



**The Pollutant Release and
Transfer Register (PRTR) in Japan
and Korean Toxic Releases Inventory (TRI)**

– an evaluation of their operation

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About Toxic Watch Network

The Toxic Watch Network (T Watch) is a concerned citizens' network for the reduction of toxics in Japan. We provide a searchable PRTR (Pollutant Release and Transfer Register) data base of Japan to facilitate the public right to know. Started as a voluntary organization in 2002, T-Watch has become a registered non-profit organization in October 2004. The mission of T Watch is to phase out toxic chemicals in local communities as well as in the whole Japan. T Watch also advocates chemical policy reform at national level.

See to <http://www.toxwatch.net/>

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1. Introduction

Many Japanese citizens have a vague uneasiness about chemicals which interfere with full enjoyment of their comfortable and affluent lives. Japanese citizens leave the management of hazardous materials to “the specialists” - people in governments, industries and research fields.

Releases of toxic substances have been reduced through the introduction of pollution control technologies and environmental management systems such as ISO14001 and pollutant release and transfer registers (PRTR) (1). From the experiences of the Toxic Release Inventory (TRI) in the United States and the PRTR systems in UK and the Netherlands (5), Japanese people expected that the disclosure of the amounts of toxic substances released from sites would lead to a reduction of the totals released in Japan through industrial countermeasures and other voluntary efforts.

On the other hand, in 2008, it was revealed that a major steel manufacturer had falsified data on its water discharge and air emissions, and that several power plants had also fabricated data regarding dams. A paper mill factory was found to be violating the Air Pollution Prevention Act (2). Since 2002 municipal governments have been reducing the number of staff in charge of pollution prevention for financial reasons and have conducted less on-site inspections (2).

A sub-committee to promote measures for pollution prevention was created in September 2009 under the Joint Committee of the Air Environment Committee and Water Environment Committee of the Central Environment Council. In December 2009, the committee submitted a report recommending the strengthening of regulations and penalties for falsification of data (2).

In addition to these measures Japanese citizens are also expected to reduce toxic substances in their daily lives, and thereby reducing global environmental risks, by understanding the environmental impacts caused by the use of chemical substances and participating in the management of chemical substances.

This report gives an overview of the PRTR system in Japan, including a short comparative insight into the Toxics Release Inventory (TRI) system in Korea, as well as an evaluation of the system from a citizen's perspective based on the activities of Toxic Watch Network (T Watch) and some brief recommendations on certain aspects that should be taken into account when trying to promote PRTRs in other Asian countries.

2. The PRTR in Japan

In 1996 the Organization for Economic Co-operation and Development (OECD) issued a Council Recommendation to implement PRTRs within three years. So as not to repeat the bitter experience with the OECD Recommendation on Environmental Assessment, which took 20 years to implement, Japan prepared its PRTR system in a relatively short time.

“The Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof”, established in 1999, governs the PRTR system in Japan. In accordance with the Act, the PRTR system was introduced in April 2001 (3). The Environment Agency of Japan (which later became the Ministry of the Environment, MOE) started a pilot PRTR project in 1998, covering 30 cities and about 2000¹ facilities. This ran for three years before the system was implemented at the national level.

The law requires Business Operators (BOs) to calculate the amounts of toxic substances released into the environment and the amounts transferred as waste by their operations, listed by site and by environmental media - air, water, and land ¹

It is remarkable that the Act covers a wide range of chemical substances (435 substances) as compared with other acts. For example Japanese air and water pollution control laws and provisions relating to polluting emissions, environmental standards and monitoring usually cover only a few dozen substances. The Act was based on a new environmental policy whereby the government aimed to establish comprehensive chemical management and reduce the use of chemical substances by understanding the total amounts of chemical substances currently in use (4). In comparison with many PRTRs in Europe, Japan is proud that the system not only gathers information on chemical releases from business operators but also estimates releases from other sources, including traffic, households and the agricultural sector.

The essential characteristics of the system (see Chart 1) are as follows:

¹ When BOs landfills wastes on their own sites, the amount is counted as transfer as wastes. The transfer is referred to as “Landfill (on site)” when wastes are landfilled on BOs’ sites with permission, and as “Soil (on site)” when they are buried on BOs’ sites without permission. Most of the amounts of transfer to “Soil (on site)” are ethyleneglycol used as antifreeze liquid.

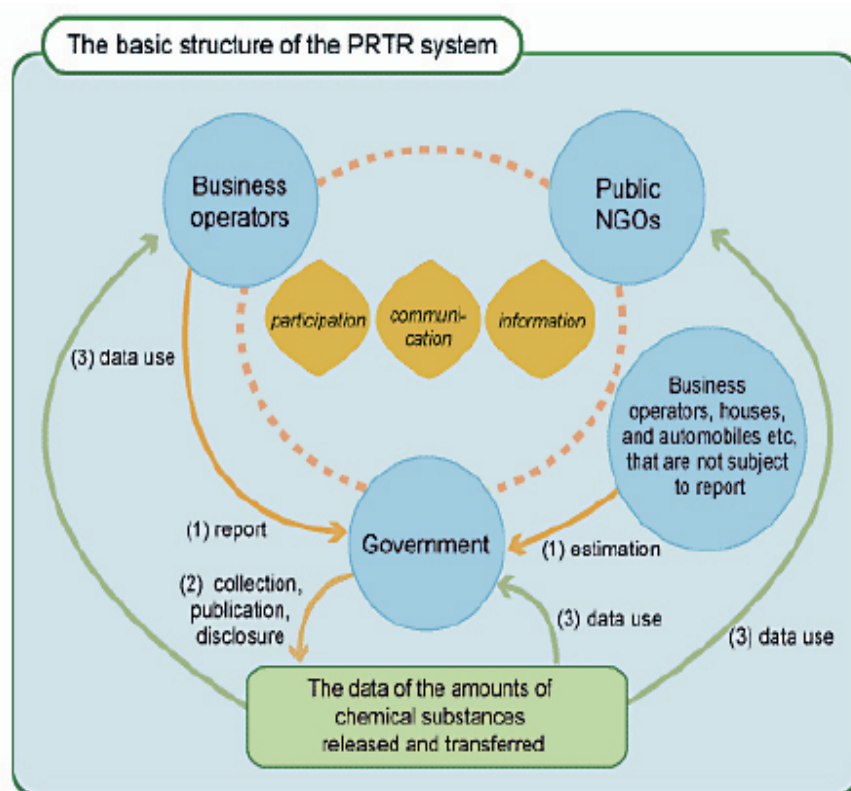


Chart 1. The basic structure of the PRTR system Source: MOE

(1) Number of substances and listed industrial sectors

A total of 354 substances were designated as “Class I Designated Chemical Substances”, requiring both PRTR reporting and production of Material Safety Data Sheets (MSDS). Another 81 substances became “Class II Designated Chemical Substances,” requiring only production of MSDS. The list of substances is available at <http://www.env.go.jp/en/chemi/prtr/substances/list.html>.

Chemical substances are categorized as Class I and Class II substances chiefly based on their manufactured quantities.

There are 23 industrial sectors listed and 34,830 sites of the listed industries reported PRTR data for the fiscal year (FY) 2001.

(2) Reporting frequency

The first data on releases and transfers related to the year FY2001 were reported to municipal governments by BOs during the three months from April to June 2002. The Ministry of Environment (MOE) and the Ministry of Economy, Trade and Industry (METI) compiled the data and disclosed the results on March 20, 2003. Data for each individual site was published on a CD-ROM, and distributed to the public on request and payment of a fee.

In subsequent years, the data for one fiscal year (which runs from April to March) are published during a three month period from April to June of the next fiscal year.

