Phosphorus use in Europe

Kimo van Dijk, Wageningen University

Christian Kabbe, Kompetenzzentrum Wasser Berlin

Sylvain Pellerin, INRA Bordeaux

Helmut Rechberger, TU Wien

Oene Oenema, Wageningen University

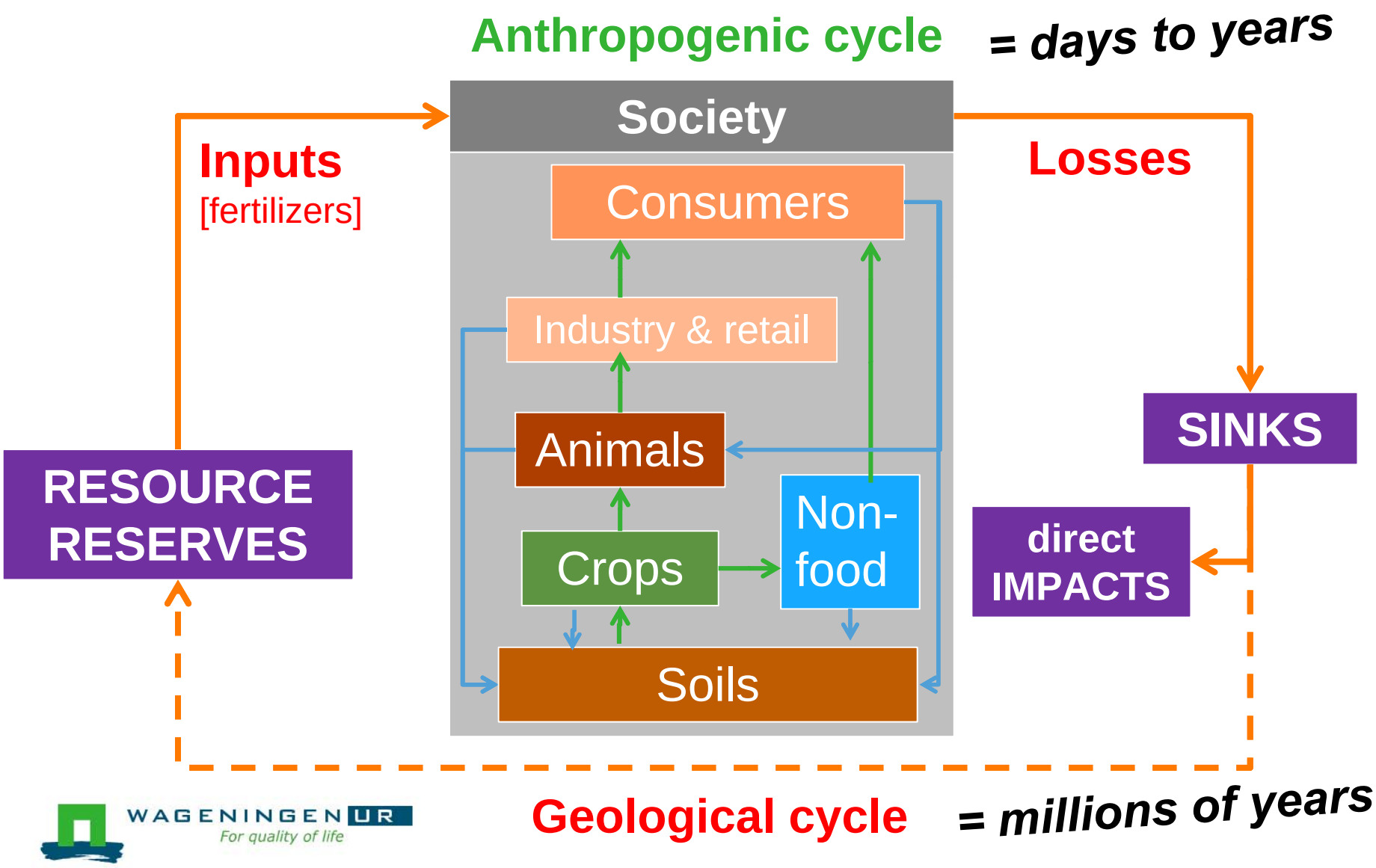
WAGENINGEN UR
For quality of life

1st European Sustainable Phosphorus Conference, Brussels, 6 & 7 March 2013

Outline

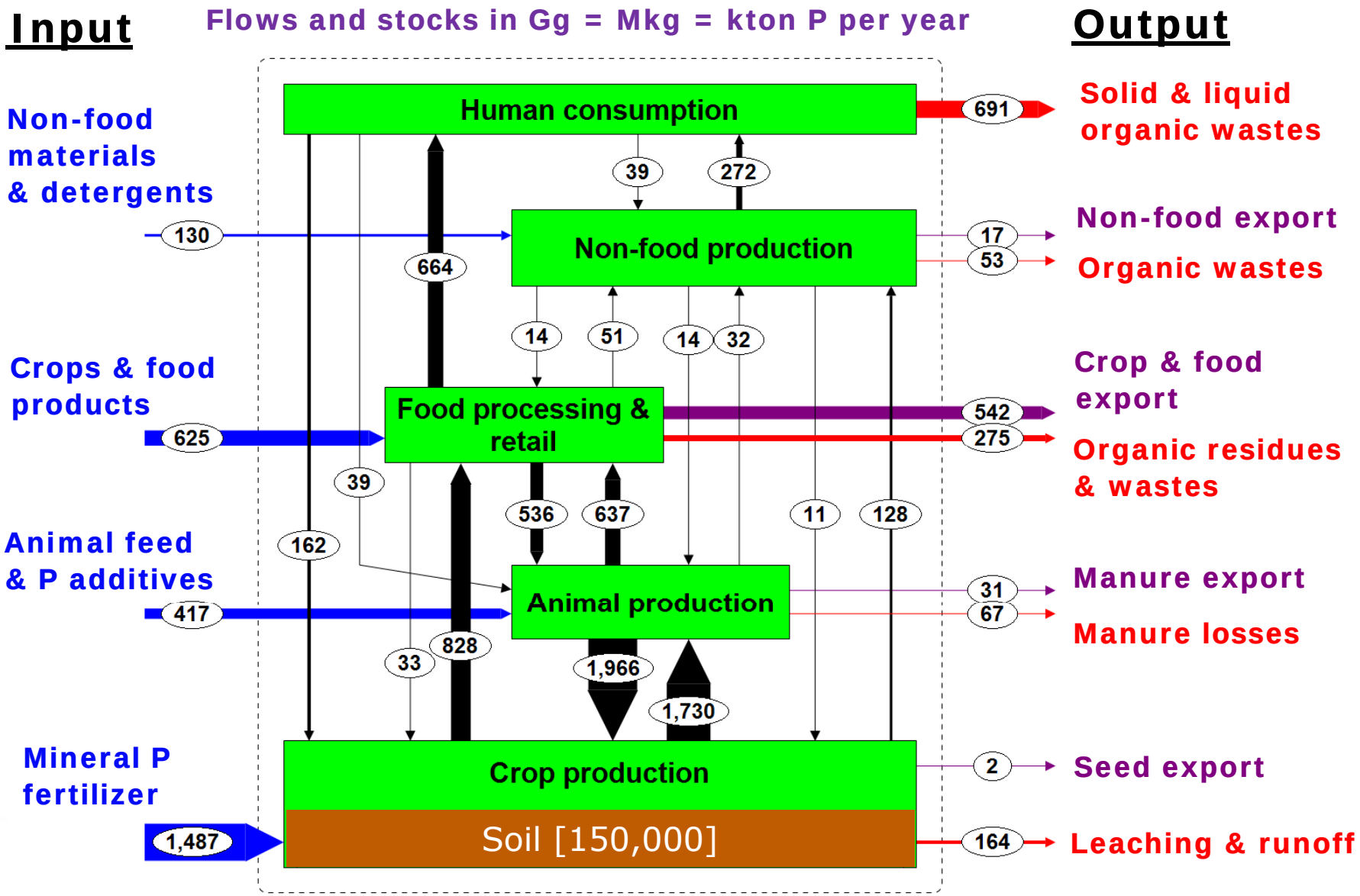
- Introduction: short versus long-term P cycling
- P cyling in the food chain in EU-27
- P inputs, balances and losses in EU-27 Member States
- Summary & conclusions

