

ATLAS of agro-environmental technologies for sustainable primary food production in the Baltic Sea Region

NEEDS, WISHES AND GUIDING PRINCIPLES FOR THE DEVELOPMENT OF THE ATLAS, AND HOW IT WILL BE TESTED, USED AND MAINTAINED



Proceedings from "ATLAS workshop" in Copenhagen on 16 May 2012

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PREFACE

The aim of this report is to clarify needs and wishes from national authorities for environmental approval of livestock farms to the "ATLAS of agro-environmental technologies for sustainable primary food production in the Baltic Sea Region", which will be developed by Baltic Compass. It is here under a goal to clarify guiding principles for the development of the ATLAS, and how it will be tested, used and maintained.

An ATLAS workshop was held in Copenhagen on 16 May 2012 for two invited persons from each of the 10 Baltic Sea countries, representing authorities with responsibilities in relation to compulsory use of agro-environmental technologies as conditions for environmental permitting of intensive livestock farms.

The workshop served to clarify the needs, wishes and guiding principles, while in the same time promoting the ATLAS towards key stakeholders. The report contains extracts and key issues of PowerPoint presentations and other material from the workshop, and provides some overall conclusions and recommendations, synthesized on basis of participants' presentations and the discussions on the workshop.

For the realisation of this report, I would especially like to thank participants in the workshop for inputs, Institutet för jordbruks- och miljöteknik for guidance and financial management, and Svenska Institutet for kind co-financing.

Tjele, 5 November 2012

Henning Lyngsø Foged Project Manager Agro Business Park

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1: EXECUTIVE SUMMARY

The ATLAS workshop has been of a very high value for the further development of the AgroTechnologyATLAS, and it has also been instrumental in promoting and raising important stakeholders' awareness of the ATLAS and how it can be used.

The largest surprise from the presentations on the ATLAS workshop was actually to find out how accidental the procedures of defining the most suitable agro-environmental technologies that must be used on intensive livestock farms appear to be in most countries.

The workshop really confirmed that there is a need for the AgroTechnologyATLAS; some countries are in need of information about technologies and manure figures, while other countries can benefit from having a benchmarking possibility towards neighbouring countries. All stakeholders benefit from sharing the information and data in the ATLAS, which typically are very expensive to produce.

Additionally, the workshop clarified that the development of the ATLAS has taken a good direction. There is a wish to develop it further and put more efforts into it, so that more technologies and biomass datasets are registered in the ATLAS and that existing information about technologies are completed.

There is a strong wish to continue the cooperation about the ATLAS in an international forum, also after Baltic Compass is finalised.

Almost ½ year has gone between the workshop was held and this report is written. In the meantime an important agreement was made with the VERA secretariat, seeing the ATLAS as a platform for better dissemination of VERA Verification Statements, and as well for promoting increased international cooperation about verification of agro-environmental technologies. The agreement, announced here <u>http://agro-technologyatlas.eu/docs/bc_wp4_technologies_newsletter_8_october_2012.pdf</u> - is a clear result of the ATLAS workshop. Likewise, some countries have send messages about meetings they have had in order to discuss how they can use the AgroTechnologyATLAS.

2: BACKGROUND

The overall objective of Work Package 4 of Baltic COMPASS (<u>http://www.balticcompass.org</u>) is to stimulate an increase use of innovative agro-environmental technologies of relevance for the countries around the Baltic Sea. One of the activities to support this objective is to develop an "ATLAS of Agro-Environmental Technologies for Sustainable Food Production in the Baltic Sea Region" (the ATLAS, or the AgroTechnologyATLAS). The rationale behind this is based on a belief that better access to trustworthy information will reduce the investors (farmers) economic risks, but also that the trustworthy and scientifically based information is costly to produce, and therefore after a cost-efficient viewpoint should and can be shared among authorities and other stakeholders in the Region.

2.1: Initial ideas about function and content of the ATLAS

It is imagined that information to be accessible via the ATLAS will comprise technology descriptions in relation to EU's Industrial Emissions Directive¹ (the IE Directive, 2010/75/EU – follower of the IPPC Directive) – the legal BAT-notes, and as well other technologies, that are identified in relation with the projects "Best Practice Manure Handling²" and "Manure processing Activities in Europe³". The ATLAS should also hold information about SCIEN drainage technologies (<u>s</u>ustainable, <u>c</u>ontrolled, <u>intelligent</u>, <u>environmentally</u> safe and <u>n</u>utrient leaching mitigating), which together with anaerobic digestion, separation of livestock manure and the use of P-indices are selected as prioritised technologies in Baltic Compass⁴.

It is in connection with the above the ambition that the ATLAS shall support the disseminated use of the coming BREF, which will designate BAT's for all EU countries.

The ATLAS is placed at the website – <u>http://agro-technology-atlas.eu</u> – together with other information, articles, tools, newsletters etc. dealing with agro-environmental technologies, produced via Baltic Compass or other projects.

The technology ATLAS is one of the available tools on the website, and its interactivity is related to the envisaged functionality, that it shall be possible to apply a given technology to a given scenario, for instance that it is used on a farm with a certain number of livestock, whereby estimations on the impacts on the given farms' economy, the environmental impacts, the required investment size, etc. can be obtained.

The ATLAS will be programmed so that its tools seamlessly can be integrated in other web pages, while still being developed and hosted within the <u>http://agro-technology-atlas.eu</u>, and the application information shall be accessible in all the regional languages.

It is the intention that the ATLAS shall be a relevant tool for all Baltic COMPASS stakeholder groups, including farmers, companies, farm advisers, authorities, researchers, educational establishments, associations, etc.

