



# **An overview of the knowledge transfer through STSMs**

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# **What is an STSM?**

**STSM - short term scientific mission**

**Their purpose is to support working visits to laboratories and institutions of COST Action FP1303 member countries.**

GP 1 – 10

GP 2 – 8

GP 3 – 7

GP 4 – 1

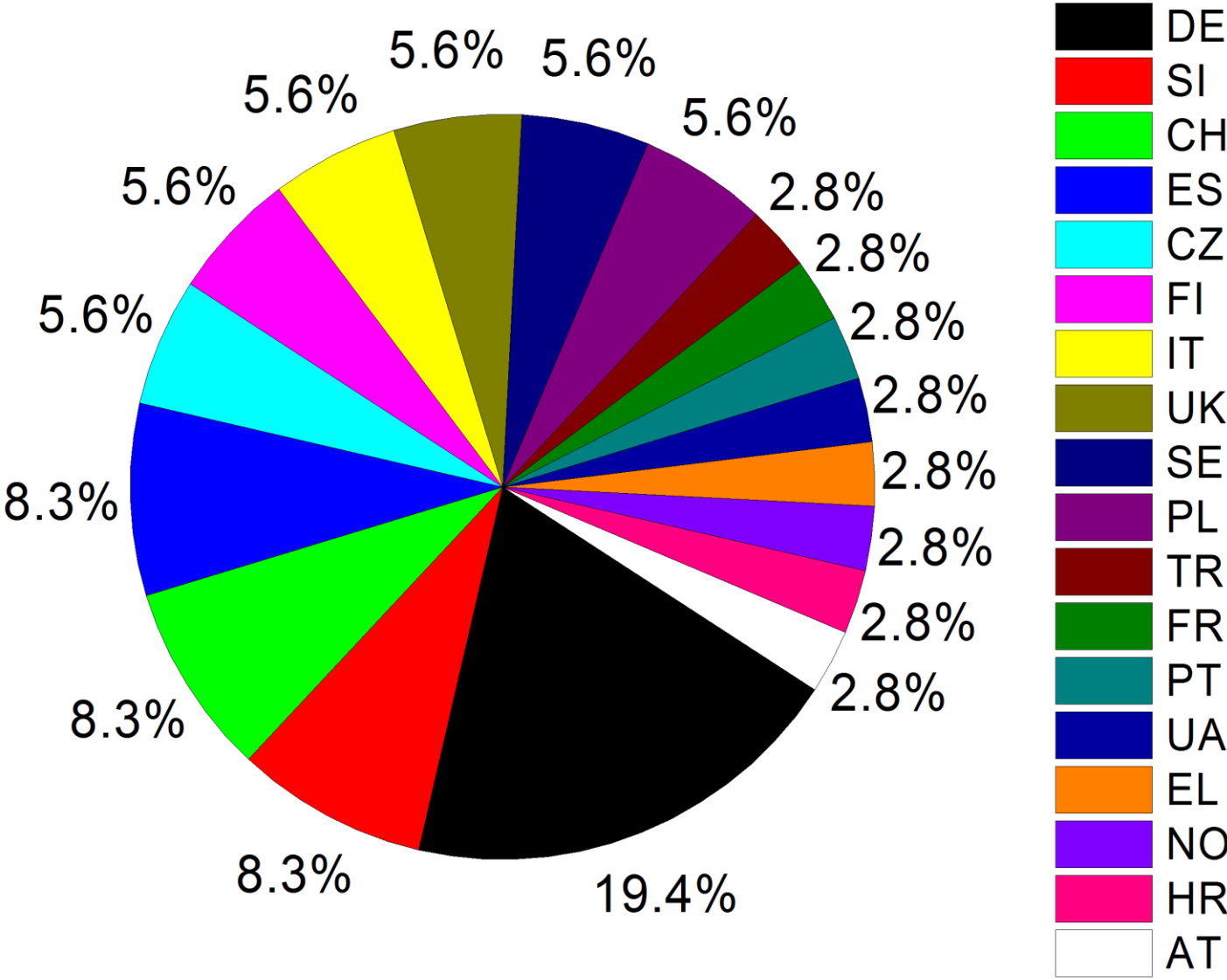
