



# Cómo se utiliza el conocimiento científico para mejorar la política agraria europea? La economía agraria en el Centro Común de Investigación

**Jesus Barreiro-Hurle**

Unidad de Economía Agraria – Centro Común de Investigación  
(Sevilla)

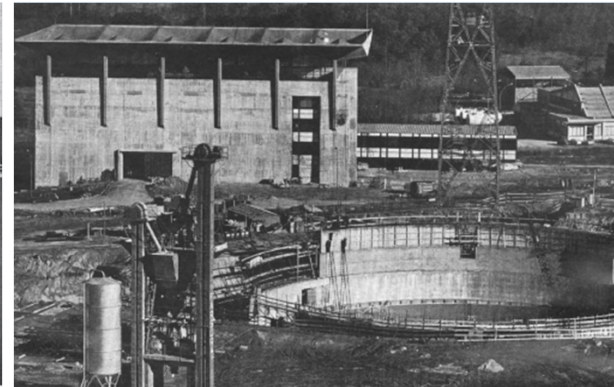
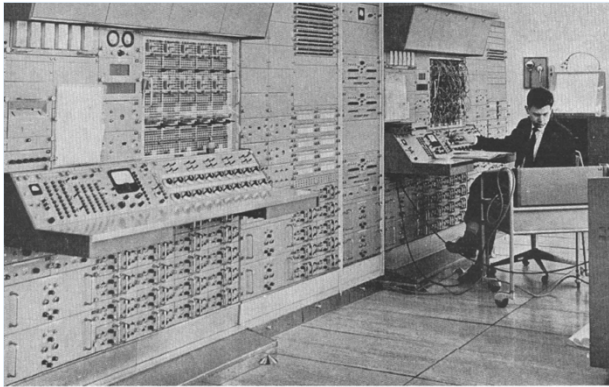
Zaragoza, 26 Noviembre 2021

Ciclo de Seminarios de la Unidad de Economía Agroalimentaria y de los Recursos Naturales  
CITA de Aragón

Joint  
Research  
Centre

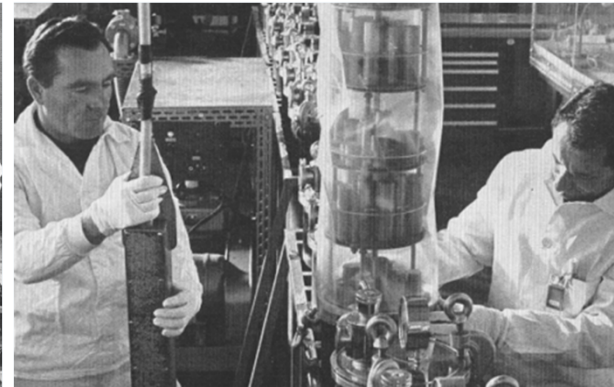
# JRC: the birth

Ispra, 1962 –  
Euratom's Scientific  
Data Processing  
Centre: any nuclear  
installation requires  
electronic equipment.



Ispra, 1963 –  
The ECO reactor  
and the ESSOR  
reactor  
construction site.

Ispra, 1966 –  
Decontamination of  
Ispra-1 reactor.



Ispra, 1967 –  
Metallurgy  
Department:  
two technicians  
placing uranium  
carbide in  
the special airtight  
containers.

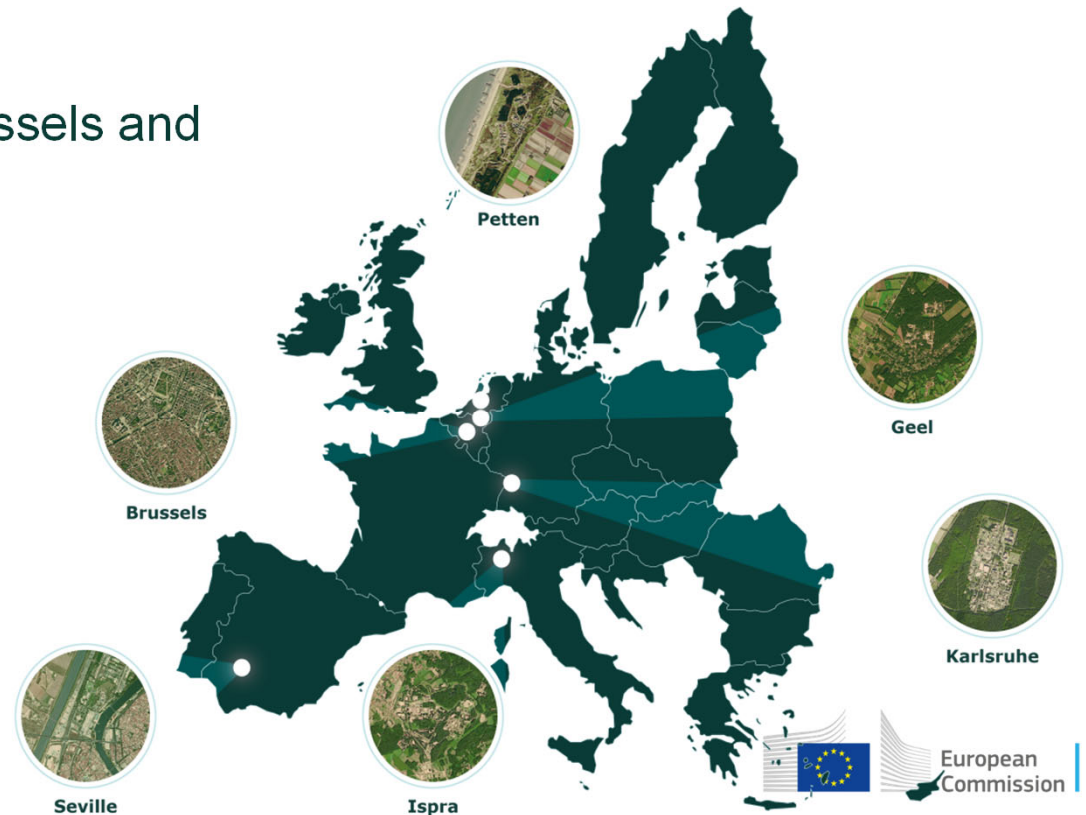


# Joint Research Centre (JRC)

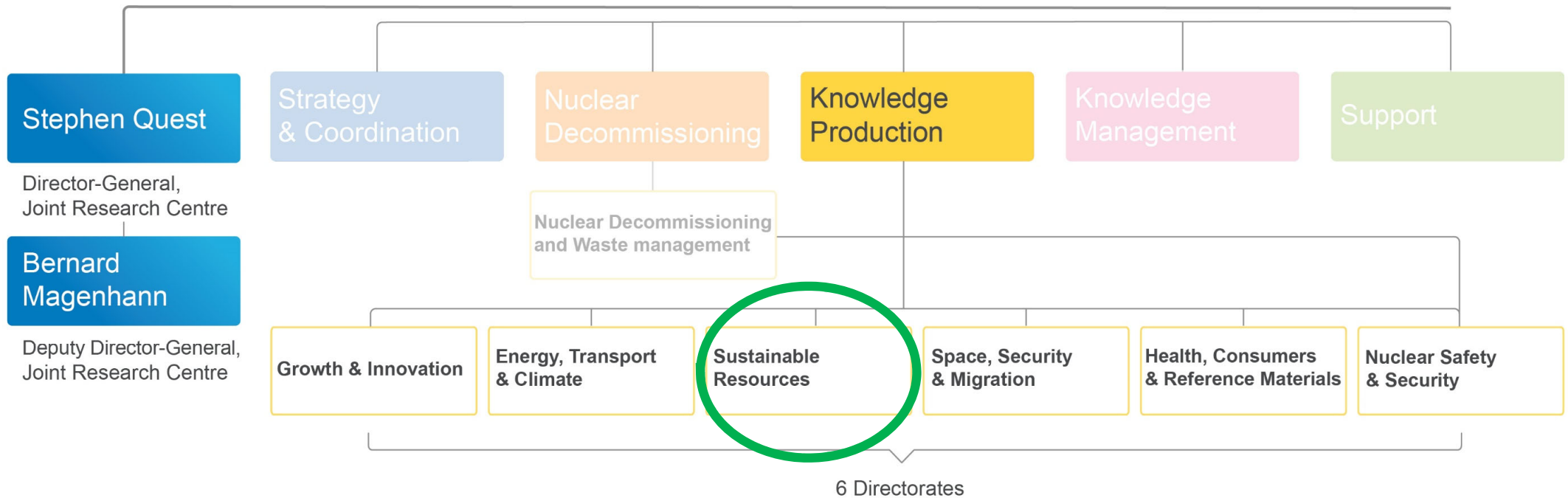
*"As the science and knowledge service of the Commission our mission is to support EU policies with independent evidence throughout the whole policy cycle"*

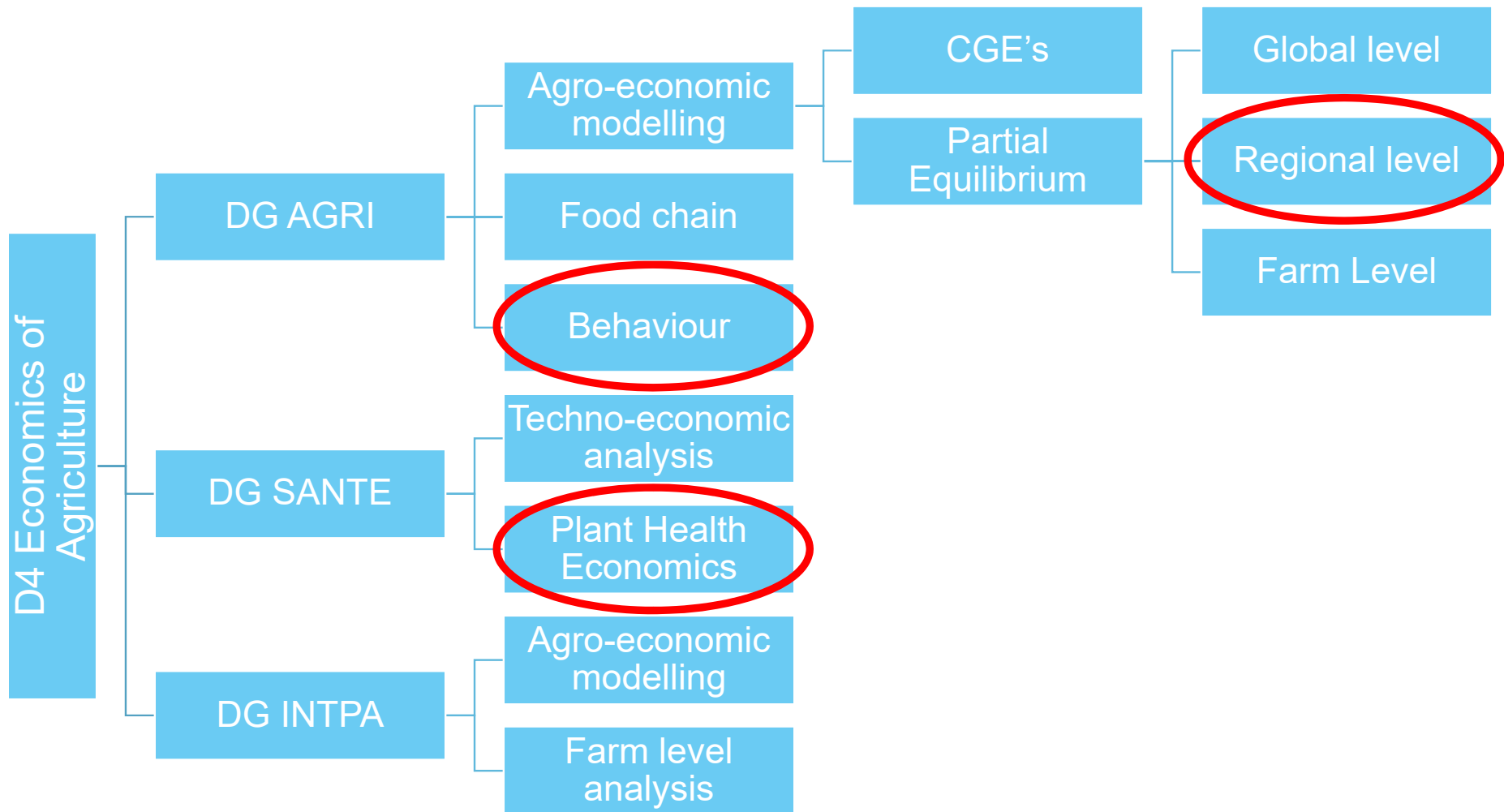
**3000 staff** Almost 75% are scientists and researchers. Headquarters in Brussels and research facilities located in **5 Member States**:

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



# The JRC within the Commission







JRC SCIENCE FOR POLICY REPORT

Farmers and the new green architecture of the EU common agricultural policy: a behavioural experiment

Ducrocq, F. J., Bonnal, J., Barreiro-Huete, J., Thomas, F., Rodriguez-Entena, M., Espinosa-Gomez, M., Zagorina, K., Cabelvoss, M., van Sandt, R.