(3) Data maintenance and quality control (harmonization)

BOs report released and transferred amounts once a year. The national government publishes manuals for each industry on the methodology for calculating release and transfer amounts. There are several methods of calculation based on (1) material balance data; (2) measured concentrations of released substances; and (3) the use of release factors and handling amounts (or “chemical use information”). BOs may choose one of these methods to calculate the pollutant releases and transfers from their sites.

The National Institute of Technology and Evaluation (NITE) provides a consultation service for BOs to help with calculation of release and transfer quantities.

(4) Operation of the system

At Government level, the work is divided between Ministries. METI handles the reports from the BOs and MOE is in charge of calculation of “Estimated Releases Outside Notification”.

METI has allocated seven or eight staff to the PRTR work and delegates aggregation of the reported data to NITE. NITE assigns several dozen people to the task. In addition, 80 prefectural governments and Government Ordinance- cities assign two or three contact persons who receive the reported data from the BOs. MOE has allocated five or six staff and convenes an expert committee to study how to estimate released amounts. The actual calculations are delegated to the private sector.

The operating cost of PRTR budget for METI is 80 million yen(700 thousand Euro) per year , excluding NITE, and a further 200 million yen (2million Euro) per year is allocated for the MOE . (5)

(5) Public access to the data

The data are available at individual facility level, with the number of sites (or industrial facilities) that reported data in 2001 reaching 34,830 sites. The full report would amount to more than 30,000 pages if all the site data were printed. However, the data can be recorded on a CD-ROM in a format for upload into a database or spreadsheet program. The disk costs only JPY 1,090 (= approx 10 euros), an affordable amount in Japan. Nevertheless, it became an issue for review because the national government was supposed to disseminate the data free of charge in order to engage with citizens and empower them.

Municipal governments are not required to publish local PRTR data although they can choose to do so. Local PRTR websites operated by municipal governments vary greatly.

3. Unique Features of the Japanese PRTR

(1) Estimated Releases Outside Notification

When the Japanese government looked at the introduction of a PRTR system, the government accepted expert opinion that there were many sources of toxic substances besides those from large factories, as evidenced by environmental monitoring data since the 1970s. Hazardous substances are released not only from industrial operations run by larger BOs, but also from a myriad of often quite small sources such as rice fields, households and roads. These are known as “Non-Point Sources” (NPS), and can be significant sources of hazardous substances when viewed as a whole.

Thus a unique feature of the Japanese PRTR is that the national government calculates amounts of listed substances released from BOs without reporting requirements and from NPSs.

For example, farmers use a large amount of pesticides and herbicides. However, because most Japanese farms are small and run by two or three family members only it was decided not to impose reporting duties. Construction sites are not regarded as sources for reporting purposes because it is rather rare that work continues for a whole year or more. The exhaust fumes from automobiles are also a major source of toxic substances. Therefore the current system includes such sources as “Estimated Releases Outside Notification”.

Although the government looked at the possibility of including estimations of transfer amounts, this did not come about due to a lack of statistical data necessary for estimation.

Chart 2 shows some of the scope of these “Estimated Releases Outside Notification”, which also include estimates for smaller point sources such as non-listed industries which are not required to submit reports. Even so, this misses some well-known pollutants - for example, nitrogen and phosphorus releases from agricultural activities are not included.

The national government also estimates released amounts of hazardous substances from mobile sources including automobiles, railways, ships and etc., and discloses the results for each prefecture.

The “Estimated Releases Outside Notification” cover releases from the following BOs and NPSs (6):

- (i) BOs of listed industries but which handle quantities of Class I substances below the reporting thresholds (generally five metric tonnes per year for the first two years one ton per year thereafter), or which have fewer than 20 employees;
- (ii) BOs of non-listed industries such as golf courses and farms which use pesticides,

construction industries which release volatile substances such as toluene, xylene and formaldehyde from adhesive agents and paints, and restaurant businesses which use detergents;

- (iii) households, which are sources of toxic substances in pesticides, detergents, deodorants and insect repellents;
- (iv) mobile sources such as automobiles, ships and planes, which release volatile organic carbon compounds (VOCs) in exhaust gases.

The national government publishes an annual report on the methods of estimation at the same time that the PRTR data is published (6). The methods of estimation are reviewed annually by an expert committee in order to improve accuracy and reliability.

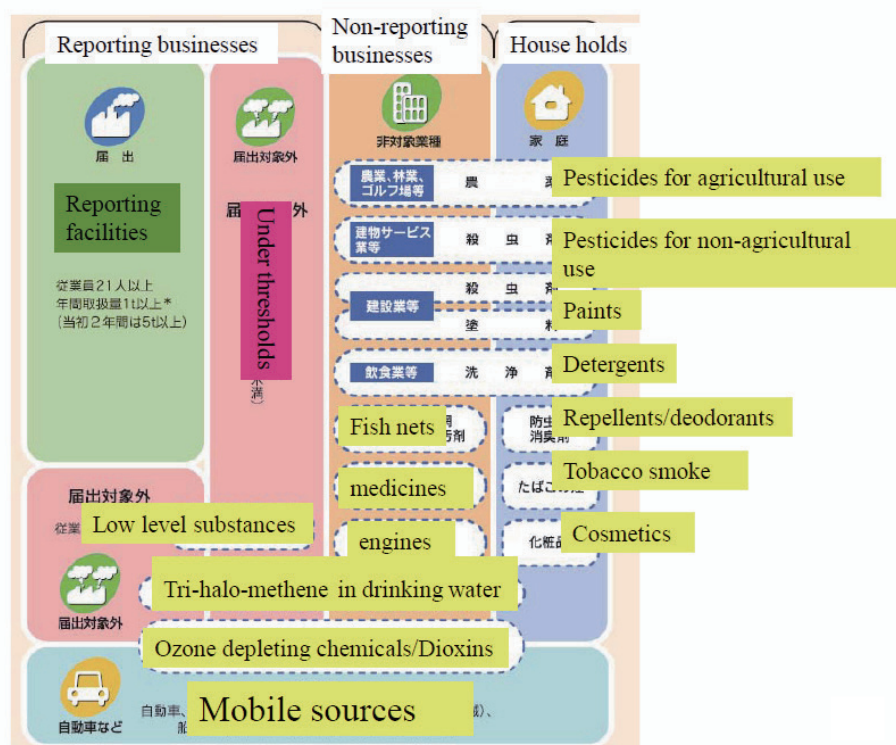


Chart 2. Composition of targeted substances for estimation and/or aggregation

Source: MOE (6)

(2) Obligation to provide Material Safety Data Sheets (MSDS)

The Act also provides that BOs shall produce and furnish MSDS when products containing Class I and II designated chemical substances are sold or transferred to other BOs. Since 2010 BOs must document and disclose the hazards in accordance with the UNECE Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

4. Overview of the First Year's PRTR Data (FY2001)

According to the first set of PRTR data (FY2001 disclosed in March 2003), reported releases of chemical substances amounted to about 310,000 metric tonnes, reported transfers were 220,000 tons, and the “Estimated Releases Outside Notification” totaled 580,000 tones, making a total of 1.1 million tons. Of the releases, 280,000 tonnes (89%) were released into air, 13,000 tonnes (4%) into water, and 20,000 tonnes (6%) were sent to landfill. Transfers consisted of 220,000 tonnes (98%) of wastes transferred outside of the reporting sites and 4,000 tonnes discharged to the sewerage system (see Chart 3).

