The Product Environmental Footprint in the agrifood sector
The PEFMED project experience

ENEA
Biotechnology and Agroindustry Division, *Nicola Colonna* PhD
Casaccia Research Center, Rome, Italy

"Best Practices Exchange Conference on soilless crops in the Mediterranean"
26_03_2021

Project co-financed by the European Regional Development Fund

Agriculture sustainability challenges

- Global Health and environmental concerns
- Public debate on pesticides, GHG emissions, W.E.F. Nexus
- Increasing consumer awareness
- Innovations in production systems
- Green Market evolution
- Certification schemes and labelling

Project co-financed by the European Regional Development Fund

Environmental/Energy labels

Project co-financed by the European Regional Development Fund

ENVIRONMENTAL PRODUCT DECLARATION SYSTEMS

Current EPD systems available in the agri-food sector

Name	website
The international EPD® system	http://www.environdec.com/
EPD Norge	http://www.epd-norge.no/
Earthsure®	https://iere.org/programmes/earthsure/
Ecoleaf environmental label	http://www.ecoleaf-jemai.jp/eng/index.html
Sustainability measurement and reporting system (SMRS)	http://www.sustainabilityconsortium.org/smrs/

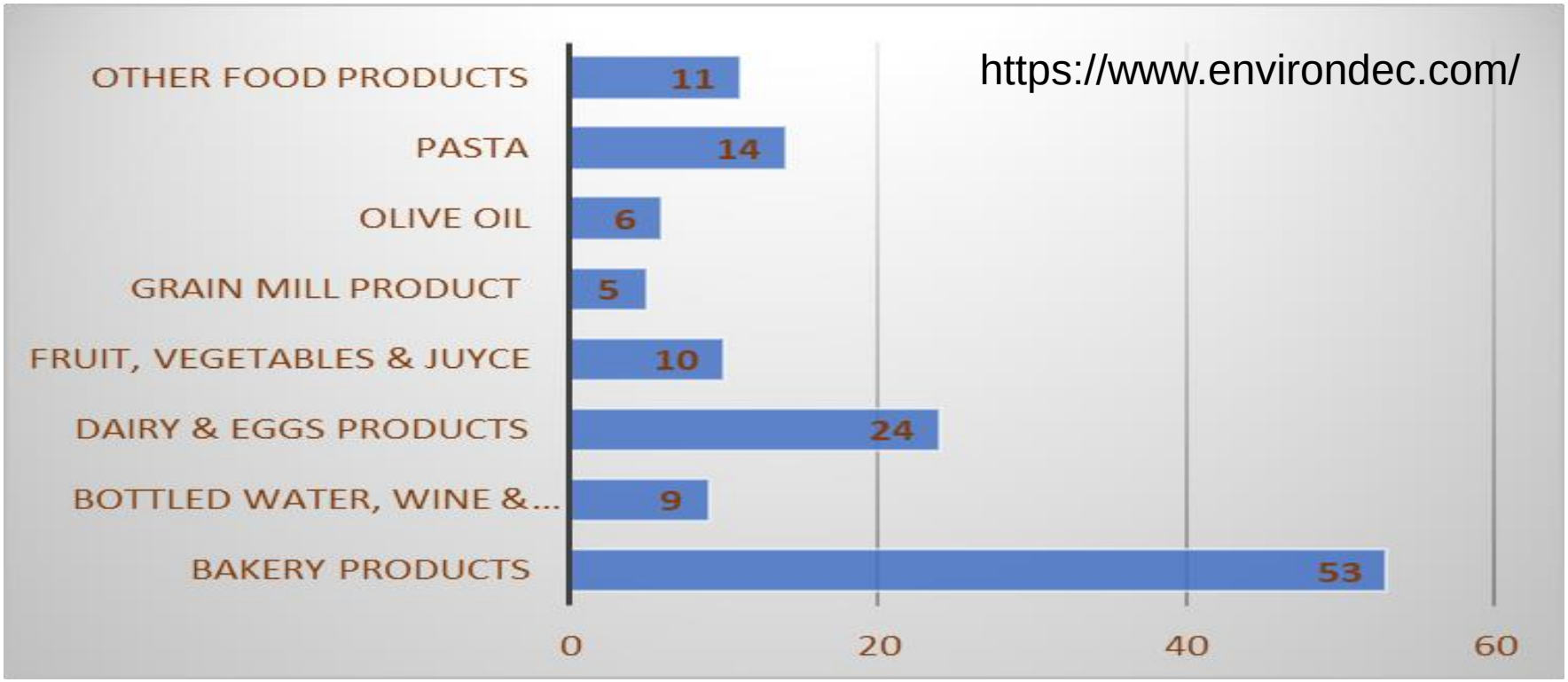
Source: Notarnicola et al. 2015, Life Cycle Assessment in the Agri-food Sector, Springer

