

Baltic Forum for Inventive and Sustainable Manure Processing

BAltic forum for inventive Techniques for MANure processing -BATMAN-

EU strategy for BSR - Flagship Project

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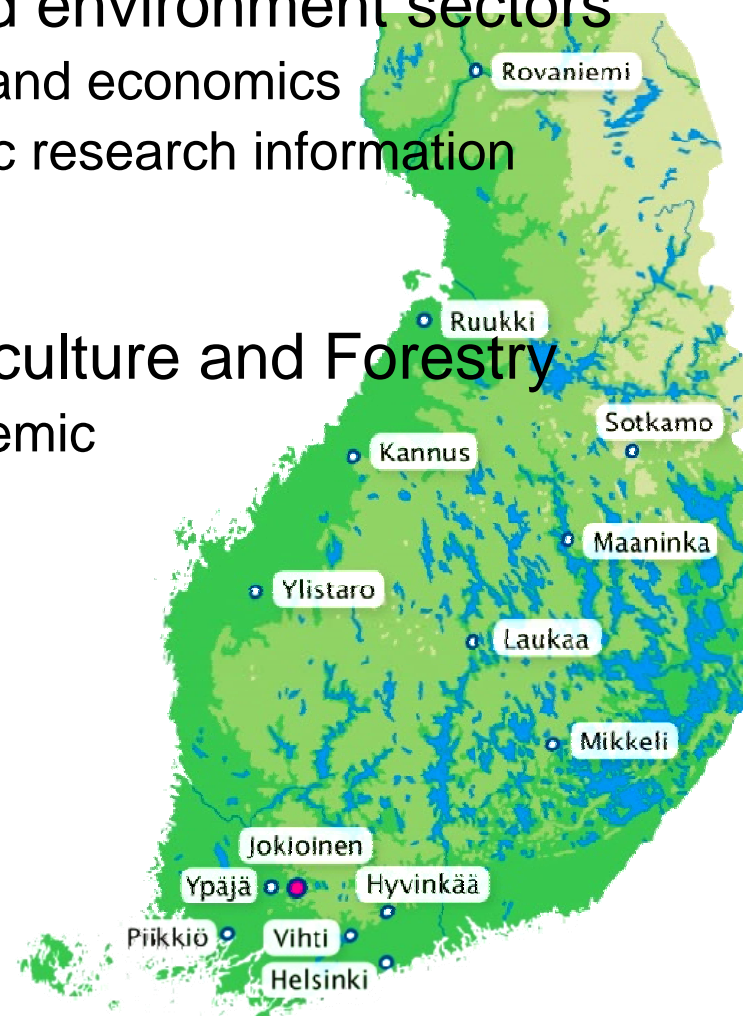
Helsinki

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MTT in brief

- MTT AgriFood Research is Finland's leading research institute in the agriculture, food and environment sectors
 - Research areas: biology, technology and economics
 - We produce and disseminate scientific research information
 - We transfer technology to the sector

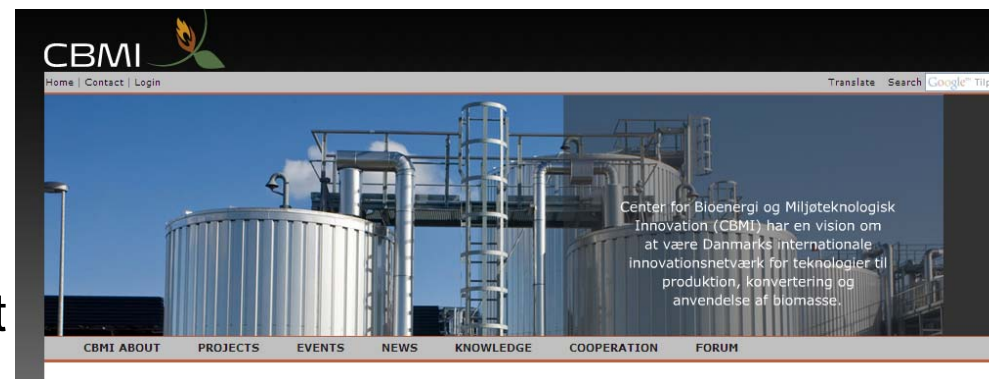
- MTT reports to the Ministry of Agriculture and Forestry
 - 750 professionals, of which 320 academic
 - 14 locations around Finland
 - Turnover in 2009 app. 50 M€
 - 30% competitive project funding



