The Netherlands PRTR-system and quality control by the public

C.W.M. van der Maas, L.J. Brandes, O.M. Knol, A.J. Leekstra
Netherlands Environmental Assessment Agency (PBL)
P.O. Box 303
3720 AH Bilthoven
The Netherlands
Email: wim.van.der.maas@mnp.nl

Abstract

Last summer the Netherlands Environmental Assessment Agency (PBL) launched www.prtr.nl as an implementation of the Aarhus requirement to present emission data to the public. We announced this website at the 16th EPA Annual Emissions Inventory Conference (Ruyssenaars, 2007). Almost a hundred million emissions are shown, complemented by documentation about how these emissions are calculated.

There are three ways to explore this vast amount of data: (1) select emission sources and present the trend in a graphic, (2) select emission sources in a map or (3) down-load a selection into your own database system. Unique is the mix between point sources and diffuse sources. For the first time the public can see e.g. the contribution of local traffic in their community in relation to the emissions from the refinery next door.

Professional users showed a lot of interest in the data and gave feedback about the quality of the data and the website. For the general public however, the presented information appears to be less adequate, as the web-statistics show.

According to the information pyramid (from the World Resource Institute, 1995) each hierarchical level in data aggregation has its own public. Not all levels are suitable for the general public. In case of www.prtr.nl there is a mismatch between the aimed target group (the general public) on one side and the abstraction level and level of detail on the other side. The next update of the website will focus on the general public and will take the principle of the information pyramid into account.

Keywords: Emission Inventory, PRTR, Aarhus Convention

Introduction

The Netherlands Environmental Assessment Agency (PBL) provides independent integrated assessments on environmental issues such as sustainable development, energy and climate change, biodiversity, transport, land use and air quality. PBL functions as an interface between science and policy and supplies both the Dutch government and international organizations (e.g. the European Environmental Agency, UN, OECD) with evidence-based assessments. For the implementation of this task, large quantities of data are collected and interpreted. In accordance with the Aarhus convention, this data is also made available to the public. Over the years we have gathered quite some experience with this activity. In this paper we focus on the website of the Netherlands Pollutant Release and Transfer Register (www.prtr.nl).

The Netherlands PRTR has al long history. The first steps for the establishment of an integrated Pollutant Release and Transfer Register (PRTR) were taken in the Netherlands in 1974. Following the ICT developments, several updates of the database application have since then been performed, including a close integration with GIS (Geographical Information System).
In the first years the focus was mainly on industrial sources. Over the years also non-industrial sectors were included in the inventory such as agriculture, transport, consumers and waste sector. At this moment the inventory covers all possible sources of air pollution and emissions to water and soil. The inventory has an annual cycle which results in a national database which is used to fulfil all (inter)national obligations to report data on emissions such as UNFCC, CLRTAP, E-PRTR and LCP).

The Netherlands Environmental Assessment Agency co-ordinates the annual compilation of the PRTR on behalf of the Ministry of Housing, Spatial Planning and the Environment (VROM) and the Ministry of Transport, Public Works and Water Management (V&W), in co-operation with various national institutes, including Statistics Netherlands (CBS) and the Netherlands Organisation for Applied Scientific Research (TNO). In total about 70 persons are involved

1. Aarhus implementation: www.prtr.nl

Initially the website prtr.nl was intended to be a sober implementation of the obligation to publish national emission data under the Aarhus convention. Given the limited resources the emission-data was presented as it is, without an extensive explanation about for example the relation between emission and air quality, effect on the environment or public health.

