



# **WP 1: Land Use in the EU 27**

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## SCOPE OF PRESENTATION

RENEW „Renewable fuels for advanced power trains“

### 4F CROPS WP 1:

- Task 1. Description of the current status of land use in Europe
- Task 4: Assessment of land availability for non-food cropping systems

**RENEW: [www.renew-fuel.com](http://www.renew-fuel.com)**

## **Aim:**

**construction of pan-European database of biomass resources and potential assessment for liquid bio-fuels production**

- **Task 1: Residue biomass resources and potential**
- **Task 2: Energy crops potential**

## **Partners:**

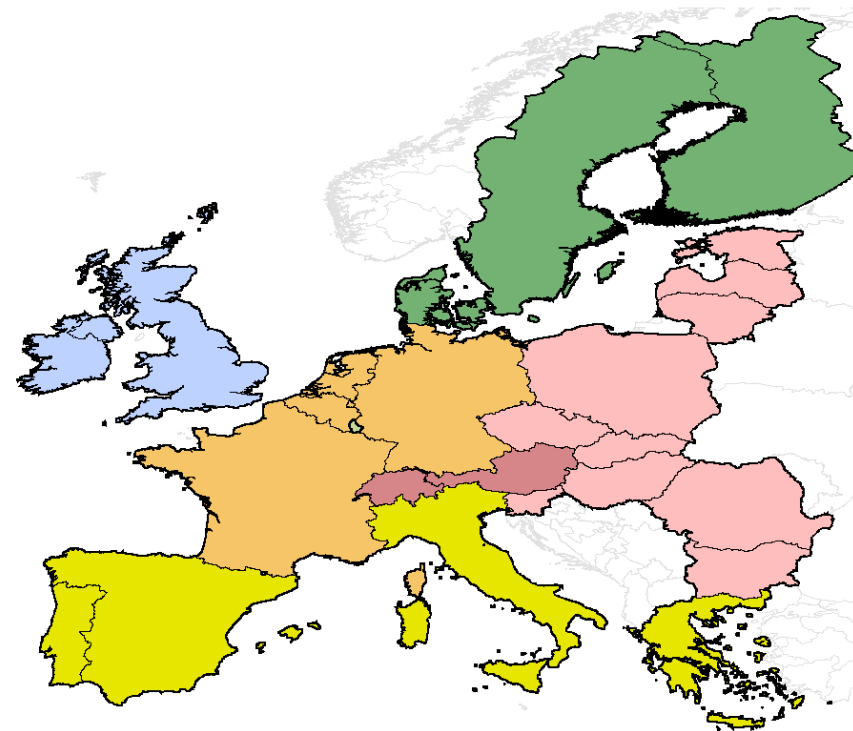
Poland, Germany, Switzerland

Sweden, Greece, Ireland

## **Results:**

Technical  
potential

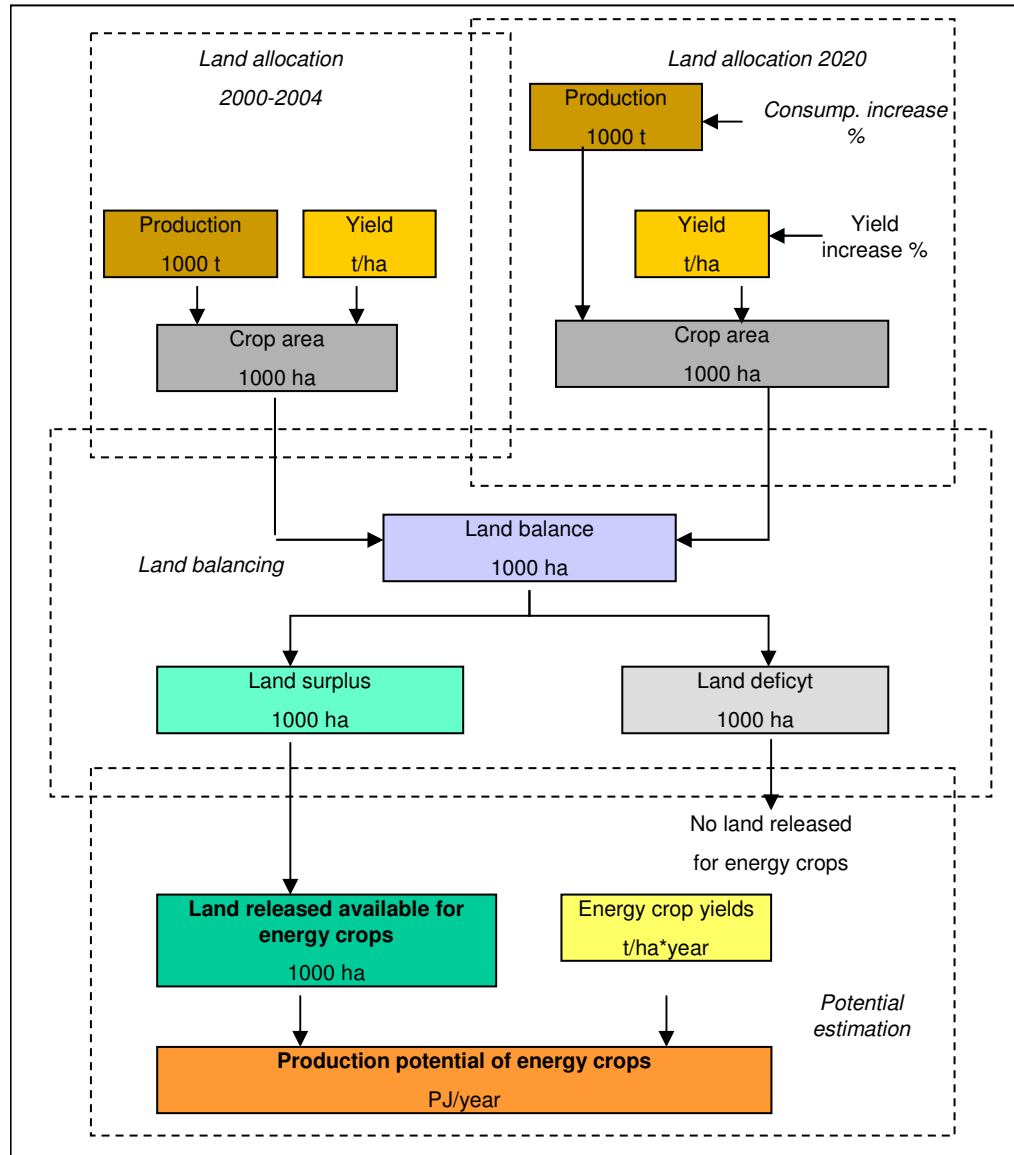
BtL plant  
location



## METHODOLOGY FRAMEWORK

- **Approach:**
  - Resource focused approach
  
- **Core assumption:**
  - Food and fibre production shall not be affected
  
