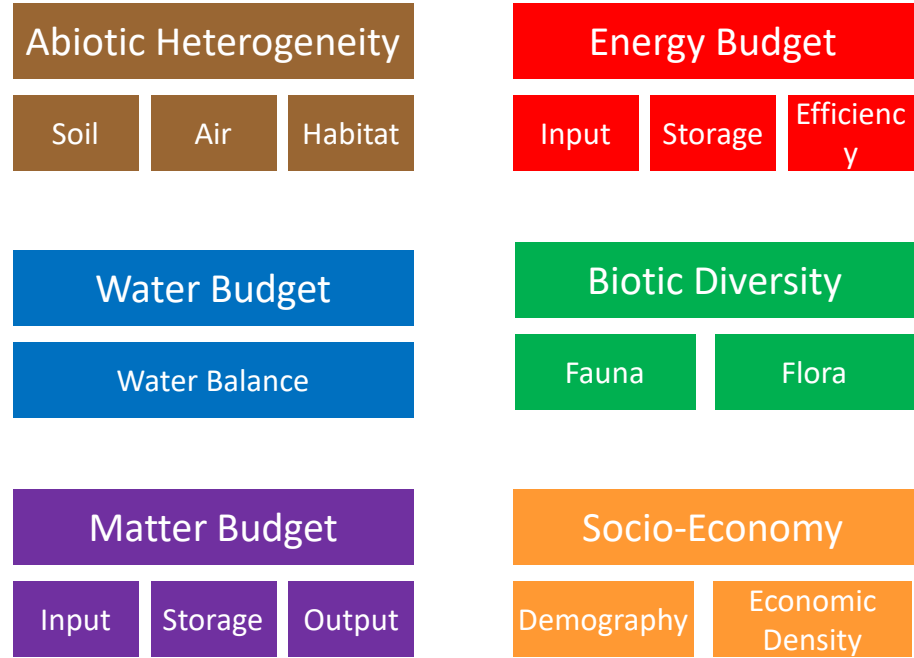
➤ Customizable characteristics

- overall purpose: leave **space within certain limits, where no general rule is technically possible** or agreeable
- characteristics, where a certain range of options exist (e.g., spatial design)
- documentation and justification

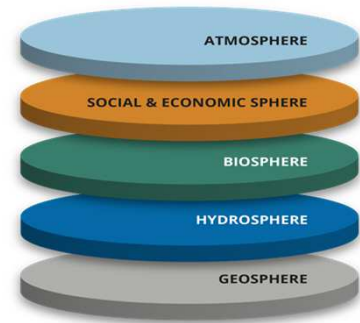
➤ Guidelines and recommendations

- overall purpose: give **additional explanations and background information** to secure understanding & buy-in and facilitate assignment
- answers to frequently asked questions concerning application of the category
- possibly a collection of typical sites for the category

eLTER Framework of Standard Observations

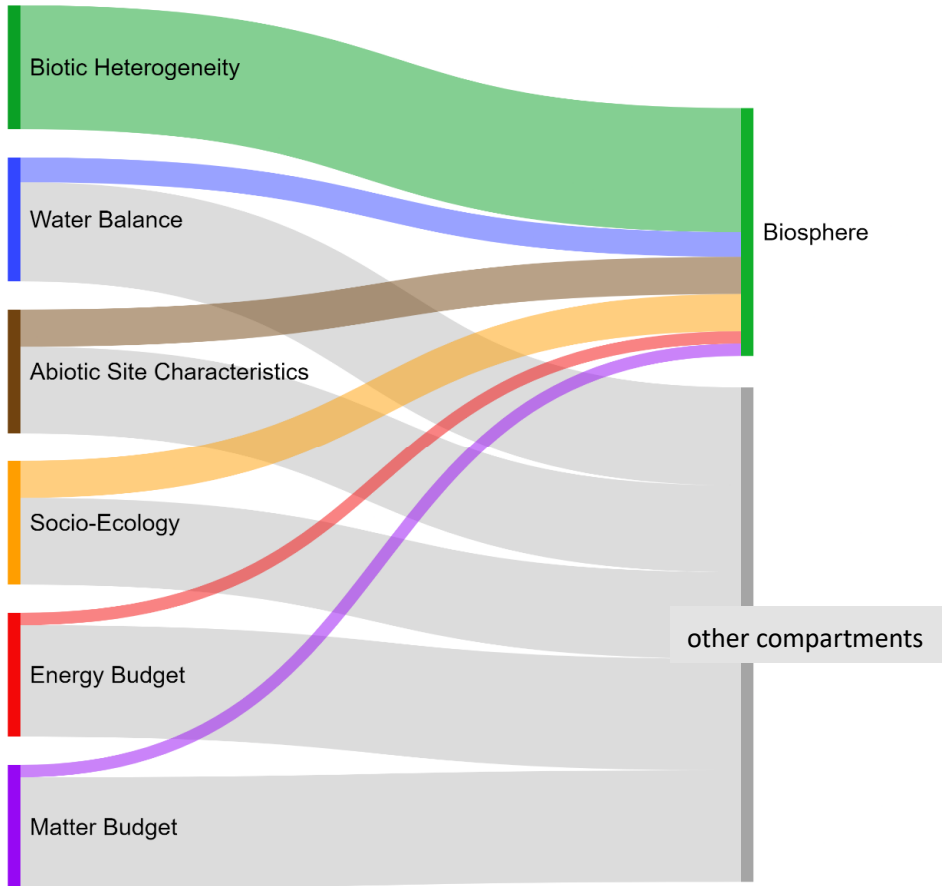


Ways of grouping eLTER SOs: Ecosystem Integrity elements vs. System compartments



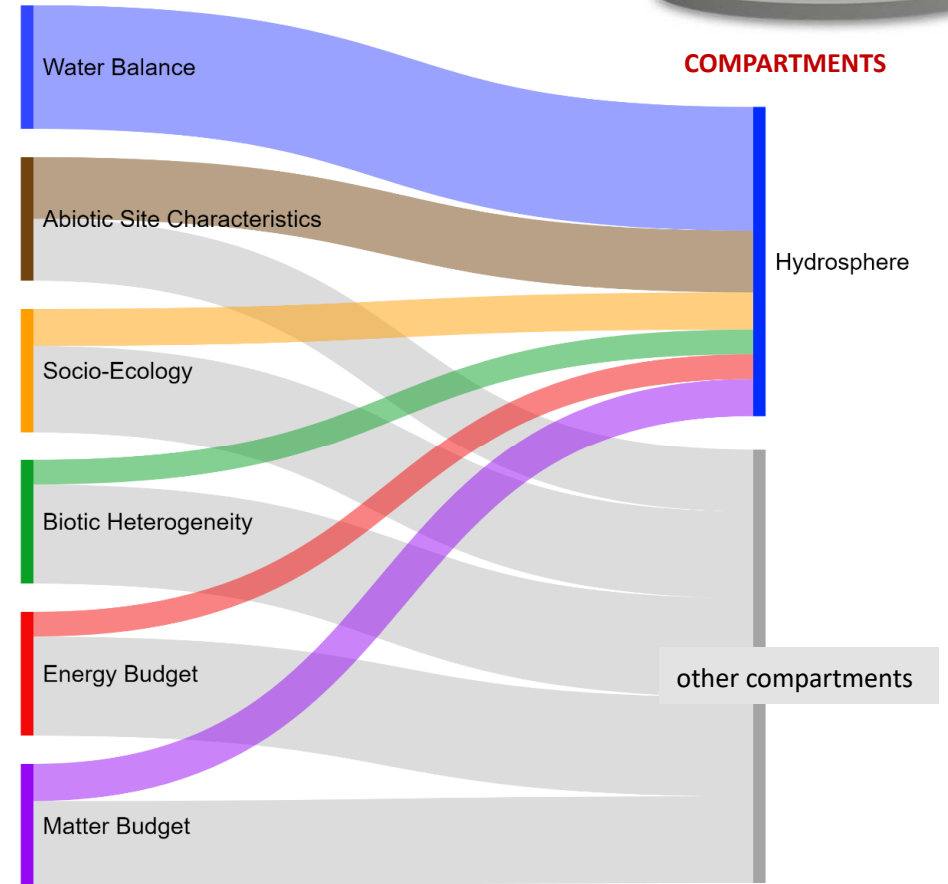
**Ecosyst.Integrity:
Structures-pools-processes**