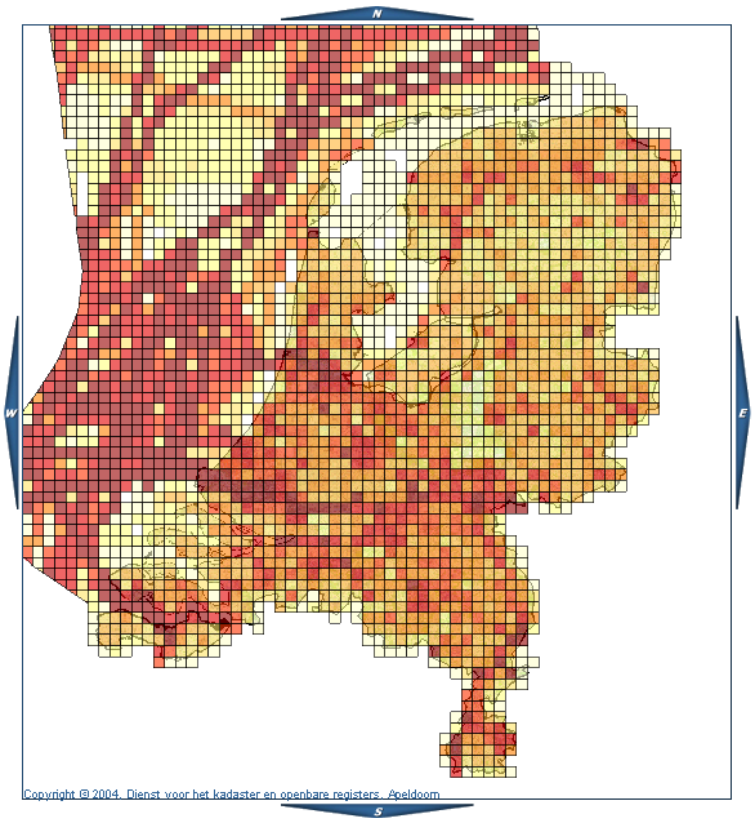

*Figure 1: SO_2 emissions in the Netherlands on 5*5 km grid, dominated by the emissions from the shipping sector*

The website was designed with the professional user in mind and has the following characteristics:

- Bilingual, with facilities for international users (e.g. decimal point or decimal comma in exports and spreadsheets)
- Emissions to the compartments air, air IPCC, soil, water indirect (emission) and direct (load))
- More than 350 pollutants
- For 1600 national emission sources and 1000 point sources

- Every national emission source is spatially allocated on maps per source on 5*5 km grid (see figure 1), per community, province, water catchment area etc.
- An unique integration of point sources and diffuse sources (see figure 2)
- The user can create emission maps of every emission-source
- Trends for each emission source
- Export of all data into spreadsheet or database
- Methodologies used for the calculation of the emissions of each source
- Methodologies used to allocate spatially the national emissions for each source