Innovation Centre for Bioenergy and Environmental Technology (CBMI)

www.cbmi.dk

- Part of AgroBusiness Park
 - A science park next door to Aarhus University
 - Faculty of Agricultural Sciences
- CBMI is the link between research and business development
 - on manure and bioenergy
- CBMI is a consortium of
 - Commercial companies
 - Danish bio-energy
 - Technological development institutions
 - Knowledge Institutions
- Internationalisation of activities



EU strategy for the Baltic Sea Region - Action Plan

- **To make the Baltic Sea Region**
 - **AN ENVIRONMENTALLY SUSTAINABLE PLACE**
 - **A PROSPEROUS PLACE**
 - **Forum for Inventive and sustainable Manure processing**
 - **ACCESSIBLE AND ATTRACTIVE**
 - **SAFE AND SECURE**

Manure challenges

- Large animal units and regionally intensive animal production
 - 1320 IPPC regulated farms in Baltic region (EU MS)
 - High amount of nutrients to be distributed
 - Disposal may create environmental loading
 - Logistic challenges
 - Transportation of liquid manure ineffective
- Economy of scale
 - large animal units may make processing of manure economically attractive
 - Concentration of nutrients (water removal)
 - Transportation over longer distances feasible
 - Separation of nutrient fractions (N, P)
 - Recirculation of P
 - Production of renewable energy



Present EU regulation

- Integrated Pollution Prevention and Control: IPPC Directive
 - Emission control for large production units (> 250 LU)
- Environmental Impact Assessment Directive
- Single Farm Payment Scheme –
 - Good Agricultural Practice
 - Cross Compliance
- Water Frame Directive & Nitrate Directive
 - reduce pollution in water catchments

Nutrient losses differ

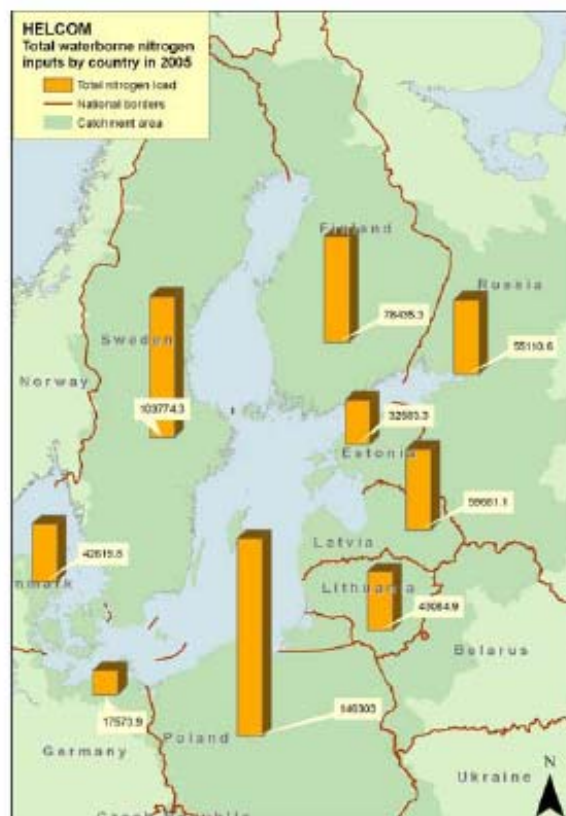


Figure 5. Waterborne load of nitrogen (in tonnes) to the Baltic Sea by HELCOM Country in year 2005. (HELCOM PLC-Group 2007). (Russian data partly missing).