COMPARTMENTS

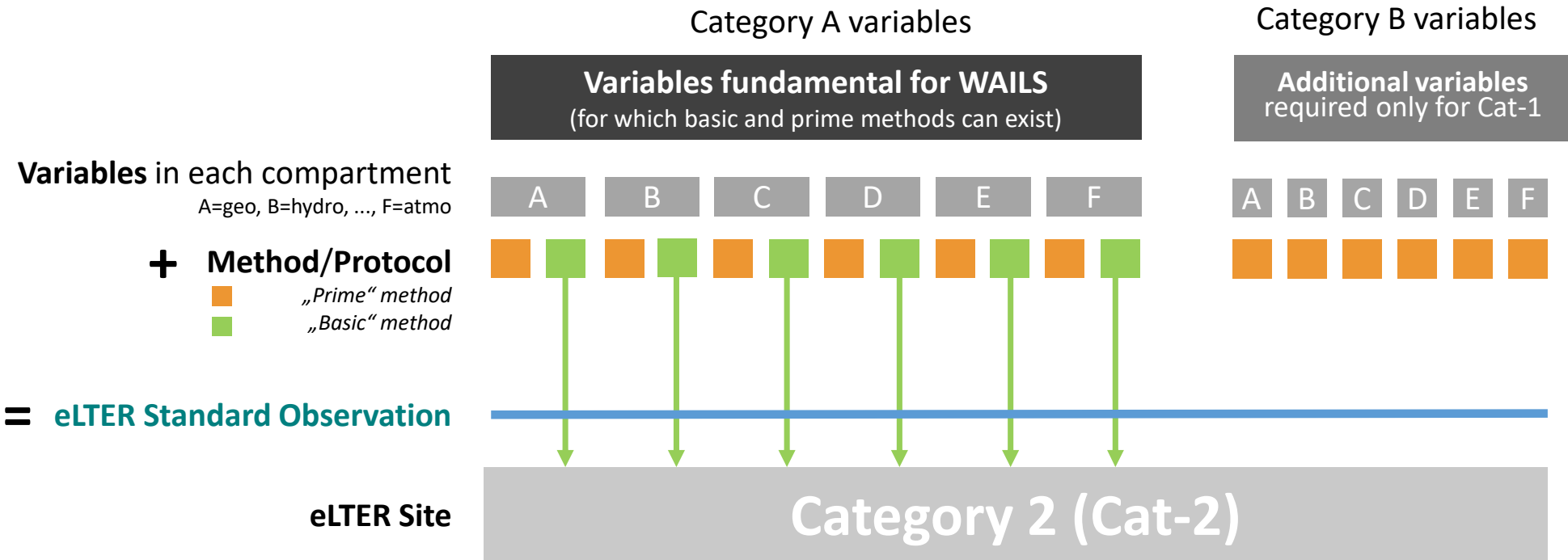


**Ecosyst.Integrity:
Structures-pools-processes**

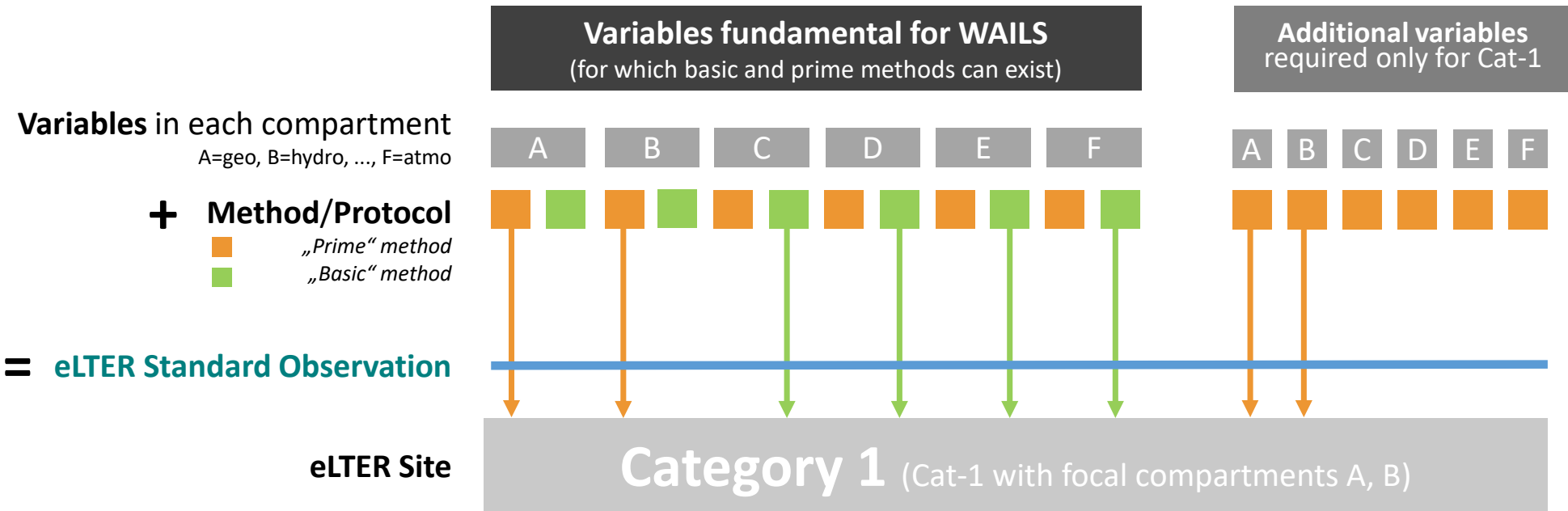
COMPARTMENTS



Linkage between eLTER Standard Observation Method Levels and Site Categories: *Example for Category 2 Site*



Linkage between eLTER Standard Observation Method Levels and Site Categories: *Example for Category 1 Site*



Examples – not agreed yet!

Variable	Basic method	Prime method
Soil moisture	<ul style="list-style-type: none"> • few soil moisture sensors should be operated (e.g. parallel to the weather station) providing rough impression about range and dynamics of soil moisture • TDR • 2 repetitions, 3 depths (5, 20, 50 cm) • Temporal resolution: 10 min 	<ul style="list-style-type: none"> • Measurement of soil moisture beyond point scale • Cosmic-Ray neutron probes covering representative locations • COSMOS-Europe protocol • Number of sensors depends upon site characteristics • Temporal resolution: continuous counting, log total counts every 15 min
Streams/Rivers - Discharge	<ul style="list-style-type: none"> • No direct measurement required • Application of hydrological model (central service, to be discussed) resp. provision of data from national monitoring programs 	<ul style="list-style-type: none"> • V-notch weirs + CTD probes (parallel measurement of conductivity, temperature and depth) • Temporal resolution: 15 min
Net Ecosystem Exchange – CO ₂ flux	<ul style="list-style-type: none"> • No direct measurement required • Assessment of carbon stocks by campaign-based sampling of carbon pools. Energy balance can be estimated based on climate monitoring and modeling. 	<ul style="list-style-type: none"> • EC-Station • ICOS protocol • Temporal resolution: 10 min
Biotic diversity - Habitat structure, vegetation/plant phenology	<ul style="list-style-type: none"> • Remote sensing: Sentinel imagery or equivalent 10-20 m for habitat mapping 	<ul style="list-style-type: none"> • On-site ground vegetation surveys • agreement on common protocol required!