2021



JRC TECHNICAL REPORTS

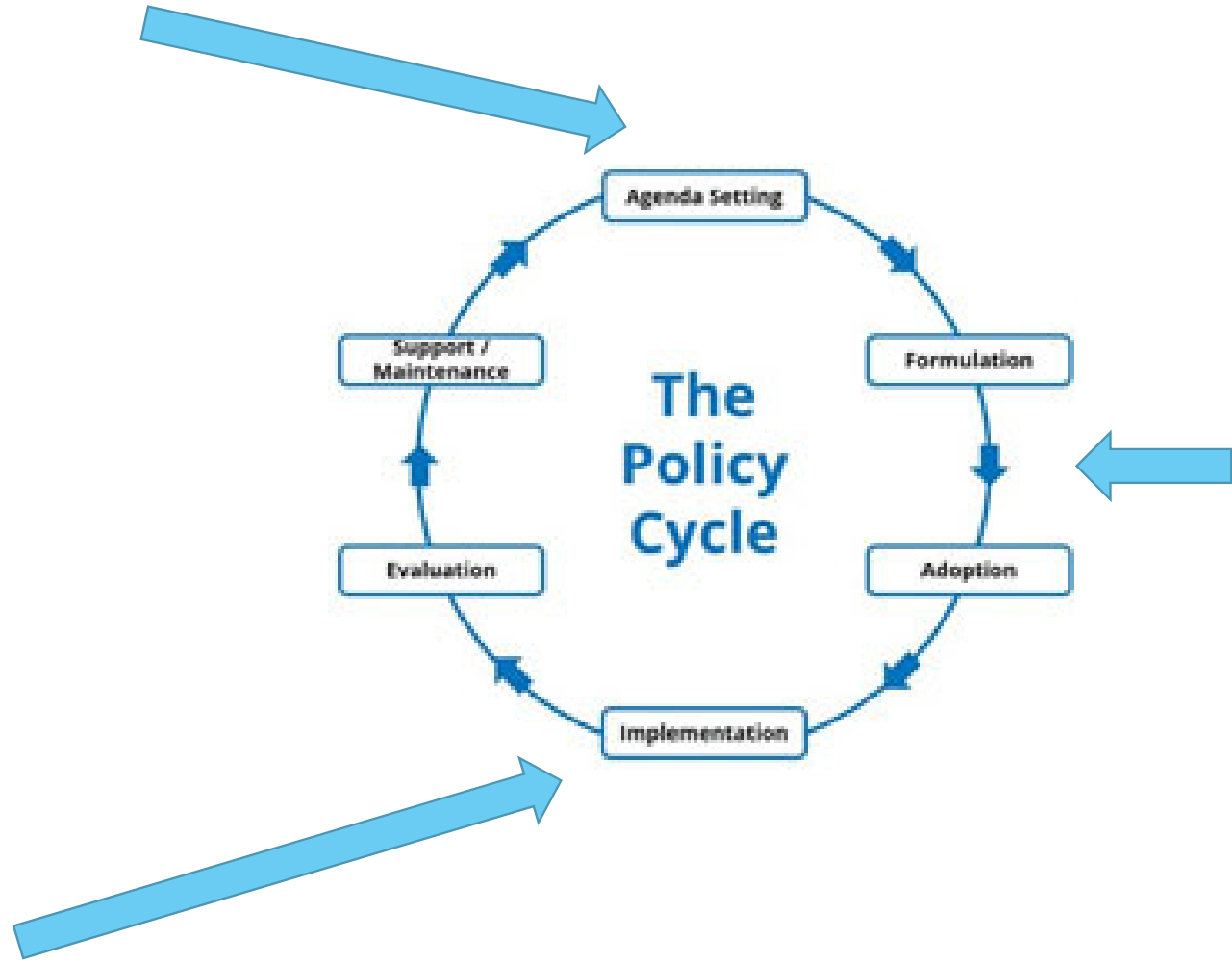
The Impact Indicator for Priority Pests (I2P2): a tool for ranking pests according to Regulation (EU) No 2016/2031

Sánchez, Berta, Barreiro-Huete, Jesús, Soto Embudias, Iria, Rodríguez-Cerezo, Emilio

2019



EUR 29793 EN



JRC TECHNICAL REPORT

Modelling environmental and climate ambition in the agricultural sector with the CAPRI model

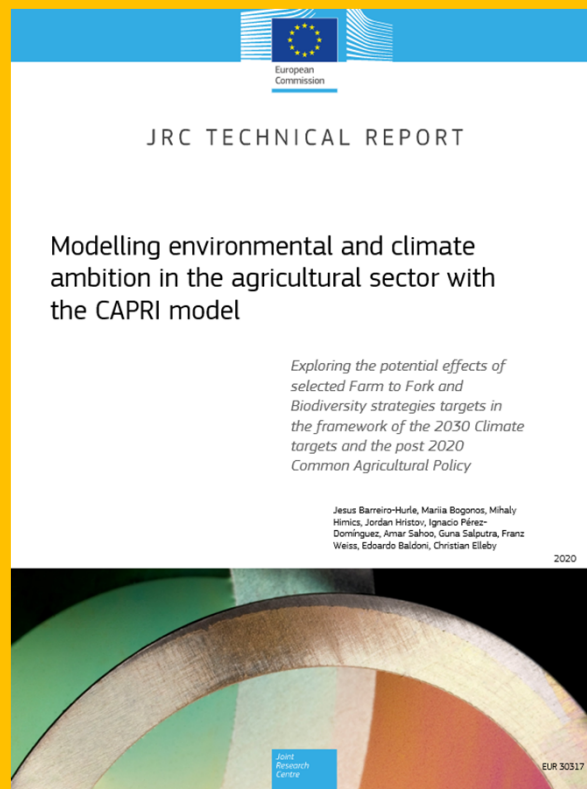
Exploring the potential effects of selected Farm to Fork and Biodiversity strategies targets in the framework of the 2030 Climate targets and the post 2020 Common Agricultural Policy

Jesus Barreiro-Huete, Maria Bogdan, Mihaly Balogh, Javier Herrero, Ignacio Lopez-Dominguez, Amir Sahel, Guna Subramanian, Franz Weiss, Edward Baskin, Christian Ebly

2020



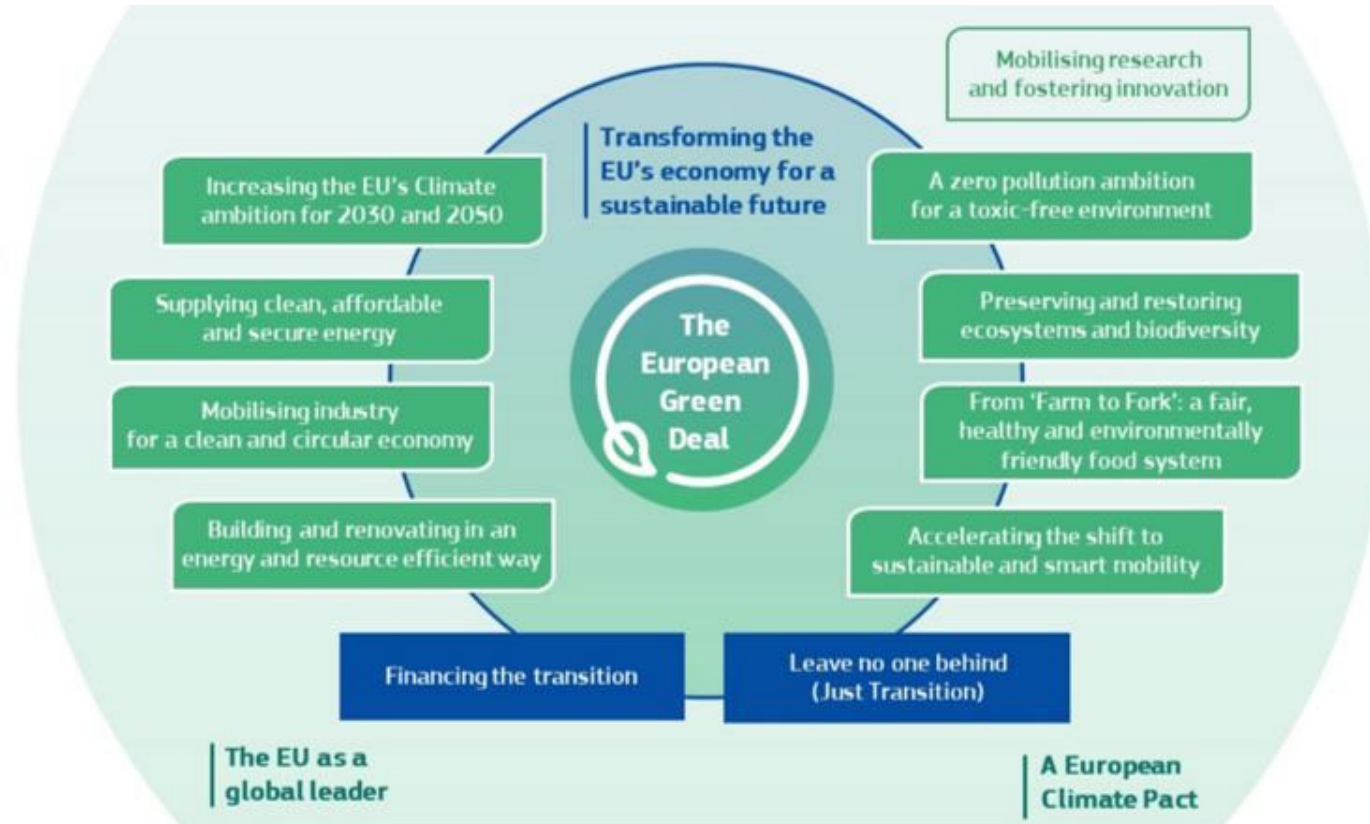
# Evaluación ex-ante utilizando modelos agro-económicos: los objetivos de las estrategias de la granja a la mesa y de biodiversidad



# Background

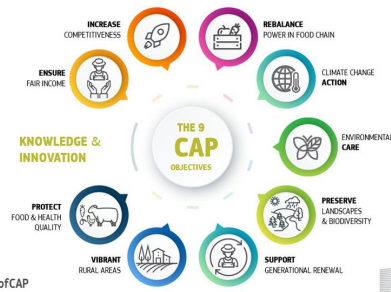


2019





# Background



2018!