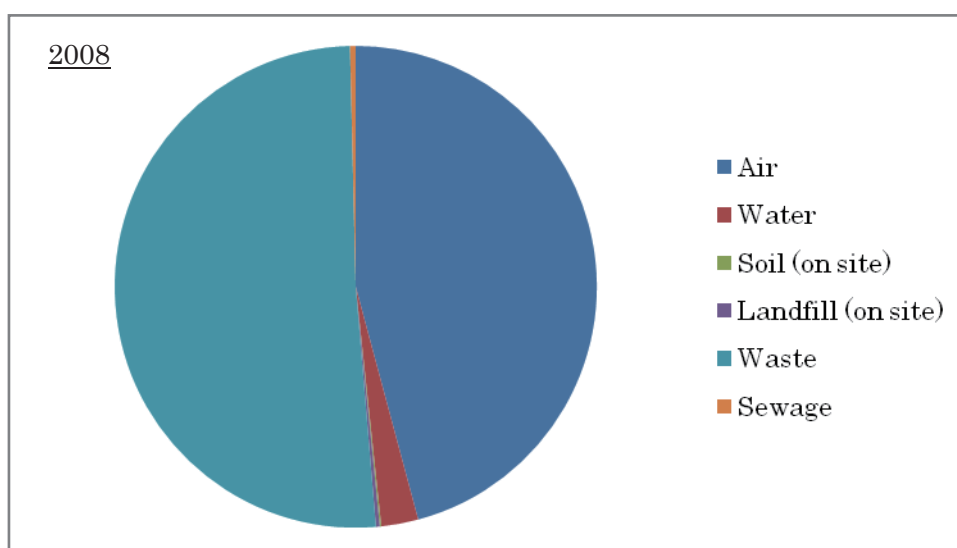
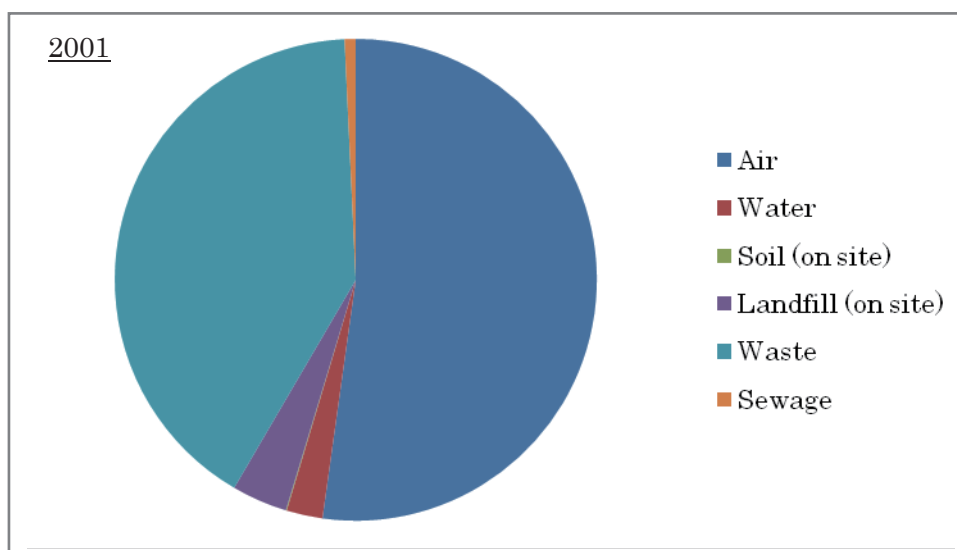


Chart 3. Total releases and transfers to each media and treatment destinations in 2001 and 2008.

Source: MOE (6)

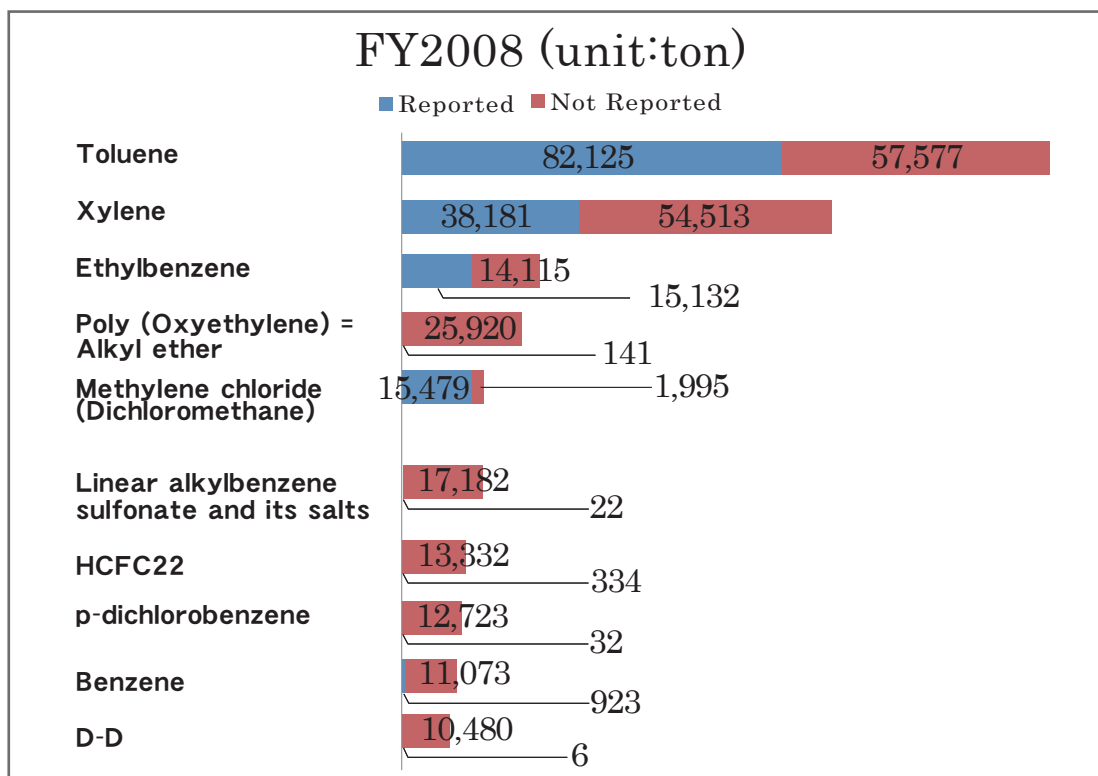
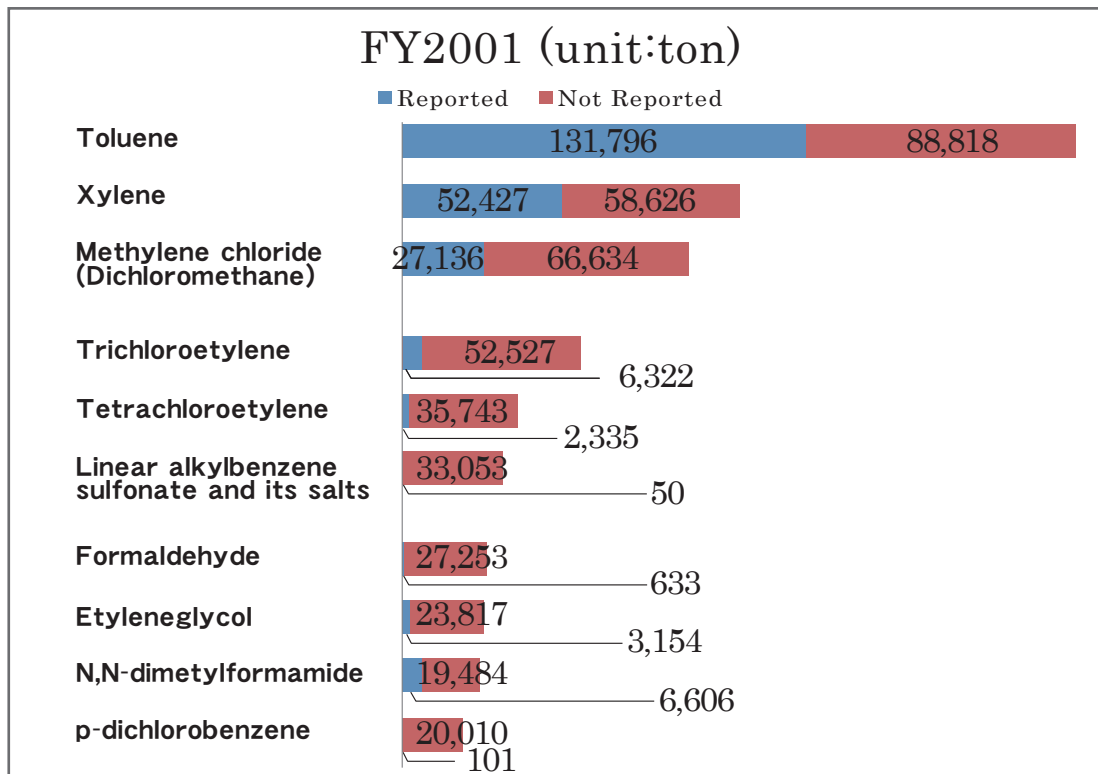


