

3rd INTERNATIONAL SCIENTIFIC MEUSE SYMPOSIUM

***THE MEUSE DISTRICT : CHALLENGES FOR TOMORROW***

LIEGE, April 22 – 23, 2010

# **FUTURE POLICY SCENARIOS FOR AGRICULTURE IN FLANDERS AND IMPACT ON WATER QUALITY**

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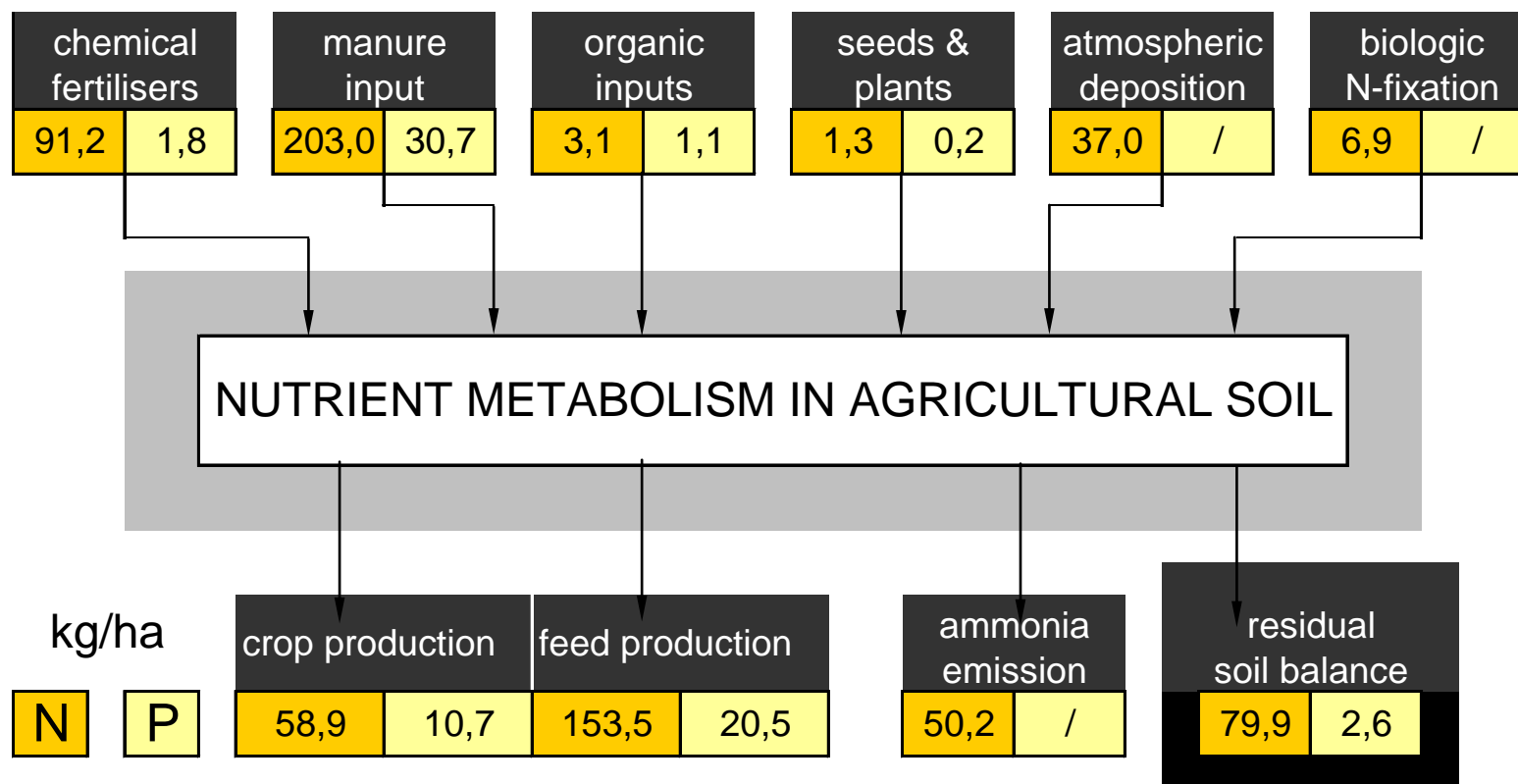
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# INTRODUCTION

1. Nitrogen soil balance today in Flanders
2. Water quality today in Flanders
3. Scenarios for environmental policy in Flanders
4. Policy scenarios for agriculture and impact on nutrient soil balance
5. Policy scenarios for water quality

# Soil balance today (flanders, 2007)



# Soil balance today (flanders, 2007)

Target soil balance:

70 kg N/ha in MINA-plan3+ (2007-2010)

Target almost reached, but water quality is behind

Due to:

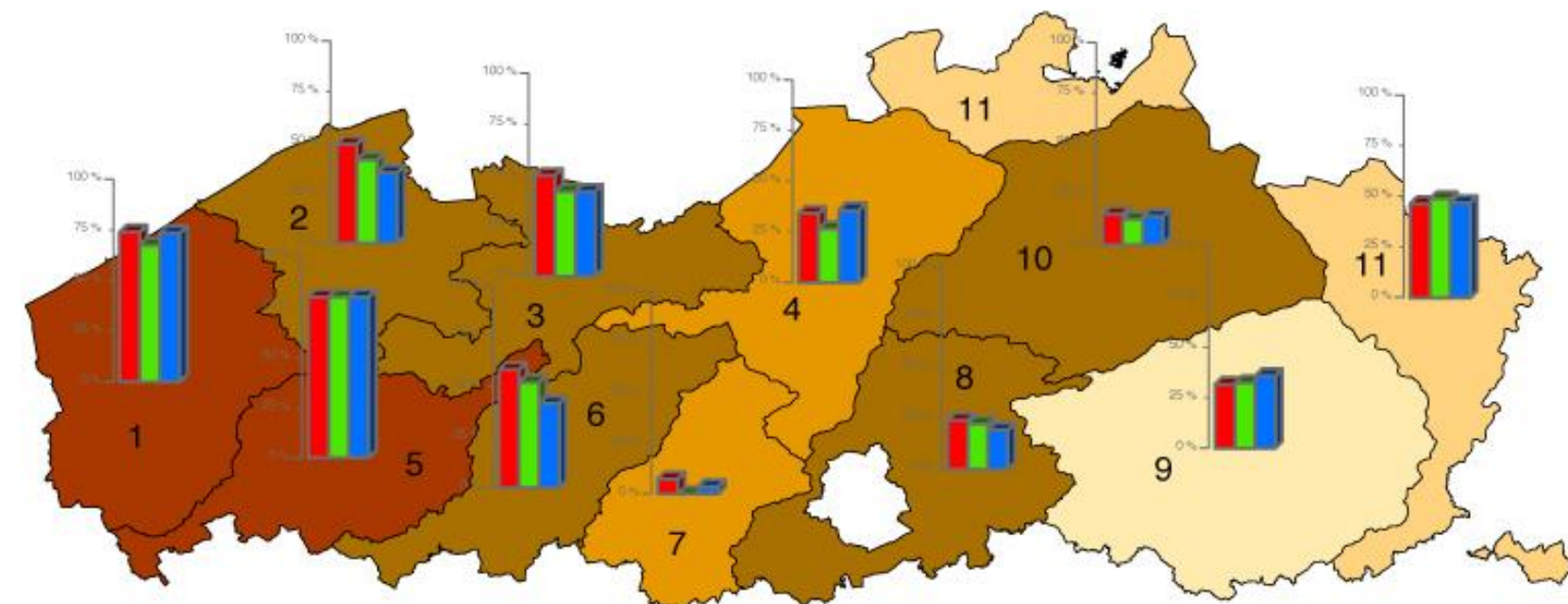
regional differences

difference in time scale

balance method accumulates errors

unknown denitrification factor

# Soil balance today (flanders, 2003-2005)



overschrijding nitraatnorm 50 mg/l

- % overschrijding 2003-2004
- % overschrijding 2004-2005
- % overschrijding 2005-2006

overschot bodembalans

- overschot tussen 75 - 89 kg N/ha
- overschot tussen 90 - 104 kg N/ha
- overschot tussen 105 - 119 kg N/ha
- overschot tussen 120 - 134 kg N/ha
- overschot tussen 135 - 145 kg N/ha

bekkens

- |                   |                 |
|-------------------|-----------------|
| 1 IJzer           | 7 Dender        |
| 2 Brugse Polders  | 8 Dijle & Zenne |
| 3 Gentse Kanalen  | 9 Demer         |
| 4 Beneden-Schelde | 10 Nete         |
| 5 Leie            | 11 Maas         |
| 6 Boven-Schelde   |                 |



0 10 20 40 60 80 100 km

# Water quality today: nitrogen

Agricultural area Flanders:

standards Nitrate Directive

= 50 mg nitrate-N/l as maximum or 95th percentile

- 27 % exceeding in surface water (2008-2009)  
29 % in the basin of the Meuse (2008-2009)
- 37 % exceeding in ground water (2008)

# Environment Outlook 2030

Environmental **policy** planning 2011-2015

Task by decree for VMM-MIRA

Expected environmental developments in case of  
unchanged policy  
change in policy  
according to a number of relevant scenarios

published in december 2009: [www.milieuverkenning.be](http://www.milieuverkenning.be)

# Environment Outlook 2030

## Socio economic outlook

- Population
  - 12 % grow 2005 - 2030
  - aging, family dilution
- Energy price
  - Increasing prices fossile fuels
- Energy price
  - 2 % annual grow GDP
  - Service economy

# Chapter Agriculture

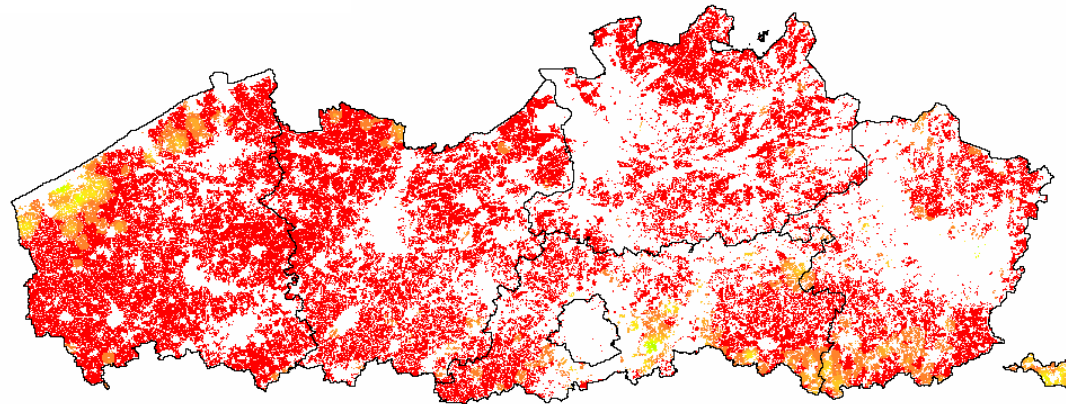
## Policy scenarios for agriculture & environment:

- unchanged policy: Reference scenario  
shrinking land use by 5 % in 25 years  
growing productivity (tonnes/ha)
- alternative policy: Europe scenario:
  - manure policy: 140 kg N/ha
  - manure processing at stable prices
  - lower nutrient content in animal feed
  - agriculture with environmental and nature objectives