The ATLAS shall be self-maintained after inspiration from Wikipedia, so that users contribute to the further information compilation, while being supervised by a committee that can validate the information etc.

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¹ Farms' use of certain agro-environmental technologies might also be demanded according other legislation, for instance legislation concerning nature protection and water quality.

See

http://www.balticsea2020.org/english/images/Bilagor/ippp%2020100201%20best_practice_manure_handling_final.pdf

³ See <u>http://ec.europa.eu/environment/water/water-nitrates/pdf/manure_processing.zip</u>

⁴ See for instance Sector Study - <u>http://agro-technology-atlas.eu/docs/repo20905_Baltic_Compass_Sector_Study.pdf</u>

Finally, the ultimate success criterion is that the ATLAS would be used in practice by at least two countries in the Baltic Sea Region. The driving force for this use would be that the ATLAS is recognised by authorities that are responsible for issuing environmental permits to intensive livestock farms; if this happen, then the other stakeholder groups would logically also use the ATLAS.

2.2: Innovative agro-environmental technologies are especially relevant for intensive livestock farms

By innovative agro-environmental technologies are understood those that have environmental effects, either on air, soil or water, or a combination of that. The costs of these technologies, i.e. the combined costs of investment depreciation and operational costs, are most typically not able to pay for the possible revenues, such as saved nitrogen or phosphorus loss. The use of the technologies to reduce the N and P pollution from the intensive livestock farming would typically have a cost, often called the abatement cost, i.e. the price for reducing the pollution from the farm with 1 kg N or 1 kg P. Therefore, the investors/farms would many times alone invest in the technologies, when they are required to do so as a condition for obtaining of environmental permits according the national legislation to implement the IE Directive. Authorities requirements to farms use of the agro-environmental technologies are stricter the more pollution sensitive the nature around the farm is, and the distance to neighbours is also a factor to take into account.

The following table shows the number of the "IED farms⁵" in the Region.

Table 1: Number of "IED farms" according Monteny et al. (2007). The data is based on livestock statistics, and	d
not on information about the actual number of environmental permits given.	

	Fatten	ing pigs	Sow	S	Laying	hens	Broi	lers
Member State	No. of "IED- farms"	% of fattening pigs	No. of "IED- farms"	% of sows	No. of "IED- farms"	% of laying hens	No. of "IED- farms"	% of broilers
Denmark	760	18	310	25	30	44	120	89
Germany	600	9	220	14	280	67	300	73
Estonia	20	31	0	0	10	70	0	0
Latvia	10	19	10	36	10	66	0	0
Lithuania	30	20	30	50	10	54	10	66
Poland	150	4	50	5	220	41	660	66
Finland	10	2	20	10	10	13	70	66
Sweden	10	13	40	26	30	41	60	93
Total, 8 Baltic Sea Region EU Member States	1,590	-	660	-	600	-	1,230	-
Total, EU25	6,040	-	2,360	-	2,450	-	5,180	-

⁵ IED-farms is defined according Annex I of the IE Directive (2010/75/EU)

3: METHODS

In order to clarify needs, wishes and guiding principles for maintenance of the ATLAS, as well as to promote the ATLAS towards key stakeholders, the idea came up to organise an ATLAS workshop for two representative from each of the countries around the Baltic Sea.

Swedish Institute (Si) has kindly donated funds to Swedish Institute of Agricultural and Environmental Engineering (JTI) to cover direct costs for the event – workshop rooms, accommodation and lunch for invited participants, as well as participants travel costs.

The workshop agenda was structured in a way so that it comprised information and status on international / EU activities (BREF revision process, VERA) as well as national activities (presentation from each country). It also included an example of NGO interest in solid information about agroenvironmental technologies, and a session for discussing wishes to the ATLAS. The workshop programme is seen in Annex A. The workshop started with a presentation of the ATLAS.



PICTURE 1: THE STATUS FOR DEVELOPMENT OF AGROTECHNOLOGYATLAS.EU WAS PRESENTED BY BEGINNING OF THE WORKSHOP.

The presentations on the workshop were in the main having the purpose to present an up-to-date status for use of agro-environmental technologies in the Region. The agenda (see Annex A) also included a point to discuss the envisaged future development: "Discussions about requirements to the further development of the AgroTechnologyATLAS, here under to procedures for updating the information." The issue was, apart from a short discussion on the workshop, handled in the way that 5 workshop participants provided a description of their overall impressions from what was said during the workshop. These descriptions and a compilation of it are shown in section 5.

The participation in the workshop, see Annex B, was an indication of the interest in the ATLAS itself. We succeeded to have participants from each of the 10 countries in the Baltic Sea Region.

It was the intention to follow the workshop up with a concrete survey of the number of IED farms in the different countries, and how the permit procedure as regarding the conditional use of Best Available Techniques are organised. This was given up due to the following:

■ The above table 1, prepared on basis of Monteny (2007) gives a fairly good picture of the number of intensive livestock farms, although 5 years old.

The workshop revealed quite clearly that the general situation in most countries is that the authority handling the environmental permit applications search for whatever available, trustworthy, research-based and validated data and information about the environmental effect of different technologies, including the BAT Reference Document, in order to decide on the conditional use of the Best Available Techniques. Only Denmark has established a system with test and validation of agro-environmental technologies, drawn up on a "Tecnology list".