Chart 4. Top 10 substances ranked by release quantities in 2001 and 2008.
Source: MOE (6)

The first set of data for FY2001 revealed that approximately 90% of the total releases were into air. The top five substances (by quantity released) from reporting BOs and Estimated Release Outside Notification were toluene and xylene used as solvent for paints, dichloromethane for cleansing of metal surfaces in the chemical, plastic and metal product manufacturing industries, trichloroethylene used in the metal product and precision equipment manufacturing industries, trichloroethylene and tetrachloroethylene used in the dry-cleaning industry (See Chart 4).

Toluene releases totalled 89,000 tonnes from Estimated Releases Outside Notification, and 220,000 tonnes were released into air in total. Xylene totalled 59,000 tonnes were from Estimated Releases Outside Notification, and 110,000 tonnes released into air in total as well. It was found that toluene and xylene are mainly released from solvents in paints for domestic use, in exhaust gases from cars and some small BOs without reporting requirements. The large amount of tetrachloroethylene was considered to be released because of its use as a cleaning agent by small dry-cleaning shops.

The PRTR data showed that the substance with the sixth highest releases was linear alkylbenzene sulfonate (LAS), used as a major component of certain detergents. Some 330,000 tonnes was released, mostly from households. The seventh largest substance was formaldehyde with the release of 270,000 tonnes from mobile sources.

These results may explain why Japanese citizens have been suffering from sick house and school syndrome and Multiple Chemical Sensitivity (MCS) since the late 1990s. Huge quantities of chemical substances are released into air, especially from Estimated Releases Outside Notification (4). The data made it clear which substances should be tackled: para-dichlorobenzene released from households and formaldehyde in the exhaust gases of cars.

Para-dichlorobenzene, sold under the trade name of “Parazoru” was the tenth highest for releases, with 20,000 tonnes of the toxic substance released from closets and storage areas for clothes in households (7).

In the 1990s, para-dichlorobenzene contained a small amount of dioxin. Japanese citizens had not been informed about this problem. But now the PRTR data gave citizens an opportunity to review their lifestyles.

The industrial sectors reporting the largest releases are importing machine manufacturing, the chemical industry, plastic products manufacturers and the publishing and printing industries. These sectors report releases in the order of 20,000 to 55,000 tons.

5. Reviewing Trends in the PRTR Data to FY2008

(1) Large reductions in release and transfer amounts

According to the PRTR data for FY2008 (released February 2010 (6) (8)), releases and transfers reported by BOs totaled 400,000 tons, a reduction of 24.5% from FY2001. BO releases alone amounted to 199,000 tons, down by 15.4% from FY2007 (but had only declined by 9.1% from 2001 to 2007). These releases break down into 179,000 tonnes (90% of total release) to air, 9,700 tonnes (4.9%) to water, 3,800 tonnes (0.19%) into soil, and 10,000 tonnes (5.1%) landfill disposal on site at facilities.

It is remarkable that 90 % of the toxic substances released into the environment is released into air from reporting BOs.

The total amounts of transfers have also reduced, to 201,000 tons, a 10% reduction from FY2007. This is the first time that a reduction has been seen in seven years since FY2001. This breaks down to 199,000 tonnes transferred as waste (a 10% reduction from the previous year) and 1,500 tonnes (a 19% reduction) for transfers into the sewage system.

The figures show that most of the transferred amounts consist of wastes for intermediate treatment or permanent disposal and only a small portion of toxic substances are discharged into sewage.

BOs often collect toxic substances in order to reduce releases. In such cases, toxic substances are counted as transfer to wastes. While releases have been decreasing due to BO's efforts, amounts of transfer as wastes increase when toxic substances are collected as wastes. Therefore, the trend shows that the releases are decreasing but that the transfers to wastes are slightly increasing. Only in FY2008, the transfers to wastes decreased due to reduction in production amounts.

The Japanese PRTR have promoted BOs' voluntary efforts to reduce releases of toxic substances since 2001. It is ironic that economic depression in 2008 apparently resulted in greater reduction of releases. It is a challenge for BOs to reduce the amounts of transfer as waste, which could increase by collecting wastes in order to reduce the releases into environment. Since wastes are not counted as transfers when they are recycled, BOs should aim to increase the amounts of recycling.

The PRTR system will be changed this year to reflect the transfer of wastes to different treatment options such as incineration or permanent disposal (including landfill disposal).

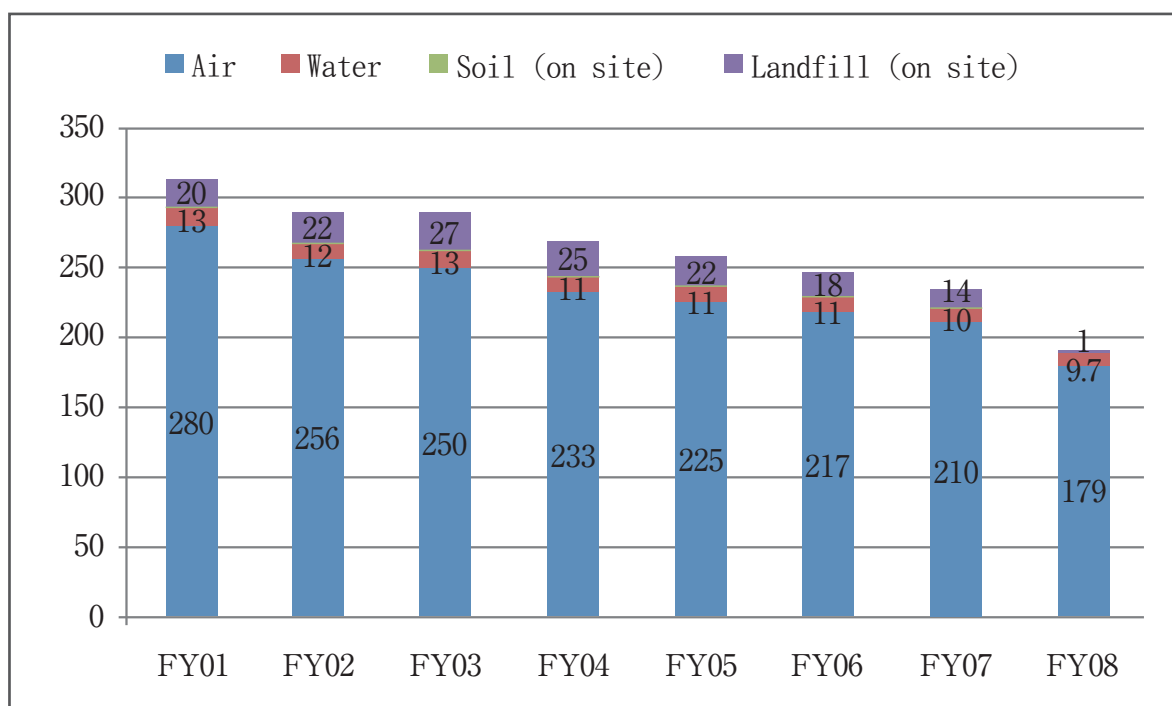


Chart 5a. Chronological changes of released amounts reported by BOs (in thousands of tons).