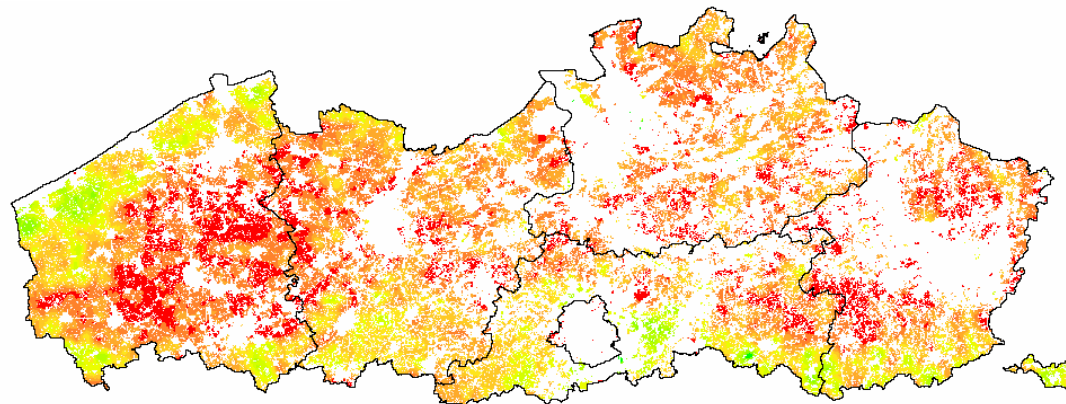
# Chapter Agriculture

## agriculture with environment and nature objectives (AEN)

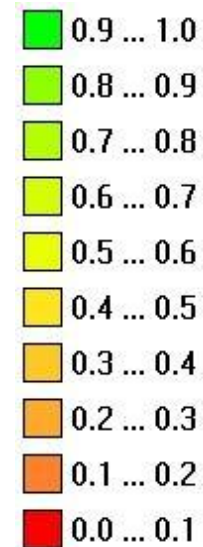
REF 2030



EUR 2030



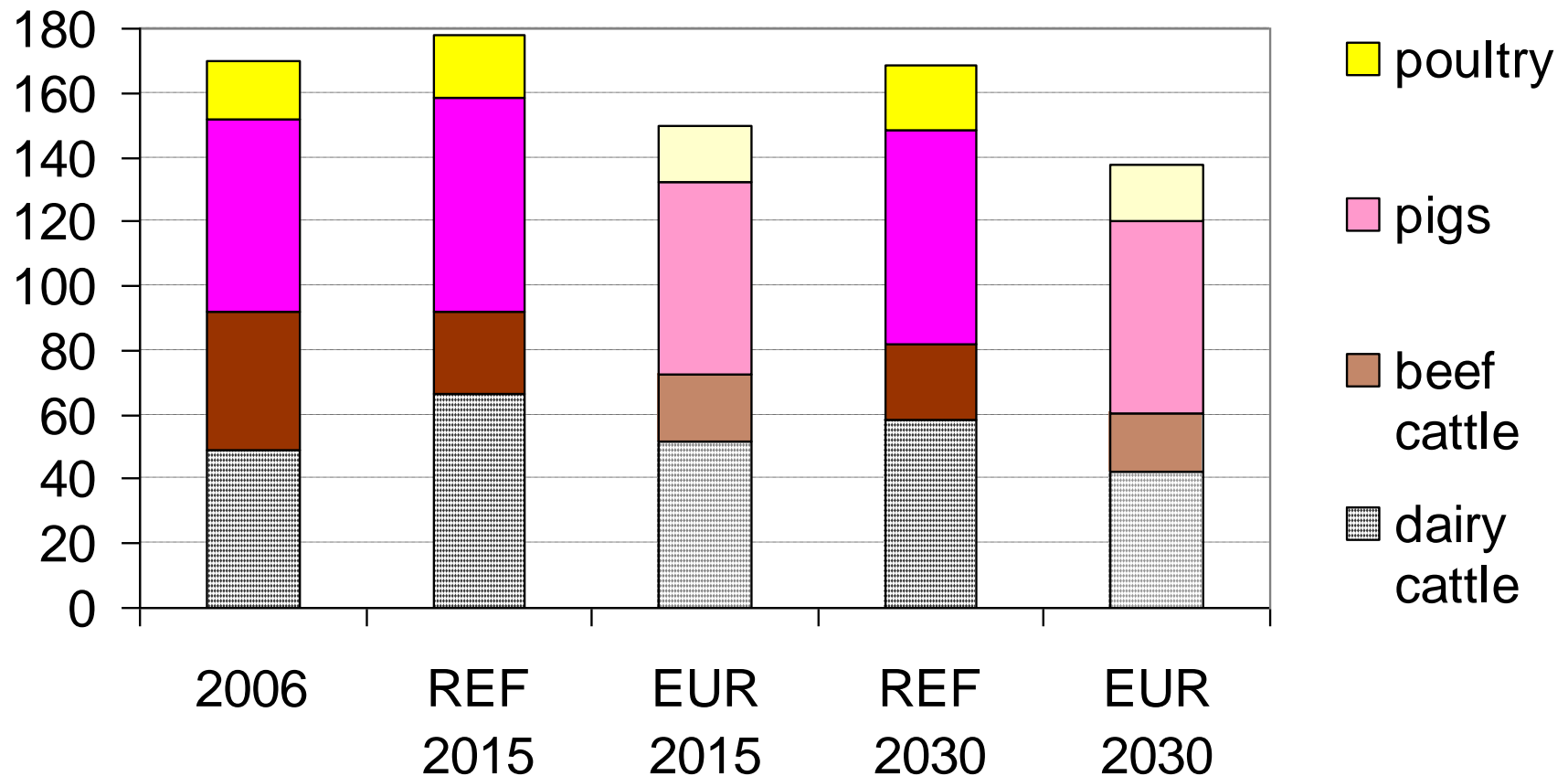
1 = 100 % AEN



# Chapter Agriculture

## Results: manure production

ktonnes N



## **Alternative target for Nitrogen Soil Balance**

**42 kg N/ha**

A/ 26 mg Nitrate-N / l (or 5,9 mg N/l as average)

