

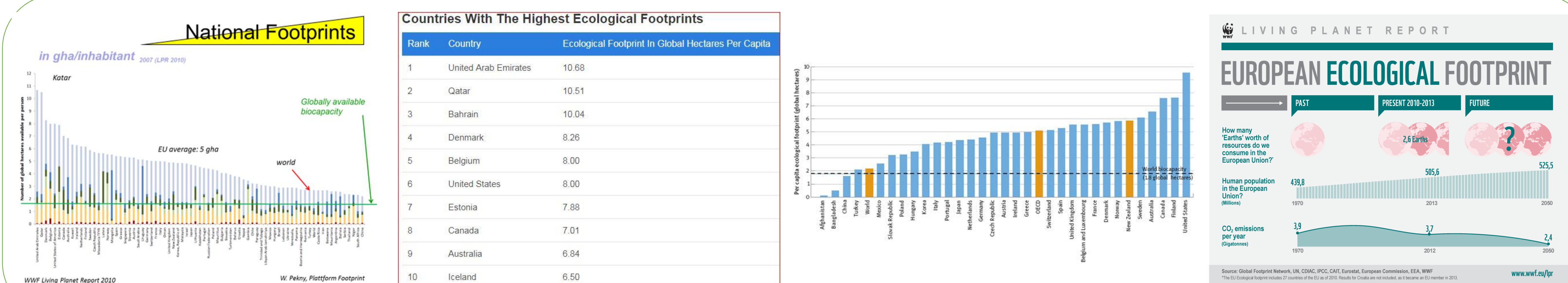
Sustainability is key to the future of mankind. Most of the sustainable development goals, defined by the UN are strongly related to the *ecological footprint*, which measures human demand on nature, expressed as a single, easy-to-understand number that is scalable from an individual to a global level. The use of this simple measure in education is being promoted by an international team of several institutions, by developing digital tools for both online and offline education under an Erasmus+ scheme. The main aim of the project is providing children aged 10-18 with sound knowledge about global ecological problems and conscious consumption using innovative methods in several European languages. The first results of this cooperation facilitating ecological education by using new digital skills on modern and widespread devices (smartphones with GPS) as well as the ways it can be integrated into different subjects according to the national curricula are presented in this poster.

Ecological Footprint: a measure of the demand populations and activities place on the biosphere in a given year, given the prevailing technology and resource management of that year. [1]

Biocapacity: a measure of the amount of biologically productive land and sea area available to provide the ecosystem services that humanity consumes – our ecological budget or nature's regenerative capacity.

Ecological Footprint and biocapacity values are expressed in mutually exclusive units of area necessary to annually provide (or regenerate) such ecosystem services. They include: cropland for the provision of plant-based food and fiber products; grazing land and cropland for animal products; fishing grounds (marine and inland) for fish products; forests for timber and other forest products; uptake land to neutralize waste emissions (currently only the areas for absorbing anthropogenic carbon dioxide emissions are considered); and built-up areas for shelter and other infrastructure. [2]

The aim of the “*e-co-foot*: E-co-logical Footprint Training - digital resources for online and offline education” Erasmus+ 2017-1-AT01-KA201-035037 project is to provide *online and offline learning and teaching material, background material and software and e-learning tools* in 5 European languages in an international collaboration, between **akaryon GmbH**, a research based Austrian SME specialized in environmental educational informatics, the Viennese NGO **Plattform Footprint**, the **Savaria Chemistry Department of the Eötvös University** in Hungary, the Greek **Environmental Education Center Pertouliou-Trikkeon** and the **Vasile Lovinescu College**, a Romanian VET high-school providing courses in ecology and environment.



