

# Finding cost-effective solutions to reduce nutrient emissions to the Baltic Sea

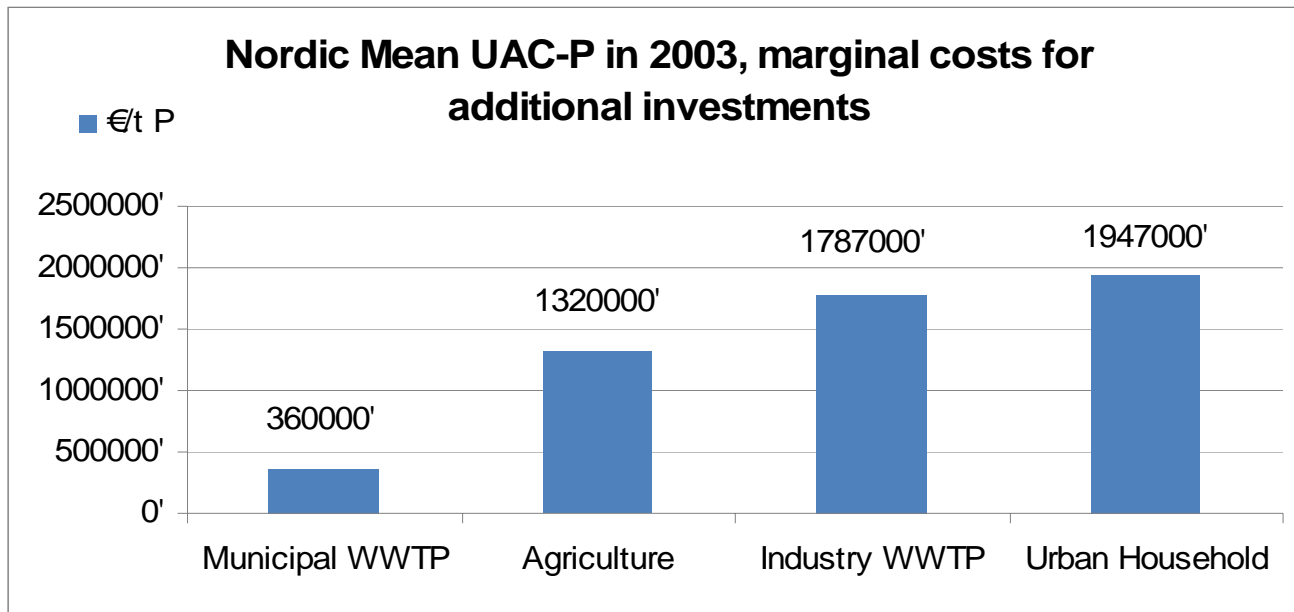
Karl-Johan Lehtinen  
HELCOM Stakeholder  
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## NEFCO's role

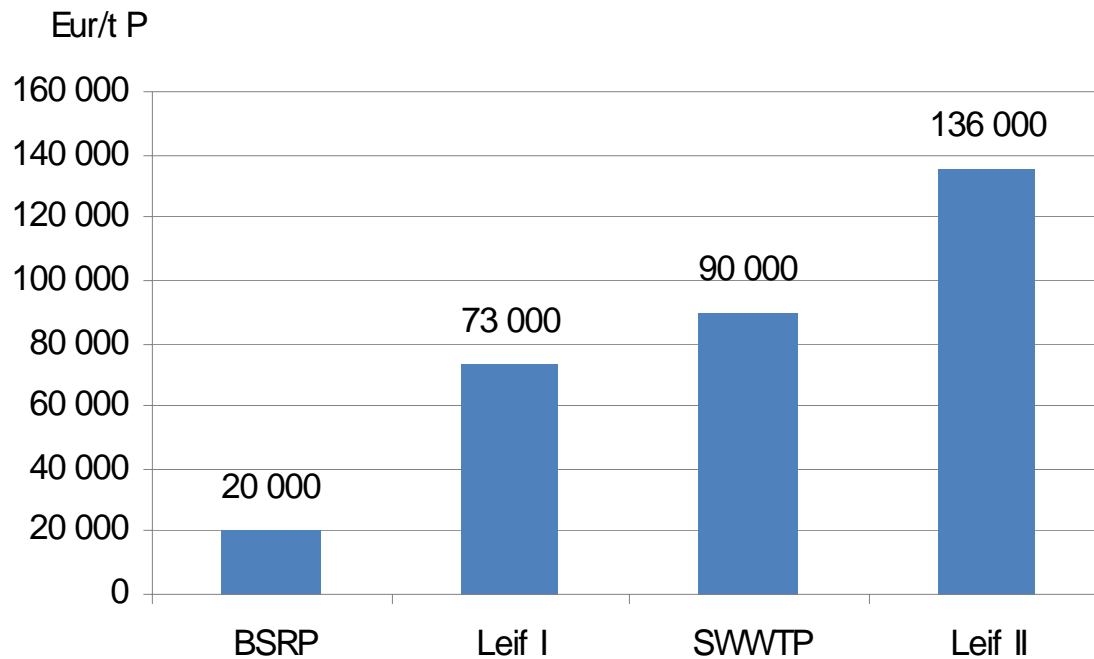
- Finding and financing cost-effective projects (biggest bang for the buck)
- Hitherto: ca. 1000 t P-reductions within NEFCO's municipal waste water projects
- UAC (Unit Abatement Cost) 90 000 €/t P
- Nordic corresponding shadow prices much higher.

