Interreg Baltic Sea Region

Baltic Slurry Acidification

EUROPEAN UNION

EUROPEAN REGIONAL DEVELOPMENT FUND

Slurry Acidification Market Potential

Mid-term meeting, Latvia, October 2017

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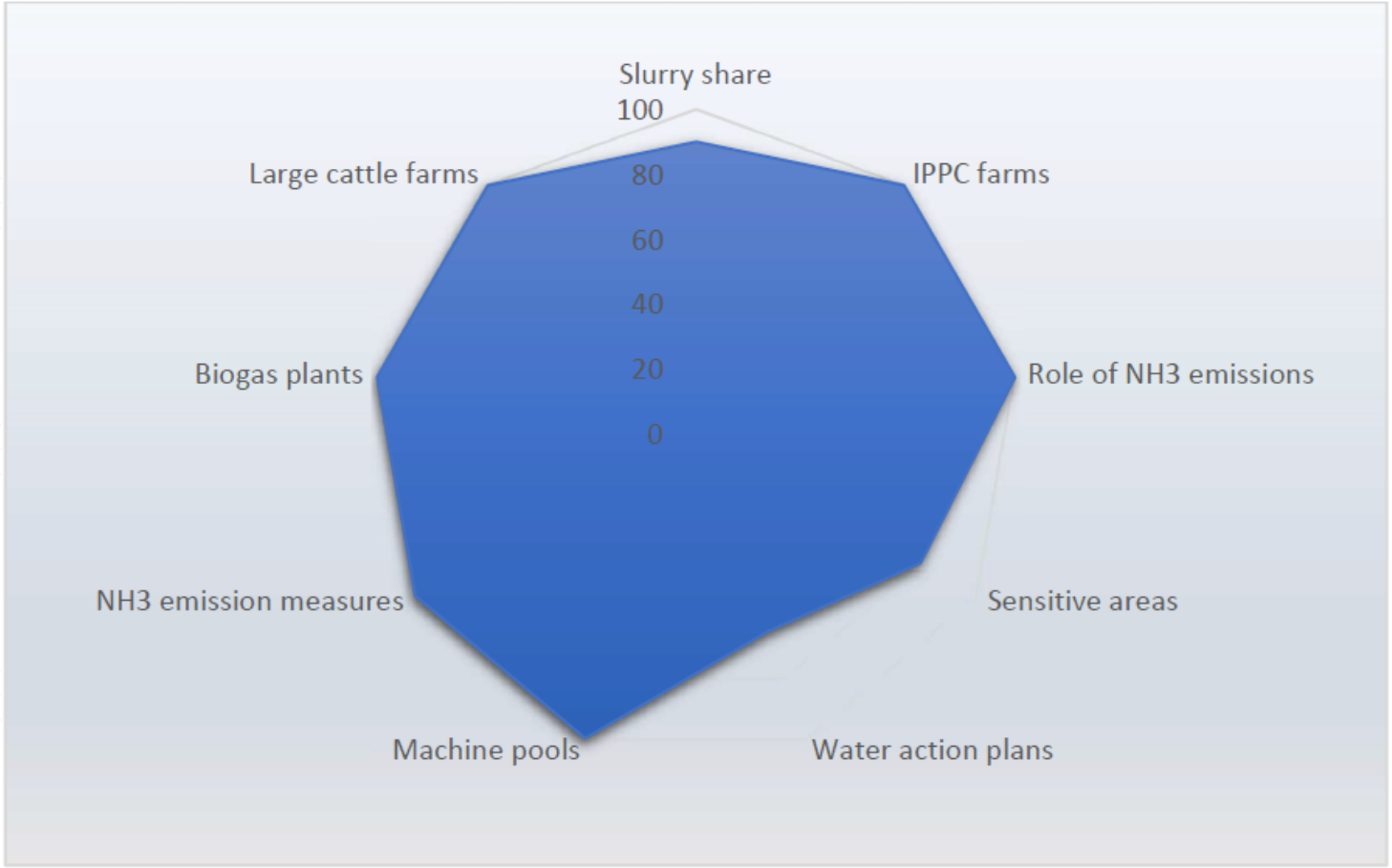
6.1 Report on Market Potential - Objective

- The overall goal of the market analysis is to
  - provide an estimate of the potential for slurry acidification and
  - an example of the corresponding number of SAT installations
  - in each of the eight EU member states of the Baltic Sea Region as well as Russia and Belarus.

