NIVA

NEW IACS VISION IN ACTION

Meeting with testing countries

14/09/2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 842009

Agenda

- State-of-play in tool development
- Questions and answers
- KPI and innovation
  - Involvement of testing countries

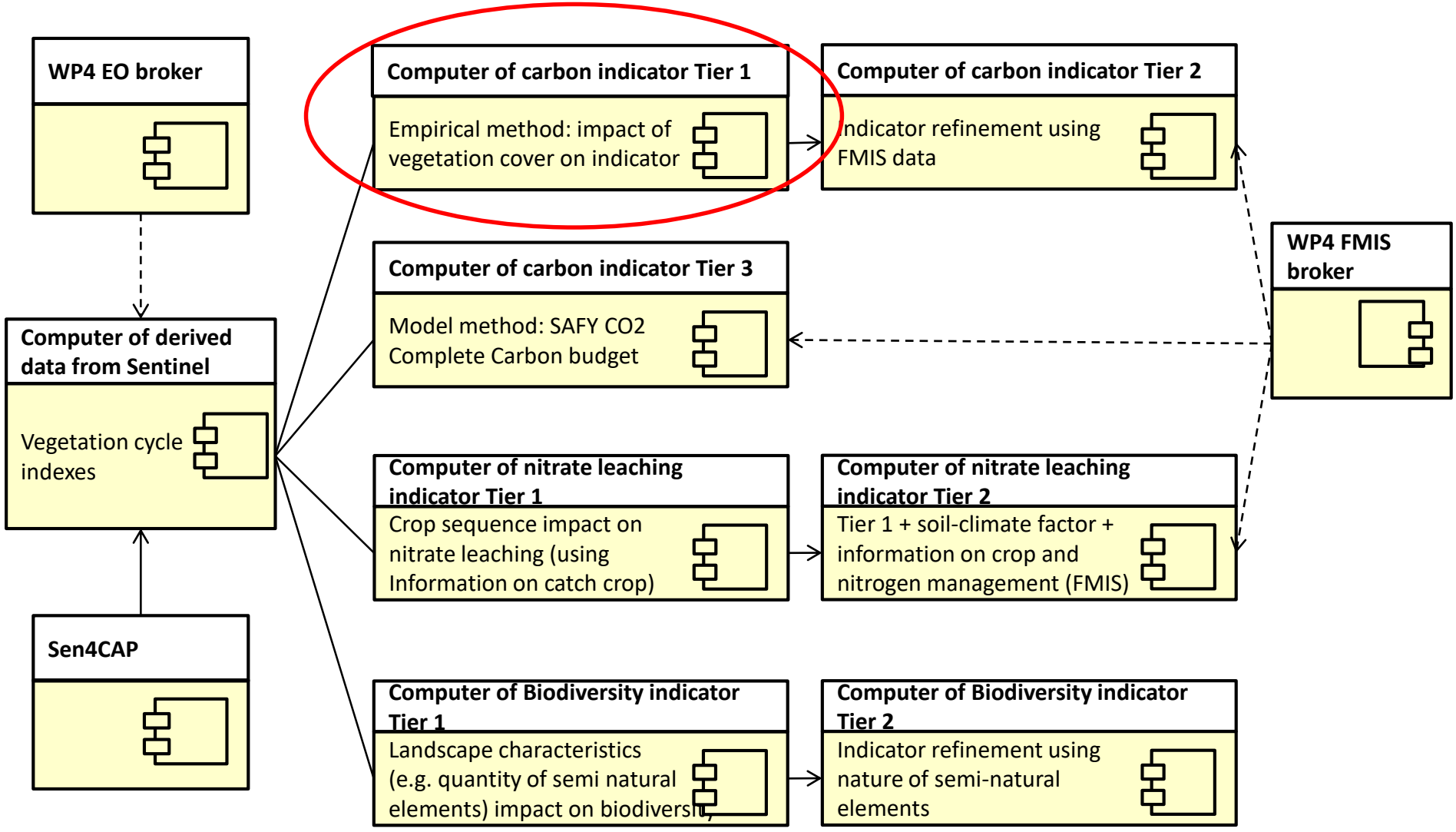
State-of-play in UC1b tool development

- **On going work on the methodological definition of 3 indicators:**
  - **Carbon storage Tier 2**
  - **Nitrate leaching Tier 1 and 2**
  - **Biodiversity Tier 1 and 2**

- **A prototype developed for carbon storage Tier 1**
  - **Based on empirical method**
  - **Already tested in 5 French departments**
  - **First version on NIVA Gitlab with documentation (user guide and code documentation)**

- **A model method for carbon storage Tier 3 (SafyCO2) being refined**

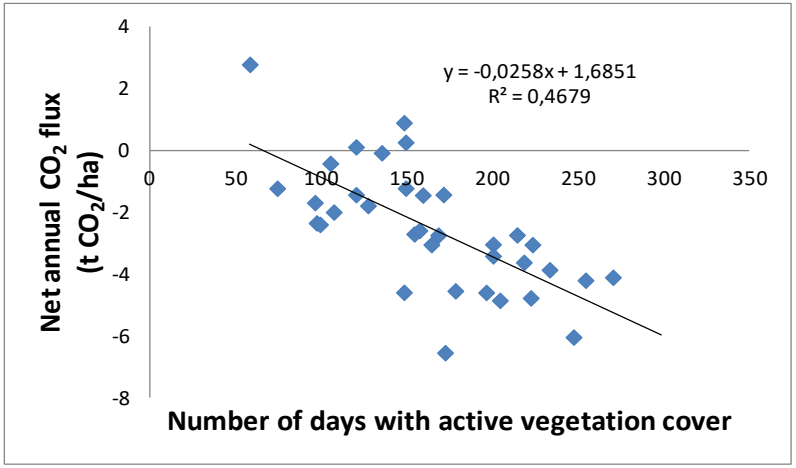
Component list



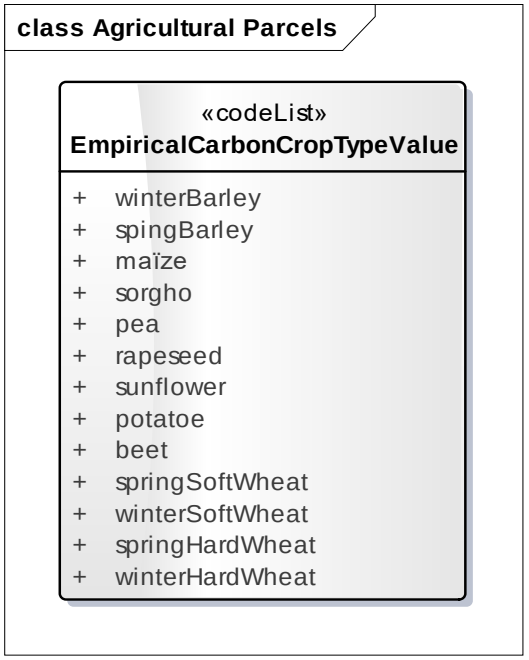
State-of-play in UC1b tool development

Carbon indicator Tier 1

- **Objective: estimate empirically the Net Ecosystem Exchange (NEE) at parcel level**
  - **carbon storage is related to number of days of vegetation**
  - **calculation only in arable land on 15 family crops**



