RINGO | Readiness of ICOS

Readiness of ICOS for Necessities of integrated Global Observations

Deliverable 2.4

Online platform as part of ICOS webpages including technical and scientific training material

RINGO (GA no 730944)

Public Document

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730944

Deliverable: D2.4	Online platform as part of ICOS webpages including technical and scientific training material
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Date:	22.12.2017
Activity:	
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Document Issue:	1
Dissemination Level:	PU
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Version	Date	Comments/Changes	Author/Partner
1.0	22.12.2017		

DISCLAIMER

This document has been produced in the context of the *project* Readiness of ICOS for Necessities of integrated Global Observations (RINGO)

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Amendments, comments and suggestions should be sent to the authors.

ONLINE PLATFORM AS PART OF ICOS WEBPAGES INCLUDING TECHNICAL AND SCIENTIFIC TRAINING MATERIAL

During the second half to the year 2017 online platform as a part of EMDESK RINGO information system.

Due to different phases in national infrastructure roadmap development, national funding procedures or EU structural funding, UVGZ in counsultancy with ICOS ERIC management has made elctronical survey that was answered by the candidate and partner countries to be ready to prepare tailor-made on-line tools and initial training.

During the initial training (in M9) hosted in WP2 leader UVGZ in the Czech Republic, with the participants of the target group (ICOS candidate countries) were disussed the training materials covering the main important contractual, managerial and funding issues connected with the ICOS research infrastructure establishment and membership. The outcome of the discussion with the ICOS candidate and partner countries are tailor-made training materials providing consultations addressing "hot issues" related to the national ICOS Research Infrastructure establishment in these countries and ICOS ERIC membership of candidate countries. Particular needs related to the diverse maturity of the ICOS candidate countries are considered and the most appropriate information for research infrastructure development has been provided in the trainings and electronic communication and online platform. As a European research infrastructure ICOS is committed to further develop its gender balance and the involvement of early career scientists specific training material focused on gender balance in research teams and capacity building, taking into account the special needs of early career development was provided in the training and published on-line.

THE MAIN TECHNICAL AND SCIENTIFIC TRAINING TOPICS PUBLISHED ON THE ONLINE PLATFORM

- RINGO initial training materials
- Outcomes of the survey addressing the needs and outputs of the ICOS candidate and partner countries
- Gender and career development related agenda
- Information addressing "hot issues" related to the national ICOS Research Infrastructure establishment and ICOS ERIC membership and collaboration with candidate countries

Annex 1: Training materials

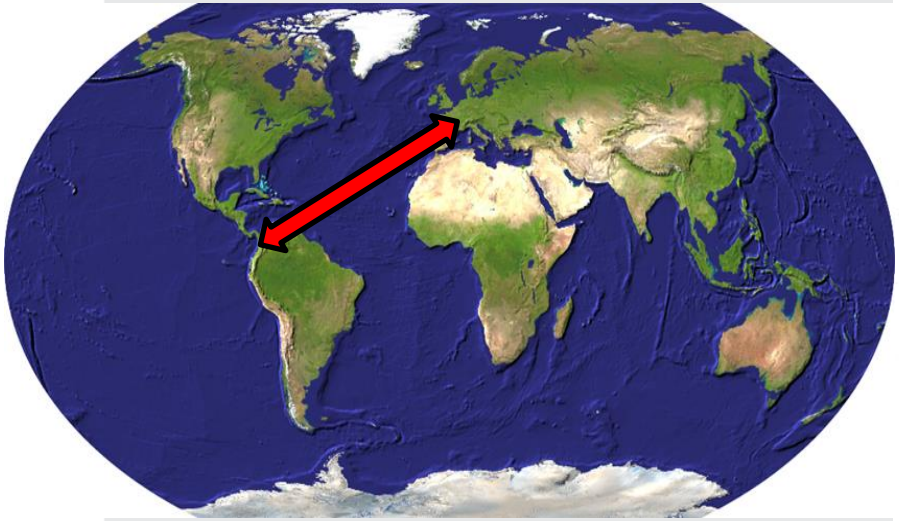
CzechGlobe

GLOBAL CHANGE RESEARCH INSTITUTE
Czech Republic Academy of Sciences

CzechGlobe

Motto: „CHANGE IS CHALLENGE“

The Czech Republic
the European country



CzechGlobe - CHANGE IS A CHALLENGE

Research activities of the CzechGlobe institute are FOCUSED ON the problems of the Changing Environment in the Changing World

CzechGlobe could be regarded as a „CHILD“ of European research programes

1992 – EPOCH EU 4. FW – the first full participation on GCC research „OTC“

1995 – ECOCRAFT EU 5. FW – enhanced CO_2 - „Lamella domus spheres“

1996 – EUROFLUX EU 5. FW – first „eddy covariance“ technique in East Europe

1997 – CARBOMONT EU 5. FW – carbon budget of mountain areas

1998 – MERCI EU 5. FW – European infrastructure: Carbon physiology of forest trees

2003 – IP CARBOEUROPE EU 6. FW – Carbon and GHG budget

2008 –ESFRI EU 7. FW – European infrastructurse ICOS, EUFAR and ANAEE

2010 – EU ESA project on remote sensing application

2014 – EU HORIZON 2020 – adaptation to the Global Change impacts

Interconnection of the CzechGlobe to European research infrastructures projects

CzechGlobe - CORE INSTITUTION of the ESFRI infrastructure ICOS

ESFRI infrastructure **ICOS:** European infrastructure for observation and research on the Carbon cycle

***I**ntegrated **C**arbon **O**bservation **S**ystem*

CzechGlobe – CORE INSTITUTION of the ESFRI infrastructure ANAEE

ESFRI infrastructure **ANAEE:** pan-European infrastructure of airborne carriers

ANA**lysis and **Experimentaion** on **Ecosystems

CzechGlobe INVESTIGATOR - MEMBER of the infrastructure EUFAR

Infrastructure **EUFAR:** pan-European infrastructure airborne carriers used inr RS

***E**uropean **F**leet of **A**irborne **R**esearch*

Interconnection of the CzechGlobe to European research infrastructures projects

ESFRI infrastructure ***ACTRIS*** **-** Aerosols, Clouds and Trace Gases

ESFRI infrastructure ***ISBE*** **-** Infrastructure for Systems Biology Europe

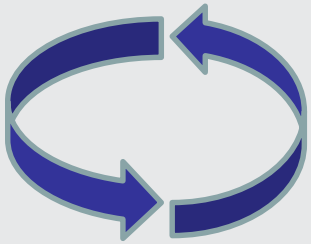
ESFRI infrastructure ***DANUBIUS*** **-** The International Centre for Advanced Studies on River-Sea Systems

Infrastructure ***eLTER-*** Long-Term Ecosystem Research in Europe – ESFRI preparatory phase

EUFAR European Facility For Airborne Research

Special-field of the CzechGlobe research activities

The problem of Global change is very complex, thus the *CzechGlobe* research activities are focused *on three main* segments:



CZECHGLOBE STAFF AND SCIENTIFIC PRODUCTIVITY

CzechGlobe staff (Full Time Equivalent): 307
Admin. and supporting staff: 195
Researchers: 212
No. of PhD students: 47

Annual average No. of impacted papers: 140
No. of international research projects 64

Current CZECHGLOBE foreign staff

Professors: **9 (**UK, Poland, Italy, Austria, USA **)**

PhD students: 10 (India, Nepal, Vietnam, Panama, Ghana, Sudan)

Postdoc and Scientists: 10 (Austria, UK, India, Russia, Hungary, Germany, Poland, Senegal, Sudan, Nepal)

Current CZECHGLOBE PhD students)

47 PhD students (10 foreign)

Current realized PhD programs:

MENDEL UNIVERZITY BRNO: *„Applied Ecology*
„ Forest Ecology“
„Applied Bioclimatology“

SOUTH BOHEMIAN UNIVERSITY
„ Landscape Ecology
„ Biophysics“

CHARLES UNIVERSITY PRAGUE:
„ Climatology and meteorology“
„Geobiochemistry“
„Human dimensions of environment changes“

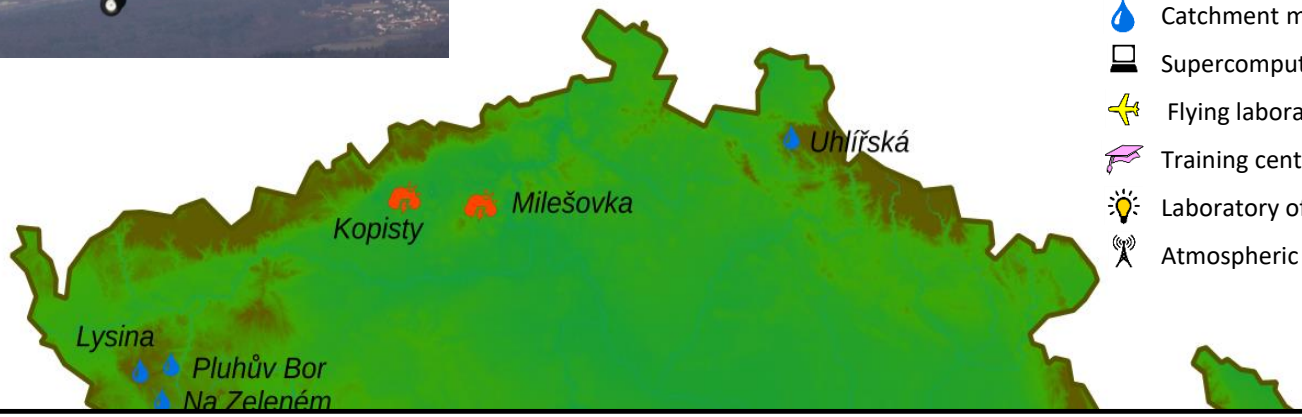
CZECHGLOBE SCIENTIFIC DOMAINS

1. Domain of climatology and atmosphere research
2. Domain of ecosystems analysis
3. Domain of impact studies and plant ecophysiology
4. Domain of human dimensions of global change impacts
5. Domain of innovation and adaptation techniques

CzechGlobe

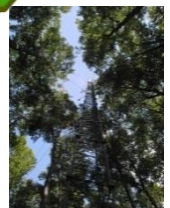
spatially distributed infrastructure

- Ecosystem station
- Grow chambers for manipulative experiments
- Laboratory (physiol., metabolom., isotop., biogeochem.
- Specialized weather station
- Catchment monitoring hydrological cycles
- Supercomputer terminal for climate modeling
- Flying laboratory of imaging systems
- Training center
- Laboratory of innovation and adaptation techniques
- Atmospheric station



Total construction financial costs: 35 M€/ 41 M$

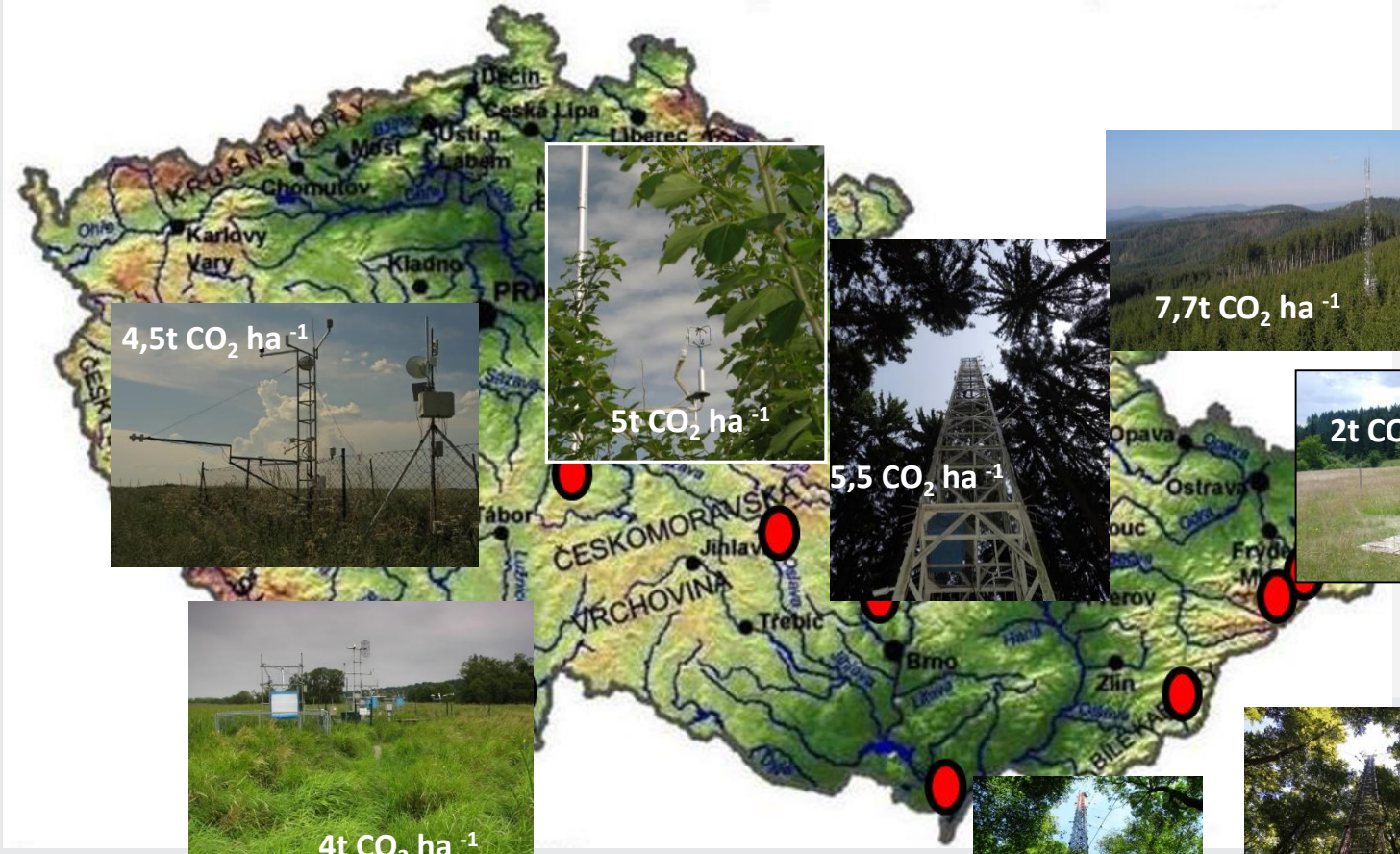
During the years 2012-2015



CzechGlobe

PRINCIPAL ELEMENTS OF THE RESEARCH INFRASTRUCTURE

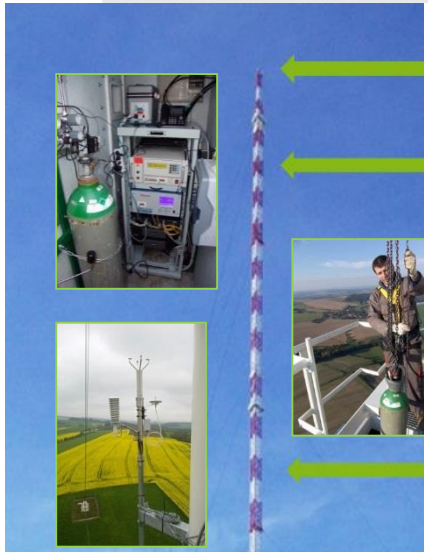
CZ network of CO_2 fluxes observation sites ICOS-ECO

