



12th Erasmus Staff Training Week  
Aristotle University of Thessaloniki  
16th - 20th October 2023



# Enhancing Universities' Sustainability Teaching and Practices

## Measuring Universities' Ecological Footprint

### Preparation:

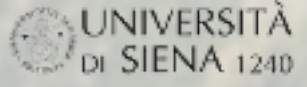
- Serena Mancini, Alessandro Galli - Global Footprint Network
- Sandra Caeiro, University of Aberta, Lisbon

Thessaloniki,  
October 18<sup>th</sup>, 2023

Presentation: [Malandrakis George](#), Associate Prof.  
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# EUSTEPs: Project factsheet

(Enhancing **U**niversities' **S**ustainability **T**Eaching and **P**ractices)



**Partners**

1. Aristotle University of Thessaloniki – GR
2. University of Aveiro – PT
3. Universidade Aberta – PT
4. University of Siena – IT
5. Global Footprint Network – USA

Funded by  
ERASMUS+  
(KA2 project)

**EUSTEPs**  
Enhancing Universities' Sustainability Teaching and Practices through Ecological Footprint

2019-2022

Intended outcome is helping shape a new generation of sustainability-conscious citizens and professionals.

**Targeted audience**

1. HEI's students
2. HEI's educators
3. HEI's management
4. HEI's administrative staff

FREE OF USE

**DELIVERABLES**

Educational Materials for sustainability teaching (EN, GR, PT, IT)

Open Online University Footprint calculator

comprised of

- Students' Module
- Educator's Module
- Administrative staff Module
- Guidelines for sustainability courses
- MOOC

FAVORS

- Hands-on experiential approach to learning

FOR

- Undergraduates
- Graduates
- All disciplines
- Administrative staff

# Ecological Footprint Introduction

Basics of the Ecological Footprint, main equations, trends and results around the world, and related indicators

# Ecological Footprint

- A University's Ecological Footprint is a measure of the use of natural resources and ecosystem services for running the activities and operations needed to:
  - provide education and
  - conduct research.





Ps  
Daily Teaching  
Footprint



Built-up areas  
infrastructures



Carbon  
sequestration



Cropland



Grazing land



Forest land



Fishing  
grounds

# THE STORY OF TODAY



# DAILY ECOLOGICAL FOOTPRINT

# BIOCAPACITY

- Measures the amount of biologically productive land and sea area available to provide the ecosystem services that humanity consumes.
- The biocapacity represents the natural capital that provides the basic life-support services, expressed as the available regenerative capacity of the biosphere.
- The biocapacity represents the ability of the biosphere to produce crops, timber, livestock as well as to absorb carbon dioxide.
- The total biocapacity of a Nation (or planet) is calculated as the sum of the biocapacity supplied by each land type.
- It depends on natural conditions but also on dominant agriculture and forestry practices.



## ECOLOGICAL FOOTPRINT: ASSESSING COUNTRIES' ECOLOGICAL BALANCE

### **Biocapacity:**

How much bioproductive area is **available to us**?



### **Ecological Footprint:**

How much bioproductive area do we **demand**?



**Biocapacity**



**Ecological Footprint**



## Unit: hectare-equivalent or **Global hectare**

The Ecological Footprint is an indicator of human appropriation of Earth's photosynthetic capacity, although expressed in hectare-equivalents.

The release of 1 t of CO<sub>2eq</sub> does not mean that this amount has actually been released (no molecule called CO<sub>2eq</sub>). Rather, it means that various GHGs with the equivalent global warming potential of 1 t of CO<sub>2</sub> have been released.

Similarly, having a per capita Ecological Footprint of 1 gha doesn't mean that 1 ha of physical land are used. It rather means that the capacity of 1 hectare-equivalents (or gha) is needed to produce (via photosynthesis) the renewable resource provisioning services consumed and to sequester the carbon dioxide emitted

# Unit: hectare-equivalent or **Global hectare**

For example, if this hectare is twice as productive as a world average, biologically productive hectare. Then it is worth 2 gha.



2 gha

For example, if this hectare is half as productive as a world average, biologically productive hectare. Then it is worth  $\frac{1}{2}$  a gha.