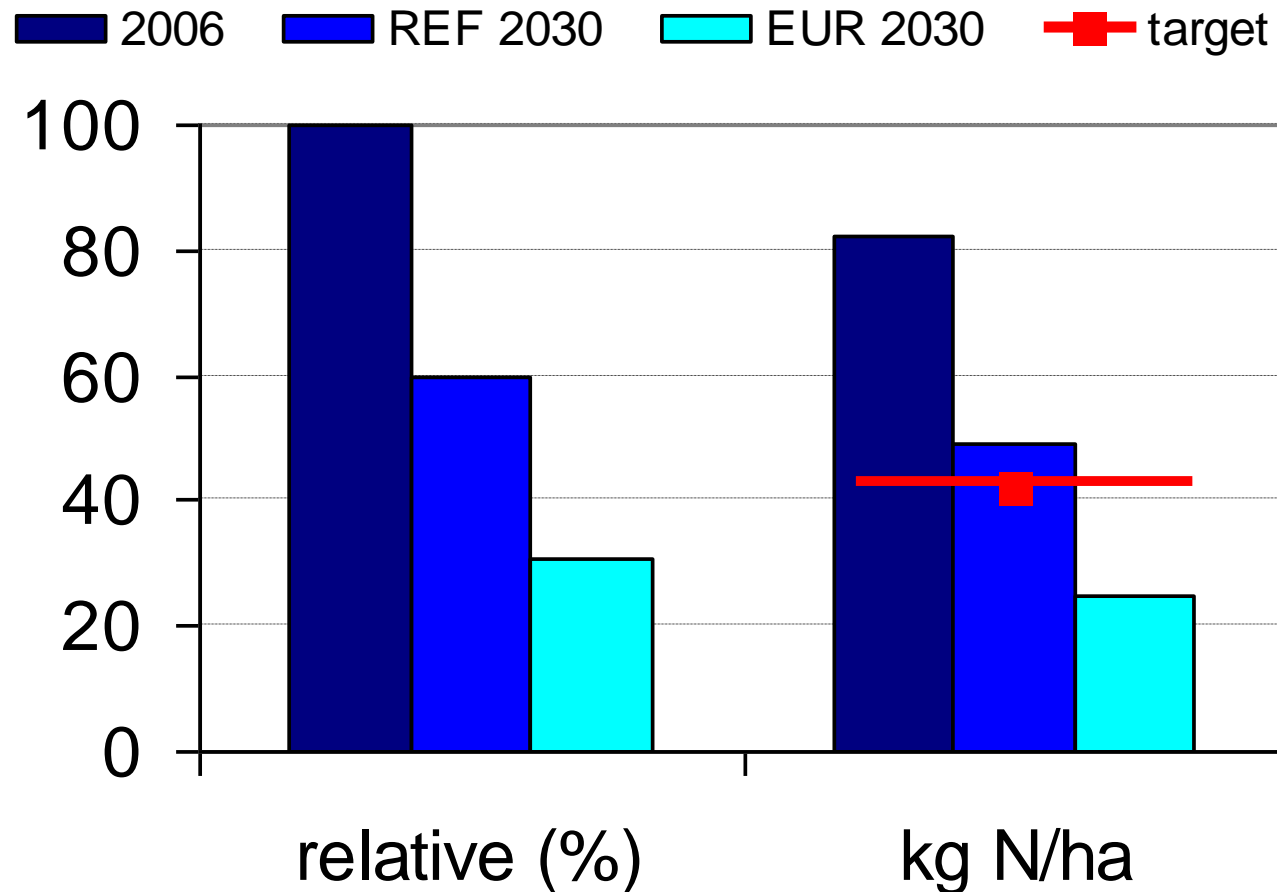
B/ proces factor of 2,4

C/ 300 mm precipitation surplus

$A * B * C = 42 \text{ kg N/ha}$

# Chapter Agriculture

## Results: nitrogen soil balance



# Chapter Agriculture

## Conclusions

- Stricter manure policy needed to reach water targets
- Manure processing can keep up stock breeding of pigs and poultry.

# Chapter Water quality

## scenario description

### REF2015:

- ✓ Public wastewater treatment (among others IP's till 2005)
- ✓ Companies meet standards (IPPC, BAT, sectoral standards)
- ✓ Agriculture: manure decree

### EUR2015:

- ✓ Public wastewater treatment (among others IP's till 2009)
- ✓ Companies meet standards UWWT
- ✓ Agriculture: manure according to manure advice, buffer strips, wintergreen cover

EUR2027 - EUR+2027

# Chapter Water quality

## scenario description

REF2015 - EUR2015

EUR2027:

- ✓ Purification of all domestic wastewater (public or individual)
- ✓ Agriculture: improved fodder efficiency, livestock reduction

...

EUR+2027:

- ✓ Good quality at border

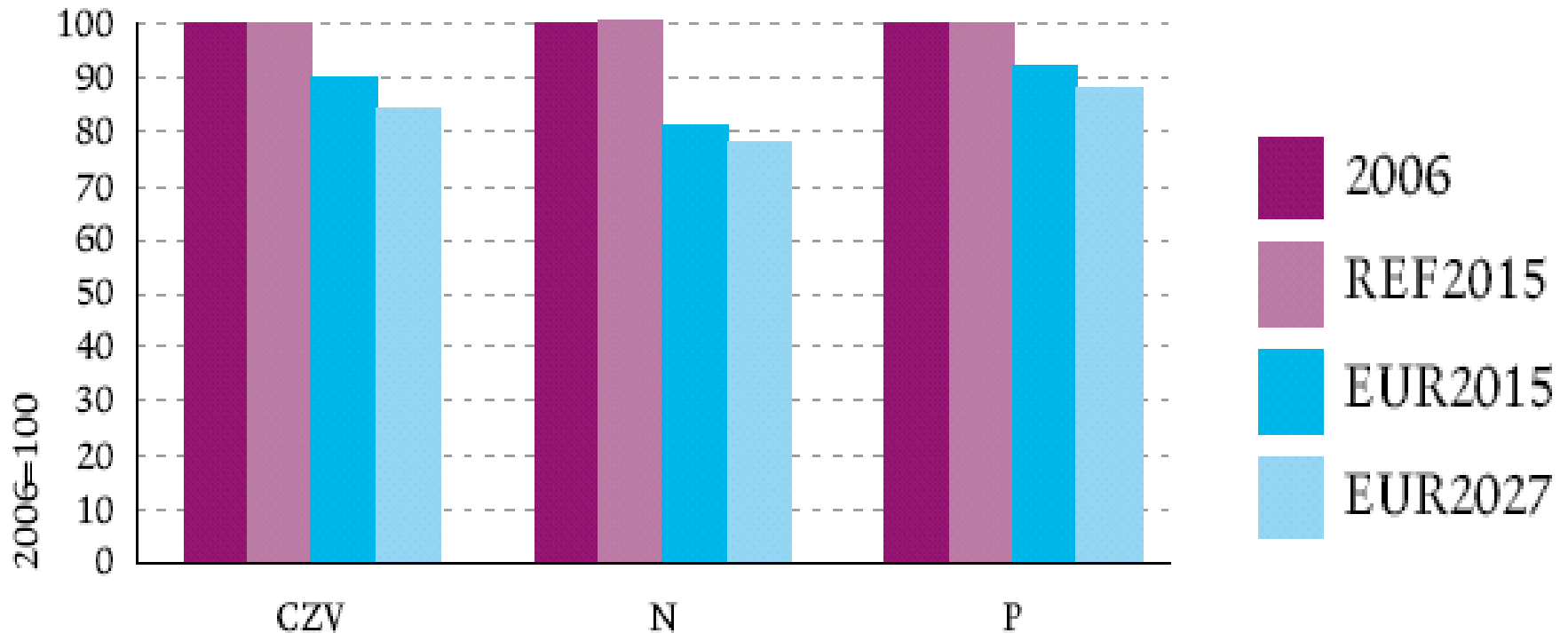
# Chapter Water quality

## Costs & effectiveness of measures

	cost/kg reduction	potential reduction of soil balance surplus	
		N	P
Low N/P feed	0,46 €/kg N	81%	71%
Manuring on advice	0,48 €/kg N	64%	66%
170 kg N/ha & no derogation	0,94 €/kg N	91%	100%
140 kg N/ha	1,45 €/kg N	64%	75%