- **Time frame:**
  - Starting Point – biomass production and harvesting technology of today, average for 2000-2004
  - Scenario S1 – year 2020, intensive biomass production with high level of inputs
  - Scenario S2 – year 2020, biomass production with low level of inputs (minimizing negative environmental impacts)
  
- **Level**
  - Regional NUTS-2
  - National NUTS-0
  - Pan-European

# LAND ALLOCATION MODEL



1. Land allocation for food, fodder and fibre crops
2. Population and consumption prospects
3. Prospects on crop yields
4. Land balancing
5. Surplus land available for energy crops:
  - 100% fallow land
  - Land released due to crop productivity increase
  - Land equivalent for cereal and meat export reduction
4. Energy crop yields for large-scale commercial plantations

Main data source:  
EUROSTAT, FAO, UNO<sup>5</sup>

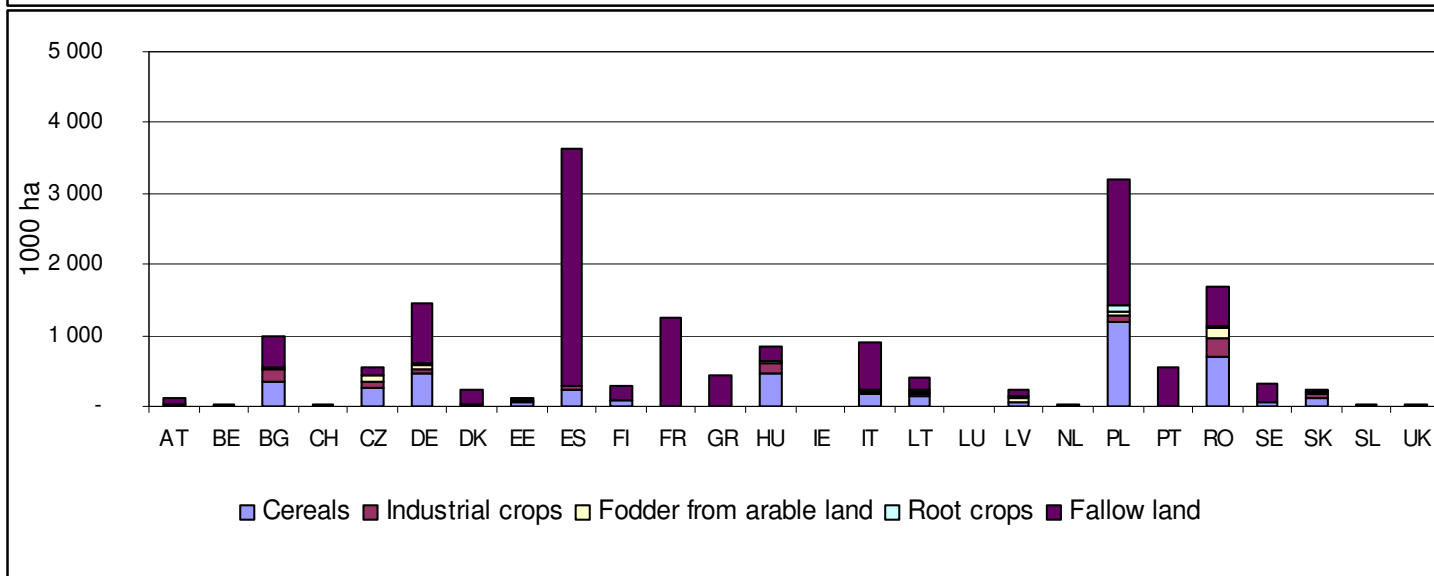
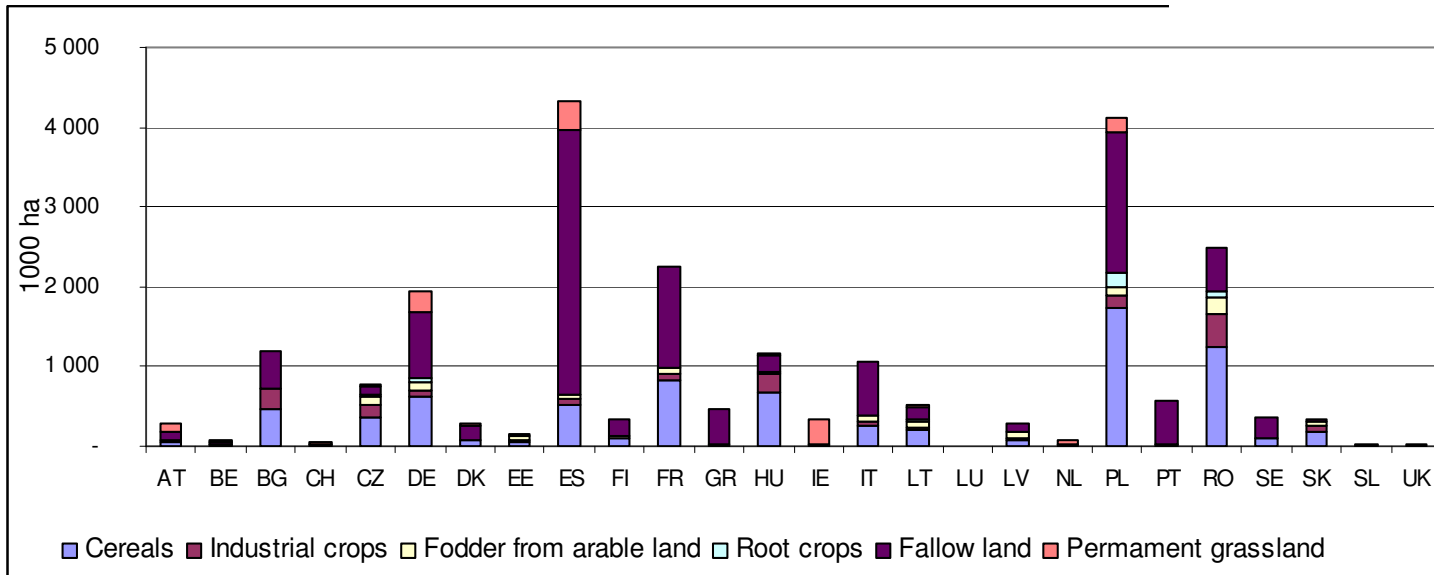
# ENERGY CROPS RESULTS available land, 1000 ha