Geological versus anthropogenic cycle

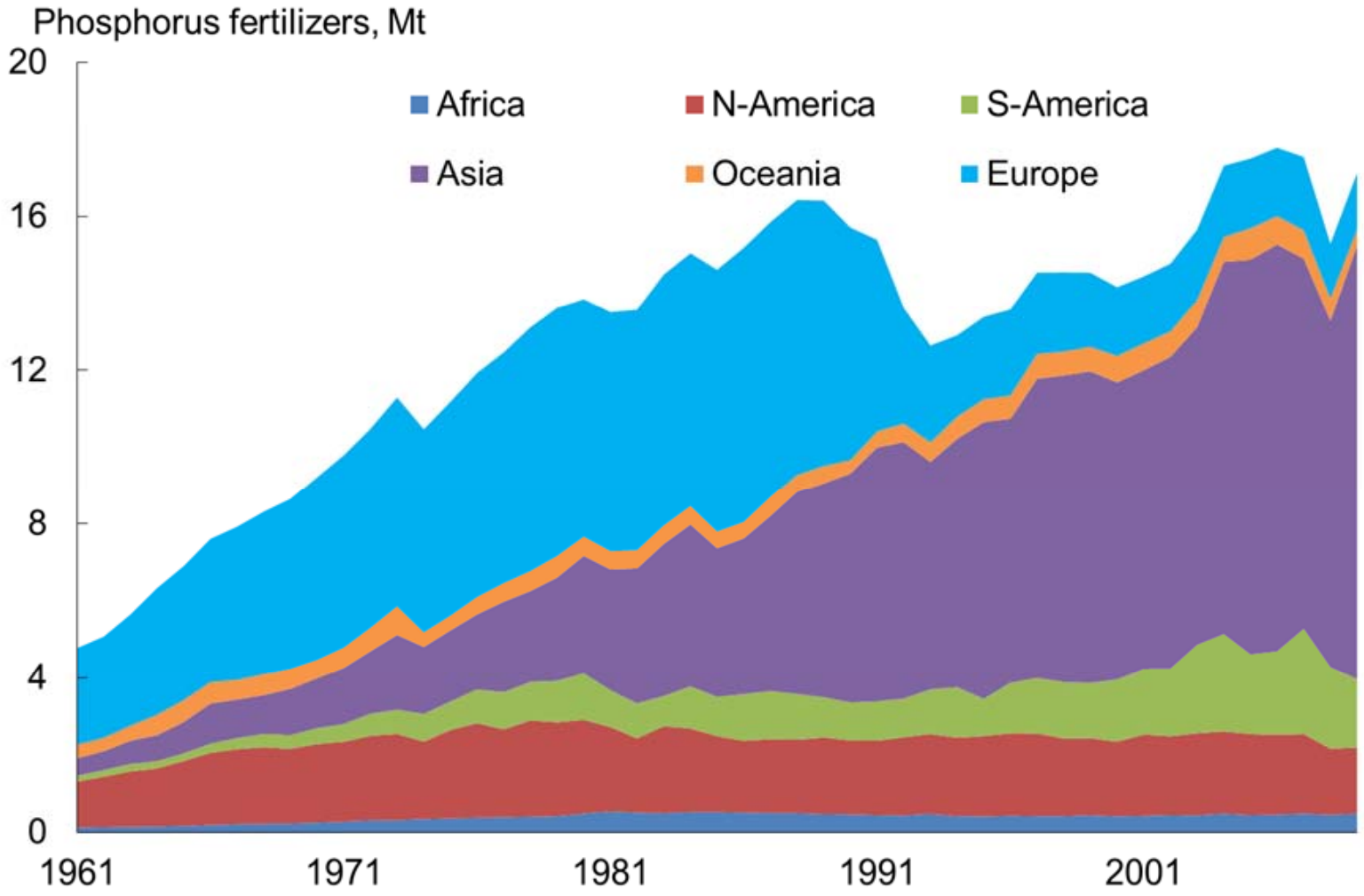


WAGENINGEN UR
For quality of life

Phosphorus use in the EU-27 in 2005



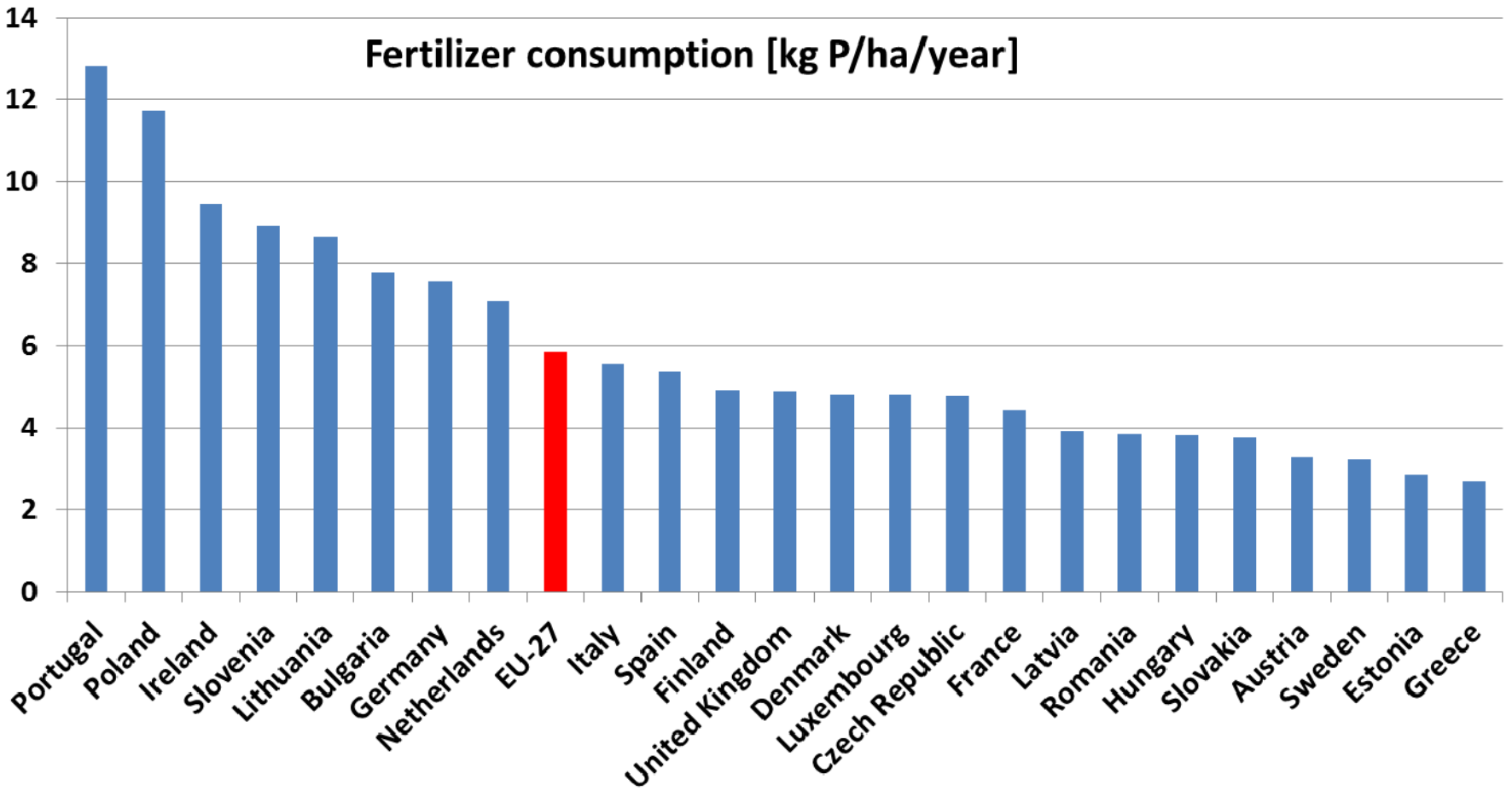