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4: STATUS IN EU AND BALTIC SEA REGION MEMBER STATES CONCERNING VALIDATION AND USE OF AGRO-ENVIRONEMNTAL TECHNOLOGIES

4.1: Information and status on international / EU activities

4.1.1: Process with revision of the Reference Document on Intensive Rearing of Poultry and Pigs (BREF)

This issue was presented by Kristian Snorre Andersen, Danish Environmental Protection Agency. He explained that the coming BREF, to replace the current one from 2003, will define Best Available Techniques with legal binding effect in the Member States, whereas the current one alone is a guiding document. The BREF applies a systematic approach to technologies, and consider their eco-effectiveness in each part of the nutrient cycle:

- Feed and feeding systems
- Housing and in-house manure management and storage
- Outdoor manure management and storage
- Field application of fertilizer and field processes

The eco-effectiveness is, in contrast to eco-efficiency, highlighting technologies ability to close nutrient cycles and provide the basis for a synergetic relationship between ecology and economy in production systems, and not produce any end-of-pipe products.

FIGURE 1: SLIDE FROM KRISTIAN SNORRE ANDERSENS PRESENTATION, SHOWING AN EXAMPLE OF AN ASSESSMENT MATRIX FOR A TECHNOLOGY.

Figure 6. Assessment matrix for the acidification example (Wesnæs et al. (2009)). The assessment is done against
selected Danish reference scenarios
Selected Danish reference scenarios

Substance	System stage Total system ^[e]						
categories	Feed and	Housing and in-	Outdoor	Field application	Adjoining		
	feeding	house manure	manure	of fertilizers and	systems ^[a]		
	systems	management	management	field processes			
		and storage	and storage				
Odour	No data	No data	No data	No data	No data	No data	
Ammonia ^[d]	No change	-70 %	-50 %	-67 %	-2 %	-69 %	
(1013-10)		[-75 to -55] %	[-90 to -50] %	[-67 to -45] %		[-74 to -51]	
Greenhouse g	as						
CH ₄	No change	-32 %	-60 %	No change	-1 %	-42 %	
		[-49 to +20] %	[-90 to -30] %			[-64 to +2] %	
CO ₂ (all)	No change	+32 %	-60 %	-5 %	+533 %	+2 %	
		[-23 to +95] %	[-90 to -30] %	[-43 to -33] %	[+174 to +533]	[-38 to +43] %	
N ₂ O-N (all)	No change	-75 %	-37 %	+13 %	-1%	-27 %	
		[-97 to -10] %	[-38 to -8] %	[-73 to +255] %		[-68 to +138] %	
Total (in	No change	-33 %	-56 %	-1 %	+105 %	-27 %	
CO ₂ eq) ^[6]		[-52 to +21] %	[-80 to -26] %	[-49 to +77] %	[-254 to +105] %	[-68 to +138] %	
Nutrients (aqu	uatic eutrophica	ation)					
N leaching	No change	n.a ^[b]	n.a	+26 %	-15 %	+19 %	
				[-16 to +89] %		[-16 to +89] %	
P leaching	No change	n.a	n.a	No change	Insignificant	Insignificant	
Toxic	No change	n.a	n.a	n.a	n.a	n.a	
substances							
Others							
NO _X -N	No change	-83 %	-36 %	+19 %	Insignificant	-51 %	
		[-92 to -67] %	[-67 to -30] %	[-40 to +138] %		[-70 to +16] %	

The new BREF was planned to be issued in spring 2012, but probably due to its legal binding effect, the European IPPC Bureau has received around 2,000 comments to the draft document, and it will take some time to process all comments.



PICTURE 2: KRISTIAN SNORRE ANDERSEN FROM DANISH ENVIRONMENTAL PROTECTION AGENCY EXPLAINED ABOUT THE BREF REVISION.

Kristian Snorre Andersen said that the ATLAS can facilitate the data collection process by providing reliable and uniform data, which includes measures on all relevant parameters, such as economy and other relevant pollutants. Data of a high level of quality is essential for the assessment of techniques' environmental and economic performances and in defining new BAT requirements.

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4.1.2: The Dutch/German/Danish VERA cooperation project and the connection to the Technology list of the Danish environmental regulation of the livestock sector

Karin Peters from the VERA secretariat said that the purpose of VERA is to enhance a well-functioning international market for environmental technologies to help solve the environmental challenges of agricultural production.

VERA is an international organisation for testing and verifying environmental technologies within the agricultural sector. VERA is an abbreviation for verification of environmental technologies for agricultural production and was initiated by the national Danish, German and Dutch environmental and agricultural authorities in 2008.

The framework for test and verification is based on the internationally accepted VERA test protocols. A technology that has been tested according to one of these VERA test protocols can then obtain a VERA Verification Statement. A VERA Verification Statement secures documentation for the environmental efficiency and operational stability of a technology and is an important step when introducing a technology to the market. Activities are currently on-going to develop new test protocols and involve additional countries in the VERA framework.

VERA consists of a number of collaborating parties, technical experts and independent institutions.

The International VERA Board – IVB consists of representatives from the national agricultural and environmental authorities from the three participating countries. The IVB is the decision making authority that establishes the rules, criteria, and scope of the VERA activities.

The technical strength of VERA is essential, and is maintained by a number of technical experts from each of the three participating countries. The technical experts are appointed to each of the technology subject areas within VERA and they are organized in the International Verification Committee – IVC. The IVC is in charge of revising existing protocols and developing entirely new ones. Furthermore they play a central role in ensuring the uniformity and reliability of the test and verification activities that are carried out within the VERA framework.



PICTURE 3: KARIN PETERS TOLD ABOUT VERIFICATION OF ENVIRONMENTAL TECHNOLOGIES FOR AGRICULTURAL PRODUCTION.