There are several among these, the most widespread and well-known is the Swedish one from Environdec.

Project co-financed by the European Regional Development Fund

ENVIRONMENTAL PRODUCT DECLARATION

In the Italian agri-food sector we currently have 132 EPDs belonging to 22 companies. .



These labels also involve important brands of the Made in Italy agri-food sector

Project co-financed by the European Regional Development Fund

policy debate > market is changing

- Companies using «environmental standards» **are exposed to this change to stay competitive**

- The green innovation challenges: not the single enterprise but the **whole agrofood local productive system**
-
- Sharp actions should be undertaken to support **the green innovation in the Mediterranean agrofood communities** to maintain and enhance competitiveness

Project co-financed by the European Regional Development Fund

Single Market for green products

The European Commission (2013), as part of the initiative for the creation of a Single market for Green products, has launched a series of initiatives aimed at reducing business costs and the **confusion** of consumers facing to the **multiplicity** of environmental certifications and ecological labels present today, proposing the definition of a **methodology for measuring** the environmental performance of products in the life cycle called **Product Environmental Footprint** (PEF).

Project co-financed by the European Regional Development Fund

European Product Environmental Footprint

- Methodology for the **quantification** of the environmental footprint of products

- Based on existing methods and standards **(Life Cycle Assessment)**

- It covers a **broad range** of environmental impact indicators

- Based on **PEFCR** - **Product Environmental Footprint Category Rules**: "Product category specific, life-cycle-based rules that complement general methodological guidance for PEF studies by providing further specification at the level of a specific product category."

Project co-financed by the European Regional Development Fund

Product Environmental Footprint Category Rules

Purposes of PEFCR:

- To provide specific **guidance** for calculating and reporting products' life cycle environmental impacts;
- To focus on the most important **parameters** in determining the environmental performance of a given product;
- To allow the **comparability** between PEF calculations within the same product category.