## Scenario S1

- Yield increase:  
10% EU15, 30% EU12
- 30% of cereal export surplus for energy crops
- Conversion of permanent grassland for energy crops

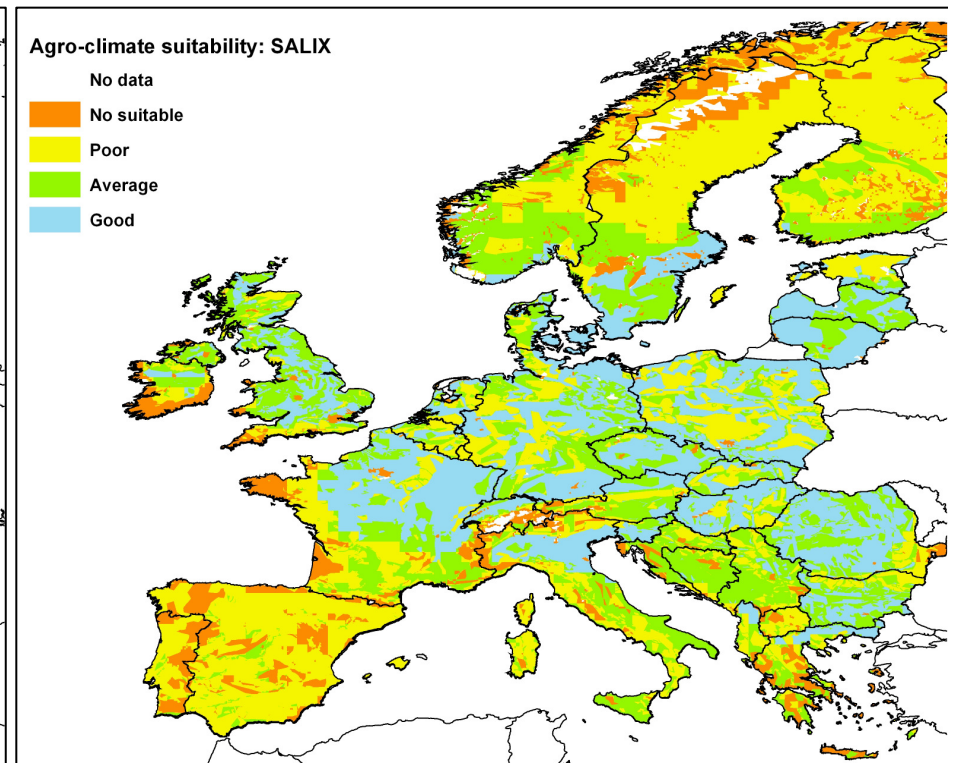
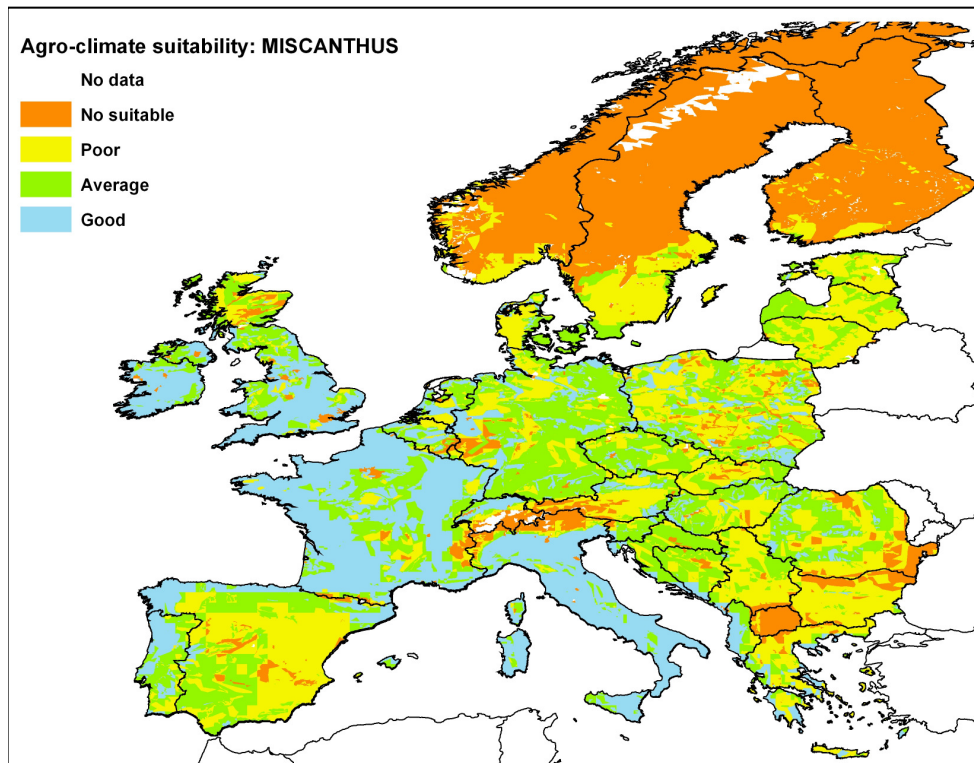
## Scenario S2