FIGURE 2: VERA ORGANISATIONAL SETUP.

The VERA test is carried out by independent test institutes. They have the main responsibility for planning, conducting and reporting test activities according to the VERA test protocols. The test institutes are independent organisations and therefore not directly a part of the VERA organisation. However, they need to demonstrate the necessary experience and knowledge regarding the areas in which they conduct tests.

The international VERA Secretariat is managed by Danish Standards Foundation on behalf of the Danish Environmental Protection Agency. The VERA Secretariat functions both as an international secretariat that facilitates the international activities in VERA and as a national secretariat that facilitates the VERA activities in Denmark. Internationally, the VERA Secretariat organizes, coordinates and implements the activities that IVB chooses to launch. The secretariat is also responsible for launching, facilitating and monitoring the activities of the IVC. In addition, the VERA Secretariat handles, among other things the international communication, dissemination and marketing of VERA and running the VERA website.

In Denmark the VERA Secretariat advices the environmental technology manufacturers, test institutes and local authorities. Furthermore the secretariat coordinates the work with the technical experts, including the assessment of applications for a VERA Verification Statement. Last, but not least the VERA Secretariat issues the VERA Verification Statements and ensures that they are used as intended.

4.1.3: The importance of validated information about agro-environmental technologies

In her presentation, Lotta Samuelson said that BalticSea2020 has main goal to contribute to turning the negative environmental trend of the Baltic Sea in a positive direction by year 2020. One of the focus areas for BalticSea2020 is comprised within the Intensive Pig Production Programme (IPPP),

which initiate projects and activities with the objective to reduce nutrients leaching from the intensive pig production industry.



PICTURE 4: LOTTA SAMUELSON EXPLAIED WHY BALTICSEA2020 IS INTERESTED IN ACCESSIBLE AND TRUSTWORTHY INFORMATION ABOUT AGRO-ENVIRONMENTAL TECHNOLOGIES.

BalticSea2020 recognised that information about innovative technologies to reduce the impacts on intensive pig production is scarce and fragmented. They therefore themselves initiated studies to increase accessibility to research-based documentation about innovative technologies that would reduce the loss of nutrients from the pig production to the aquatic environment. An important aspect is the cost efficiency of the technologies, which should give advantage to both the farming economy and the environment in order to secure their dissemination.

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BalticSea2020

WHY IS VALIDATED INFORMATION ABOUT AGRO-ENVIRONMENTAL TECHNOLOGIES IMPORTANT?

Thomas Antas, Farmer in Lappträsk, Finland:

"- It is frustrating to discuss causes for the state of the Baltic Sea and possibilities to reduce negative effects.

Nobody seem to have robust facts and much of what is said is based on opinions.

Most farmers care about the environment and the Baltic Sea.

We would in our work benefit of more facts regarding what mechanisms decide our impact and what measures have a real benefit for the environment."

Huvudstadsbladet 2012-05-10



FIGURE 3: SLIDE FROM LOTTA SAMUELSONS PRESENTATION, REFERRING TO A FARMERS FRUSTATION OVER ROBUST FACTS ABOUT POSSIBILITIES TO REDUCE THE NEGATIVE IMPACT ON THE BALTIC SEA OF FARMING.

Based on those research studies, BalticSea2020 next step is to support the establishment of a manure based biogas demonstration plan, where efficient recirculation of nutrients to plant production will be achieved by the technology combination; anaerobic digestion and post separation of manure, together with improved manure management such as safe storage, timely spreading and robust fertilizer plans. As a bonus, renewable energy and an improved fertilizer will be produced.

4.2: Information and status on national activities

4.2.1: Belarus

Nikolay Vakhonin, on behalf of himself and Vladimir Samosyuk, explained that:

- Belarus has more than 200 intensive livestock farms, including 107 farms with 12 108,000 pigs. There are plans to establish 72 more intensive livestock farms, and the existing farms are gradually renovated and equipped with more modern systems for manure handling.
- 54 farms with more than 2,000 hectares irrigated land are required not to use more than 200 kg/ha of nitrogen.
- 108 farms has a daily output of about 3,000 m3 livestock manure, and the impact on the environment is equivalent to a city with a population of 300,000 people. Manure is a potential source of more than 100 diseases of animals and humans.
- It is particularly important to use BAT technologies on meliorated land, which constitute one third of the 9 million hectares of farmland in Belarus, especially for ameliorated peaty soils (0.9 million hectares). After the reclamation the degree of drainage catchment area increased ten times, and the drain enable a rapid outflow of nutrient pollutants from

agricultural fields to the hydrographic network in the Baltic Sea catchment area. Therefore ameliorated land must have stronger limitations for use of mineral and organic fertilizers, or a water circulation system should be implemented to recycle dissolved nutrients.

On this basis, there is a need for the ATLAS as a source of information about agro-environmental technologies, and the ATLAS can provide a background for future regulations and standards in Belarus, and relevant parts of it be placed at official homepages in Russian language.

It is important to build up a GIS based information system for planning and registration of farms crop production, in order to fully enable the exploitation of the benefits of innovative and best agroenvironmental technologies.



FIGUR 4: DISTRIBUTION OF NPK AT THE 8,000 HA FARM "JURAVLINOE", WHICH IS LOCATED ON RECLAIMED LAND IN THE BREST REGION.

The AgroTechnologyATLAS will be used in educational and training processes of the Academy of Agriculture of Belarus and State Agro-Technical University of Belarus, and also be presented in six Administration boards of agriculture and food of the Republic of Belarus.