$\frac{1}{2}$  gha

# Ecological Footprint of Universities

# EUSTEPs University Footprint calculator

Multiple reasons for using Ecological Footprint in Universities:

**1**

## Monitoring ecological performance

*based on the consumption of natural resources and ecosystem services of the HEIs*

**2**

## Determining where the greatest impact is occurring

*Interventions area for reducing the environmental impact of universities' activities and operations.*

**3**

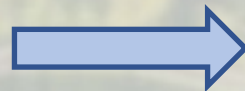
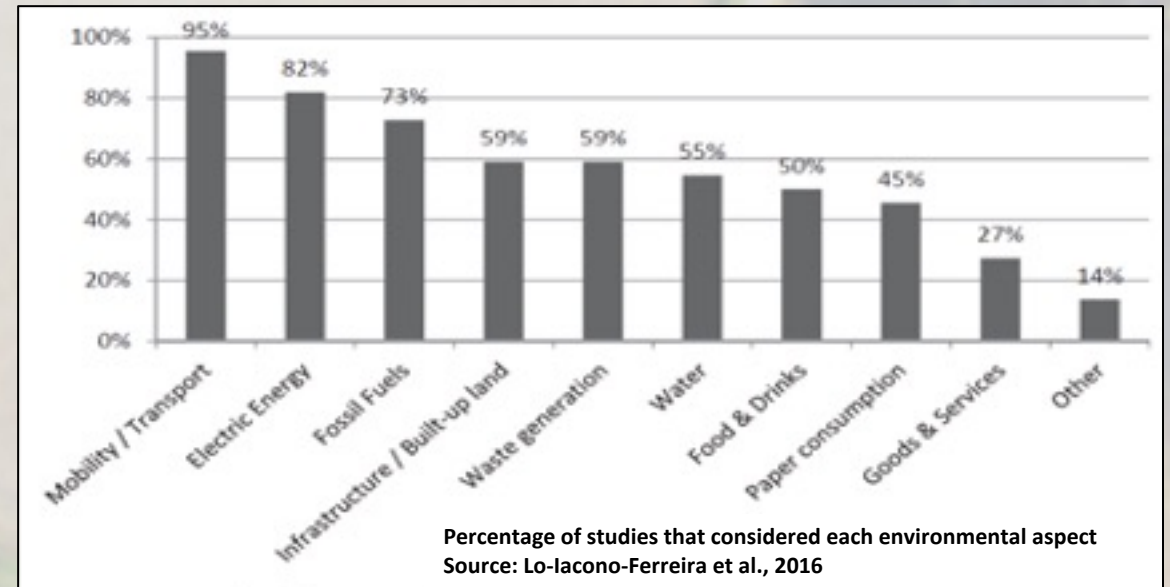
## Interactive and educational tool

*Raising awareness among staff and students by involving them in the process of calculation*

# EUSTEPs University Footprint calculator

## Process of development

1. Review of Sustainability Assessment tool in HEIs and the related indicators
2. Review of the Ecological Footprint applications to HEIs
3. Consultations with experts from different HEIs on how to develop the EUSTEPs calculator
4. Background research for conversion factors involving all Project Partners



# EUSTEPs Calculator conceptual map

## Relevant Metrics:

- gha (total)
- gha/Student
- gha/FTE

## Possible other Metrics:

- gha/Publication
- gha/Degree (graduations)
- gha/€ of research funds

### Direct control of Administration

Domains under direct control of the University

#### General Info about the HEI

#### Infrastructure / Utilities

Energy Use

Buildings & Recreational areas

Water use & Waste management

Cleaning Services

#### University's population

#### University community actions

Travels

Materials, Electronics & Equipments

Feeding staff and students

#### Holding events (future inclusion)

Conferences & Events

Sports & Athletics

### Indirect control

Footprint of **staff** and **students** outside of the direct academic environment

#### 2 Options: Tier 1 or Tier 2

Commuting

Tier 1: automatic calculation

Tier 2: data collected through surveys from a sample of staff and students

Energy at home & internet connectivity

Tier 1

Tier 2

Food at home

Tier 1

Tier 2

# University Footprint Calculator



From the EUSTEPs webpage  
[www.eusteps.eu](http://www.eusteps.eu)