- Yield increase:  
7% EU15, 20% EU12
- No export surplus reduction
- No conversion of permanent grassland for energy crops



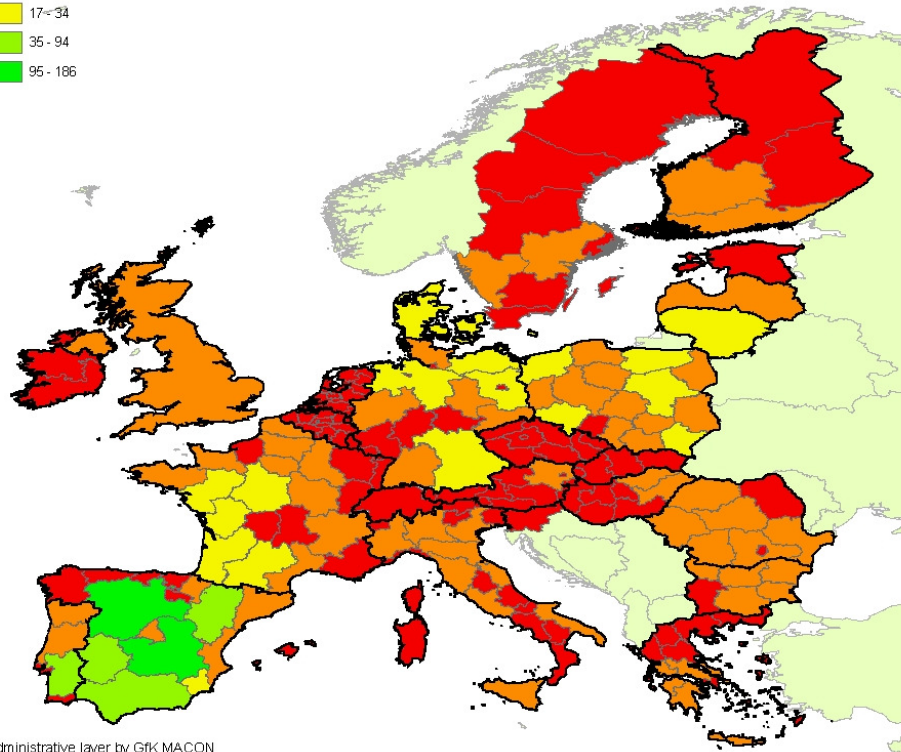
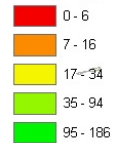
# SUITABILITY ANALYSIS results

Which crop suits the best?