GP 5 – 6

GP 6 – 4

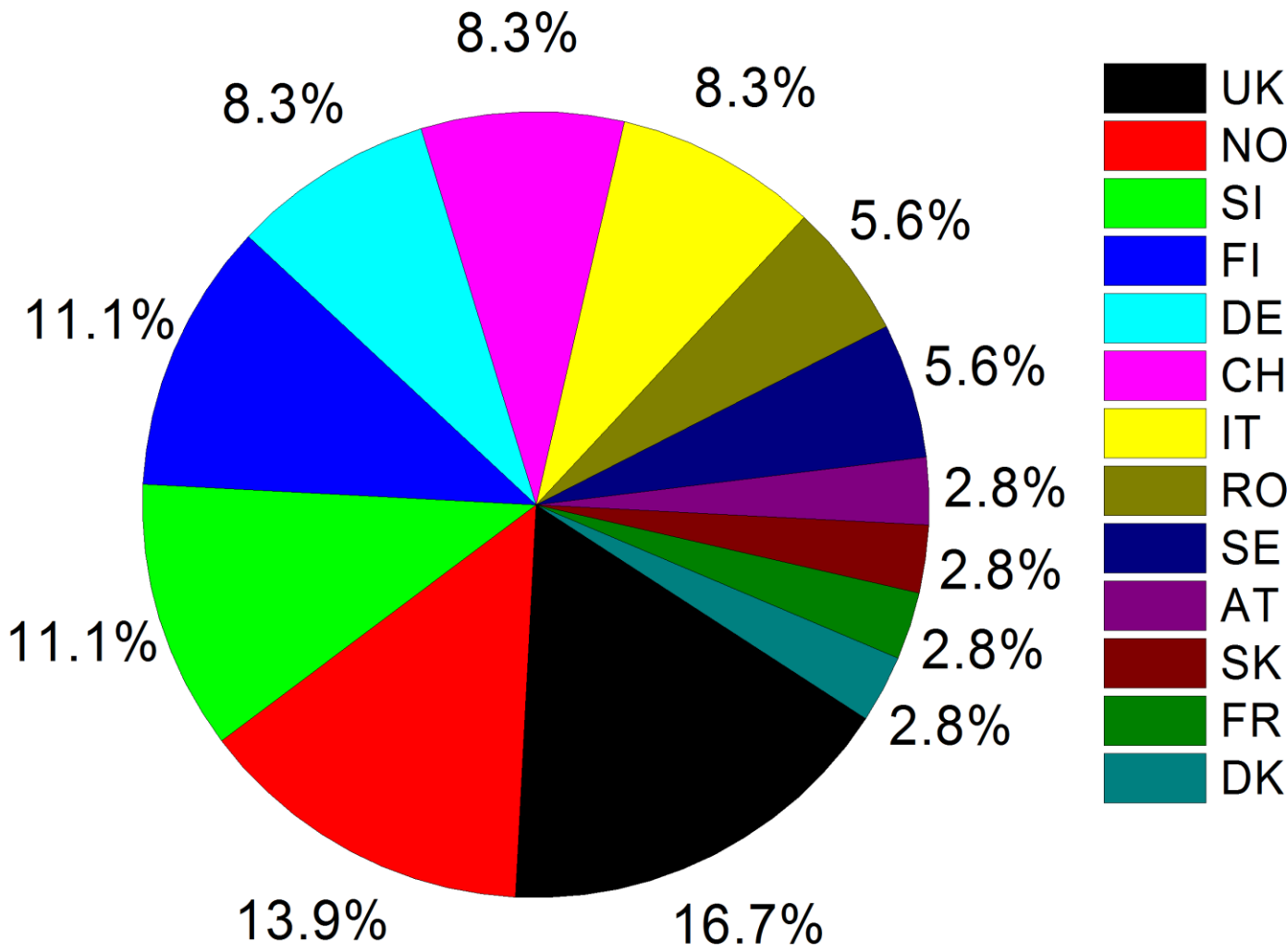
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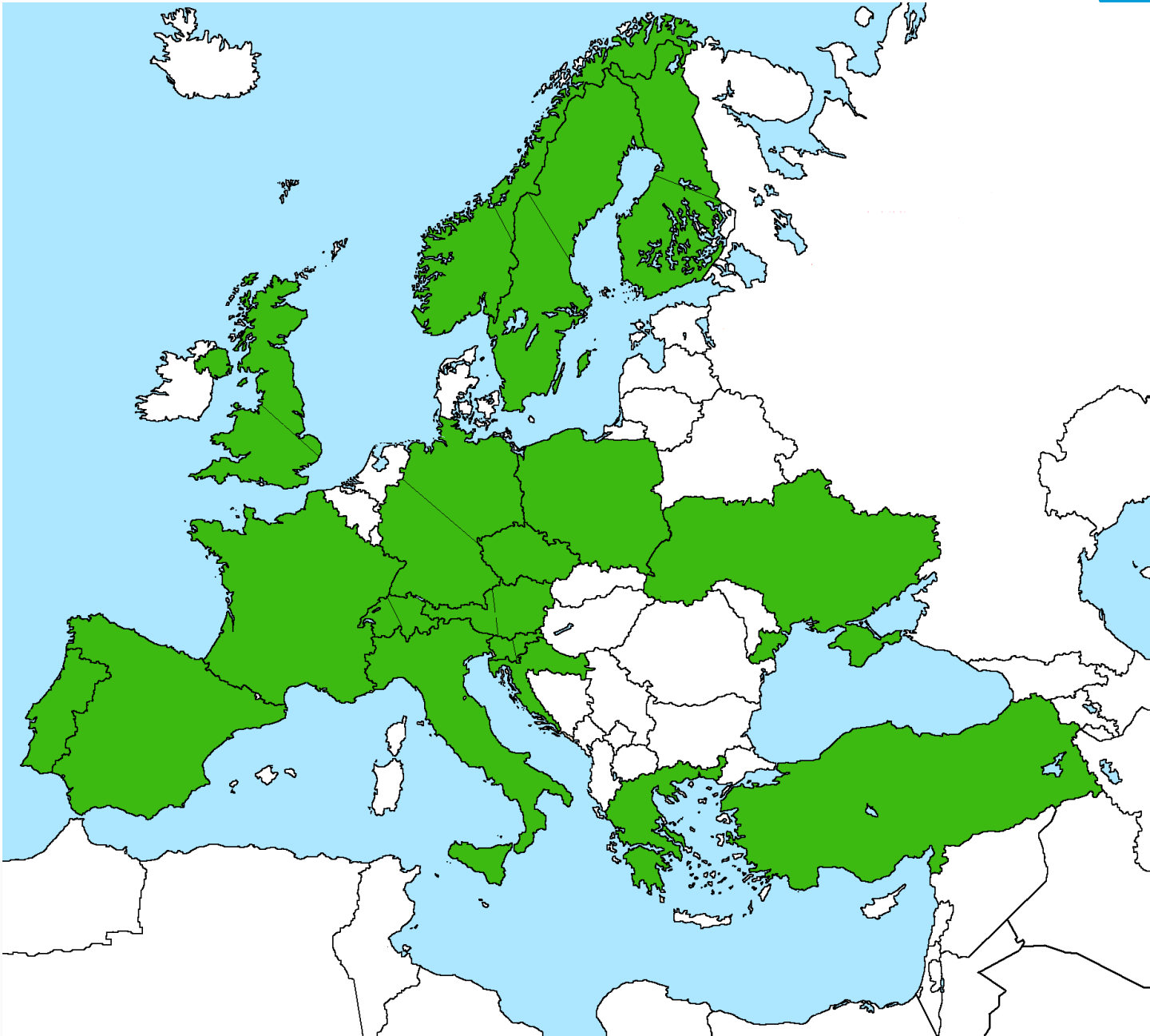
# Statistics – applicant country



