St. Petersburg, 7th TFRN meeting, 2012

ABATEMENT OF AMMONIA EMISSIONS IN THE CZECH REPUBLIC – the case study

&

PRODUCTION OF MANURE IN DIFFERENT SYSTEMS OF ANIMAL HOUSING

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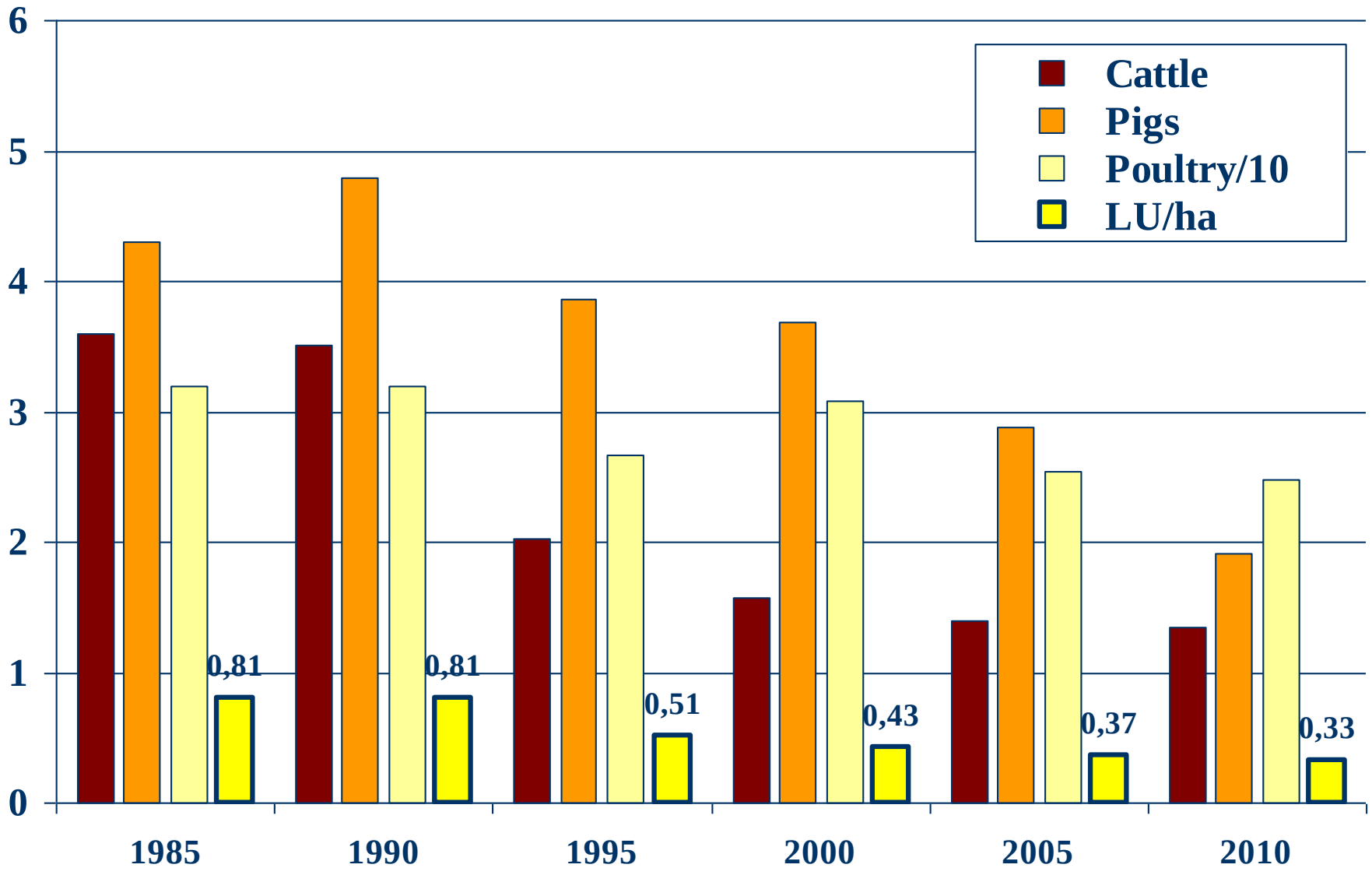
The number of animals in Czech agriculture