Project co-financed by the European Regional Development Fund

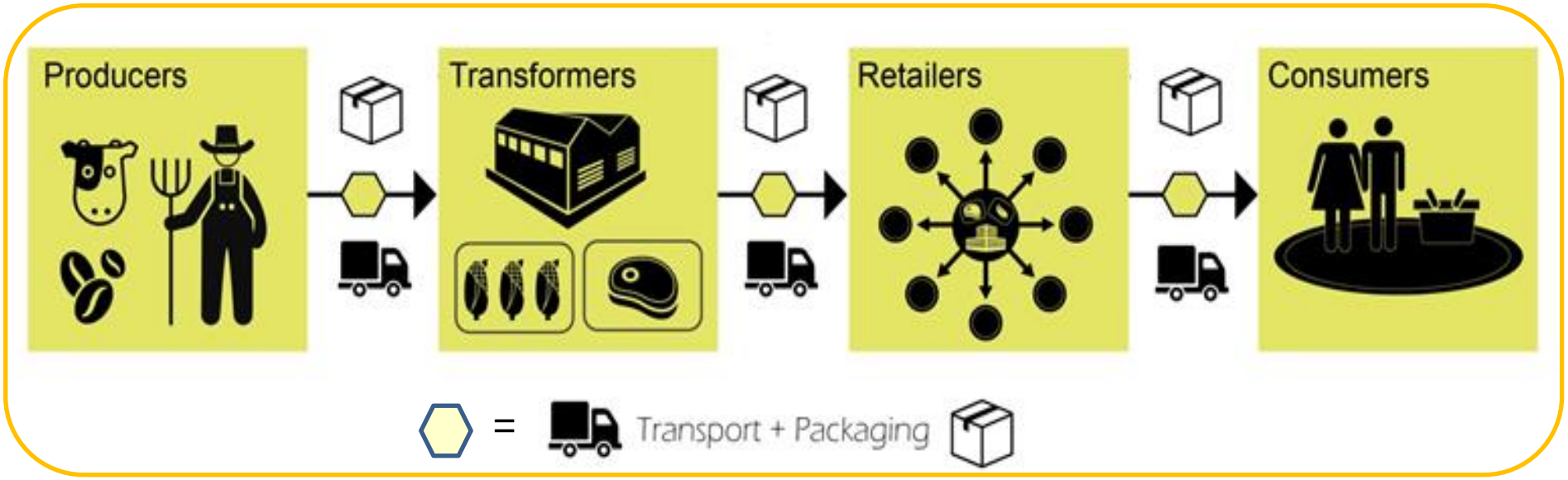
Life Cycle Evaluation

A complex and costly **analytical accounting** of all resources of any nature used during the entire life of a product from cradle to grave (in the food sector it becomes from **Farm to Fork**)

Fonte immagine: National Institute of Standards and Technology

Project co-financed by the European Regional Development Fund

Life cycle of agri-food products



Agri-food supply chains varying in space, in length, complexity and in the number of actors involved

Wide heterogeneity of products and markets

Project co-financed by the European Regional Development Fund

Product groups of the pilots (PEFCRs)

1st wave of pilots

- Batteries and accumulators
- Decorative paints
- Hot & cold water pipe systems
- Liquid household detergents
- IT equipment
- Metal sheets
- Non-leather shoes
- Photovoltaic electricity generation
- Stationary
- Intermediate paper products
- T-shirts
- Uninterrupted power supplies
- Retailer sector
- Copper sector

2nd wave of pilots

- Leather
- Thermal insulation
- Beer
- Coffee
- Fish
- Dairy products
- Feed
- Meat
- Pet food
- Olive oil
- Pasta
- Wine
- Packed water

PEFMED

Uptake of the Product Environmental Footprint across the MED agrofood regional productive systems to enhance innovation and market value

Following the results of the **pilots performed by EC in 2014-2015**, the overall objective of PEFMED project was **to test the applicability of the new EU PEF method** for some specific product groups in **9 MED agrofood regional systems.**

Time frame:	1/11/2016 to 31/4/2019
Duration:	30 months
Total budget	2.438 kEuro
Partners	9

Project co-financed by the European Regional Development Fund

PROJECT OBJECTIVES

- PEFMED represents the 1st verification in Europe of the PEF standards **within given territorial domains**.

- **Strengths** connection & cooperation between LCA research & ecoinnovation experts and agrofood business organization in MED Countries **by providing a set of technology, organizative & market intelligence drivers.**

- To **guide** a mind-change in traditional agrofood productions model towards PEF-compliant measures

Project co-finance
Regional Developr

Project co-financed by the European
Regional Development Fund

What we test in a product chains?

PEFCR of each product group, to identify:

- ***life cycle "hot spots"*** and compare the environmental footprint against the european benchmark *(distance to target)*

- **PEF benchmark:** A standard of reference against which any comparison can be made.
- It refers to the *average* environmental performance of the representative product ***sold*** in the EU market. A benchmark can be used, to compare the environmental footprint of a product belonging to the same category.

Project co-financed by the European Regional Development Fund

PEF – Impact Categories

ENVIRONMENTAL IMPACT CATEGORY	UNIT of MEASURE	REFERENCE SOURCE
Climate change	kg CO_2 eq.	IPPC 2007
Ozone depletion	kg CFC-11 eq.	WMO 1999
Human toxicity – Cancer effects	CTUh	USEtox (Rosenbaum et al., 2008)
Human toxicity – Non-cancer effects	CTUh	USEtox (Rosenbaum et al., 2008)
Particulate matter	kg PM2.5 eq.	Rabl and Spadaro (2004) and Greco et al (2007)
Ionizing radiation	kg U^{235} eq.	Frischknecht et al. (2000)
Photochemical ozone formation	kg NMVOC	Van Zelm et al. (2008)
Acidification	Mol H+ eq	Seppala et al 2006, Posch et al (2008)
Eutrophication terrestrial	Mol N eq.	Seppala et al.2006, Posch et al 2008
Eutrophication freshwater	kg P eq.	ReCiPe2008
Eutrophication marine	kg N eq.	ReCiPe2008
Ecotoxicity freshwater	CTUe	USEtox (Rosenbaum et al., 2008)
Land use	kg C deficit	Mila i Canals et al (2007)
Resource depletion – Water	m^3 water eq.	Swiss Ecoscarcity 2006
Resource depletion – Mineral, fossils and renewables	kg Sb eq.	Van Oers et al (2002)