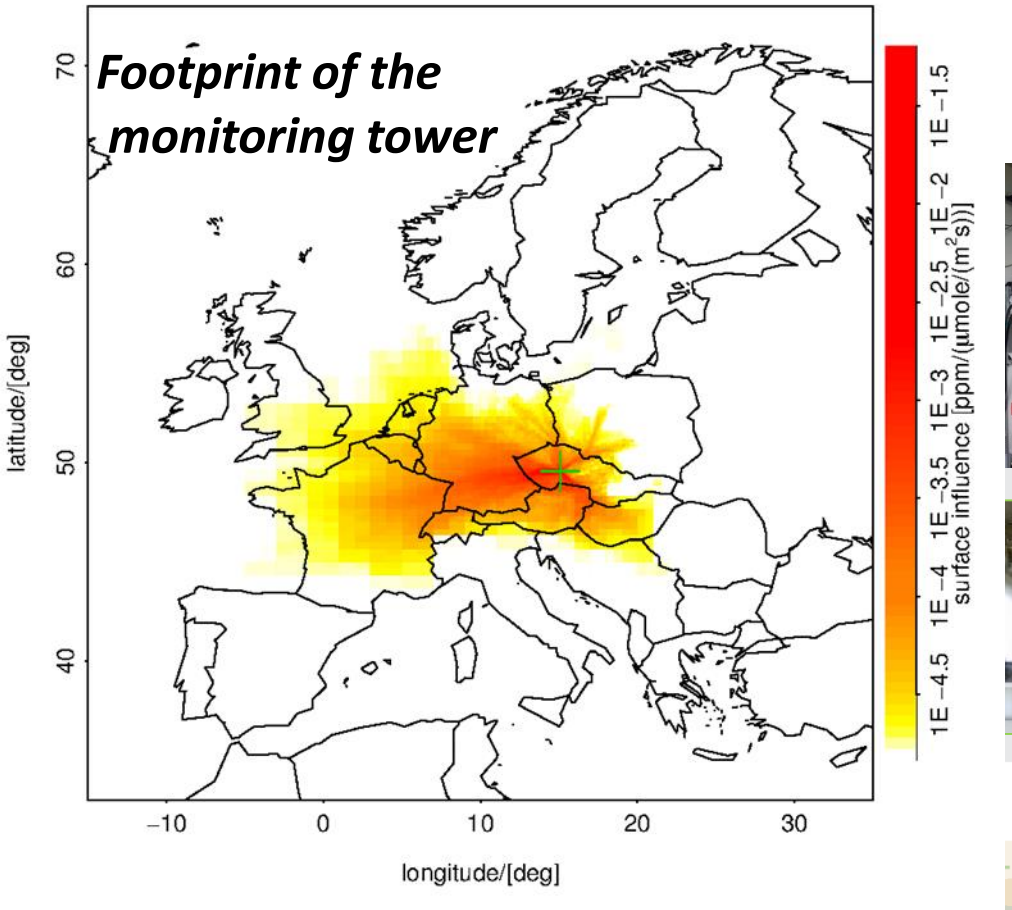


CzechGlobe

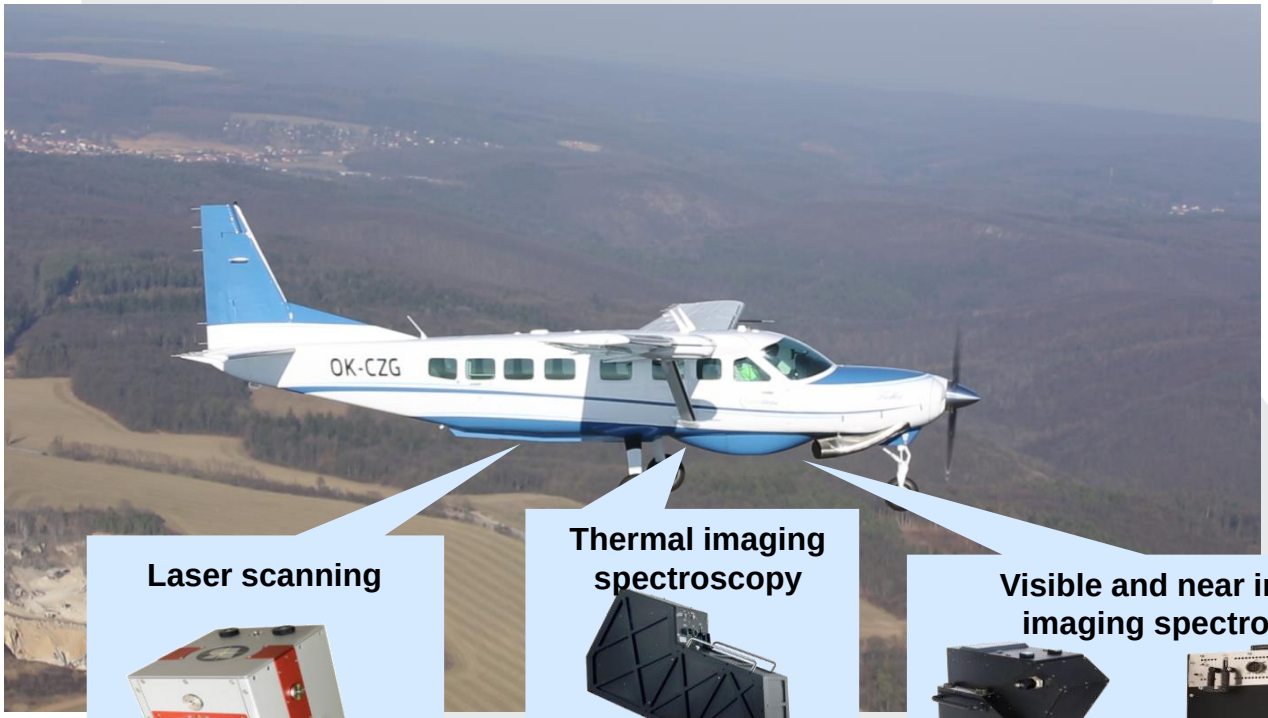
Global Change Research Institute

Precise measurement of green-gasses concentration in the atmosphere reference layer

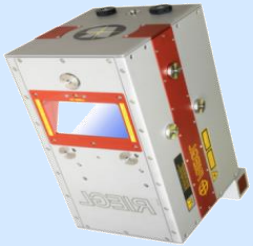




Aircraft „Lidka“ - hyperspectral and thermal sensors, camera and LIDAR

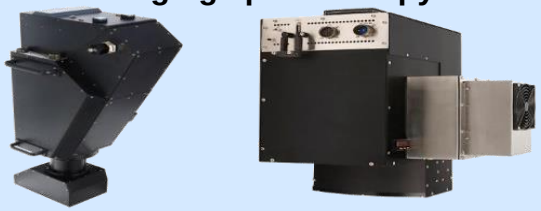


Laser scanning



Thermal imaging spectroscopy

Visible and near infra-red imaging spectroscopy



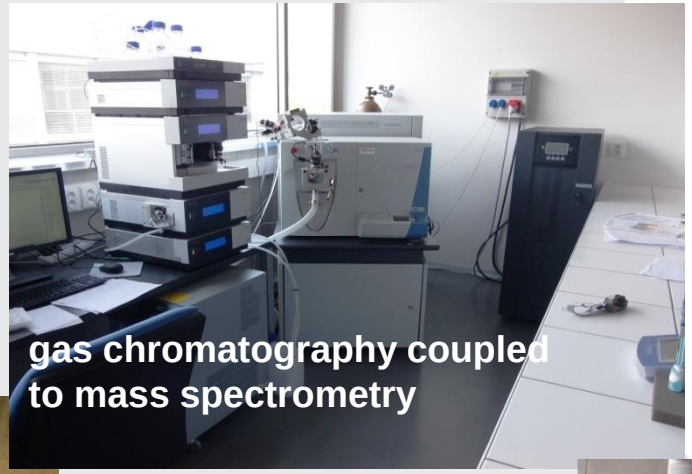
Special tools used for the long-term cultivation and manipulative experiments realization

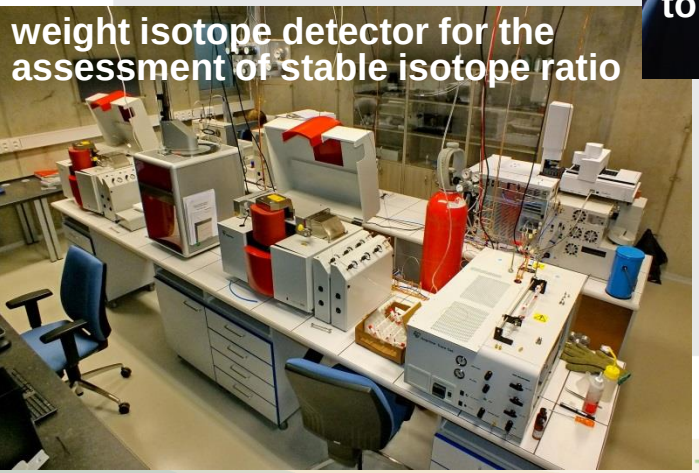
OTC farm Domanínek

Phytotrone cluster

Lamellar houses

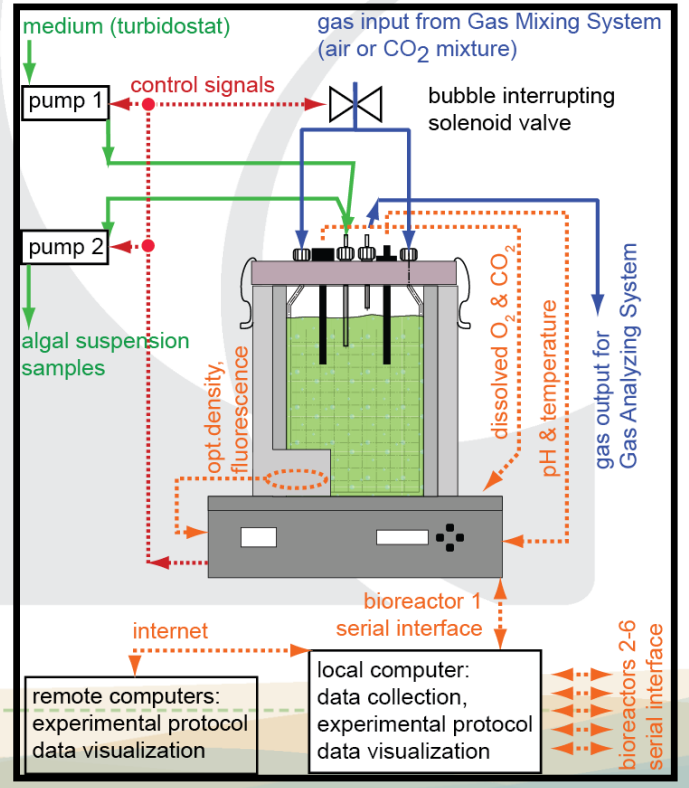
Environmental metabolomics and carbon isotopic analysis


gas chromatography coupled to mass spectrometry

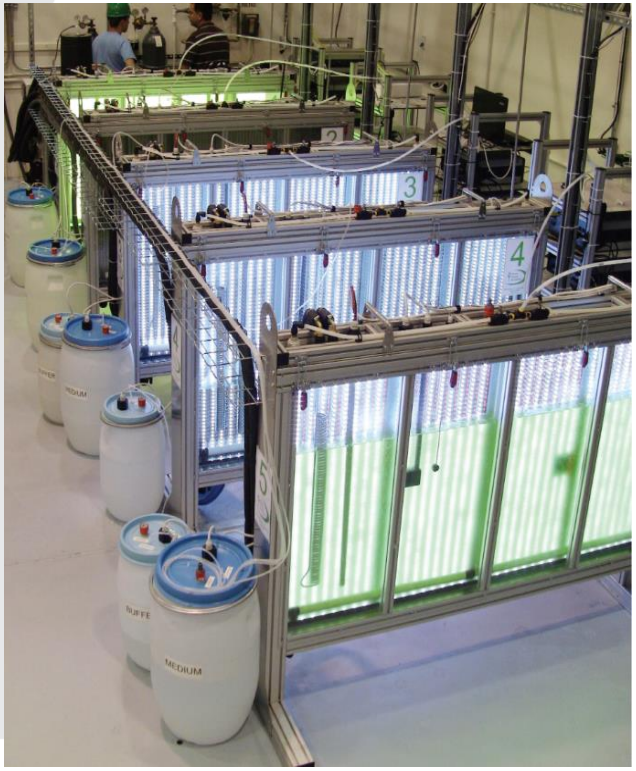

weight isotope detector for the assessment of stable isotope ratio


HPLC coupled to mass spectrometry

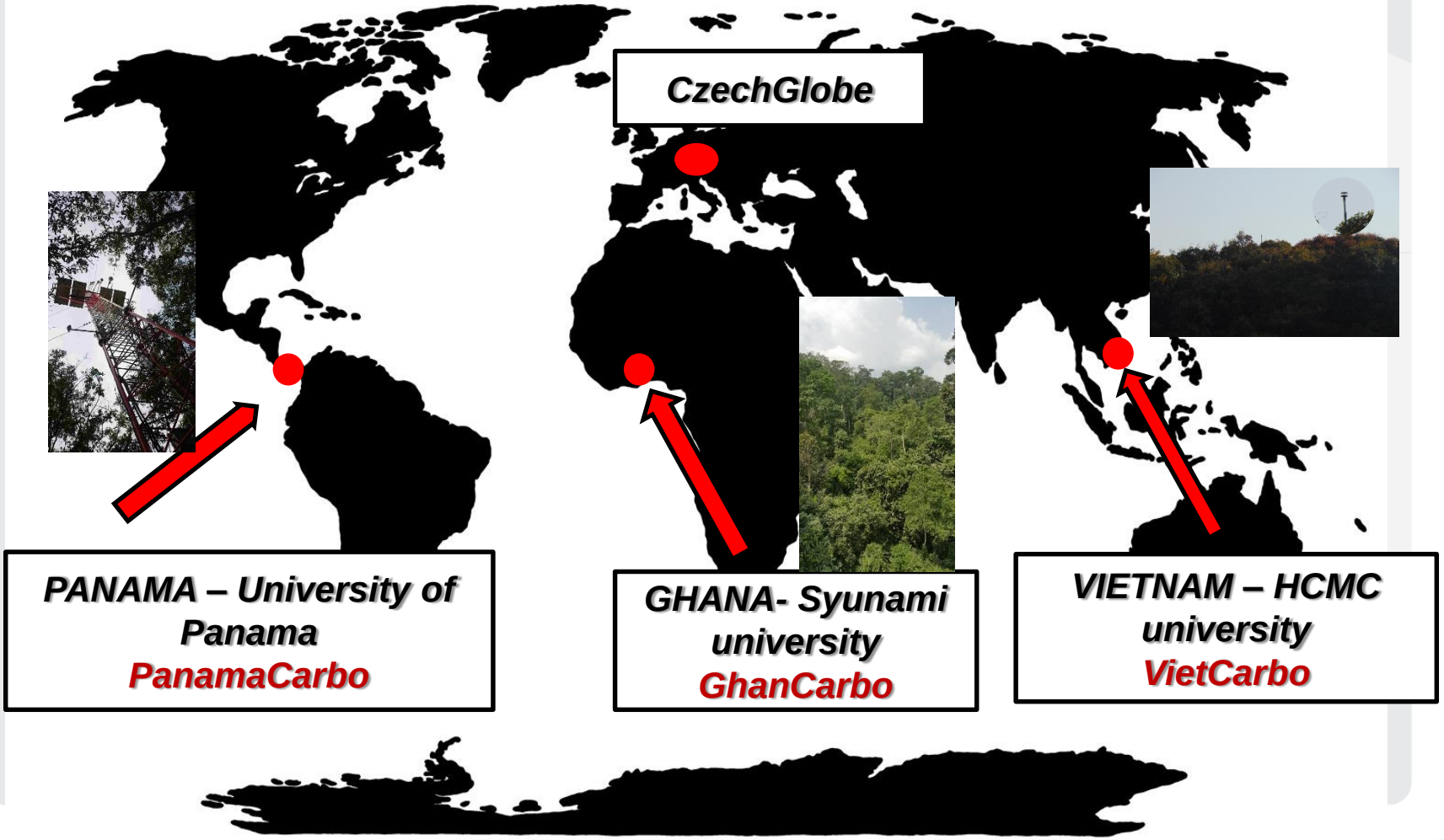
International reference laboratory for characterization and optimization of photosynthetic microorganisms. Platform for screening of optimal conditions for both biomass and high value products accumulation