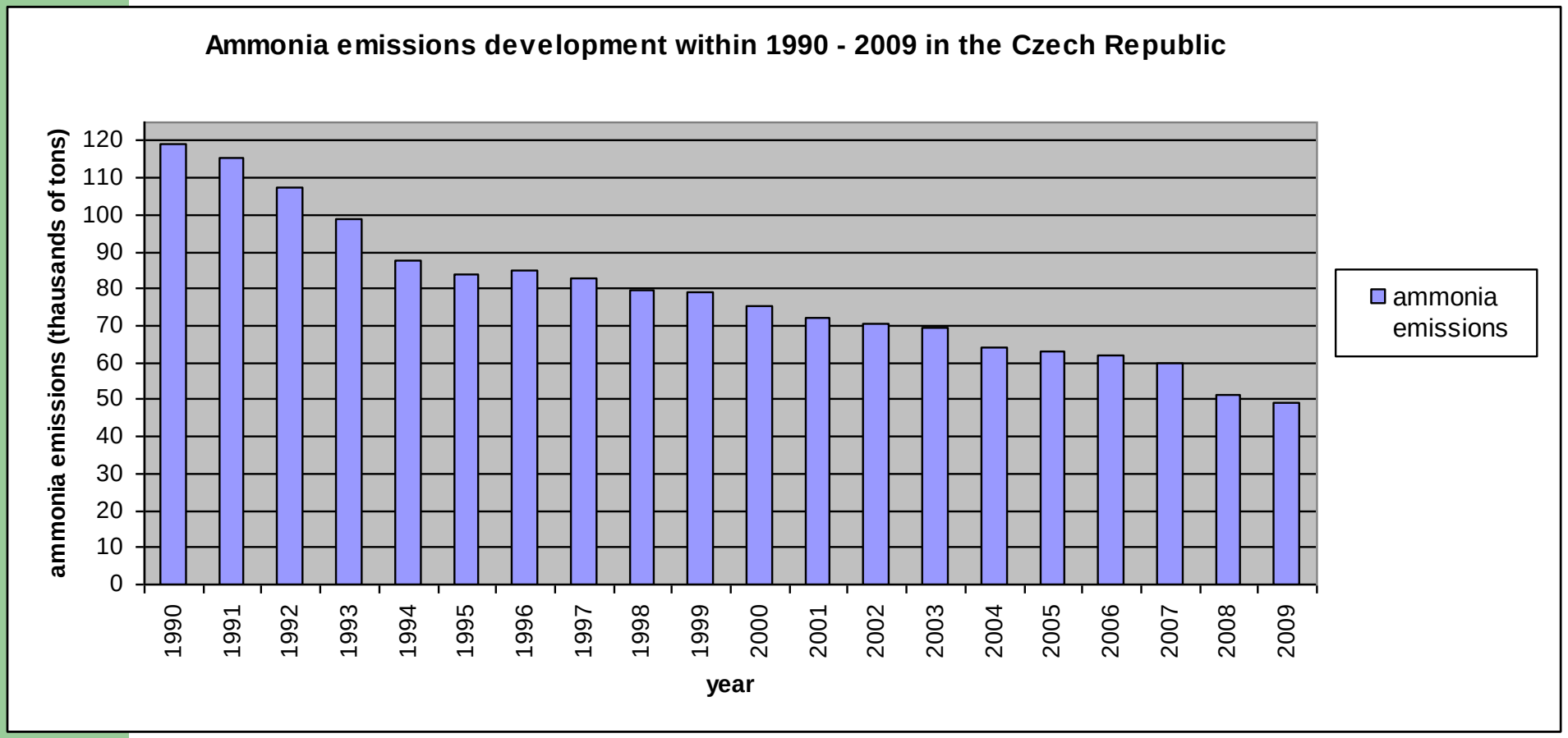


Source: CzSO

Manure production in Czech agriculture

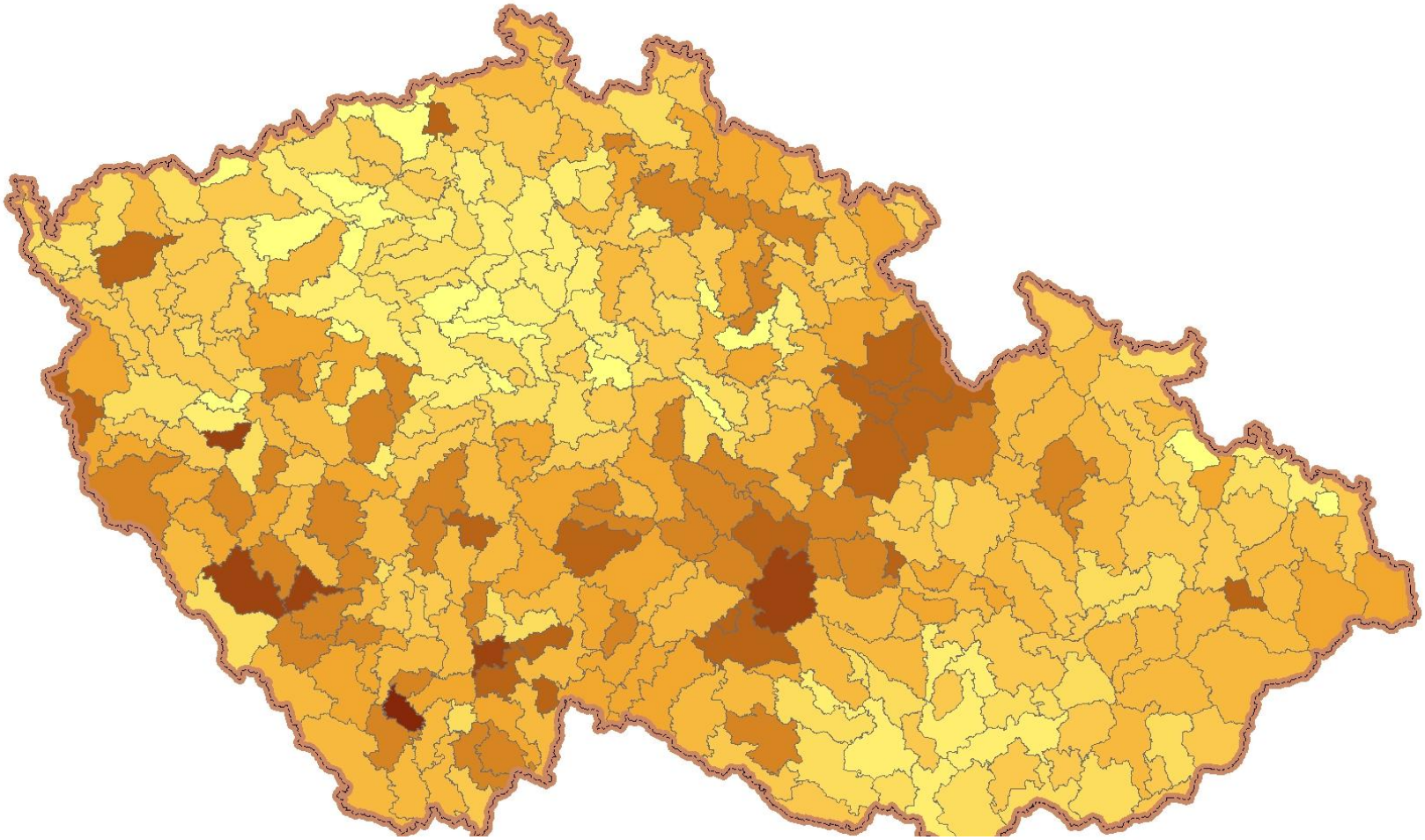
Category	Livestock units (mil.)	Slurry (mil. t)	Farmyard manure (mil. t)	Liquid manure (mil. t)
Cattle	1,15	3,3	9,1	3,1
Pigs	0,31	3,0	1,2	0,9
Total	**1,46**	**6,3**	**10,3**	**4,0**

Development of ammonia emissions from agriculture in the Czech Republic
(total amount from housing, storage & application to the soil)



Source: VUZT

Livestock distribution in Czech agriculture



Average livestock density (LU per 1 ha of agricultural land)

0.00 - 0.10
0.11 - 0.20
0.21 - 0.30
0.31 - 0.40
0.41 - 0.50
0.51 - 0.60
0.61 - 0.70
0.71 - 0.80
0.81 - 0.90
0.91 - 1.00
1.01 - 1.10

What has been already done to fulfill of the Gothenburg Protocol principles ?