Global fertilizer P consumption 1961-2010



WAGENINGEN UR
For quality of life

FAOSTAT 2010

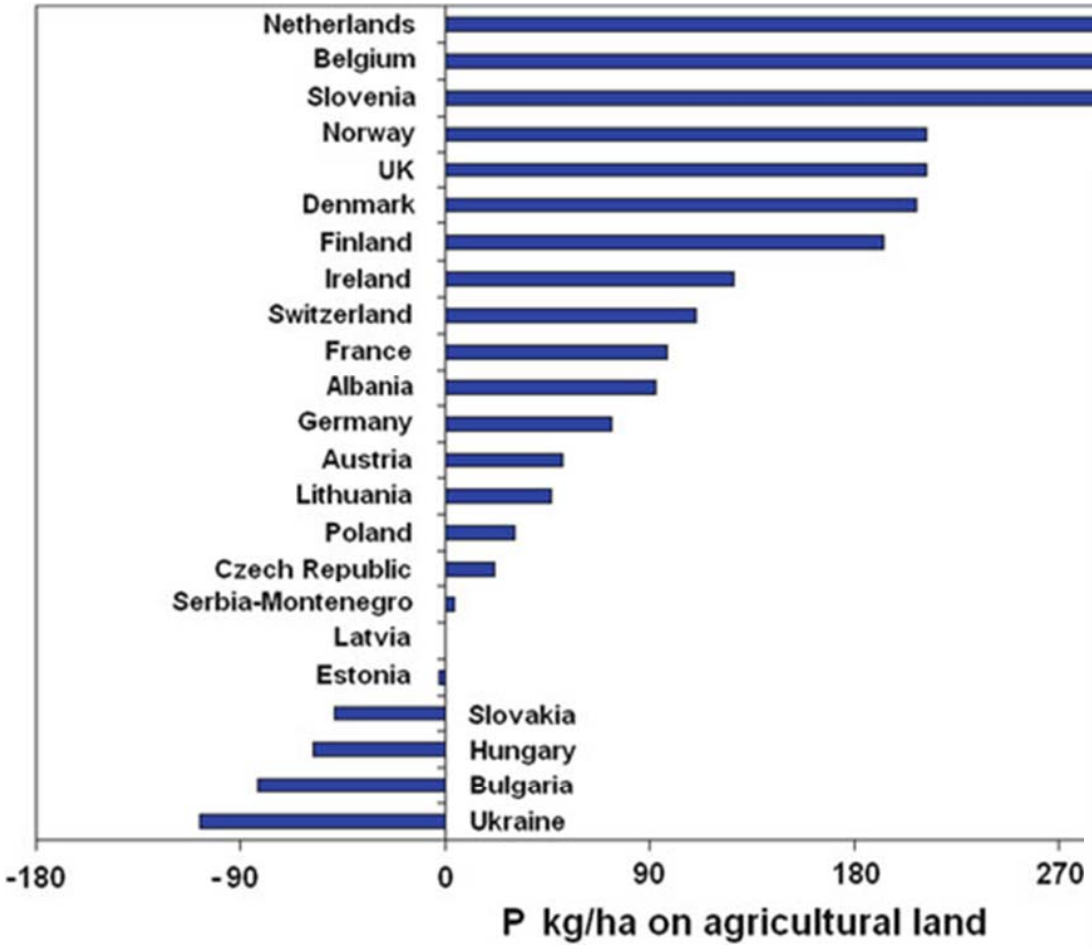
Fertilizer P consumption in EU-27 in 2010