Pilot Industrial-Scale Photobioreactors



CzechGlobe international activity: establishing of the eddy sites network: TropCarboNet



CzechGlobe – Research domain:

1. CLIMATOLOGY AND ATMOPSHERE RESEARCH

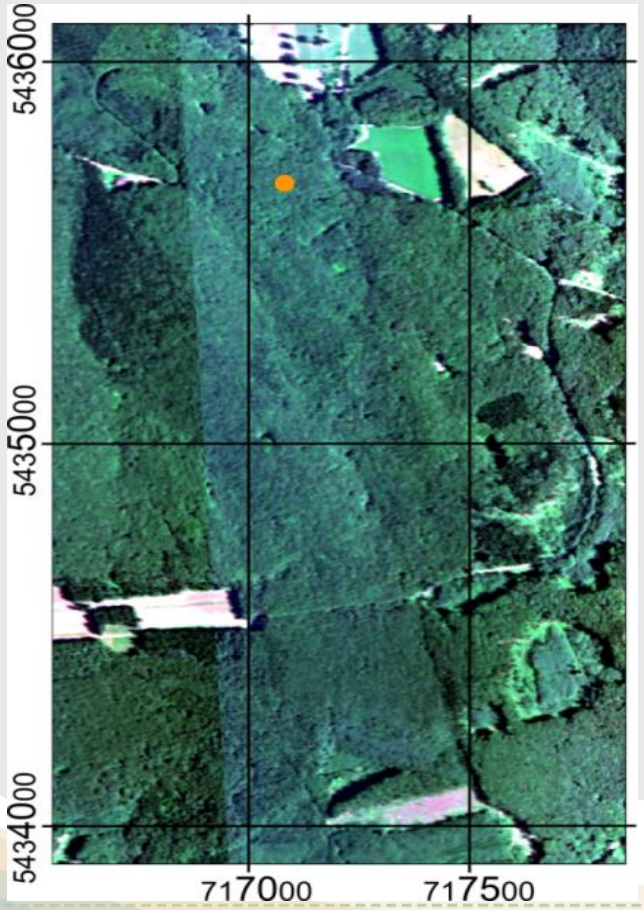
- ***Department of climate variability and climate change analysis***
- ***Department of the climate modelling***
- ***Department GC impacts on managed ecosystems***
- ***Department of atmospheric mass transfer observation***

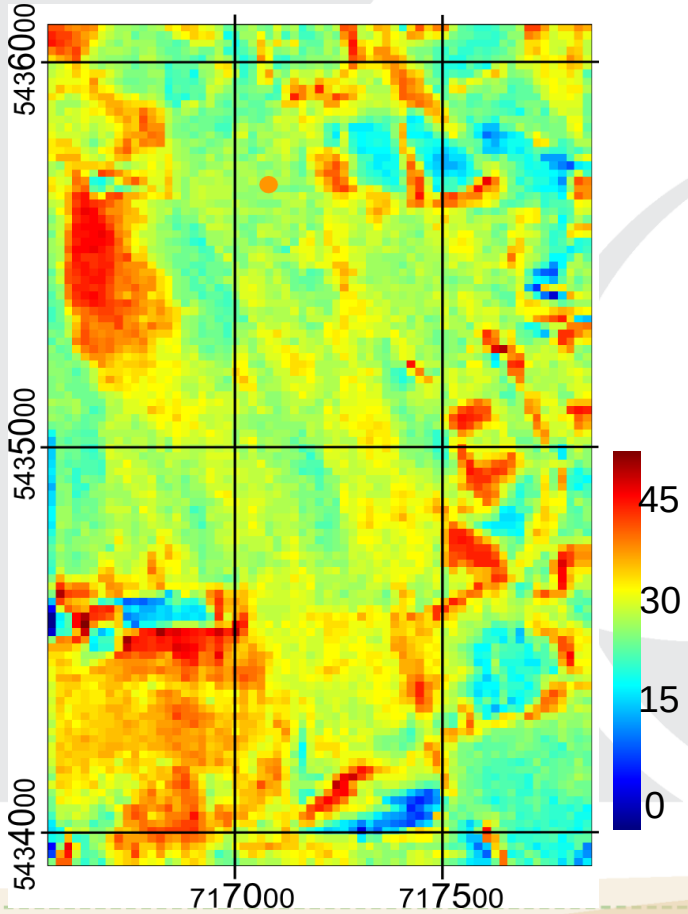
CzechGlobe – Research domain:

2. ECOSYSTEMS ANALYSIS

- ***Department of energy and mass fluxes***
- ***Department of remote sensing and process imaging***
- ***Department of biodiversity research***
- ***Department of geochemical and hydrological cycles***

Distribution of chlorophyll fluorescence in the N. spruce stand





Airborne image (2.5m)

CzechGlobe – Research domain:

3. DOMAIN OF ENVIRONMENTAL EFFECTS ON TERRESTRIAL ECOSYSTEMS

- ***Laboratory of ecophysiological plant physiology***
- ***Laboratory of environmental metabolomics and isotopic analysis***
- ***Department of water operation and formation and allocation of biomass***

CzechGlobe – Research domain:

4. HUMAN DIMENSIONS OF GLOBAL CHANGE IMPACTS

- ***Department of human dimension of GC impacts***
- ***Department of landscape carbon deposition***

CzechGlobe – Research domain:

5. INNOVATIONS AND ADAPTATION TECHNIQUES

- ***Department of adaptive technologies***

- ***Experimental prototype bioreactor***

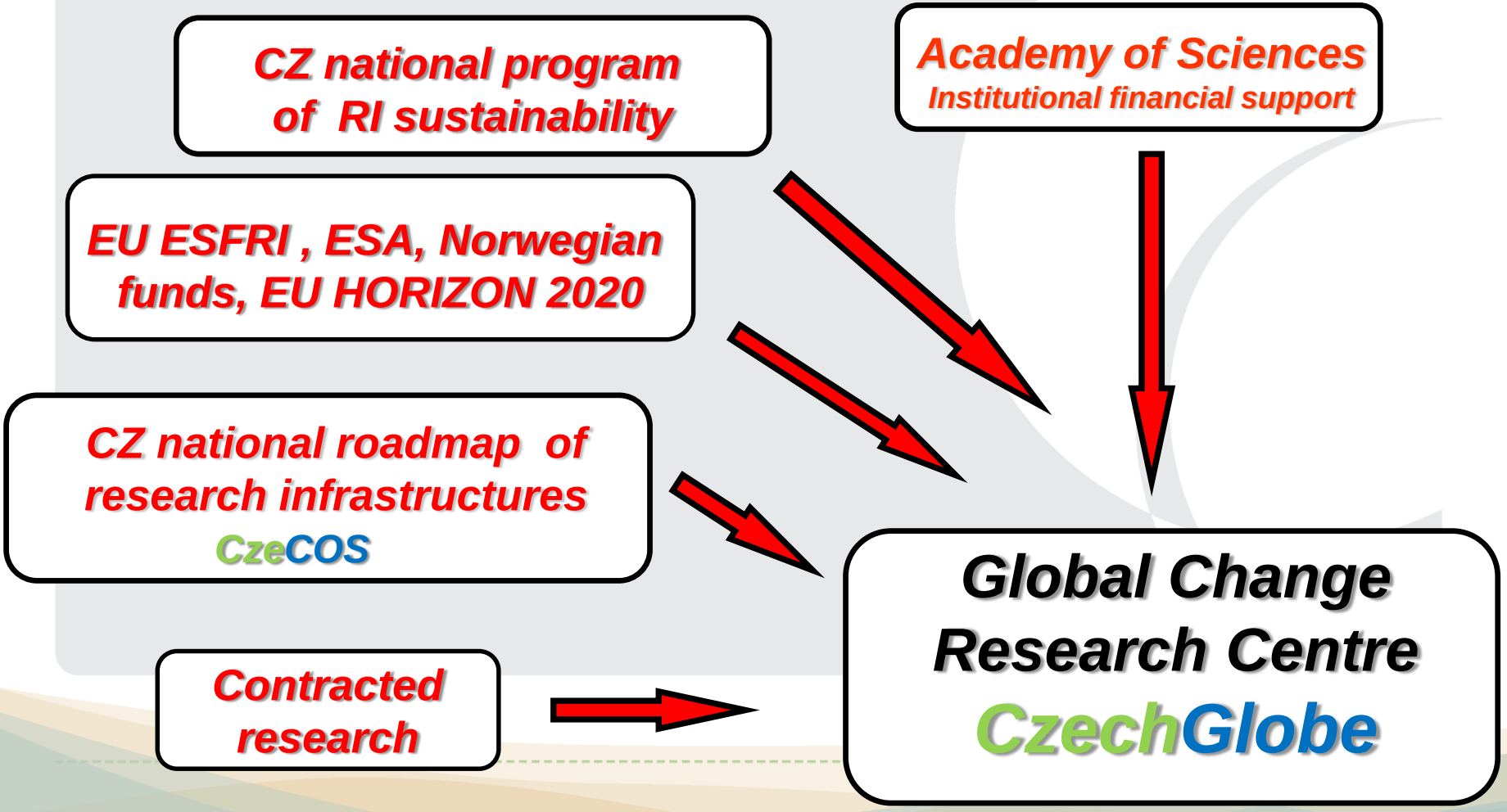
CZECHGLOBE SPIN-OFF COMPANY

Photon Systems Instruments

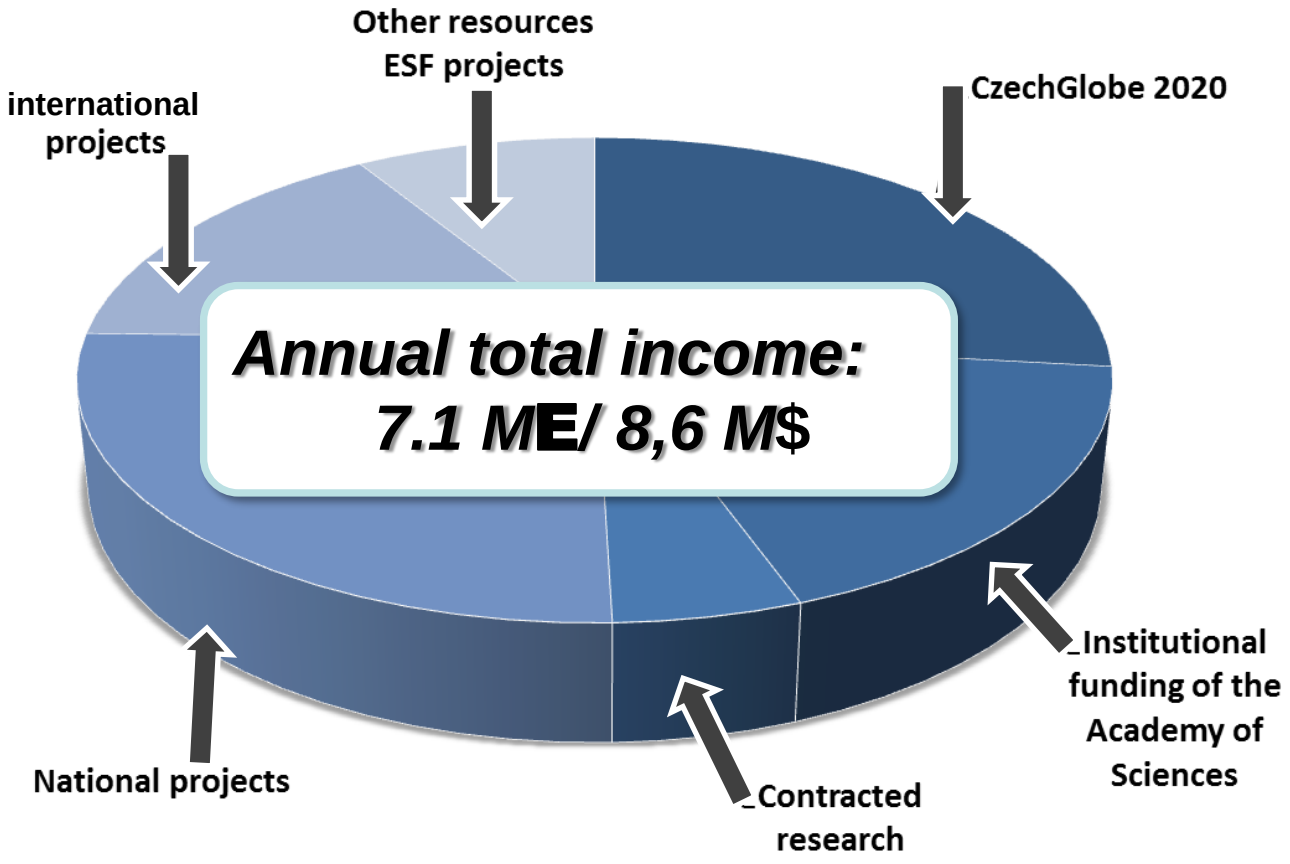
Professional Instruments for Plant Science, Biotechnology, and Agriculture

