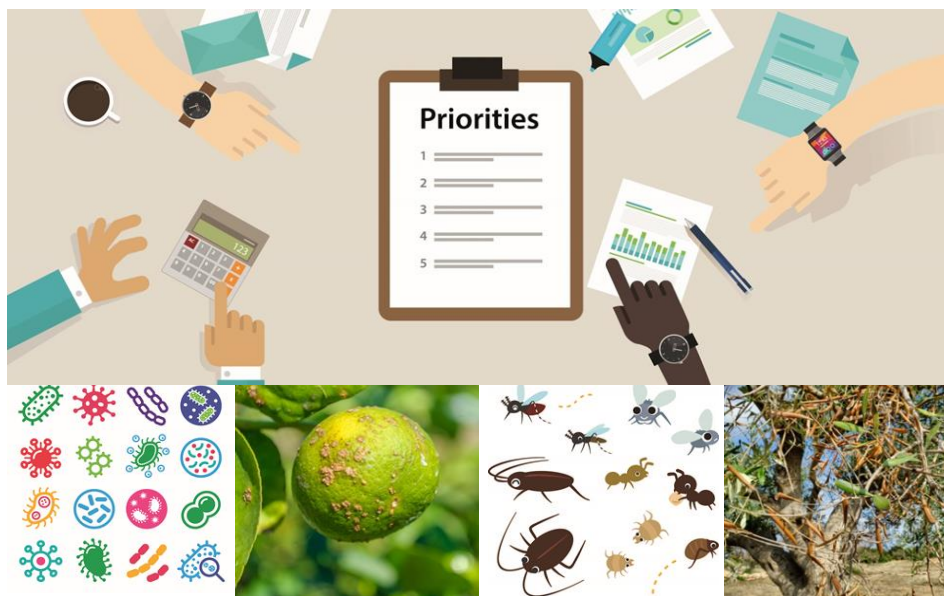


# Developing a methodology to prioritize EU plant pests based on socio-economic and environmental impacts: **The Impact Indicator for Priority Pests (I2P2)**



**Berta Sánchez**

Jesús Barreiro-Hurle

Emilio Rodríguez-Cerezo

Iria Soto-Embodos

Mihaly Himics

European Commission

Joint Research Centre (JRC)

Unit D.4 Economics of Agriculture

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# Joint Research Centre (JRC)

*"As the science and knowledge service of the Commission our mission is to support EU policies with independent evidence throughout the whole policy cycle"*

**3000 staff** Almost 75% are scientists and researchers. Headquarters in Brussels and research facilities located in **5 Member States**:

- Belgium (Geel)
- Germany (Karlsruhe)
- Italy (Ispra)
- The Netherlands (Petten)
- Spain (Seville)



# EU legal framework for Plant Health



*Xylella fastidiosa* is just an example: numerous pests and diseases are listed as quarantine pests for the EU

*How to establish EU-wide priorities when resources are limited*

# The new plant health regulation

## Regulation (EU) 2016/2031

Article 6 (1) defines priority pests

Pests whose **potential economic, environmental or social impact** is the most severe

Article 6(2) empowers the EC to adopt a delegated act establishing a list of priority pests based on specific criteria (Annex I)

Technical assistance based on

**JRC** scientific expertise

**EFSA** extrapolation of technical and scientific data related to those pests

# OBLIGATIONS FOR PRIORITY PESTS

Special provisions in place as regards:

- Information to the public
- surveys
- contingency plans
- simulation exercises
- action plans for eradication and
- co-financing of measures by the Union



# Partners and roles



Mandates to EFSA and JRC for support on ranking priority pests  
List of Union Quarantine pests to be assessed and executive decisions on weights of individual indicators or decision rules (cut-off value; number of pests)

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Development and application of a methodology to evaluate social, economic and environmental impacts of quarantine pests in EU



Support on priority pests via expert knowledge elicitation to provide key information to JRC methodology to calculate indicators by pest

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Plant Health Expert Working Group from EU member states for ad-hoc data requests and consultation on methodology