Cat-1 Sites: Hard criteria

- Whole system approach implemented
 - observational design reflecting WAIS
 - all system compartments covered with basic method
- Specialization beyond basic method, which justifies Cat-1: **For at least two compartments/layers the prime method** of Standard Observation variables is achieved
- Secured capacity for **Transnational (physical) Access (TA)**, Remote Access (RA)
- Guaranteeing Virtual Access (VA)
- **All-year access guaranteed** (road infrastructure or other infrastructure)
 - Remark: in principle the resolution in time, needed technical maintenance etc. leaves hardly any space NOT to require the possibility of all-year access (in which way ever it is granted). This does not suggest that any sub-area of a site needs to be permanently accessible, but the site as a such and the location of the facilities that need to be permanently operated and controlled
 - Stable power supply with reserves for potential additional TA activities
- Site coordinator, **data manager** and responsible director in the operating institutions appointed
- Long-term operation since **≥ 5 yrs or ≥10 yrs (even preferences so far): Not applicable in case of new sites**
- Further operation bindingly agreed by the operating institution for >5yrs (not finally decided; options: >10yrs, 5-10 yrs...?)

Cat-2 Sites: Hard criteria

Hard criteria

- Whole system approach implemented
 - observational design reflecting WAIS
 - all system compartments covered
- Standard Observations variables covered across all compartments with basic method
- Supporting Remote Access (RA)
- Guaranteeing Virtual Access (VA)
- Secure physical access for the needed Standard Observations (installation, technical maintenance...)
- Appropriate power supply
- site coordinator and responsible director in the operating institutions appointed
- Long-term operation since >5 years (not finally decided; >10 yrs was also suggested)
- Further operation bindingly agreed by the operating institution for >5yrs (not finally decided; options: >10yrs, 5-10 yrs...?)

Cat-1 & Cat-2 Sites: Customizable characteristics – SPATIAL DESIGN

- Closely linked to the question of the size
- Can be
 - a compact spatial unit
 - a cluster of sub-units
- Possible need for specific terrain characteristic/property for certain topics
 - e.g.: “(sub-)catchments” for hydrological studies, where the absolute size of the catchment is of subordinate importance
 - In such cases the spatial design might form part of the methodology to measure a given variable (e.g. SOs specification).
- Mandatory reviewed justification

Cat-1 & Cat-2 Sites: Customizable characteristics - SIZE

- In general: size has to “be **appropriate for...**”
- Needs to be **explicit and scientifically justified** (review)
- Collect **for each compartments information that is representative of the site** (the chosen geographical boundary).
- The spatial extent also **determines the required effort** for the measurements (# replications, co-location etc.).
- Consider the **required size for possible RIs co-location**
- Space needed to accommodate the amount of observations incl. needed **replicates and reference points**, - plus some **reserve** in case of catastrophic events.
- A minimum of 0,75 km² was discussed, but finally dropped as “hard criterion”.
- **Mandatory reviewed justification**

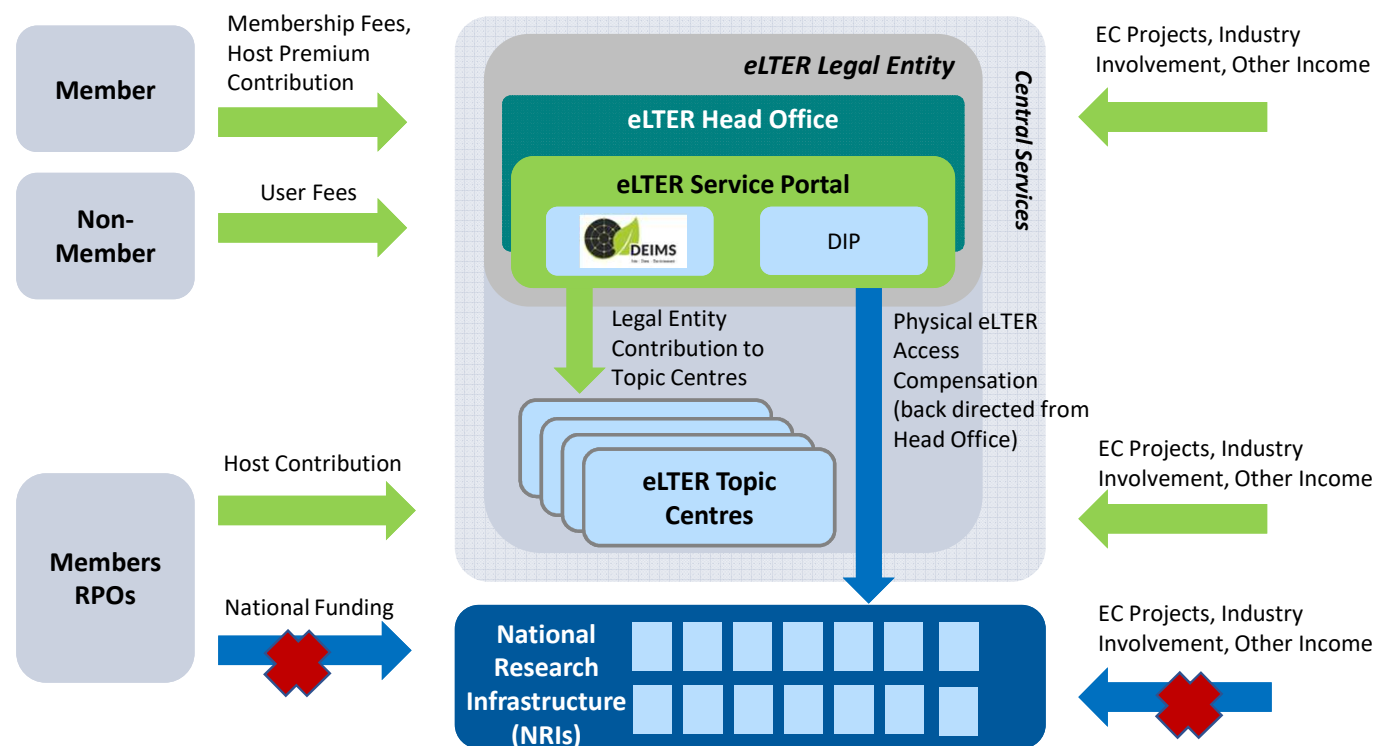
Vývoj portfolia služeb (Service Portfolio Development)

- *K čemu to celé bude? Jaké služby bude eLTER RI nabízet?*
- Centrálně nabízené služby udělají z eLTER RI více než „sumu“ národních sítí. Tyto centrální služby (Central Services) budou nejspíše sestávat z:
 - ● **eLTER ERIC Head Office**: coordination, strategic development, outreach. For the time being, Head Office activities are hosted by UFZ, Germany.
 - ● **eLTER Service Portal**: access to all eLTER RI services, such as data and Sites.
 - ● **eLTER Topic Centres**: for example,
- technological development, capacity building, data processing, and linking researchers to sites.