WAGENINGEN UR
For quality of life

FAOSTAT, 2010

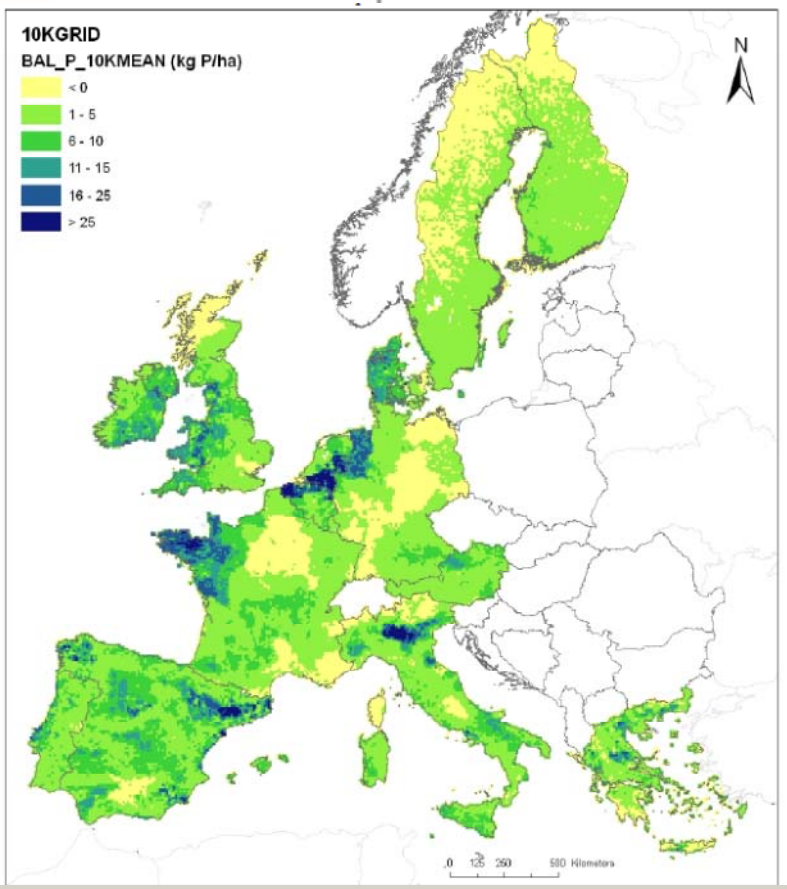
Agronomic P balances in the EU



Estimated cumulative P balances [kg P/ha] of EU countries, 1991–2005

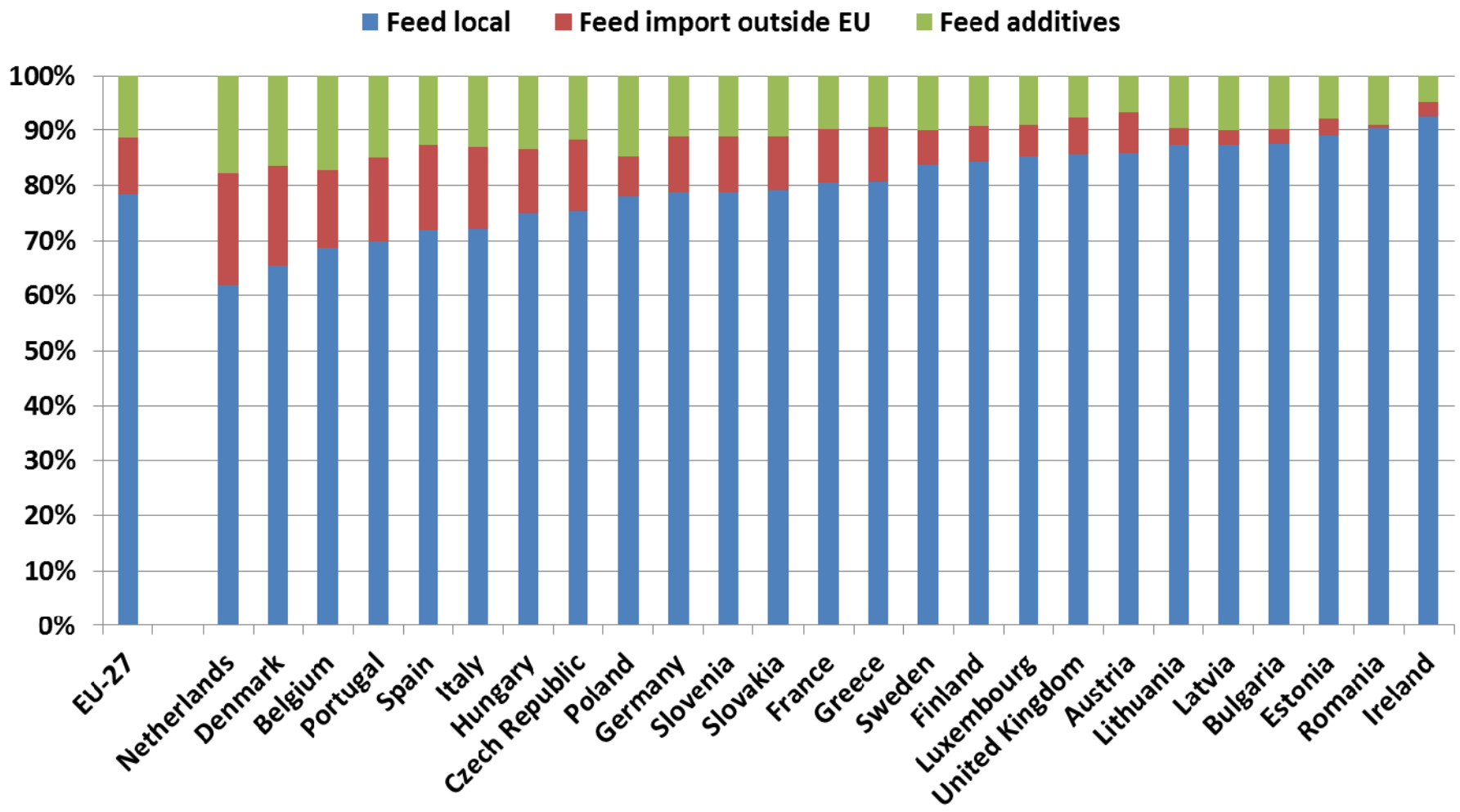
Csathó & Radimszky 2012