**I2P2** a composite indicator to rank  
pests based on the socioeconomic  
and environmental impact

# Other EU initiatives for identification of priority pests

**Pest risk ranking** in the Netherlands



The **UK Plant Health Risk Register**



**Bior<sup>2</sup>**: a database/software process dedicated to plant pest ranking in France



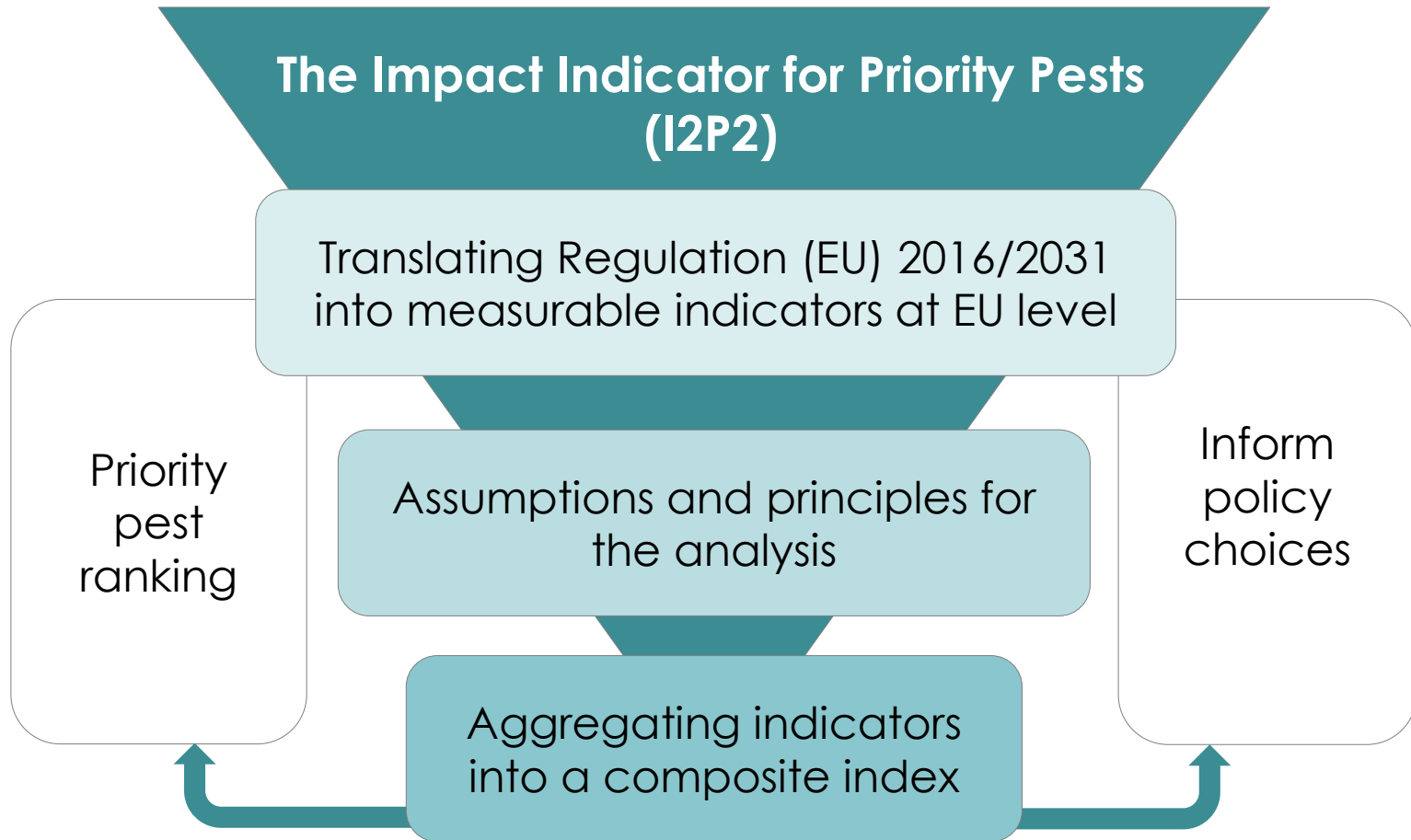
**FinnPRIO**: A Model for Ranking Invasive Plant Pests Based on Risk



The **ERIN** system to identify, describe and rank new plant health threats in Norway



# Composite indicators including multiple criteria



# Composite indicators including multiple criteria

## **The Impact Indicator for Priority Pests (I2P2)**

Translating Regulation (EU) 2016/2031  
into measurable indicators at EU level

# How to translate from regulation to indicators?

Systematic review of Regulation to identify all criteria mentioned  
Each indicator covers one or more criteria - all criteria addressed by one or more indicators