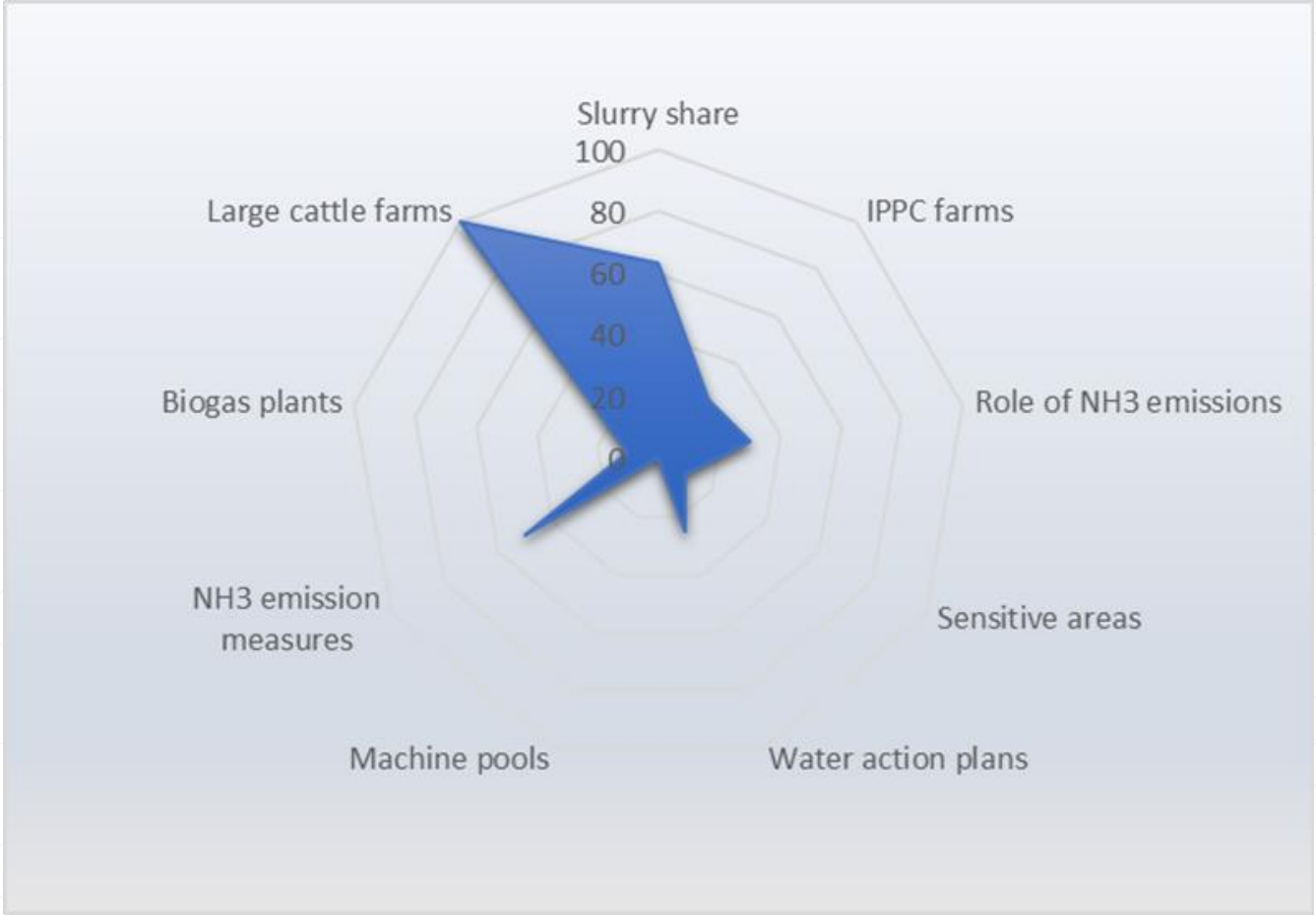
6.1 Report on Market Potential - Method

Germany is scoring high on many parameters, for instance due to its high focus on NH3 emissions in regulation of livestock farming. The total of the subjective scoring is 835 and the weighed potential for slurry acidification thus estimated to be 159.5 million tons. The production of this amount of acidified slurry would require 3,435, 1,794 and 2,655 installations, respectively for in-house, in-storage and in-field slurry acidification.



6.1 Report on Market Potential - Method

- Another spider example, from Belarus, visualises the differences in national market potentials.
- It shall be kept in mind that the scoring is subjective.



6.1 Report on Market Potential – Overall result

- Today, there is a theoretical, weighed potential for SAT installations with a capacity to process **242.8 million tons** slurry and other liquid manures in raw and processed form in the Baltic Sea Region.
- An example of equivalent number of SAT installations, given the same market share as for DK, is **5,215 in-house, 2,730 in-store, and 4,043 in-field installations**.

	Estimated, weighed potential for slurry acidification	Example of equivalent number of SAT installations, given the same market share as for DK		
	Million tons	In-house	In-storage	In-field
Denmark	25.0	538	281	416
Estonia	1.1	24	12	18
Finland	3.9	83	44	65
Germany	159.5	3,435	1,794	2,655
Latvia	0.9	18	10	14
Lithuania	1.5	32	17	25
Poland	21.6	456	243	360
Sweden	11.7	252	131	196
Belarus	14.3	307	161	240
Russian BSR regions	3.3	70	37	54
Total	242.8	5,215	2,730	4,043