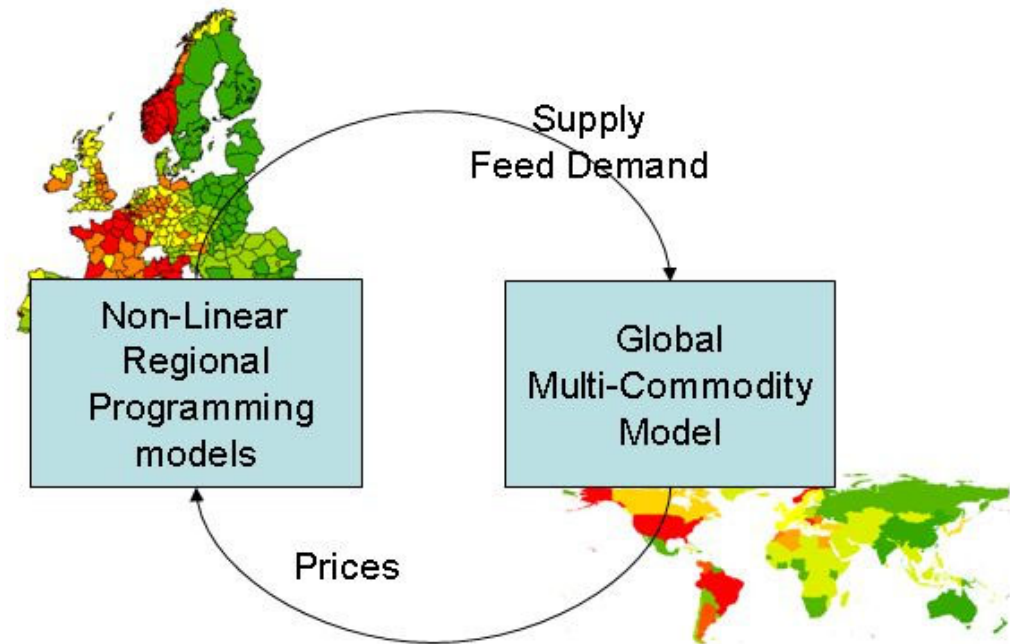


2020



# Approach

the CAPRI model

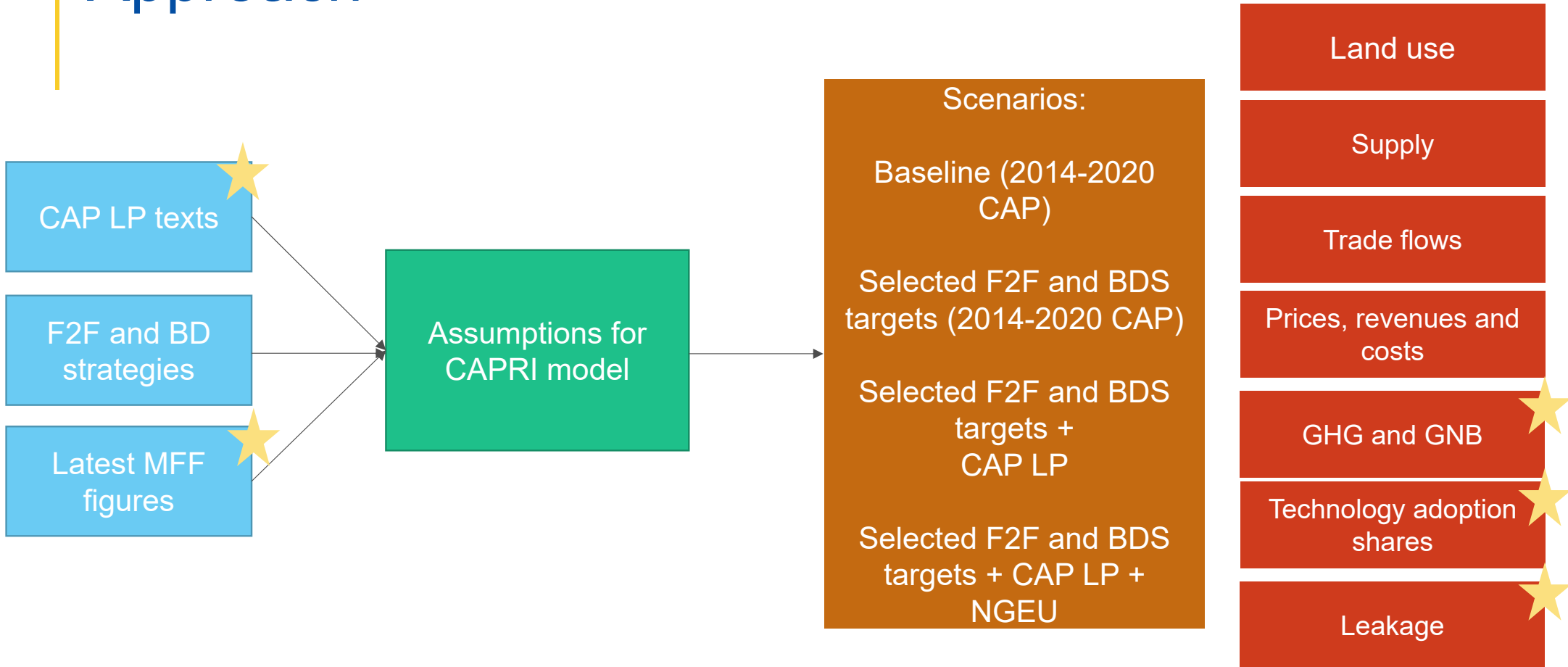


Nitrogen and carbon cycle

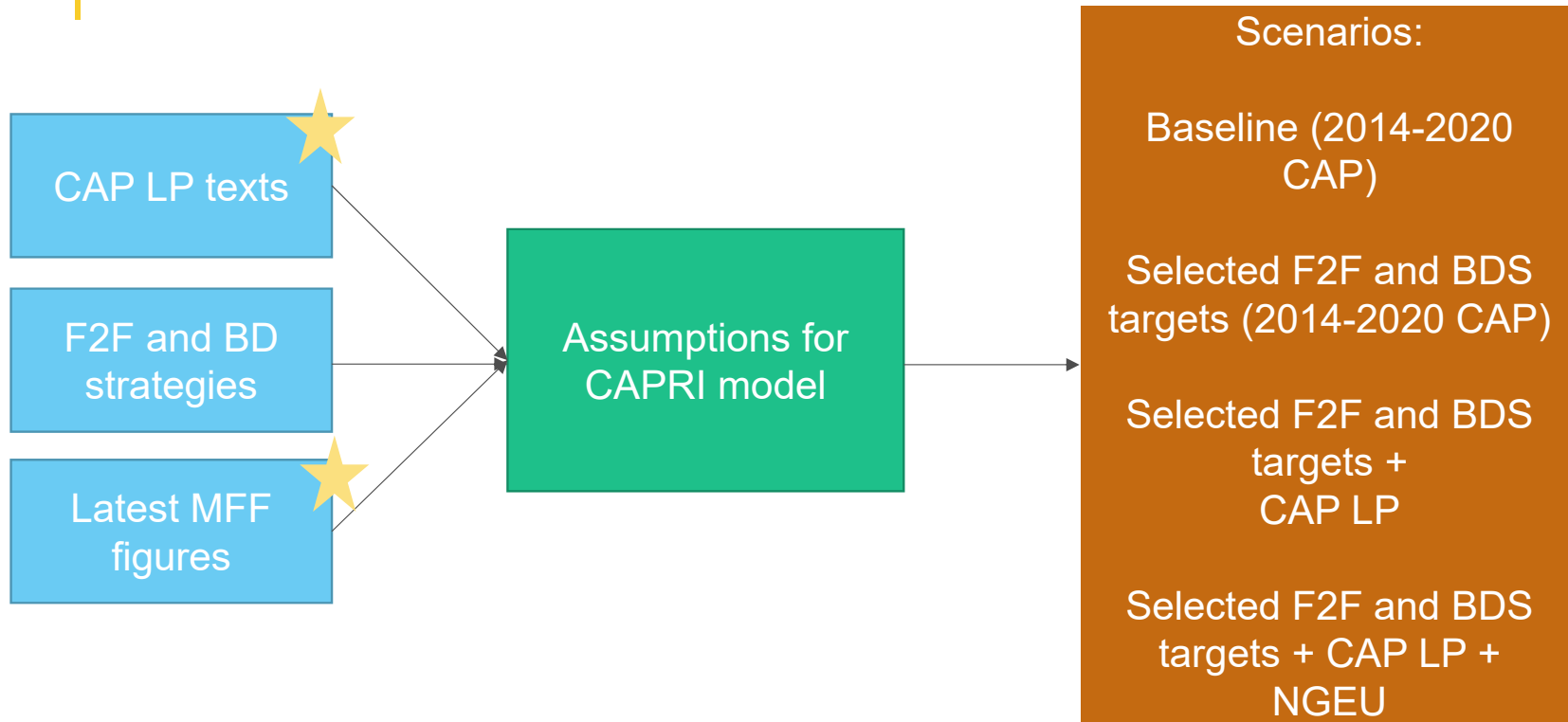
Detailed representation of *some* technologies

Regional diversity on farm systems

# Approach



# Approach



# 4 targets of the F2F and BDS Strategies

- Most direct relationship with the agricultural sector
- Most adequate for targeting CAP support

Reduction of overall use of pesticides and risk of chemical pesticides by 50% and the use of more hazardous pesticides by 2030

Reduction of 50% of the costs of plant protection products  
Increase of other costs to reflect alternative management options  
10% decrease of yield

Reduce nutrient losses by at least 50% while ensuring that there is no deterioration of soil fertility. This will reduce the use of fertilizers by at least 20% by 2030

Progressive reduction of nitrogen surplus depending on 2030 levels  
Technologies to enhance the nitrogen efficiency use available for farmers (i.e. precision farming, nitrification inhibitors) ★

reach the objective of at least 25% of the EU's agricultural land under organic farming by 2030 and a significant increase in organic aquaculture.

Increase of organic farming taking into account project baseline level for 2030 (i.e. 12% - shock +13%)  
No mineral fertilizer or plant protection products + reduce yield based on actual differences from FADN ★

At least 10% of agricultural area is under high-diversity landscape features.

Increase of fallow land taking into account project baseline level for 2018 (i.e. 4.7% - shock + 5.3%)  
No inputs no outputs ★

# What is missing from the F2F and BDS Strategies

- Action plans to facilitate the transition
  - Integrated nutrient management plan
  - Action plan on organic farming
  - Changes in taxation of food products
  - Food labelling initiative
- Other targets
  - Reduction of food waste
  - Planting of 3 billion trees
  - Broad-band in rural areas
  - Sales of antimicrobials

# CAP LP - Scenario assumptions

- Budget- latest figures of the 2018 proposals for the Multi-Annual Financial Framework (MFF)
  - *25% of the Basic Direct Payments Budget is allocated to Eco-Schemes (ECS)*
  - *30% of the Rural Development funds are allocated to Agro-environmental and Climate Measures (AECM) excluding payments for Areas with Natural Constraints (ANC)*
  - *Voluntary Coupled Support*
    - *Extensive beef, sheep and dairy*
    - *Includes the additional 2% of Pillar I for protein crops.*
  - *Additional 9 billion euros in constant prices proposed by the Commission in June 2020 as reinforcement of long-term budget not included*
- New green architecture
  - Mandatory measures (conditionality) and voluntary measures (incentives via ECS - 25% of direct payments and AECM - 30% of rural development funds).

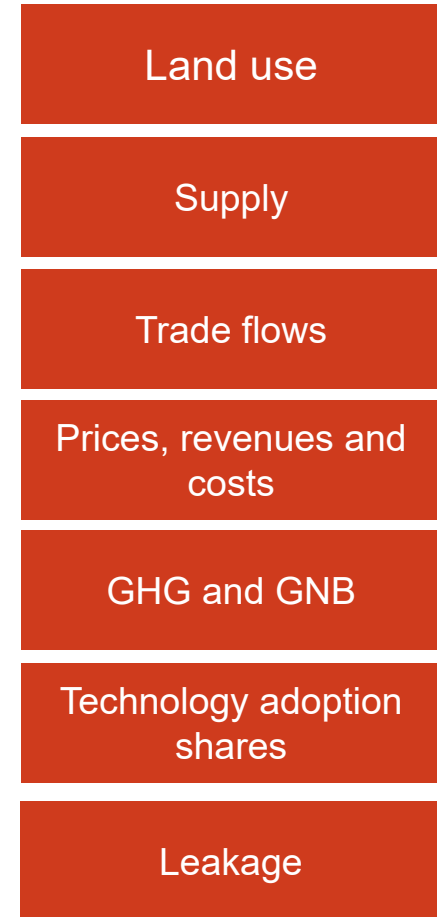
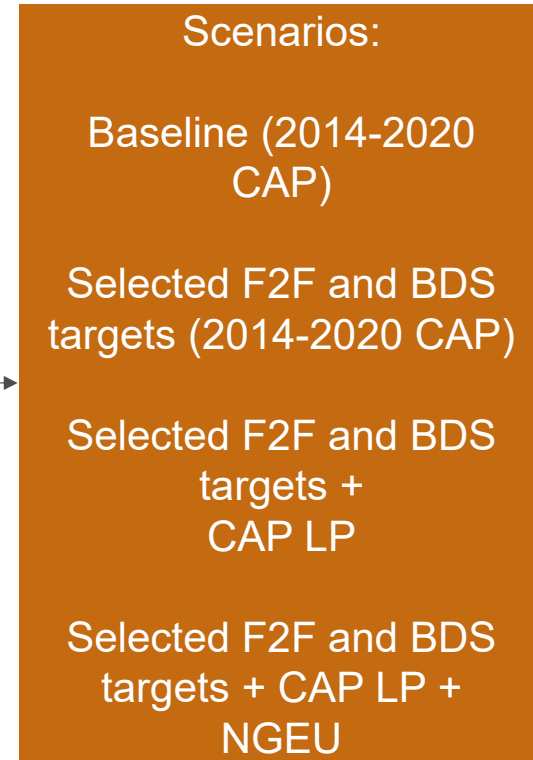
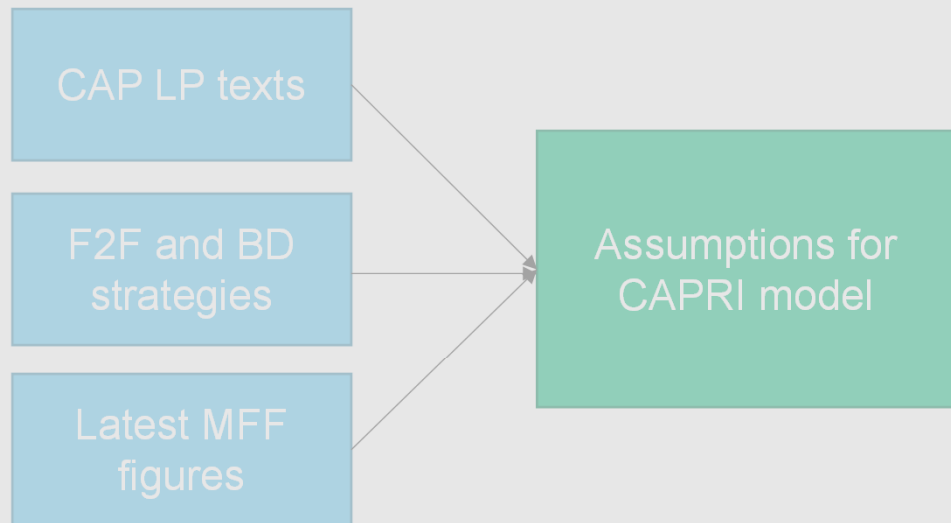
# Scenario assumptions (cont.)

- **CAP LP + NGEU**

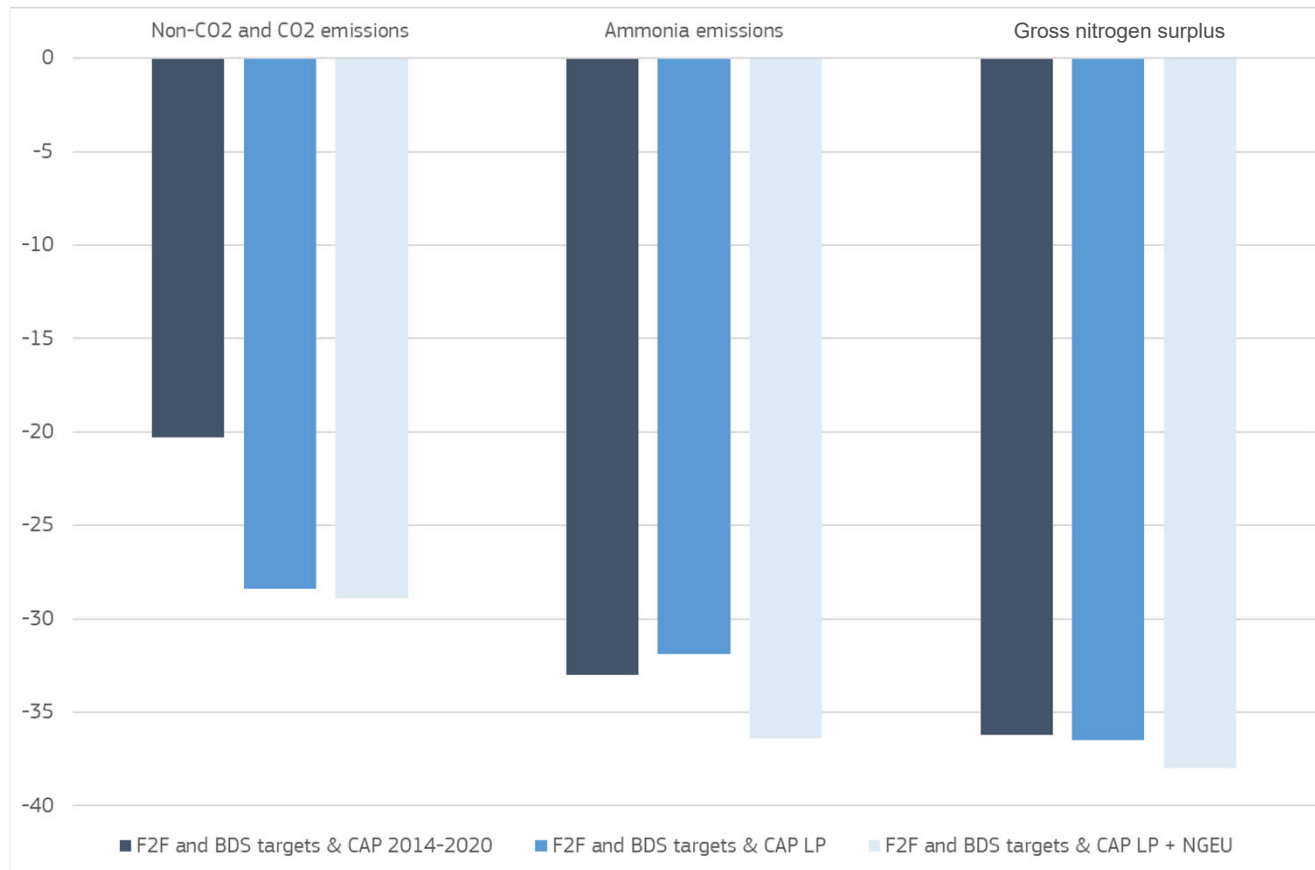
- Additional scenario incorporating NextGenerationEU budget – 15 billion euros supposed to support to digitalization and investments in the agricultural sector in line with the Green Deal Priorities
- Assumption: 30% reduction in cost for technologies for which investments are needed (*precision farming, anaerobic digestion, breeding measures and ammonia measures for housing and storage*)