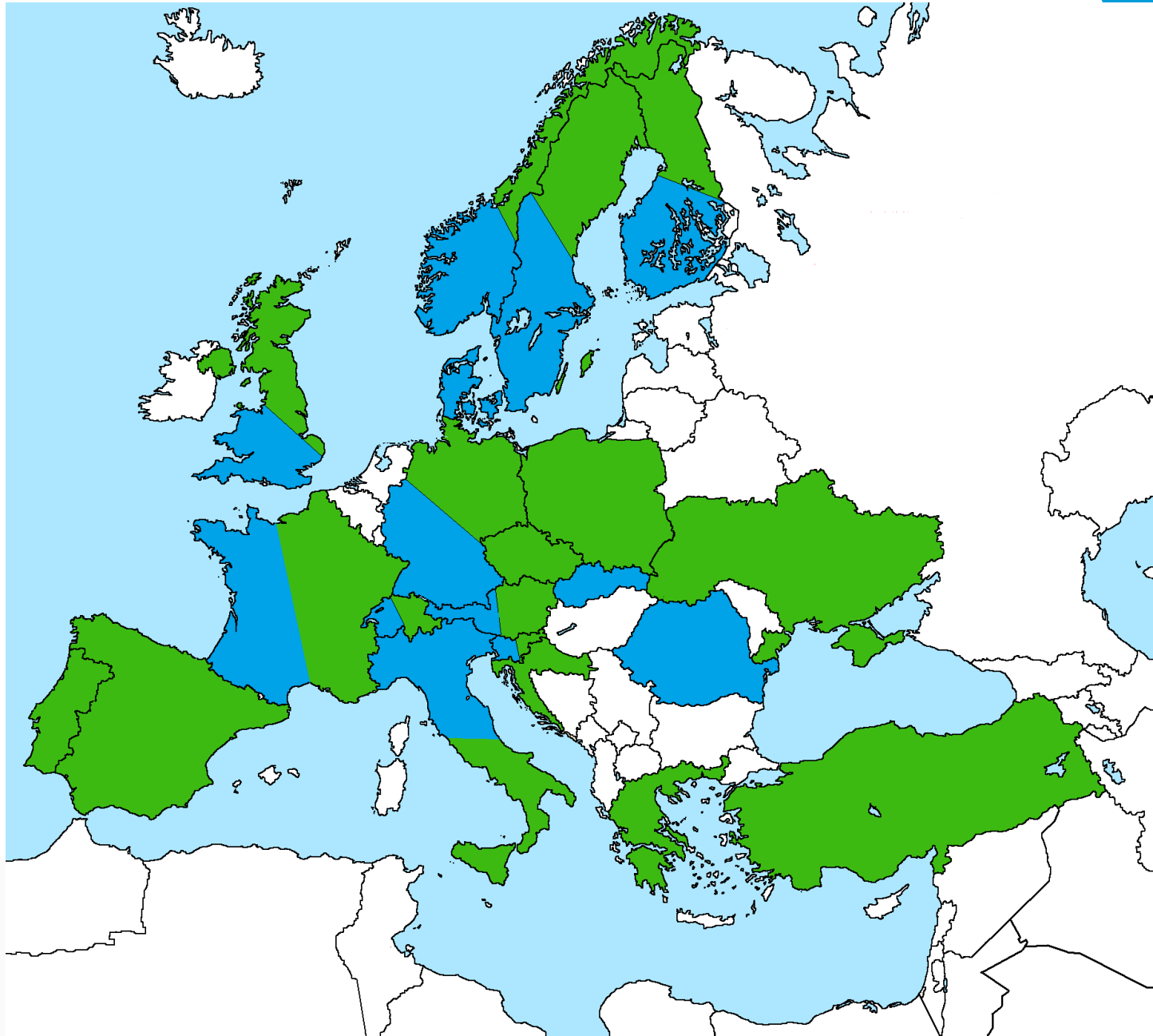
# Statistics – host country



# Statistics – applicant country

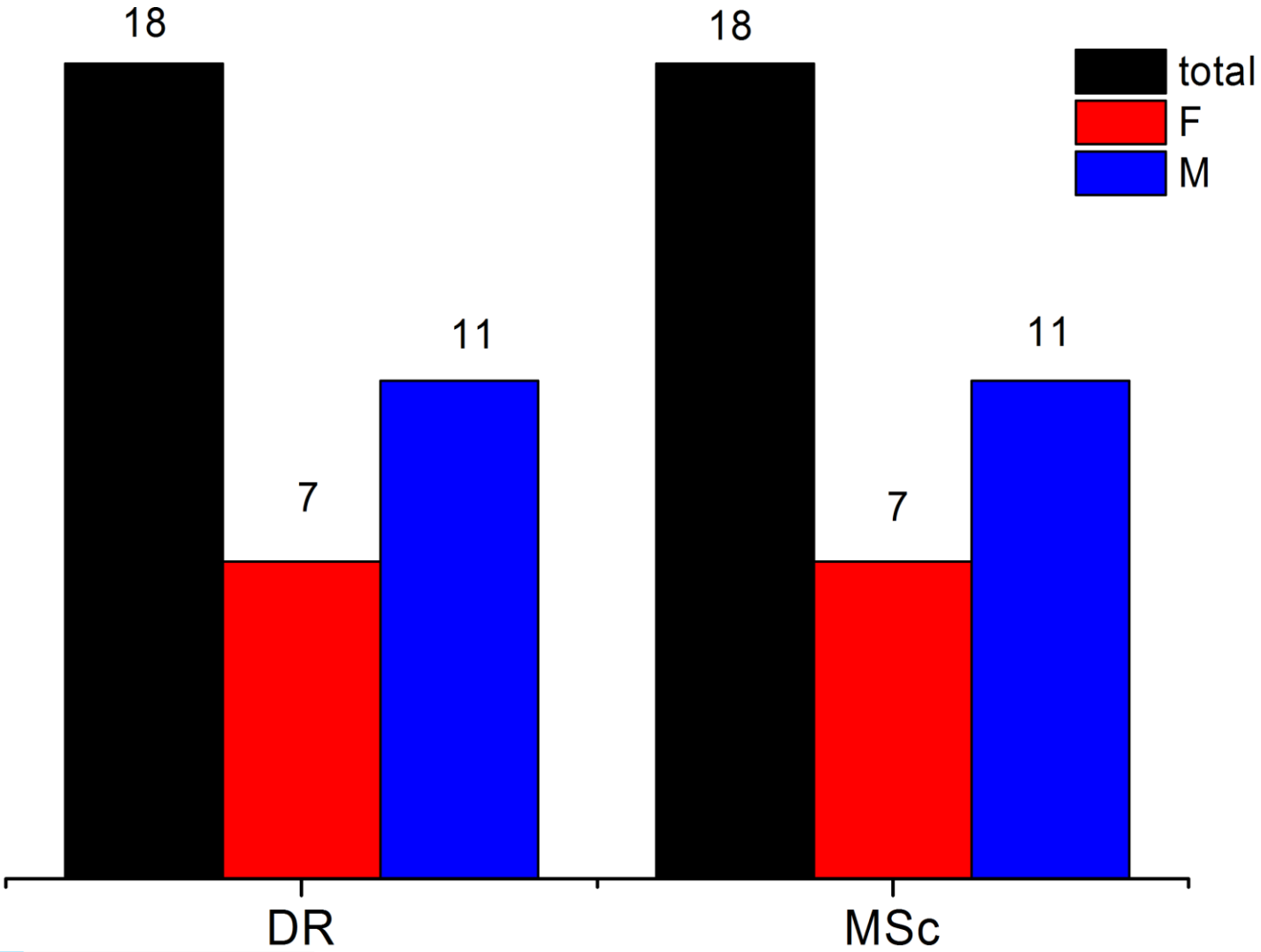


# Statistics – host country





# Statistics – applicant



# **Aim of the Action**

- **improve the knowledge on the performance of bio-based materials used as building products and the assessment of factors influencing these**
- **understanding the interlinked relationships between durability, product aesthetics, fibre-moisture relationships, decay hazards**
- **achieving a better understanding of the biology and mechanisms influencing the growth of fungi and other degrading organisms**
- **the evaluation of the efficacy of impregnation, chemical modification and surface treatments of the materials against fungal growth**
- **develop a more scientific approach to determining service life and ultimately the performance of a material as a building component**

Investigating Views of Naturalness Across Europe

Applicant: Mr. **Michael Burnard** (SI)

Host: Dr. **Mark Hughes** (FI)

- assessing how individuals across Europe perceive building materials according to their naturalness and to understand the cultural differences in the perception of naturalness across Europe.

Wood densification treatments of veneer specimens and environmental impact assessment

Applicant: Dr. **Serkan Ozdemir** (TR)

Host: Dr. **Andreja Kutnar** (SI)

- densification methods and methods and tools for environmental impact assessment of processes and products (LCA, EPD)

Forecasting the environmental issues of in-development ultralight bio-based particleboard

Applicant: Dr. **Christelle Ganne-Chédeville** (CH)

Host: Dr. **Johannes Welling** (DE)

- life cycle assessment (LCA) of ultralight particle boards with a bio-based core layer, identify weaknesses, and improve the approaches in order to get a consistent model for the forecasting the environmental impact