Menu: Resources



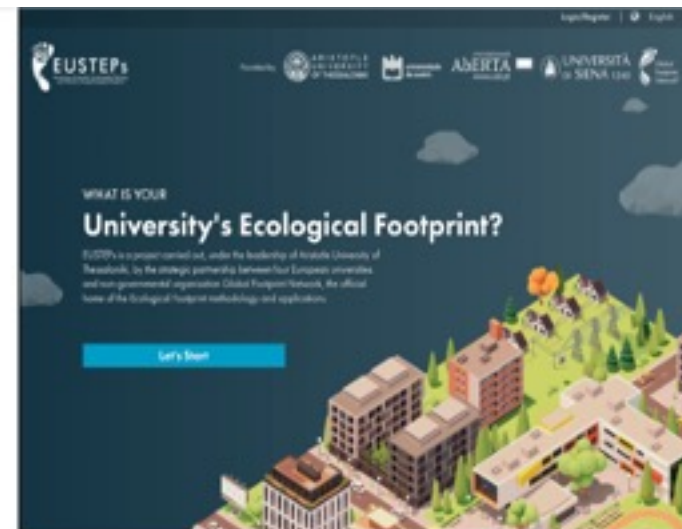
University Footprint  
Calculator

<https://www.eusteps.eu/resources/university-footprint-calculator/>

The EUSTEPs project aims to equip EU university students and the wider academic community with science-based knowledge, tools, multidisciplinary skills, and the transdisciplinary mindset needed to actively participate in the societal effort towards sustainability.

To help EU universities become transformative agents of sustainability, the EUSTEPs project has developed an open-access, online University Footprint Calculator. Conceived as an open digital tool, it allows calculating the Ecological Footprint of universities based on their consumption of natural resources and ecosystem services, and identifying interventions area for reducing the environmental impact of universities' activities and operations.

Contact us if you are interested in testing the calculator or discussing your university's Footprint results.



**CALCULATE YOUR UNIVERSITY'S ECOLOGICAL FOOTPRINT**

# Data collection process

Lessons learned from the 4 piloting Universities  
in EUSTEPs Project





# EUSTEPs Footprint Calculator landing page



# Scope and Users of the Calculator

- **Management and/or admin. bodies** of the University, possibly an office dealing with environmental or sustainability practices (e.g., a HEI's Sustainability Office)
- Anyone else: single prof/student, single departments, faculties
- For HEIs to **monitor** their consumption of natural resources and ecosystem services via a standardized methodological approach
- Identify HEI's unsustainability drivers and initiate a process of **reducing** their ecological impact, thus contributing to **SDGs 2, 11, 12, 13, and 16**.
- Streamline the collection and management of **data** required to assess the scale and significance of Footprint results (and beyond)