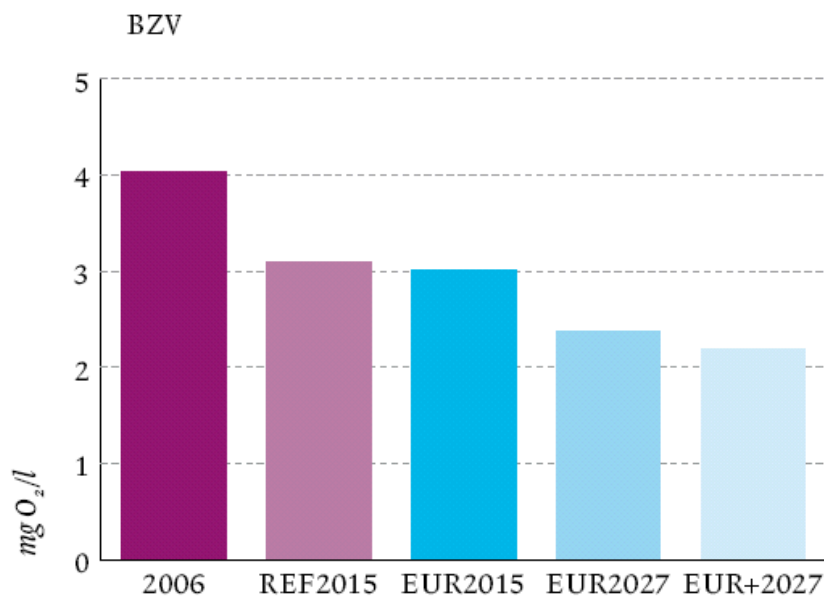
# Chapter Water quality

## Charges in surface water by agriculture:

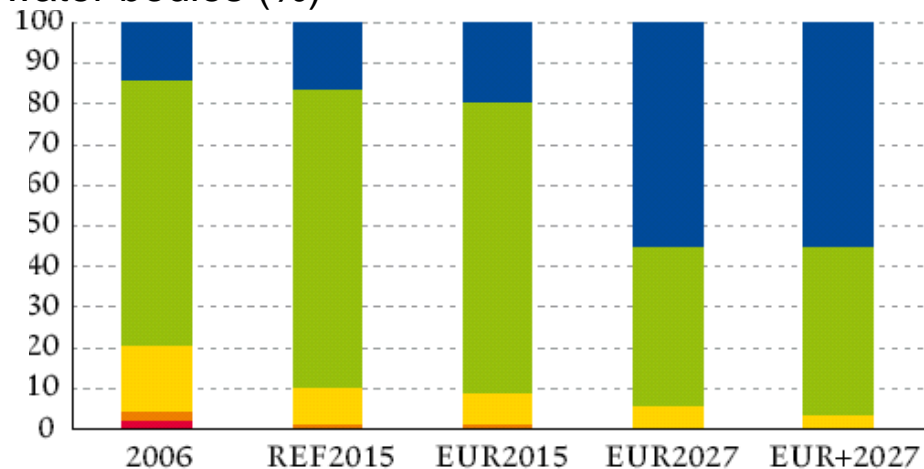


# Chapter Water quality

## Physico-chemical water quality: Biological Oxygen Demand



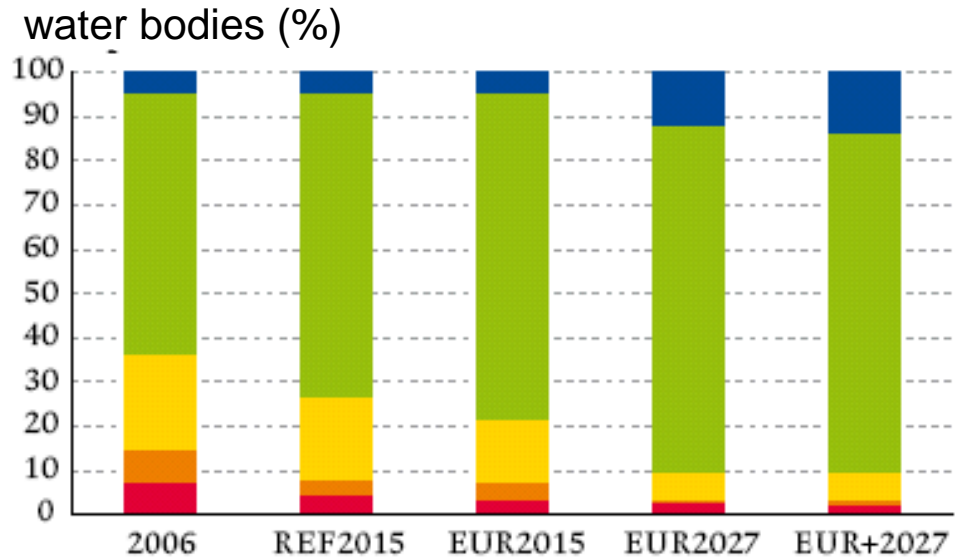
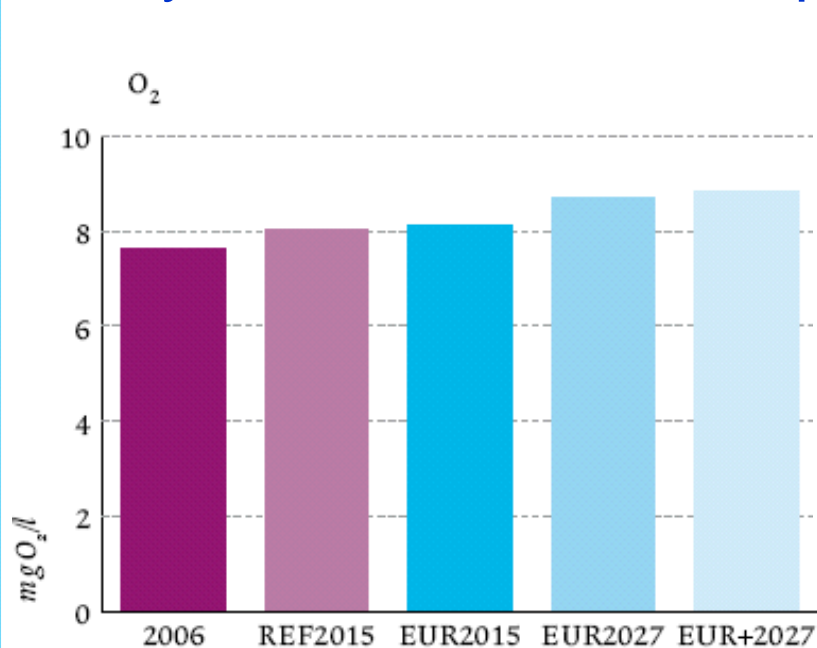
water bodies (%)