Model financování (Funding model) & scénáře

- *Z čeho se bude činnost eLTER RI platit?*
- *Discussion paper:*

Suggested Funding Model for eLTER RI (in Roadmap Proposal)



Envisioned Funding Sources of eLTER RI (1/2)

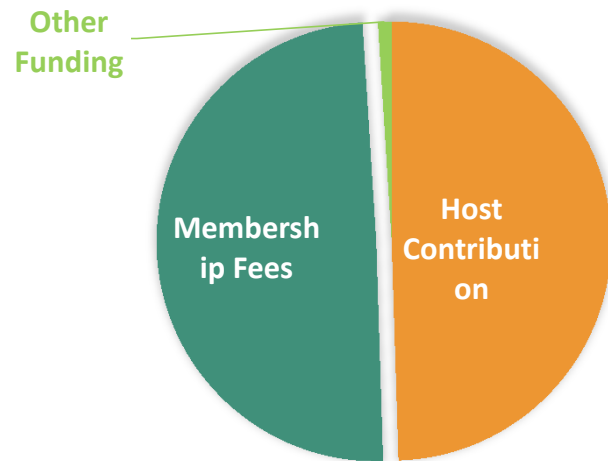
National funding (NRI)	<p>Funding provided by RPOs, RFOs or ministries.</p> <p>Existing: The part of ongoing funding at a Site that can be redirected to renew the infrastructure to meet the eLTER standards. The ongoing upgrade is assumed to be 5% of the capital value of the site annually, and half of that is assumed to be used for eLTER NRI purposes.</p> <p>New: Additional funding for upgrading the infrastructure.</p>
Host (premium) contribution	<p>National funding provided by the institution(s) hosting the Central Service. Can be either cash and/or in-kind as agreed by the shareholders. Host premium is provided by the Member (and/or Permanent Observer) countries hosting the eLTER Central Service within eLTER ERIC.</p>
Membership fees	<p>Income from membership contributions by members. The principles of calculating the membership fee will be negotiated during the PPP. The largest part of the membership fees will be used to cover the CS costs, but part of it can be allocated to NRI to compensate the members' use of the services.</p>
Non-member user fees and other income	<p>User fees that the eLTER legal entity can collect from non-members and industry users to access the facilities of eLTER RI. This fee will be coordinated and reallocated by the Head Office based on real access. Other income, for example SMEs and industry involvement, and private funding.</p>

* in-kind contributions (such as personnel, equipment, office space, utilities, software, hosting of meetings, editing and publishing)

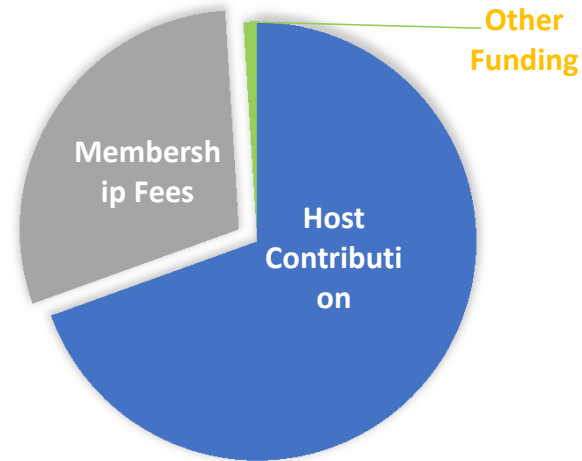
Envisioned Funding Sources of eLTER RI (2/2)

Access compensation	Funding from the membership fees and non-member user fees, collected by the legal entity, which is reallocated following the use of transnational access (TNA) of a Site. Presumably all Master Sites will provide TNA.
EC projects	Project funding from European Commission on competitive calls.
EU structural funds	Cohesion funds of European Union. Only certain regions are eligible for structural funding. Can be used during the Implementation Phase, covering both construction and pre-operation costs.
In-kind policy	Stable long-term funding of the operations of eLTER RI is formed by a combination of cash and in-kind contributions by participating members and other sources. eLTER RI can use resources, including human resources, provided in-kind to support its activities. In-kind contributions must always support and benefit the operations and aims of the eLTER RI.

TENTATIVE eALTER ERIC Funding Model



**Host (premium) Contribution \approx 50%
+ Membership Fees \approx 50%**
e.g. AnaEE model



**Host (premium) Contribution \approx 70%
+ Membership Fees \approx 30%**
e.g. ACTRIS model

TENTATIVE Model for eLTER ERIC Membership Fees

Membership Fee = 30-50% Equal share + 25-45% GDP + 25% Site number

- **Equal share** = dividing 50% of the costs of Central Services not covered by Host Premium contribution equally among Members.
- **Gross domestic product (GDP)** = dividing 25% of the remaining costs among Members using share of total GDP of all Members. The reference will be the average GDP over the last known period of 5 years before the constitution of the ERIC (e.g., 2020 – 2024).
- **Site number-based contribution** = dividing 25% of the remaining costs among Members using Member-specific Site contributions. Different Site types can be charged in the following way:

- The Master/Level 3 Site: full price.
- The LTSER Platform: 20% discount of the full price.
- The Regular/Level 2 Site: 40% discount of the full price.

ICOS case



STATION TYPE	ANNUAL STATION CONTRIBUTION, €
Atmosphere Class 1	32,795
Atmosphere Class 2	11,990
Ecosystem Class 1	6,320
Ecosystem Class 2	3,160
Ecosystem associated	1,580
Ocean stations	9,650

Mathematical Formula for eLTER ERIC Membership Fees (1/2)

- The corresponding mathematical formula used to derive the full Site price and the Membership Fee for eLTER ERIC Member (denoted by "i") is given below:

$$\mathbf{Site\ Price}_{full} = \frac{0.25 \left(1 - \frac{HC}{100\%}\right) Cost}{N_{Master\ Site} + 0.8 N_{Platform} + 0.6 N_{Regular\ Site}}, \text{ (Equation 1)}$$

•where HC is the Host Premium contribution (%), $Cost$ is the total annual Central Services cost, N stands for the number of National Sites in the eLTER ERIC infrastructure, and its subscripts denote the type of the Site.

- Then the total Membership Fee for Member i is:

$$\mathbf{Membership\ Fee} = 0.50 \frac{\left(1 - \frac{HC}{100\%}\right) Cost}{N_{Members}} + 0.25 \frac{GDP_i}{100\%} \left(1 - \frac{HC}{100\%}\right) Cost + \left(N_{i,Master\ Site} + 0.8 N_{i,Platform} + 0.6 N_{i,Regular\ Site}\right) \mathbf{Site\ Price}_{full}, \text{ (Equation 2)}$$

where $N_{Members}$ is the number of eLTER ERIC full Members, GDP_i is a member specific percentage share of total GDP of all Members, and N_i is the Member specific number of certain type of Sites (similar to above).

eLTER ERIC Exemplary Funding Model Scenarios

Table 1. Exemplary eLTER ERIC funding model scenarios with varying share between Host Premium Contributions and Membership Fees, and varying number of Member Countries in the Operational Phases.

Name of Scenarios	Operation Phases	Years	No. of Member Countries	Funding Model Components	
				Host Contribution	Membership Fees
Scenario 1	Operation Phase 1	2025-2027	6	50%	50%
Scenario 2	Operation Phase 1	2025-2027	6	70%	30%
Scenario 3	Operation Phase 2	2028-2030	10	50%	50%
Scenario 4	Operation Phase 2	2028-2030	10	70%	30%
Scenario 5	Operation Phase 3	2031 onward	15	50%	50%
Scenario 6	Operation Phase 3	2031 onward	15	70%	30%

eLTER Central Services' Costs Allocation (estimated) Over the Operational Phases

Table 2: Estimated Central Services' costs allocation over the Operational Phases, used in the calculations for funding model scenarios, and expected gradual ramping up of activities in Central Services.