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6.1 Report on Market Potential – Overall result

- Estimated share of liquid manure
  feasible for slurry acidification
  shows variations from 30 to 85%

Country	Estimated share of liquid manure feasible for slurry acidification, %
Denmark	85
Estonia	68
Finland	36
Germany livestock manure and digestate (17%)	x
Latvia	x
Lithuania	30
Poland	50
Sweden livestock manure and digestate (1,3%)	x
Belarus	63
Russian BSR regions	62.8

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6.1 Report on Market Potential – Overall result

- Denmark is completely dominating with respect to number of farms with environmental approval

Country	No. of farms with environmental approval
Denmark (2016)	23,940, whereof 4,000 cattle and 3,000 pig farms are requested to use BATs
Estonia (2017)	162: 108 cattle, 45 pigs and 9 poultry farms
Finland (2015)	117: 102 pigs and 15 poultry farms
Germany (2016)	2,800 (only pigs)
Latvia (2017)	29 (only pigs)
Lithuania	39 pigs and 42 poultry farms
Poland (2010)	752: 146 pigs and 606 poultry farms
Sweden (2017)	285: 2 intensive aquacultures, 14 poultry or pigs, 160 poultry, 109 pigs, 14 sows
Belarus	106 pigs and 45 poultry farms
Russian BSR regions	There are 532 industrial enterprises in the considered area, including 200 falling under IPPC-farm size.

6.1 Report on Market Potential – Overall result

- The question about the assessment of ammonia emissions in connection to the environmental permit appraisal was difficult for the countries to answer.
- The issue might not even be considered in several countries.