1

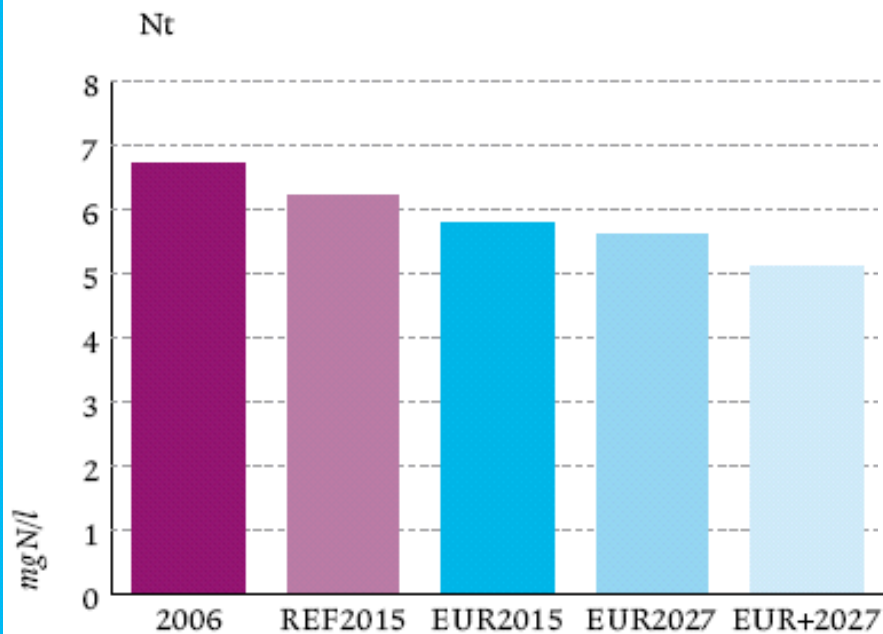
# Chapter Water quality

## Physico-chemical water quality: OXYGEN

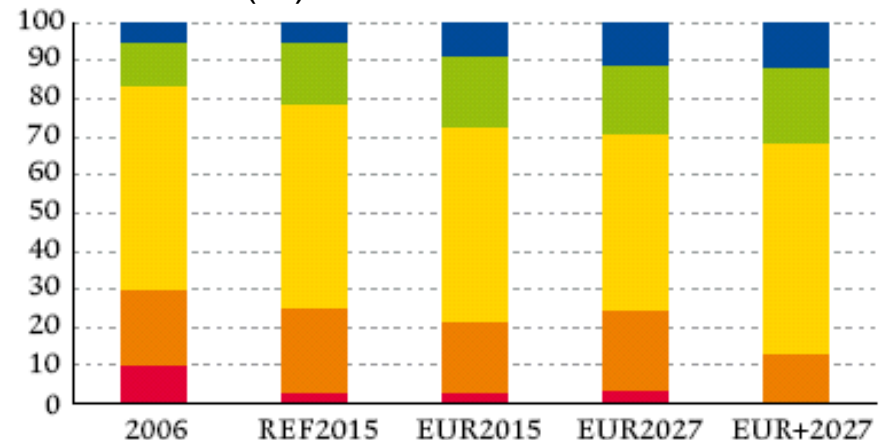


# Chapter Water quality

## Physico-chemical water quality: total NITROGEN



water bodies (%)