simple relation between number of days with vegetation and carbon storage



State-of-play in UC1b tool development

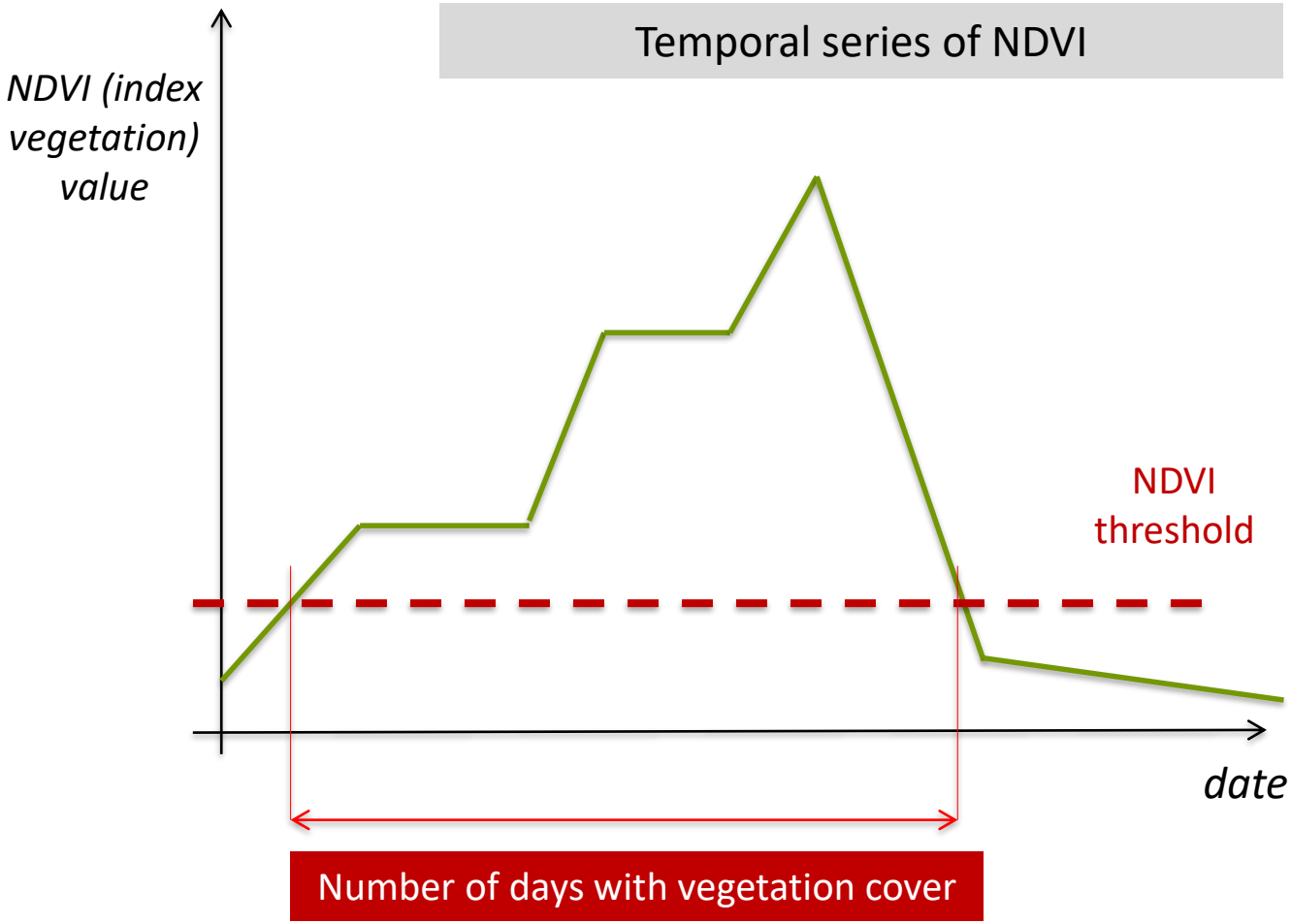
Carbon indicator Tier 1

- **Input data**
  - **NDVI temporal series (.csv table) at parcel level with average and standard deviation**
    - Coming from Sentinel 2
    - But other sources possible if similar format
  - **IACS data (agricultural parcel with crop codes)**

- **Output data**
  - **Excel file with the mass of carbon stored per plot of land (t CO2/ha)**

State-of-play in UC1b tool development

Carbon indicator Tier 1: threshold crossing (parameter)



To obtain the net CO2 flow, we look for the number of days on which a threshold value of NDVI has been crossed.

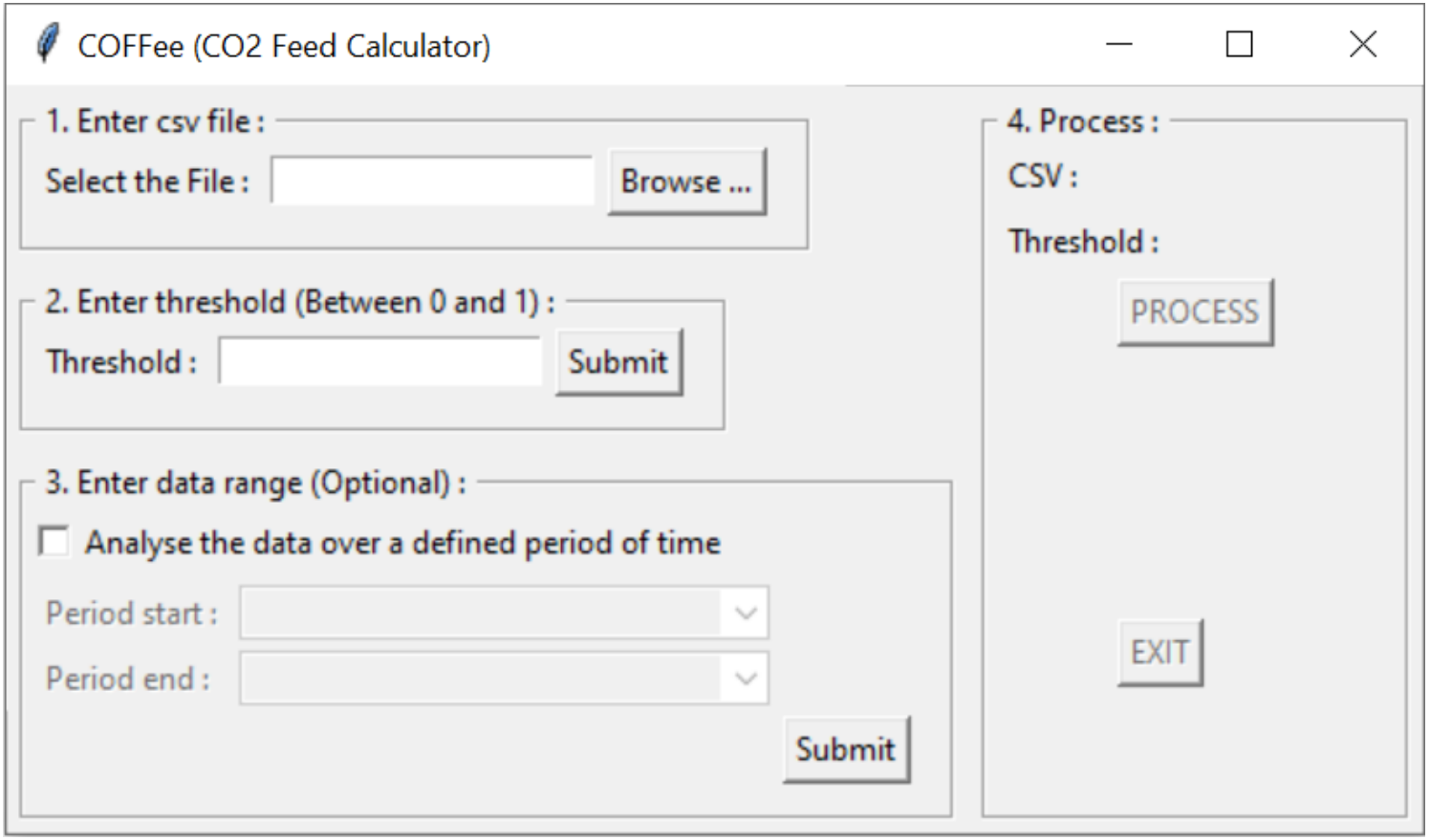
State-of-play in UC1b tool development

Carbon indicator Tier 1 issue : lack of data for an NDVI time series

- Generally due to cloud effect on images
- Identification of the lack of data (holes)
- Linear interpolation of NDVI values at threshold crossings (day-by-day interpolation)
- To allow this interpolation at the beginning and at the end of the agricultural campaign it is necessary to have images over a period greater than the calculation period