Grizzetti & Aloe 2007



Annual regional agricultural P balances [kg P/ha] for EU-15 in 2000

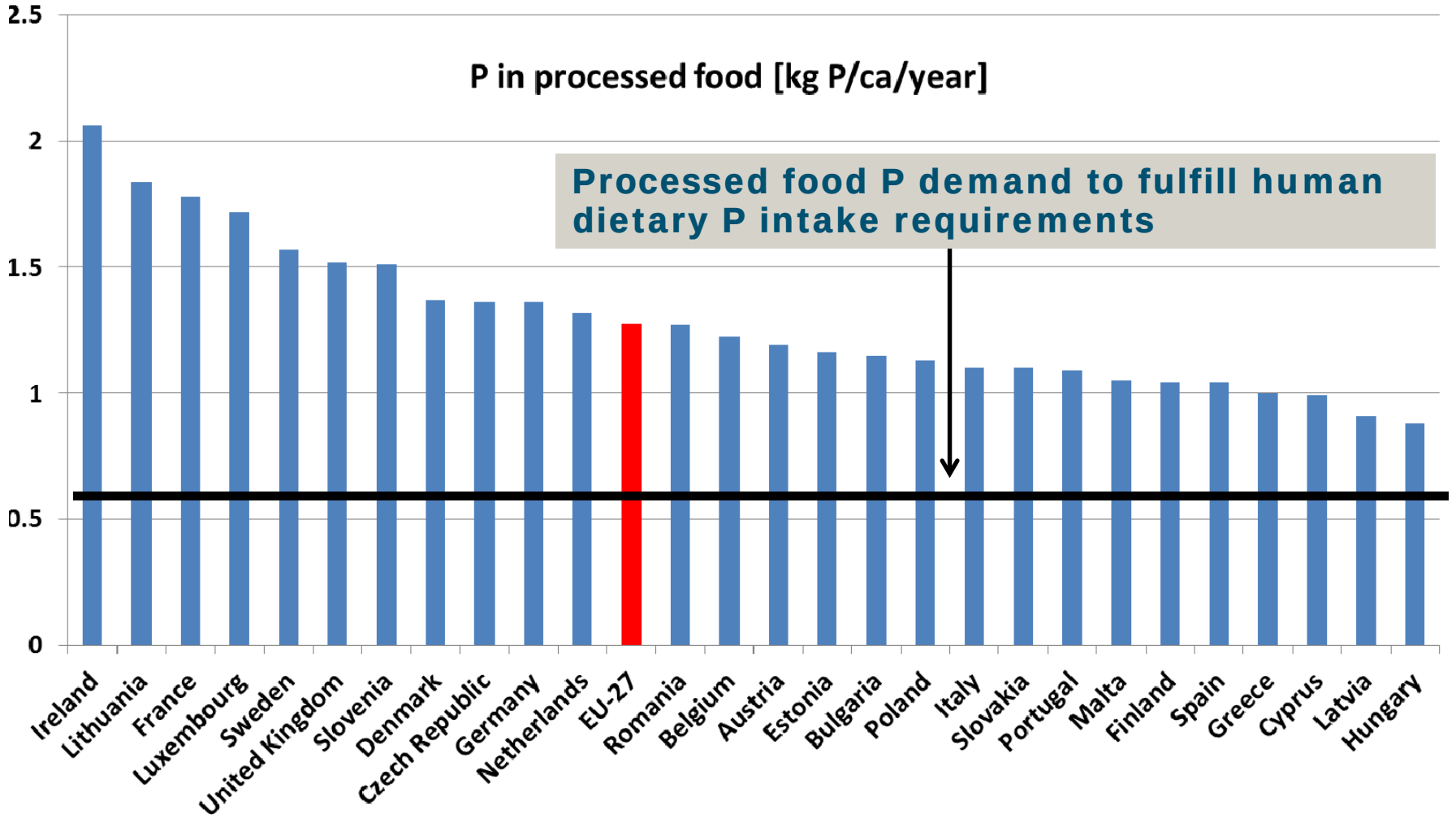
Animal feed use in EU-27 in 2005



WAGENINGEN UR
For quality of life

Miterra-Europe model, based on CAPRI and FAO data 2003-2005