Drasov 470, 664 24 Drasov, Czech Republic

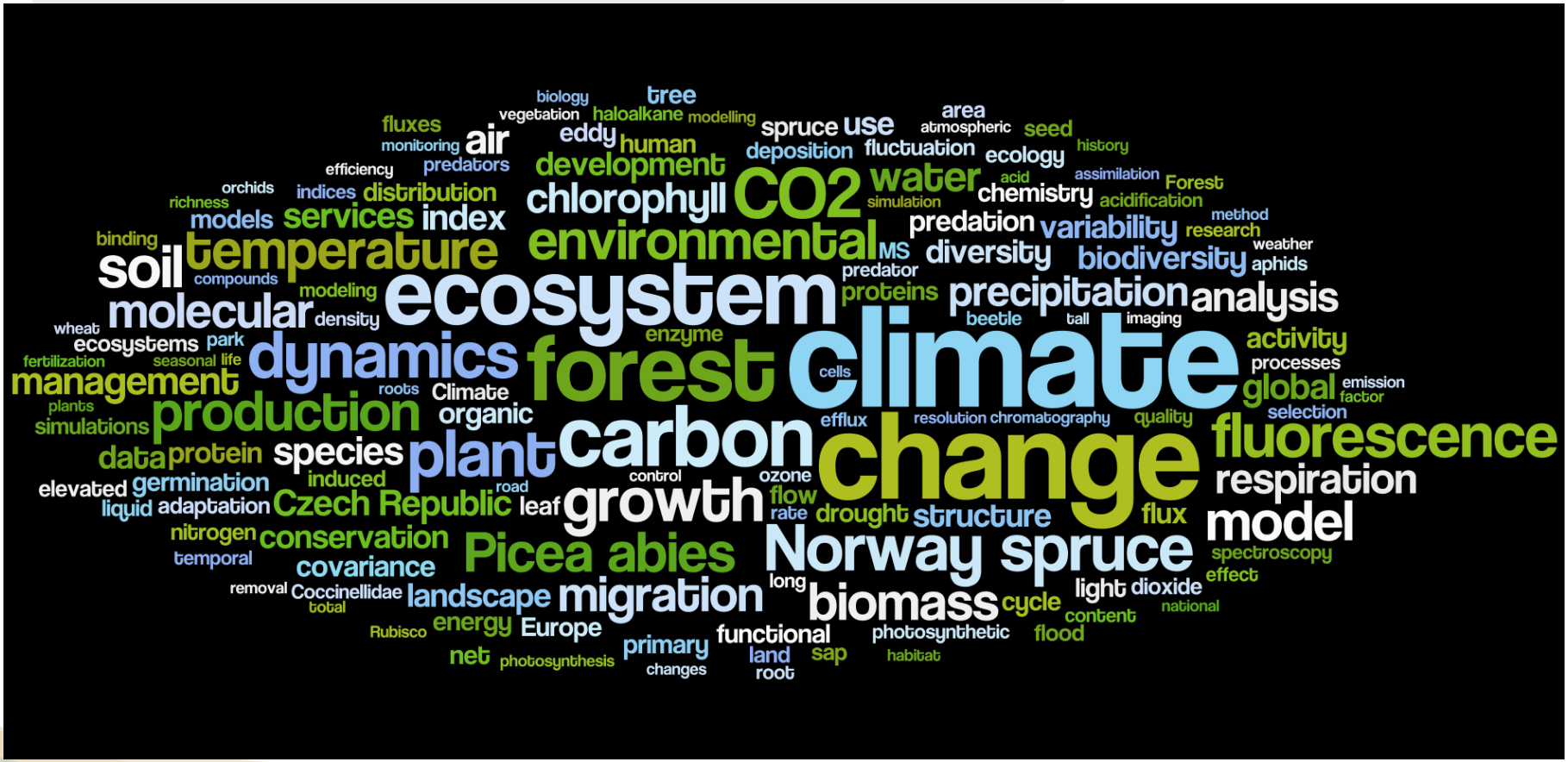
CZECHGLOBE FINANCIAL SOURCES



Average annual financial income



The most frequented key-words of the CzechGlobe staff published scientific papers



CzechGlobe – change is a challenge

Thank You for

Your attention…….

GENDER DIMENSION IN HORIZON 2020 AND EU RESEARCH POLICY

Project n°612413

Hana Víznerová
National Contact Centre for Gender & Science
Institute of Sociology of the Czech Academy of Sciences

Jiří Kolman
CzechGlobe

GENDER EQUALITY IN ERA AND HORIZON 2020 OBJECTIVES

1. Fostering gender balance in research teams/scientific careers

2. Ensuring gender balance in decision-making (H2020 – advisory boards, evaluation panels, expert groups)

3. Integrating gender/sex analysis in research and innovation content

GENDER IN H2020
PRIORITY AND CROSS-CUTTING ISSUE

- **Framework Programme (Regulation)**
  - Article 14: gender as a cross-cutting issue across H2020 priorities
  - Article 16: gender equality and gender dimension at all stages of the research cycle

"Horizon 2020 shall ensure effective promotion of gender equality and the gender dimension in research and innovation content."

  - Articles 31 and 32: gender in monitoring and evaluation

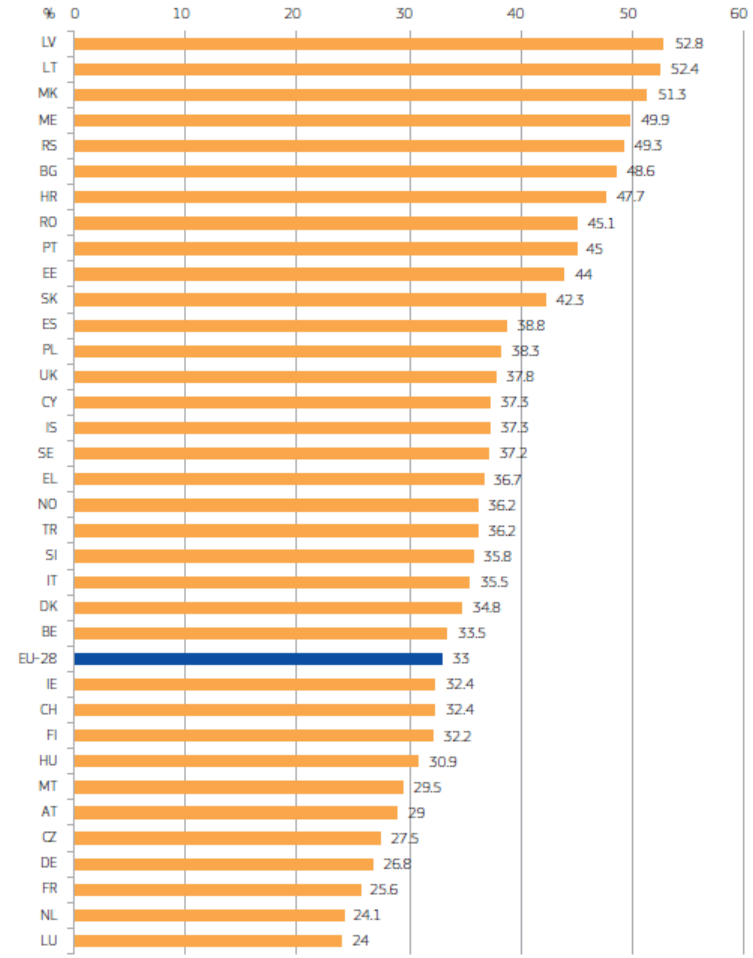
Vademecum on Gender Equality in Horizon 2020 (Rev. 21-03-2016)

GENDER IN H2020
OBJECTIVES - APPLICANT´S PERSPECTIVE

- (1) GENDER BALANCE – HUMAN RESOURCES
  - Fostering gender balanced representation in Horizon 2020 research teams, at all levels of implementation
- (2) GENDER DIMENSION IN RESEARCH CONTENT
  - Integrating sex/gender analysis in research and innovation content

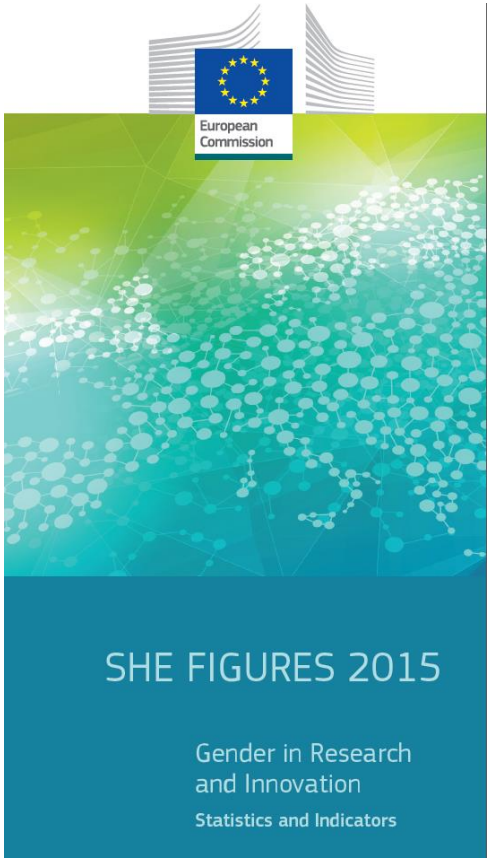
(1) GENDER BALANCE – HUMAN RESOURCES STATISTICS I.

Figure 4.1. Proportion of women researchers, 2012



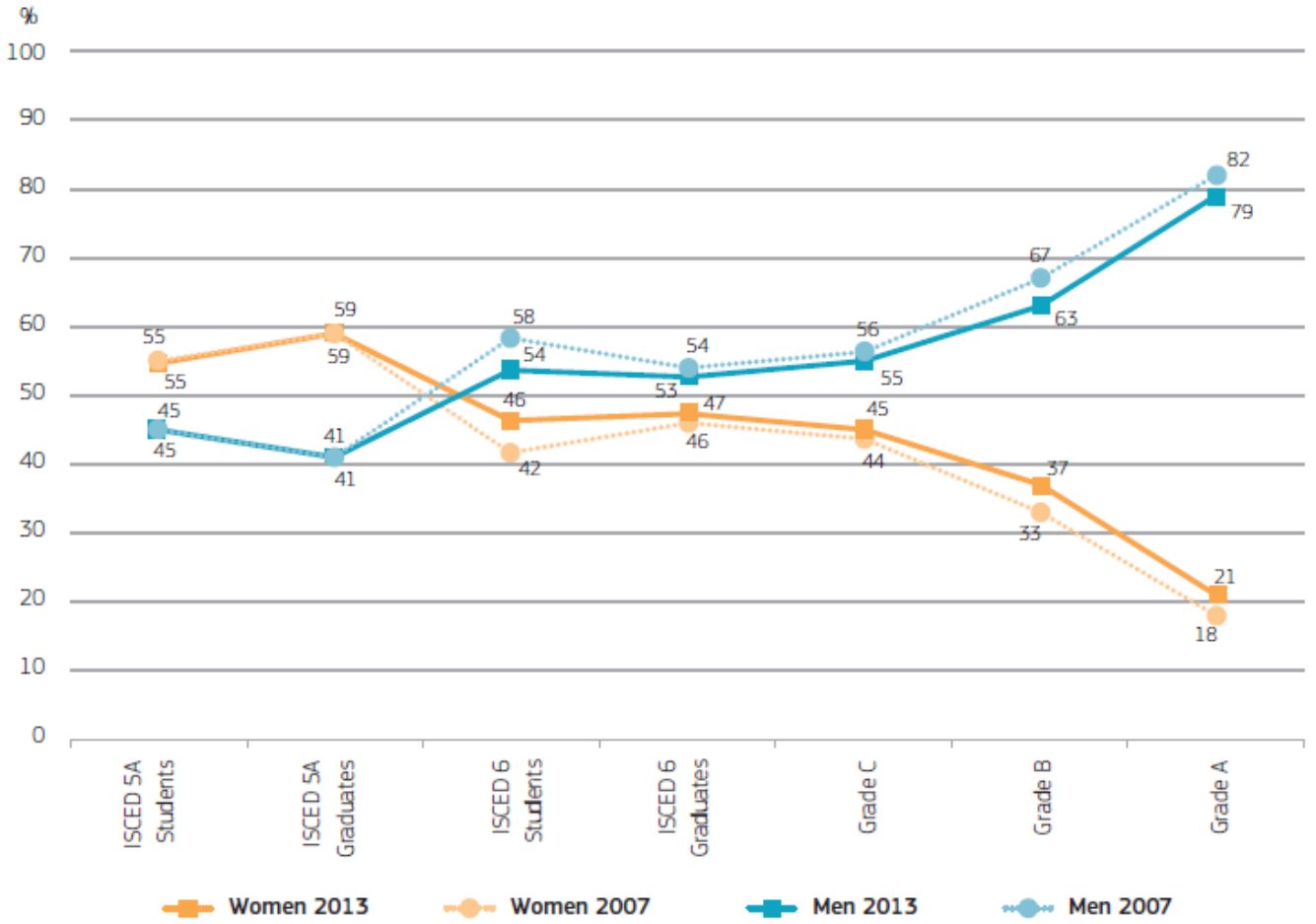
Notes: Exceptions to the reference year: EU-28, BE, DE, IE, EL, LU, AT, SE, IS, ME, RS: 2011; MK: 2009; Data unavailable for: LI, AL, BA, IL, FO, MD; Data provisional for: CZ; Data estimated for: DK, UK; Break in series for: EL, NL, IS; Definition differs for: FR

Source: Eurostat – Statistics on research and development (online data code: rd_p_femres)