Source: MOE (6)

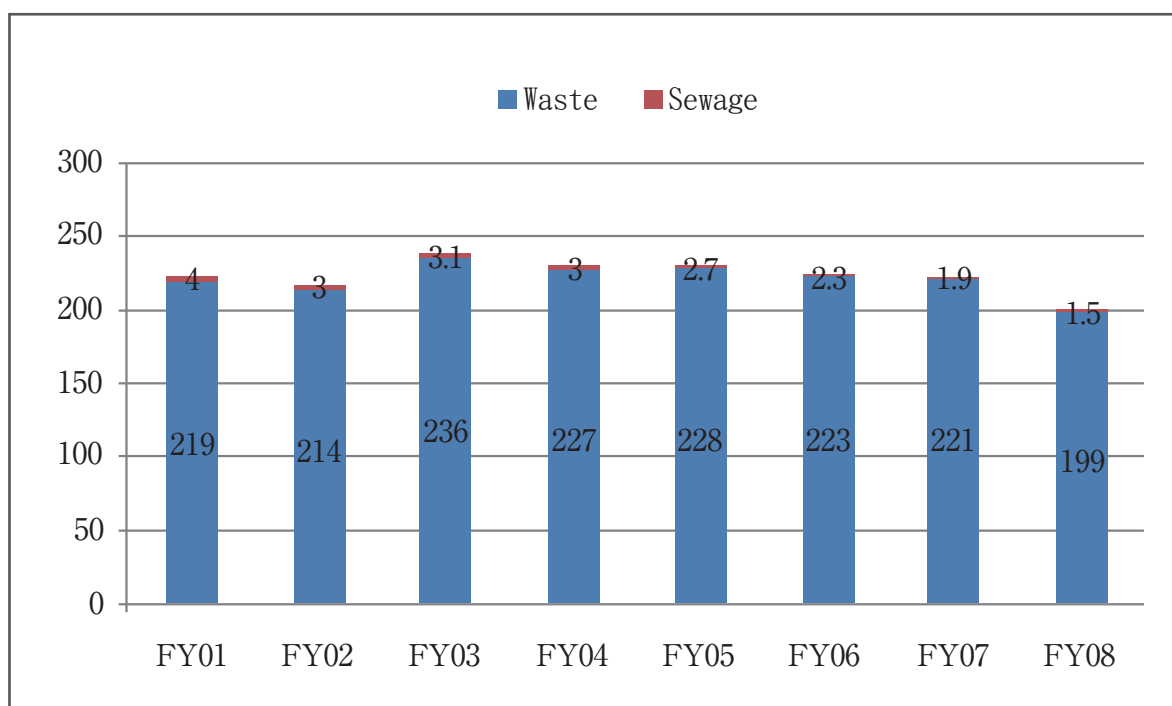


Chart 5b. Chronological changes of transferred amounts reported by BOs (in thousands of tons).

Source: MOE (6)

(2) Estimated Releases Outside Notification remain at the same level

The total estimated quantity of releases from BOs without reporting requirement and from NPSs for FY2008 is 291,000 tons, a reduction of only 1,000 tonnes from the previous year. This breaks down to 47,000 tonnes a (16% reduction from the previous year) from BOs of listed industries, 95,000 tonnes (4.3% increase) from BOs of non-listed industries, 56,000 tonnes (19% increase) from households, and 93,000 tonnes (6.1% reduction) from mobile sources. Compared with the previous fiscal year, the released amounts reported by BOs of the listed industries were reduced drastically, reflecting the economic trend, but Estimated Releases Outside Notification increased. Although the released amounts from households markedly increased by 19 %, the total Estimated Release Outside Notification remained at the same level as the previous year due to a reduction of released amounts from mobile sources. Chart 6 summarizes the annual Estimated Releases Outside Notification.

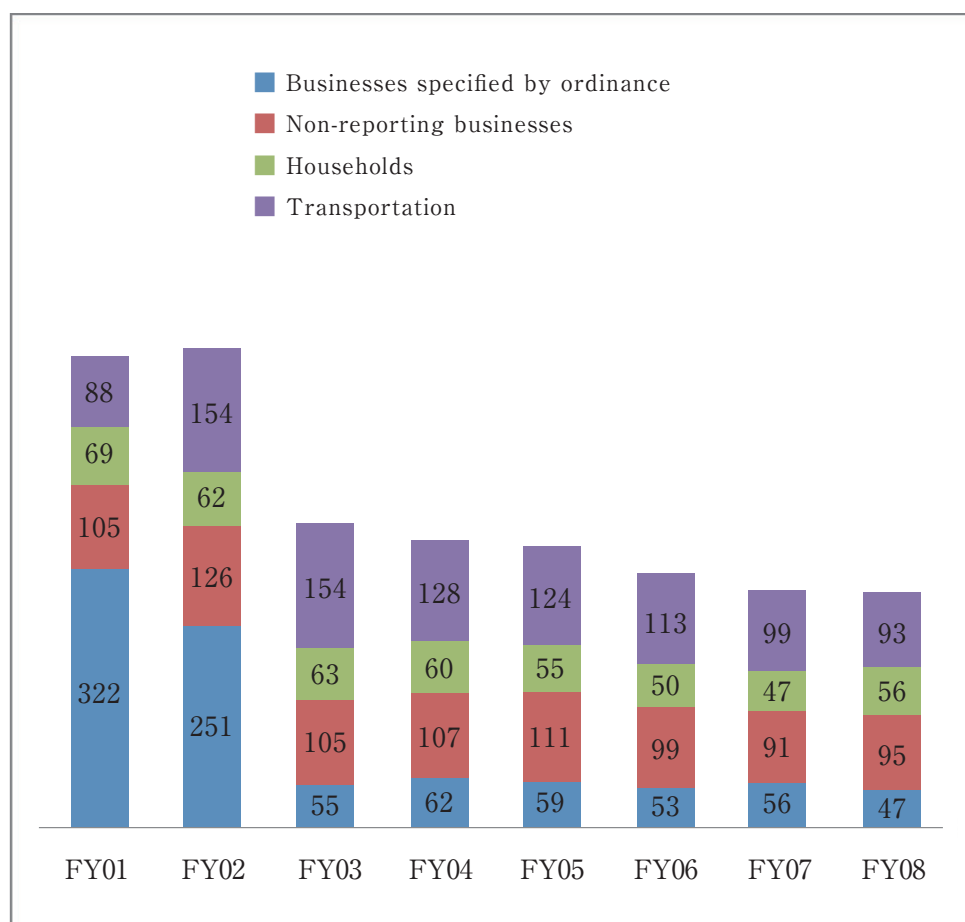


Chart 6. Annual Estimated Releases Outside Notification Source: MOE (6)

(3) Discerning between voluntary reductions and the influence of reduced productivity in FY2008

The author has looked at several industrial statistics (9), including production data, to research how Japanese industries' production activities were affected by the global financial crisis in the wake of Lehman's fall. Despite decreasing car production in the US, Toyota still boasted the world's largest production of cars. However, the Japan Automobile Manufacturers Association, Inc., announced that FY 2008 production was 10,005,771 cars, a reduction of 15% on the previous year. In FY 2007, the production was 11,790,059 cars, a slight increase (102.5%) on the previous year.