Nitrogen

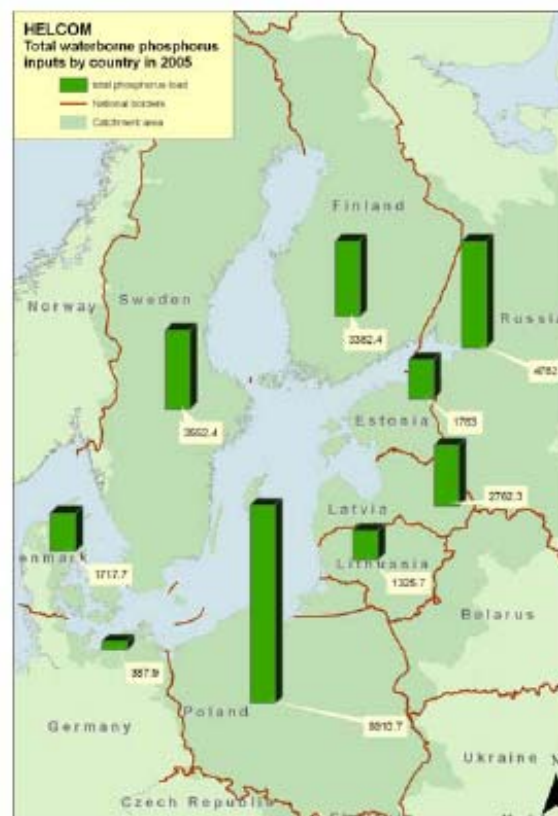


Figure 6. Waterborne load of phosphorus (in tonnes) to the Baltic Sea by HELCOM Country in year 2005. The reported total waterborne phosphorus input was 28 600 tonnes in 2005. (HELCOM PLC-Group 2007). (Russian data partly missing).

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Phosphorous

Diffuse sources

- Nitrate Directive
- Water Frame Directive

Point sources

- IPPC Integrated Pollution & Prevention Control Directive
- EIA directive
- Waste Water Directive

Manure opportunities

- We need a new approach to manure – Business Opportunities
- BAT for Manure brings immediate results
- Processing leads to more effective use of manure
 - Develop fertiliser products
 - Solid pills / pellets
 - Liquid 'designer' fertilisers
- Many partial solutions are under way
 - Separation, Aerobic treatments, Anaerobic digestion (biogas)
 - Drying, incineration, Acidification, ozonization, Biological treatments, Others
- Emergent technologies in the lab
- Business opportunities to be developed



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Photos: Sari Luostarinen ja Perttu Virkajärvi, MTT