## ANNEX I

### CRITERIA FOR THE QUALIFICATION OF PESTS ACCORDING TO THEIR RISK TO THE UNION TERRITORY

#### SECTION 1

*Criteria to identify pests which qualify as a quarantine pest, as referred to in Article 3, Article 6(1), Article 7, Article 29(2), Article 30(2) and Article 49(3)*

#### (4) Potential economic, social and environmental impact

The entry, establishment and spread of the pest in the territory in question, or, if present but not widely distributed, in the part of that territory where it is absent, shall have an unacceptable economic, social and/or environmental impact on that territory, or the part of that territory where it is not widely distributed, as regards one or more of the following points:

(a) crop losses in terms of yield and quality;

### Example:

Crop losses in terms of yield and quality is criteria 4(a) of Section 1 of Annex I

I2P2 Indicator #1  
Maximum value of production losses fulfils regulation criteria: [4(a) of Section 1 of Annex I]

# How to identify measurable indicators?

## OECD steps!

We are here!

Indicators selection

Quantitative or qualitative measures

Data selection

Measuring indicators based on available statistics and experts

Normalization

Allows comparing indicators with different scales; dimensions or units

Weighting

To aggregate indicators based on weights set by the Legislator(s)

Uncertainty of data

Probabilities and sensitivity analysis

# Composite indicators including multiple criteria

## The Impact Indicator for Priority Pests (I2P2)

Translating Regulation (EU) 2016/2031  
into measurable indicators at EU level

Assumptions and principles for  
the analysis



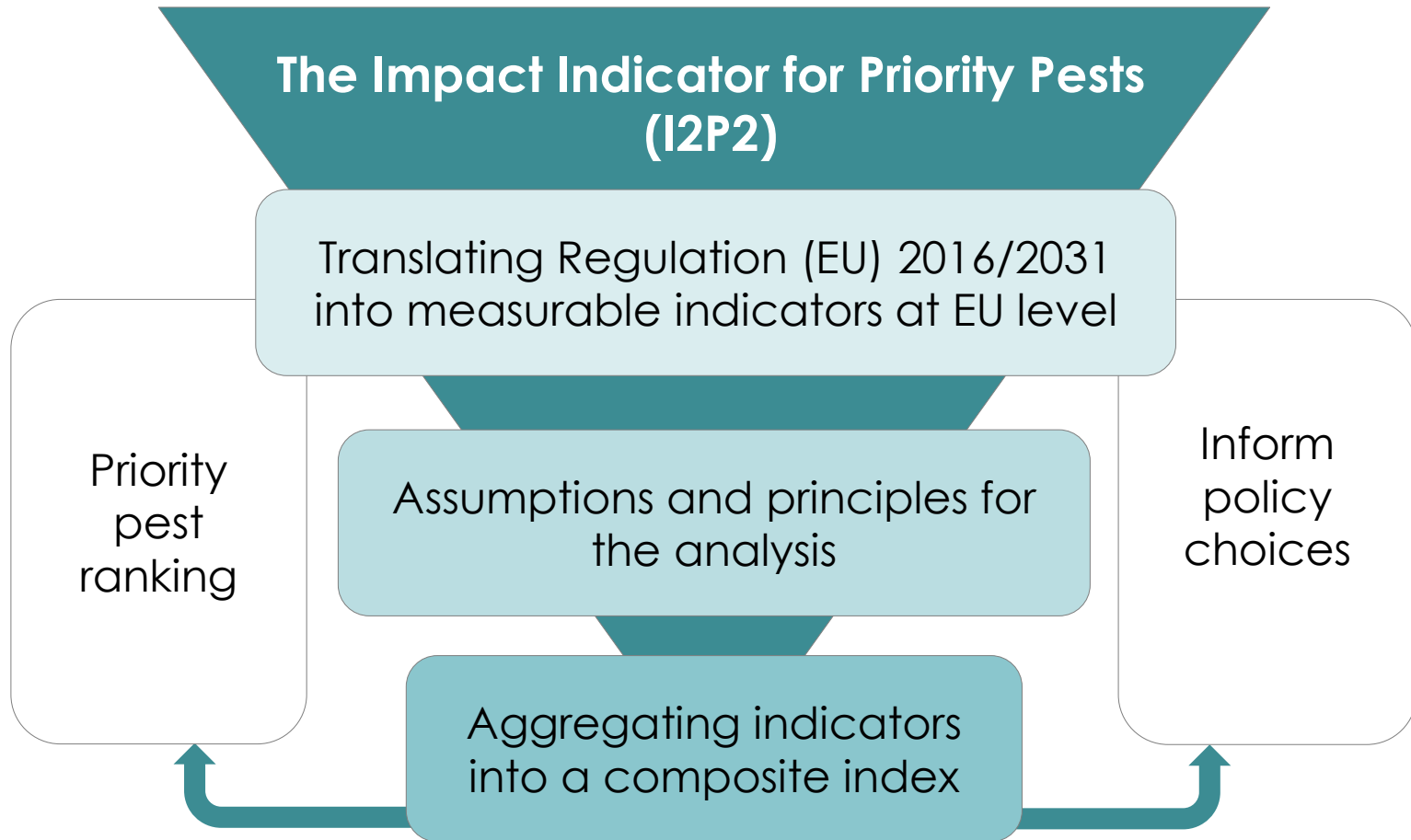
# Assumptions on reference scenario for impact assessment