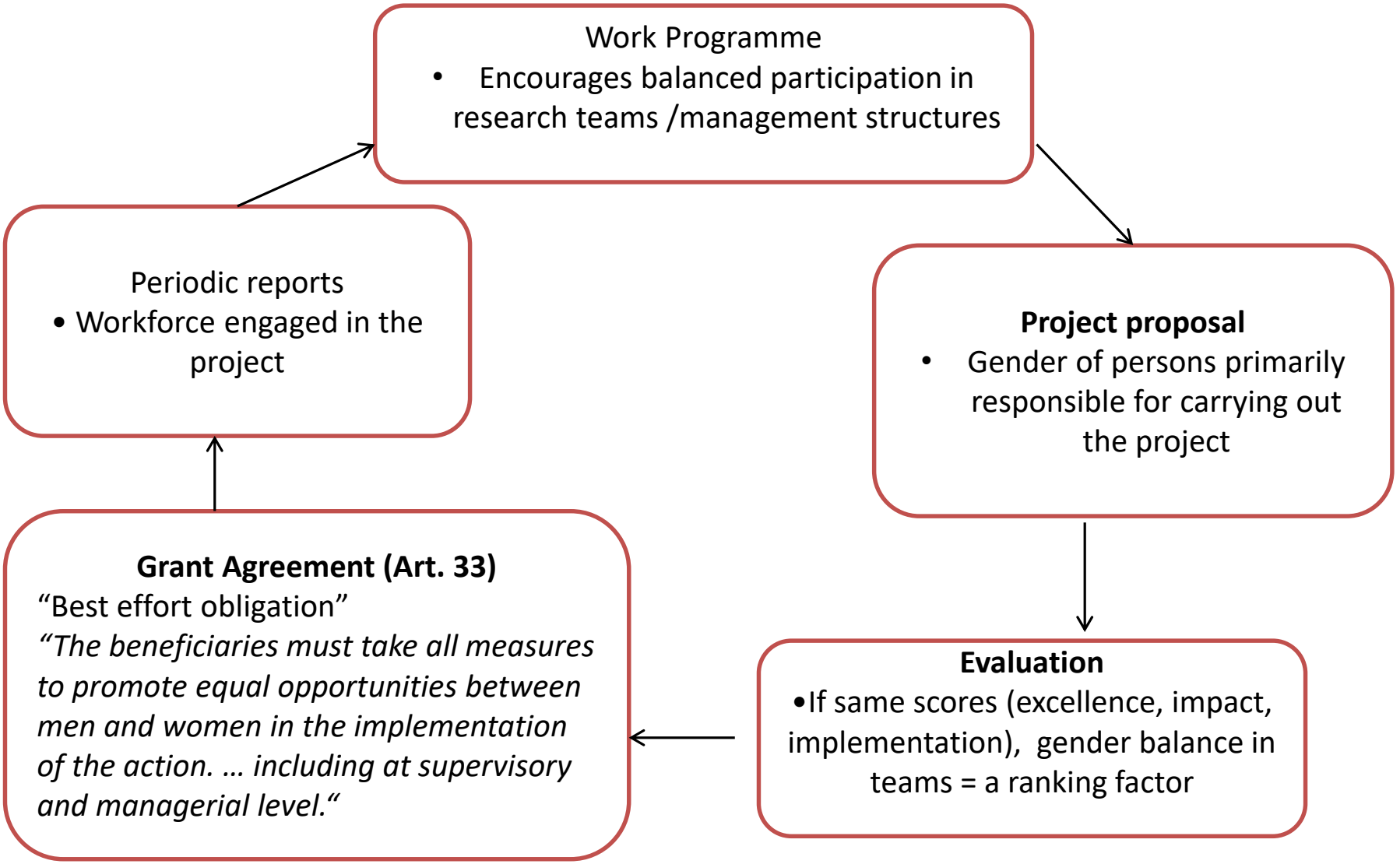


(1) GENDER BALANCE – HUMAN RESOURCES STATISTICS II.

Figure 6.1. Proportion of women and men in a typical academic career, students and academic staff, EU-28, 2007–2013



(1) GENDER BALANCE – HUMAN RESOURCES



MSCA: WORK-LIFE BALANCE AND MOBILITY INDIVIDUAL FELLOWSHIPS

- Consideration of parenthood in grant schemes:
  - in the eligibility criteria
  - modification of the project on personal grounds (related to PIs only; e.g. maternity leave, long-term illness) possible:
    - suspension of grant
    - part-time work
  - funding: a family allowance is paid in case the supported researcher has family obligations
- Career Restart Panel (MSCA-IF-EF-CAR)
  - support of individual researchers who wish to resume research in Europe after a career break (e.g. after parental leave, working outside research, etc.)

MODEL GRANT AGREEMENT
Other rights and obligations

- ARTICLE 32 - RECRUITMENT AND WORKING CONDITIONS FOR RESEARCHERS
- 32.1 Obligation to take measures to implement the **European Charter for Researchers** and **Code of Conduct for the Recruitment of Researchers**

  - working conditions
  - transparent recruitment processes based on merit
  - career development

MODEL GRANT AGREEMENT MSCA INNOVATIVE TRAINING NETWORKS

- ARTICLE 32 - RECRUITMENT AND WORKING CONDITIONS FOR RECRUITED RESEARCHERS
- 32.1 Obligations towards recruited researchers

The beneficiaries must respect the following recruitment and working conditions for the researchers recruited under the action:

c) recruit the researchers, following an open, transparent, impartial and equitable recruitment procedure, on the basis of:
   i. their scientific skills and the relevance of their research experience;
   ii. the impact of the proposed training on the researcher's career;
   iii. a fair gender representation (by promoting genuine equal access opportunities between men and women throughout the recruitment process)

Source: H2020 Model Grant Agreement for Marie Skłodowska-Curie Innovative Training Networks
http://ec.europa.eu/research/participants/data/ref/h2020/mga/msca/h2020-mga-msca-itn-multi_en.pdf

HR STRATEGY, AWARD, CHARTER AND CODE

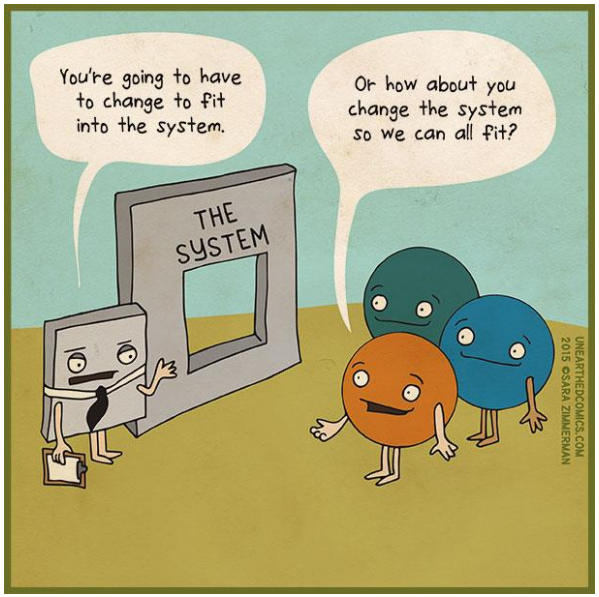
- The ‘HR Strategy for Researchers’ supports research institutions and funding organisations in the implementation of the Charter & Code in their policies and practices. The concrete implementation of the Charter & Code by research institutions will render them more attractive to researchers looking for a new employer or for a host for their research project.
- https://euraxess.ec.europa.eu/jobs/hrs4r
- The European Commission has adopted the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. These documents are a set of general principles and requirements which specifies the roles, responsibilities and entitlements of researchers as well as of employers and/or funders of researchers.

HOW TO PROMOTE GENDER BALANCE IN RESEARCH TEAMS/RESEARCH ORGANISATION

Structural and cultural barriers

change must be structural

holistic approach



EXAMPLES OF GOOD PRACTICES I.

- **Institutional policy, practices and measures:** processes of recruitment, promotion and evaluation of research work
  - Open dissemination, criteria available and clearly defined
  - Establish an active search committee to identify women qualified for the position
  - Transparent decision-making process, including review
  - Career breaks, maternity/parental leave, part-time work etc. are considered in the evaluation system
  - Guidelines for committee members
  - Ensure the balance of women and men in the evaluation committee/boards

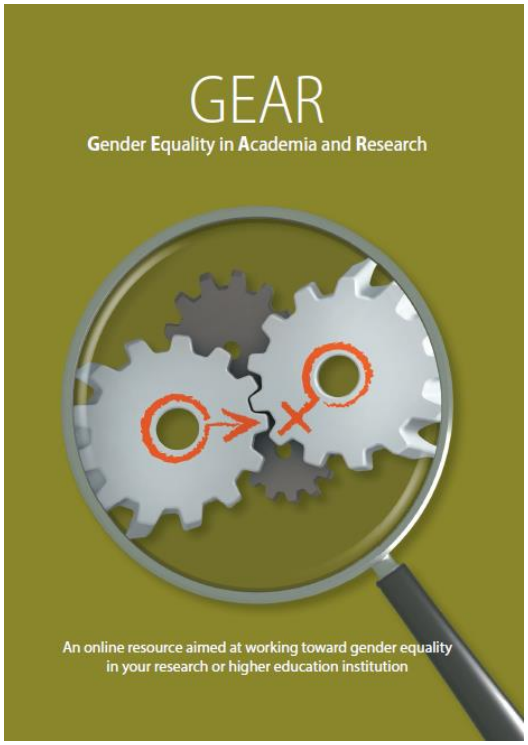
EXAMPLES OF GOOD PRACTICES II.

- **Working environment** – gender culture and unconscious bias
  - Internal analysis (statistics, working conditions, barriers and needs)
  - Encourage women to apply
  - Present role models
  - Awareness raising = gender trainings for heads of dpt./teams, management
  - (Informal) networking – involve women
- **Individual support**
  - Mentoring programme
  - Leadership programme

RECOMMENDATIONS: STRUCTURAL CHANGE PROJECTS, GENDER ACTION PLANS

- FP7 and H2020 projects on structural change and implementation of gender equality plans
- TRIGGER, FESTA, GARCIA, EGERA, LIBRA, GENOVATE, GENDER-TIME,…
- http://ec.europa.eu/research/swafs/index.cfm?pg=policy&lib=gender

- EIGE (online) GEAR tool
- http://eige.europa.eu/gender-mainstreaming/toolkits/gear

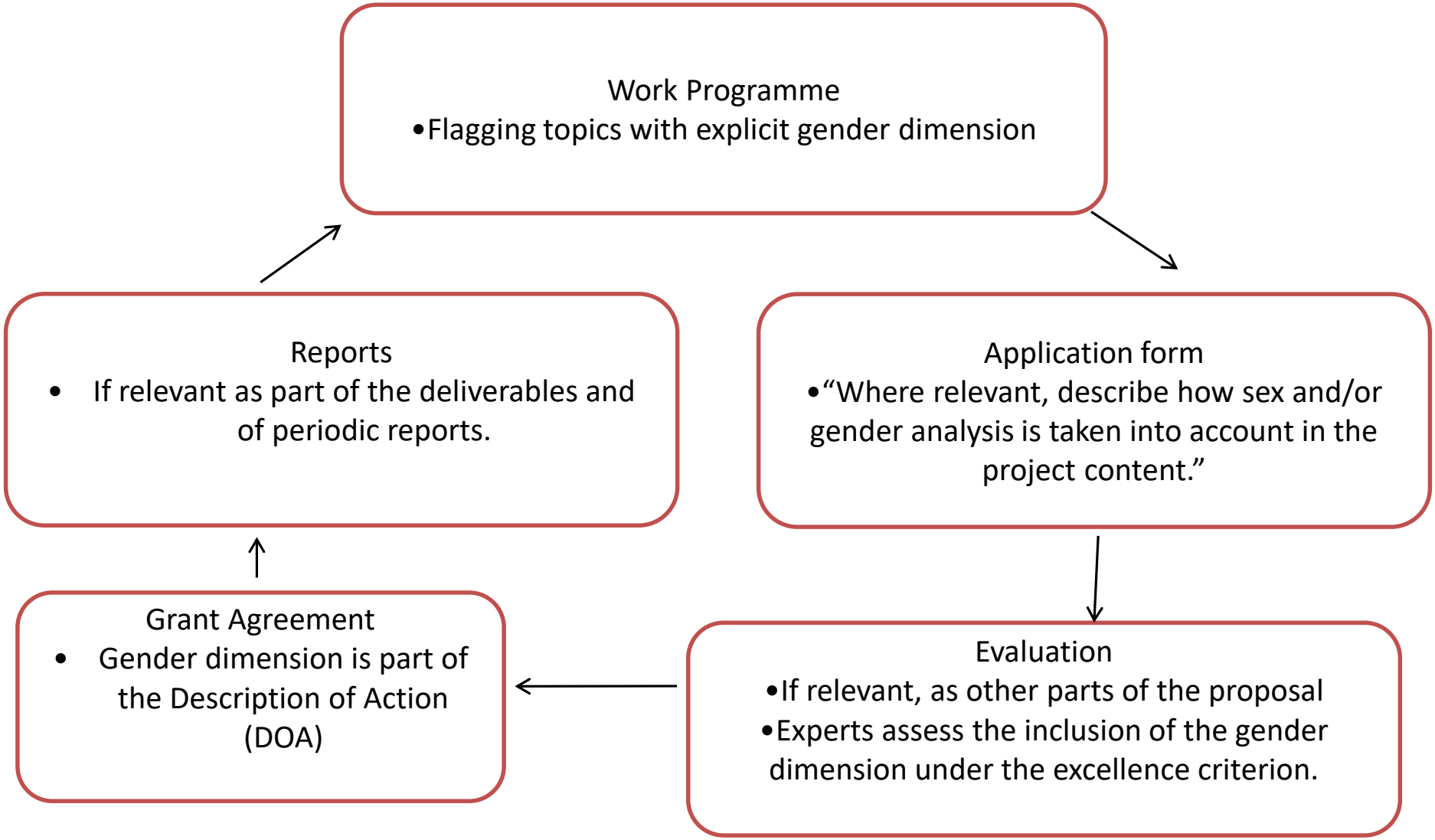


GENDER ACTION PLAN
PROJECT EGERA

- **EGERA – CzechGlobe Gender Equality Action Plan**

- Monitoring (i.e. gender statistics, surveys, interviews, analysis)
- Building gender friendly work environment (recruitment, WLB, career support, trainings)
- Mainstreaming gender in research content and study curricula
- Training academic and research communities

(2) GENDER DIMENSION IN RESEARCH CONTENT



GENDER DIMENSION IN RESEARCH CONTENT

Integrating the gender dimension in research content means taking into account

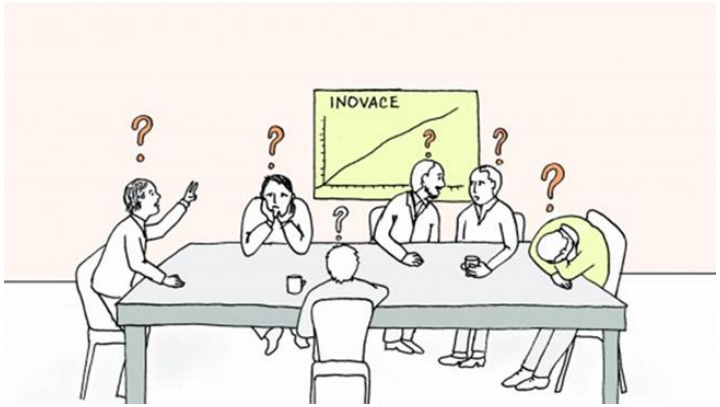
- SEX = the biological characteristics of both females and males
- GENDER = the evolving social and cultural features of women and men
- Interactions between sex and gender and other valid aspects (socio-economic status, age, etc.)