Name of Scenarios	Operation Phases	Head Office Costs*, K Euro	Service Portal Costs*, K Euro	Topic Centres Costs*, K Euro	TOTAL Costs, K Euro
Scenario 1	Operation Phase 1	1278	695	0	1973
Scenario 2	Operation Phase 1	1278	695	0	1973
Scenario 3	Operation Phase 2	1278	695	695	2668
Scenario 4	Operation Phase 2	1278	695	695	2668
Scenario 5	Operation Phase 3	1278	695	3015	4988
Scenario 6	Operation Phase 3	1278	695	3015	4988

eLTER ERIC Exemplary Funding Model Scenarios

NOTE: All country selections are open, but in the scenarios the selection was based on

- 1) the 'potential' host countries**
- 2) the Political Support (EoS) and / or the roadmap situation**
- 3) informal information about the national situation**

eLTER ERIC Funding Model Scenarios: 6 countries

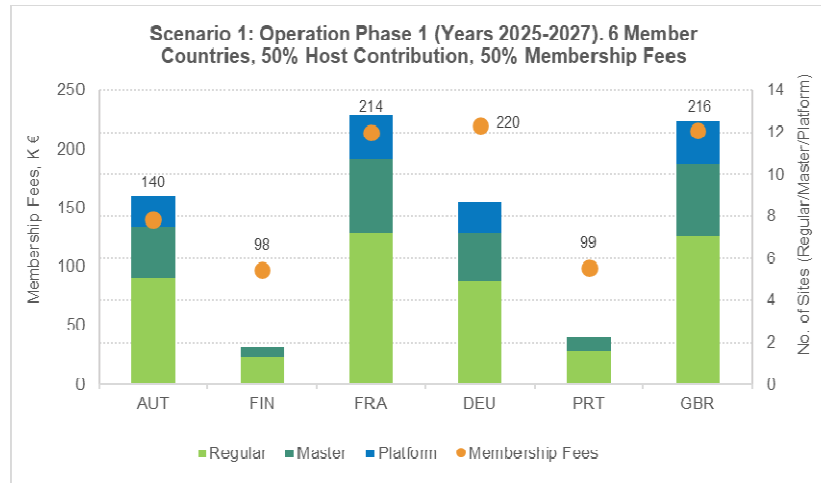


Figure 1 # Scenario 1: Operation Phase 1 (Years 2025-2027). We assume 6 Member Countries, **50% Host Contribution, 50% Membership Fees.** Total costs of Central Services 1973 K Euro.

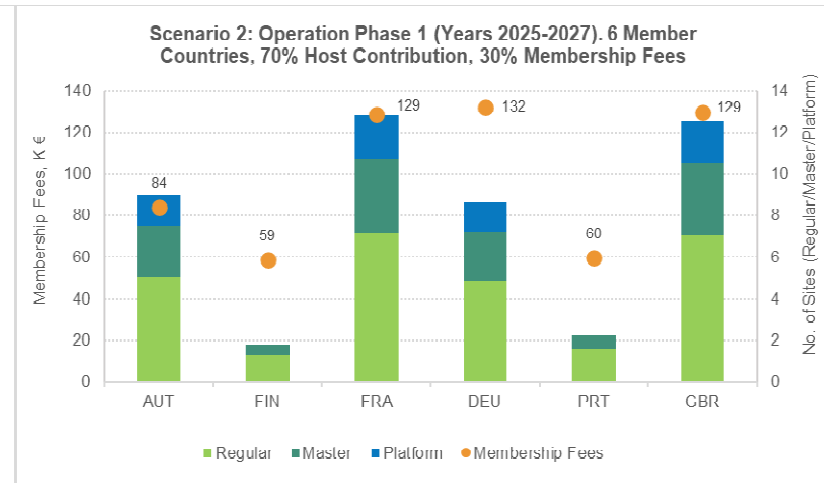


Figure 2 # Scenario 2: Operation Phase 1 (Years 2025-2027). We assume 6 Member Countries, **70% Host Contribution, 30% Membership Fees.** Total costs of Central Services 1973 K Euro.

eLTER ERIC Funding Model Scenarios: 10 countries

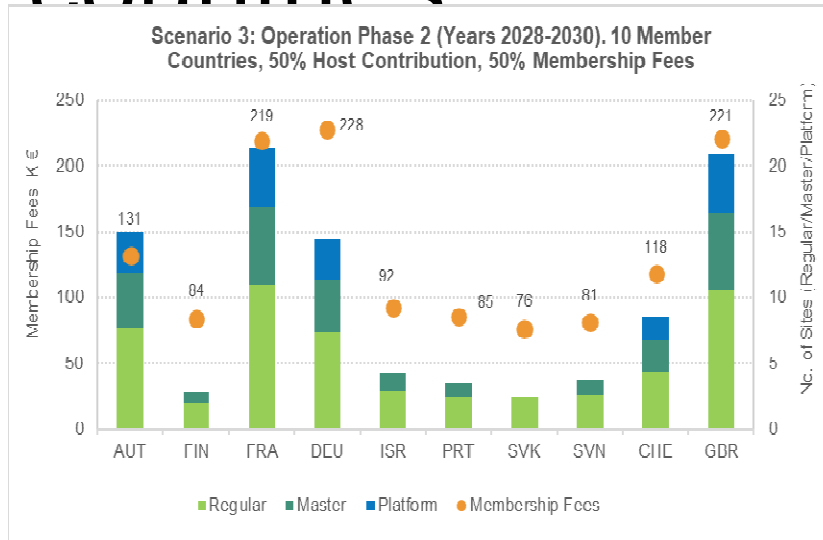


Figure 3 # Scenario 3: Operation Phase 2 (Years 2028-2030). We assume 10 Member Countries, **50% Host Contribution, 50% Membership Fees**. Total costs of Central Services 2668 K Euro.

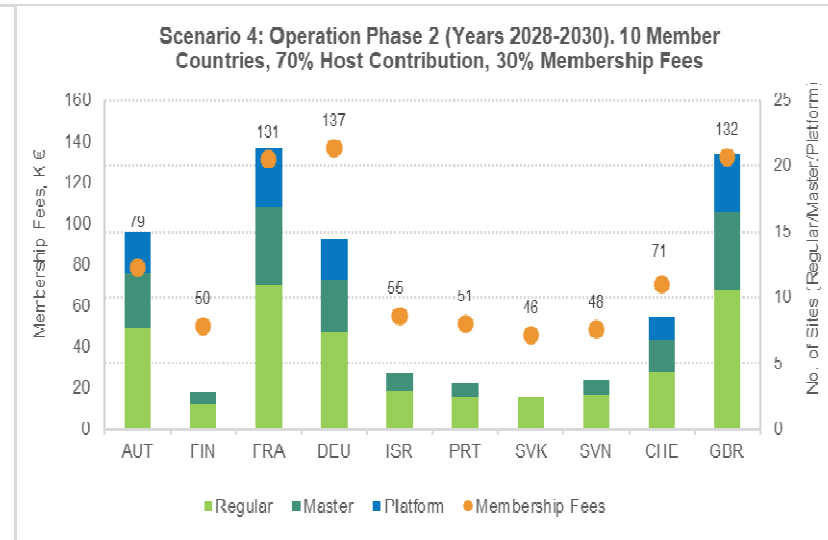


Figure 4 # Scenario 4: Operation Phase 2 (Years 2028-2030). We assume 10 Member Countries, **70% Host Contribution, 30% Membership Fees**. Total costs of Central Services 2668 K Euro.