Electrical machine production statistics indicate that the shipment value in FY 2008 was JPY 23,377,340 million, similarly down by 15% on the previous year (10). According to statistics on raw steel production from the Japan Iron and Steel Federation, the production amount was 105.5 million tons, a 13.2% reduction on the previous fiscal year (11).

As shown above, production in FY2008 was reduced by 15% for major industries and so we might assume that the materials and chemical substances used for production should also be reduced by 15%, with similar reductions for releases and transfers. Releases were down by 15.4 %, very similar to the industrial production changes. Transfers were down by just 10% and so there is some discrepancy with the change in industrial production.

The purpose of the Act is to reduce the amounts of toxic substances released into the environment and the PRTR system is implemented as a tool to promote voluntary management by industry. BOs are expected to make voluntary efforts to reduce the released amounts of toxic substances by reviewing their data every year and comparing them with their competitors' data.

During the five years from FY2003 (when full implementation started with the more stringent one ton threshold) the total released amounts reduced by 24.3%, an approximately 5% reduction annually for five years.

On the other hand, a 15% reduction is seen from FY2007 to FY2008 due to the economic downturn. It becomes obvious that the influence due to production decreases is greater than industries' voluntary efforts. The analysis of FY2008 data teaches us that it is important to be able to correlate quantities of hazardous substances being handled and released, or to be able to correlate releases with production units in order to evaluate industries' voluntary management efforts.

Several local governments, such as Saitama prefecture, Kanagawa prefecture and Tokyo Metropolitan Government, have introduced local ordinances to require BOs to

report handling amounts (12). At regional seminars hosted by T Watch (Picture 1), local government staff in charge of PRTR implementation have claimed that industries in their communities have successfully reduced releases into the environment more through industries' voluntary efforts than through decreases in production even for FY2008. Progressive local governments with local ordinances regarding chemical substances seem to encourage reductions through voluntary efforts by industry (12). For "average" local governments without ordinances, it is not clear whether FY2008 releases were reduced only in proportion to the decrease in production. Further analysis is required (4).

(4) Potential risks of overestimation of Estimated Releases Outside Notification

Chart 4 indicates that releases from BOs of listed industries reduced from 251,000 tonnes in 2002 to 55,000 tonnes in 2003, but reasons for this significant reduction have not been given by the national government (9). The reporting thresholds with respect to annual handling amounts were changed from five tonnes per year to one ton per year in 2003. As a consequence of the change many BOs were transferred from the Estimated Releases Outside Notification section to direct reporting; and the national government estimated that the Estimated Releases Outside Notification were reduced by 200,000 tons. Although at the same time the releases reported by BOs should have increased theoretically, in fact they did not. This probably means that the government calculation overestimated the releases from BOs without reporting requirements. T Watch requested a review of the estimation by the government. However no errors were admitted, no review was allowed and the mysterious reduction of 200,000 tonnes remains without explanation (author's correspondence with MOE in December 2006). (13)

6. Revision of the PRTR

“The Act on Confirmation, etc., of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof” was established in 1999 and became effective in April 2001. The Congress passed the law with an additional resolution that the Act shall be reviewed seven years after coming into force. Two committees, one from MOE and one from METI, jointly reviewed the Act, beginning in December 2006 (13).

The MOE hosted a number of discussion sessions with experts from May 2005 on and issued a report prior to the review by the Joint Committee. The author attended the expert discussion sessions as a representative for civil society (14).

The author also attended and commented at the joint MOE/METI committee as a committee member for the Central Environment Council’s sub-committee for the environmental management of chemical substances. The result of the review by the Joint Committee was published as an “intermediate report” in August 2006, and it became a final report after going through a public comment process. An ordinance was issued based on the review, and the PRTR system was renewed in April 2010.

The following are some of the most relevant changes which reflect the report.

(1) Active dissemination of data by the national government

The most meaningful revision based on the review is the change in the way data are disseminated. Previously the national government only disclosed the data on request and on payment of a fee; now the national government actively publishes all the data reported by BOs on the internet. The system was changed in 2009 in response to opinions expressed by citizens and NGOs. The change brings a significant benefit to citizens.

(2) Review of the listed industries and designated substances

It was pointed out that the agriculture and construction industries, which have significant releases, should be listed since the purpose of the Act is to understand chemical releases and quantities. The Joint Committee, however, decided not to designate agriculture as a listed industry for the reasons that the Agricultural Chemicals Regulation Act deals with the reduction of pesticide use, that the released amounts from agriculture are already covered as Estimated Releases Outside Notification, and that most farms are run by family members and it is rare that the number of employees exceeds 20 people. With respect to the construction industry, the Joint Committee will keep studying the possibility of listing although the committee

was concerned that it may not be suitable because most construction sites exist for short periods of less than a year and the releases from paints occur only for limited periods.

Since medical services are a listed industry, it has been decided to include university hospitals from the viewpoint of fairness, in spite of their small releases of designated chemical substances.

After the Joint Committee published an intermediate report, an expert committee was held to review the list of designated substances. The report was finalized after the public comments procedure.

The review increased the number of Class I substances for PRTR reporting and MSDSs was increased from 354 to 462 substances. The number of Class II substances (MSDS only) was also increased, from 81 to 100 substances (15).

(3) Further calculations for Estimated Releases Outside Notification

Sewage treatment is a listed industry but its reporting requirements cover only 30 substances. Surface active agents and some other substances are not included but civil society representatives claimed that they should be reported under the Act. The national government did not expand the coverage, but decided to calculate releases and these data have been disclosed since 2007. Similarly, the national government also decided to calculate the quantities of designated substances released from waste incinerators. These data are not available yet as it is still being calculated.

(4) Change in registration items

During the public comment process, the government received many opinions calling for transferred amounts of wastes to be separated into two categories, one for intermediate processes such as incineration and one for permanent disposal such as in landfill sites. The government revised the ordinance so that BOs report categories of transfer of wastes from 2010. BOs must also describe the location to which the wastes are transferred. Note that when wastes are recycled or reused, they are not considered as “transferred”.

(5) Issues unsolved in the committee

A controversial issue which did not reach resolution in the committee is the question of whether BOs should report the handling amounts and/or the maximum storage amounts of waste or used chemicals. The author asserted that citizens should be informed about the quantities as well as the risks accompanying accidents and disasters, by revising the purpose of the Act to achieve more fully the “right to know”. On the other

hand, the committee members representing industrial sectors strongly objected to disclosure of the amounts, claiming that these are trade secrets and that the disclosure does not promote reductions of releases. They also insisted that the maximum storage amounts do not have to be reported because they are already reported to governments in accordance with other laws such as the Fire Service Act. However, the maximum storage amounts are not made public under that Act. Disclosure is necessary from the perspective of increasing citizens' safety and trust.

Now the data reported by individual BOs after FY2007 can be downloaded through the website operated by the national government free of charge. Although the Act took the approach that citizens could receive the information for a fee, the national government has now decided to publish the data directly and without waiting for revision of the Act (13). This reflects the intermediate report by the Joint Committee.

In order to download the PRTR data reported by BOs, users must download the program called "Kensakun" offered by the government. As "Kensakun" requires a user to download all the data (and not just that of interest), the program is considered not user-friendly and too complicated for average citizens to use (16). The PRTR database operated by T Watch often receives favorable feedback that it is much easier to use than "Kensakun".

However, the national government has been working on a webpage where people could click on factory icons on a map to access the data reported by factories. But the MOE says that the government is having difficulties locating factory icons accurately because of the need to convert the reported addresses of sites into latitude and longitude. The website is not yet open two years since the plan was announced. Another problem is that the government must create original maps for copyright protection (without using Google Maps) as the website is officially operated by the national government of Japan .