Country	
Denmark	Always considered if >75 AU[1]
Estonia	BATs about cattle, pig and poultry production, whole manure handling chain
Finland	Yes: criteria determined case by case
Germany	Yes: TA-Luft, BImSchG
Latvia	No
Lithuania	Is considered and permits can be conditioned the application of ammonia emission reduction measures.
Poland	Yes. Environmental permits might be conditioned the use of ammonia emission reduction BAT's.
Sweden	No information provided.
Belarus	Ammonia emissions from Belarus livestock farms is considered, and the farms imposed an excise tax on basis of their emissions, except in cases where they use a single tax payment system.
Russian BSR regions	Current environmental legislation regulates pollution emissions, including ammonia. It is expected that BAT introduction will cause tightening of regulations.

6.1 Report on Market Potential – Overall result

- The share of NVZs varies from 100 to 4%
- The share of Natura2000 areas varies from 4.5 to 25%

Country	Nitrate Vulnerable Zones %	Nartura2000
Denmark	100	8,3 / 17,7% (on / off shore)
Estonia	7.2	17
Finland	100	5 Mio. ha: 25 / 75% (on / off shore); 12,4% of total area of Finland
Germany	100	156.000 / 756.000 ha (on / off shore)
Latvia	13	12% of the territory or 787,729 ha
Lithuania	100	13% of the territory.
Poland	4	4.5% of the area designated as NVZ. 983 Natura2000 areas: 145 birds, 845 habitats
Sweden	70	11.6% of the territory or 4,532,000 ha
Belarus	N/A	7.6% of the total territory.
Russian BSR regions	N/A, but Water code of the Russian Federation	n/a, but HELCOM Marine Protected Areas

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6.1 Report on Market Potential – Overall result

- The question about concrete N loss reduction goals in water action plans was also difficult for several countries, who is not focused on this in their policies.

Country	
Denmark	Further reductions of 6,000 tons nitrogen planned, but ammonia emission reductions do not count in that respect.
Estonia	No, but Estonian Water Act 2016.
Finland	No, but Nitrate Directive and the agro-environmental protection scheme, where 90% of farms are committed to support WFD
Germany	No, but instruments are agricultural advice service, special agricultural provision programs and the fertilisation decree.
Latvia	Yes: Law on Water Management 2002 transposes the Water Framework Directive 2000/60/EC This is the case for all EU member states, but the question is how nitrogen loses is regulated by the national laws
Lithuania	Governmental Action Plans includes plans to develop various measures. Concretely Lithuania has under HELCOM committed themselves to reduce nitrogen loads to the Baltic Sea with 15,66 Kt per year.
Poland	Yes: Water Law 2001 transposes the Water Framework Directive 2000/60/EC, flaws occurred in implementing process, new Program of Action improves
Sweden	Yes: goal of no eutrophication, WFD is part of the Nitrate Directive from 1999
Belarus	No concrete goals.
Russian BSR regions	n/a, but Russian Schemes of integrated use and protection of water bodies (SKIOVO), are for some rate similar to Action Plans under Water Framework Directive.

6.1 Report on Market Potential – Overall result

- *2007 and 2013 CARTs on nitrogen for HELCOM and non-HELCOM countries, as well as progress towards CARTs for 2012.*

Country	2007	2013	2012	
	Country-Allocated Reduction Targets, Kt/a		Extra reduction (total input) compared to targets for Baltic Sea basins since 1997-2003, Kt/a	Missing reduction (total input) to fulfil targets for Baltic Sea basins since 1997-2003, Kt/a
DA	17.21	2.89	16.86	0
DE	5.6	7.17 +0.5*	6.18	2.66
EE	0.9	1.8	0.2	2.42
FI	1.2	2.43 +0.6*	0.29	7.66
LV	2.56	1.67	0.001	9.83
LT	11.7	8.97	0.02	15.66
PL	62.4	43.61**	1.24	23.78
SE	20.78	9.24	9.64	2.77
RU	6.97	10.380*	0	14.86
Transboundary Common pool* (including BY)	3.78	3.32 1.98	0 0	2.65 1.85

6.1 Report on Market Potential – Overall result

- Existence of machine pools almost only in old EU Member States

Country	
Denmark	yes
Estonia	yes – a few
Finland	yes
Germany	yes
Latvia	yes – a few
Lithuania	This service sector is not developed.
Poland	Machine pools does not exist, except very few cases.
Sweden	Around 25
Belarus	None, big farms have their own machine pools.
Russian BSR regions	No, not in the same way, but all big farms have their own machine pools.