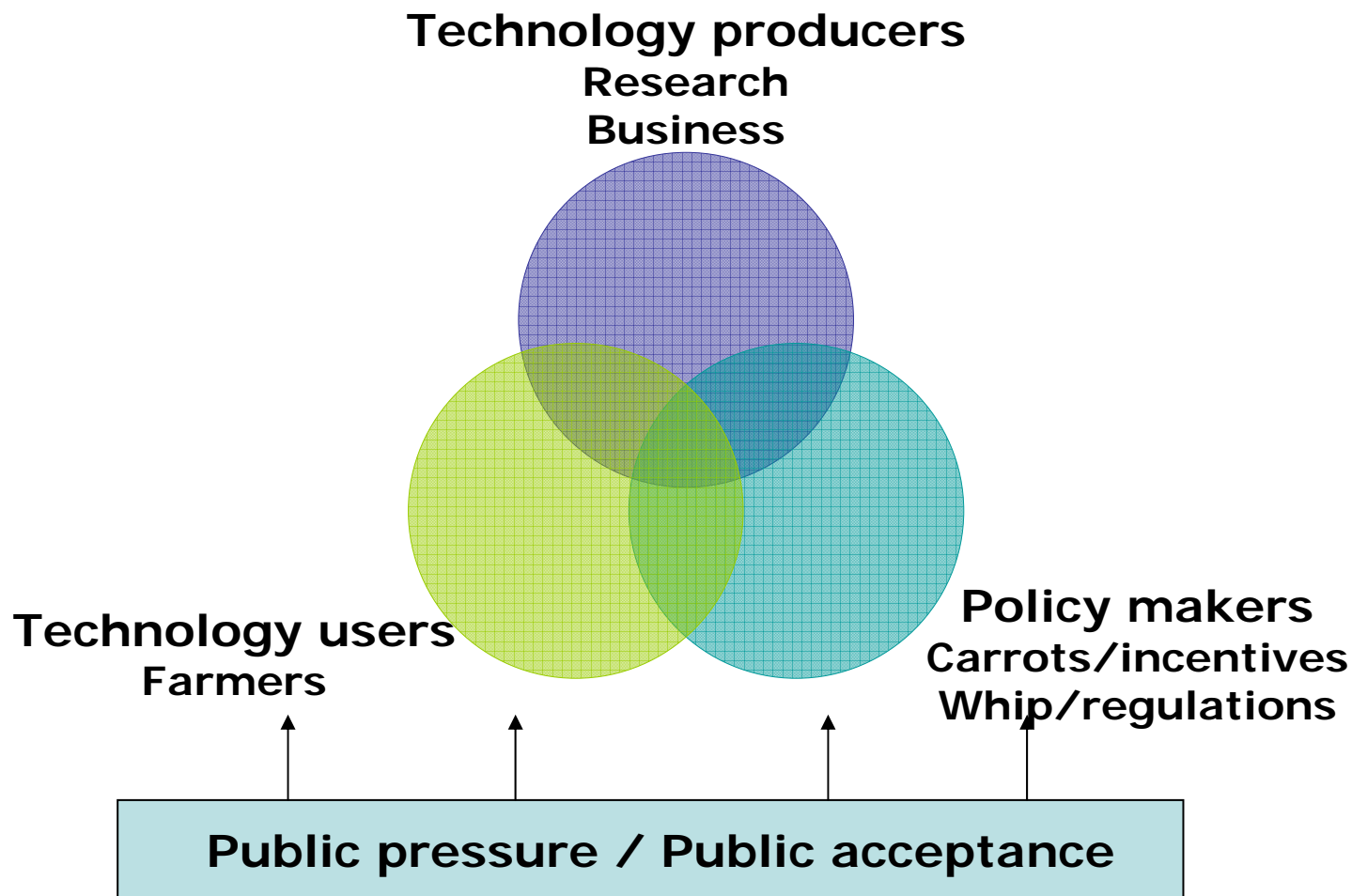
BATMAN

- From Waste to Resource
 - A dialogue between science, technology and policy makers
- Exchange of knowledge/concepts/interpretations of legislation
- The proposal covers 6 major themes:
 - Manure knowledge forum (Project management & communication)
 - Develop common standards for manure handling
 - Phosphorus challenge
 - Life Cycle Analysis incl. Green House Gas emissions
 - Manure energy potentials
 - Manure business potentials

Manure knowledge forum

- Establish a manure knowledge forum
 - Research and business can meet physically and virtually
 - Strategic and applied research present relevant results and ideas
 - Innovators/ companies present their ideas and business plans
 - Stimulate business and rural development through the values of manure handling (A prosperous region)
- Organize yearly manure Conference and seminars, workshops
 - for scientists, for policy makers, B2B, Matchmaking,
 - Demonstrations of technologies, field visits
 - 'Baltic Manure processing (BATMAN) award'
 - Co-operation with agricultural advisory service and business innovation service

Manure Knowledge Forum



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Standards for manure handling

- Develop and describe methodologies and international standards for manure
 - Manure markets needs standards and transparency to develop
 - Solid manure, Fibers & Liquid manure
 - Nutrients: N, P & K
 - Energy
 - Biogas, Fibre fraction, energy potentials
- Tools for management and intelligent re-use of manure resources
 - Certificate for manure handling (farmers)
 - Mapping of vulnerable soils (planning)
 - N₂O potentials
 - Nitrate leaching, P-Leaching