GENDER DIMENSION IN RESEARCH CONTENT

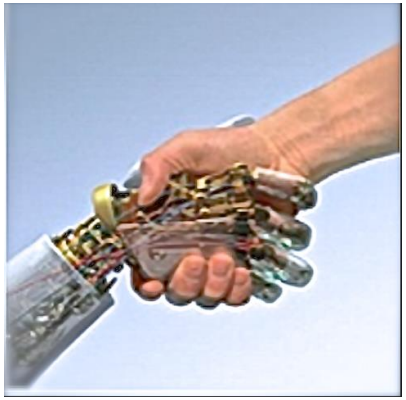
- The gender dimension is likely to be relevant wherever the research targets people
- People are object of the research or the results of research and innovation will have an impact on people or be used by people
  - The functioning of the human body, treatment of diseases, development of diagnostic tools, the body's reaction to substance
  - Social research: attitudes, opinions, behaviour
  - Development of technologies: who is the potential user/consumer
  - Drug development, food safety (different metabolization), materials for use on and in the human body

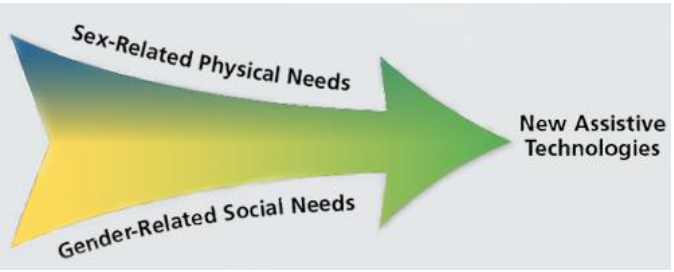
GENDER DIMENSION IN RESEARCH CONTENT

- Diversity in research teams = different approaches, perspectives and experiences (hypotheses, concepts, testing, target groups, users etc.)
  - "Gender diversity leads to better science" (PNAS, vol. 114, no. 8, 2017)
  - "Creating and maintaining high-performing collaborative research teams: the importance of diversity and interpersonal skills" (Ecological Society of America, 2014, 12, 1)



EXAMPLE





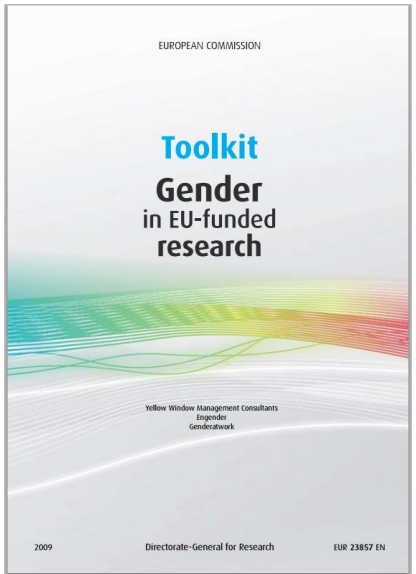
- **Assistive Technologies for the Elderly**
  - **Assessing Women's and Men's Needs for Assistive Technologies**
    - Studies show that sex and gender interact to impact health in old age
    - **Hearing impairment** is more common among men than in age-matched women (Cruickshanks et al., 2010). These differences may depend on sex-specific biology but gendered divisions of labor also mean that men are more likely than women to be exposed to occupational noise (Engdahl et al., 2012).
  - **Using Participatory Research and Design to Create the Next Generation of Assistive Technology**

TIPS AND RECOMMENDATIONS

- Gendered Innovations

  http://genderedinnovations.stanford.edu/

- Toolkit Gender in EU-funded research and innovation

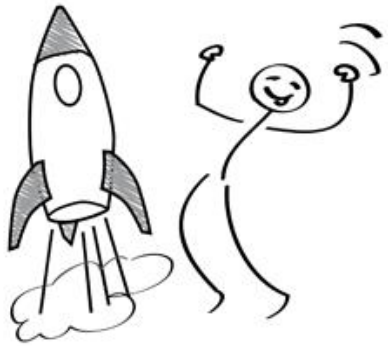


ELIGIBLE COSTS IN H2020

- Gender training
  - Costs to organize a training session
  - Travel costs and per diem if training takes place away from the place of work
  - Financial compensation for researchers participating in the training, equal to the actual hours spent at the training

  - Work Programme 2016 – 2017, Annex D (specific provisions and funding rates)





GENDER IN CLIMATE CHANGE/CZECHGLOBE

- **Impact of the research on the society (gender aspect)**
- **Methodological aspects** (i.e. formulation of the research questions, preference of certain methods…)
- **Scientific style of work and management** (preference to work in office x in the field)
- **Depends on topic/object of the research** (i.e. if the topic is related with social aspects, animals…)

CONTACT

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www.genderaveda.cz
www.gendervH2020.cz
http://www.facebook.com/NKCgenderaveda
http://twitter.com/NKC_CZ

MINISTRY OF EDUCATION
YOUTH AND SPORTS

Large Research Infrastructures Interim Evaluation
Scientific Panel Consensus Report

Name of RI	**CzeCOS**
Acronym of RI	**CzeCOS**

1. DESCRIPTION OF THE LARGE RESEARCH INFRASTRUCTURE

1. Do you find the RI´s technologies/expertise used and services provided exceptional and unique compared to other R&D facilities? Do you think that the RI is providing the user community with capacities and capabilities enabling to conduct excellent and cutting-edge R&D?
2. Do you assume that the RI is adequately responding to the needs of research community and of the industrial sector in the Czech Republic and at the international level?
3. How do you assess the quality of the RI´s open access services taking into consideration the RI´s scientific orientation, user access potential and technologies/expertise used?
4. Do you consider the structure of the RI's own ("in-house") R&D and relationship/ratio between the RI´s own ("in-house") R&D and supported (open access) R&D well-balanced?
5. How do you assess the overall progress of the RI in the course of the period 2014-2016? Do you find it satisfactory given the background documentation?
6. Do you consider the RI´s organisational chart and managerial structure well-developed? Do you consider the relationships between the RI and the RI´s hosting institution clear enough?
7. How do you assess the overall strategy approach of the RI (technology development strategy, human resources development strategy, open access strategy, public relations strategy, etc.)? Do you consider the RI´s strategy approach in various management fields sufficient enough?

Grade:	**5-excellent** / 4-high / 3-average / 2-low / 1-very low / 0-poor

Comments:

1. The RI CzeCOS is hosted by one institution (Global Change Research Institute) divided into 5 sections: manipulation experiments (large scale facilities), Observatory facilities (ecosystem stations); biochemical laboratory (enzymes, proteins, metabolites); portable physiological field tools (basic physiology processes); flying laboratory (remote sensing, lida imaging). The RI provides various facilities integrating the complexity of ecosystems for performing excellent R&D projects.

2. The RI substantially contributes to the fulfilment of international commitments of the Czech Republic in the field of research, adaptation and mitigation of Global Change impacts. The RI is mainly involved in various research networks at the national, European and international level and is adequately responding to the needs of the research community. It is also the founding member of various EU initiatives: ICOS, AnaEE. Furthermore, the active involvement of the RI in the ERICs and H2020 projects indicates that its activities are at the top level of European as well as international research.

3. The RI has developed open access users´ services on several aspects. Among all the management levels, everybody is concerned by the open access facilities: data management, availability of the data, call for proposals, and evaluation of the proposal. All the procedure is detailed on the web site (http://www.czechglobe.cz/en/). The RI has a clear structure for open access. There is an online form for accessing the various components of the RI, there are no deadlines (rolling call) and potential users get a relatively quick reply to their applications. Data can be accessed via the application procedure, however, it may be worth considering publishing and visualising (selected) datasets e.g. near real time data from observatories on the website to gain even more attention e.g. from the general public. An online database can also provide standardized usage statistics.

4. The ratio of research supported by RI's in-house budget and external funding is a good indicator for a healthy relationship between these two sorts of funding mechanisms and related activities. The ratio between RIs´ own R&D and supported R&D is difficult to find. Nevertheless, 74% of funding is coming from state resources, 14% of institutional resources, 4% contracts and services, 8% foreign grants.

5. The activities of the RI may be assessed by the production of data, the production of scientific publications, the number of accepted projects and its involvement in networks. On a broad scale, all the previous indicators have increased in the period 2014-2016. The RI has been significantly upgraded in terms of hardware and extent. This includes among other matters continuous CO2 and H2O flux measurements in manipulation experiments, investigation of spatial heterogeneity in fluxes at the observatories and new airborne hyperspectral sensors for flying laboratory. Also, importantly, recruitment of international experts (2 senior researchers) and an increasing number of post-doctoral researchers and PhD students.

6. The RI is hosted by the Global Change Research Institute and subordinated to that body. The RI management structure is totally integrated into the existing management of the GCRI. Management structure of the RI is following: (1) Scientific Director (principle investigator) of RI, (2) Executive Director, (3) Managing Committee, (4) RI Board of Directors, (5) Scientific Advisory and Ethical Board (SAEB), (6) Domain Leaders, and (7) RI Open Access Committees. The relationships between the hosting instution and the RI are transparent. The RI is managed according to the rules of the hosting institution in terms of human resources management. However, there are also theoretical risks associated with only having one institution involved. A strong advisory board is needed to make evaluations of pursued works and future strategies.

7. The short- and mid-term scientific strategy of the RI is focused in two directions: a) reaching a comparable level with world leading scientific RIs and ensure the standardization of methods, procedures and equipment to achieve full comparability of data with similar RIs in Europe (particularly those involved in ICOS and AnaEE), and b) development and implementation of new state-of-art methods enabling a deeper understanding of the processes within the biogeochemical cycles and processes of acclimation and adaptation to changing environmental conditions. Development of technology in response of changing climate and its effects is mainly undertaken in close collaboration with industry and the private sector. This is a promising approach since such developments often go beyond the scope of a research organization or RI The terms and conditions for open access of the CzeCOS infrastructure are published on the CzechGlobe webpage and are well outlined.

   The RI provides unique competences in the Czech Republic and is part of international organisations allowing the RI to get a position comparable to the other large infrastructures all over the world. It is also an example as a European RI.

2. IMPORTANCE OF THE LARGE RESEARCH INFRASTRUCTURE

1. Do you think that the RI matches progressive trends of the R&D field, which the RI is operated in? Does this R&D area develop accordingly to the focus of the RI?
2. Do you find the added value described by the RI sufficient in terms of R&D services provided, knowledge/technology transfer achieved and RI´s involvement in education?

Grade:	**5-excellent** / 4-high / 3-average / 2-low / 1-very low / 0-poor

Comments:

1. The RI as well as its aims and scientific activities are unique and the only one in the Czech Republic. The RI closely cooperates and is interlinked with various national and international partners and RIs. The RI is well anchored in the current trends of the R&D field in which it is located. It is very well connected with the development within the ESFRI sphere which is the most up-to-date Roadmap in Europe. The combination of joining both ICOS and AnaEE is excellent. Another trend is also to make closer interaction between RIs working with all aspects of climate impacts, i.e. both GHGs and particles. A closer collaboration between the institution in the Czech Republic responsible for the ACTRIS and CzeCOS could therefore be beneficial. A comprehensive approach to the climate change impact studies enables an achievement of breakthrough discoveries in the basic research due to the high interdisciplinary combined. The RI is contributing as a national point to the Czech and EU contributions and obligations in the area of climate and environmental policy.
2. The RI contributes to practical education, elaboration of Bc, MSc and PhD theses supervised by researchers/teachers working at the RI. GCRI also organizes conferences, workshops, training

courses and summer schools for PhD students and young scientists where the RI is practically demonstrated and used. At the national level, the added value consists in an application of bottom-up as well as top-down approach. For example, interconnection of observational research with modern physiological and biochemical techniques can reveal the molecular basis of plant acclimation and allows to detect acclimation processes by remote sensing methods on large scales (spectral reflectance imaging, infrared thermal imaging). At the international level, the RI interconnects the missions of ICOS, AnaEE, and EUFAR infrastructures. Thus, an added value and efficiency of the RI utilization are markedly enhanced. Particularly an interconnection of GHG and energy fluxes monitoring with multi-factorial manipulation experiments is highly needed. Such knowledge is essential for selection of management strategies reducing the risks of GC. The added value is also formed by an Open Access to the RI, data, and training (website: http://www.czechglobe.cz/cs/open-access/czecos/). For example, data-sharing from different ecosystems and geographical/climatic regions in the professional databases (ICOS, FLUXNET) leads to an increased interpretability and robustness of predictions.

R&D services provided by the RI include the provision of technical facilities as well as provision of data, using data from a whole network of stations covering larger than national areas.

3. COOPERATION OF THE LARGE RESEARCH INFRASTRUCTURE

1. How do you assess relationships developed by the RI internationally (both within and outside European Research Area) in terms of cooperation with other RIs, universities, public research institutes, private research organisations, industry and businesses?

Grade:	**5-excellent** / 4-high / 3-average / 2-low / 1-very low / 0-poor

Comments:

1. The level of relationships of the RI with international organisations and institutions is really worldwide and excellent. The RI is well recognized internationally as a major actor in the field. The RI naturally collaborates closely with the established European infrastructures that it is involved with. The RI is a founder and long-time member of ICOS and numerous atmosphere and ecosystem stations are provided by the RI. The RI is very active within AnaEE as a founding member and has applied for hosting an Interface and Synthesis Centre. Furthermore, the RI is actively involved in ACTRIS, EUFAR, ECRA and EODC as well as a number of FP7, H2020 and JPI projects and numerous COST actions. The RI has strong connections with the agricultural sector, notably a strategic relationship with the Agrarian Chamber has been established, on transfer of up-to-date knowledge within climate change impacts and adaptations. The RI has a number of users from industry and business sectors, mainly within developments of various sensors. The RI "concentrates on the application of research results in the industrial sectors that focus on technologies for mitigation and adaptation to climate change impacts particularly in agriculture, forestry and water management."

The RI has numerous well-developed collaborations with universities and other partners both in Europe and beyond (e.g. NEON). The RI has developed strong national and international networks in all the fields of Global Change impacts on terrestrial ecosystems.

4. CAPACITY USE AND OUTPUTS OF THE LARGE RESEARCH INFRASTRUCTURE, INCLUDING ITS IMPORTANCE FOR DEVELOPMENT OF NEW TECHNOLOGIES

1. How do you assess the user access strategy of the RI, including open access arrangements and methods used for the RI´s capacity allocation? Do you consider it well-developed?
2. Do you find the RI´s user community well-balanced from the point of view of the ratio between the national/international users and public/private sector users?
3. How do you assess the scientific results reached by using the RI´s capacities? Do you consider the quantity and quality of these scientific results high enough?
4. To which extent does the RI contribute to development of new technologies? Do you find this contribution adequate taking into account the technology development potential of the RI?

Grade:	5-excellent / **4-high** / 3-average / 2-low / 1-very low / 0-poor

Comments:

1. The open access arrangements are well organised in terms of access portal for a lot of databases in earth sciences. It is the major objective of the RI as stated in the activity report. The open access strategy of the RI has been developed by the management in collaboration with the Scientific Advisory and Ethical Board. User access is easily achievable through an online application form with permanent calls (no deadlines). The response to applications is generally fast. The application is evaluated by technical feasibility and scientific merit. The capacity allocation of RI components is not explicitly mentioned in the document. The RI should consider a strategy for the case of multiple applications for similar components of the RI, as well as applications that have overlapping/conflicting interests.
2. Regard the balance between national/international users, using numbers of users mentioned in the text, percentage and number of users from the Czech universities/Czech public research institutes/foreign universities and foreign institutions/private research organisations, industry, businesses in 2016 were: (percentage): 31%/12%/46%/11% and users: 40%/15%/60%/14%. This is well-balanced. In general most outreach and advertisements must be put towards attracting national users, as well international users through activities within the ERICs and other research projects. A low number for the private/business sector is not surprising, but a strong emphasis on trying to attract more such users in the upcoming period is desirable.
3. The lists of articles provided in the evaluation form shows that the papers have been published in international high impact journals. 211 articles published in 2012-2016; 139 non-reviewed papers. 10 public grants running in the last two years; 10 international grants running in the last

M. Pavgi

two years. In 2016 national resources were 149 MCZK; foreign resources: 12.4 MCZK; services and contracts: 2.87 MCZK. Cooperation for foreign institutions: 31 bilateral agreements; project consortia: 111. Quantity and quality of the dissemination of the scientific results is excellent. An increasing number of even more publications are likely to be released considering the growing interest of users in using the facilities and/or data gathered within CzeCOS. A decent number of publications in the Czech are also listed, which is of less relevance for the international research community, but is of importance to also keep national stakeholders and the public informed.