The life cycle assessment of novel timber treatments

Applicant: Mr. **Jinbo Hu** (FR)

Host: Dr. **Graham Ormondroyd** (UK)

- life cycle environmental impacts related to tannin-boron-treated raised lumber floor and uses LCA to quantify such impacts

Performance of post-manufacture thermally modified linear welded birch wood (*Betula pendula* Roth): shape stability, mechanical properties and environmental effects

Applicant: Dr. **Petr Cermák** (CZ)

Host: Dr. **Lauri Rautkari** (FI)

- mechanical performance, i.e. tensile shear strength, internal bonding, delamination tests, as well as LCA calculation

Boostering knowledge and information about the importance of the LCA analysis in environmental impact assessment of wooden products

Applicant: Dr. **Andreja Pirc Barcic** (HR)

Host: Dr. **Andreja Kutnar** (SI)

- Life Cycle Inventory – development of the system boundaries and data collection process for the LCA analysis

# STSM – modelling

Development of a numerical model for computation of the weather dose in natural weathering of biomaterials

Applicant: Dr. **Jakub Sandak** (IT)

Host: Dr. **Ingunn Burud** (NO)

- to develop a novel numerical model for computation of the weather dose on the base of meteorological data and other geo databases

Statistical modelling of colour change of wooden model house unit as a function of climatic exposure

Applicant: Mr. **Davor Kržišnik** (SI)

Host: Dr. **Thomas Thiis** (NO)

- to apply monitored conditions to the model to simulate the microclimate for a wooden façade and decking and further to simulate weather degradation and mould growth on the surface

# STSM – adhesives

Investigation on bonding properties of modified birch veneers using ABES machine

Applicant: Mr. **Alireza Bastani** (DE)

Host: Dr. **Anti Rohumaa** (FI)

- bonding properties of modified birch veneers (furfurylated, heat treated and melamine treated) with PF adhesive

Properties of plywood panels manufactured from thermally compressed veneer

Applicant: Dr. **Pavlo Bekhta** (UA)

Host: Dr. **Jan Sedliacik** (SK)

-effect of thermo-mechanical treatment of veneer on the properties of plywood panels made using this non densified and densified veneer and commercial phenol-formaldehyde glue resin



# STSM – adhesives

Analysis of the behaviour of bonded wood under cyclic stress

Applicant: Mr. **David Zerbst** (DE)

Host: Dr. **Peter Niemz** (CH)

- to compare the most important adhesive groups for timber construction (polyurethane, melamine-formaldehyde resin and phenolic resorcinol-formaldehyde resin) focusing on the behaviour of the bondline during alternating shear tension

Performance of adhesives on glulam made with European chestnut timber

Applicant: Dr. **Eduard Correal Mòdol** (ES)

Host: Dr. **Stefanie Wieland** (NO)

- production of prototypes of glulam with the different adhesive formulations among Dynea's formulations and testing of the performance of the adhesives

# STSM – moisture

Influence of dry-soak cycles on dim. stability and OH-group's accessibility of thermally mod. Wood

Applicant: Dr. **Petr Cermák** (CZ)

Host: Dr. **Lauri Rautkari** (FI)

- to evaluate the moisture behaviour of thermally modified wood - dimensional stability after certain drying, sorption behaviour and OH-group's accessibility by means of DVS

Influence of high humidity exposure on sorption properties and morphology of wood particles after thermal modification

Applicant: Ms. **Susanna Källbom** (SE)

Host: Dr. **Holger Miltz** (DE)

- to study the influence of earlier high humidity exposure on the sorption properties and wood particle morphology/size of unmodified wood particles before and after thermal modification

Wood-water interactions in brown-rot decayed wood characterized by low-field NMR

Applicant: Dr. **Sanne Johansson** (SE)

Host: Dr. **Emil Englund Thybring** (DK)

- the water-saturated samples (both degraded material and controls) were analyzed by low-field NMR for differentiating between LFNMR signals from water in different physicochemical environments

# STSM – fungi

Isolation of decay fungi from in-ground and above ground durability field tests

Applicant: Ms. **Linda Meyer** (NO)

Host: Dr. **Pia Larsson Brelid** (SE)

- to sample fungal isolates from field test specimens for identification and reproduction under laboratory conditions

Analysis of fungi in TMT samples

Applicant: Mr. **Lothar Clauder** (DE)