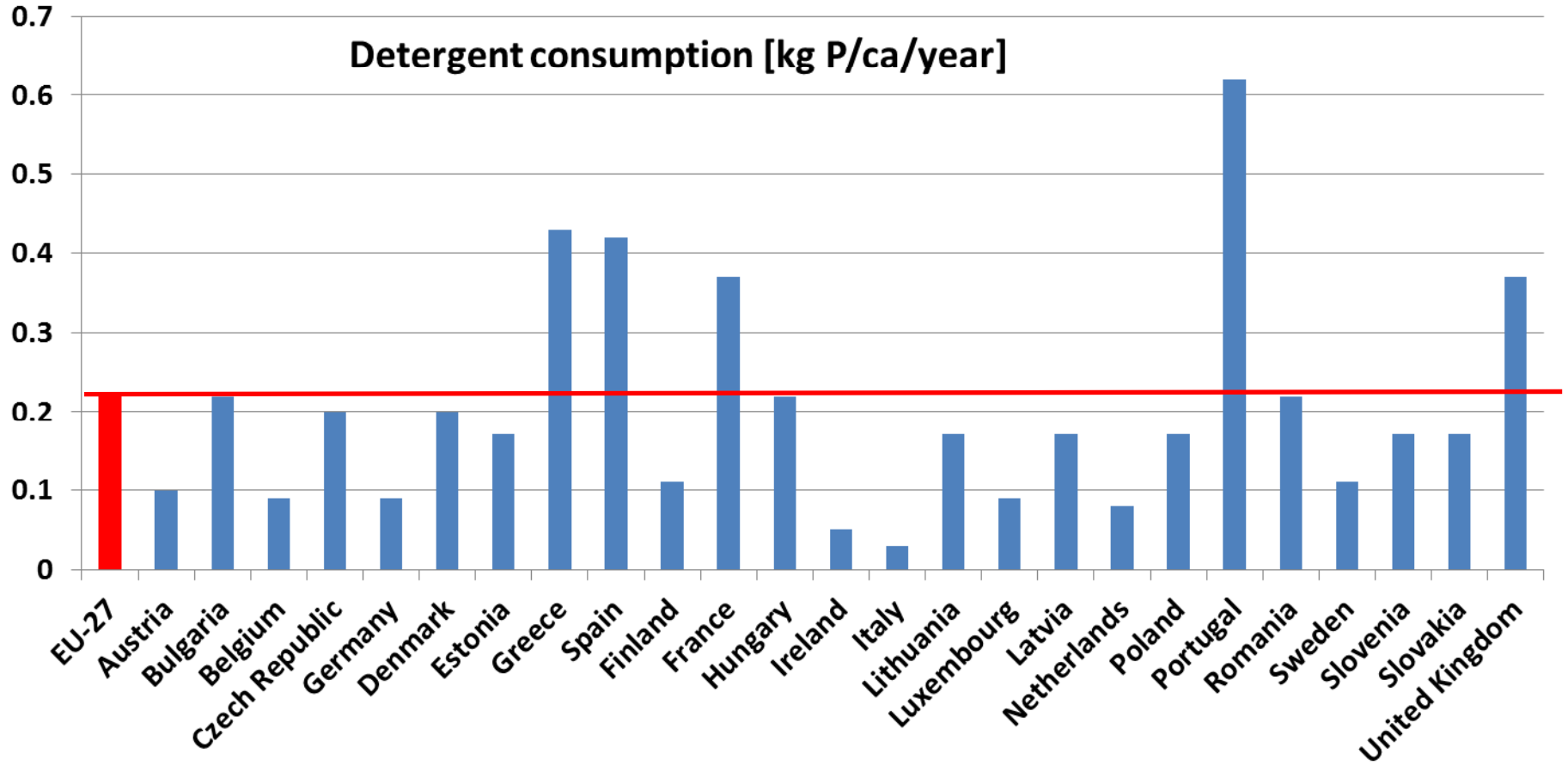
Amounts of P in food in EU-27 in 2005



WAGENINGEN UR
For quality of life

FAOSTAT 2005 & Eurostat 2005

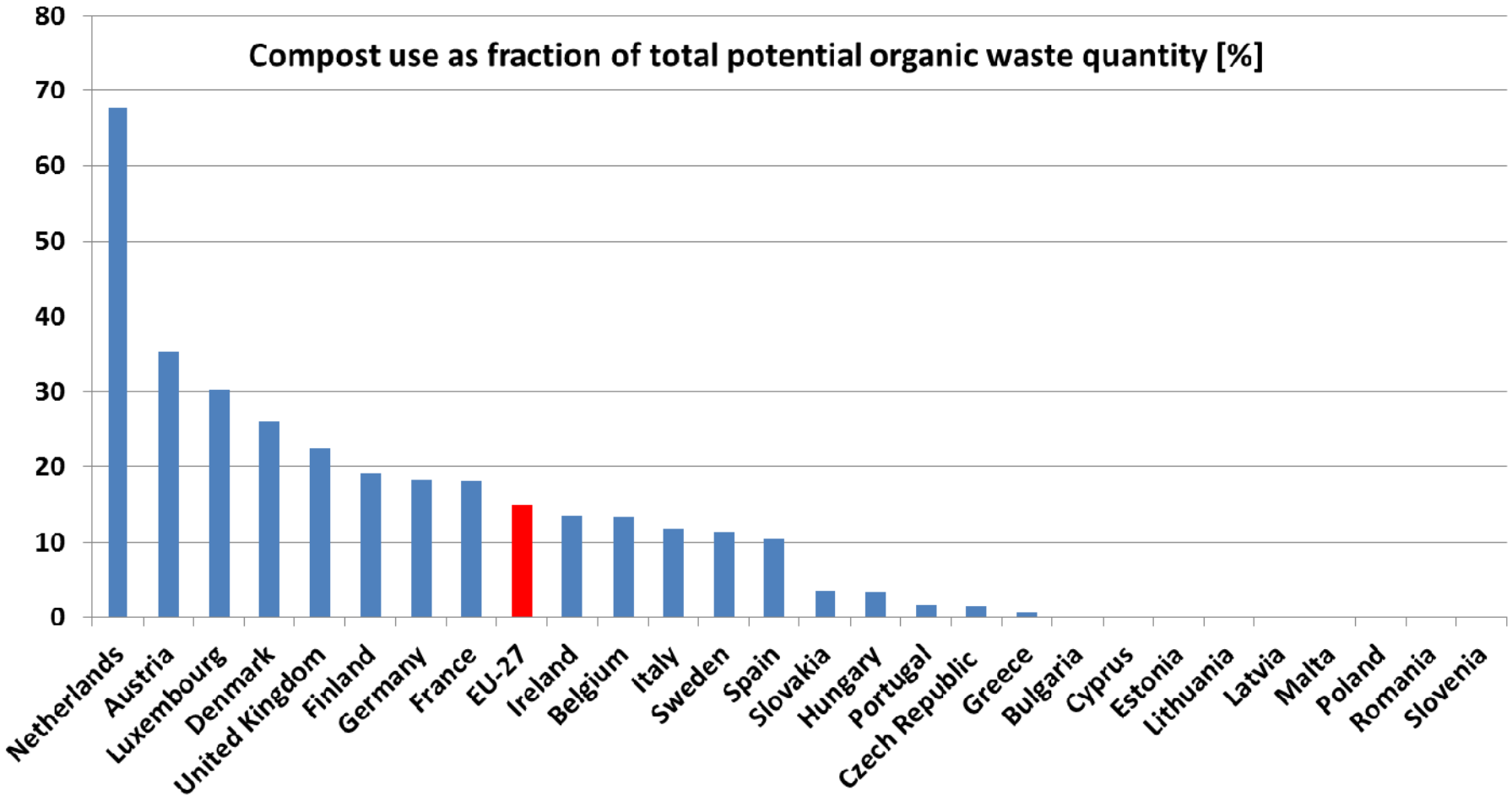
Detergent P consumption in EU-27 in 2005