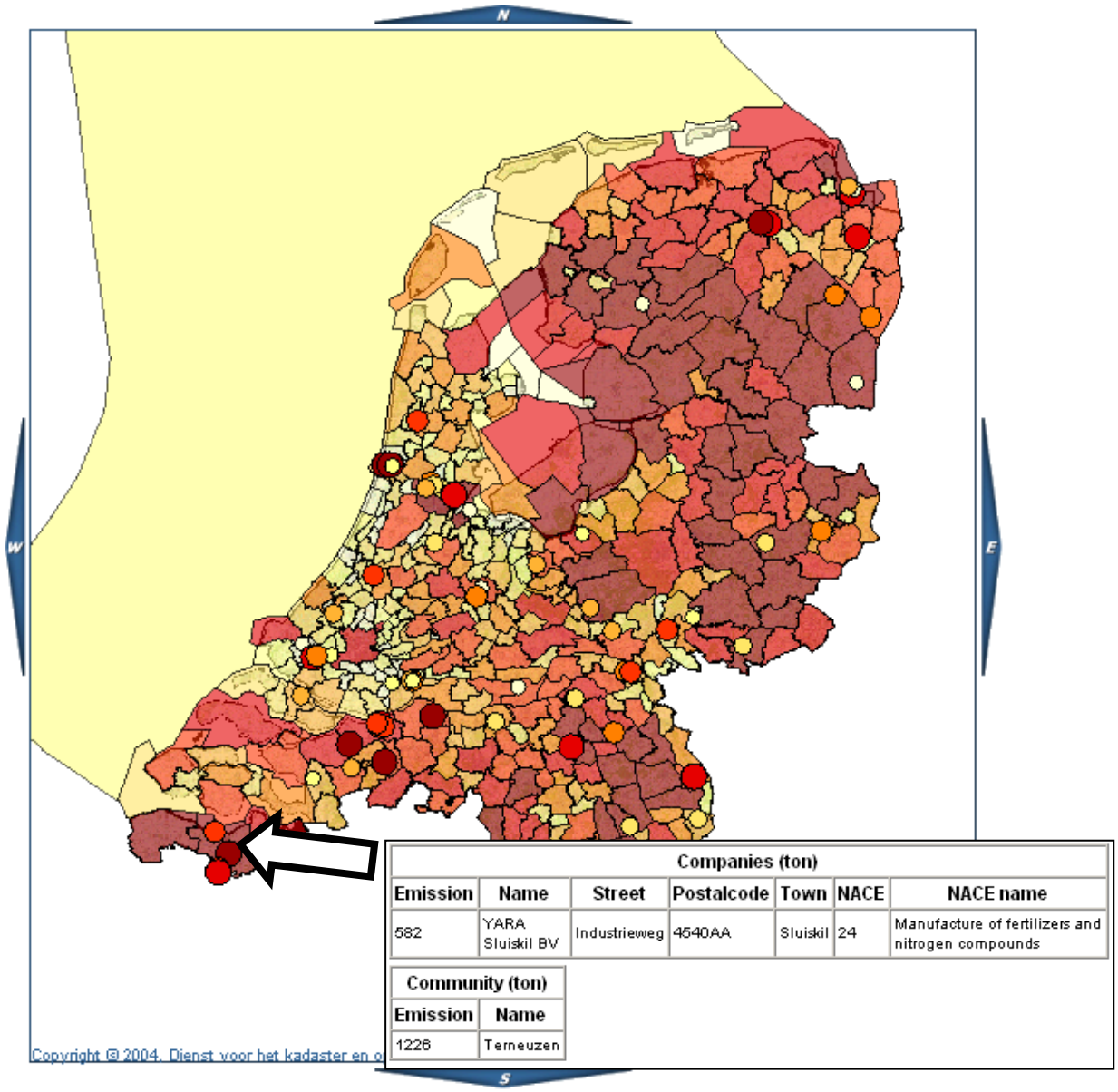

Figure 2: NH_3 emission (ton/y) from a company related to the total emission of that community

To inform the general public about emission-sources in their neighbourhood (and, by doing so, increasing the involvement of the public in the validation of emission data) some additions where made:

- top 10 graphics: the most significant emission trends
- top 10 maps with the most popular selection

- the possibility to navigate on the map to your Postal-code, community or the name of a company (see figure 3)
- context sensitive help and a glossary
- links to related websites where the effect of emission is explained and the related policy goals for emission reduction

