

A permit fee system for reducing nitrogen and phosphorus loads to the sea - SE

1. Policy Objective & Theme

- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards
- SUSTAINABLE USE OF RESOURCES: Preserving coastal environment (its functioning and integrity) to share space

2. Key Approaches

- Ecosystems based approach

3. Experiences that can be exchanged

The Swedish Environmental Protection Agency (Naturvårdsverket, EPA) on behalf of the Swedish Government and following consultation with the competent authorities for the West Sea, the Southern Baltic and the Northern Baltic has produced a methodology with the aim of reducing nitrogen and phosphorus loads to the Baltic Sea and the West Sea in a cost-effective manner. It is a cross sectoral fee system with features of a permit trading system.

4. Overview of the case

This case presents a proposal for a permit fee system to make it cheaper for society to reduce nitrogen and phosphorus discharges to the Baltic and the West Sea. The proposal entails setting a cap for discharges for example from agriculture, sewage treatment plants and industrial plants. Anyone wishing to discharge more than the cap has to pay a fee which funds an equivalent reduction in discharges elsewhere. It can also be possible to sell and buy discharge credits.

5. Context and Objectives

a) Context

The load of nitrogen and phosphorus to the sea from Swedish sources has decreased over the last years, but the marine environment has not recovered at the same pace and further reductions are required. Sweden has signed an agreement, the Baltic Sea Action Plan, with other countries around the Baltic Sea to take further actions. From the Swedish point of view, the agreement signifies a recommendation to reduce phosphorus inputs to the sea by 34% (290 tonnes/year) and nitrogen inputs by 29% (20 780 tonnes/year) by 2021. Far-reaching measures will be required in most of the sectors that cause nutrient discharges if this target is to be met. For each country to meet the undertaking and do so at the lowest possible cost within the country concerned, action programmes have to be drawn up by 2010 and measures have to be implemented by 2016 at the latest. Already there are a number of policy instruments geared toward emissions of nitrogen and phosphorus, but research shows that these instruments generate unnecessarily high costs. This can be explained by the fact that the majority of existing policy instruments are sector- or, in some cases, even measure specific and therefore limit the possibilities of low cost measures being implemented first. Most of these instruments do not consider the measures' impact on the actual recipient but focus mainly on emissions at the source. Policy makers are confronted with at least two challenges. Firstly, the level of ambition must increase substantially in order for higher targets to be reached. Secondly, policy instruments must be shaped so that low cost measures are implemented first.

b) Objectives

The aim was to describe how a cost-effective policy instrument in the form of a permit fee system, with the option of trading, for nutrients is to be designed to reduce eutrophication in the Baltic Sea and the West Sea. The policy instrument is to focus on both non-point and point sources, as far as possible be cross-sectoral and be differentiated at appropriate geographical scales. The work was also to identify what constraints must be resolved for the policy instrument to have the desired effect and should include, as far as possible, the economic effects generated by the proposed policy instrument in comparison with present-day policy instruments.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

The EPA is responsible for the work under a government assignment.

b) ICZM tools

The permit fee system consists of three inter-connected markets. By separating the system into these markets, each market can be shaped in order to fulfil a specific function. As a first step, sources of discharges are regulated through caps in the fee market. The caps allow regulated sources to discharge a certain amount of nutrients without having to pay a fee. However, for any amount of discharge that exceeds the requirements, the emitters can choose between implementing measures to meet the regulations or paying a fee that gives them the right to emit a certain load during a specific time period, a so called "right to load". The actors on the fee market are a regulating authority and regulated sources that, through fees paid to the authority, finance so called "compensatory measures". Compensatory measures are measures that compensate for the amount of discharges on the fee market that exceeds the sum of individual caps. They are contracted by the regulatory authority in the measures market and carried out by market agents that can achieve reductions in excess of their cap or by those who can mitigate emissions to the sea through unregulated activities that do not generate emissions, e.g. mussel farming and wetlands. The measures are financed by revenues obtained in the fee market. Compensations paid on the measures market therefore determine the fee level in the fee market. When these two initial markets have been established, a secondary-market is created where rights to load can be traded. In this market, rights to load are traded directly between different stakeholders. The purpose of this market is to enhance the cost-effectiveness and flexibility of the system. The regulating authority is a key actor in the system and can be likened with a broker: it manages the contact with fee payers on the fee market and is responsible for using the revenues from these fees to finance compensatory measures. This role reduces the transaction costs that have been an obstacle when a traditional permit market have been used to reduce the load of nutrients from non-point sources as well as point sources. Although the proposed permit fee system is expected to lead to decreased transaction costs compared with traditional trading systems, the transaction costs are likely to increase in comparison with existing policy instruments but, in return, the instrument is expected to generate benefits with regard to the following aspects: cost-effectiveness of measures, target fulfilment, dynamic efficiency as well as an increased potential to deal with uncertainties and distributional consequences. The EPA, therefore, has proposed to deepen the analysis (2009-10) and run a test in a pilot area.

7. Cost and resources

The EPA have estimated that a total of 4-5 person-years will be required for the in-depth analysis of which around half is provided by the EPA and the remainder by experts from outside the Agency. The financial need for the latter is estimated to total around SEK 2 million (ca. €200,000).

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

The proposed permit fee system has advantages compared with other policy instruments that aim to reduce nitrogen and phosphorus load to the sea. It creates economic incentives to find the cost-effective alternatives of measures to achieve a given reduction in load which in turn means that the fees are low. The fee system gives regulated sources economic flexibility in that they are given the option of either paying a fee or taking their own measures to bring discharges below the cap. The fee system has high potential with regard to target fulfilment, cost-effectiveness and dynamic efficiency. The measure is described at national level, but it may also be of interest to think about ways of implementing it jointly for all the countries around the Baltic Sea. Although the policy instrument is only implemented in Sweden, it would be possible for the auction procedure to be

opened up for measures within other countries around the Baltic Sea.

9. Success and Fail factors

The work builds upon the experiences gained by a similar measure being implemented in the USA. The Great Miami River in the state of Ohio is where nutrient reductions are being achieved through point sources (principally municipal wastewater treatment plants) in the basin having financed measures upstream in agriculture. This trading system started as a pilot program in 2006, but is now undergoing staged expansion, as very promising results have been obtained to date and clear acceptance and demand is being experienced from wastewater. By October 2008, the 50 or so projects in agriculture that have been granted funding have contributed to a reduction in nutrient load of 294 tonnes of nitrogen and phosphorus at a cost of \$923,069, which means a cost per kilogram of \$3.14.

There were consultations with the water authorities for the North and South Baltic and the West Sea as well as an internal review group and three external review groups, one scientific, one for authorities and one for other stakeholders. In 2008, a seminar was arranged for an exchange of experience with representatives of existing water quality trading systems in the United States.

The cost of implementing the measures were not included in the assignment but will be dealt with in the pilot study. The reason for this was that the costs depend upon political decisions not yet taken on reduction targets and what sectors will be included. It was also decided that the assignment should focus on one model for a fee system (rather than several models of fee systems) that can be designed in various ways. It has also been difficult to find any alternative fee system that has great potential for cost-effectiveness at the same time as the targets are fulfilled.

10. Unforeseen outcomes

It has not been possible to address all aspects of the permit fee system to such a degree that it is ready for implementation. Further analysis is needed in a number of areas.

11. Prepared by

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12. Verified by

It has not been possible to verify this case.

13. Sources

- Proposal for a Permit Fee System for Nitrogen and Phosphorus (2009) Swedish Environmental Protection Agency
- www.naturvardsverket.se/bokhandeln



Proposal for a fee system for N & P (948.51 KB) 