# Approach

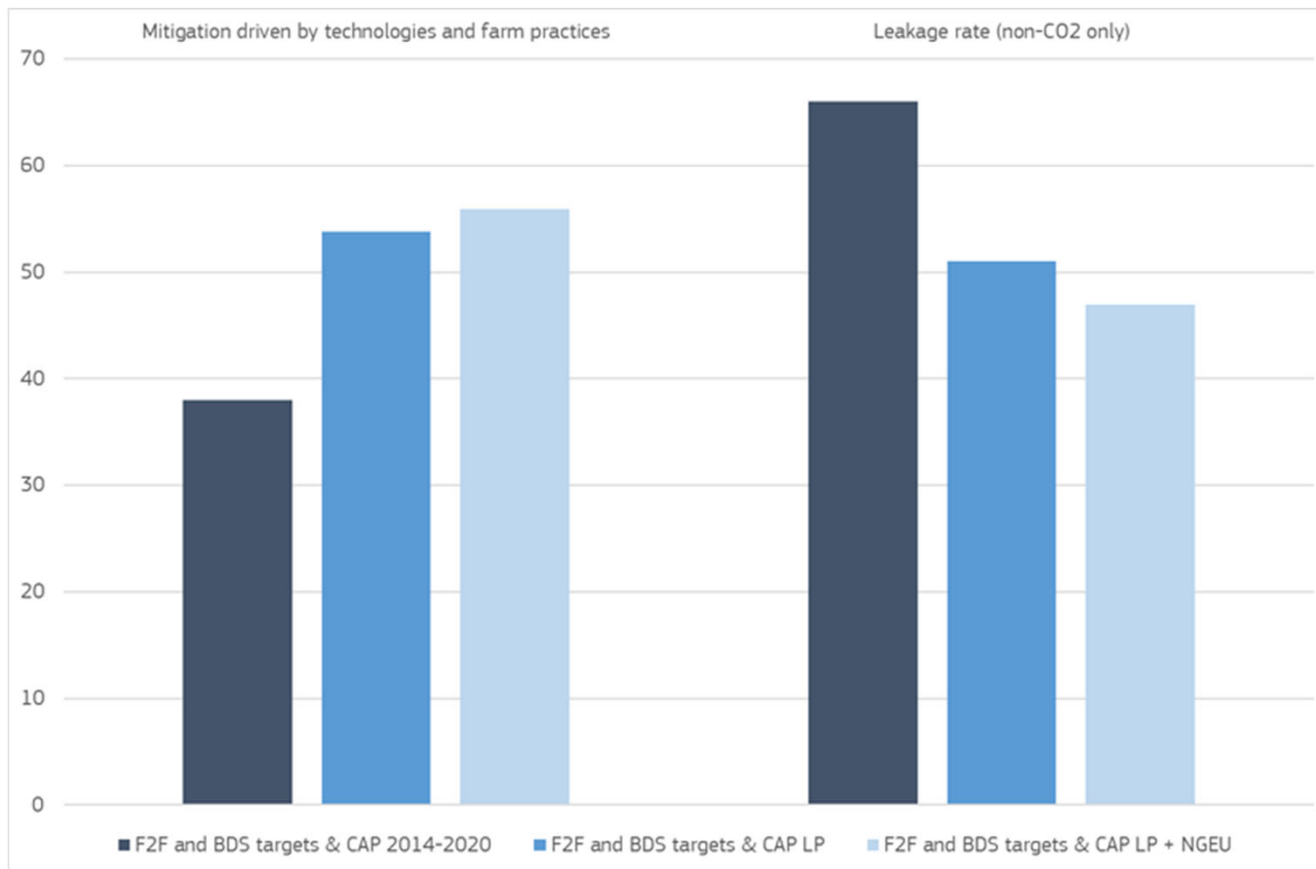


# Provision of environmental benefits



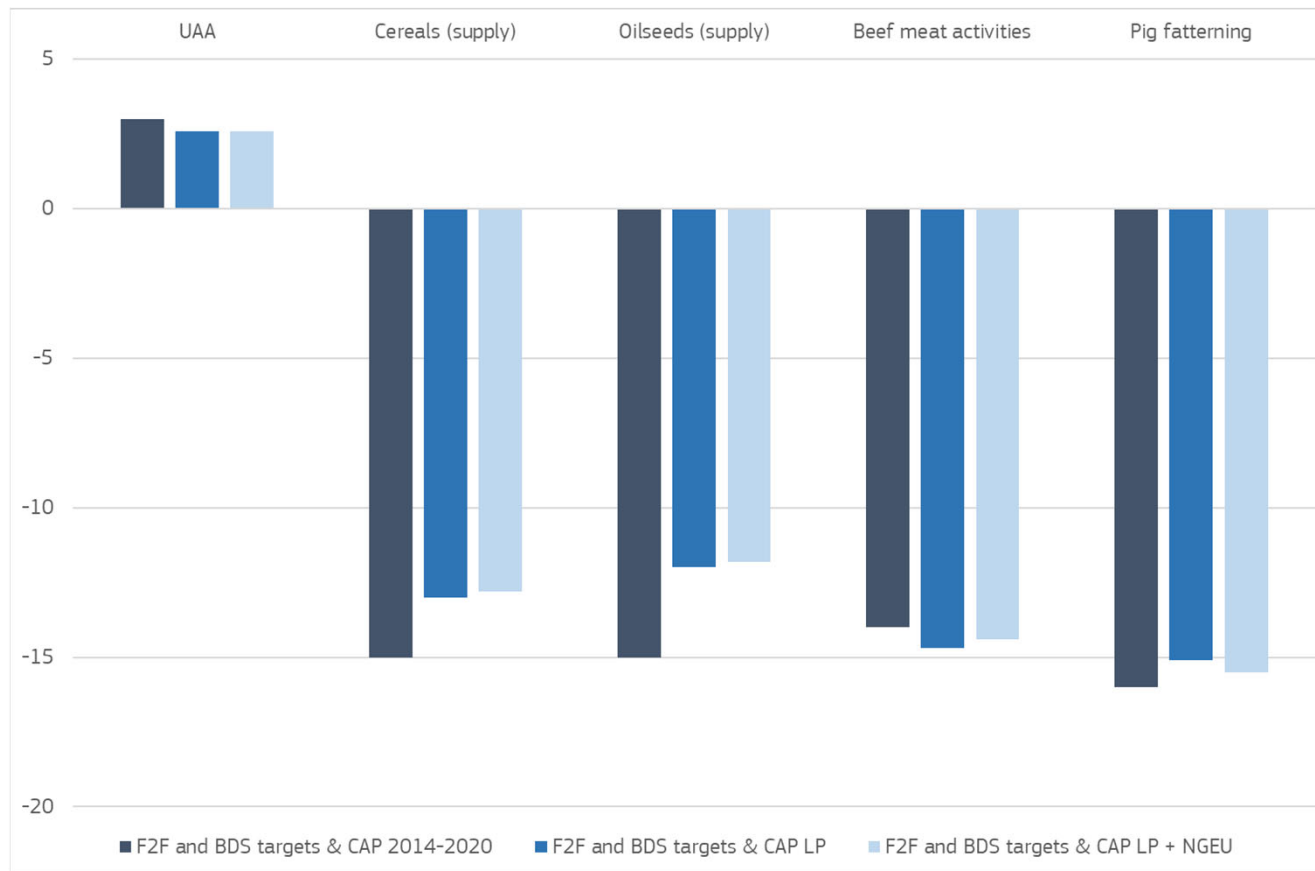
- F2F and BDS targets improve environmental performance of the agricultural sector
- The implementation of the CAP LP further increases the improvement
- Again the most challenging aspect is the nitrogen balance of the agricultural sector

# From reduced production to improved efficiency – the case of GHG emissions



- The implementation of the CAP LP allows meeting the Climate targets via technology instead of via reduced production
- The integrity of the effort improves as leakage to the rest of the world falls
- Including technologies and practices focusing on nitrogen could replicate this trend

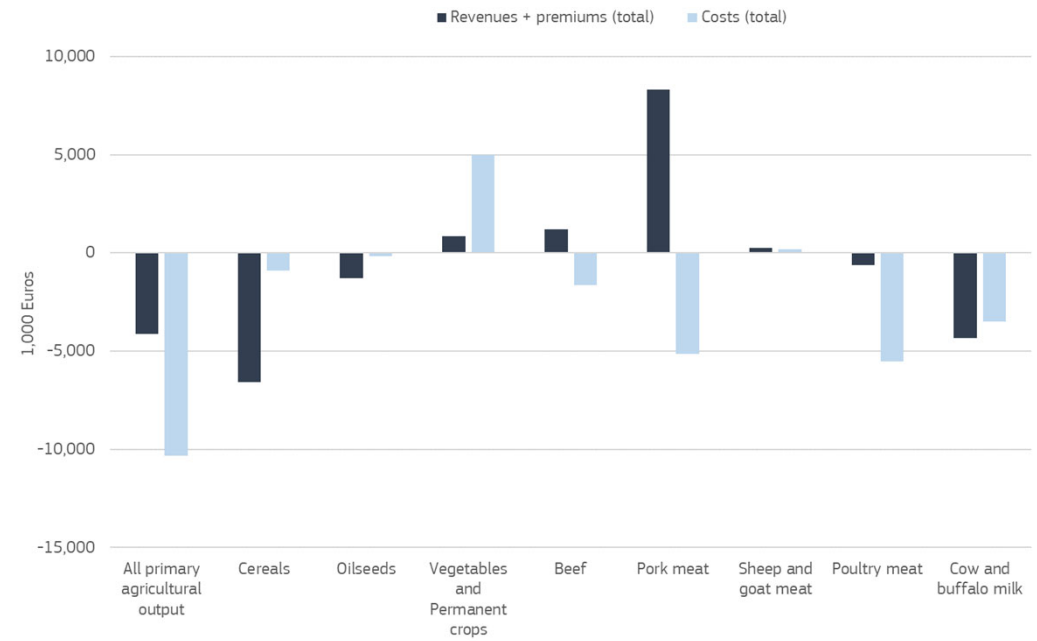
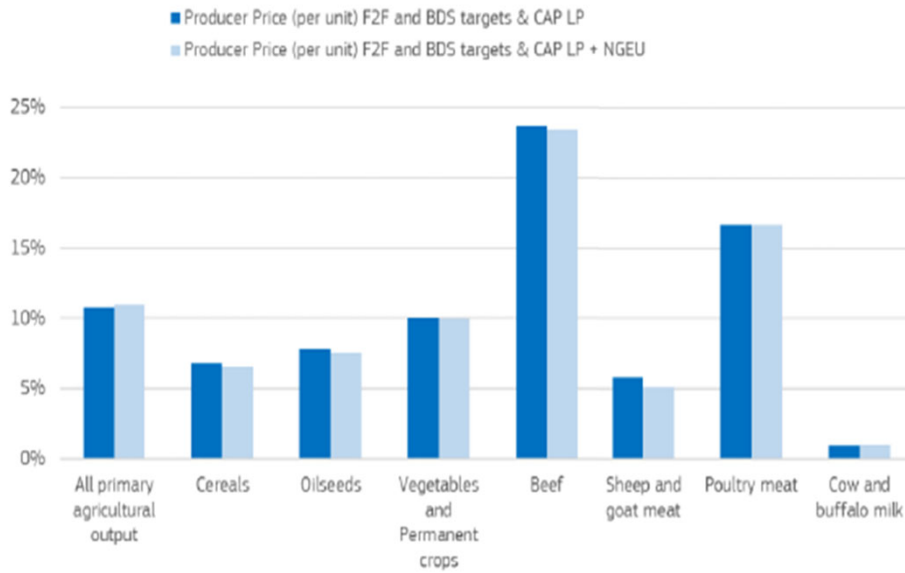
# Change in agricultural production



- Reduction in production mainly driven by the nitrogen restriction
- The implementation of the CAP LP eases the pressure in agricultural production
- Farm level analysis shows that it is possible to further reduce the impact via efficiency gains



# Impact on prices and income

Targets + CAP LP only



# Conclusion

- Our analysis confirms the **positive impact of the Farm to Fork and Biodiversity strategies on our environment and climate**, showing that agriculture is indeed essential to achieving the Green Deal objectives.
- **The environmental benefits** of the F2F and BDS may come at a **cost for the EU agricultural sector** regarding production and income, but a strong EU policy can **mitigate these effects** by accelerating the transition towards sustainable food systems creating new opportunities for farmers.
- The green architecture of the **future CAP has the right tools to support such a transition through the enhanced conditionality, a ringfenced budget and the eco-schemes. The future CAP will be instrumental to implement the (production-related) targets of the Green Deal.**

Policy initiative	Coming from....		Covered in analysis?
			