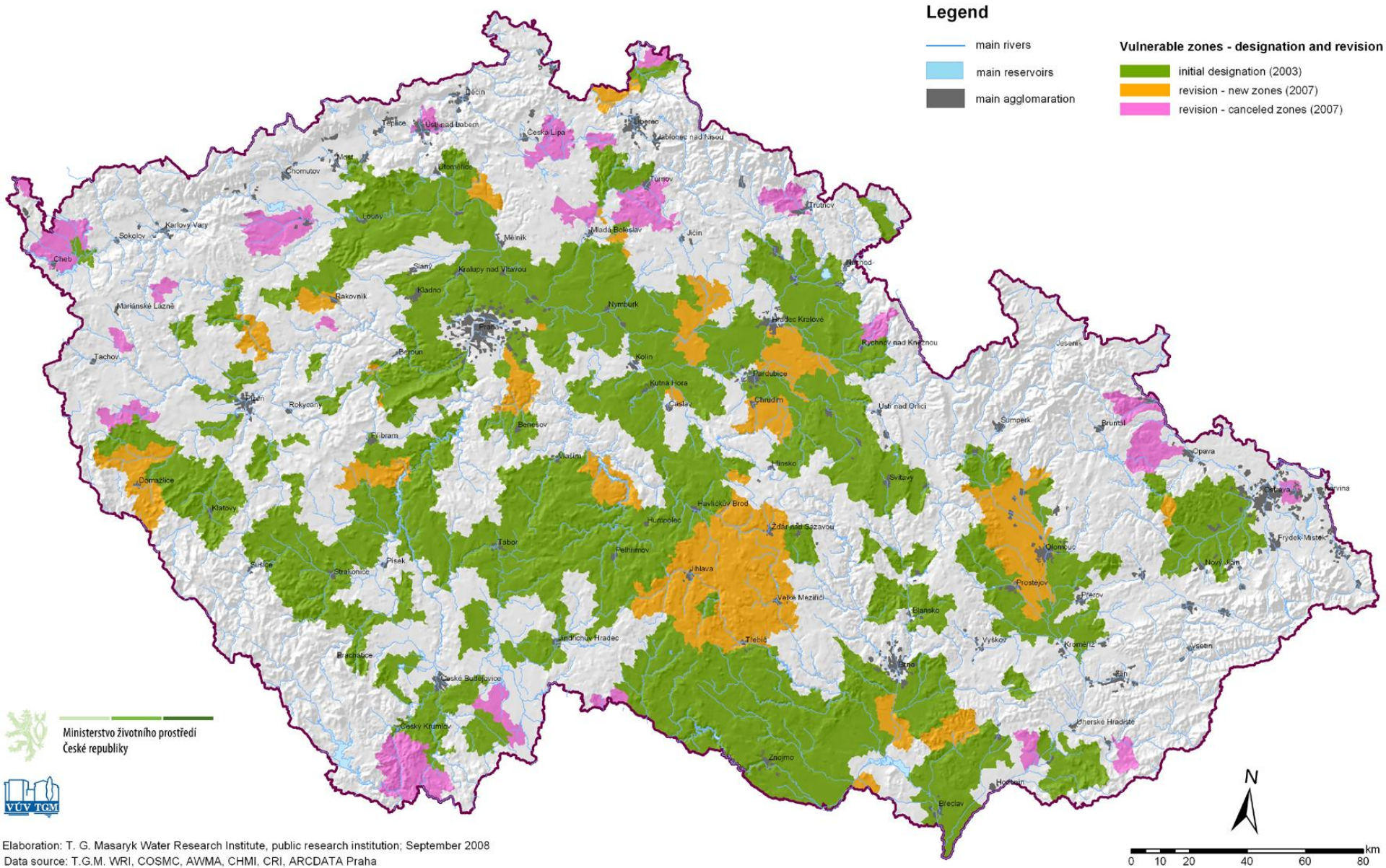
- Acceptance of a new legislation:
  - On the air protection – NH3 abatement measures
  - On manure handling – incorporation within 24 hours
  - Concerning Integrated pollution prevention and control - integrated permissions (IP) for operators
- Utilization of the Best Available Techniques
- Processing of the Evaluation study of the IP comparision of operated technologies with BAT

Evaluation study of integrated permissions for pigs and poultry farms

- 422 installations under IPPC / GP are in CZ
- 100% of chickens is housed in VEA system (i.e. low emission systems)
- 90% of laying hens is kept in enriched cages.
- 45% of pigs is housed in a partly-slated floor with a reduced manure pit system, 32% on partly-slated floor with a vacuum system for slurry frequent removal
- 90% of manure is transferred to contractor for application (no responsibility for choice of manure application technique)

Vulnerable zones in the Czech Republic

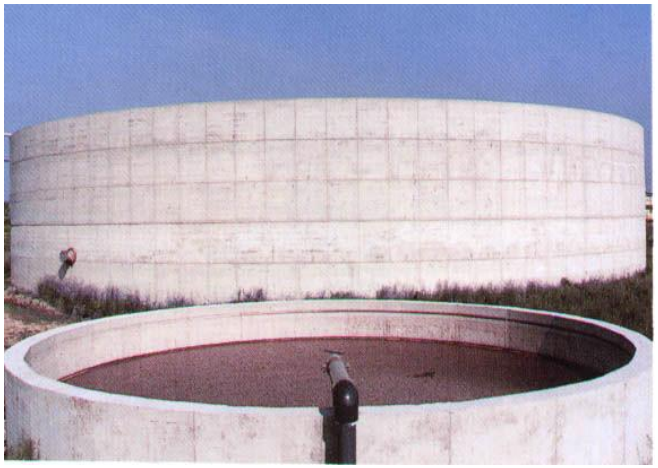
(designation in 2003 and 1st revision in 2007)