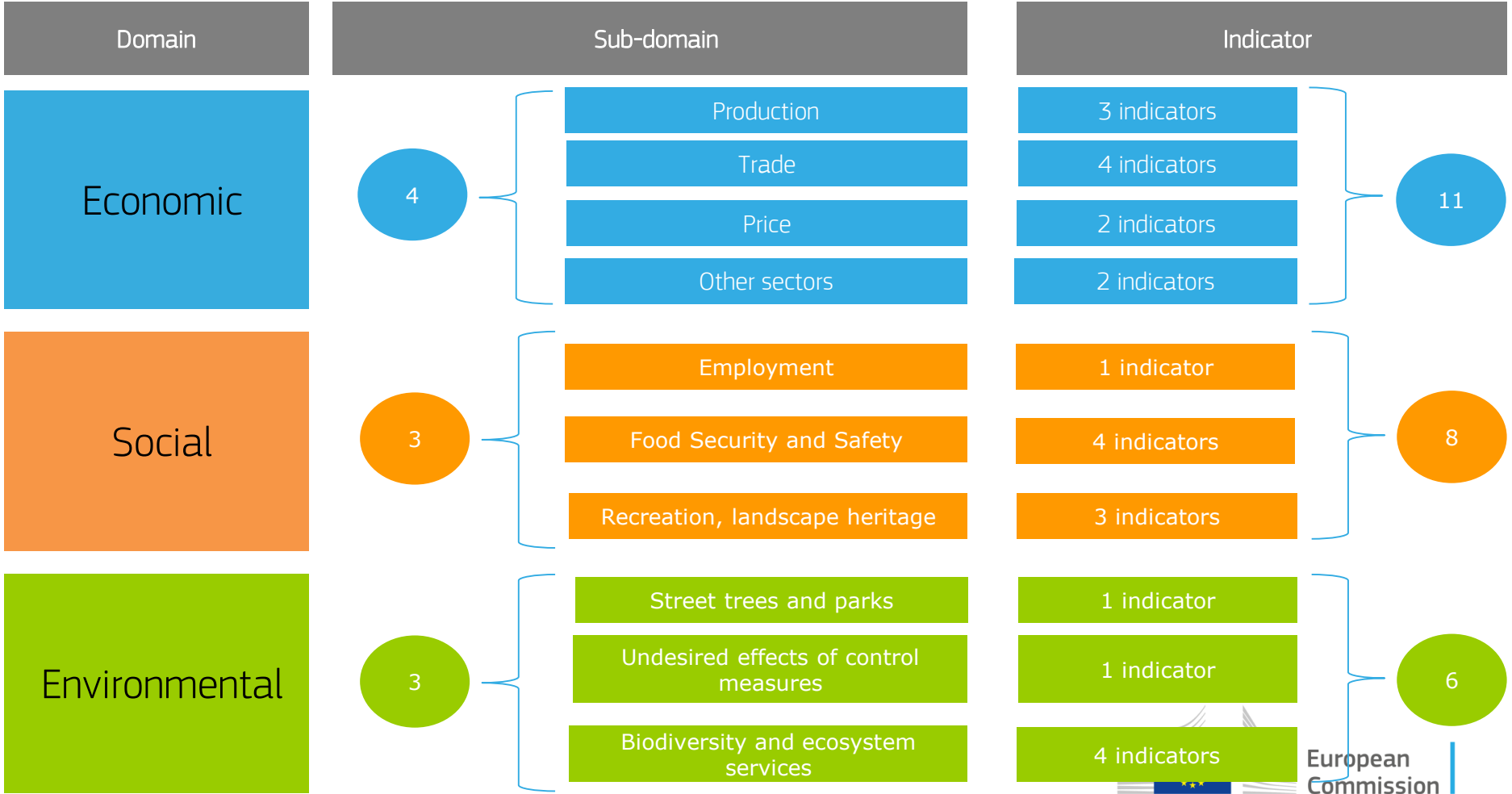
- Pest is **already present throughout the area of potential establishment** in the EU
- Pest has reached **a stable spatial distribution / maximum potential abundance** based on the current environmental conditions and production practices
- Yield/quality losses are evaluated in a **time frame long enough to take into account the temporal variation** in pest population dynamics
- For **polyphagous pests**, indicators aggregated for all pest-host pairing when cardinal data and using maximum value for shares or ratios