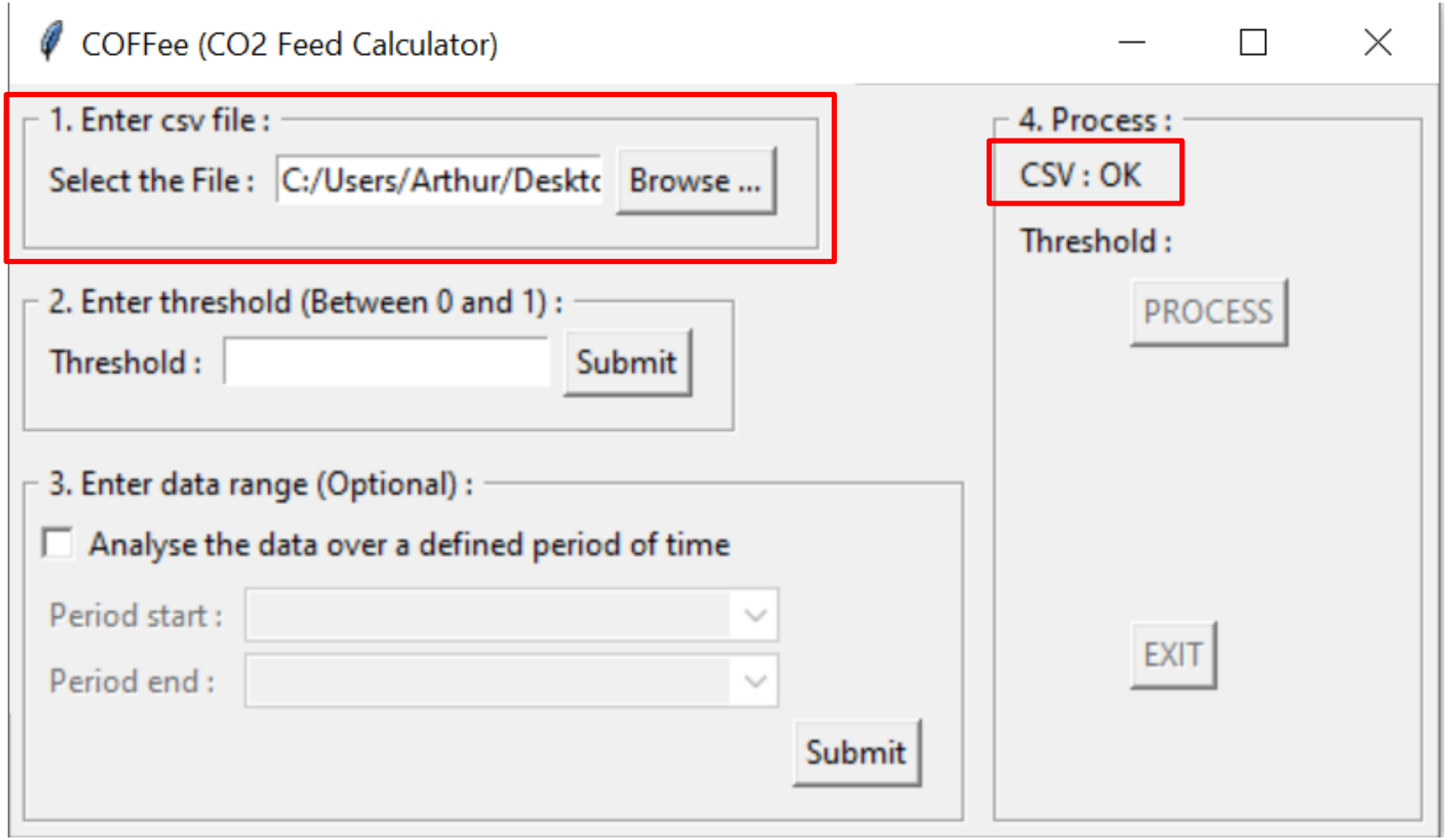
How to run the prototype carbon indicator Tier1 ?

- **Open .bat to install open library and open software (Python) all components are in the same folder**
- **Open another .bat to run the tool and fill out boxes**



How to run the prototype carbon indicator Tier1 ?

1. Select NDVI temporal series (.csv Sen4CAP like format)



How to run the prototype carbon indicator Tier1 ?