4. The RI has developed a lot of new products and services based on the use of new technological development for observation of ecosystem changes. The RI is involved in the Technology Transfer Centre of Mendel University supporting transfer of new knowledge into practice, specifically technologies for mitigation and adaptation to climate change impacts particularly in agriculture, forestry and water management. The RI is connected with the application sector via the contractual research and joint research projects supported particularly by the Technology Agency of the Czech Republic (TACR) and National Agency of Agricultural Research (NAZV). The RI has also broad experience in cooperation with non-industrial users including policy makers, ministries, national and international authorities in the field of environment, agriculture, forestry and organizations bringing together various interest groups focusing on ecosystems and impacts of global climate change. Genomics is also a challenge.

   The CzeCOS thus provides excellent facilities and competences providing high quality outputs as research papers and technological developments.

5. BENCHMARKING OF THE LARGE RESEARCH INFRASTRUCTURE

1. Do the benchmarked RIs/research organisations correspond to the RI in terms of their scientific focus and overall R&D potential? Are they comparable?
2. How would you assess the portfolio of the RI´s activities/services and approaches compared to the benchmarked RIs/research organisations?

Grade:	5-excellent / **4-high** / 3-average / 2-low / 1-very low / 0-poor

Comments:

1. The activities of the RI are based facilities for observing global changes from molecular level to the land level. The RI has reported 3 RI of the same importance: ICOSSweden, AnaEE Belgium, and ICOS Italy. The benchmarking RIs are not really comparable to the current RI. The most noticeable difference is the multidisciplinary of the CzeCOS as compared to the others. Also, the Swedish ICOS is only providing resources for other scientists; they are not allowed to perform any research by themselves for the funding obtained. The Italian ICOS is also hosting a thematic centre serving the whole ICOS RI ecosystem community, which makes it special as compared to CzeCOS. Finally AnaEE Flanders, which only covers part of the activities of CzeCOS. It is therefore

very difficult to benchmark against other RIs because of the significant differences between them.

2. The RI has a wider portfolio compared with the benchmarked RI's, making a direct comparison difficult. The RI should supplement their application with detailed information on the CzeCOS ICOS. However, as far as it can be accessed, the indicators of CzeCOS will exceed the benchmarks of most national RIs being active in comparable disciplines (i.e. environmental research).

   Benchmarks is difficult, but the RI indicators exceed benchmarks of most national RI active in environmental research.

6. FEASIBILITY OF THE LARGE RESEARCH INFRASTRUCTURE

1. Do you find the RI´s business plan feasible? Are the risks identified by the RI handled properly?
2. Do you consider the RI´s short-term and long-term development outlook satisfactory taking into consideration the strategy development of the respective R&D field?

Grade:	5-excellent / **4-high** / 3-average / 2-low / 1-very low / 0-poor

Comments:

1. Based on the development of reported activities, the risks of failure are rather limited. Public support needs to be sustained at least for up-grading the instrumentation and for maintaining the large facilities. There is also an increasing number of potential users of data to monitor/ anticipate the effects of global changes. The RI is members of various networks in which similar institutions are facing the same potential problems: public support, fund raising, etc. Some classical risks have been listed: weather phenomena, reduction of financial support, overloading by administrative works.

   One risk that is not discussed is the management structure. It looks like the RI is dependent on just one key position namely the Scientific Director. One method would be to have board at the top of the structure consisting of a suitable number of competent persons sharing the responsibility for the operations.

2. The RI is really unique in Czech Republic and it is an important node in Central Europe. The RI objectives are clear based on developing better tools for the observation of the global change on the ecosystem. The CzeCOS has been very successful in its activities within ERICs and other infrastructure and research projects. The RI has thus been a success story so far. The future development is bound to the developments of the key infrastructures that CzeCOS participates in. The plan for upgrades of measurement technologies and sensors is extensive and sound. Another aspect is also to for providing policy makers and private companies better understanding of the ecosystem functioning and adaptation under global change stress.

The CzeCOS is a unique RI in Central Europe and node for several international observation networks.

7. COSTS AND BUDGET OF THE LARGE RESEARCH INFRASTRUCTURE

1. Do you find the overall RI´s costs and budget adequate and well-justified?
2. Do you consider the calculation of person-months of various RI´s personnel groups reasonable?

Grade:	5-excellent / **4-high** / 3-average / 2-low / 1-very low / 0-poor

Comments:

1. The RI's costs are totally justified due to the management of the large facilities and also the involvement in future ERIC (ICOS, ANAEE). Personnel costs represent 40% of the all budget. That budget is very well detailed and certainly prepared by a professional accounting person from the hosting Institution. The large number of technicians is probably justified considering the large amount of infrastructures belonging to CzeCOS. Field stations are remotely distributed and this motivates travel cost as well as participation in the international collaborations. The cost for upgrade and renewal of instruments is reasonable. This is actually a very important component in the budget because without regular upgrade, the RI will be obsolete after some time.
2. It is difficult to judge whether the time allocated for the different personnel categories are sufficient or not without detailed knowledge of the tasks required to operate and manage the different component of the infrastructure. However, considering the number of sub-infrastructures and the complexity of them, a considerable amount of technicians will be needed. The balance between science and support personnel is also difficult to judge since this also depends on the specific aims and objectives of the RI although it seems reasonable.

   It is difficult to assess budgets for organisation of this size so the uncertainty in grading is comparably high.

8. PORTFOLIO OF INDICATORS OF THE LARGE RESEARCH INFRASTRUCTURE

1. Do you consider the portfolio of RI´s indicators suitable and figures ambitious enough?
2. What is the status of fulfilment of the default figures filled-in by the RI in 2014?

Grade:	5-excellent / **4-high** / 3-average / 2-low / 1-very low / 0-poor

Comments:

The portfolio of indicators is well described and very useful to check the increase of activity of the RI.

1. The portfolio of indicators is sound. The specific indicators are well selected. The goals (planned numbers for the individual indicators) are ambitious, but reasonable. It shows that a thorough and realistic planning was done based on the knowledge and experience already gained in the previous years. The indicators based on number of collaboration partners/projects must be better defined: time period, number of people involvement, results obtained (database, publications, and patents).
2. Nearly all indicator figures are met; in particular, the numbers for all specific indicators exceed the planned achievements. The largest deficit is reported for the number of master students educated within the RI. Participation of students is crucial for a long-term success of the RI as it is the basis for future scientists to be involved. On the other hand, it is well taken note that the number of trained PhD students nearly met the goal and the deficit is only due to PhD students from abroad. The missed target in terms of publications (output #2; 81 vs. 95) is considered less critical as the visibility of the RI is definitely given which is also seen in many other indicator figures. Overall, the reported figures are impressive.

   The indicators are mostly suitable and the results are very positive with increasing number for all the different indicators.

9. LARGE RESEARCH INFRASTRUCTURE´S ADVISORY BOARD ASSESSMENT

1. How do you consider the role of RI´s scientific board/international advisory committee in terms of its duties and responsibilities and level of its involvement in the RI´s overall governance? Do you find its structure and personnel composition appropriate?

Grade:	**5-excellent** / 4-high / 3-average / 2-low / 1-very low / 0-poor

Comments:

1. The role of the SAB sounds good on the scientific aspects. The composition is adequate. The participation of some SAB members during the course of the RI must be mentioned. There is no conflict of interest but only links of interest. No special threats have been identified by the SAB. It is still an open question how to handle the huge data-sets produced by the users of the RI. No particular or specific risk identified by the SAB for CzechCOS.

FINAL EVALUATION AND RECOMMENDATIONS	
1. Following the assessment of individual characteristics of the RI, please sum-up your evaluation and justify your overall grade by highlighting the major strengths and/or weaknesses of the RI. 2. Please specify what recommendations (up to 5 most important) would you give to the RI while being aware of the RI´s future development plans and strategy approach?	
Overall grade:	**4**

Comments:

1. The major strengths of the RI is its uniqueness and activity field. This is the major infrastructure not only in Czech Republic but also in Central Europe. The RI is involved in numerous networks and it is a major actor at the European level. The weakness maybe the very ambitious aims of all RI of such type, managing the complexity of ecosystem under global change. But the others RI on similar topics in other countries are facing the same issues.
2. The recommendations will be the following :
    - The ERIC ICOS and ANAEE are the milestones of the RI and they must pay attention and put time into such infrastructures.
    - Maybe some other involvement, if not related to the heart of the RI must be discarded not to spread the RI on too many aspects.
    - Be aware of new technological development: genomic tools are one of them, but it implies also the management of huge sets of data and also high technical support.
    - The RI is run by one single institution, there are theoretical risks associated with poor decision-making resulting in unwanted development. This is not the case so far, but in order to minimize the risk the RI must allow its SAEB much freedom and take careful notes of their recommendations.
    - The RI should strive towards attracting more top research talents, to boost the outputs in terms of impact publications.
    - The RI should further work towards establishing collaboration with the private sector. The multidisciplinarity of integrated approach is unique and allows for development of methodologies for improved management of ecosystems, e.g. within agriculture.
    - Key datasets from the RI should be made available on the websites. Particularly, relevant data from the RI where users can easily download datasets, without having to apply. This should boost the number of outputs in terms of outreach (e.g. for teaching), MSc theses and publications by external groups

The RI CzeCOS has very high technological standards with most state-of-art equipment within the different activities embraced by the RI. It is among the top RIs in the world.

MINISTRY OF EDUCATION
YOUTH AND SPORTS

NOTE TO APPLICANTS

Summary decision of the Scientific Panel of International Evaluation Committee is the result of the assessment process combining the results of 3 individual, but mutually inter-connected assessment procedures, still leaving the main responsibility for the overall evaluation results on the Scientific Panel of International Evaluation Committee:

(1) Evaluation of documentation on the RI´s implementation state-of-play provided by the RI within the "Evaluation form" and "RI´s advisory board assessment form";

(2) External peer-review of documentation on the RI´s implementation state-of-play provided by the RI within the "Evaluation form" (3 external peer-reviews);

(3) Personal interview with the RI´s representatives.

Summary decision of the Scientific Panel of International Evaluation Committee is based on the synthesis of outputs of all 3 above-mentioned assessment processes as well as on the deliberations of the Scientific Panel of International Evaluation Committee during the whole evaluation period.

Evaluation scale	
5	The RI is of excellent quality compared to the leading actors worldwide with respect to its uniqueness, originality, importance and impact on the user community. The RI is highly relevant for the future development of research and innovation environment of the Czech Republic as well as inevitable for strengthening the competitiveness of the Czech Republic.
4	The RI shows very high quality and high potential, but doesn´t reach the top-class standards of international excellence with respect to the uniqueness, originality, importance and impact on the user community. However, the RI is still highly relevant for the future development of research and innovation environment of the Czech Republic, substantially contributing to strengthen the competitiveness of the Czech Republic.
3	The RI's quality and potential enable good quality services to be provided in the given sphere. The RI shows significant usage possibilities and is relevant for the future development of research and innovation environment of the Czech Republic. Nevertheless, the RI is not a crucial one for strengthening the competitiveness of the Czech Republic.
2	The RI's quality and potential enables it to contribute to provision of services in the given sphere. However, the RI has only minor user community, limited importance and thus also limited relevance for the future development of research and innovation environment of the Czech Republic.
1	The RI does not attain the level required for provision of relevant services at the national or international level and it lacks sufficient potential to become an important element in the future development of research and innovation environment of the Czech Republic.
0	Although being publicly funded as a RI and being included in the Roadmap of the Czech Republic of Large Infrastructures for Research, Experimental Development and Innovation for the years 2016-2022, the respective entity does not meet the general characteristics and criteria of a RI anymore.

RINGO | Readiness of ICOS

RINGO INITIAL TRAINING

SEPTEMBER 13th & 14th, 2017

RINGO initial training for managers and other relevant stakeholders from ICOS candidate institutions (as planned in WP2 Task 2.2 of the RINGO project), organised in Brno in CzechGlobe headquarters (Brno, Bělidla 4a, 603 00) on Wed. 13 September. The second day Thu. 14. September will be organized in CzechGlobe research site Křešín u Pacova, which is a part of the National atmospheric observatory Košetice (situated cca in the middle way between Brno and Prague). Visit will be focused on the CzechGlobe atmospheric and ecosystem crop field eddy site, which is a part of ESFRIs ICOS and ACTRIS.

Below time slots include the time for interactive discussion, the audience will be with mixed experience. The event rather consider as a joint discussion how to help each other with development research infrastructure to be ready for ICOS ERIC membership or partnership.