# EUSTEPs University Footprint calculator - Detailed results



# EUSTEPs University Footprint calculator

## Detailed results

Direct Results

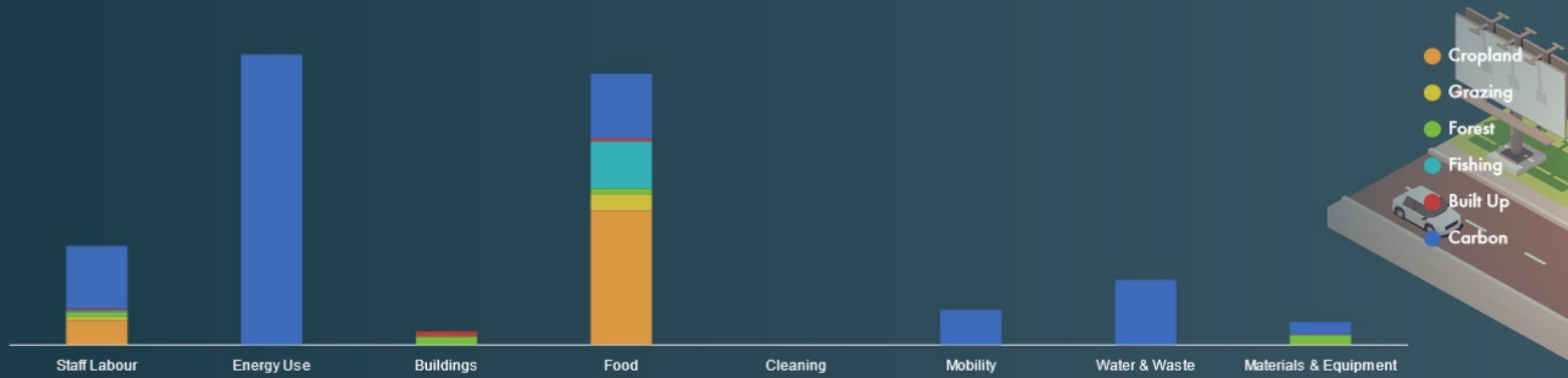
Indirect Results

Total Direct Footprint

**11.374,98**  
gha

Total Footprint

**53.302,24**  
gha