1. Enter de csv file link (raw format from Sen4CAP)

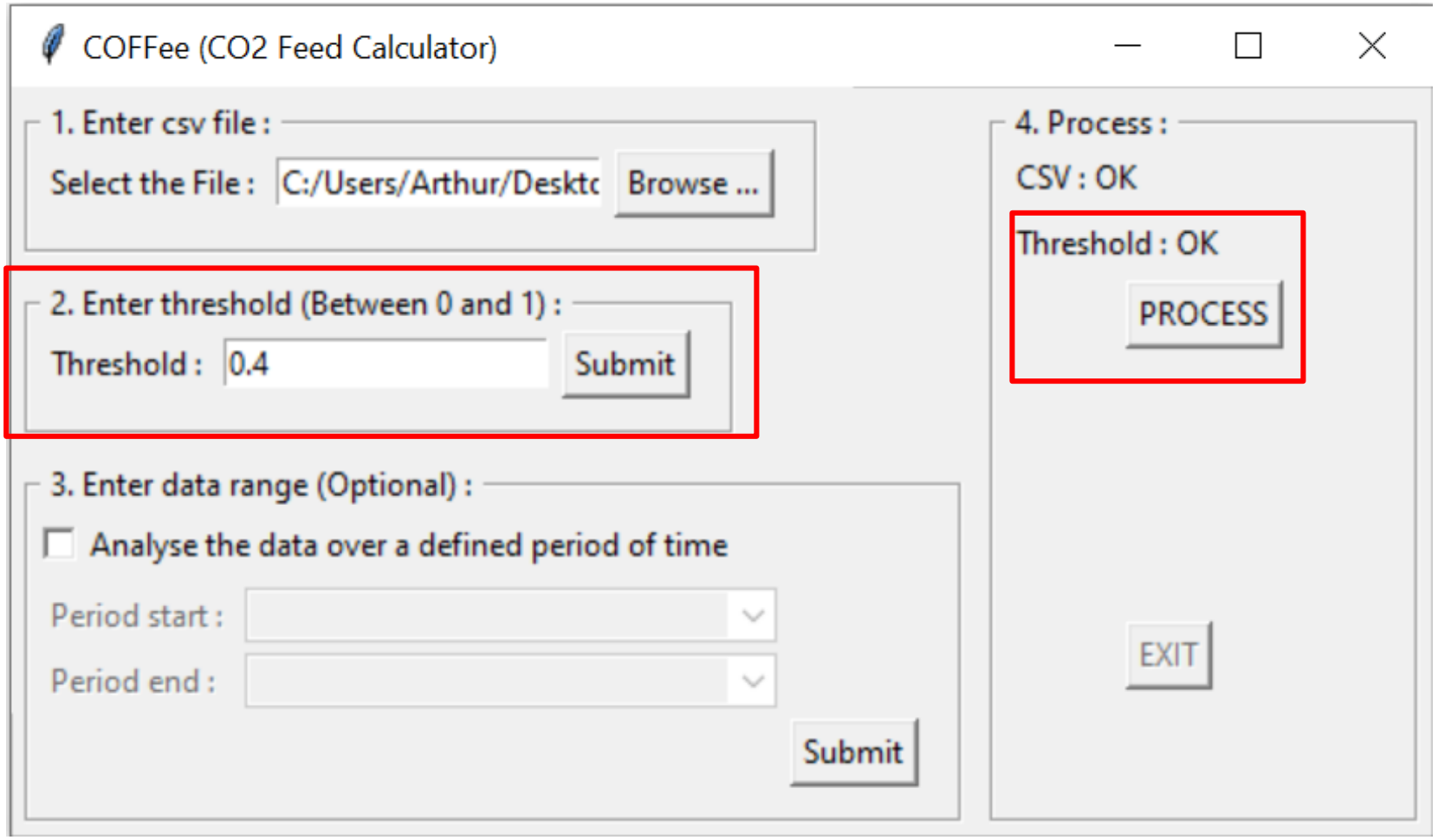
KOD_PB	suffix	date	mean	stdev		
10069	NDVI	03/01/2019	385.0000000	41.0626065|2019-01-15	405.7137097	41.1377991|2019-02-12
10072	NDVI	03/01/2019	804.7838617	67.6041861|2019-01-15	821.9020173	59.5221013|2019-02-12
10073	NDVI	03/01/2019	799.3844086	60.5738957|2019-01-15	810.8198925	60.8681340|2019-02-12
10074	NDVI	03/01/2019	296.6823529	81.2002539|2019-01-15	353.7647059	110.1443476|2019-02-12

-> Automatically formatted with one separator

KOD_PB	suffix	date	mean	stdev				
10069	NDVI	03/01/2019	385.0000000	41.0626065	15/01/2019	405.7137097	41.1377991	12/02/2019
10072	NDVI	03/01/2019	804.7838617	67.6041861	15/01/2019	821.9020173	59.5221013	12/02/2019
10073	NDVI	03/01/2019	799.3844086	60.5738957	15/01/2019	810.8198925	60.8681340	12/02/2019
10074	NDVI	03/01/2019	296.6823529	81.2002539	15/01/2019	353.7647059	110.1443476	12/02/2019

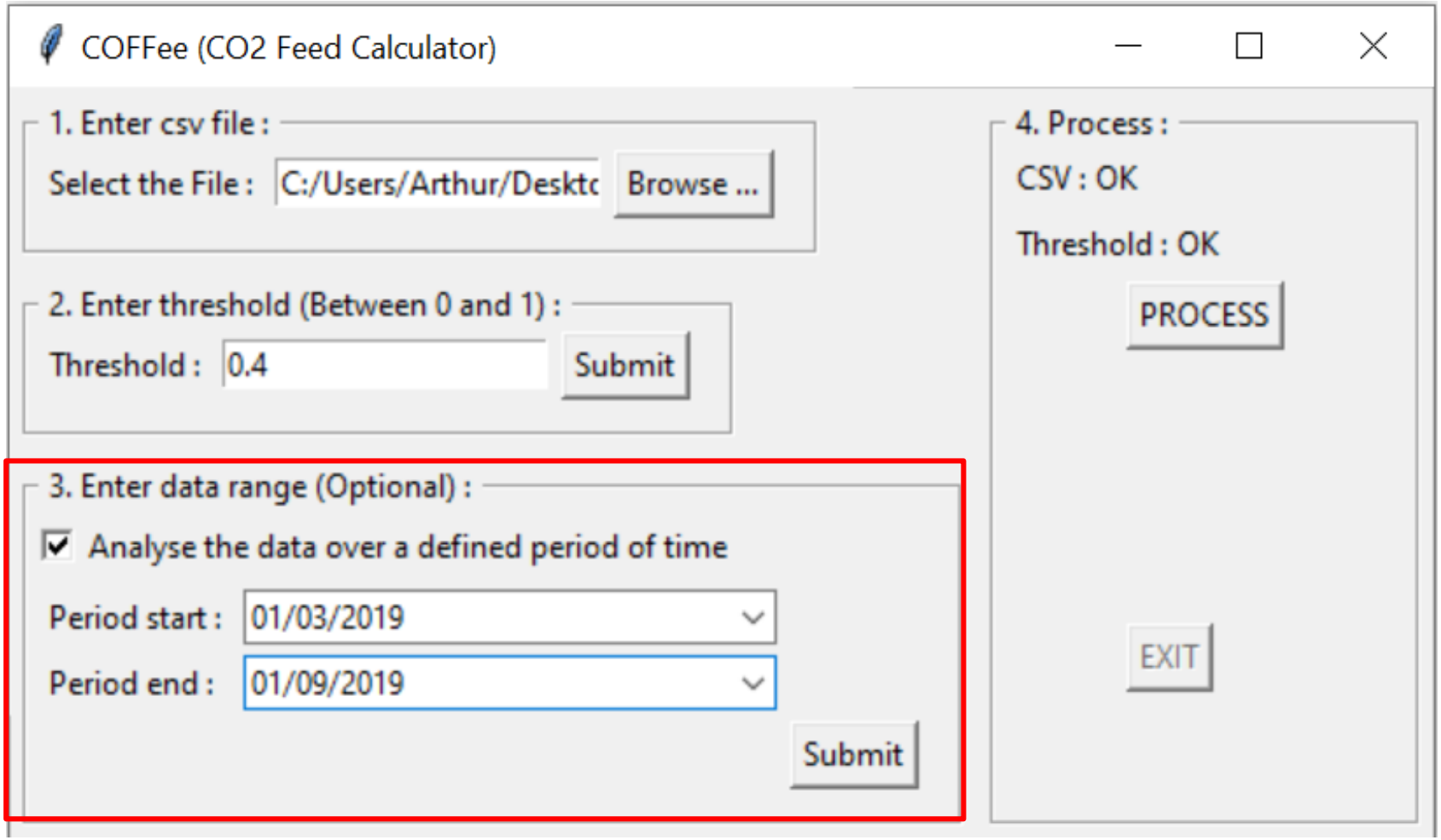
How to run the prototype carbon indicator Tier1 ?