6.1 Report on Market Potential – Overall result

- None of the countries have direct NEC measures – they are integrated in other legislation.
- Answer from Polish side is that the Polish Government actively works against EU policies in this field!

Country	
Denmark	Yes/No, measures are integrated in other legislation, especially IED
Estonia	No - some measures via ND regulations (Estonian Water Act, 2016)
Finland	Yes/No, through feeding and manure handling – legislation integrated in other legislation, f. ex IED
Germany	Yes/No - New measures related to slurry spreading will be implemented under the new fertilisation ordinance (Düngeverordnung, DüV)
Latvia	Yes/No – Cabinet Regulations No. 829 and 834, considerations ongoing
Lithuania	There are no concrete measures to reduce ammonia emissions from farming, but several measures are integrated in the entire regulation of farming.
Poland	No, and Polish Government is actively working against the reach of the decided target.
Sweden	No: but commitments based on Gothenburg Protocol and objective of no eutrophication
Belarus	None, but ammonia emissions are considered as part of the entire set of regulations for farming.
Russian BSR regions	n/a, but Russian Schemes of integrated use and protection of water bodies (SKIOVO), are for some rate similar to Action Plans under Water Framework Directive.

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6.1 Report on Market Potential – Overall result

- As we already knew, Germany is totally domination when it comes to biogas – and therefore also have the highest need for preventing ammonia and methane emissions from them.

Country	No of biogas plants	Amount of digestate
Denmark	76	6.8 million ton
Estonia	5	
Finland	14	
Germany	9,000	32.5 million ton
Latvia	51	
Lithuania	8	?
Poland	85	1.2 million ton
Sweden	40	0.3 million ton
Belarus	9	1.2 million ton
Russian BSR regions	0	0

6.1 Report on Market Potential – Overall result

- Sizes of dairy farms are fast growing as reflected in the number of large cattle farms.

Country	Number	Average herd size
Denmark	974	180
Estonia	130	504
Finland	340 with > 100 cows	144[1]
Germany	15,969 farms with buildings for more than 200 animals in 2016	55[2]
Latvia	127	331
Lithuania	150	403
Poland	577	188
Sweden	271 holdings with more than 200 dairy cows	286[3]
Belarus	4,160	App. 500
Russian BSR regions	320	ca. 500