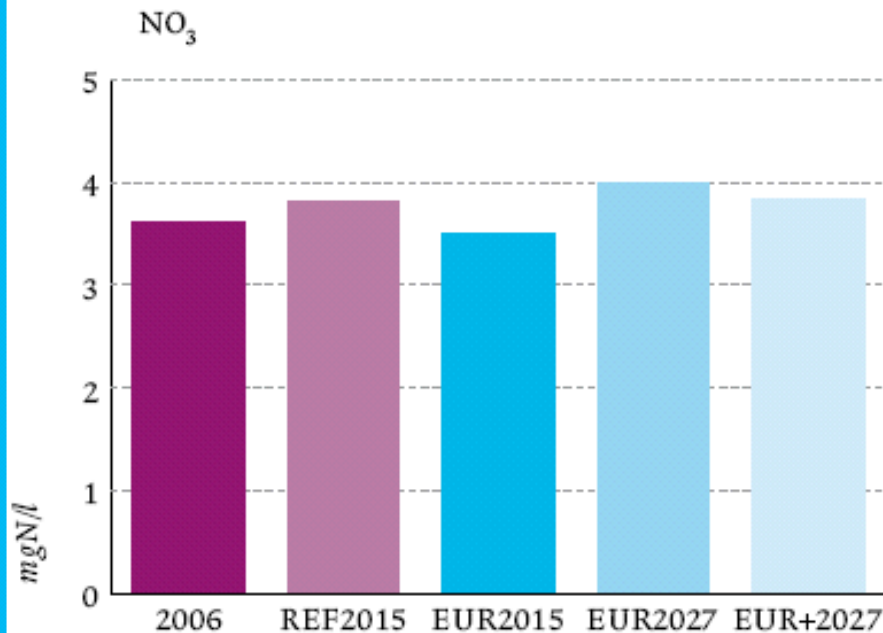


- very good
- good
- moderate
- inadequate
- bad

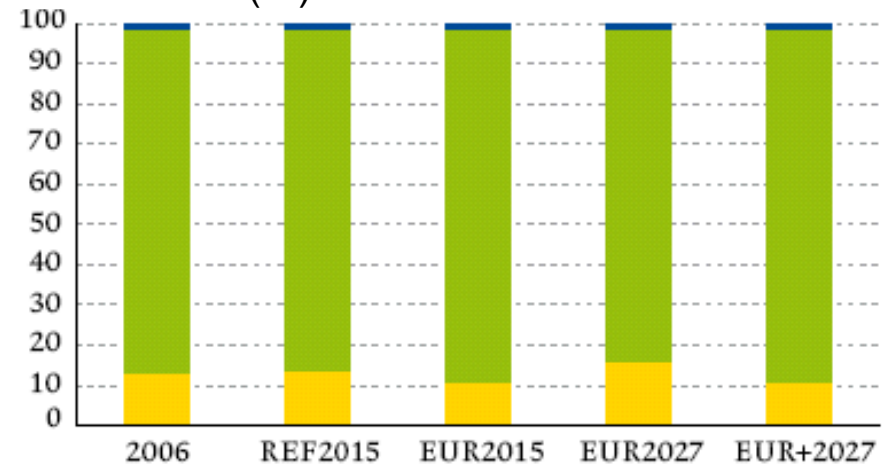
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# Chapter Water quality

## Physico-chemical water quality: NITRATE



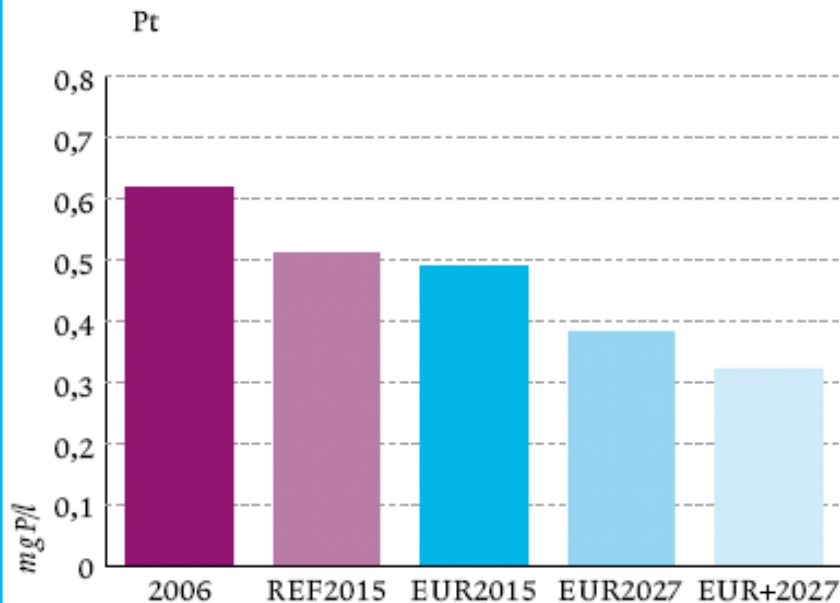
## water bodies (%)



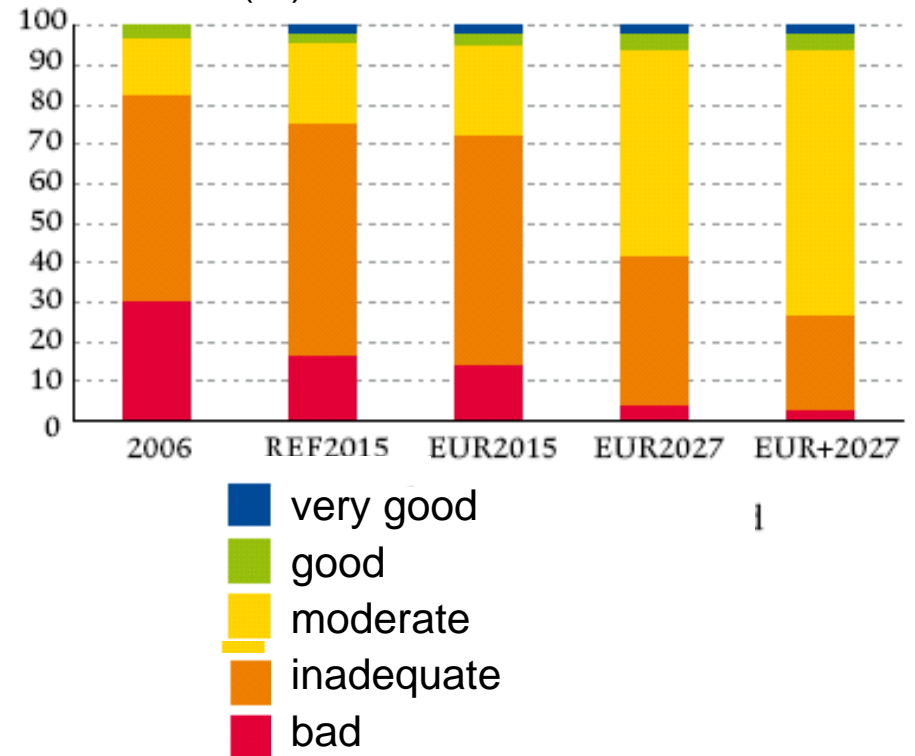
- very good
- good
- moderate
- inadequate
- bad

# Chapter Water quality

## Physico-chemical water quality: PHOSPHORUS



water bodies (%)