2. Enter the NDVI threshold



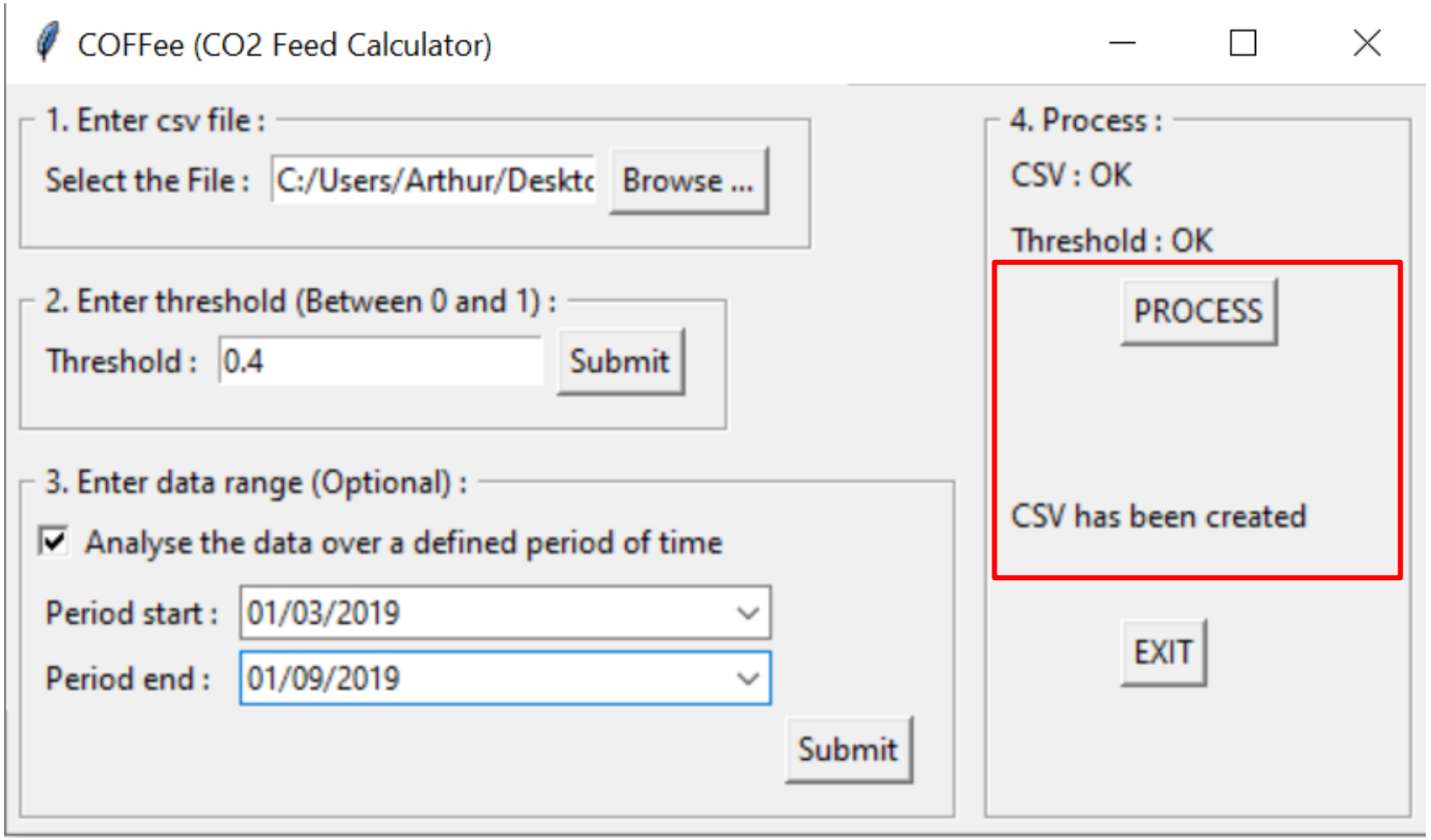
How to run the prototype carbon indicator Tier1 ?

3. Enter the cultural period (in option)



How to run the prototype carbon indicator Tier1 ?

4. Processing to generate result file



How to run the prototype carbon indicator Tier1 ?

- **Result file (Excel format)**

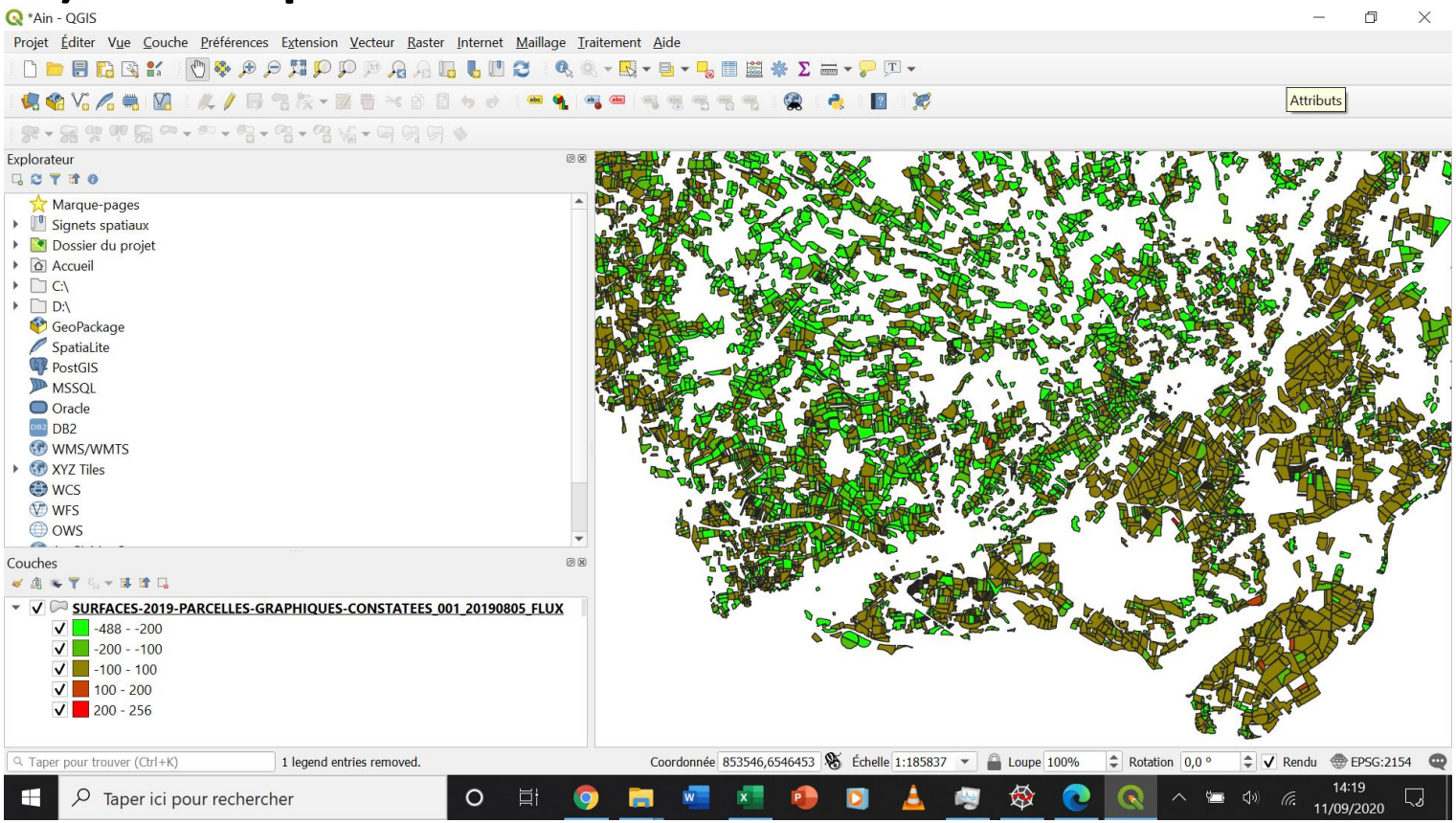
KOD_PB	suffix	CO2_FEED	NB_DAYS_VEG	NB_ACQS	FIRST_ACQ	LAST_ACQ	NB_CYCLES	LST_CYCLES
10069	NDVI	-39,9	128	38	16/03/2019	31/08/2019	1	[['01/03/2019', '07/07/2019', 0.91]]
10072	NDVI	-123,06	164	36	16/03/2019	31/08/2019	1	[['01/03/2019', '08/07/2019', 0.87]]

NB_HOLES	LST_HOLES	MIN_VAL	MOY_VAL	MAX_VAL	MIN_STD	MOY_STD	MAX_STD
4	[['01/03/2019', '16/03/2019',	0,11	0,53	0,91	19,96	44,03	76,19
4	[['01/03/2019', '16/03/2019', 15], ['31/03/2019', '15/04/2019',	0,31	0,69	0,87	17,59	45,65	97,43

How to run the prototype carbon indicator Tier1 ?