Wednesday 13 September

(Brno, CzechGlobe headquarters, Street Bělidla 4a, ground floor big meeting room)

9:00 – 10:00 - Introductory word of CzechGlobe director prof. Michal V. Marek (he is also Czech delegate to ESFRI) and Jiří Kolman

- *ESFRI participation of CzechGlobe in ESFRI research infrastructure, sharing the experience with the development of CzechGlobe to be ready for ICOS ERIC membership from managerial perspective (finances, management, sustainability of the operation of the infrastructure, upgrade and outlook for the future)*

10:00 – 10:15 - coffee break

10:15 – 11:45 - Eija Juurola, Head of Operations Unit ICOS ERIC Head Office

- *What is ICOS (history of the development of ICOS, outlook, and plans for the future)? Why ICOS? What are the benefits to be a member of ESFRI ICOS ERIC, what to say to national government to get on board?*
- *What are the necessary steps to become ICOS ERIC member?*
- *What are the main challenges to be tackled by candidate countries and for the ICOS ERIC members as well?*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730944

- *ICOS stations labelling process (from ICOS perspective)*

11:45 – 12:15 - Jiří Kolman, CzechGlobe and WP2 RINGO leader

- *Summary of the RINGO WP2 questionnaire, what can RINGO and ICOS do for you - discussion about the expectations of the candidate countries representatives about RINGO project.*

12:15 – 13:15 - Lunch break in CzechGlobe premises

13:15 – 14:15 - Marian Pavelka (CzechGlobe) and Bogdan Chojnicki (PULS - Poznan Univeristy of Life Sciences), Poland

- *CzechGlobe experience with development of ICOS Czech Rep. ecosystem research infrastructure and experience with ICOS ERIC CzechGlobe membership (i.e. ICOS labelling process)*
- *Experiance from Poland: Past, presence and future of ICOS PL*

14:15 – 15:15 - prof. Ivan Holoubek and Gabriela Vítková

- *CzechGlobe experience with development of ICOS Czech Rep. atmospheric research infrastructure and experience with ICOS ERIC CzechGlobe membership (i.e. ICOS labelling process)*

15:15 – 15:30 - Coffee break

15:30 – 17:30 - Hana Víznerová (Institute of Sociology of the Czech Academy of Sciences) and Jiří Kolman

- *Gender dimension in Horizon 2020 and EU research policy, current state and trends, HR development: How to support it from EU funding, HR logo agenda and trends in EU research policy towards development of research teams; Open Access to Research Infrastructures*

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Thursday 14 September

(National atmospheric observatory Košetice/Křešín - atmospheric station and ecosystem crop field eddy site)

07:30 – 10:00 - **Departure at 7:30 at CzechGlobe headquarters at Brno, Street Bělidla 4a.** Transport by cars to National atmospheric observatory Košetice/Křešín

10:00 – 11:00 - Introductory word of Jaroslava Svobodová (Czech Hydrometeorological Institute - that is also national ACTRIS node) and prof. Ivan Holoubek: *National atmospheric observatory - synergies of research institutes benefits and challenges*

11:00 – 11:30 - Vlastimil Hanuš (CzechGlobe technician): *Technical aspects of construction and maintenance of the atmospheric tower*

11:30 – 12:30 - Marian Pavelka: *Technical aspects of construction and maintenance of the eddy crop field eddy site*

12:30 – 13:30 - Lunch break on site

13:30 – 15:00 - *Excursion of the site* (research infrastructure being part of ICOS, ACTRIS and other research programmes: Atmospheric tower, crop field eddy site, Czech Hydrometeorological station) guided by Gabriela Vítková, Vlastimil Hanuš, Marian Pavelka, Jan Čech, Jaroslava Svobodová a Jaroslav Pekárek

15:00 – 17:00 - Transport to Brno or to Prague airport (for participants who had registered)

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Respondent	Involved institutions
Bruce Osborne. Bruce.Osborne@ucd.ie University College Dublin Ireland	**1. University College Dublin** (Bruce Osborne) **2. Trinity College Dublin** (Matt Saunders; saundem@tcd.ie) Existing forest ICOS-compliant ecosystem station (Dooary Forest Research Platform 2002-); new peatland ecosystem station to be established (2017-). Potentially other existing stations might be included, including additional peatland and grassland sites run by other researchers; there are also potentially three atmospheric stations but none of these are involved in RINGO.
László Haszpra, Hungarian Meteorological Service, haszpra.l@met.hu Hungary	**Atmosphere**: Hungarian Meteorological Service (László Haszpra, haszpra.l@met.hu - operation of Hegyhátsál tall-tower GHG monitoring station). Specific contributions from other institutions. **Ecosystem**: Szent István University (Zoltán Nagy, Nagy.Zoltan@mkk.szie.hu - operation of Bugac grassland ecosystem monitoring site) **Ocean**: not relevant for Hungary
Sofia Cerasoli, Centro de Estudos Florestais, Instituto Superior de Agronomia, Universidade de Lisboa, Portugal sofiac@isa.ulisboa.pt	**1.Centro de Estudos Florestais (CEF), Instituto Superior de Agronomia, Universidade de Lisboa**. Domain: ecosystem: forest (i.e.: Mediterranean oak woodland) and pasture **2. Centro de Estudos do Ambiente e do Mar (CESAM) Universidade de Aveiro**. Domain: atmosphere: urban/suburban environment (not a tall tower)

Bob Scholes, Global Change Institute, Wits University, South Africa bob.scholes@wits.ac.za	**South African Environmental Observation Network (SAEON)** Johan Pauw johan@saeon.ac.za Ecosystems, freshwater and coastal/ocean. **Enhanced Freshwater and Terrestrial Ecological Observation Network (EFTEON)** Bob Scholes bob.scholes@wits.ac.za Hosted at SAEON, ultimately six highly instrumented integrated land-atmosphere-freshwater-biodiversity-people landscapes. **SA Weather Service (SAWS)** Warren Joubert Global Atmosphere Watch station at Cape point **Council for Scientific and Industrial Research (CSIR)** (1)Gregor Feig gfeig@csir.co.za Network of eddy covariance sites, Picarro instruments (2) Pedro Monteiro pmonteir@csir.co.za **Southern Ocean Climate Change Observatory (SOCCO)**
Nikolaos Mihalopoulos, Department of Chemistry, University of Crete (UOC), Greece and Institute for Environmental Research and Sustainable Development, National Observatory of Athens (NOA), Greece	The institutes involved in ICOS infrastructure are **National Observatory of Athens (NOA), University of Crete (UOC), National Center for Scientific Research (Demokritos) and Athena-Innovation RI**. At the moment there is one official ICOS **atmosphere** station, located at the Finokalia environmental station of the UoC. It is envisioned that at least one more combined **atmosphere –ecosystems** station is established at Southern Greece and Finokalia station is upgraded to **atmosphere-ocean station**. For both institutes, contact person is Prof. Nikolaos Mihalopoulos (nmihalo@noa.gr). In addition a free **tropospheric atmospheri**c station is operated by NCSR (Demokritos) with contact person Dr. K. Eleftheriadis (eleftheri@ipta.demokritos.gr) as well as an **ecosystem station** in Northern Greece with contact person Prof. Rapsomanikis S (rapso@env.duth.gr). The plan is to upgrade these two stations to ICOS stations.

National governmental authority contact	Current situation in the country – state of the development of ICOS as a national research infrastructure
Michael Ryan, SFI (Science Foundation Ireland); Michael.Ryan@sfi.ie	State of the development of ICOS in Ireland is unclear; discussions have taken place but no decision has been made as far as I am aware. Funding, and who provides the funding, may be an issue.
Péter Gyula SZIGETI, vice president for research and innovation, National Research, Development and Innovation Office (peter.gyula.szigeti@nkfih.gov.hu) - direct responsibility for ESFRI projects Péter KISS-TÓTH, head of Department for Programme Analysis and Information Systems, National Research, Development and Innovation Office (peter.kiss-toth@nkfih.gov.hu) - direct responsibility for ESFRI projects Bálint DOBI, head of Environment Conservation Department, Ministry for Agriculture (balint.dobi@fm.gov.hu) - professional interest in ICOS Barbara BOTOS, head of Climate Policy Department, Ministry of National Development (barbara.botos@nfm.gov.hu)	There is an informal professional cooperation among the potential participants of ICOS-Hungary consortium waiting for the official decision on joining ICOS. The potential Hungarian ICOS atmospheric and ecosystem stations are operational but they need refurbishing to satisfy the ICOS requirements. Development is not possible without high-level decision on joining ICOS. The Hungarian ESFRI roadmap is under preparation.
Professor Miguel Castanho, miguel.castanho@fct.pt (Vice President of National Foundation for Science and Technology, FCT) Cristiana Leandro, cristiana.leandro@fct.pt	Three ESFRI (Lifewatch, eLTER and ICOS) are actually integrated in only one national infrastructure named PORBIOTA (Portuguese E-infrastructure for information and Research on Biodiversity). Different research areas (corresponding to different ESFRI) have independent scientific coordination.We are now in the preparation phase. We expect to complete the setup of ICOS stations by 31-12-2019.

Dr Daniel Adams, Department of Science and Technology: Infrastructure **Dr Brian Mantlana,** Department of Environment Affairs: Monitoring and Evaluation	There is an national research infrastructure roadmap (DST, 2016). It identifies and funds two projects, EFTEON described above, and Shallow Marine and Coastal Research Infrastructure (SMCRI), both hosted at SAEON, and both currently being imprlemented. In addition there are about 9 existing flux towers (CSIR x 3, ARS Africae x 3, University of the North West x 1, University of Rhodes x 1, SAEON x 1), and a long-established GAW site at Cape point. The Dept of Environmental Affairs is responsible for national GHG reporting to UNFCCC and commissions regular assessments of the terrestrial carbon budget.
Ms Maria Koutrokoi, **MSc,** Senior Scientific Officer, General Secretariat for Research and Technology/GSRT, Ministry of Culture, Education and Religious Affairs 14-18 Messogion Avenue, 115 10 Athens, Greece Tel:+30 210 7458 094 E-mail: mkoutr@gsrt.gr **Mr Yannis Ioannidis**, President RI "Athena-Innovation" Artemidos 6 & Epidavrou, 151 25 Maroussi, Greece Tel: +30 210 6875301 E-mail: yannis@athena-innovation.gr	At present, there is one official ICOS atmosphere station, located at the Finokalia environmental station of the UoC. At the National Roadmap for RI published in 2014 and updated in 2017, the PANACEA (PANhellenic infrastructure for Atmospheric Composition and climatE change) RI was included with a direct link to ICOS and ACTRIS RIs. PANACEA is expected to be officially launched in 2018. Within the frame of PANACEA, at least two stations (FInokalia and NEO) will be ICOS-atmosphere stations. UoC is the host institute of the PANACEA RI.

The entry process in ICOS ERIC starts with sending a request letter to the ICOS ERIC, including the information of the first stations the country will bring in ICOS ERIC. This should be scheduled well before the planned year of entry, latest by June of the preceding year. What is your current forecast for joining in ICOS ERIC as a Member or Observer?	**What type of funding** do you use and plan to use for the ICOS infrastructure construction and operation? Do you already have dedicated funding for ICOS type of activities? (i. e. do you plan to use EU structural funding?)
No information on this	Some internal funding and yet to be deployed infrastructure obtained from a previous HEA (national Higher Education Authority) grant, although no long term funding. No plans to use EU structural funding.
According to the national laws of Hungary, a request letter can only be issued when the funding is already secured in the national/government budget. Currently, it is planned in the budget for 2018, which is under discussion with the Ministry of Finance.	The existing, potential Hungarian ICOS infrastructures are run on institute/university budgets and topic-relevant short-term Hungarian grants. There is no dedicated ICOS budget at the moment. After joining ICOS government support may be expected.
It's our intention to send the request letter in the beginning of next year and preview to join ICOS ERIC in 2019.	The infrastructure has been funded for 36mm only for equipment acquisition and for a small fraction of human resources. PORBIOTA is partially funded from national budget and partially by EU structural funds.

Perhaps in 2019	South Africa would not use EU structural funding. It will use funding from the Dept of Science and Technology for core operations, and project funding from various sources as appropriate for add-ons.
It is expected that a request letter will be sent within 2018 if financial situation will allow (see also below) with contact person.	At the moment there are no direct funds towards the national ICOS RI. Nevertheless, it is expected that funds from the PANACEA RI will be allocated for ICOS type activities.

What sort of information and trainings (topics; targeted groups of researchers, administrators ((i.e. project managers, lawyers, financial experts), technicians responsible for infrastructure construction and operation, governmental officials responsible for ESFRIs) **would you prefer to have within the RINGO project activities, for which target groups especially? Please provide your needs to all three ICOS domains (ecosystem, atmosphere, ocean) and also if there is possible financial coverage of the participation of extra non-RINGO participants (i. e. national infrastructural partners, governmental officials) to RINGO events**	Can you already now or in near future **provide some results, methodology, data or infrastructure** (via open access) related to ICOS research?
Training in data collection/management; error assessments; eddy covariance technology/instrumentation	Results potentially available from 2002 for a forest site; 5-6 years of data from a cropland and a grassland site; one year of data from two further forest sites.
First of all the Hungarian decision makers, potential stakeholders should be convinced of the usefulness of joining ICOS. Domestic efforts have not been successful yet, although some interest could be arisen. The Hungarian RINGO budget is not allowed to cover the travel/participation of government officials. The Hungarian professionals have experience on atmospheric and ecosystem measurements, further training is not a priority at this phase. Professional training will be appreciated after joining ICOS when staff can be expanded.	The potential Hungarian ICOS sites (Hegyhátsál atmospheric and Bugac ecosystem sites) have been operational for many years, although they do not comply with all ICOS requirements. Publications on the measurement results are available. CO2 atmospheric concentration data are publicly available at the WMO WDCGG database along with the methodological and other information. CO2 flux data from the ecosystem site are available in project databases.
Technical level: advice for the upgrade of the existing tower and the setup of a new one (pasture). **project management level**: advice on the development and implementation of societal services **financial level**: advice on the pursuit of further funding (for both the development and operational phase) and on budget of the operational phase. **No further fund** for the participation of extra non RINGO participants is available.	Flux data collected form the existing towers: a Mediterranean oak woodland since 2011 and urban/suburban stations since 2014 are available but please consider data collected may not fulfill ICOS requirements.

1. Techniques training for postgraduates and technicians on operating specific technologies, such as eddy covariance, stream chemistry, atmospheric profiling etc 2. Management training from network operators on how to plan and maintain a network, including data management issues, budgeting, scheduling.	Yes. The Skukuza site has been operating since 2000, and data up to 2010 is in the public domain via fluxnet.
For all three ICOS domains top priority for the Greek ICOS is the training of the people involved in ICOS RI, both at technical and administrative level. Additional training and information for all stakeholders will be highly appreciated. As a starting point, training for technicians and researchers for atmosphere domain will be needed. Currently there is no option for funding non-RINGO participants to RINGO events.	In the near future and, the Greek partners will provide all available results, methodologies, data and infrastructure related to ICOS research via open access procedures.

How could ICOS and RINGO project help you with the support to ICOS membership and collaboration at governmental level? (i.e. Which supportive documents you would need to be provided? Invitations to events? Provision of trainings?...)
Representation needs to be made at National level to convince the funders of the benefits of ICOS membership. The two main organisations to contact would be DAFM (Department of Agriculture, Fisheries and the Marine) and the EPA (Environmental Protection Agency).
As the primary need in Hungary concerning ICOS is the convincing the decision makers and other stakeholders of the usefulness of joining ICOS, well-addressed supportive documents may help the most. They should explain what the direct benefit of ICOS for the country is, why it is worth the required investment and running cost. Perhaps, what the disadvantages of being out of ICOS are. They may contain information on ICOS member countries and their contributions to demonstrate the wide participation in Europe and usefulness of the infrastructure. The known existing ICOS documents seems to be either too long and detailed for a decision maker to read and interpret or too short and general (e.g. leaflets) to be convincing or not addressed directly to a country to feel a real national need to join the research infrastructure. Meetings and trainings are also useful as soon as the decision makers are already interested enough to
We are actually preparing a development and operational plan to present to our ESFRI delegates. We don't know yet if some formal support from ICOS is necessary at this stage.

We would need to build a strategic and business case for South Africa to join ICOS. It does belong to similar networks in other domais, but needs to be convinced that the benefits exceed the costs.
Since Greek ICOS is at its start, close collaboration with ICOS and RINGO will be needed. Training of technicians, researchers and administrative involved in ICOS is a priority. Events held related to ICOS will be followed by the Greek members and therefore invitations to all events will be highly appreciated.