7. Using PRTR Data – T Watch and Organization for Research and Communication on Environmental Risk of Chemicals (Eco-Chemi)

(1) The Experience of T Watch

In 2000, the author started discussions with several citizens' organizations about the operation of a website where PRTR data disclosed by the government could be translated into comprehensive and meaningful information for citizens. In April 2002 the author and his colleagues established an independent organization called "Toxic Watch Network," or "T Watch".

The national government often showed the attitude that it government should make the people trust it, but it should not explain the reason," and was not accountable to citizens. In such circumstances, T Watch was established in the hope that transmission of PRTR information would promote reduction of chemical use as well as chemical releases.

The 2002 action policy of T Watch was approved by the inaugural meeting as follows:

- [1] Operating a website to transmit information which can be easily understood by citizens by processing and translating PRTR data disclosed by the national government, and by publishing an introductory PRTR guidebook for citizens;
- [2] Supporting NGOs and citizens to work regionally for reduction of chemical substance releases by using PRTR data;
- [3] Reviewing laws regarding toxic substances and advocating policy recommendations regarding comprehensive chemical management;
- [4] Networking with overseas NGOs to reduce toxic chemical substances globally;
- [5] Conducting research and studies regarding PRTR and chemical management and holding study meetings for citizens who are concerned about chemical substance related issues.

As mentioned above, T Watch provides PRTR information for citizens. MOE and METI compile the data reported by BOs by prefectures and by industries for the chemical substances, and they calculate the Estimated Releases Outside Notification. Although the data reported by individual BOs are available on CD-ROM (it only became possible to download this from a website since 2009), it is not easy for citizens to access the information they want from the big spreadsheet format given by the government. Citizens would like to find out the environmental risks of the region where they live in an easier manner.

In order to respond to such demands, it is necessary to understand the quantities of the various chemical substances released in municipal communities, to score the

relative toxicity of these substances, and to calculate environmental risks by multiplying the quantities and the toxicity scores. As T Watch cannot do all the necessary work alone, it has been cooperating with the Organization for Research and Communication on Environmental Risk of Chemicals (nicknamed Eco-Chemi and which will be described later).

Table 1 shows contents of T Watch's website (<http://www.toxwatch.net/>).

Note: Currently, T Watch is creating a website in English by (partly) translating its website.

1. About PRTR (Explanation about the system, laws, usage and glossary)
2. PRTR database search (provides access to the original national data provided by MOE) *site search --> PRTR Database search *Interpretation and notes on the data
3. PRTR processed information -- > links to websites operated by the national government and by Eco-Chemi.
4. Information about designated chemical substances *toxicity and material information -- > links to websites operated by Eco-Chemi *Usage and products database (<i>under construction</i>)
5. Consultation and questions (Lists of questions to ask local BOs how to communicate with BOs, and question forms to local BOs)
6. Introduction to PRTRs in other countries (Guidance for citizens on how to use foreign websites)
7. Update on domestic and international chemical substance management policies

Table 1. Contents of T Watch's site as of Aug. 31, 2010

□ T Watch HP (<http://www.toxwatch.net/>)

□ To Search for PRTR Data in English

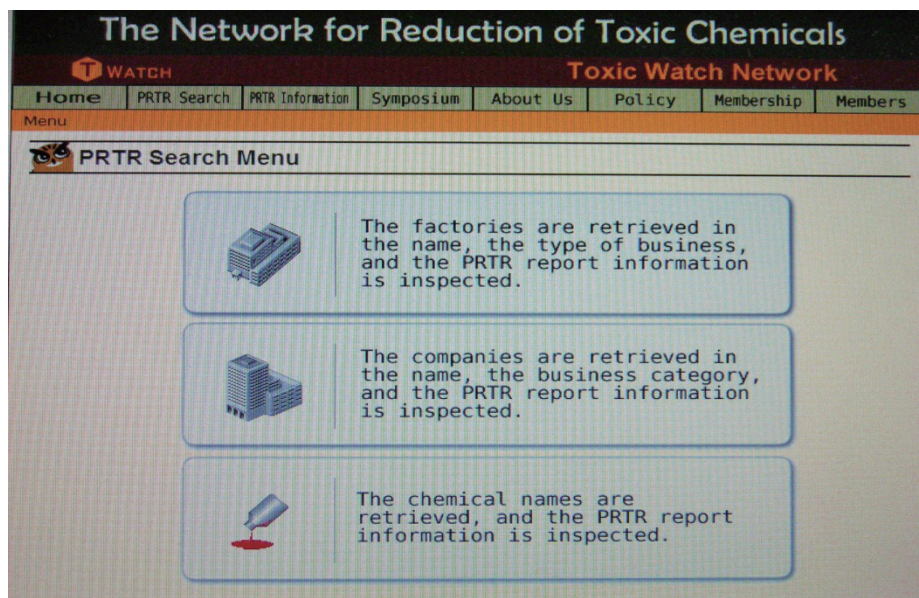


Chart 7. A screen shot of the T Network website, accessed on Aug. 31, 2010.

(2) The role of Organization for Research and Communication on Environmental Risk of Chemicals (Eco-Chemi)

Eco-Chemi is an academic organization of scholars and business persons working on chemical substances and the environment. Eco-Chemi is mainly operated and managed by Professor Urano and Dr. Kameya's laboratory at Yokohama National University. The laboratory offers information to the public, such as data on releases of PRTR substances, the use of pesticides by prefectures or by municipal communities, reference concentrations for air and water quality, and toxicity scores calculated based on information about human carcinogenicity, ecotoxicity, and sensitizing properties (17).

Table 2 shows the information available on Eco-Chemi's website.

1.Released and transferred amounts from BOs with reporting requirements (other than pesticides), by media and in total for respective substances
2.Released amounts from and used amounts by BOs without reporting requirements and NPSs, by media or by purpose of use for respective substances
3.Amounts of agricultural pesticides (active substances) by usage
4.Amounts of non-agricultural pesticides by purposes of use
<p>5.Released amounts from BOs with reporting requirements with toxicity scores (other than agricultural pesticides)</p> <ul style="list-style-type: none"> - Released amounts into air with human toxicity scores <ul style="list-style-type: none"> ● List of five main substances according to released amounts and toxicity scores by prefecture, these parameters are illustrated separately ● List of five main substances for top 200 municipal communities according to releases and toxicity scores - Released amounts into water with human toxicity scores <ul style="list-style-type: none"> ● List of five main substances by prefectures according to releases and toxicity scores ● List of five main substances for top 200 municipal communities regarding release with toxicity scores - Released amounts into water with toxicity scores for aquatic organisms <ul style="list-style-type: none"> ● List of five main substances by prefectures according to release amounts and toxicity scores ● List of five main substances for top 200 municipal communities according to releases and toxicity scores - Amounts of agricultural pesticides used with toxicity scores <ul style="list-style-type: none"> ● Amounts used with human toxicity scores ● List of five main substances with amounts used with toxicity scores by prefectures ● Amounts used with toxicity scores for aquatic organisms ● List of five main substances with amounts used with toxicity scores by prefectures

Table 2. Website operated by Eco-Chemi as of Aug. 31, 2010

8. Overview of the PRTR in Korea

Korea introduced a PRTR system earlier than Japan, from 1996. The Korean system is called Toxic Release Inventory (TRI) (18). At the “Symposium regarding international trends for chemical substances” held by MOE of Japan in March 2007 (19), a manager for the Chemical Substance Safety Department in the Ministry of Environment of the Republic of Korea described the TRI as a system which imposes duties on corporations to report quantities of chemical substances released into the environment during production and use. Corporations shall also report amounts transferred for the purposes of recycling and disposal. The Korean TRI covers 388 chemical substances and sites which deal with or produce more than 100 kg of chemical substances must report the amounts. It was also reported that, while the handling amounts were 372,250 tonnes and the released amounts were 16,243 tonnes in 2001, in 2005 the handling amounts were 454,910 tonnes and the released amounts were 7,750 tons. Although the handling amounts had increased by 22.2%, the released amounts were drastically reduced by 53.5% (20).