5. Carry out an attribute join with the agricultural parcel

6. Create a shape in order to aggregate (farm or administrative level) and map the results



T cO2/ha (< -200 / to -200 to -100 / to -100 to 100 / to 100 to 200 / > 200)

Questions and answers

Stakeholder involved

Stakeholder	Title/Role	Communication Vehicles	Stake in Project
Ministry of Agriculture (FR)	Policy maker	Meeting	Setting up of CAP national strategic plan
APCA (Chambers of Agriculture) (FR)	Advisory services	Meeting	Contact with professional organisation IT providers (interoperability) Provide technical advices to farmers
Agence BIO (FR)	Organic farming promotion	Meeting	Interaction between organic farming certification process and tools and IACS process
French Biodiversity Agency OFB (FR)	Biodiversity protectionand management	Meeting	Environmental data user
INRAe (FR)	Research Institute	Meeting	Agronomic approach to validate scintifically methods and indicators computation

Stakeholder involved

Stakeholder	Title/Role	Communication Vehicles	Stake in Project
Sen4CAP (EU)	Sentinels for Common Agriculture Policy	Meeting	Provide Sentinel processing chain reused in UC1b components
Copernicus (EU)	High Resolution Vegetation Phenology and Productivity	Meeting	Provide European phenological data and servicies from Sentinel
EEB (EU)	Environmental NGO	Workshop	Potential user
DG Agri (EU)	EC	Workshop	Potential user
DG Clima (EU)	EC	Workshop	Potential user
JRC (EU)	EC	Workshop	Potential user
DG Connect (EU)	EC	Workshop	Potential user
WUR (NL)	Research university and project management	Workshop	NIVA consortium
RVO (NL)	Testing NIVA partner	Meeting and Workshop	NIVA consortium
DAA (DK)	Testing NIVA partner	Meeting and Workshop	NIVA consortium
FEGA (TRAGSA) (ES)	Testing NIVA partner and WP2 management	Meeting and Workshop	NIVA consortium

KPI and innovation

- **Context**

Meeting between Tomaso and UC1b team on 11/06/2020

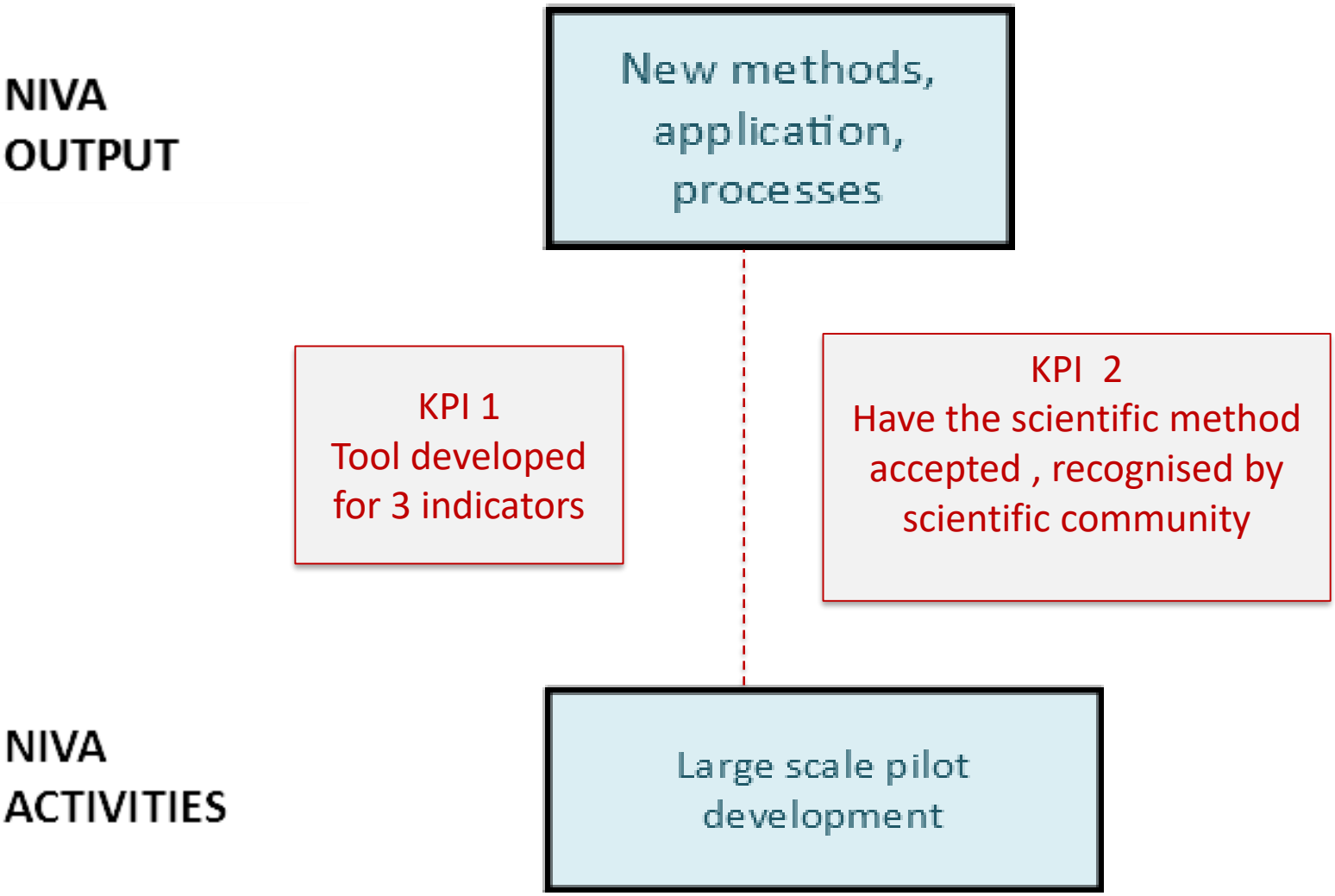
⇒ Clarification on UC1b objectives & impacts