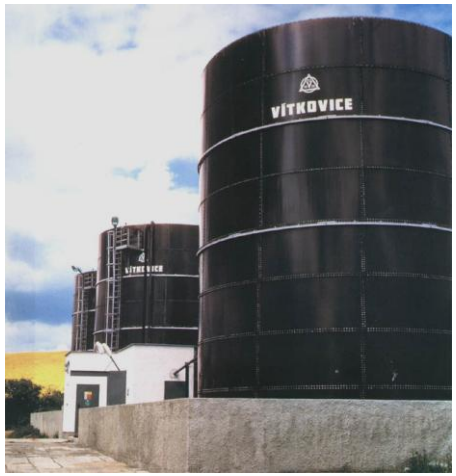


Elaboration: T. G. Masaryk Water Research Institute, public research institution; September 2008
Data source: T.G.M. WRI, COSMC, AWMA, CHMI, CRI, ARCDATA Praha

Storage capacities for manure

- Slurry:
  - **4 months** (non vulnerable zones)
  - **4 months** (vulnerable zones – till 2013)
  - **6 months** (vulnerable zones – since 2014)





Storage capacities for manure

- Farmyard manure (solid):
  - **6 months**, or placement on field (non VZ s)
  - **6 months**, or placement on field (VZ s - till 2013)
  - **6 months**, or placement on field in case of cattle FYM with higher proportion of straw (VZ s – since 2014)

Inspections of manure storage provides Central Institute for Supervising and Testing in Agriculture

Inspection in agriculture practice are based on:

- Directive No 91/676/EEC
- Czech Government Ordinance No 103/2003 Coll., (on vulnerable areas establishment, storage and usage of fertilizers, crop rotation and erosion control in these areas)
- Czech Act No 156, on fertilisers

Main aim:

Surface and ground water protection

Inspection results in 2011

Inspections of manure storage

The sum of inspections	421
Inspections with Acts violation	9

Acts violation in 2011

Acts violation	No
Infringement of the regulations for manure storage on agricultural land	5x
Unsuitable storage areas for manure storage	3x
Outflow of manures to the environment	1x

Slurry production

Animal category	Slurry production		DM production	Nitrogen production in slurry	
	t/LU	*% of normative*	*% of normative*	kg N/LU	*% of normative*
Pigs	15,7	*83*	*66*	69	*73*
Cattle	19,4	*93*	*91*	*72*	*108*

Farmyard manure production
(technology without liquid manure production)

Animal category	FYM production		DM production	Nitrogen production in FYM	
	t/LU	*% of normative*	*% of normative*	kg N/LU	*% of normative*
Pigs	5,0	*44*	*46*	42	*51*
Cattle	11,4	*99*	*90*	*74*	*107*

Farmyard manure production
(technology with liquid manure production)

Animal category	FYM production		DM production	Nitrogen production in FYM	
	t/LU	*% of normative*	*% of normative*	kg N/LU	*% of normative*
Pigs	5,9	*85*	*88*	50	*116*
Cattle	7,8	*97*	*87*	*51*	*126*

Liquid manure production

Animal category	Liquid manure production		Nitrogen production in liquid manure	
	t/LU	*% of normative*	kg N/LU	*% of normative*
Pigs	8,8	*92*	17	*64*
Cattle	12,3	*216*	10	67

Poultry manure production

Manure type	Manure production		DM production	Nitrogen production in manure	
	t/LU	*% of normative*	*% of normative*	kg N/LU	*% of normative*
Fresh droppings	9,6	*57*	*68*	171	*57*
Ripe droppings	6,2	53	49	115	58
Deep litter	5,9	*50*	43	125	*55*

Conclusions

- Strengthened legislative requirements
- New technologies in animal housing and feeding
  - litter consumption, waste water, reduced N a P feed, etc.
- Requirement to update the normative data
- Results of investigation on manure production:

Cattle FYM	97 - 99 % of normative
Pig FYM	44 – 85 %
Cattle and pig slurry	83 - 93 %
Poultry manure	50 – 57 %

- Further validation needed