### Total Ecological Footprint of your University

Total Footprint per Student  
**0,71 gha**

Total Footprint per Staff  
**19,74 gha**

Total Footprint per Graduation  
**6,69 gha**

Total Footprint per Publication  
**22,5 gha**

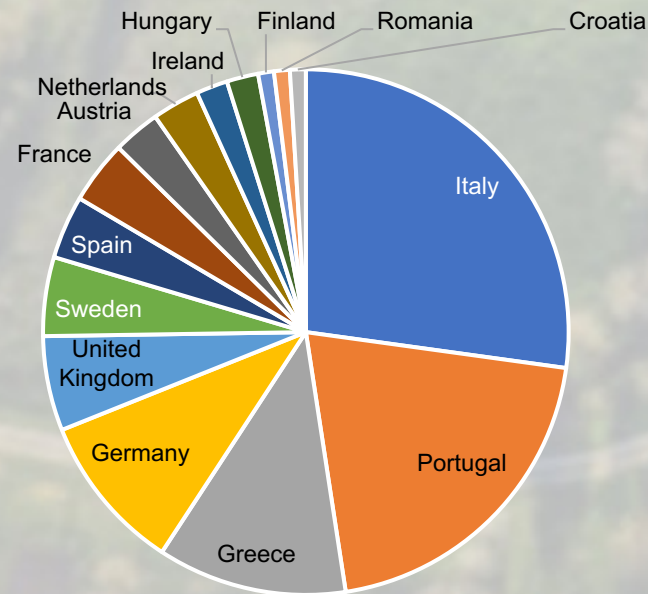
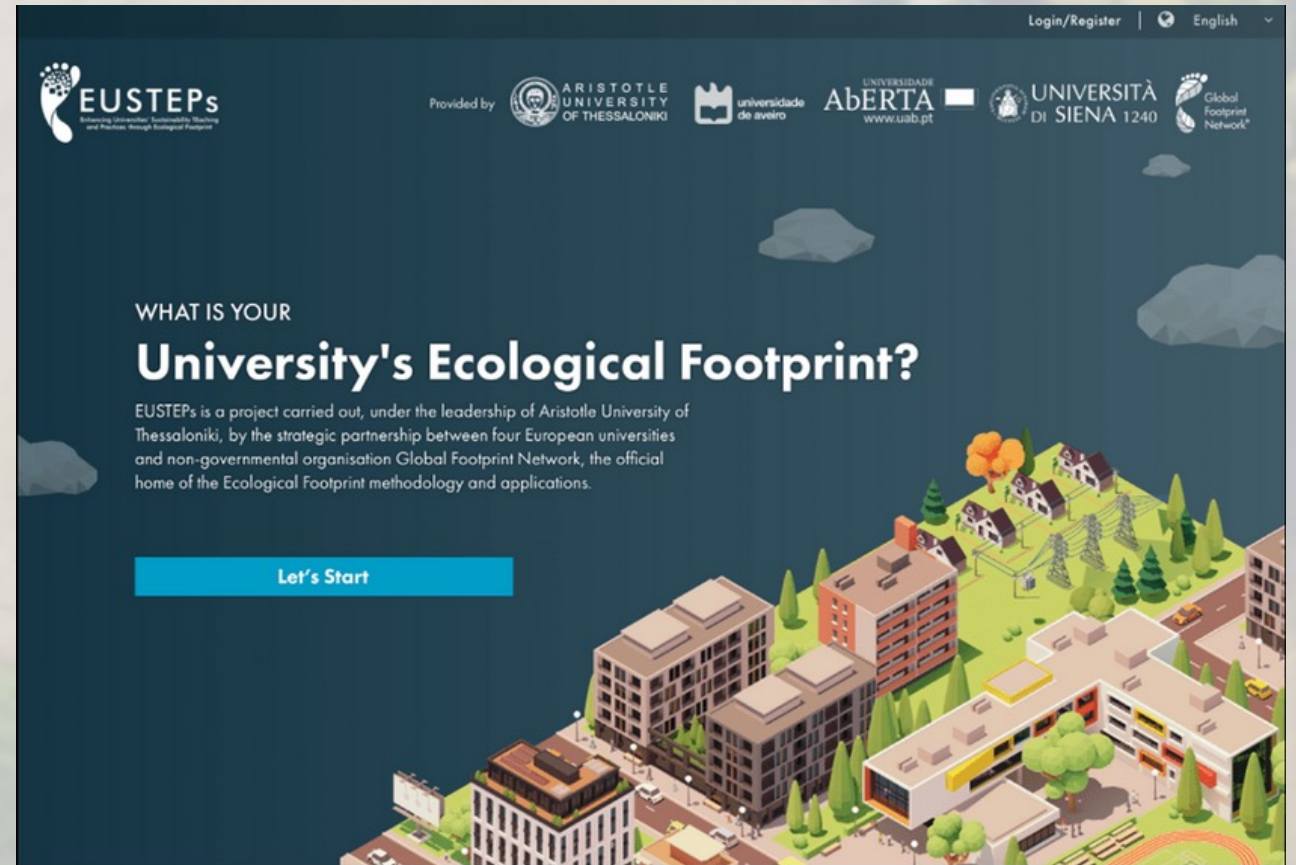
Total Footprint per Fund  
**1,09 gha**