⇒ New KPIs

  - **testing countries involved to achieve some of them**

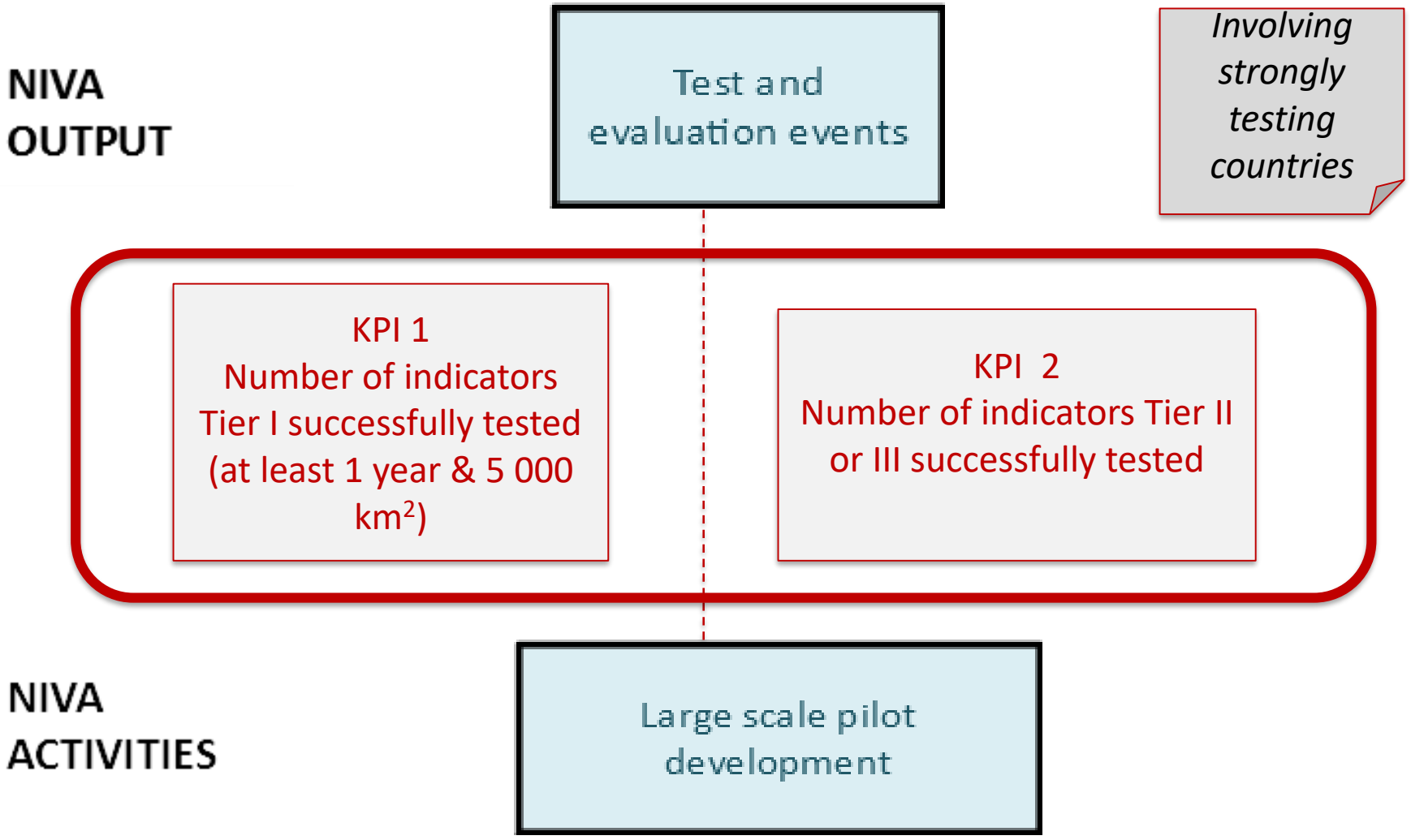
- **Meeting objectives**
  - Present where we are
  - Initiate discussion

KPI and innovation



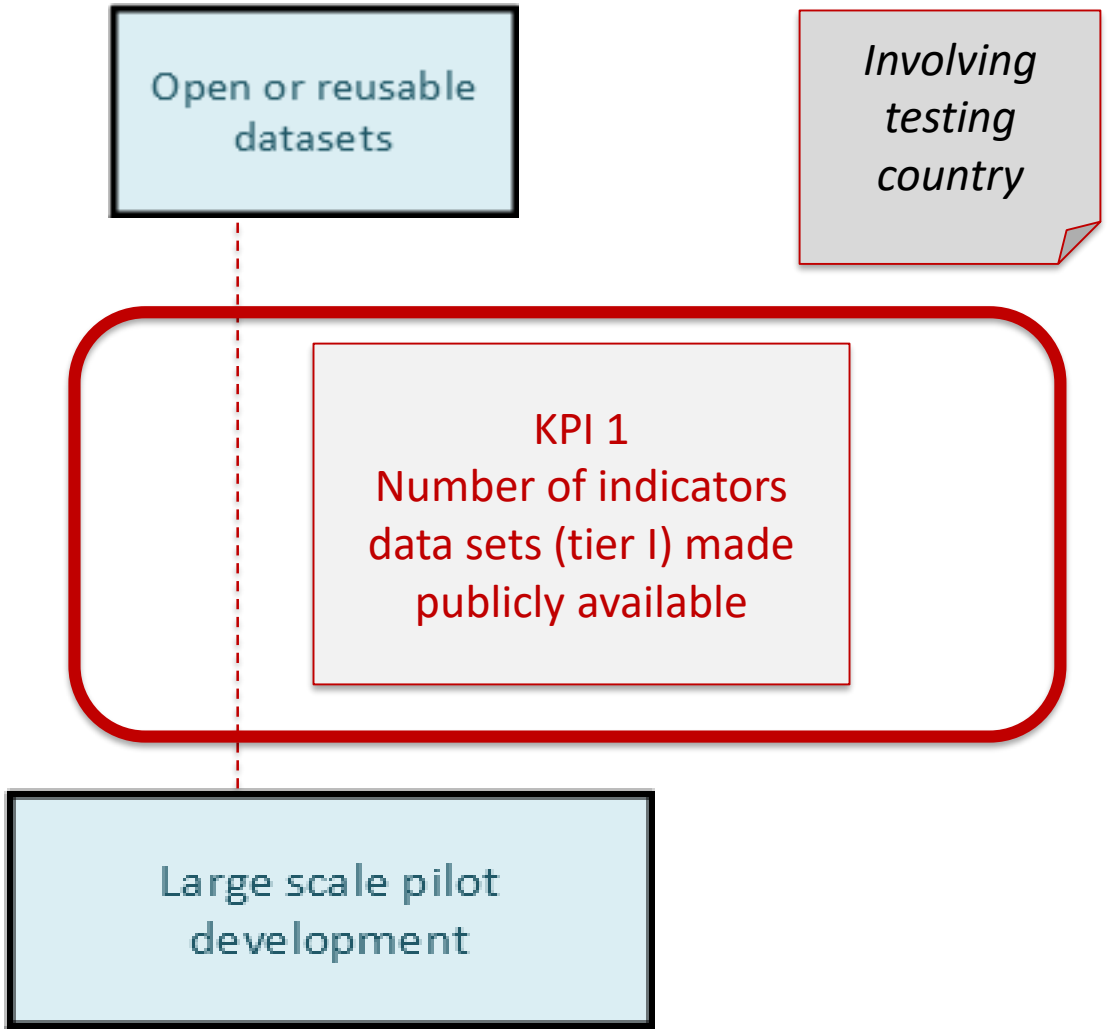
KPI and innovation

Strength : easy computation at European level (at least Tier I)