# SUPPORT ON PRIORITY PESTS via EXPERT KNOWLEDGE ELICITATION (EKE)

- For each pest-host combination and per MS
  - Area of potential establishment
  - Potential impact on yield (distribution of)
  - Potential impact on quality (distribution of)
  - Potential changes in agricultural practices (i.e. need for additional treatments)
  - Time from 1<sup>st</sup> detection to max dispersal and spread
  - Nature 2000 area and sites affected

# Composite indicators including multiple criteria





Domain	Sub-domain	Indicator
Economic impact	Production impacts	I.1 Maximum value of production losses
		I.2 Share of EU production affected
		I.3 Difficulty of eradication
	Trade impacts	I.4 Number of importing countries banning trade
		I.5 Value of export losses
		I.6 Share of export losses over total production
		I.7 Trade dispersion
	Price and market Impacts	I.8 Change in domestic price
		I.9 Change in domestic production over imports
	Impacts on other agents	I.10 Upstream effect
		I.11 Downstream effect

Domain	Sub-domain	Indicator
Social impact	Impact on employment	I.12 Job losses
	Impact on Food Security and Food safety	I.13 Share of caloric supply
		I.14 Share of protein supply
		I.15 Share of fat supply
		I.16 Capacity to produce fungal toxins
	Impact on recreation, landscape and cultural heritage	I.17 Share of holdings with OGA
		I.18 Products covered by EU quality labels
		I.19 UNESCO World Heritage sites

Domain	Sub-domain	Indicator
Environmental impact	Impact on street trees, parks and natural and planted areas	I.20 Use of hosts as street trees and in parks
	Undesired impacts of control measures	I.21 Undesired effects of control measures
	Impact biodiversity and ecosystem services	I.22 Soil erosion
		I.23 Number of protected species and habitats related to hosts
		I.24 Share of Natura 2000 area and sites affected
I.25 Share under sustainable management practices		

# Example of Impact Indicator of Priority Pests (I2P2)

	Pest4	Pest1	Pest6	Pest5	Pest2	Pest3
Economic impact	40	5	30	50	10	30
Social impact	10	50	10	30	10	30
Environmental impact	5	4	25	5	75	35
<b>I2P2 [sum of above]</b>	<b>55</b>	<b>59</b>	<b>65</b>	<b>85</b>	<b>95</b>	<b>95</b>

Not priority | Priority

(1) Simplified example only for presentation purposes; (2) Priority if I2P2  $\geq 60$ ; (3) Equal weights for all impacts



# Challenges: data sources and aggregations

- Quantitative or qualitative components based on the **existing evidence and data available**
- Use only the **most representative and reliable official statistical data** Expert assessment by **EFSA Expert Knowledge Elicitation (EKE) process**
- **Alternatives to official EU datasets** and expert elicitation explored when EU wide data is not available
- **Non-discrimination across pests**, all data sources available for all host-pest
- **Crop VS forestry** rankings
- **Weighting** by legislator (cut-off value; number of pests)

# Thanks for your attention

[Jesus.BARREIRO-HURLE@ec.europa.eu](mailto:Jesus.BARREIRO-HURLE@ec.europa.eu)

[Berta.SANCHEZ@ec.europa.eu](mailto:Berta.SANCHEZ@ec.europa.eu)

[Emilio.RODRIGUEZ-CEREZO@ec.europa.eu](mailto:Emilio.RODRIGUEZ-CEREZO@ec.europa.eu)