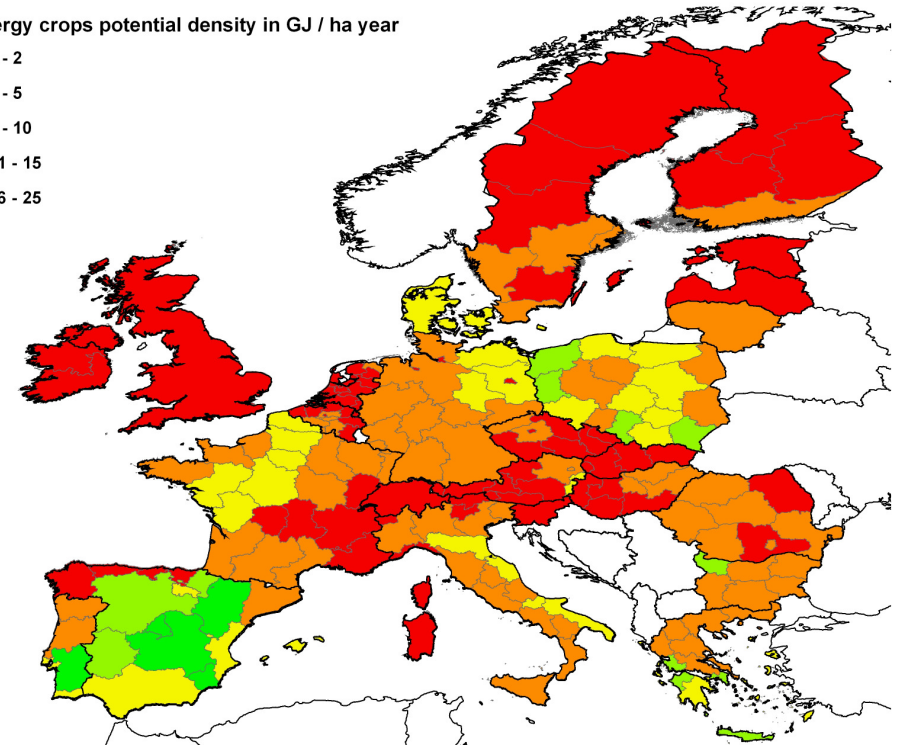
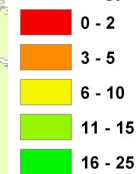
# ENERGY CROP POTENTIAL absolute potential and regional specific potential

SP: Energy crops potential in PJ / year



Administrative layer by GfK MACON

SP: Energy crops potential density in GJ / ha year

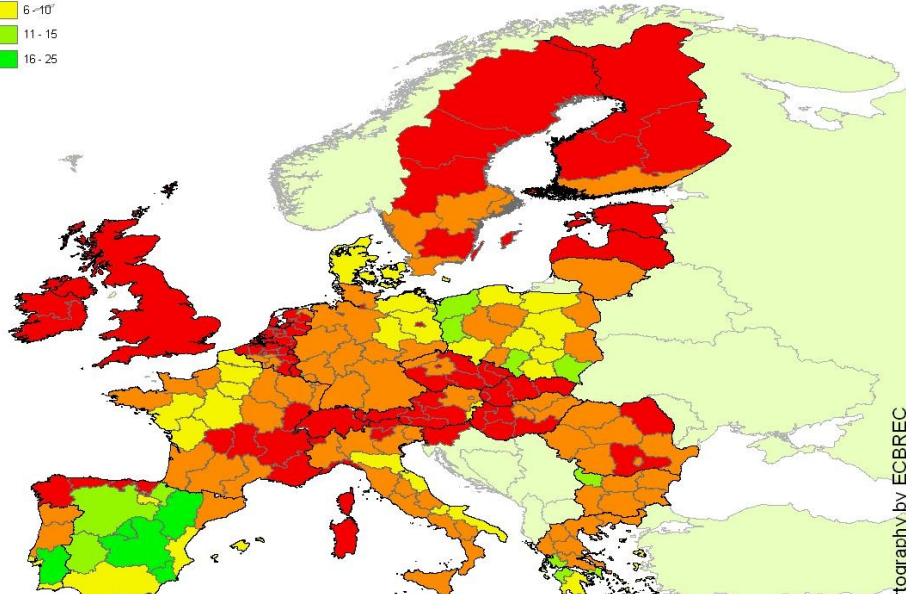




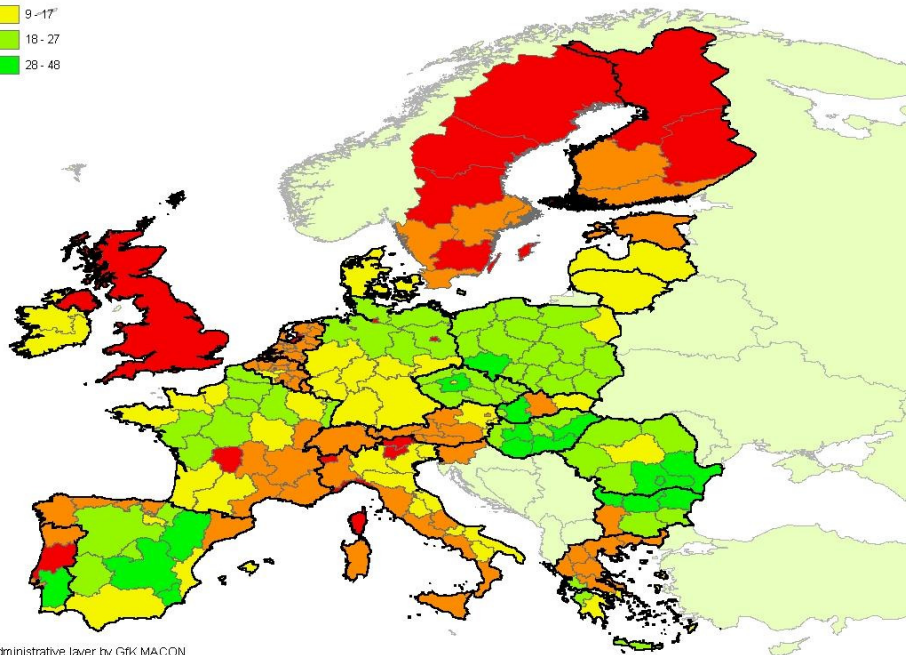
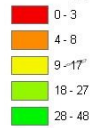