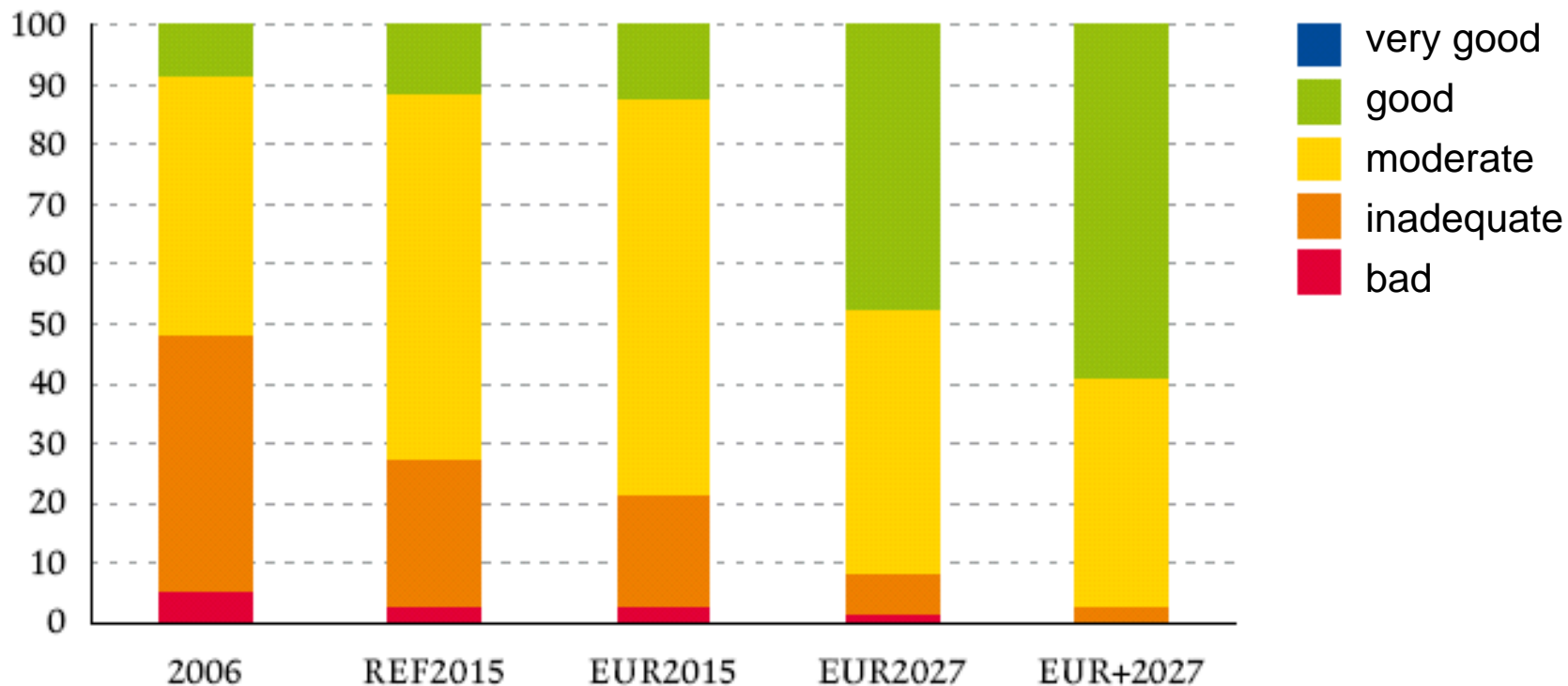


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# Chapter Water quality

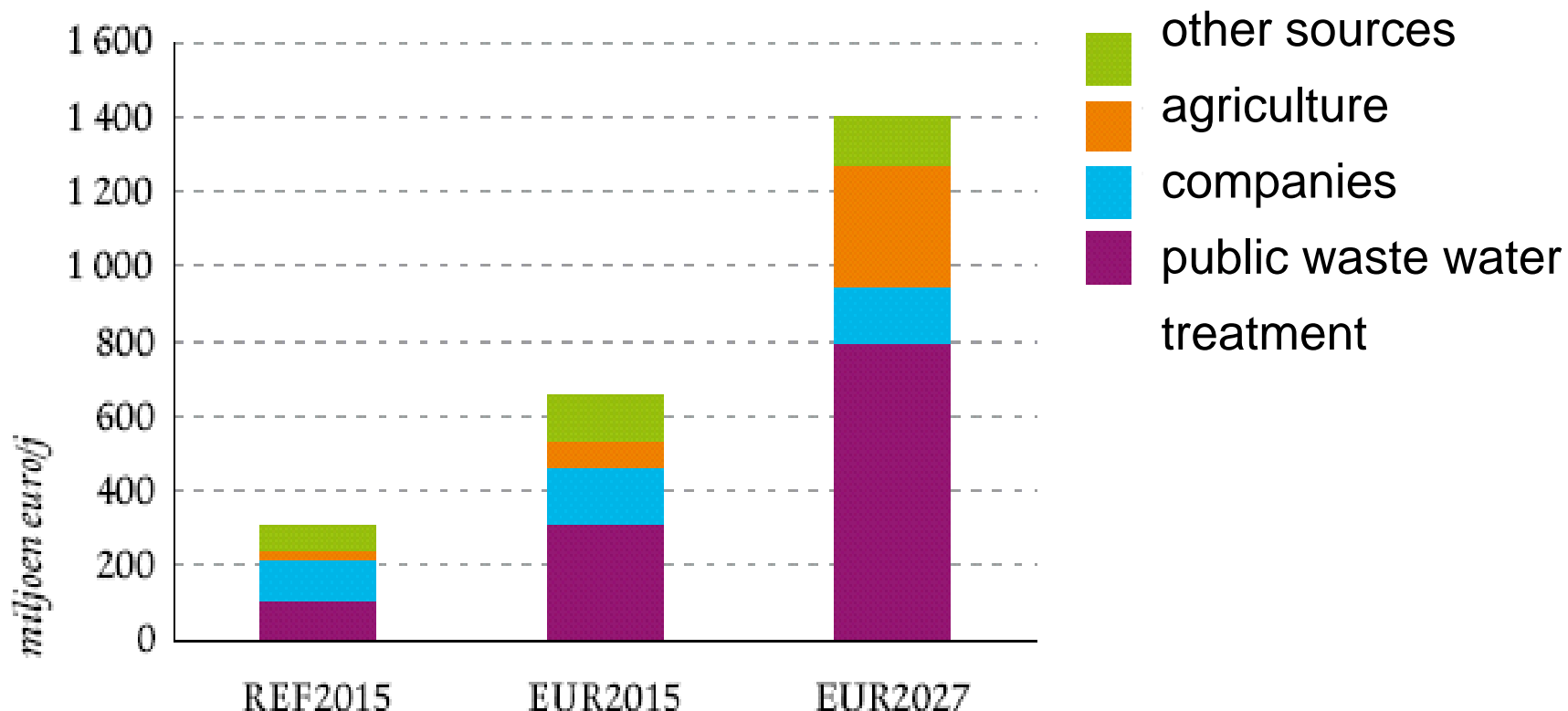
## Biological water quality

water bodies (%)



# Chapter Water quality

## Costs



# Chapter Water quality

## Conclusions

- Current and complementary measures will lower discharges into surface water.
- The importance of the out roll and good practices of public watersanitation stations.
- Fysico-chemical waterquality continues to increase, but phosphorous remains a major problem.
- Even biological quality increases, but in the most advanced scenario only 60% of the waterbodies reaches a good water quality.

# Environment Outlook

# 2030

[www.milieuverkenning.be](http://www.milieuverkenning.be)

soon available in english