4.2.2: Estonia

In Estonia, Allan Kaasik explained, the livestock density is low, compared to other parts of the European Union. However, in the same time the livestock farms are averagely large. Farm's uses of innovative technologies are low, and only one agricultural biogas plant has so far been built.

Type of animals	Number of animals *	Number of animals in big farms, tk **	Share of animals in large farms, %
Dairy Cows	96 263	50 551	53%
Other cattle	144 762	97 168	67%
Pigs	388 502	354 551	91%
Broilers	1 042 220	1 040 593	99%
Laying Hens	856 415	760 649	89%
Horses	6 737	-	-
Sheep	87 140	-	-
* Statistics of Estonia 2010, http://w ** Estimated by size of holdings, tak (Estonian own regulation), 2000 slau large scale farms: Dairy cows 117, p	ww.stat.ee/pollumaja en into account if nu ighter pigs/ 750 sow igs 47, poultry 7. Mo	ndus mber of animals is equa s or 40 000 animal plac st of them are new or re	al or bigger of 300 dairy es for poultry farms. Ne enovated

FIGURE 5: NUMBER OF LIVESTOCK FARMS AND LARGE LIVESTOCK FARMS IN ESTONIA.

4.2.4: Denmark

The situation in Denmark is that Danish Environmental Agency keeps a list, the so-called "Technology list", which summarizes suppliers' agro-environmental technologies, that has undergone an impartial test performed by a research institute. The technologies on the list are most often those that the municipals choose among, when it in connection to an environmental approval is necessary to reduce the nutrient load from a farm. However, the list is not exclusive and municipal authorities may give environmental permits on condition of the use of other agro-environmental technologies, but the Technology list is a very useful instrument for their work.

The environmental permit system is in Denmark principally comprising all types of farms with more than 15 Animal Units (AU).

While the test and validation of agro-environmental technologies so far has been a purely Danish matter, it will from 2013 alone be done in the frames of the German/Dutch/Danish VERA cooperation, as presented above. This is a guarantee for the suppliers, who pay for the test and verification that their technologies are recognised in all three countries.

Kristian Snorre Andersen said that the AgroTechnologyATLAS can facilitate the data collection process (for BAT notes and the BREF) by:

- Providing reliable data.
- Uniform data, which includes measures on all relevant parameters: Economic data and environmental data on all relevant pollutants.

Data of a high level of quality is essential for the assessment of techniques' environmental and economic performances, and in defining new BAT requirements.

4.2.5: Finland

Environmental permitting is in Finland regulated by Environmental Protection Decree 169/2000. Permits are given on basis of case-by-case evaluation of the relevant and necessary techniques to use on the farms.

Antti Unnaslahti said, that "Guidelines for Environmental protection in animal husbandary" supports the environmental permitting process, and express the official view on BAT's and best practices.



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FIGURE 6: GUIDELINE USED FOR ENVIRONMENTAL PERMITTING IN FINLAND.

Controlled drainage is in Finland a voluntary environmental measure, which already covers 24,000 ha.

The AgroTechnologyATLAS could in Finland especially be useful in connection to:

- Rural development program planning (2014-) (AEM);
- When considering new agro-environmental measures and updating of existing technological descriptions and requirements;
- Environmental permitting as supporting material for regulators and when updating "Guidelines for environmental protection in animal husbandry";
- When regulating agro-building permits;
- As background information and updating the Reference Document on Best Available Techniques for Rearing of Poultry and Pigs (BREF)

4.2.6: Latvia

For Latvia, Judite Dipane said, there are a relatively small number of farms with environmental approvals, but especially the pig farms continue to cause some rather sensitive debates about nuisances from the production, and it would be useful with a common reference for the effects of BAT's.

4.2.7: Lithuania

Vaclovas Berzinskas said that there currently are 39 IED pig-farms in Lithuania. Totally 1.9 million of fattening pigs are produced in the country every year, however a number that is gradually decreasing. The biggest farms have 25,000 and 43,000 places for pigs, with an average for all farms of about 10,000 pigs. Also 34 IED poultry farms do exist, and the chicken production is increasing.

Between many other provisions during permitting Lithuanian Environmental Protection Agency takes into account important IED provision: after granting an IED permit, the environmental standards and norms (including smells) cannot be breached. In this context impact assessment of pig houses to ambient air is complicated. There are a lot of complaints from citizens, and IED permit have to prove, that calculations on impact are right.

Farms started to apply BAT's, also microbiological treatment of houses against ammonia and odor emissions.

The AgroTechnologyATLAS both have the potential to support the dissemination and use of the updated BREF for pig and poultry farming, and for Lithuania it could

- become an encyclopedia for pig and poultry farming and manure treatment;
- **be** a source of knowledge for progressive farmers if available in Lithuanian language; and
- be a concrete reference in discussions, considerations and decisions about environmental permitting.

4.2.8: Poland

Ksawery Kuligowski pointed out that farms generally are small in Poland. The largest farms are in the northern part of the country.

Poland is in a situation, where the implementation of basic agro-environmental regulations from EU is still progressing. It is for instance currently considered to simplify the Polish Fertilizer and Fertilization Act by considering the digestate as natural fertilizer, thus reducing the administrative/ permission burden. From research side the following is recommended:

- Secure a full implementation of the Helsinki Convention requirements for industrial animal farms;
- Monitor and control the implementation of the IE Directive (former IPPC Directive) on industrial farms;
- Execution of regular, independent soil monitoring in terms of P contamination for farmland with high load of manure;
- Improvement of manure mng in small scale agriculture;
- Establishment of P-index (together with other BSR countries);
- Popularization of Ref. Doc. on BAT for Intensive Rearing of Poultry and Pigs (BREF) from 07.2003, Good Agricultural Practice Code.