Reduction in pesticides			Green
Reduction in nutrient loads			Green
Integrated nutrient management action plan			Yellow
Increased area under organic farming			Green
Organic farming action plan			Yellow
Increased area under high-diversity landscape features			Green
Facilitate the placement on the market of sustainable and innovative feed additives			Yellow
Stimulation of healthier and sustainable diets			Yellow
Revision of animal welfare legislation and option for animal welfare labelling			Yellow
Code of conduct for responsible business and marketing practice			Yellow
Reduction in food losses and waste			Yellow
Reduction in sales of antimicrobials			Yellow
Shift to sustainable fish and aquaculture			Yellow
Revision of competition rules for collective initiatives promoting Sustainability			Yellow
Contingency plan for ensuring food supply and food security to be put in place in times of crisis			Yellow
Revision of marketing standard			Yellow
Harmonized mandatory front-of-pack nutritional labelling			Yellow
Change in taxation of food products			Yellow
....and many more!			

# What next?

- Change of paradigm – from restriction to production inputs
- The baseline is a moving target – i.e. impacts of no action on biodiversity loss need to be incorporated
- Significant changes such as those implied by the level of targets put at risk the plausibility of many parameters
  - Models get out of their comfort zone
  - Examples of the impossible becoming reality exist (e.g. carbon free production processes for steel)
- A supply side analysis - Systemic changes affect also fundamentals of behavior all along the value chain (processors, retailers & consumers)



Evaluación ex-ante utilizando modelos agro-económicos: los objetivos de las estrategias de la granja a la mesa y de biodiversidad



Apoyo a la implementación de actos delegados de la legislación: evaluando el impacto de plagas para su priorización



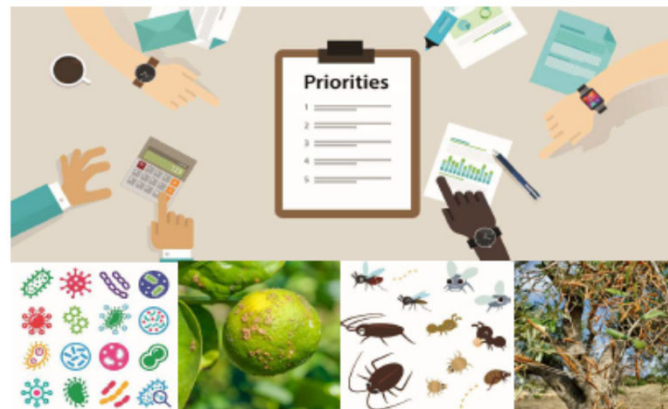


## JRC TECHNICAL REPORTS

# The Impact Indicator for Priority Pests (I2P2): a tool for ranking pests according to Regulation (EU) No 2016/2031

Sánchez, Berta  
Barreiro-Hurle, Jesús  
Soto Embodas, Iria  
Rodríguez-Cerezo, Emilio

2019

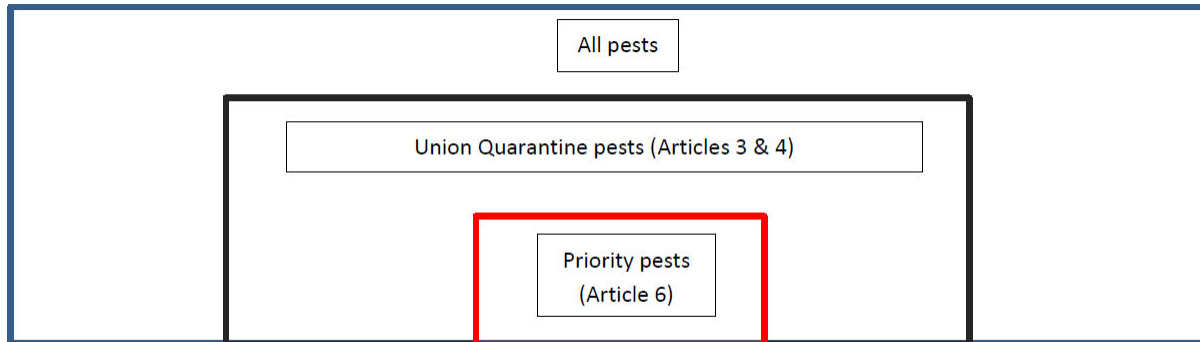


Joint  
Research  
Centre

EUR 29793 EN



## Pest categorization



Note: the figure is not to scale

- Not present in the EU, present in a limited area or with scarce, irregular, isolated and infrequent presences.
- **Most severe economic, environmental or social impact**

**Annual surveys (Art. 24)**  
**Contingency plan (Art. 25)**  
**Simulation exercises (Art. 26)**  
**Action plan for eradication (Art. 27)**

# JRC & EFSA: integrating economics & pathology



European Commission

JRC TECHNICAL REPORTS

The Impact Indicator for Priority Pests (I2P2): a tool for ranking pests according to Regulation (EU) No 2016/2031

Sánchez, Berta  
Barreiro-Huñe, Jesús  
Soto Embodas, Ina  
Rodríguez-Cerezo, Emilio

2019

Joint Research Centre

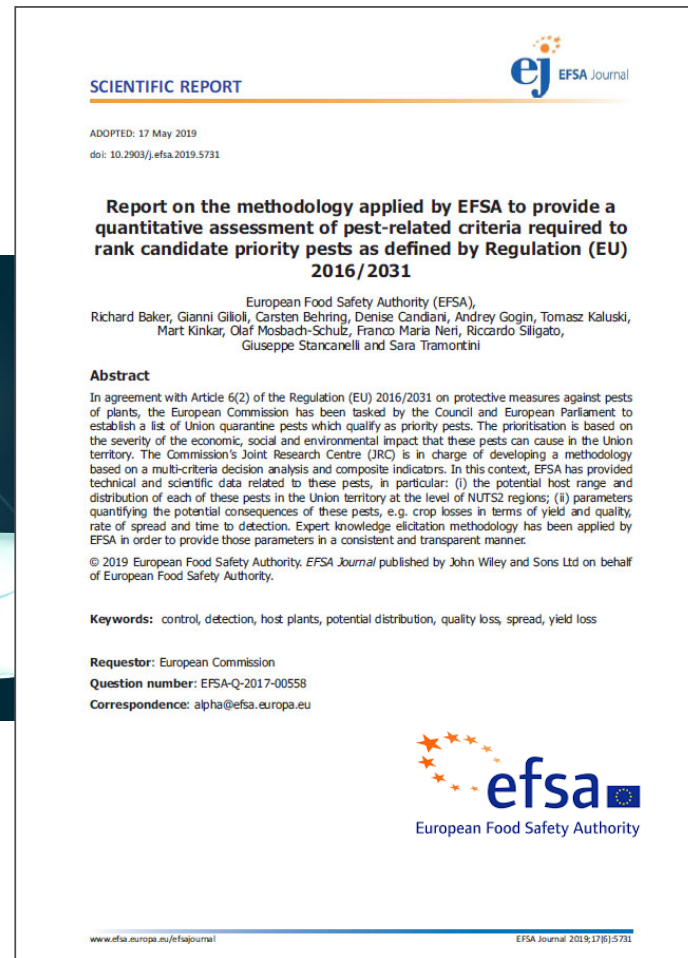
EUR 29793 EN



European Commission

Directorate-General for Health and Food Safety (DG SANTE)

A joint methodology on



SCIENTIFIC REPORT

ADOPTED: 17 May 2019  
doi: 10.2903/j.efsa.2019.5731

Report on the methodology applied by EFSA to provide a quantitative assessment of pest-related criteria required to rank candidate priority pests as defined by Regulation (EU) 2016/2031

European Food Safety Authority (EFSA),  
Richard Baker, Gianni Giloli, Carsten Behring, Denise Candiani, Andrey Gogin, Tomasz Kaluski,  
Mart Kinkar, Olaf Mosbach-Schulz, Franco Maria Neri, Riccardo Siligato,  
Giuseppe Stancanelli and Sara Tramontini

**Abstract**

In agreement with Article 6(2) of the Regulation (EU) 2016/2031 on protective measures against pests of plants, the European Commission has been tasked by the Council and European Parliament to establish a list of Union quarantine pests which qualify as priority pests. The prioritisation is based on the severity of the economic, social and environmental impact that these pests can cause in the Union territory. The Commission's Joint Research Centre (JRC) is in charge of developing a methodology based on a multi-criteria decision analysis and composite indicators. In this context, EFSA has provided technical and scientific data related to these pests, in particular: (i) the potential host range and distribution of each of these pests in the Union territory at the level of NUTS2 regions; (ii) parameters quantifying the potential consequences of these pests, e.g. crop losses in terms of yield and quality, rate of spread and time to detection. Expert knowledge elicitation methodology has been applied by EFSA in order to provide those parameters in a consistent and transparent manner.

© 2019 European Food Safety Authority. *EFSA Journal* published by John Wiley and Sons Ltd on behalf of European Food Safety Authority.

**Keywords:** control, detection, host plants, potential distribution, quality loss, spread, yield loss

**Requestor:** European Commission  
**Question number:** EFSA-Q-2017-00558  
**Correspondence:** alpha@efsa.europa.eu

www.efsa.europa.eu/efsajournal

EFSA Journal 2019;17(6):5731

# STRUCTURE OF THE IZFLZ



1. Indicators selection  
(Reg. criteria/data availability)

Quantitative / qualitative measures by HOST / PEST

### 3 Domains

**Economic**

**Social**

**Environmental**

### 10 Sub-domains

4

Production

Trade

Price

Other sectors

3

Employment

Food Security and  
Food Safety

Recreation and  
landscape heritage

3

Street trees and parks

Undesired effects of  
control measures

Biodiversity and  
ecosystem services

### 25 Indicators

3 indicators

4 indicators

2 indicators

2 indicators

11

1 indicator

4 indicators

3 indicators

8

1 indicator

1 indicator

4 indicators

6

# Different data sources

## EFSA\*

Data on Hosts; Potential distribution; Y,Q loss; Spread/detection rate; Quarantine; Treatments

## MS and experts

Ad-hoc data requests on Forestry; Cultural heritage; street-park trees; prices

## Secondary data

Data on production (EUROSTAT,FAO); trade (COMEXT); Soil erosion(articles)

## Data calculated by JRC

All indicators per pest

\*Note: data for a maximum spread scenario based on the current environmental conditions and production practices, within a time frame long enough to take into account the temporal variation

# Indicators by PEST

## THE IMPACT INDICATOR FOR PRIORITY PEST (I2P2)

Anastrepha\_ludens

Domain	Sub-domain	Indicator	Result
Economic Impacts	Production impacts	I.1 Maximum value of production losses (Million euros)	295.4
		I.2 Share of EU production value affected (%)	5.13%
		I.3 Difficulty of eradication	18,017
	Trade impacts	I.4. Number of importing countries banning trade	127
		I.5 Value of export losses (Million euros)	809.3
		I.6 Share of export losses over total production (%)	7%
		I.7 Trade dispersion	0.91
	Price and market impacts	I.8 Change in domestic price (%)	9%
		I.9 Change in domestic production over imports (%)	0%
	Impacts on other agents	I.10 Upstream effect (Million euros)	291.2
		I.11 Downstream effect (%)	5%
Social impacts	Impact on employment	I.12 Job losses (jobs)	5,760
	Impact on Food Security and Food safety	I.13 Share of caloric supply (kcal/capita/day)	0.072%
		I.14 Share of protein supply (g/capita/day)	0.037%
		I.15 Share of fat supply quantity (g/capita/day)	0.014%
		I.16 Ability to produce fungal toxins (y=1/n=0)	0
	Impact on recreation, landscape and cultural heritage	I.17. Share of holdings with other gainful activities (%)	40%
		I.18 Products covered by EU quality labels (number of designations)	29
		I.19 Presence of affected hosts on cultural heritage landmarks	28.88
	Environmental impacts	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	1
		I.22 Soil erosion	0.7812
Impact biodiversity and ecosystem services		I.23 Number of protected species and habitats related to hosts	1
		I.24 Share of Natura 2000 area and sites affected (%)	50.0%
	I.25 Share under sustainable management practices (%)	0.21%	



# STRUCTURE OF THE IZFL

## RANKING

Pest	IPZ		Ranking by domains		
	Rank	Value	Economic	Social	Environmenta
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.8104	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.5117	4	3	2
<i>Phaenobotria leucotreta</i> (Citrus codling moth)	3	0.4714	8	2	3
<i>Candidatus Liberibacter</i> (Citrus greening)	4	0.3750	2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3349	10	6	4
<i>Anthonomus eugeni</i>	6	0.2960	5	9	7
<i>Pericoma cockerelli</i>	7	0.2792	7	4	14
<i>Cydia pomonella</i> (Apple maggot fly)	8	0.2728	3	12	10
<i>Frugiperda</i> (Fall armyworm)	9	0.2246	11	10	11
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	10	0.2068	17	11	11
<i>Bactrocera zonata</i> (Mediterranean fruit fly)	11	0.2051	16	11	11
<i>Dioryctes</i>	12	0.1983	15	11	11
<i>Phytophthora</i> (of grapevine)	13	0.1887	15	11	11

## 2. Normalization and weighting

Aggregate indicators and compare pests

## 1. Indicators selection (Reg. criteria/data availability)

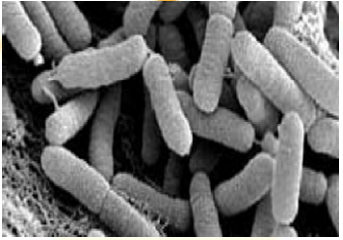
Quantitative / qualitative measures by HOST / PEST