eLTER ERIC Funding Model Scenarios: 15 countries

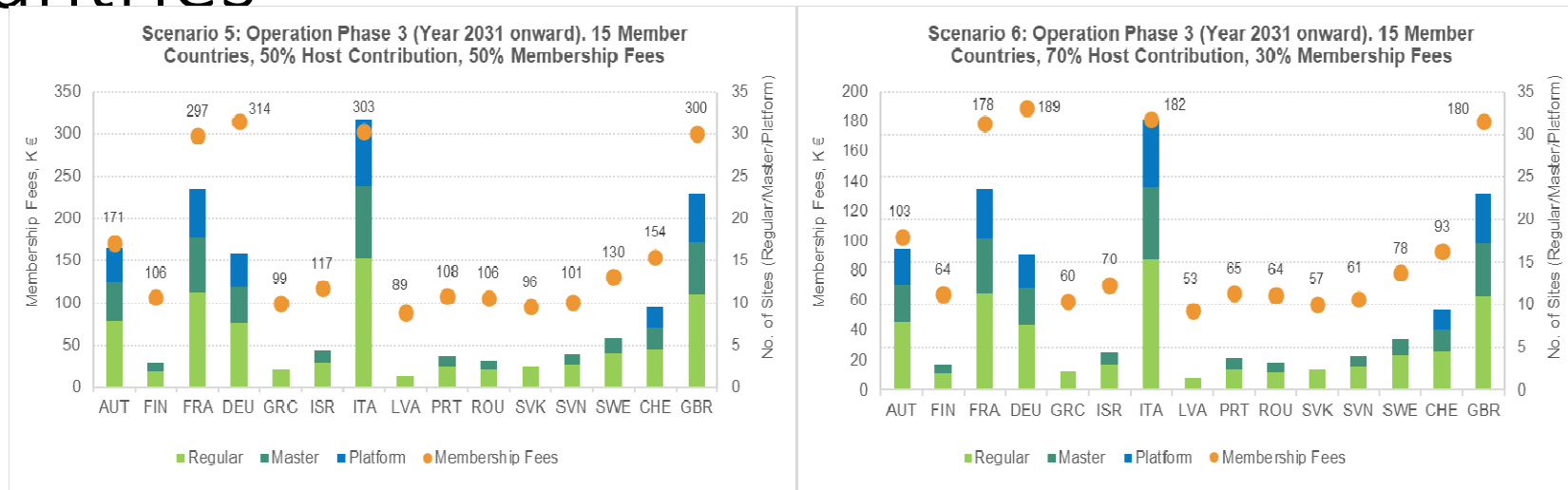


Figure 5 # Scenario 5: Operation Phase 3 (Year 2031 onward). We assume 15 Member Countries, **50% Host Contribution, 50% Membership Fees.** Total costs of Central Services 4988 K Euro.

Figure 6 # Scenario 6: Operation Phase 3 (Year 2031 onward). We assume 15 Member Countries, **70% Host Contribution, 30% Membership Fees.** Total costs of Central Services 4988 K Euro.

Analysis of the Results

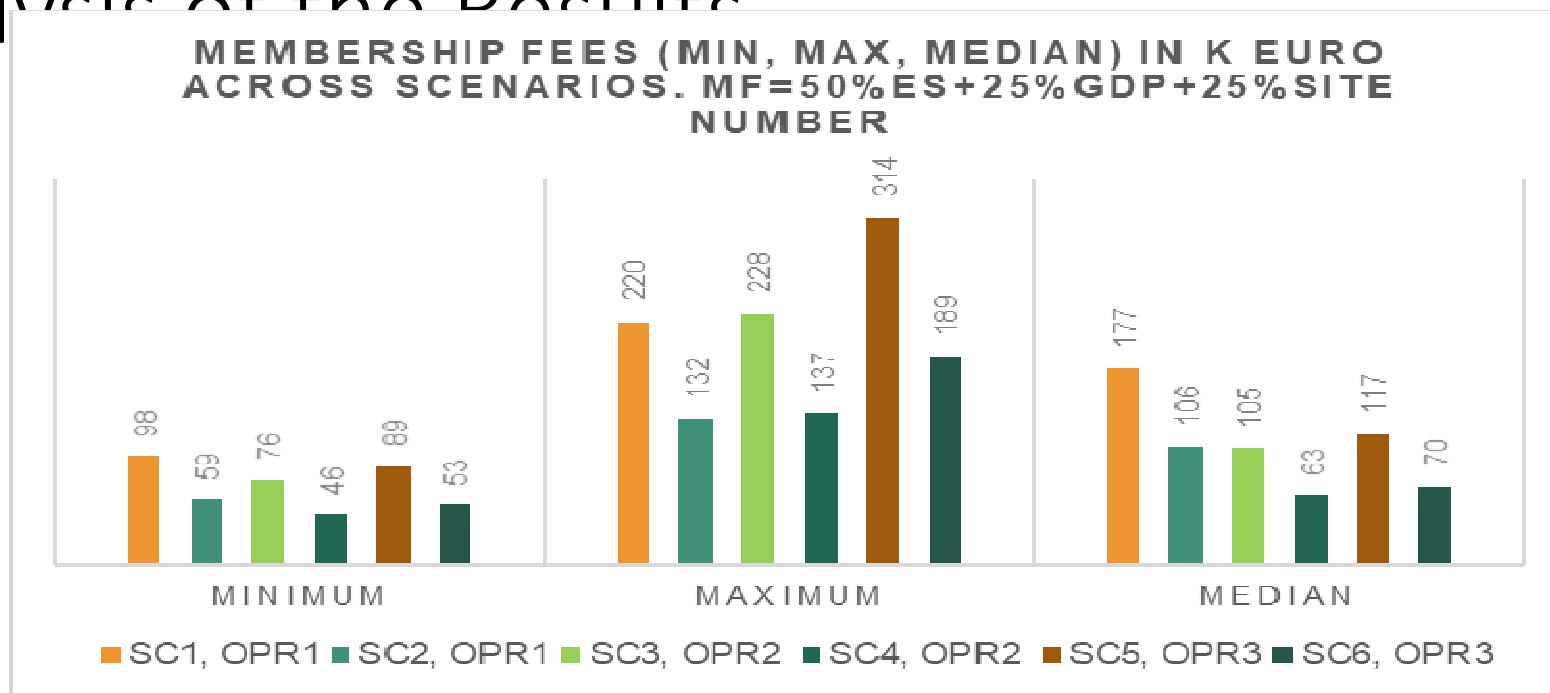
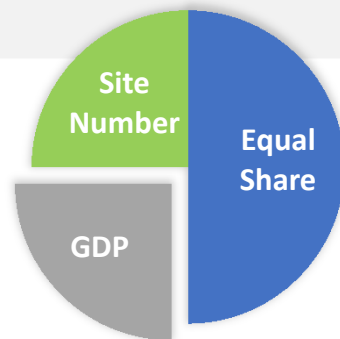