FIGURE 7: LOCALISATION OF IED FARMS IN POLAND.

So far environmental permits are issued without requirements to use specific BAT's, but some descriptions of BAT's is found at the homepage of Ministry of the Environment at <u>http://ippc.mos.gov.pl/ippc/</u>, which informs that there in March 2012 are given environmental permits to the following number of intensive livestock farms:

- fattening pig farms > 30 kg: 82
- sow farms: 48
- mixed profile farms: 16
- poultry farms: broilers 660, in total 752.

4.2.9: Russia

Igor Subottin, who had prepared a presentation together with Mikhail Ponomarev, explained that North-West Research Institute of Agricultural Engineering and Electrification (SZNIIMESH) in Saint Petersburg covers 9 regions, and that there are many intensive livestock farms in that region, with the highest concentration in Leningrad Oblast. Around half of the livestock manure is produced in the form of slurry. It had been estimated, that more than 85% of environmental impacts of farming is

due to livestock production in the regions, and the manure is not used efficiently as fertilizer but just deposited /dumped on the fields.

The situation is not satisfactory and some major barriers that must be removed in order to improve the situation are lack of knowledge/information about environmental safety as well as lack of awareness. A part of the difficulty is the climatic, wherefore the performance of agro-environmental technologies in the North-Western regions of Russia in some case would differ from their performances in for instance Denmark.

HELCOM and other have financed projects to find the best technological solutions and way to reduce the pollution from intensive livestock farms. The absence of a functioning market for end and byproducts from the promising technologies is a bottleneck for the disseminated use of them.



FIGURE 8: AGRO-ENVIRONMENTAL TECHNOLOGIES THAT ARE CONSIDERED AS PROMISING IN THE RUSSIAN CONTEXT.

SZNIIMESH also works on the development of a technology information system to find the optimal technology for a given farm - see figure 9.



FIGURE 9: TECHNOLOGY INFORMATON SYSTEM UNDER DEVELOPMENT OF SZNIIMESH.

It would be ideal, if the future development of SZNIIMESH's technology information system could be coordinated with the AgroTechnologyATLAS.

22 4.2.10: Sweden

In Sweden, Arne Joelson explained, there is about 200 IED-farms and a similar licensing process for about 80 dairy farms (>400 LU, 1 LU = 1 milk cow or 3 recruitment cattle).

Farms with > 100 LU shall make a notification to the supervisory authority when increasing or changing their production. More than 50 % of the cows and > 80 % of the pigs and poultry production comes from farms with individual permit or notification.

In Sweden we had only 14 biogas plants on farm level in 2010, but the number is increasing. The Swedish government gives 30 % subsidy to investments in biogas plants.

The consideration of approval has focus on acceptable localization and the effects on water and air, both from stable and from storage and spreading of manure. If it is possible the permit with conditions shall be functional, and not demand specific techniques, but in practice it is often a question of best available measures as choice of acceptable arable land for manure application, spreading time, buffer strips etc. The agri-technology atlas will hopefully give better bases for the licensing considerations. It is important to clear out the influence of different techniques on the environment.



PICTURE 5: PARTICIPANTS IN THE WORKSHOP.

4.2.11: Conclusions from participants' presentations

The presentation on the workshop clarified the following:

- Authorities' demands to intensive livestock farms use of agro-environmental technologies as conditions for environmental permits are in general based on a non-structured procedure and therefore relatively accidental information. For instance in Germany, the current Best Available Technique Reference Document (BREF) is used as one of the information sources, although this document is from 2003 and alone a guiding and general document that is not suited to base legal enforcement on, and despite Germany is part of the VERA cooperation, which however, has first in September 2012 produced its first VERA Verification Statement⁶. However, the authorities in Finland have produced a handbook to guide the selection of Best Available Technique's. The highest degree of systemization of the agro-environmental technologies with proven environmental effects, and furthermore together with German and Dutch authorities has initiated the VERA cooperation to verify agro-environmental technologies.
- The impression is that especially the new EU member states sets low or even no demand to farms' use of agro-environmental technologies, and that it has not been defined what the specific Best Available Techniques are in the given country, neither organised any procedure to verify the environmental effects of commercially offered technologies on the market.

⁶ <u>http://www.veracert.eu/da/nyheder/miljoeminister-overraekker-den-foerste-</u>

vera_erklaering/~/media/DS/Files/Downloads/Artikler/VERA/VERA_erklaering_2012_okt_enkeltside.ashx

- The coming BAT reference document (BREF) will with legal effect in all EU's Member States determine which agro-environmental technologies that shall be considered as Best Available Techniques.
- The need in the Baltic Sea Region for trustworthy and science-based information about agroenvironmental technologies, and especially their abatement costs, is enormous. There is a need for both generic descriptions of the technologies, and for the science based verification of commercially offered technologies on the market. The costs for producing such information are high, and there are all reasons for authorities' cooperation in the Region about sharing of such information.
- The AgroTechnologyATLAS can be a useful media for sharing of information about agroenvironmental technologies in the Baltic Sea Region.