WAGENINGEN UR
For quality of life

Based on Wind 2007

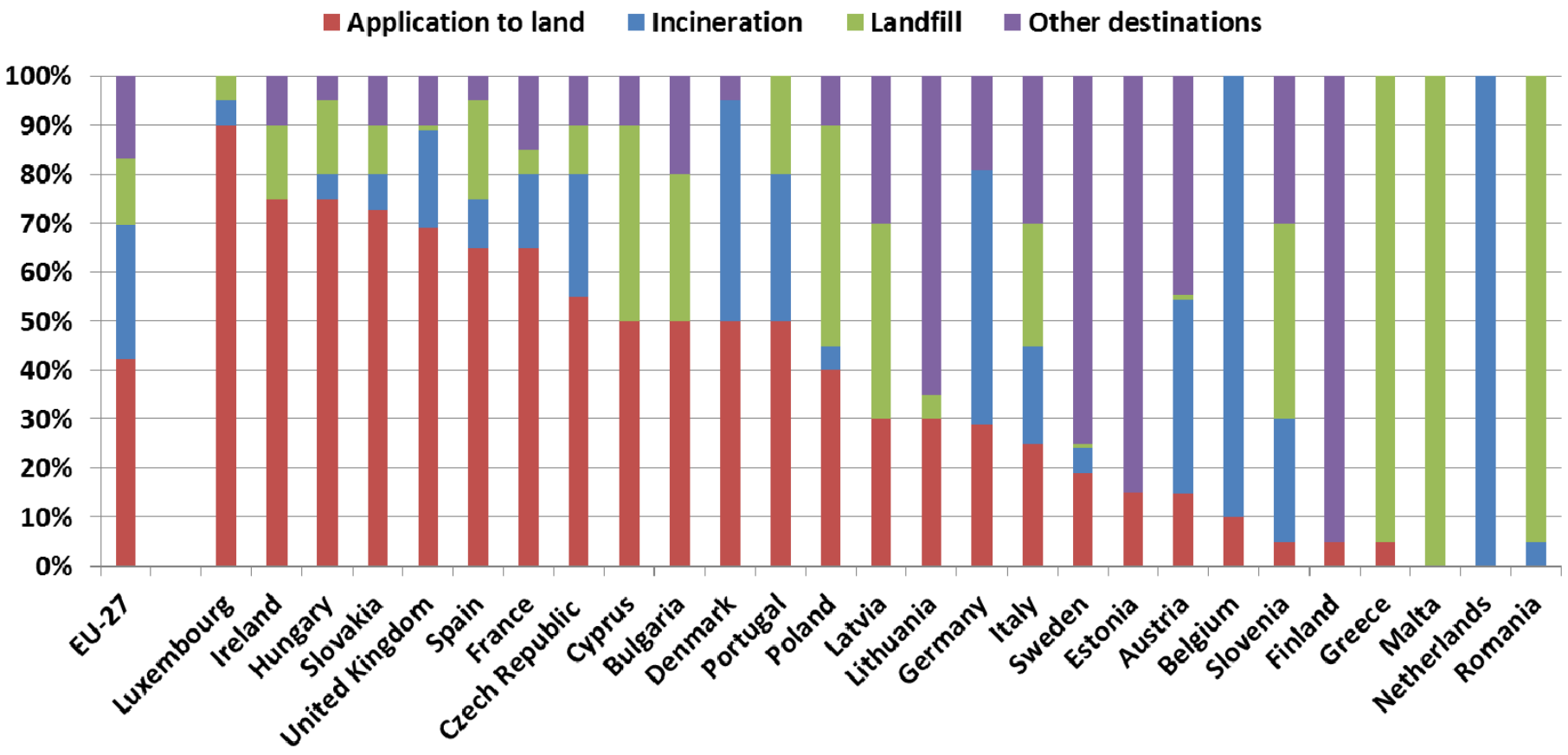
Reuse of organic waste in EU-27 in 2005



WAGENINGEN UR
For quality of life

Based on Barth et al. 2008

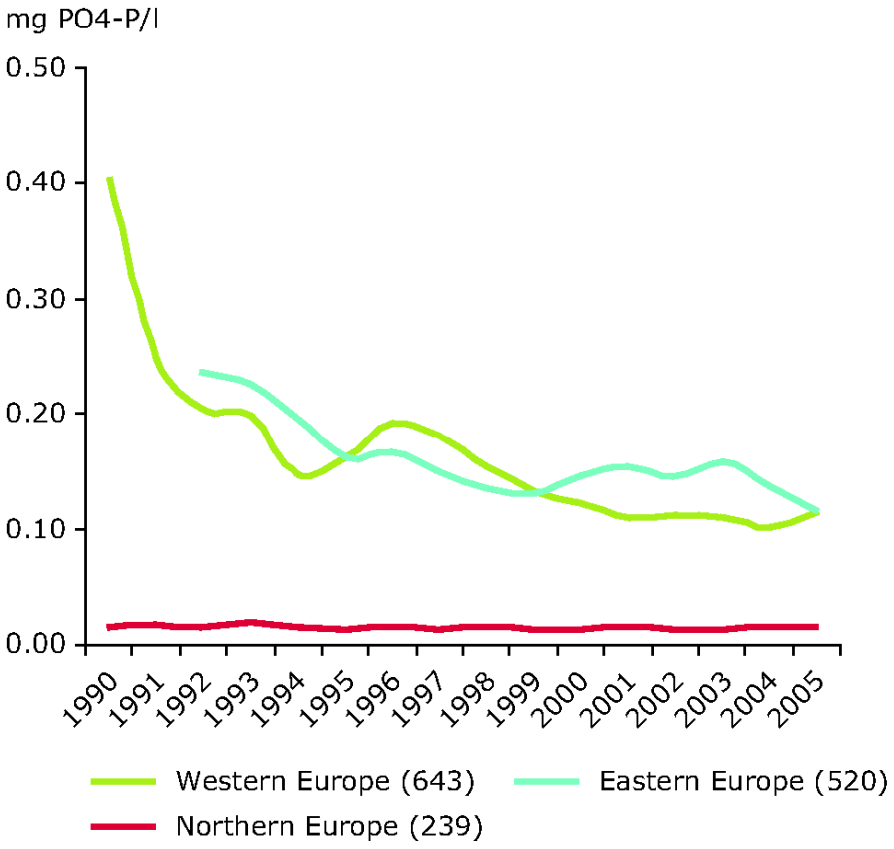
Sludge destinations in EU-27 in 2010

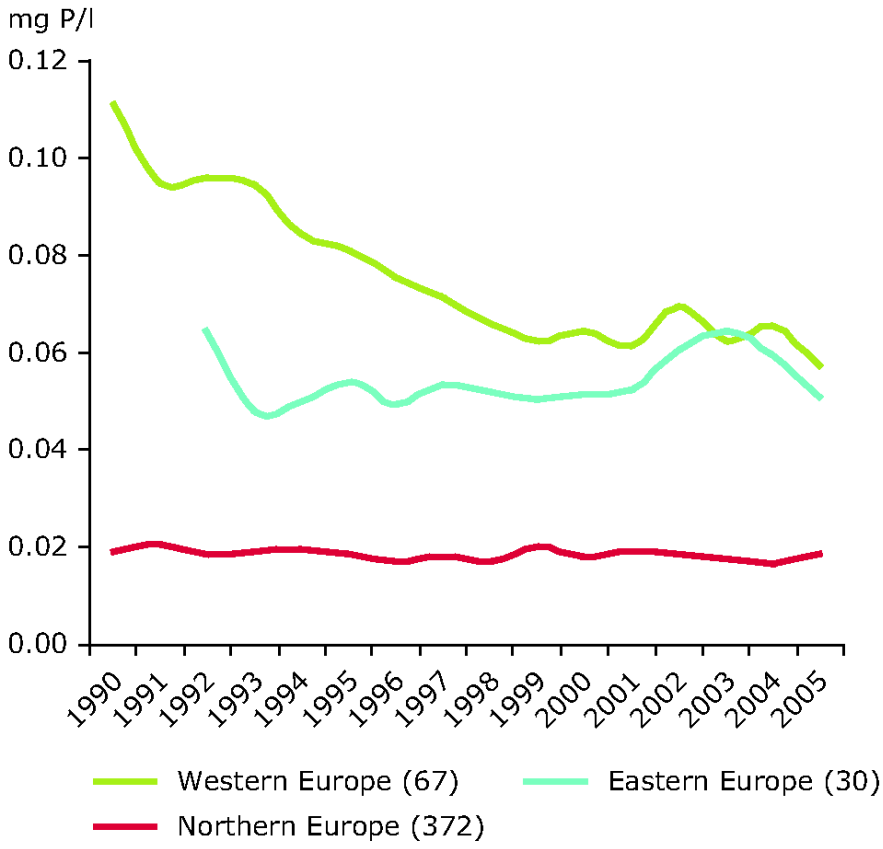


WAGENINGEN UR
For quality of life

P-Rex, based on Eurostat 2010, Milieu Ltd 2010 & Destatis 2011

P concentrations in rivers and lakes in EU regions, period 1990 - 2005





WAGENINGEN UR
For quality of life

European Environment Agency 2007

Summary & conclusions

- Europe is largely dependent on P imports via:
  - Mineral fertilizers (70%), animal feed & additives (20%), food & non-food materials (10%)
- Ongoing P accumulation in agricultural soils, especially in western Europe by P surplusses
- Various recycling rates, generally low (except manure):
  - Sewage sludge P recycling ranging from 0 - 90%
  - Compost P re-use ranging from 0 - 70%
- Significant P losses via:
  - Waterways: sewage discharge, leaching & erosion
  - Sequestration: incineration, landfilling, infrastructure
- High potential to improve P use efficiency

Thank you for your attention

Questions or comments?

Email: kimo.vandijk@wur.nl

WAGENINGEN UR
For quality of life