Total Footprint  
**53.302,24 gha**

### Direct vs Indirect responsibility

- **EF per students *and* per staff:** indicate the quantity of natural resources and ecosystem services used by the University per single individual receiving (student) or providing (staff) education, respectively.
- **EF per number of graduations:** it indicates the quantity of natural resources and ecosystem services a University requires to allow a student to receive its graduation.
- **EF per publication:** it indicates the quantity of natural resources and ecosystem services a University requires to publish a peer-review Journal article in the year of reference.
- **EF per thousand euro of funds received:** allows a university to understand how resource- and ecosystem-services-intensive are the activities for which the University received financial support.

Type of user	Number
Accounts created	129
Active users	104
Countries	16
Unique Universities	≈45
UNI that completed >50%	12

**EUSTEPs**  
Enhancing Universities' Sustainability Teaching and Practices through Ecological Footprint

Provided by  
 ARISTOTLE UNIVERSITY OF THESSALONIKI  
 universidade de aveiro  
 UNIVERSIDADE ABERTA www.uab.pt  
 UNIVERSITÀ DI SIENA 1240  
 Global Footprint Network

Login/Register | English

## WHAT IS YOUR University's Ecological Footprint?

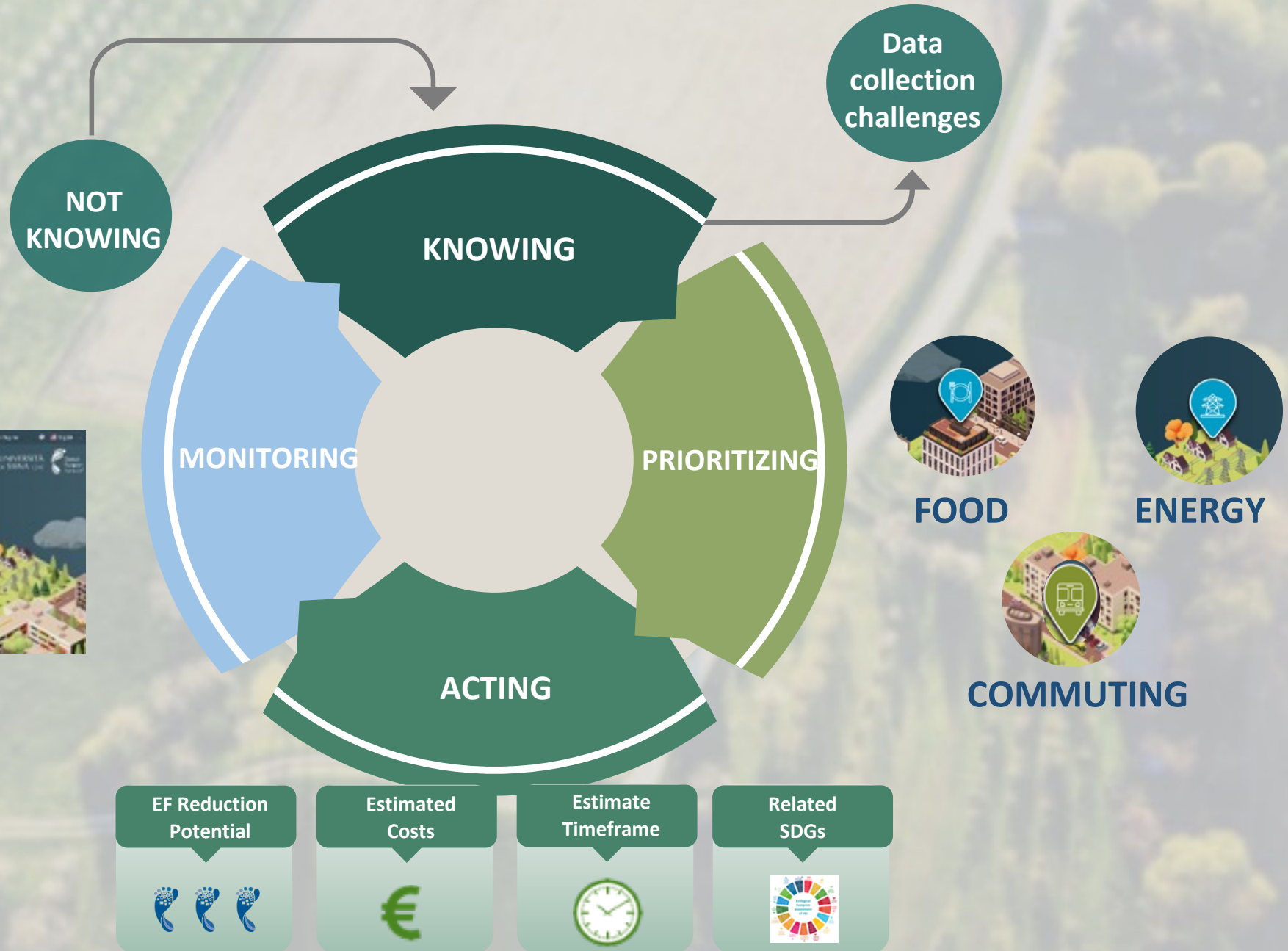
EUSTEPs is a project carried out, under the leadership of Aristotle University of Thessaloniki, by the strategic partnership between four European universities and non-governmental organisation Global Footprint Network, the official home of the Ecological Footprint methodology and applications.

[Let's Start](#)