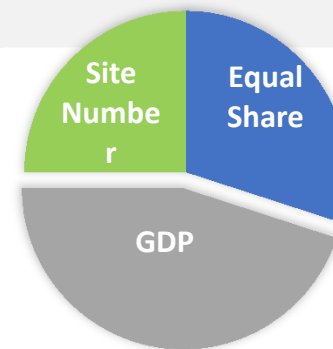
Figure 7. Variation of Membership Fees across the six scenarios, Membership Fee calculated as 50% Equal Share, 25% GDP, 25% Site Number but the Host Premium Contribution, Membership Fees shares, the number of Member Countries and the costs for Central Services vary across scenarios

Variation of country-wise membership fees within each scenario with the changes of percentage share of its components

- Membership Fee can also vary within each scenario with the changes of percentage share of its components: Equal share and GDP.
- We considered two combinations of Membership Fee components:
 - **Option 1:** Membership Fee = 50% Equal share + 25% GDP + 25% Site number
 - **Option 2:** Membership Fee = 30% Equal share + 45% GDP + 25% Site number

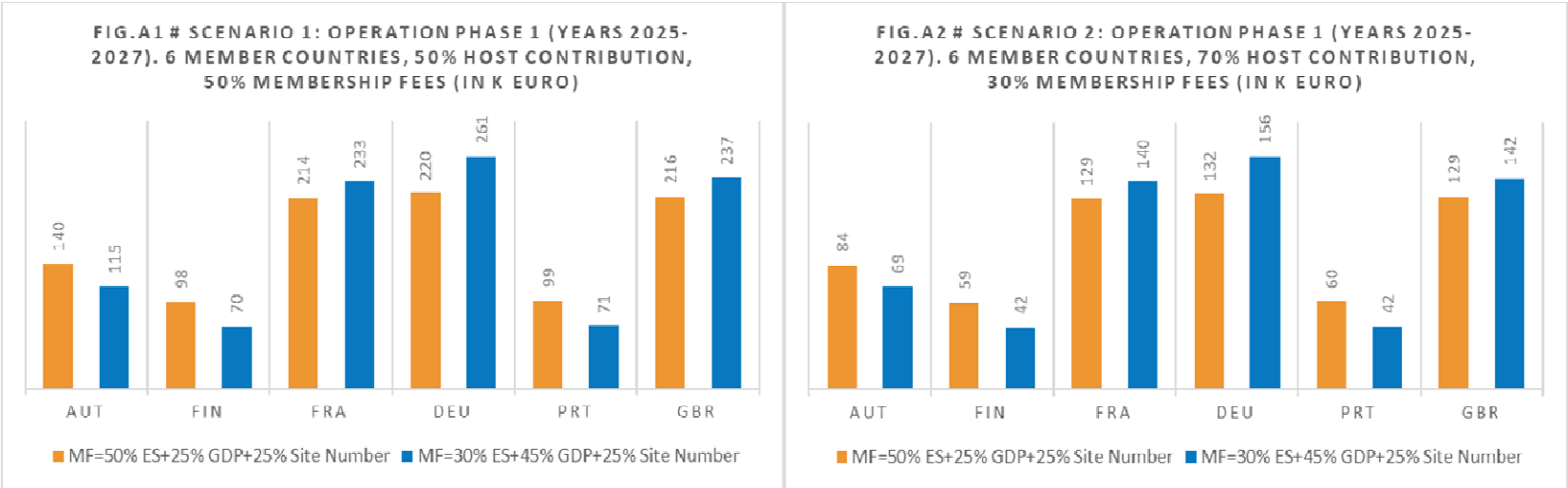


**Membership Fee = 50% Equal share +
25% GDP + 25% Site number**
e.g. AnaEE model

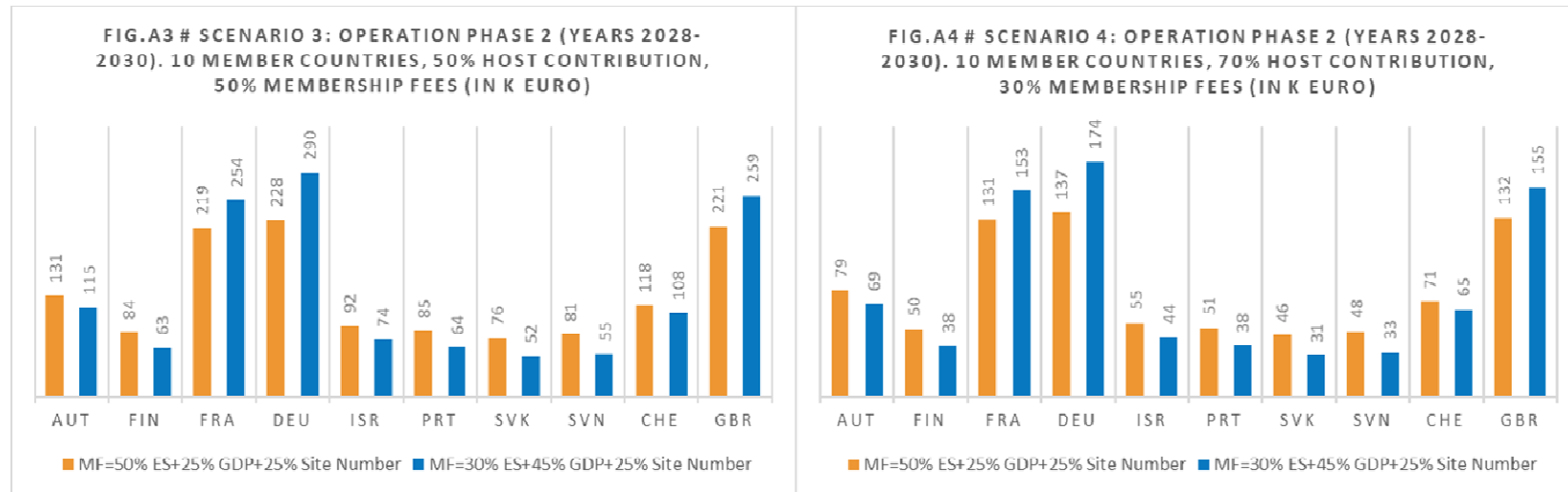


**Membership Fee = 30% Equal share +
45% GDP + 25% Site number**

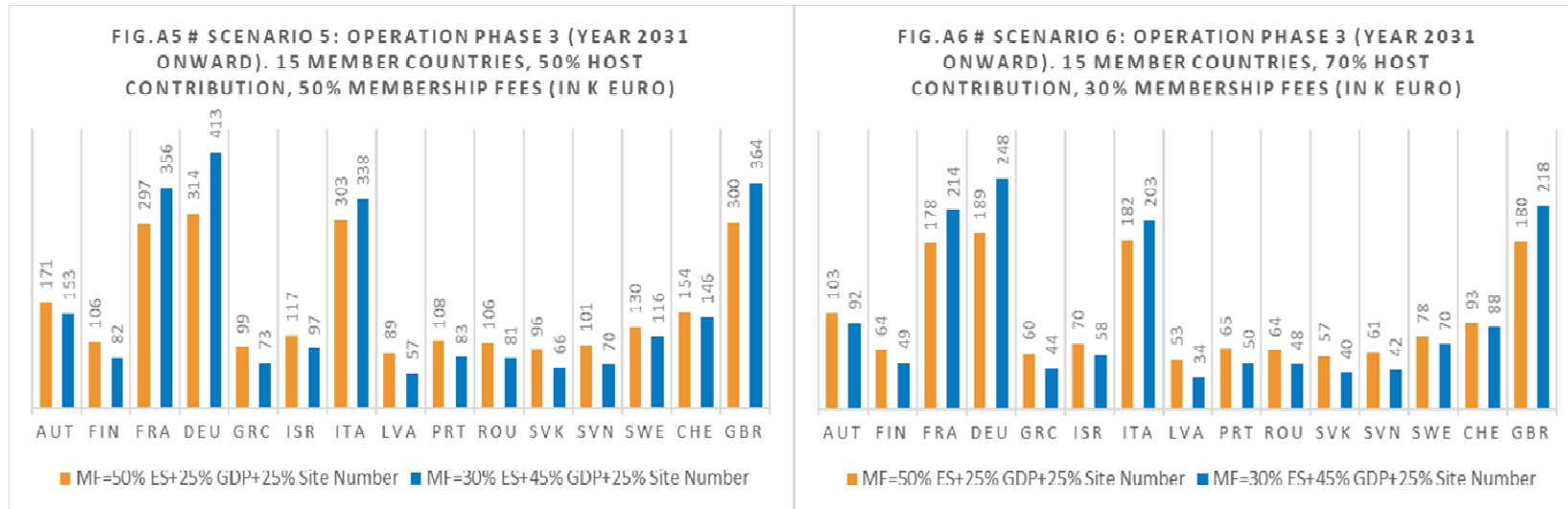
Variations in Equal share and GDP basis: 6 countries