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5: NEEDS AND WISHES

5.1: Inputs from selected participants

Four participants with widely different background, institutionally and geographically, provided a written input that expresses their perceptions of opinions expressed during the workshop concerning future needs, wishes, possibilities and guiding principles for further development of the AgroTechnologyATLAS:

Antti Unnaslahti, Agency for Rural Affairs, Finland	Provide reliable data (how to check and confirm reliability when filling ATLAS?)
	Economical data and information from the technologies is especially needed
	Use in education and training, for students, farmers etc.
	Manure coefficients can be updated and compared between countries
	 Development of regulations and technological standards by ATLAS information
	 Atlas will promote development of BREF for pig and poultry farms
	Decision making processes are better documented and have sounder background
Marie Poulsen, Agro Business Park, Denmark	In general, the opinion among the country representatives was that there is a great need for the information in the ATLAS and that it gives access to:
	 Flexible and trustworthy information (one click and you can compare data)
	Uniform data, which include data on all relevant parameters
	Good tool for renewing manure standards in some countries
	The ATLAS can be used for educational purposes, for updating reference documents on BATS, as supportive material for regulators, etc.
	The ATLAS will promote faster and more comprehensive development of updated BREF for pig and poultry farming/ATLAS can substantiate the BREF system

	 Will become an encyclopaedia
	A concrete basis for discussions, considerations and decisions
	Will facilitate/and speed up decision-making processes
	Both authorities and farmers can make use of the ATLAS
	Disseminating info across countries
	At the meeting it was noted, that it is important that the ATLAS is kept flexible and that it is updated on an on-going basis. Suggestions for improvements concerned that the ATLAS:
	Needs to be more structured/ There should be clear requirements as to how data should be presented/Needs analytical framework in accessing the techniques
	Must present economic and environmental performance
Mikhail Ponomarev, North- West Research Institute of Agricultural Economics, St Petersburg-Pushkin, Russia	Information about traditional and modern agro-environmental technologies is limited, not structured and not easy to find in Russia. Usually there is no a unified reliable source of information where a potential customer could get required technology description with technical specification, environmental effects and economic indicators. At the same time there is a demand in Russia for such information source of modern environmentally friendly technologies for agricultural production, because these technologies only 1-2 years ago started to be used in some agricultural companies within the process of modernization and reconstruction and will be used more and more.
	The ATLAS of Agro-Environmental Technologies is very useful service and tool to find necessary information and parameters of BAT and promising technologies. It is easy accessible in the Internet with a possibility of translation to Russian language. It contains description of various technologies with reference links, but sometimes description is not full and some parameters are missing, so it will be necessary to update information and fill gaps. At the same time several improvements could be proposed to provide greater support for farmers, companies, farm advisers, authorities, researchers, educational establishments, associations, etc.:
	Make it more interactive. Add comparative function to be able to see parameters of several technologies at one screen (table). Add possibility to select necessary parameters and see only them when compare technologies.
	Include more economic data for possibility to make economic assessment (calculations). Perfect if there is a <u>method</u> of economic efficiency assessment developed for the ATLAS and placed on the web-site as an additional section*.

- The Russian North-West Research Institute of Agricultural Economics is ready for common work on this issue together with Agro Business Part, JTI and other interested partners around the Baltic Sea (for example MTT, Finland). It has experience in evaluation of economic efficiency of agroenvironmental technologies and is looking forward to develop cooperation on this topic by support of on-going EU project "Baltic COMPASS" and by other opportunities.
- Make possible to publish opinions of registered users about technologies, express advantages and disadvantages of technologies or its parts, share experience and exchange opinions.
- Add links to implemented examples existing in different countries, indicating contact information of farm manager/owner.
- Let registered producers leave links to their companies, catalogues of equipments, etc.

The Russian partners are developing similar Database/Information System of Russian technologies together with a computer program which is able to help a user to select required agro-environmental technology, machines and equipment by input farm characteristics (several parameters). Description of this work was presented during the workshop 16 May 2012 in Copenhagen.

We propose to establish cooperation between the developers of the ATLAS and the Russian Database in order to exchange existing information on technologies and specification of parameters (technical and economical) for mutual enrichment of both web-based instruments/tools.

This work could be implemented by 2 partner organization from the Russian side:

- North-West Research Institute of Agricultural Mechanization and Electrification;
- North-West Research Institute of Agricultural Economics.

Both partners belong to the Russian Academy of Agricultural Sciences (North-West Science and Research Center) and responsible for giving recommendations for regional authorities and large agricultural companies/farms in the region and have great experience in agricultural research work.

The cooperation will help to complete this work and make a very useful product for agricultural producers, authorities and potential investors in all countries around the Baltic Sea. Finally it will lead to preparation of investment projects, implementation and use environmentally friendly BAT in agriculture, optimally selected from a range of technologies based on most recent and relevant information

	on technical, economical and environmental parameters and recommendations.
	As a first step a workshop on BAT and evaluation methods of BAT at the same time together with a working meeting of ATLAS's and Database's developers could be organized in Russia. During the workshop and meeting it will be possible to discuss further activities, plans and financing.
Ksawery Kuligowsky, Pomeranian Centre for Environmental Research and Technology at	Inserting new data on biomass characteristics from new editors,
University of Gdańsk, Poland	Developing economic assessment tool for farmers willing to compare the manure processing technologies,
	Simplifying the output data (visualization) for different stakeholder groups,
	Creating a big market for solutions/ techniques from broader areas (maybe better technologies may be found elsewhere than Baltic Sea Region),
	Promote, promote, promote! after the lesson learned from promotion of <u>www.biobrokers.eu</u> , we advise you to attend seminars and conferences and spread the information in an interactive way like you showed during the meeting on Wed in Copenhagen,
	Equalizing differences between East and West >> especially technology transfer to Belarus.

5.2: Compilation and interpretation of needs, wishes and guiding principles for further development

In the following is an attempt to compile needs, wishes and guiding principles for the future development of the ATLAS.

