Technologies to Stabilize Soil Organic Carbon and Farm Productivity, Promote Waste Value and Climate Change Mitigation

➢Environmental targets **P**rogressive decline of SOM quantity and quality in European agricultural soils; **I**ntense deterioration of soil fertility and decrease of crop productivity; **I**ncrease of residual biomasses; **S**oil contribution to Green Houses Gases emissions; **R**aising of energetic and economic inputs

➢Objectives **P**romote the long term SOC stabilization; **V**alorization of local agricultural biomasses; **M**aintenance of crop yields with lower energetic inputs; **M**onitoring soil GHG emissions; **R**aising awareness on sustainable SOM managements practices

➢Strategies a) soil amendment with high quality compost from local agricultural biomasses: compost from the solid residues of bio-gas plant and development of on-farm compost facility tailored on local assets (manure or green compost);
b) soil addition with eco-friendly biomimetic catalyst to strengthen the SOC stabilization

5 farming sites with different soil types and cropping systems (maize, horticultural crops , orchards)

The objectives and activities of LIFE CarbOnFarm project refer to indications, warnings, updates and requirements provided within the Soil Thematic Strategy framework, with respect to SOC issues, sustainable approaches for SOM management, land degradation, biomasses recycling, adaptation for climate changes, etc.

2004 *Reports Of The Working Groups Established Under The Thematic Strategy For Soil Protection: Volume III Organic Matter*

2008 *Review of existing information on the interrelations between soil and climate change.*

2010 Technical report 049: *Soil biodiversity: functions, threats and tools for policy makers*

2011 Technical report 051: *SOM management across the EU – best practices, constraints and trade-offs*

2011 *SOIL the hidden part of the climate cycle*

(http://ec.europa.eu/environment/soil/publications_en.htm)

Life+ Environment Policy and Governance
LIFE CarbOnFarm
progetto: LIFE12 ENV/IT/000719

Monitoring activities

- Compost: humus composition, TOC and N content, compost quality (13C-NMR; Off-line pyrolysis; C, N, P, metagenomic analysis, pH, EC suppressivity, bio-activity)

- Soil: soil aggregate stability, TOC and N content, SOC dynamics (13C-OC), microbial community (PLFA), off-line pyrolysis

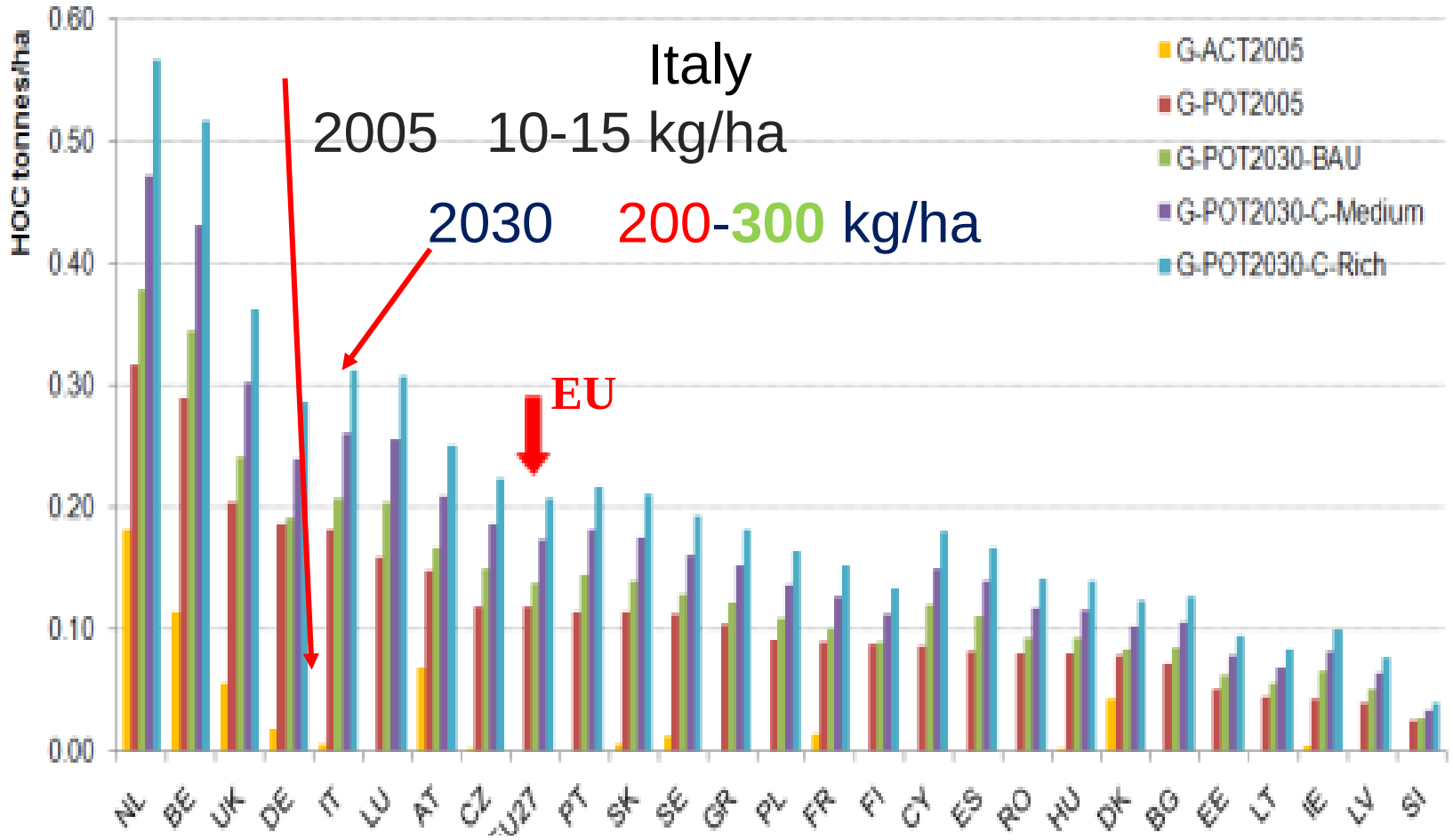
- Crops: yields, N and P, dry matter, polyphenols, acidity, firmness

- GHG emission: laboratory analysis and field evaluation

- Life Cycle Assessment of composting processes and soil managements

System boundaries for LCA calculations of lattuce and brassicacee

On-farm compost distribution in peach orchard



Current and estimated Humified Organic Carbon stocks (tonnes/ha) for different **green compost** management options (**Actual 2005**, **Minimun**, **Optimum** 2030)

(*SOM management across the EU – best practices, constraints and trade-offs -2011*)

Food and Agriculture Organization of United Nations FAO

Global Symposium on Soil Organic Carbon 2017

(http://www.fao.org/about/meetings/soil-organic-carbon-symposium/en/)