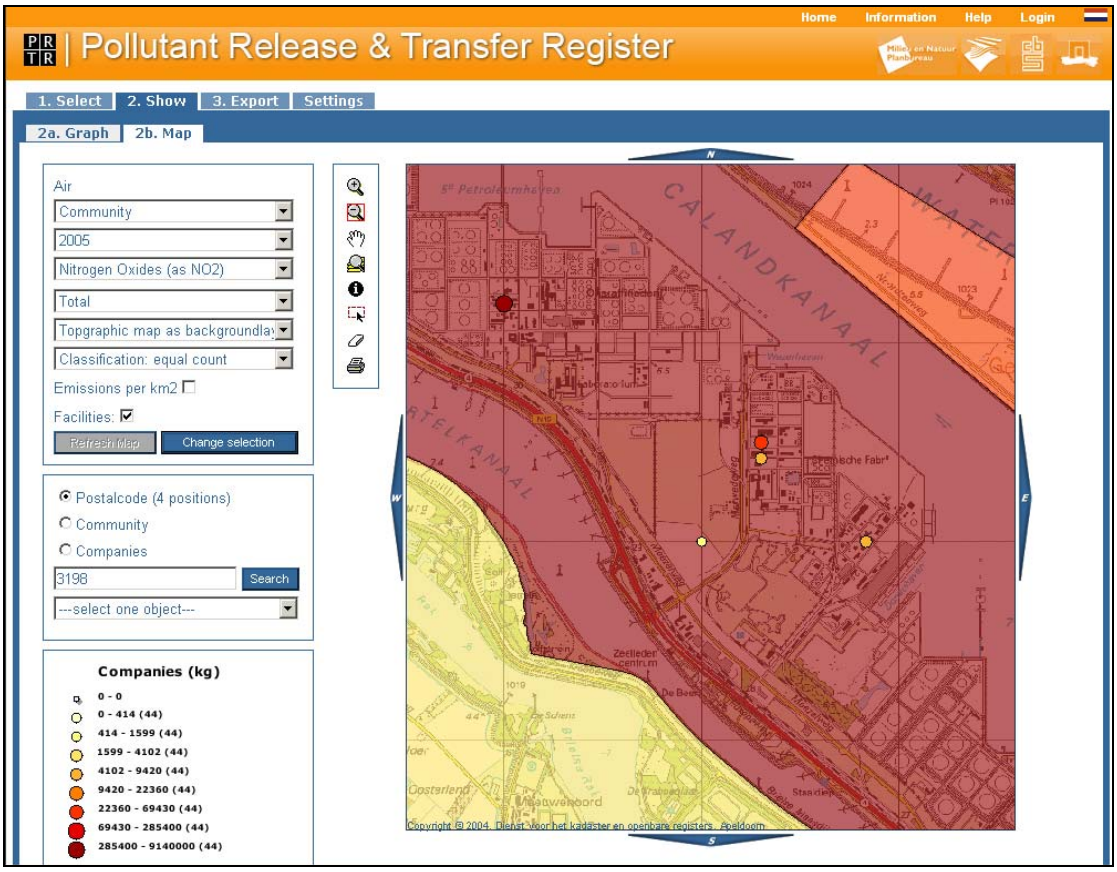

Figure 3: Navigate in the map by ZIP-code, community-name or company-name

The website is created in Microsoft dotNet. The emission-data is stored in an Oracle database. ESRI ARC-IMS is used as the Geographical Information System. All the tables, graphics and maps are created run-time from the database.

2. QA/QC by the public

Many organizations, both governmental and NGO's (non governmental organizations) acquired information from the website. Web-statistics shows that 20 percent of the visitors are from abroad, in general using the English version. The Summery of the web-statistics over the last nine months shows:

Maximum number of visitors per day	1837	
Average number of visitors per month	1480	
Average number of page-views per month	14,085	
Language of choice	Dutch 80%	English 20%
Number of subscribers to the newsletter	57 (Dutch)	3 (English)

Number of data requests to the helpdesk	150 per year (2007)	
Type of users[1]	85% professionals	15% general public
Number of errors corrected by the public	14 (2007)	

Most requests to the helpdesk were question for additional data, information about the methodology used to calculate the emissions and about the use of exported data in other database and application.
Very useful feedback was given by NGO's and local authorities about mistakes in the presented data, many related to the spatial allocation of CO_2-emissions, missing point source emissions and errors on the hierarchy of emission-sources to (sub-)sectors.
However, as the web-statistics also shows, very little visits came from the target group of the Aarhus convention: the general public.

3. Hierarchical levels of abstraction

To make the next version of the website suitable for the target group we clearly missed in our first attempt we looked for some theoretical background.
To be successful in communicating environmental information, three dimensions have to be considered:

- abstraction level and the level of detail;
- target group;
- medium and format.

These dimensions determine and focus the content of the information. A key challenge is to communicate the right information at the right abstraction level to the right target group. In this paper we present an adapted version of the information pyramid (World Resource Institute, 1995) to illustrate the hierarchical levels of abstraction.
Top level of the pyramid: Communication at this level is meant to the affect the perception of environmental problems, often aimed at a wide public. Examples are books and movies which address larger environmental problems like global warming. To communicate the message typical forms are pictures, photographs, metaphors, headings, press releases.
The second level is formed by integrated assessments. These studies inform primarily governments on the state of the environment. These are often books with (bulleted) short messages, supported by graphs and maps. A typical graph form at this level is the so called "traffic light table" with signalling colours: green as OK, orange as "needing attention" and red as "in danger".
At the third level we present indicators. Here graphs with trend lines, maps with geographic distributions play an important role in communicating insights, always presented in the policy context. See our website www.environmentaldata.nl.