KPI and innovation

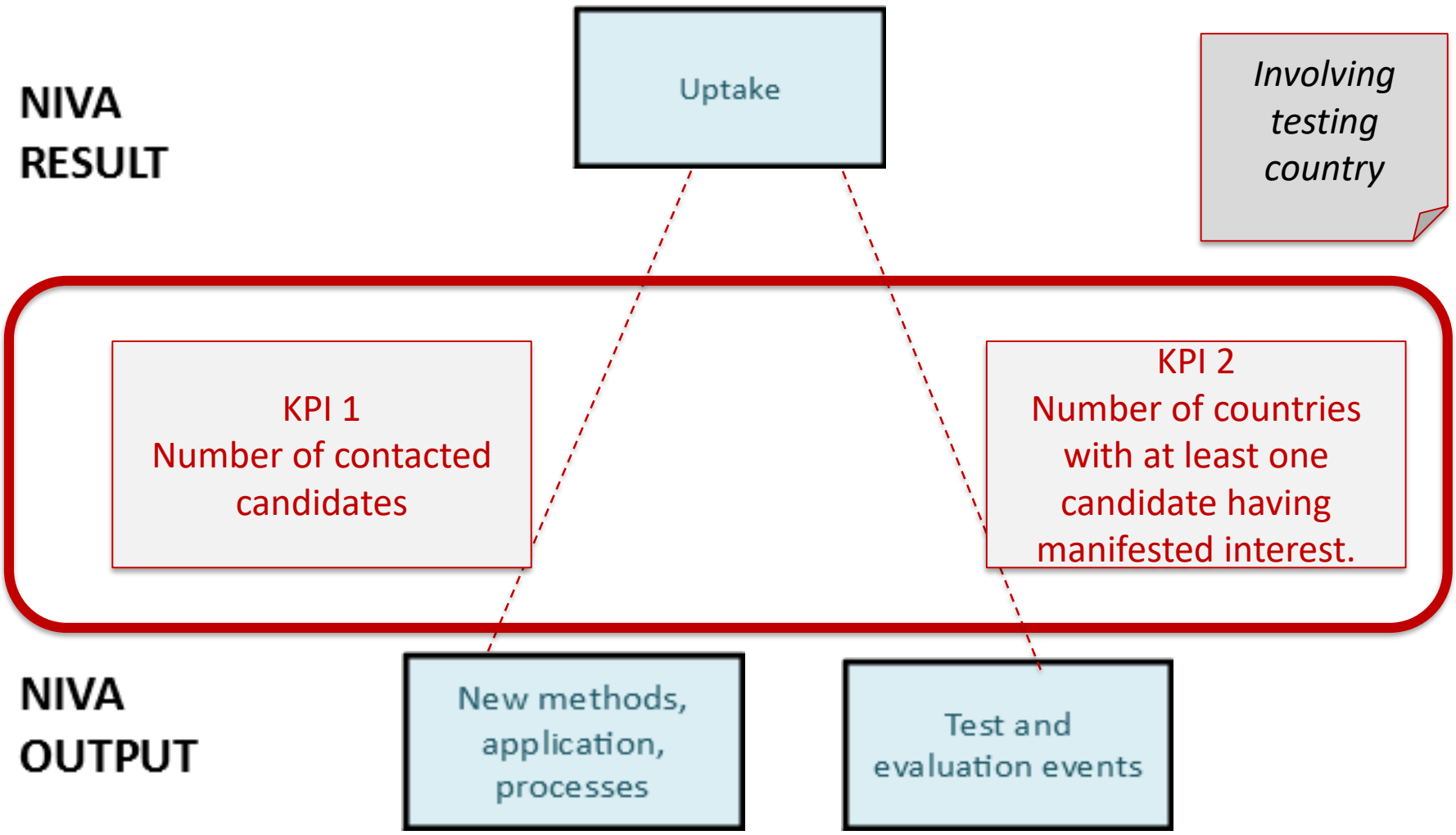
NIVA OUTPUT



NIVA ACTIVITIES

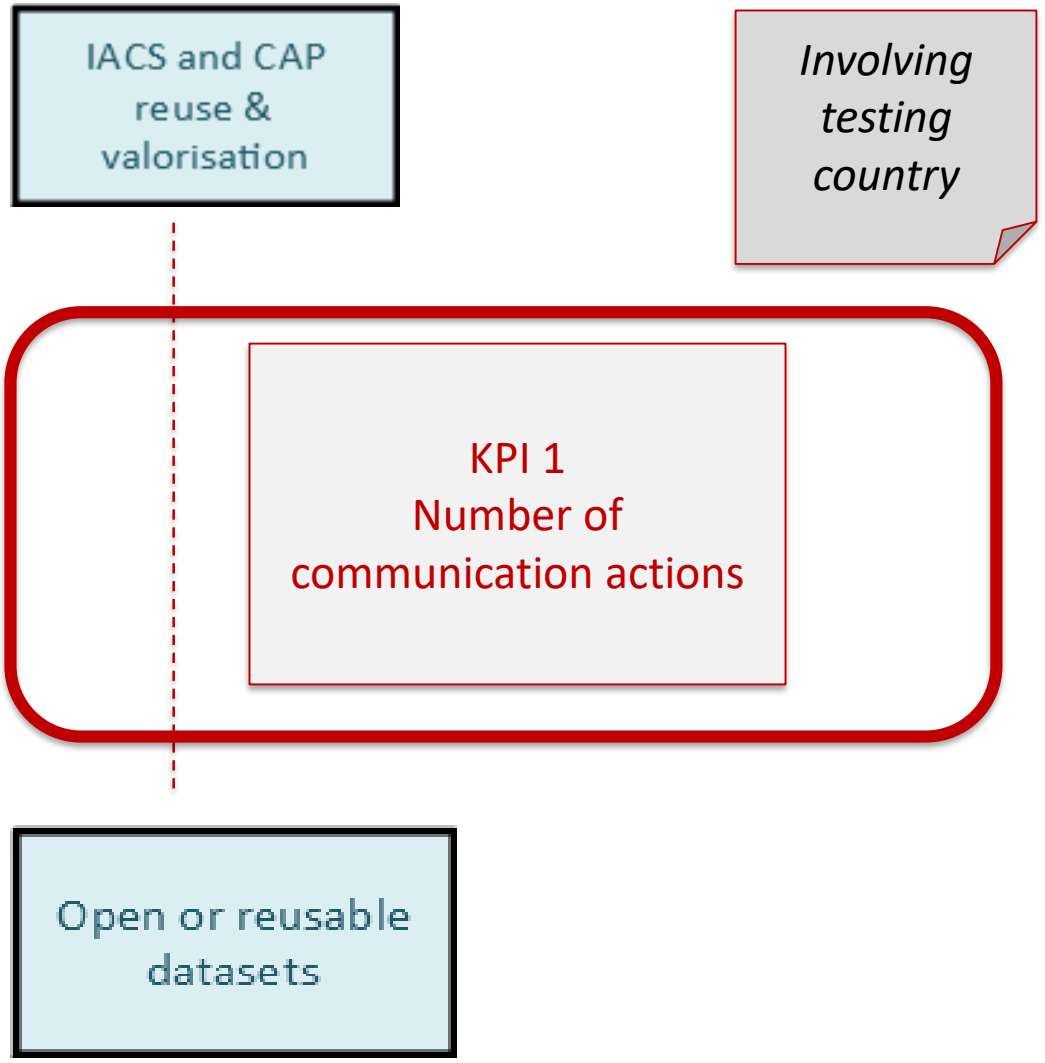
KPI and innovation

Weakness: not yet any public body in charge of computing UC1b indicators



KPI and innovation

NIVA OUTPUT



NIVA ACTIVITIES