# Determination of cost-efficiency at NEFCO

- Unit Abatement Cost
- Transparent and objective way to illustrate cost-efficiency
- Calculation: Total investment (or the environmental part) - EBITDA (or annual savings based on technical analysis)/annual reduction of the environmental indicator
- Investment cost: annualised cost (usually 5 %, 10 yr capital recovery time)
- Probably not bound for the Noble prize but the inherent error is always the same e.g. comparable methodological incorrectness



### UAC for Earlier P-reductions in Variuous Sectors



# What's Next?

- Areas of specific interest are:
- Kaliningrad town and adjacent communities
- Finalisation of St Petersburg Municipal waste water treatment
- Agri-industrial production in Leningrad oblast for the following reason:

- Annually 800 000 t of manure produced from poultry farms
- Manure contains 3000 t P and 14 000 t N
- P content higher than the total need for P reduction in the Gulf of Finland

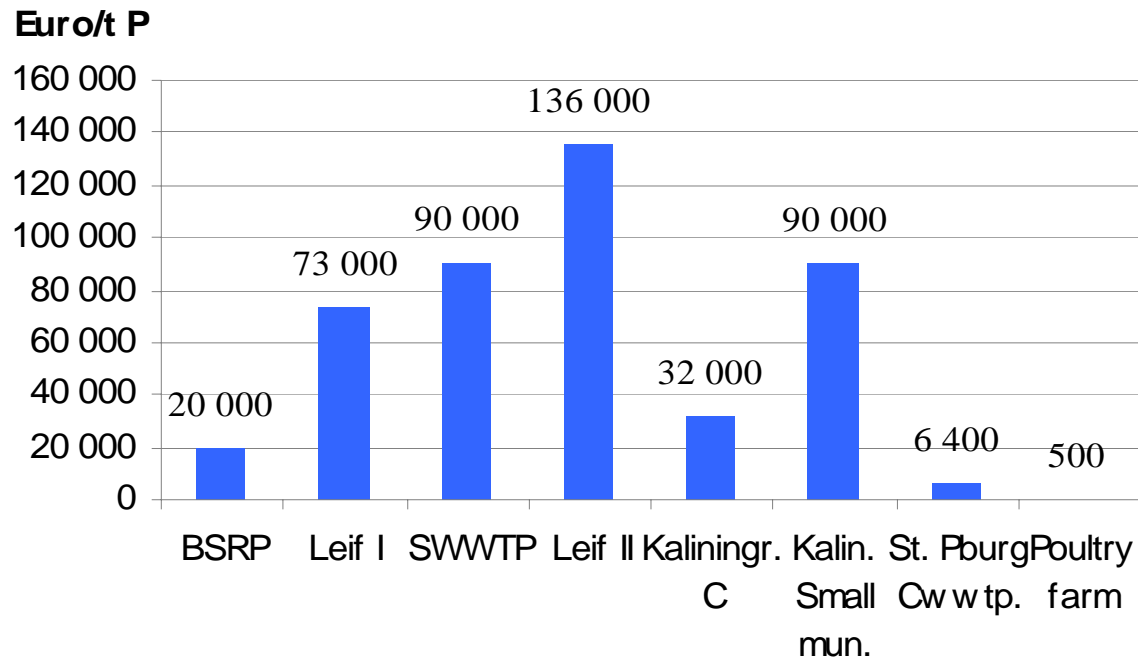
# Locations of poultry farms





# Some examples

**UAC for Earlier and Predicted P-reductions**





# Manure leaching into waterways



# Poultry manure cntd.





# Cost-Efficiency & Time

- Crucial to make decisions fast if BSAP is to be successfully implemented
- If planning and financing is managed within 2 yr, only 5-6 years effective time for action

## Find the low-hanging fruits!

- The **P-goal within BSAP** is ca. **15 000 t/a** reduction for the whole Baltic. The Gulf of Finland and Riga Bight ca. **2750 t/a**.
- By the finishing of St P:burg wwtp 1800 t P/a reduction (remaining total cost 750+ MEUR)
- Kaliningrad (+ 20 additional comm) estimated **400 t P/a** at a cost of around 140 MEUR
- About **3000** additional manure-P tons with potential to reach GF could be eliminated at a, sofar, estimated cost of about 1000 €/t

- BSAP goal to reduce 8460 t P/a from MWWTPs: St. P:burg 1800 + Kaliningrad 400T = 2200 t/a
- 217 MWTTP discharge directly to BS: make a list and separate the largest ones > 50-100 t P/a
- In total 3036 plants that cover 6260 t P: make list and prioritise the largest ones



- What about the rest 6540 t P from nonpoint sources?
- Use the money available for improvement of farm routines (manure, application of fertilizer etc according to GAP)
- Use new schemes: for ex. rent biotopes from farmers for certain periods ; hide inert wood coal into farmland after utilization of energy from pyrolysis (win-win solution)
- Nutrient trading probably not avoidable if true nutrient reductions are foreseen.