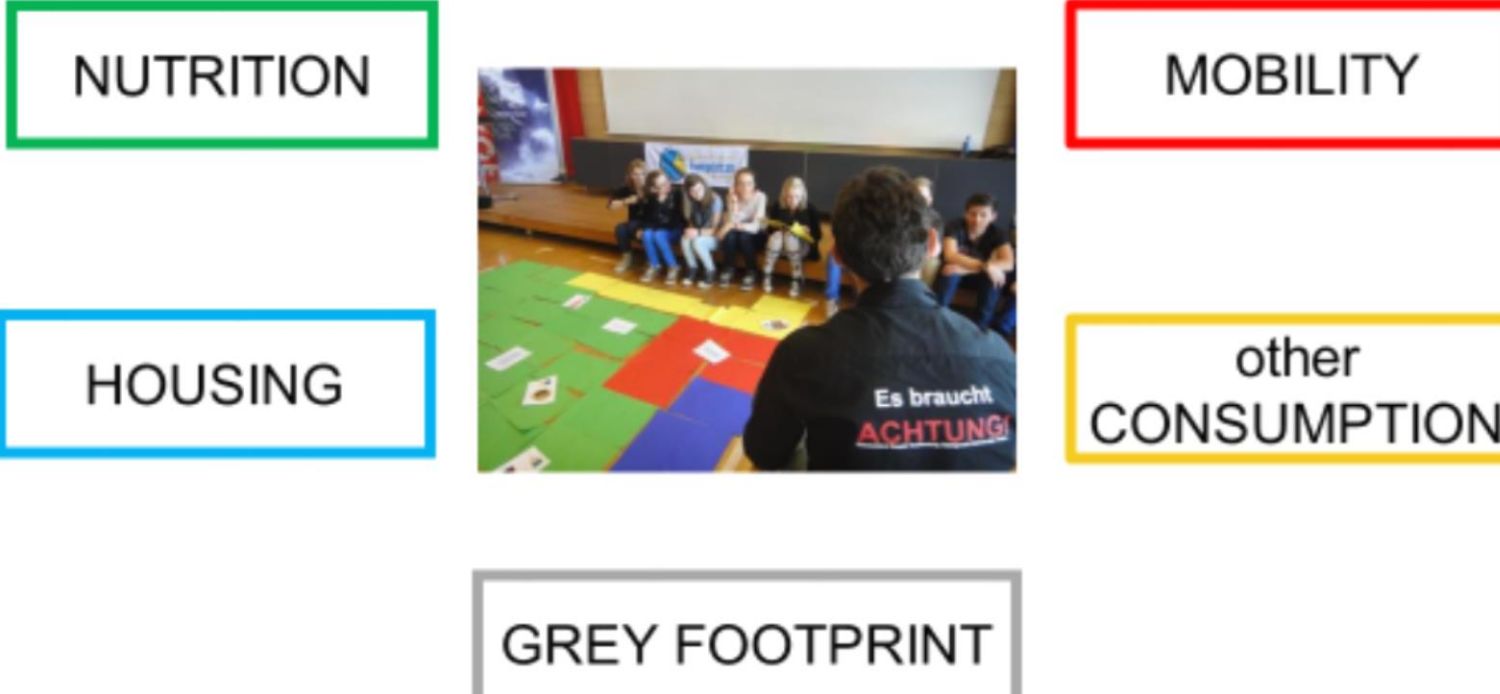
Mini hectare workshop

One of the teaching methods proposed by Plattform Footprint, is the so-called mini hectare workshop, where each pupil (or group of them) can calculate an estimate of the ecological footprint, which is based on his/her own lifestyle and consumption. They can compare it to a fair share of an average citizen expressed in global hectares per year (gha/yr). This can be easily calculated, if you divide the total biocapacity by the total number of people living on Earth. The four main categories where our everyday life (on an individual level) impacts the biocapacity of Earth is: Nutrition, Housing, Mobility and Other consumption.

Healthy nutrition – food pyramid
How often do you eat meat?
Transportation – how long does your food travel?
Healthy lifestyle – sports, local food, no overweight

Size of house/apartment?
When was it built?
Heating mode?
Energy efficiency? (insulation)
How can you save energy?

Mini-Hectare-Workshop
Cover the playing field with game pieces representing your needs for one year



How much do you travel (distance)?
Where do you go for vacation?
What means do you use for travel? - on foot – by bike – using public transport – by car – by airplane

paper consumption
furniture
sports equipment
clothing
electronics: PC-laptop, mobile phone

The part of the ecological footprint that is not attributed to individual people, but to the "**community**", i. e. all people who use these facilities. E.g.: Footprint of roads, hospitals, schools, fire brigades, courts, police and public buildings.

How to teach sustainability in Hungary? (legal background and regulation)

- National Sustainable Development Strategy
- Law governing education
- National curriculum
- National Program for Environment Protection
- Thematic week on sustainability

The Fundamental Law of Hungary.
Foundation P) (1) – Natural resources, in particular arable land, forests and the reserves of water, biodiversity, in particular native plant and animal species, as well as cultural assets shall form the common heritage of the nation; it shall be the obligation of the State and everyone to protect and maintain them, and to preserve them for future generations.

School subjects most fit for this program (through the entire 12 school years)

- Foreign language(s) (English, German, etc.)
- Ethics 5-12
- Our environment 1-4
- Nature 5-6
- Biology 7-12
- Science subjects (geography, physics, chemistry)