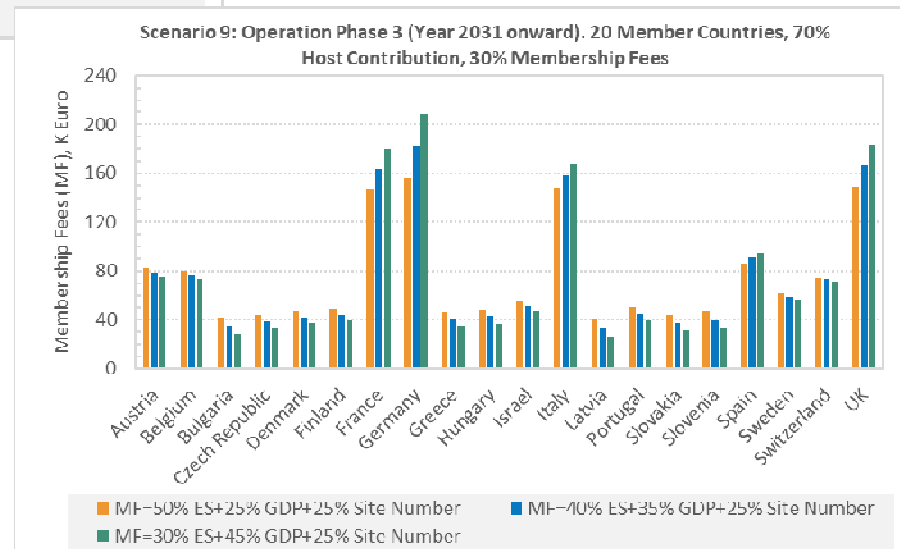
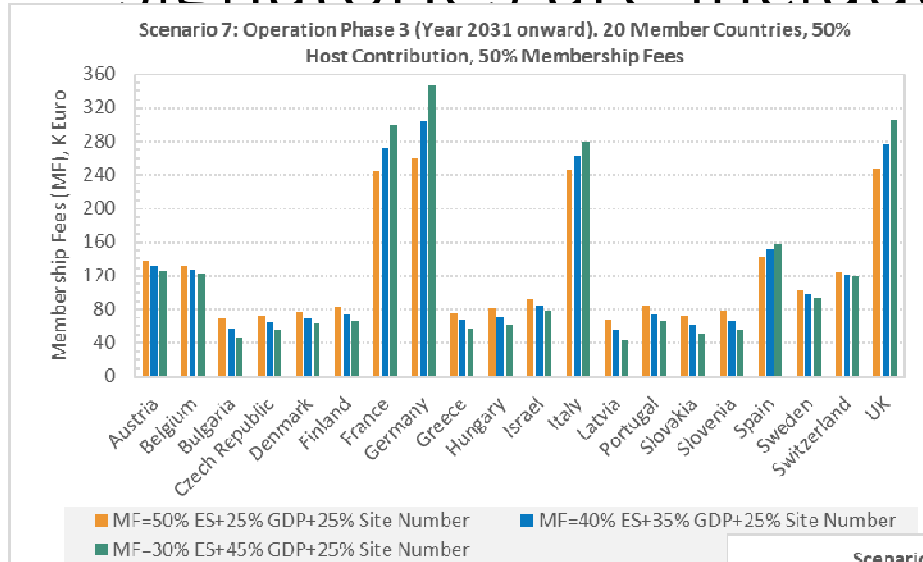
Variations in Equal share and GDP basis: 10 countries



Variations in Equal share and GDP basis: 15 countries



Membership fees when all 20 EoS signatories are included:



Integrated Governance

- *Jak se budou věci rozhodovat/řídít „až to poběží“*
- *Discussion paper: **Towards an Integrated Governance in eLTER RI***

Integrated Governance

- *Jak se budou věci rozhodovat/řídit „až to poběží“*
- **Discussion paper: Towards an Integrated Governance in eLTER RI**

The 2-step-approach

Step one (approved: NCs 3rd Dec 21, Interim Council 28th Jan 22):

Agree on the strategic goals of an Integrated Governance Structure

Step two:

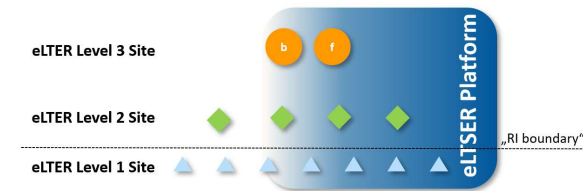
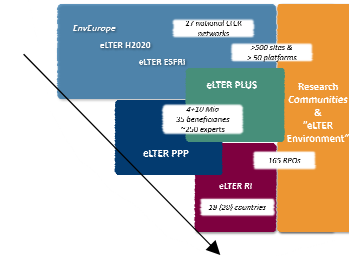
Elaborate upon concrete options for such governance

a) Elaboration of tangible objectives to achieve the goals

b) Formulate formal options accordingly

Step one done: The strategic goals of IG

- Enable a **close linkage between the RI and larger scientific community** through anchoring networking and science events in the eLTER RI scope (ref. ICOS science conferences)
- **Integrate** a site and platform **infrastructure backbone** (compliant with all criteria) **with a pool of associated sites representing the high potential of eLTER** to - inter alia - respond to future research challenges
- Enable a **balanced steering of the eLTER RI**, where the main organizational/structural elements of LTER with their demands and capabilities are properly reflected and represented
- Achieve a **just balance between contributions and benefits**



Possible components of an IG

- Sustainable linkage with wider national LTER communities
 - Assembly of associated sites (recently established Sites and Platforms Forum as potential precursor)
 - National LTER networks coordinators forum

- Think tank representing the scientific user communities
 - Possibly a follow-up of the recently established eLTER Expert Groups

- Country membership levels
 - membership levels with varying voting rights (weight)
 - voting rights (weight) driven by criteria like
 - number and quality of sites
 - roles assumed by the country in the RI
 - varying service levels mirroring the membership level

Site and Platforms Coordinators Forum

- Thu 28 April and Tue 3 May 2022
- Příští SPF datum neznámé
- Working groups:
 - **Governance**
 - **Information clusters**
 - **Data management**
 - **Training**

Expert Groups

- Pavel Krám – CZO
- ?

Různé

- National communications representative: funkce je k dispozici 😊
 - Materiály pro newsletter/Twitter: olga.vinduskova@natur.cuni.cz