Host: Dr. **Magdalena Kutnik** (FR)

- genomic DNA extraction, quantification and identification of genotypes of different fungi on TMT wood

Studies on the material resistance & moisture performance of four european wood species

Applicant: Ms. **Carola Hesse** (DE)

Host: Dr. **Miha Humar** (SI)

- durability aspects and the resistance against soft, white and brown rot of Common juniper, Black cherry, Yew and Rowan

# **STSM** – termites and marine borer

Assessment of subterranean termite symbiotic fauna under different diets

Applicant: Ms. **Sónia Duarte** (PT)

Host: Dr. **Carl Gunnar Fossdal** (NO)

- subterranean termites captured and tested in Portugal were analyzed for their symbiotic fauna (flagellate protists) in terms of their morphological characteristics and for their lignocellulolytic capacities

Laboratory screening of thermo-mechanically densified and thermally modified timbers for resistance to the marine borer *Limnoria quadripunctata*

Applicant: Mr. **Malte Janus** (DE)

Host: Dr. **Simon Cragg** (UK)

- testing the resistance of wood against *Limnoria quadripunctata*

Microscopic evaluation of morphological changes to spruce wood after short term natural weathering

Applicant: Dr. **Anna Sandak** (IT)

Host: Dr. **Marion Noel** (CH)

- to investigate the kinetic of the degradation rate of wooden samples exposed for the short term weathering conditions through optical, scanning and atomic force microscopes

# STSM – structure

Raman imaging of naturally and artificially decay resistant wood

Applicant: Dr. **Lauri Rautkari** (FI)

Host: Dr. **Emil Engelund Thybring** (DK)

- Raman imaging to map pinosylvins in the cell walls of pine heartwood

The use of NIR spectroscopy as a quality marker of hydrothermally treated wood

Applicant: Dr. **Charalampos Lykidis** (EL)

Host: Dr. **Jakub Sandak** (IT)

- NIR spectra of hydrothermally treated with saturated steam wood



# STSM – structure

Surface characterization of spruce after natural weathering

Applicant: Dr. **Athanasios Dimitriou** (UK)

Host: Dr. **Jakub Sandak** (IT)

- colour change determination, VIS, NIR, MIR spectroscopy, determination of glossiness, XRF analysis, roughness determination

The reactivity of organosilicon compounds with wood - FT-IR study

Applicant: Dr. **Magdalena Broda** (PL)

Host: Dr. **Maria-Cristina Popescu** (RO)

- to evaluate the reactivity of various organosilicons with wood by using the infrared spectroscopy methods, and thus - to assess their influence on the performance of treated wood

# STSM – structure

Determination of the effectiveness of a combined thermal/chemical wood modification by the use of spectroscopic methods

Applicant: Dr. **Dennis Jones** (UK)

Host: Dr. **Maria-Cristina Popescu** (RO)

- combined thermal/chemical treated samples were analysed by infrared and near infrared spectroscopy to better understand chemical changes in the samples

Effect of thermal modification on the colorimetric parameters and physical properties of Eucalyptus

Applicant: Ms. **Carolina Gomes de Oliveira Griebeler** (ES)

Host: Dr. **Gianluca Tondi** (AT)

- heat treated wood was analyzed on the esthetical properties, as well as mass loss, shrinkage, equilibrium moisture content, volumetric swelling and fiber saturation point

# STSM – density mapping

X-ray density mapping of weathered wood samples

Applicant: Mr. **Petter Stefansson** (NO)

Host: Dr. **Jakub Sandak** (IT)

- to investigate the kinetic of the degradation rate of wooden samples exposed for the short term weathering conditions by X-ray for detailed mapping of wood density

# STSM – modification

Utilization and modification of the Istrska belica olive as a wood preservation treatment

Applicant: Dr. **Matthew Schwarzkopf** (SI)

Host: Dr. **Viacheslav Tverezovskiy** (UK)

- identify feasible oil modifications and prepare modified oil to be used in further wood impregnation studies

# STSM – DMTA/DMA

DMTA analysis of modified and weathered wood samples

Applicant: Dr. **Marion Noel** (CH)

Host: Dr. **Graham Ormondroyd** (UK)

- analyse the influence of humidity on solid wood modification process with bio-polyesters, and characterise naturally weathered samples exposed at several places in Europe, via Dynamic Mechanical Thermal Analysis under varying humidity