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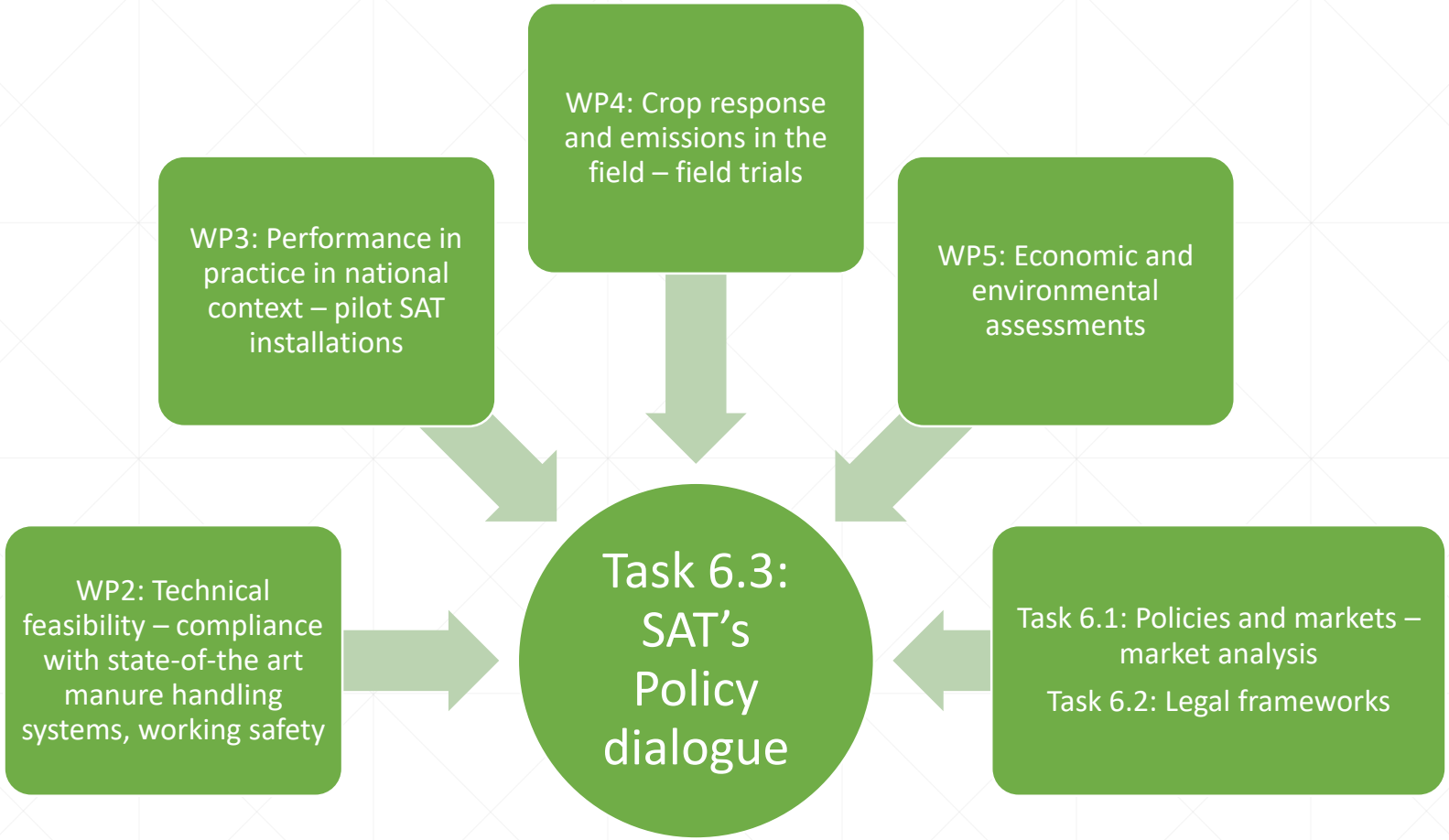
The project makes a 360° examination of SAT's for the BSR and for the individual countries



Ammonia emissions are increasing

- Status for ammonia emissions: It is going in the wrong direction!
- Germany remain the country with the largest distance to ceiling.

Sources: https://www.eea.europa.eu/data-and-maps/indicators/eea-32-ammonia-nh3-emissions-1 and https://www.eea.europa.eu/data-and-maps/indicators/eea-32-ammonia-nh3-emissions-1

Country	2013	2014	2015	2020	2015 distance to 2020 ceiling, % of ceiling value
	Actual emissions			2020 CLRTAP Gothenburg Protocol ceilings	
				%	
DA	71	72	73	63	-16
DE	633	737	759	545	-39
EE	11	11	12	10	-20
FI	34	33	32	31	-3
LA	11	19	19	15	-27
LT	38	29	29	35	17
PL	259	269	267	267	0
SE	45	59	60	47	-28
TOTAL, kt	1102	1229	1251	1013	
TOTAL, %	109	121	123	100	

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