5.2.1: Needs

It is very important that the information and data in the ATLAS to the utmost extent is reliable, trustworthy, scientifically based and validated, especially when it comes to the most important figures about their environmental performance and costs.

The ATLAS shall be a tool for all stakeholders, and therefore be easy accessible (via the Internet) and with possibility to access the information in own language.

The possibility to compare data from different countries is an important feature to develop further on. Currently there is no feature for comparison of data in 2 columns, and this could be part of further development.

The AgroTechnologyATLAS should be more promoted, and after Baltic Compass ends, the ATLAS could be further developed and promoted via the Baltic Compass extension project, BalticCOMPACT,

or by BalticMANURE. Furthermore, it is already now expected that the VERA secretariat will refer to the ATLAS.

5.2.2: Wishes

It is envisaged the ATLAS can be used for the following:

- Training and education about agro-environmental technologies.
- Comparison of manure figures between countries.
- Providing benchmarking and inspiration when preparing new national legislation and standards.
- Providing background material for the environmental permitting process.
- Comparison of technologies with respect to for instance their environmental and economic performance.

It is, however, important that the ATLAS is further developed so that the current technology descriptions are completed (some technologies miss part of the descriptions and data), and that more technologies are added.

It is especially important that data and information about investment and operational costs are further developed for some of the technologies, as well as data and information about the environmental performance, and further that the provided data are calculated on basis of a uniform method.

It would be good to have more datasets on livestock manure registered in the ATLAS.

International cooperation is imperative for the future development of the ATLAS.

5.2.3: Guiding principles

The ATLAS shall be frequently updated in order to maintain its relevance. It is in order to fulfil that goal important to promote the use of the ATLAS more and get more users.

There should be established a procedure for approving new data/information that is registered in the ATLAS.

6: USED ACRONYMS

- ATLAS or AgroTecnologyATLAS ATLAS of Agro-Environmental Technologies for Sustainable Food Production in the Baltic Sea Region
- AU Animal Unit, a Danish coefficient for the environmental load of livestock. 1 Animal Unit = 100 kg nitrogen ex storage.
- BAT Best Available Technique, as defined in article 3 of the Industrial Emissions Directive
- BREF BAT reference document, Reference Document on Intensive Rearing of Poultry and Pigs – see <u>http://eippcb.jrc.ec.europa.eu/reference/</u>
- IEDIndustrialEmissionsDirective(2010/75/EU)-http://eur-lex.europa.eu/Lex.UriServ.do?uri=0J:L:2010:334:0017:0119:EN:PDF

7: LITTERATURE, REFERENCES AND FURTHER READING

- Danish Environmental Protection Agency. Teknologilisten (In English: The list of approved Best Available Techniques for intensive livestock farming in Denmark) - <u>Teknologiliste</u> -<u>Miljøstyrelsen</u>
- BREF Best Available Techniques reference document -<u>http://eippcb.jrc.ec.europa.eu/reference/BREF/irpp_bref_0703.pdf</u>
- IED Industrial Emissions Directive <u>http://eur-</u> lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:334:0017:0119:EN:PDF
- Miljøministeriet. 2010. Fosforindhold i slagtesvinefoder. Teknologiblad. http://www.mst.dk/NR/rdonlyres/811E9192-2EEF-4E62-BF1D-B7C56FD89A5A/0/Udkast Svin fodring fosforredigeretaflonkh.pdf
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- Jakub Skorupski, Kowalewska-Łuczak, Inga, Kulig, Hanna & Roggenbuck, Anna. 2012.
 Wielkotowarowa produkcja zwierzęca w Polsce a ochrona środowiska przyrodniczego Morza Bałtyckiego.

http://balticgreenbelt.org.pl/uploads/WIELKOPRZEMYSLOWA%20PRODUKCJA%20wersja%20 skompresowana.pdf

ANNEX A: AGENDA FOR THE ATLAS WORKSHOP

- 10:00: Introduction, status and purpose etc. of the ATLAS. Presentation of showcases of technologies in the ATLAS – a BAT (manure separation) and a non-BAT technology (controlled drainage). Henning Lyngsø Foged, Agro Business Park.
- 10:30: Status, overview and progress with development of the new BREF, and in which ways the ATLAS possibly could assist the implementation of the use of the coming BREF. Kristian Snorre Andersen, Danish Environmental Protection Agency.
- 11:00: The Dutch/German/Danish VERA cooperation project and the connection to the Technology list of the Danish environmental regulation of the livestock sector. Karin Peters, VERA Secretariat.
- 11:30: The importance of validated information about agro-environmental technologies. Lotta Samuelson, BalticSea2020.
- 12:00: Lunch.
- 13:00: Participating country representatives' presentation of their situation about verification of agro-environmental technologies, access to trustworthy information about agro-environmental technologies, and use of the verified technologies for environmental permitting of farms.
- 15:00: Coffee.
- 15:15: Discussions about requirements to the further development of the AgroTechnologyATLAS, here under to procedures for updating the information.
- 15:45: Conclusions and next steps.

ANNEX B: PARTICIPANTS IN ATLAS WORKSHOP

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Meaning of 'ATLAS'

'ATLAS' according The Free Dictionary: "A volume of tables, charts, or plates that systematically illustrates a particular subject".

This Technology ATLAS is interactive: You can find data, information, illustrations, graphics and tables about the individual technologies, you can join them in combined technologies and see their combined costs and effects, and you can even send predefined amounts and types of livestock manure mixtures through the technology processes, and see qualities and amounts of end and by-products, as well as emissions and environmental impacts.