Teaching materials – teacher training

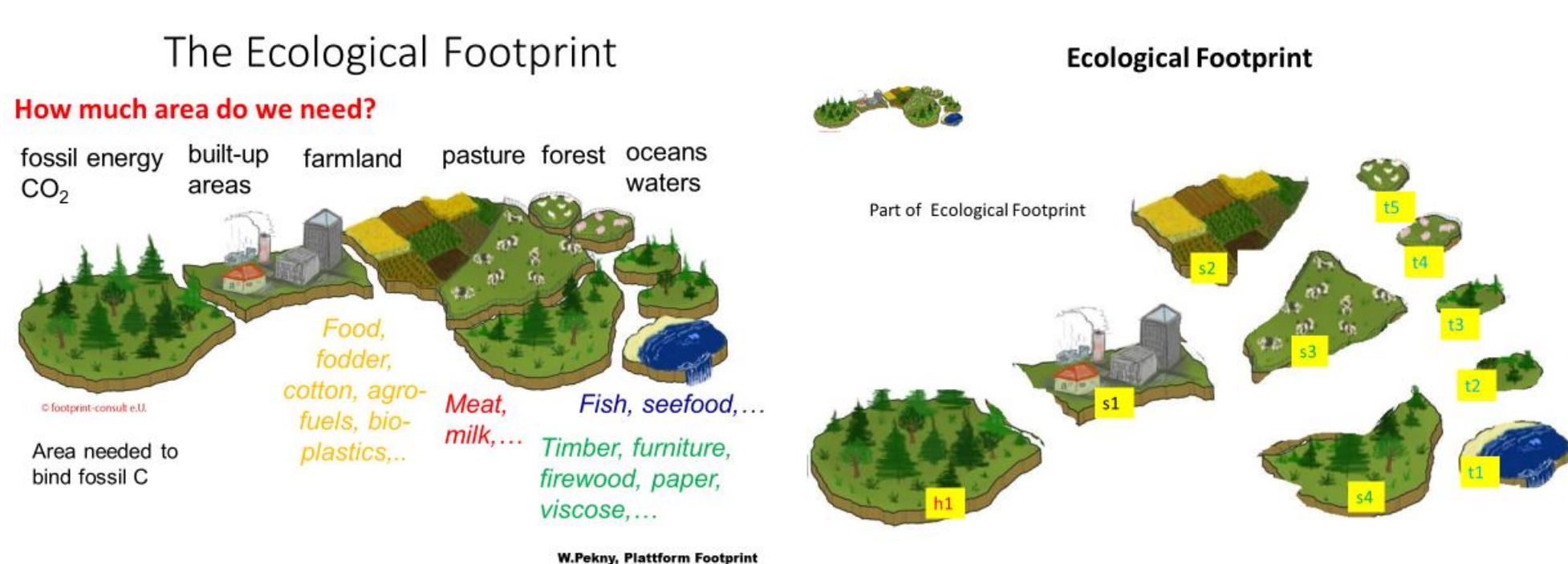
- Guide to starting points for teachers of different school subjects – min. 2 versions
- Background information on learning units
- Different depth of content, methodology and didactics for age 10-13 and for age 14-18
- Guide to excursions, class project lessons, projects on Ecological Footprint
- Course material for teacher training

Software tools

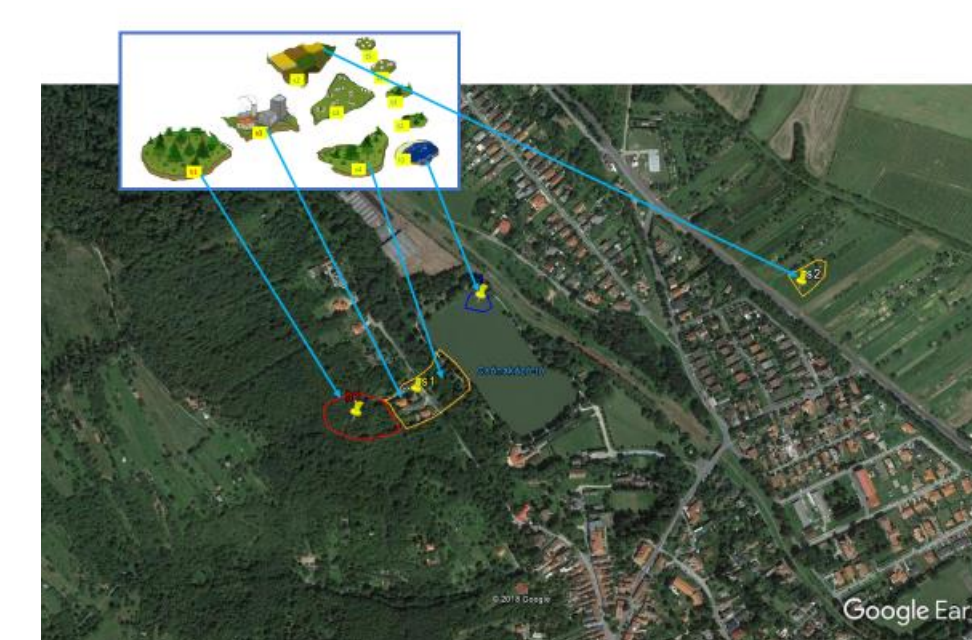
- Ecological footprint calculator
- Social media tools
- E-learning tools
- Moodle course
- Virtual Eco Footprint – GPS Smartphone app**

Virtual Eco Footprint

Global hectare workshop outdoors. Proposal: take pupils out into nature and walk around your ecological footprint using your GPS-smartphone



- Outdoors on a real acre of land.
- You can associate such "virtual footprints" with food, housing etc, or you can find a specific type of land (forest, cropland etc.) for the footprint.
- Mark points and make it visible using an app (e.g. Handy GPS) in a suitable file format (e.g. kml) using Google Earth software.



- [1] M. Wackernagel, W.E. Rees: *Our Ecological Footprint: Reducing Human Impact on the Earth*, New Society Publishers, Gabriola Island, BC (1996)
[2] M. Borucke et. al.: *Accounting for demand and supply of the biosphere's regenerative capacity: The National Footprint Accounts' underlying methodology and framework*, *Ecological Indicators*, 24, 518-533 (2013) <https://doi.org/10.1016/j.ecolind.2012.08.005>