# ENERGY CROPS regional sepcific potential, GJ/ha

SP: Energy crops potential density in GJ / ha year

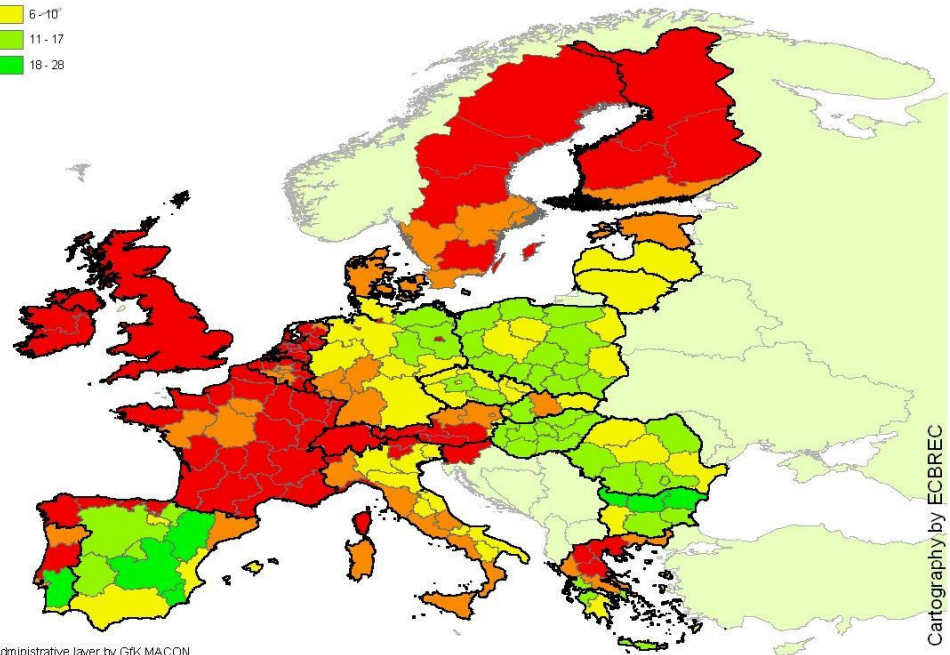


S1: Energy crops potential density in GJ / ha year



Administrative layer by GfK MACON

S2: Energy crops potential density in GJ / ha year



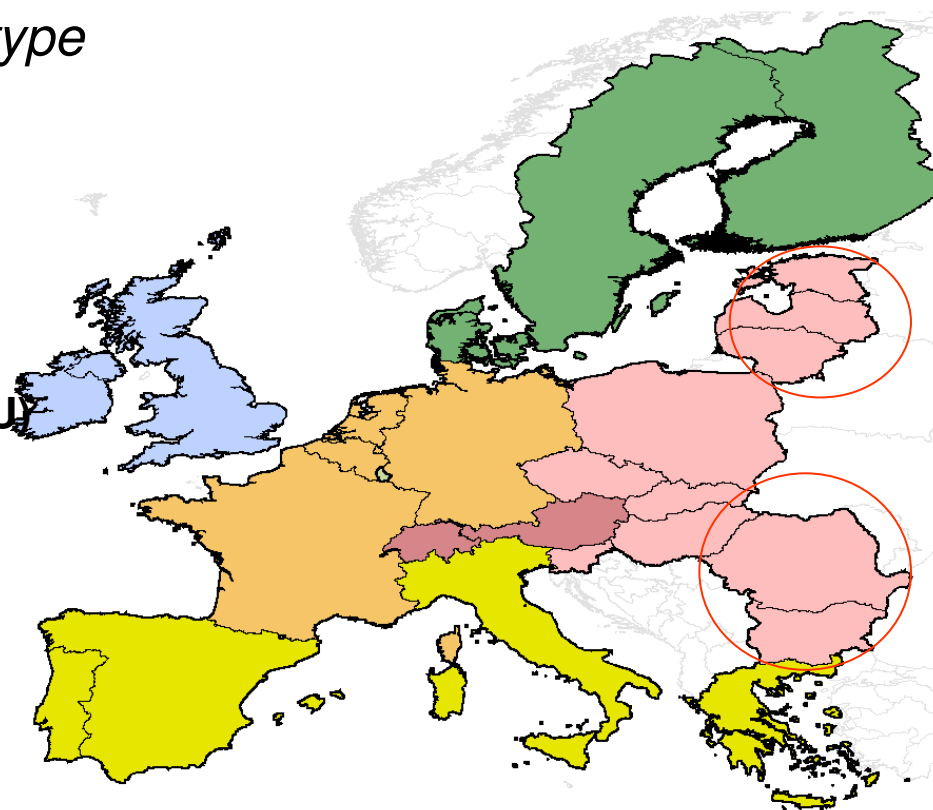
Administrative layer by GfK MACON

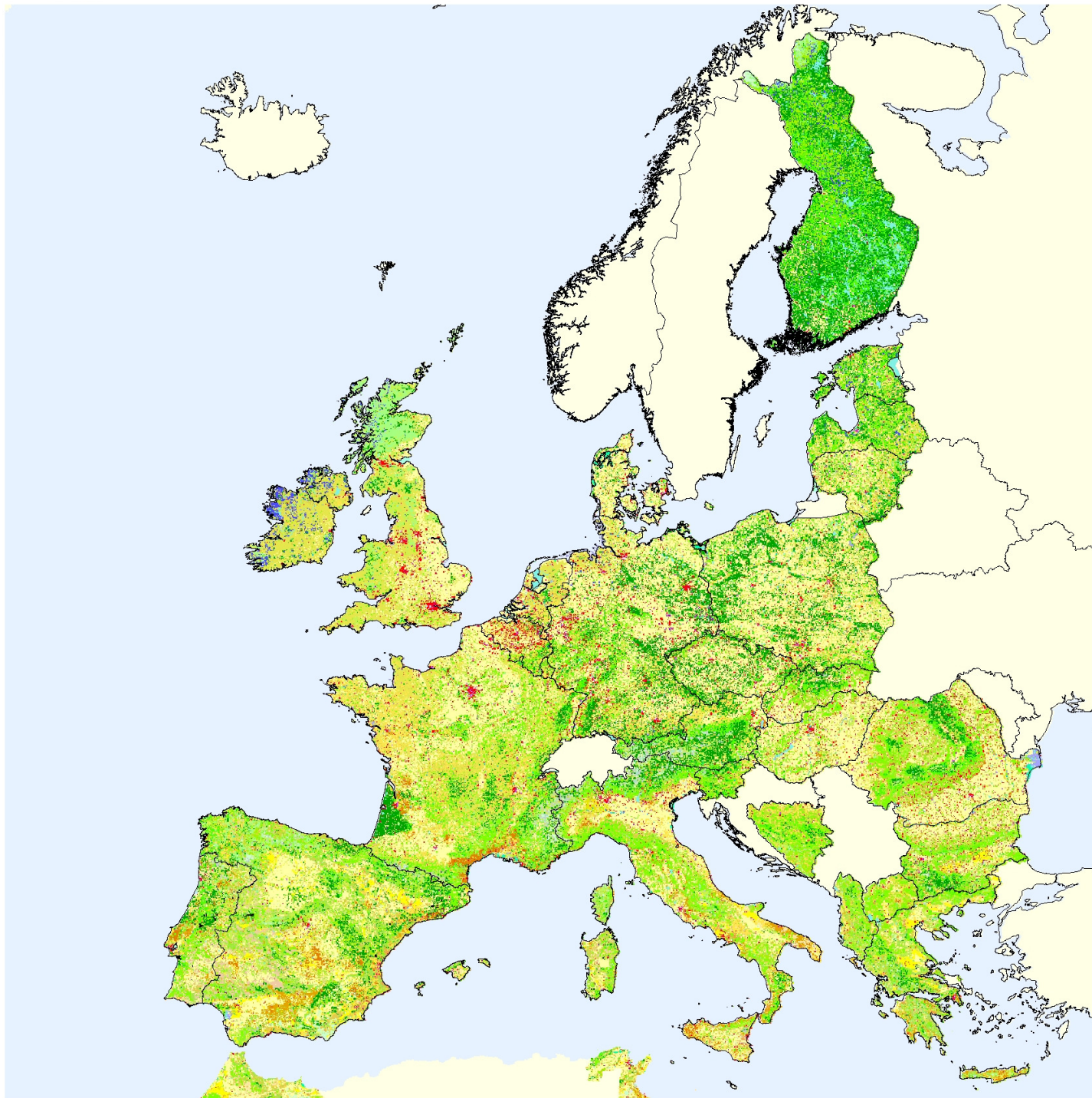
Cartography by ECBREC

## WP 1. Land use in EU-27

*Task 1.1. Description of the current status of land use in Europe*

- *CORINE LC map*
- *Statistical data EUROSTAT (2002-2006)*
- *Land use per region and crop type*
  - **Nordic (SE, FI, DK)**
  - **Baltic (EE, LT, LV)**
  - **UK + IE**
  - **Western (FR, NL, BE, DE, AU)**
  - **Southern (PT, ES, IT, GR)**
  - **Central-East (PL, CZ, SK, SV, HU)**
  - **Southern-East (RO, BU)**





- Continuous urban fabric
- Discontinuous urban fabric
- Industrial or commercial units
- Road and rail networks and associated land
- Airports
- Mineral extraction sites
- Dump sites
- Construction sites
- Dump sites
- Sport and leisure facilities
- Non-irrigated arable land
- Fruit trees and berry plantations
- Pastures
- Complex cultivation patterns
- Land principally occupied by agriculture...
- Broad-leaved forest
- Coniferous forest
- Mixed forest
- Natural grasslands
- Moors and heathland
- Transitional woodland-shrub
- Beaches, dunes, sands
- Bare rocks
- Sparsely vegetated areas
- Inland marshes
- Peat bogs
- Water courses
- Water bodies

### LAND USE CHANGES in main crop areas 2008

**Increase in cereals area (+5,7%)**: a response to very high producer price - imbalance between supply and demand for cereals worldwide, importanta reduction of fallow land area.

**Rapeseed area decreases (-3.1%)**: possibly a partial shift from rapeseed area to cereal area, the policy of encouraging biofuelshas been put in question - biofuels may compete with word food demand. However, this area is still significantly above the 2003-2007 average (+23.9%).