# RANKING (pest affecting crops example)

Pest	I2P2		Ranking by domains		
	Rank	Value	Economic	Social	Environmental
<i>Xylella fastidiosa</i> ( )	1	0.8104	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.5117	4	3	2
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	0.4714	8	2	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3750	2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3349	10	6	4
<i>Anthonomus eugeni</i>	6	0.2960	5	9	7
<i>Bactericera cockerelli</i>	7	0.2792	7	4	14
<i>Rhagoletis pomonella</i> (Apple maggot fly)	8	0.2728	3	12	10
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2246	11	10	11
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	10	0.2068	17	11	8
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	0.2051	16	14	6
<i>Bactrocera zonata</i> (Peach fruit fly)	12	0.1983	15	13	9
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	13	0.1958	9	16	12
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	0.1747	12	7	17
<i>Thrips palmi</i>	15	0.1707	20	8	13
<i>Xanthomonas citri</i> (Citrus canker)	16	0.1321	19	18	15
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	17	0.1262	18	19	16
<i>Tilletia indica</i> (Karnal bunt of wheat)	18	0.1220	6	20	20
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (Bacterial ring rot of potato)	19	0.1126	13	15	19
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.0930	14	17	18

# Some figures for the pests in the podium



## *Xylella fastidiosa*

5.5 billion EUR of agricultural production at risk  
103 protected habitat and species potentially affected



## *Popillia japonica* (Japanese beetle)

2.4 billion EUR of agricultural production at risk  
158 countries we trade with might restrict imports from EU



## *Thaumatotibia leucotreta* (Citrus codling moth)

1.2 billion EUR of agricultural production at risk  
0.21% of total protein intake at risk

Note - Results for the median scenario

# STRUCTURE OF THE IZFL

Indicator	Value
1 Maximum value of production losses (billions euros)	0.001
2 Share of EU production value affected (%)	0.000
3 EU productivity of production	0.000
4 Number of importing countries banning trade	0.000
5 Share of export losses (billions euros)	0.000
6 Share of export losses over total production (%)	0.000
7 Trade dispersion	0.000
8 Change in domestic price (%)	0.000
9 Change in domestic production over imports (%)	0.000
10 Increase in other agents	0.000
11 Decrease in other agents	0.000
12 Job losses (jobs)	0.000
13 Share of cabinet capacity (billions euros)	0.000
14 Share of protein capacity (billions euros)	0.000
15 Share of fat capacity (billions euros)	0.000
16 Ability to produce large losses (CJ/€)	0.000
17 Share of buildings with other agents (billions euros)	0.000
18 Reduction in overall EU quality (billions of kilograms)	0.000
19 Reduction of affected habitats in other heritage landscapes	0.000
20 Use of forests in other trees and in parks	0.000
21 Individual effects of control measures	0.000
22 Full effects	0.000
23 Number of protected species and habitats related to hosts	0.000
24 Share of Natura 2000 areas and other affected (%)	0.000
25 Share under sustainable management practices (%)	0.000

1. Indicators selection  
(Reg. criteria/data availability)

Quantitative / qualitative measures by HOST / PEST

## RANKING

Pest	IP2		Ranking by domains		
	Rank	Value	Economic	Social	Environment
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.8104	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.5117	4	3	2
<i>Thaumetobia leucotreta</i> (Citrus codling moth)	3	0.4714	8	2	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3750	2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3349	10	6	4
<i>Vithionomus eugenii</i>	6	0.2960	5	9	7
<i>Periclerus cockerelli</i>	7	0.2792	7	4	14
<i>Cydia pomonella</i> (Apple maggot fly)	8	0.2728	3	12	10
<i>Frugiperda</i> (Fall armyworm)	9	0.2246	11	10	11
<i>Drosophila</i> (Oriental fruit fly)	10	0.2068	17	11	11
<i>Drosophila</i> (American fruit fly)	11	0.2051	16	11	11
<i>...</i>	12	0.1983	15	11	11
<i>...</i>	13	0.1887	15	11	11

2. Normalization and weighting

Aggregate indicators and compare pests

## Ranking uncertainty - EFSA parameters

Pest	Median	Q25		Q75	
	Ranking	Ranking	Change	Ranking	Change
(disease)	1	1	=	1	=
(beetle)	2	2	=	2	=
(Citrus codling moth)	3	3	=	3	=
(greening)	4	4	=	5	-1
	5	5	=	4	1
	6	6	=	8	
	7	7	=	7	
	8	10	=		

3. Uncertainty and sensitivity analysis

Stakeholder consultation

MS feedback

**ANNEX**  
**List of priority pests**

*Agrilus anxius* Gory

*Agrilus planipennis* Fairmaire

*Anastrepha ludens* (Loew)

*Anoplophora chinensis* (Thomson)

*Anoplophora glabripennis* (Motschulsky)

*Anthonomus eugenii* Cano

*Aromia bungii* (Faldermann)

*Bactericera cockerelli* (Sulc.)

*Bactrocera dorsalis* (Hendel)

*Bactrocera zonata* (Saunders)

*Bursaphelenchus xylophilus* (Steiner et Bühner) Nickle *et al.*

*Candidatus Liberibacter* spp., causal agent of Huanglongbing disease of citrus/citrus greening

*Conotrachelus nenuphar* (Herbst)

*Dendrolimus sibiricus* Tschetverikov

*Phyllosticta citricarpa* (McAlpine) Van der Aa

*Popillia japonica* Newman

*Rhagoletis pomonella* Walsh

*Spodoptera frugiperda* (Smith)

*Thaumatotibia leucotreta* (Meyrick)

*Xylella fastidiosa* (Wells *et al.*)

L 260/8

EN

Official Journal of the European Union

11.10.2019

**COMMISSION DELEGATED REGULATION (EU) 2019/1702**

**of 1 August 2019**

**supplementing Regulation (EU) 2016/2031 of the European Parliament and of the Council by  
establishing the list of priority pests**

Evaluación ex-ante utilizando modelos agro-económicos: los objetivos de las estrategias de la granja a la mesa y de biodiversidad



Apoyo a la implementación de actos delegados de la legislación: evaluando el impacto de plagas para su priorización



Apoyo a la implementación de actos delegados de la legislación: evaluando el impacto de plagas para su priorización





## JRC SCIENCE FOR POLICY REPORT

# Farmers and the new green architecture of the EU common agricultural policy: a behavioural experiment

Dessart, F. J., Rommel, J., Barreiro-Hurlé, J., Thomas, F., Rodríguez-Entrena, M., Espinosa-Goded, M., Zagórska, K., Czajkowski, M., van Bavel, R.

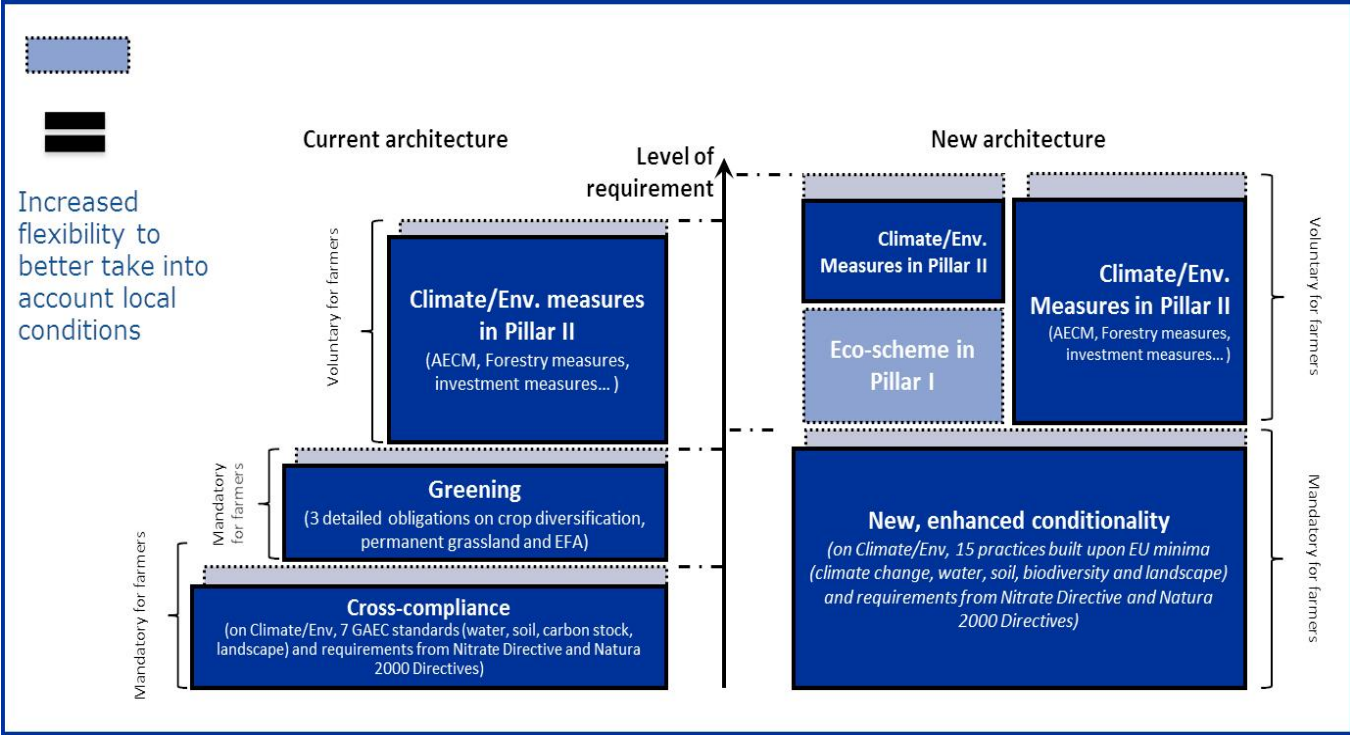
2021



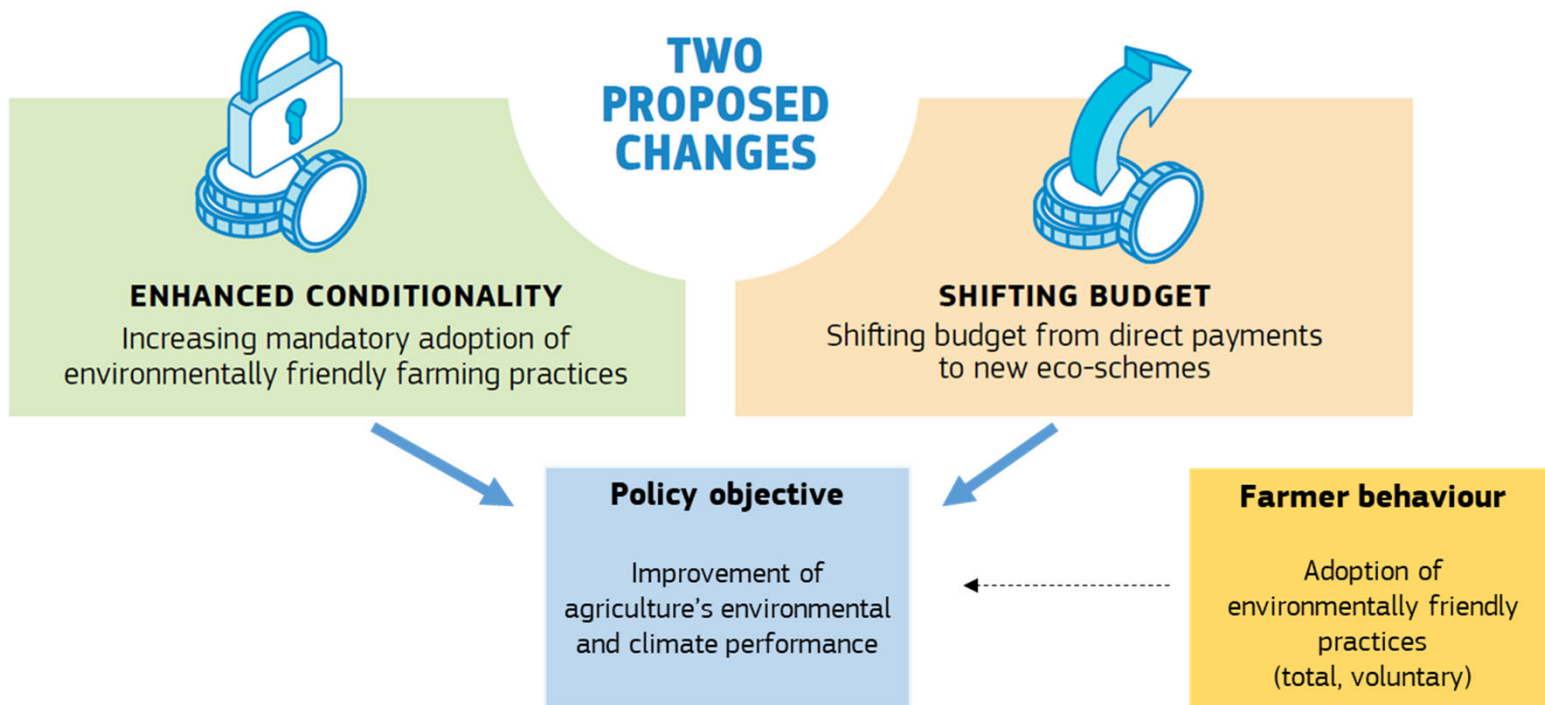
Joint  
Research  
Centre

EUR 30705 EN









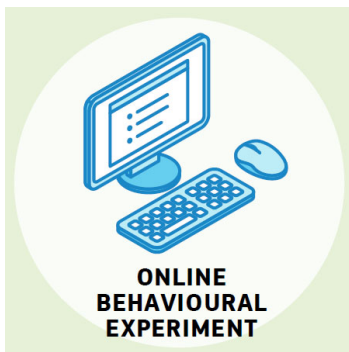


Crowding out effect / mental accounting / Moral licensing – when mandatory increases voluntary decreases