**CALCULATE YOUR UNIVERSITY'S ECOLOGICAL FOOTPRINT**

**DOWNLOAD DRAFT CALCULATOR USER MANUAL**

# The implications of the EUSTEPs University Footprint calculator





## DATA COLLECTION RECOMMENDATIONS



### Who?

Define responsibilities



### What?

Map and Assess the required Data



### How?

Systematize Data for long-term analysis

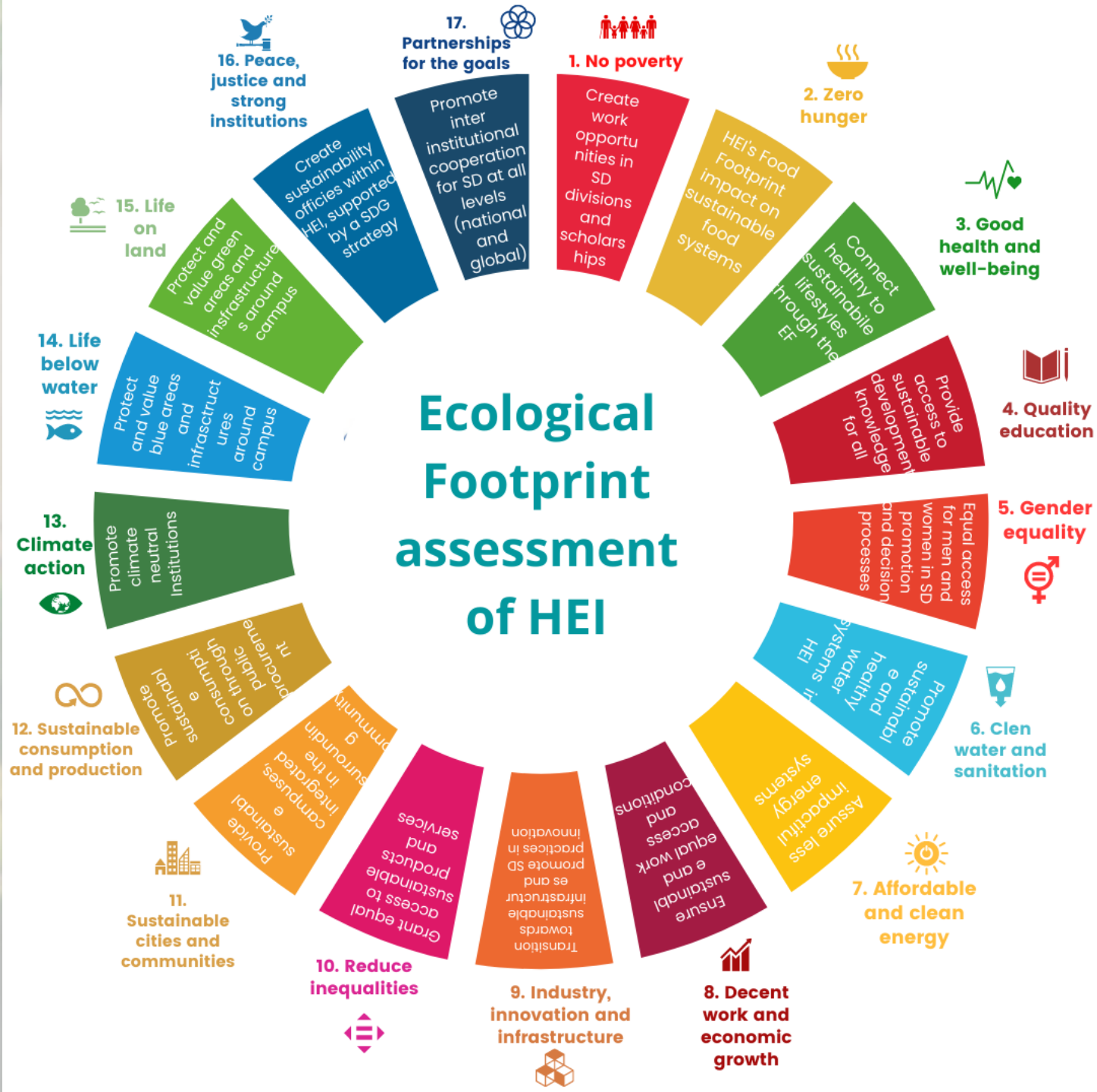




Examples of recommendations on Ecological Footprint reduction actions from the pilot application of the Calculator to the 4 Universities involved in EUSTEPs

Recommendation Goal	Description	Main category	EF Reduction Potential	Estimated Costs	Estimate Timeframe	Related SDG
Reduce food waste	Distribute campus food excess through the sale after closing time, or donate them to a local food bank/charity and redirect to food compost all the remaining food that is not distributed (assess/measure the quantity of food waste)			€		
Promote sustainable commuting	Delivery of sustainable travel initiatives (e.g. discounted monthly pass for public transport, increase the payment for car parking at the university, promote a monthly day without cars, online app for car-sharing, students' app to compete for the sustainable University-related "lifestyle") to encourage walking, cycling, use of public transport and car sharing by both staff and students.			€		
Increase the share of renewable energy sources	Increase the share of the renewable energy consumption by photovoltaic, wind, geothermal or other sources.			€€€€		
Promote the reduction of animal protein consumption in University canteens	To replace a percentage of the consumption of meat or fish by nutrient equivalent and adequate vegetarian products, ideally sourced/procured from local producers.			€		
Reduce carbon emissions from staff air travel	Encourage to reduce traveling by air (for short distances) and propose a limited number of flight trips or a carbon budget per staff.			€		

By assessing the EF of HEI and implementing actions for reductions, we can trigger the discussion within the academic community on a comprehensive sustainability strategy and the contribution to the achievement of several SDGs



# The personal Ecological Footprint calculator

Created and powered by  Global Footprint Network®

<https://www.footprintcalculator.org/home/en>

English ^

- Deutsch
- Español
- Français
- हिन्दी
- Italiano
- Português
- 繁體

Discover your personal

WHAT IS YOUR

## Ecological Footprint?

How many planets do we need if everybody lives like you?  
When is your personal Overshoot Day?

TAKE THE  FIRST STEP





# EUSTEPs

Enhancing Universities' Sustainability TEaching  
and Practices through Ecological Footprint

## Thank you for your attention!

## Any Question?

"The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflect the views of the authors only. The Commission, along with the National Authority (IKY), cannot be held responsible for any use which may be made of the information contained therein."

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