**Protein crops area continue its negative trend (-13.4%)**: decrease with 35.5 % over the past five years.

**Sugar beet area shows a reduction (-6.8%)**: effect of the reform of sugar regime (-19.3% relative to the 2003-2007)

## EU – 27 reas 2008 1000 ha

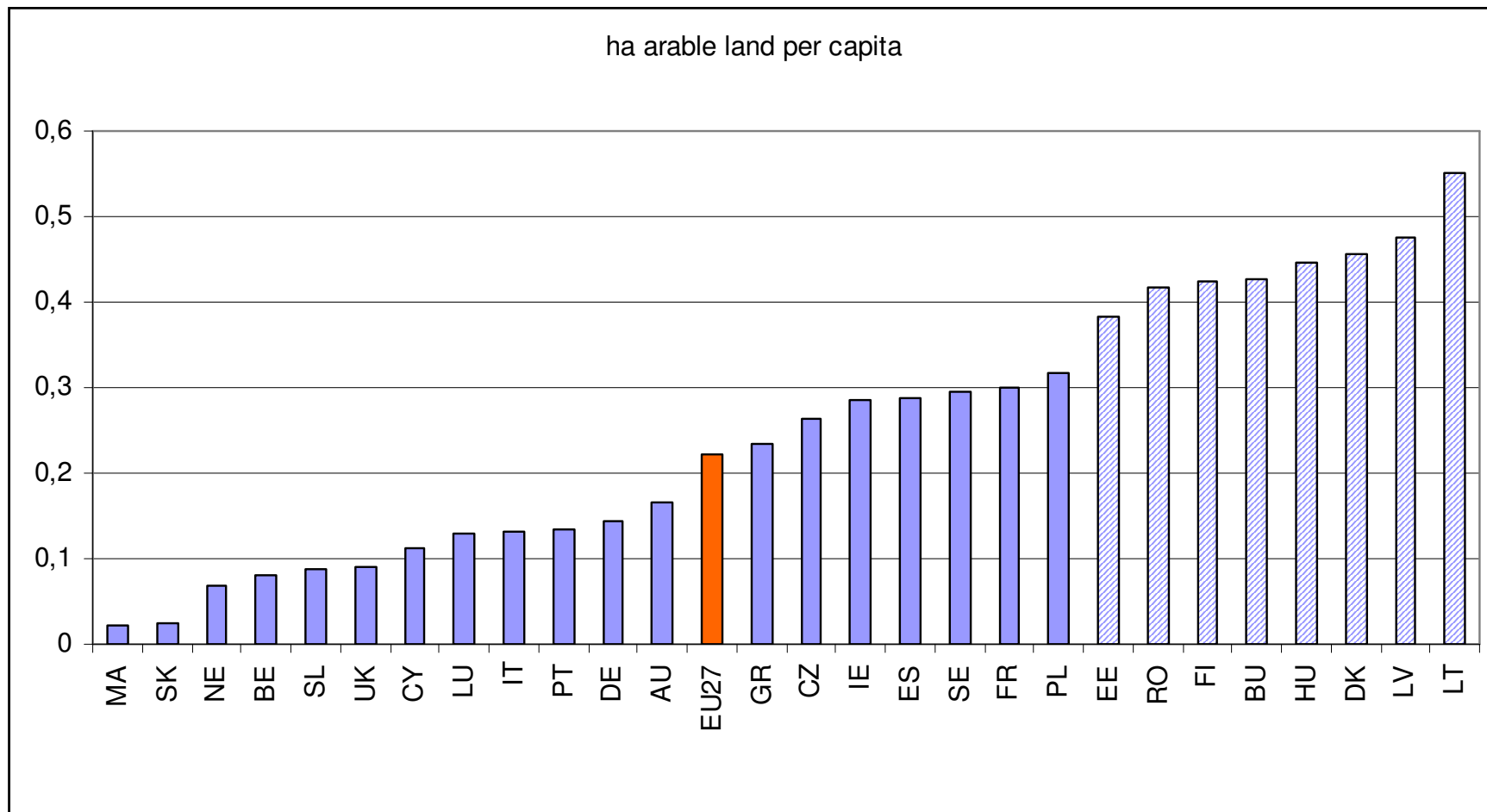
	Average 2003-2007	2007	2008	% change 2008/2007	% change 2008/ 2003-2007
Cereals	58.5	56.8	60.0	5.7	2.6
Sugar beet	2.0	1.8	1.7	-6.8	-19.3
Rapeseed	5.0	6.5	6.3	-3.1	23.9
Peas	0.9	0.6	0.6	-13.4	-35.5

Source EUROSTAT 2008

### Land allocation in EU-27 is affected by:

- Policy rules (sugar sector reform, set-aside obligation)
- Economic incentives (set-aside payments, energy crop premium)
- Worldwide agri-product market (cereal prices)
- Demand for energy crops as a result of RE obligatory targets

## ARABLE LAND AVAILABILITY per capita



Source EUROSTAT 2006

## Land availability assessment

### Task 1.4. Assessment of land available for non-food cropping systems

- Scenarios 2020 and 2030
- Food and feed production cannot be affected (however food self-sufficiency is not required)
- Non-food crops cultivated only on surplus land
- Assessment based on statistics, agro-climate data performed in GIS software
- Final result – maps indicating development opportunities for non-food crops
- Focus on the available methodology improvement rather than developing a new approach

## SUMMARY

**RENEW methodology and calculation tool will be used, however the assumptions and land allocation rules need to be re-defined for 4F CROPS**

Critical factors for the assessment:

- Type of crop production system (intensive, semi-intensive, extensive)
- Farm structure
- Environmental constraints – water availability, slopes, soil quality
- Climate change – marginalization of land (Task 1.2.)
- Demand for non-food crops – market for non-food crops (Task 1.3)
  
- Economics of crop production – FADN data



## WP1 DELIVERABLES

Del.	Deliverable name	<i>Lead contractor</i>	<i>Person-months</i>	Delivery month
D1	Review of the current situation for the land use in EU27	EC BREC	3	December 2008
D2	List with the restrict factors for EU agriculture	UNI.CT UNIBO	2	December 2008
D3	Report on the market demand for non-food crops in EU27	A&F	3	March 2009
D4	Report entitled "Land use in EU27 now, 2020 and 2030"	EC BREC	7	September 2009