Crowding in effect – when mandatory decreases voluntary increases due to injunctive norms



Lower endowment leads to lower contribution in absolute terms



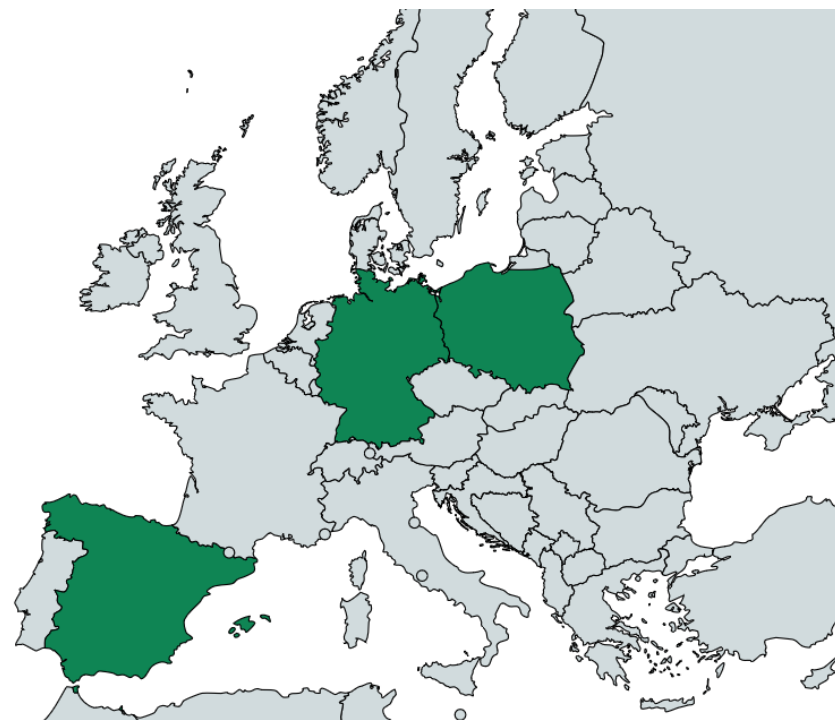
## *Self-administrated*

Semi-contextualised

Incentivized

Pre-registered


AS PREDICTED




600 farmers (200 x country)

Soft quotas for size, age and farming activity


FOR YOU




Your initial net income is \_\_\_\_ tokens.




Your **CONTRIBUTION TO THE ENVIRONMENT**




FOR YOU







Your initial net farm income is \_\_\_\_ tokens.








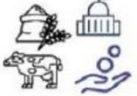
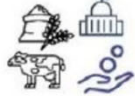

Your **CONTRIBUTION TO THE ENVIRONMENT**  
*(will be deducted from your initial net farm income on the next screen)*



<p><b>MANDATORY</b></p>  <p>You <b>must give</b> _ tokens to the environment.</p>  <p>No compensation for this mandatory contribution.</p>	<p><b>VOLUNTARY</b></p>  <p>You <b>can decide to give more tokens</b> to the environment.</p>  <p>You will receive a compensation corresponding to 90% of the number of tokens that you voluntarily give to the environment.</p>
---	---

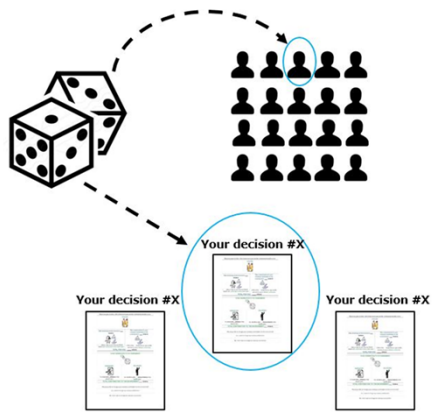
**YOUR VOLUNTARY CONTRIBUTION TO THE ENVIRONMENT:**  
Please enter a number between 0 and .

**XXX**

Framing of variation		Parameters	Within-subject factor (Every participant was exposed to all three levels, one after the other, in random order)		
			Level 1	Level 2	Level 3
<b>Between-subject factor</b> (Every participant was randomly allocated to one and only one of these two experimental conditions)	Variation in mandatory contribution to the environment	Held constant: Your initial net income is <b>300</b> tokens. 	<b>MANDATORY</b>  You <i>must</i> give <b>5</b> tokens to the environment.	<b>MANDATORY</b>  You <i>must</i> give <b>40</b> tokens to the environment.	<b>MANDATORY</b>  You <i>must</i> give <b>90</b> tokens to the environment.
		Gap from Level 1		+ 35 tokens	+ 85 tokens
		Disposable initial net income (= initial net income – mandatory contribution)	295 tokens (= 300 – 5)	260 tokens (= 300 – 40)	210 tokens (= 300 – 90)
	Variation in income, framed as variation in direct payments	Held constant: <b>MANDATORY</b>  You <i>must</i> give <b>5</b> tokens to the environment.	Your initial net income is <b>300</b> tokens. 	Your initial net income is <b>265</b> tokens. 	Your initial net income is <b>215</b> tokens. 
		Gap from Level 1		– 35 tokens	– 85 tokens
		Disposable initial net income (= initial net income – mandatory contribution)	295 tokens (= 300 – 5)	260 tokens (= 265 – 5)	210 tokens (= 215 – 5)

Individuals assigned randomly to one of two treatments

Levels presented in random order

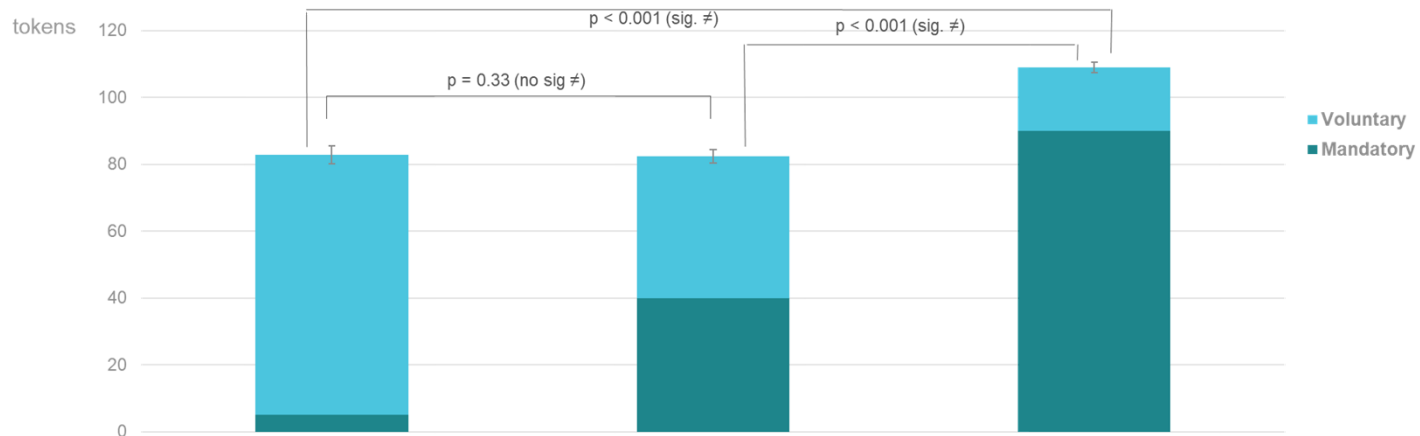


# Incentivisation





## TOTAL CONTRIBUTION TO THE ENVIRONMENT



Constant:  
FOR YOU  
Your initial net income **300** tokens

MANDATORY  
You **must give 5** tokens to the environment.  
No compensation for this mandatory contribution.

MANDATORY  
You **must give 40** tokens to the environment.  
No compensation for this mandatory contribution.

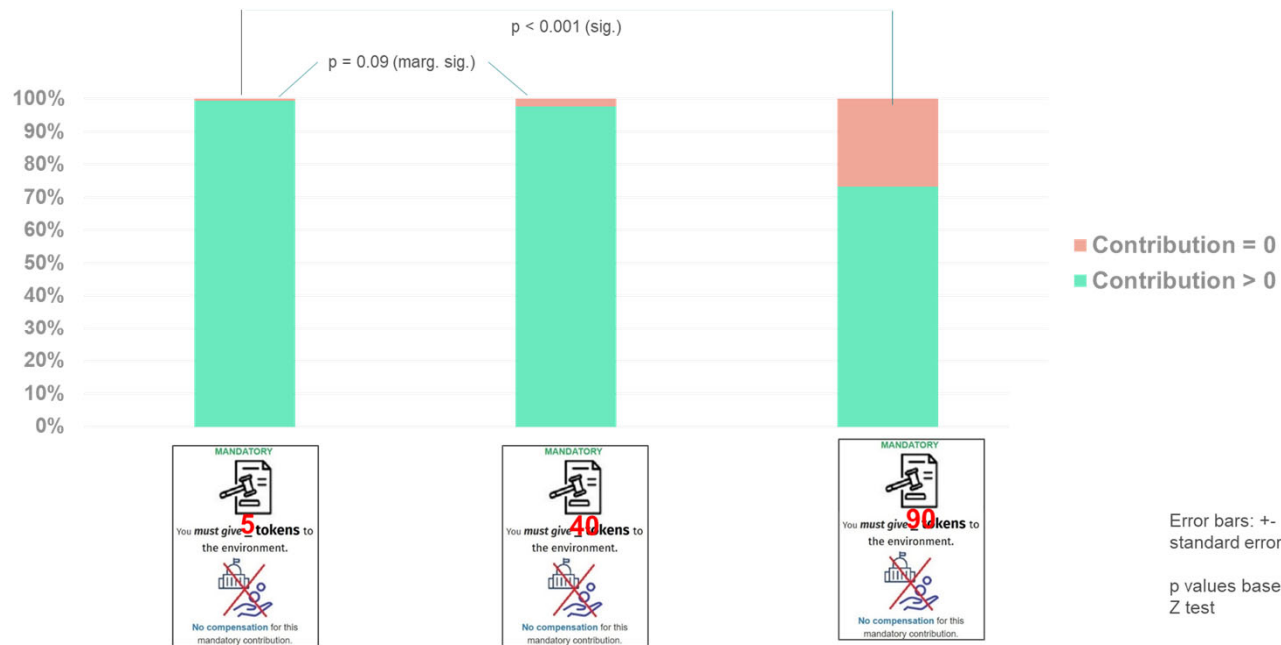
MANDATORY  
You **must give 90** tokens to the environment.  
No compensation for this mandatory contribution.

Error bars: +/- standard error

p values based on Wilcoxon (comparing distributions)



## SHARE OF ZERO CONTRIBUTIONS



Constant:  
FOR YOU  
Your initial net income: **300 tokens**

MANDATORY  
You **must give 5 tokens** to the environment.  
No compensation for this mandatory contribution.

MANDATORY  
You **must give 40 tokens** to the environment.  
No compensation for this mandatory contribution.

MANDATORY  
You **must give 90 tokens** to the environment.  
No compensation for this mandatory contribution.