Manure standards

- Outputs
 - Standards for processed manure types
 - Standards for Horses, goat/sheep, fur animals
 - Harmonized analysis methods
 - Scientific cooperation on methodologies and standards
 - Collection of coefficients
 - kgN/animal/yr
 - N/P concentrations in feed etc
 - Incl promotional activities
- Provisional Actors
 - Green Federation GAJA (PL)
 - Est. Univ. Life Sci.
 - MTT/SYKE
 - DJF-Univ Aarhus, DK

Phosphorus challenge

- Crucial nutrient & resource
 - Fertilizer potential
 - Designer fertilizers – e.g. mix slurry with bio-ash
 - Development of P-index for soil types
 - Fodder re-use potential of P
- Potential business interest
 - Developing market, Supply chain management – manure to fertilizer
 - Demonstrations

Focus of Phosphorus recycling

- Outputs
 - Separation overview (to make P transportable),
 - Biogas, Plant available, Keep it simple
 - P-Index for soil types
 - to give the right dosis of P – correlated to Nitrogen, Timing
 - P uptake/ retention/ filter/ constructed wetlands
 - How the sea takes up P should be analysed
 - P for increased - but intelligent - production of fish, mussels etc
 - Farm-fish-food – Re-think the cycles!!
- Actors: R&D, Extension service

Life Cycle Assessment

- Selected manure handling technologies
 - Existing
 - Emergent
- GHG emissions (N_2O and CH_4 emissions)
- Ammonia emissions
- LCA as tool for prioritizing and recommending technologies
 - Including business potentials

Manure energy potentials

- Solid manure/Fibre fraction focus
 - Combustion
 - Thermic gasification
 - Other technologies
 - Biogas, composting
- Emissions, Ash fraction, recirculation
- Supply chains for manure energy
 - Intelligent energy use (e.g. district heating)

Manure business potentials

- Manure as an option – part of solutions for BSR
- Business innovation
- Optimize potentials
 - Nutrients
 - Energy
- Develop markets, describe value chains,
- Sustainable Supply Chain Management

Manure energy & Business innovation

- Outputs
 - Analysis of legislation in EU Member states and Russia
 - Basic calculations on different technologies (standards, parameters – input/output, necessity for business development)
 - Analysis of other Products
 - Energy (Heat, Electricity, fuel, CO₂, S, fertiliser etc)
 - Knowledge exchange
 - Politicians, scientists, businesses, farmers
 - Demonstrations, excursions, conferences, seminars
- Provisional actors:
 - JTI & IVL, Biogasfor, EON (S), MTT (FI)
 - Rural Advisory & Training Centre, Latvia
 - DK, DE

Provisional partners

- MTT (lead partner)
 - Syke
 - Private companies
- CBMI/ABP and Univ. Aarhus Denmark
 - Private companies
- JTI, IVL, Sweden
- JTI & IVL, Biogasfor,
 - Baltic Sea 2020, EON (S)
- Rural Advisory & Training Centre, Latvia
- Estonian Min. of Agriculture
- Lithuania....
- Poland....
- Germany.....JKI??
- Russia...
-?

Conclusions

- Very good inputs – thanks to all contributors!!
- New name: **BATMAN**: BAltic forum for inventive Technologies for MANure processing
 - A new mindset:
 - **manure problem turned into manure opportunities**
- A Manure forum for exchange of info between research, business, policy makers and advisory service
 - WP 2 Develop common standards for manure handling
 - WP 3 Phosphorous challenges
 - WP 4 Life Cycle Analysis incl. Green House Gas emissions
 - WP 5 Manure energy potentials
 - WP 6 Manure business potentials

Tak for opmærksomheden!
Kiitos mielenkiinnosta!

Thank You for your attention!!