According to a survey conducted in 2006, the number of sites which reported data was 2,829.

A unique feature of the Korean TRI system is that the registered data has not been disclosed since 1996 when the system was introduced, while European countries, the U.S. and Japan all publish their data through various media such as websites, CDs and reports. The Korean MOE shows only the total handling amounts and release amounts (aggregated at the national level) on their website. These data are published (in PDF files) in Korean (21).

T Watch visited Korea in March 2010 for research and found that even citizen groups working on environmental issues did not know of the existence of the TRI system because the Korean government does not make the data public.

Although English pages of the Korean MOE website claim (21) that the government has started to disclose registered data for 280 corporations, there were no links to such pages. When the author visited Korea in March 2010, the author tried to access the TRI website but could not access any data pages, not even in Korean.

9. Recommendations on introducing PRTRs to Asian Countries

When introducing PRTR systems to countries where there are often many small and medium-sized enterprises, governments should adopt the system of estimation of releases from such smaller sites, as the Japanese government does. Governments will need to conduct on-site inspections to calculate the quantities in use and releases from those sites. The results can then be used as a basis for estimation of releases from small and medium-sized enterprises all over the country.

Before implementing a PRTR system, governments should conduct pilot programs for approximately three years. The Japanese government initiated a three-year PRTR pilot program in 1998, before the official launch of the system in 2001. In the last year of the pilot program, the Japanese government asked approximately 2,000 sites in 30 prefectures to report their releases on a voluntary basis. This amounted to 5% of all sites with reporting requirements and the number of persons in charge and involved in the program was rather limited. Nevertheless, it is considered that the pilot program greatly facilitated full implementation of the PRTR system.

There are many subsidiary companies of European or Japanese group companies in Asian countries. When PRTR systems are introduced in Asian countries, they should be designed to require corporations to satisfy the same standards as their parent corporations in Europe or Japan in order to avoid double standards. Such standards should be applied not only to reported releases of chemical substances but also to environmental reports and MSDS.

In Japan, quantities being handled at a site are not disclosed due to strong opposition by industry. However, handling amounts are crucial to assess appropriately on a per unit basis whether the reported data are accurate and whether reduction of releases has been promoted. These handling amounts should be reported in addition to released amounts.

References

(Please note: All the URLs shown below are valid as of Aug 29, 2010)

- 1) Shigeharu Nakachi, Environmental Information Science, Vol.32 No.2, 2003.
<http://sciencelinks.jp/j-east/article/200318/000020031803A0541466.php>
- 2) A sub-committee to promote measures for pollution prevention under the Joint Committee of the Air Environment Committee and Water Environment Committee, Central Environment Council. <http://www.env.go.jp/council/41air-wat/yoshi41-01.html>

(Japanese only).

3) With regard to PRTR in Japan, the MOE website has pages called “PRTR information plaza Japan”. <http://www.env.go.jp/en/chemi/prtr/prtr.html> (in English), and <http://www.env.go.jp/chemi/prtr/risk0.html> (Japanese).

NITE (National Institute of Technology and Evaluation) also operates web pages called “Chemical Management Field”. English pages are available at <http://www.safe.nite.go.jp/english/index.html>

4) Shigeharu Nakachi, Environmental Information Science, Vol.32 No.2, 2003. <http://sciencelinks.jp/j-east/article/200318/000020031803A0541466.php>

5) Ministry of Environment Report “Countermeasures toward Reduction of Environmental Risk by Chemical Substances” (June 4, 2010) http://www.env.go.jp/council/02policy/y027-10/mat01_3.pdf

6) Method of estimation for Estimated Releases Outside Notification can be downloaded from MOE’s website. http://www.env.go.jp/chemi/prtr/result/todokedegai_siryo.html (Japanese only)

PRTR data for each fiscal year can be downloaded from the websites below.

2001 http://www.env.go.jp/chemi/prtr/result/past_gaiyoH13.html

2002 http://www.env.go.jp/chemi/prtr/result/past_gaiyoH14.html

2003 http://www.env.go.jp/chemi/prtr/result/past_gaiyoH15.html

2004 http://www.env.go.jp/chemi/prtr/result/past_gaiyoH16.html

2005 http://www.env.go.jp/chemi/prtr/result/past_gaiyoH17.html

2006 http://www.env.go.jp/chemi/prtr/result/past_gaiyoH18.html

2007 http://www.env.go.jp/chemi/prtr/result/past_gaiyoH19.html

2008 <http://www.env.go.jp/chemi/prtr/result/gaiyo.html>

The data reported by BOs can be downloaded from either of two websites.

- i) The Japanese government’s site. Users must download a program called “Kensakun” to access the data. The site is only available in Japanese.

<http://www.env.go.jp/chemi/prtr/kaiji/index.html>

- ii) The T Watch site. This has a searchable database. Available search fields are corporation names, factory names, and names of chemical substances. English pages are limited, but T Watch is working on a complete translation.

<http://www.toxwatch.net/en/Default.htm>

7) Gen Nakaminami, Environmental Monitoring, No.85, 2002 (Japanese only)

8) Shigeharu Nakachi, Journal of Environmental Conservation Engineering, Vol.39 No.4, 2010 (Japanese only).

9) Statistics on automobile production amounts, Japan Automobile Manufacturers

Association, Inc.

http://www.jama-english.jp/statistics/production_export/2010/index.html

10) Statistics on production and exports/imports of electronic equipment, Japan Electronics and Information Technology Industries Association -

<http://www.jeita.or.jp/english/stat/index.htm>

11) Statistics on raw steel production, Japan Iron and Steel Federation Website

<http://www.jisf.or.jp/en/statistics/index.html>

12) Websites by municipal governments actively working on a PRTR system:

Kanagawa prefecture,

http://www.pref.kanagawa.jp/osirase/05/0515/kagaku/prtr/index_prtr.html

Tokyo Metropolitan, <http://www2.kankyo.metro.tokyo.jp/chem/tekisei/tekiseikanri.htm>

Saitama Prefecture, <http://www.pref.saitama.lg.jp/page/kagaku-tekiseikanri.html>

13) A sub-committee for Chemical Substances Environmental Management, Environment and Health Division, Central Environment Council

<http://www.env.go.jp/council/05hoken/y055-07.html> Japanese only

14) Expert discussion regarding “Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof” (Japanese only).

<http://www.env.go.jp/chemi/prtr/archive/kondankai/houkokusyo/houkokusyo.html>

15) Expert committee regarding PRTR designated substances. Environment and Health Division, Central Environment Council

<http://www.env.go.jp/council/05hoken/yoshi05-06.html> (Japanese only)

16) Users must download a program called “Kensakun” to access the data. The site is only available in Japanese. <http://www.env.go.jp/chemi/prtr/kaiji/index.html>

17) Website of Organization for Research and Communication on Environmental Risk of Chemicals. <http://www.ecochemi.jp/> (Japanese only)

18) In MOE site information:”A List of Documents for Tripartite Information Exchanges (Republic of Korea)”. http://www.chemical-net.info/pdf/Korea_list_e.pdf

19) Lecture information from “Latest Trends of Chemicals Management in North America, Europe and Asia” hosted by MOE on March 30, 2007.

<http://www.env.go.jp/chemi/reach/second.html> (Japanese only)

20) Chemicals management policy in Korea.

http://www.chemical-net.info/pdf/Korea_Lee_e.pdf

21) Korean TRI data. <http://ncis.nier.go.kr/triopen/>

22) Announcement by Korean MOE about the latest Korea TRI Data.

http://eng.me.go.kr/board.do?method=view&docSeq=8564&bbsCode=new_news