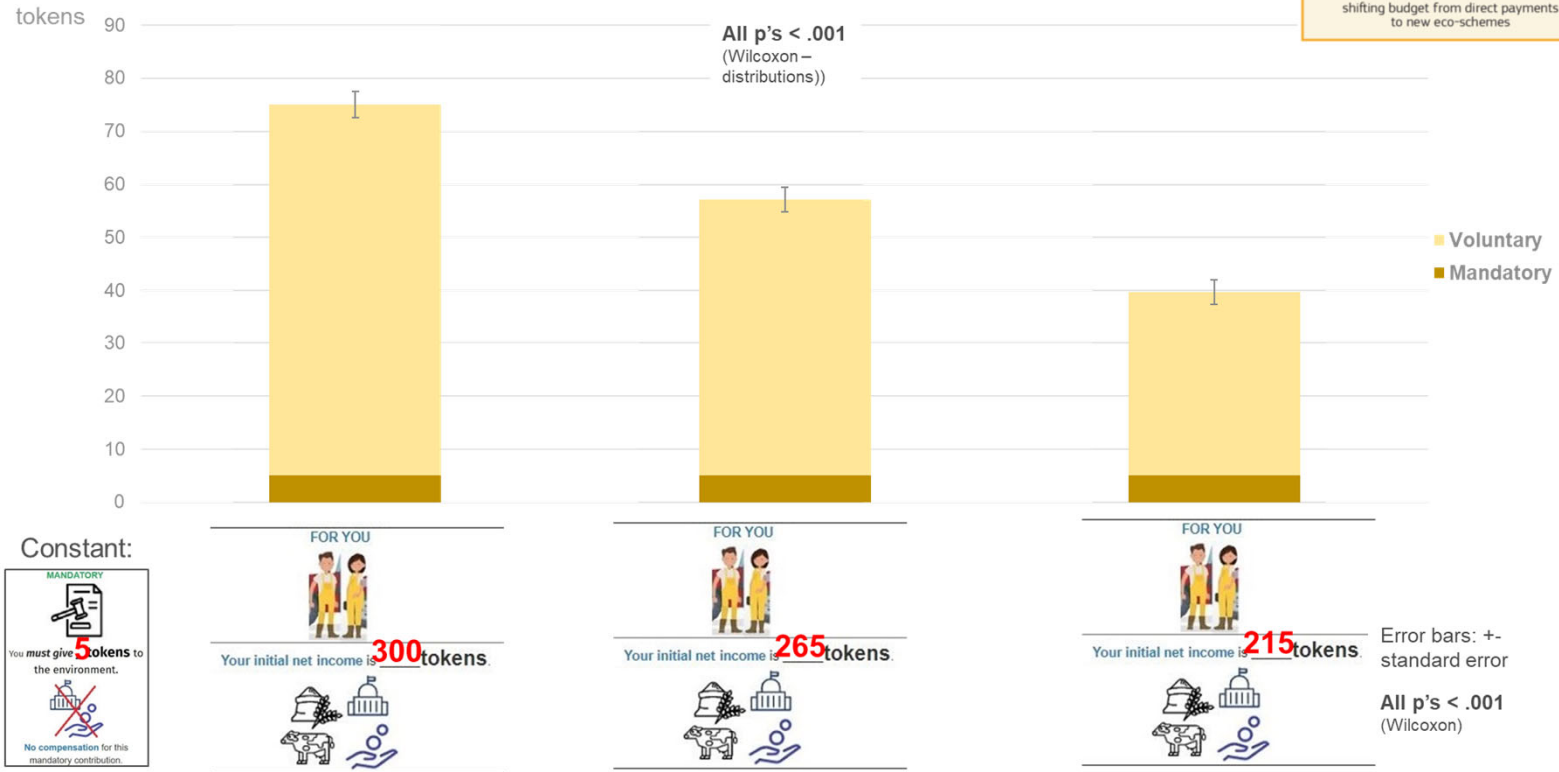
Error bars: +/- standard error

p values based on Z test

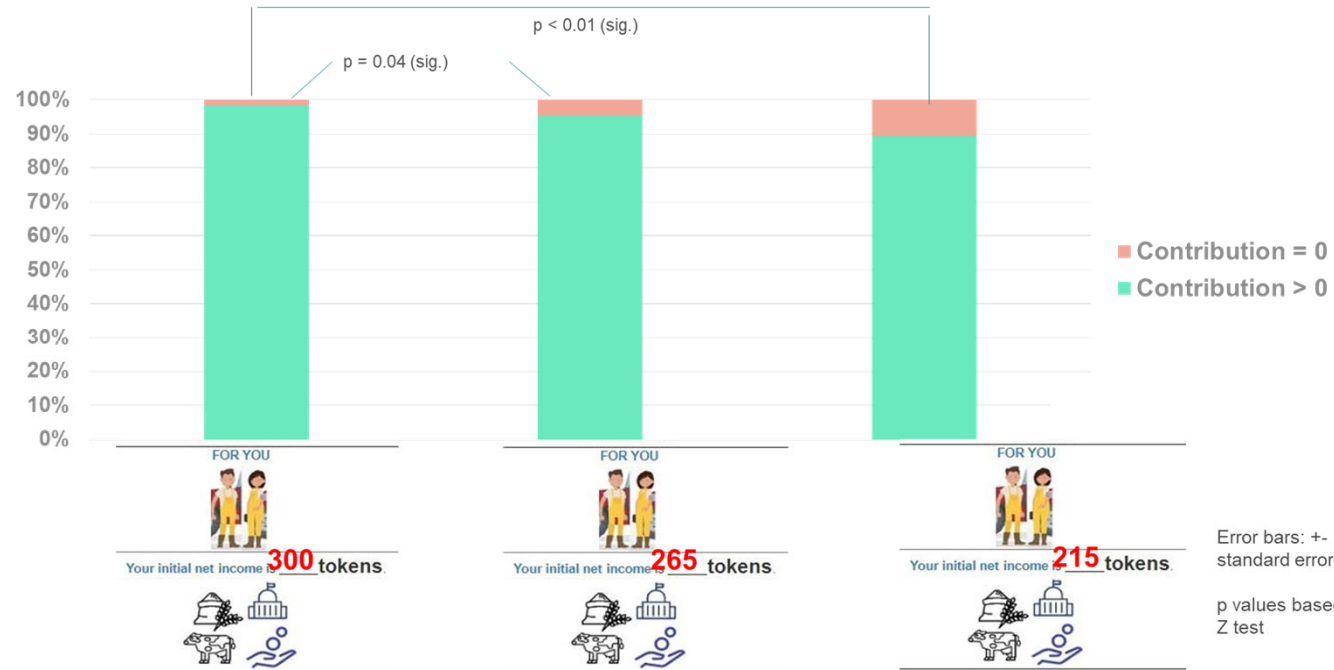


# TOTAL CONTRIBUTION TO THE ENVIRONMENT

**DECREASE DIRECT PAYMENTS**  
shifting budget from direct payments to new eco-schemes



## SHARE OF ZERO CONTRIBUTIONS



Constant:

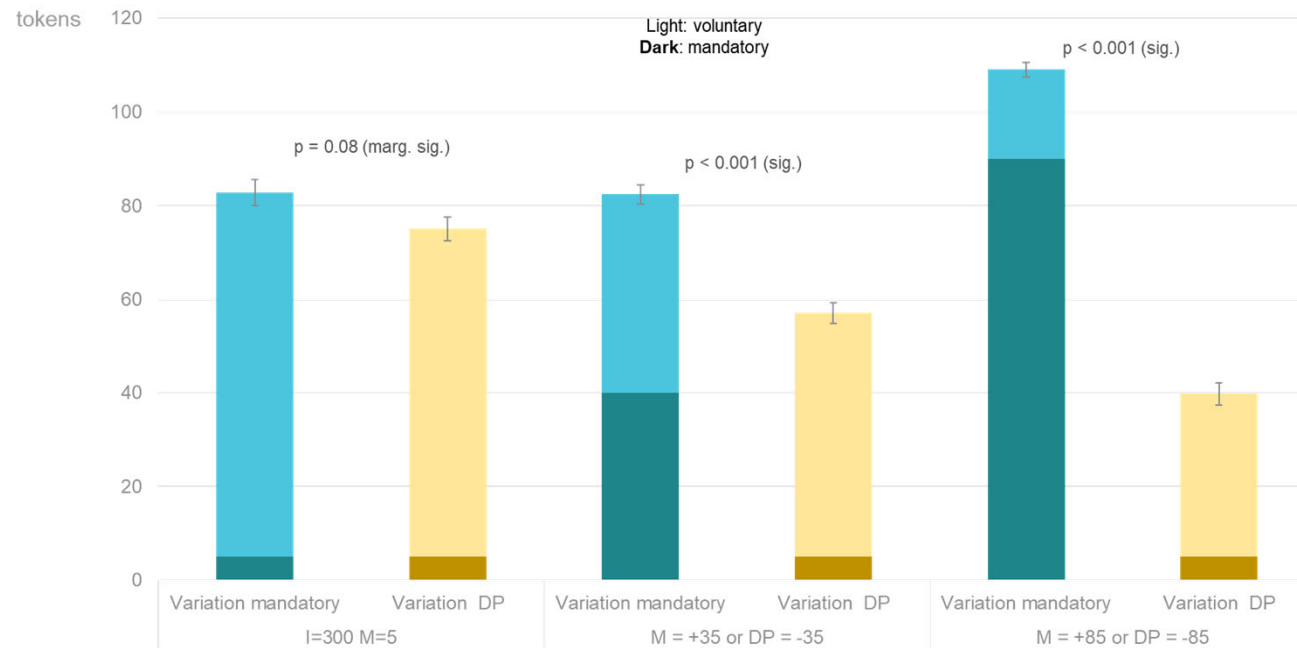
**MANDATORY**

You **must** give **5 tokens** to the environment.

No compensation for this mandatory contribution.

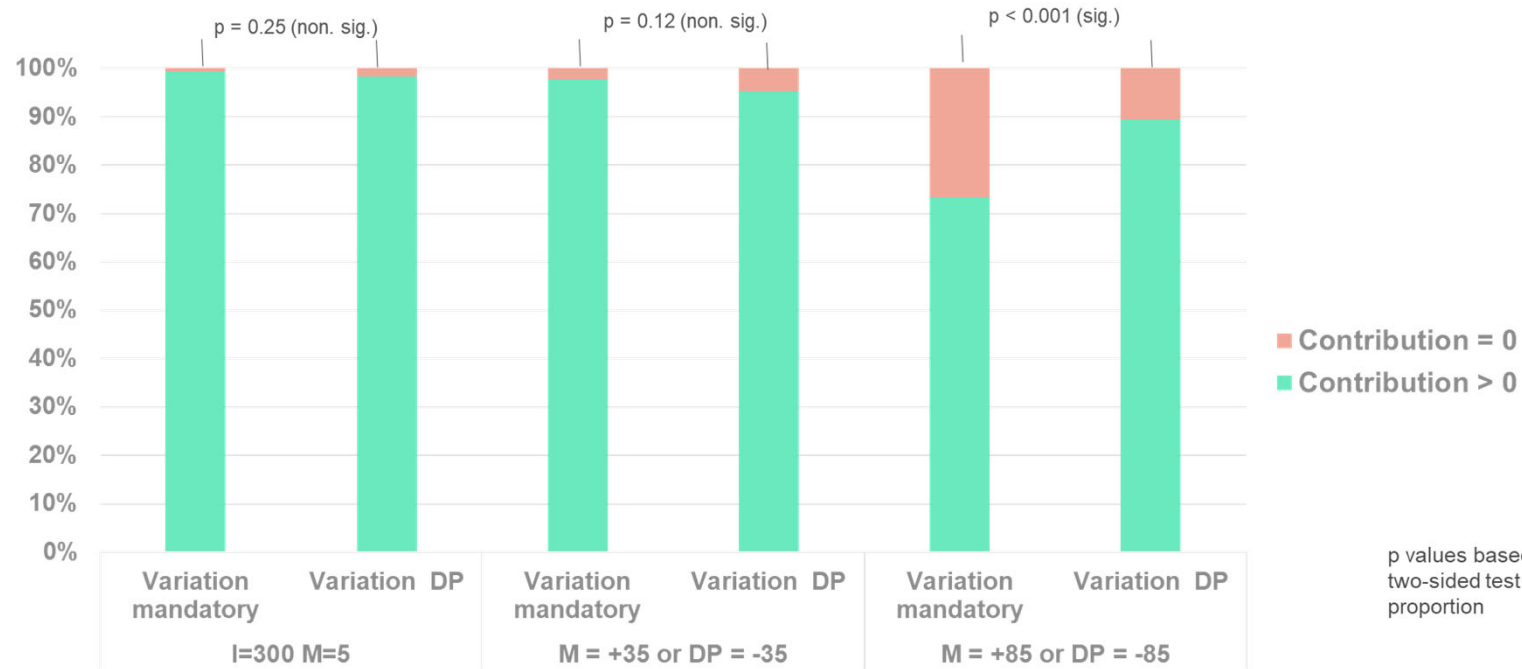


## TOTAL CONTRIBUTION TO THE ENVIRONMENT



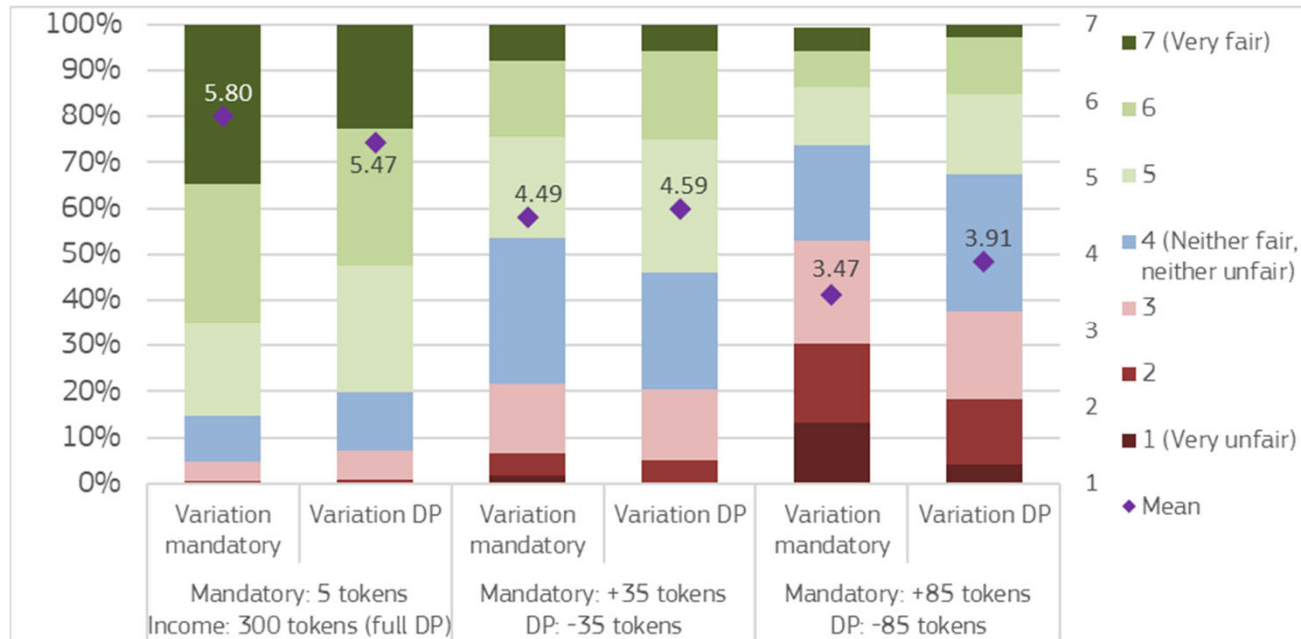


## SHARE OF ZERO CONTRIBUTIONS





## FAIRNES PERCEPTION OF OPTIONS





***Enhancing conditionality may not necessarily increase the overall adoption of environmentally friendly practices...***

***... unless the increase in requirements is substantial.***

***Decreasing BISS payments in favour of eco-schemes may not increase overall adoption of environmentally friendly practices.***



***... but the picture could be different in real life and for higher compensation rates***

***Voluntary contribution more sensitive to variation of mandatory contribution than to equivalent variation of endowment***

***Evidence of moral licensing effect?***

# Thank you



© European Union 2020

Unless otherwise noted the reuse of this presentation is authorised under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license. For any use or reproduction of elements that are not owned by the EU, permission may need to be sought directly from the respective right holders.