[1] Based on the origin of questions to the helpdesk

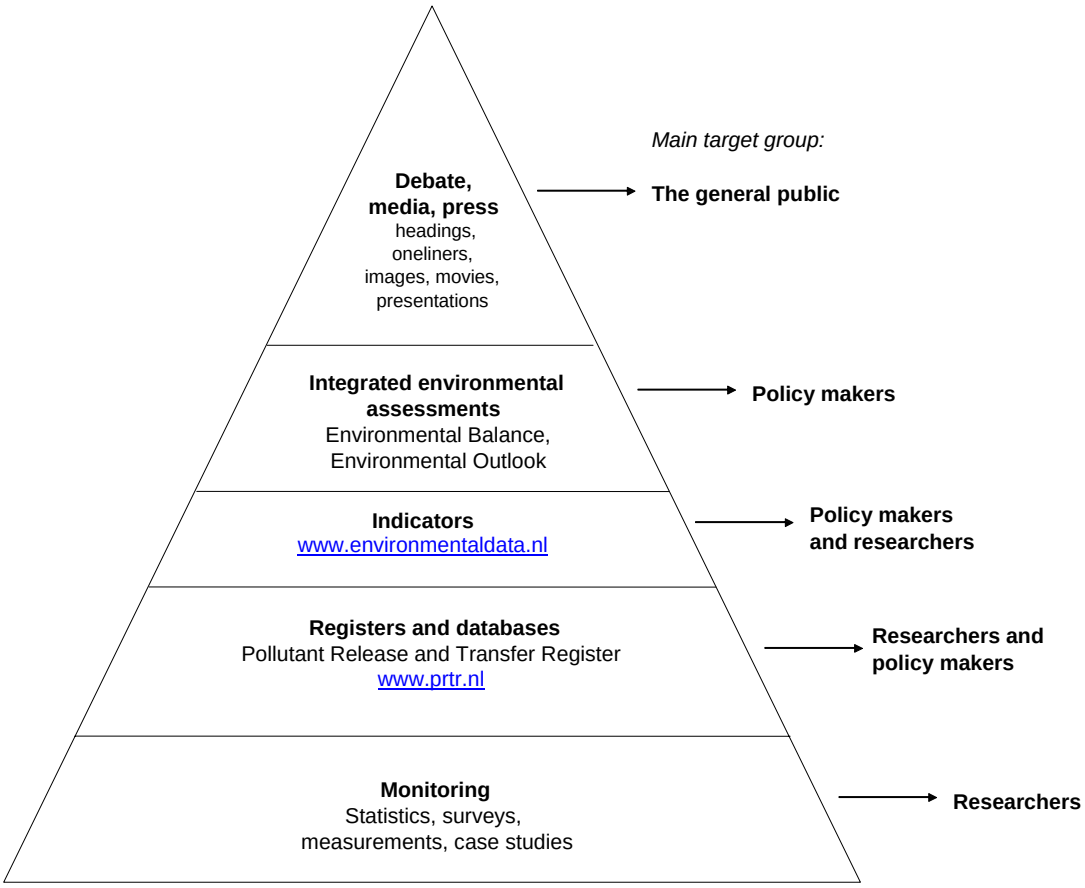

Figure 4: information pyramid for environmental data in The Netherlands

At the fourth level we find registers and databases. A Dutch example of a database-system is www.prtr.nl. This aims at the professional user but also tries to reach a wider audience. At the bottom of the pyramid we present the data from monitoring programs, mostly communicated in spreadsheets and 'background' reports. The European Shared Environmental Information System (EU-SEIS) has a strong focus on the bottom two layers of the pyramid but also shows some ambition to reach the levels above.

4. Conclusion

From our experience, we conclude that serving policy makers, researchers and the general public with the same environmental information system is difficult if not impossible. Combining various levels of the pyramid into one information system makes the communicative aspects of the system a real challenge. We would prefer serving each target group with its own information stream, despite the extra costs and effort it will take.

References

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