Using DMA device to characterise physicommechanical properties of archaeological oak wood treated with

Applicant: Dr. **Magdalena Broda** (PL)

Host: Dr. **Erik Larnøy** (NO)

- characterize the mechanical properties of archaeological oak wood treated with silanes by dynamic mechanical analysis

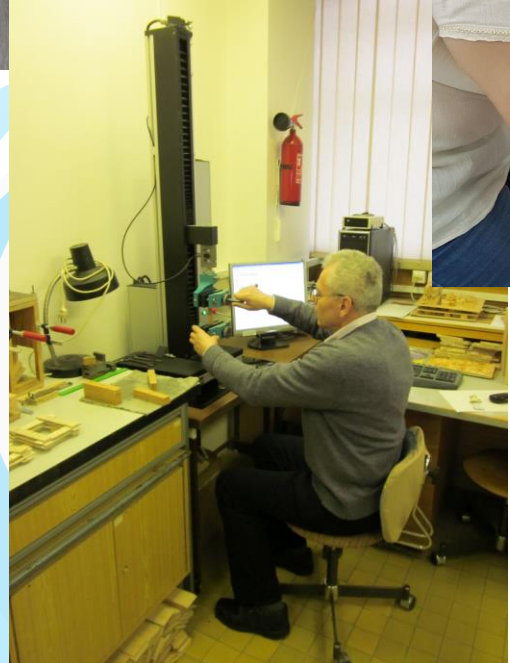
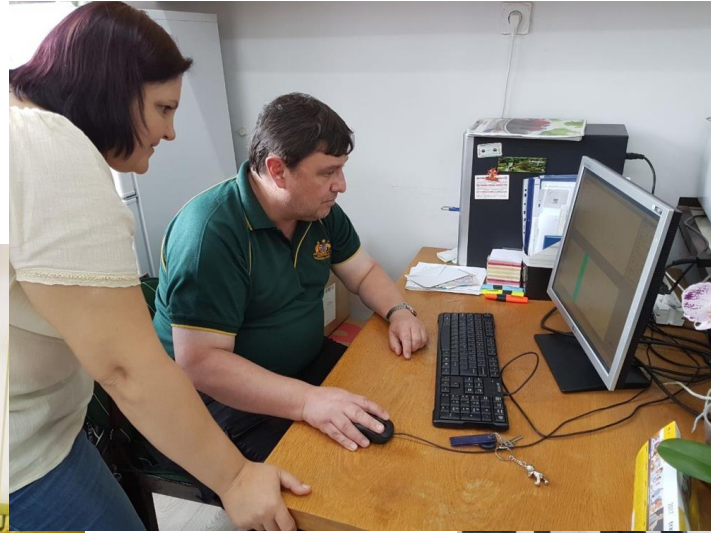
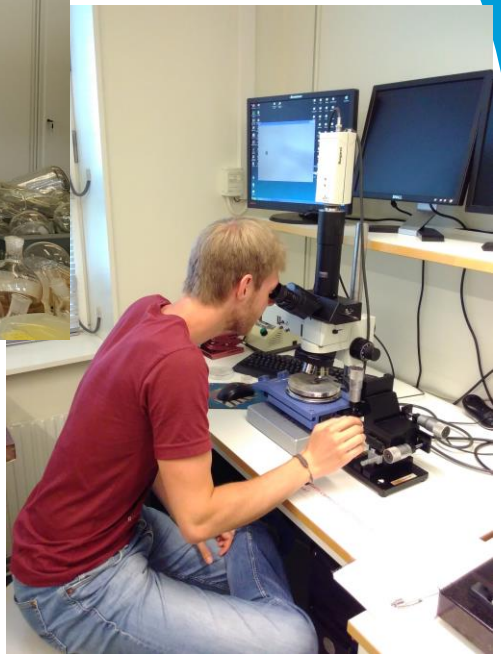
Investigation of the impact of dislocations in hemp fibres at the composite level

Applicant: Mr. **Albert Hernandez Estrada** (FI)

Host: Dr. **Jörg Müssig** (DE)

- study the impact of dislocations at the end product level, at the composite level (using for composites fibres extracted manually from the plant without any further processing and fibres that followed processing and epoxy resin)

# STSM





**Thank you!**