Each category has a defined unit of measure and a source for definition and calculation method.

Project co-financed by the European Regional Development Fund

Products below EU benchmark

- ***GOAL: Pushing products below EU benchmarks towards PEF-compliance, by* profiling *econoinnovation scenario*** (set of technological and managerial alternatives)

PEF compliant products

- ***GOAL: Exploring market potential of "best in class" PEF-compliant productions***
  Trasform a positive environmental footprint assessment in a ***marketing leverage and territorial trademark*** by means of quality, traceability and transparency (designing of a marketing strategy).

Project co-financed by the European Regional Development Fund

Other outcomes and Lesson Learned

- **Transnational methodology** to extend the PEFMED approach **outside** the tested regions.
- **National roadmaps** for environmental footprint sustainability in MED productions
- **Methological contribution** to European DG ENV about the application of PEF to agri-food chains.

- **Complex methodology SMEs needs expert consultants to apply it properly**
- **Time consuming but very useful to introduce systematic monitoring of all the production phases**
- **Semplification are needed**

Project co-financed by the European Regional Development Fund

WHAT ABOUT HORTICULTURE?

- Till now there are no Pilots performed about horticultural sectors
- Many research activities are in progress to set category rules about some specific productions

Project co-financed by the European Regional Development Fund

WHERE ARE WE?

At European level, the communication strategy of the PEF is still being defined. Now we are in a **transition** phase

In Italy, the application of the PEF is already the basis of the **Made Green in Italy brand**, promoted by the Ministry of the Environment, in force since 13 June 2018.

MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE
MADE GREEN
IN ITALY

Project co-financed by the European Regional Development Fund

LIFE MAGIS – Made Green in Italy Scheme

A project **coordinated by ENEA and e co-funded by the EU LIFE Programme** (09/2019 – 12/2022), to support the **diffusion of the "Made Green in Italy" scheme (MGI)**, promoted by the Italian Ministry of the Environment to valorise Italian products with the best environmental performances, **and the Product Environmental Footprint (PEF) method** the MGI scheme is based on.

The partners are **research institutions and universities, trade associations, consortia and cooperatives**:

ENEA
ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES, ENERGY AND SUSTAINABLE ECONOMIC DEVELOPMENT
COORDINATOR

apo conerpo

CONSORZIO LEGNOLEGNO

Unione Italiana Food
qualità, gusto e piacere

NaB Institute of Sustainability in Civil Engineering | RWTH AACHEN UNIVERSITY

INSTITUTE OF MANAGEMENT Sant'Anna School of Advanced Studies – Pisa

LINEAPELLE

CNR-IBE Institute of BioEconomy

Goals and activities

- **Guidelines to apply PEF and MGI** to different product categories (i.e. draft PEFCRs)

- Videos, social campaigns, mobile app, in-store activities to test the most effective ways **to communicate the environmental profile of products**

- **Tools to support companies** willing to approach PEF and MGI

Project co-financed by the European Regional Development Fund

Interreg Mediterranean PEFMED

ENEA
Italian National Agency for New Technologies, Energy and Sustainable Economic Development

Please for more informaton write to

nicola.colonna@enea.it

To deepen the topic

Website https://pefmed.interreg-med.eu/ **Wiki platform**: https://www.pefmed-wiki.eu/

Website Life MAGIS https://www.lifemagis.eu/index.php/en

This report is based on the materials produced as part of the European PEFMED project coordinated by ENEA, eng. Caterina Rinaldi, and the Life MAGIS project coordinated by eng. Sara Cortesi

Project co-financed by the European Regional Development Fund