National Waste Data System
System Summaries –
National Pollutant Inventory

Department of Sustainability, Environment,
Water, Population and Communities
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Report

Report preparation

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Introduction

Background

A new *National Waste Policy: Less Waste, More Resources* (the Policy) was agreed upon by Australia's environment ministers in November 2009. The Policy includes 16 strategies that will be implemented over ten years. Strategy 16 covers the design and development of an online, accessible and up-to-date National Waste Data System (NWDS) for Australia, to support a periodic (three-yearly) National Waste Report.

Purpose

There are a number of Australian government models in place that capture environmental data, including waste data. It is prudent to review these systems to identify any alignment with the objectives of the NWDS and to capture learnings from the development and management of these systems. The three systems being reviewed are:

- The National Greenhouse and Energy Reporting Scheme (NGERS)/ the Online System for Comprehensive Activity Reporting (OSCAR)

- The National Pollutant Inventory (NPI)

- The Australian Bureau of Statistics' approaches to, and systems for, waste and recycling data.

The review consisted of desktop research, a system walk-through and interviews with the system operators.

Four reports have been produced as outputs of this project:

- Three systems summaries, each profiling one of the systems listed above (including this report)

- An integration opportunities report outlining opportunities for integration and learnings.

The National Pollutant Inventory

Description

The National Pollutant Inventory (NPI) tracks pollution across Australia, to ensure that the community, industry and government have access to free information about the emission and transfer of toxic substances which may affect them.

The NPI provides data on emissions estimates for 93 substances, and the source and location of these emissions that have been identified as important due to their possible effects on human health and the environment. The data comes from a variety of facilities including mines, power stations and factories, and other sources, such as households and transport. More than 4000 facilities from a wide range of industry sectors report annually to the NPI[1]. Examples of reportable substances include mercury, lead and carbon monoxide. These substances can be emitted to air, land or water.

Data for the 12th year, covering the 2009–10 financial year, was published on 31 March 2011.

History and development of use

A history of international industrial accidents at chemical plants and growing awareness and concern about the consequences of certain substances on surrounding communities led to the introduction of the NPI under the *National Environment Protection (National Pollutant Inventory) Measure* (NPI NEPM), effective from 1 July 1998.

Prior to the introduction of the NPI, data on pollutants was reported in the Pollutant Release and Transfer Registers (PRTR). The PRTR was introduced following an explosion and fire at the Coode Island hazardous chemical storage facility in Melbourne in 1991, in response to demands about the community's 'right-to-know' about possible health and safety hazards.

In June 2007, the NPI NEPM was varied to enable it to operate as a tool for environmental management and cleaner production. This variation included mandatory reporting of NPI substances in waste transferred to a destination for containment or final disposal. A further change was the inclusion of greenhouse gas emissions reporting. This was an interim measure, pending the establishment of a national purpose-built greenhouse gas reporting mechanism under the *National Greenhouse and Energy Reporting Act 2007 (Cwlth)* (NGERS Act) in 2007. In 2008, once the NGER Act was introduced, the NPI NEPM was varied to remove greenhouse gas and energy reporting requirements.

Work on the NPI started substantially in 1995, three years prior to its introduction, and was guided by a number of working groups including the National Environment Protection Council (NEPC); a non-government organisation advisory group to represent industry, environment and community concerns; and an independent Technical Advisory Panel. Public meetings and workshops were also

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[1] http://www.npi.gov.au/substances/index.html

held across Australia. Trials of the process for compiling and presenting NPI data were carried out in two locations.

From 1998 to 2007, the reporting system utilised by the NPI comprised of a separate database in each state, maintained by the state and territory environmental agency, supported by a system called the National Reporting Tool (NRT), developed by EPA Victoria. EPA Victoria provided all users with a database file and the NRT software for installation on their computer. This process posed many challenges as not all users were able to install the software on their computer and email security often rejected the email containing the database file. Once completed, users provided their database file to the state and territory jurisdictions for validation and the data was then transferred to the Australian Government.

The Australian Government was advised by an external business analyst on the re-design of the system and also on the inclusion of processes that were required as a result of the NEPM revisions introduced in 2007. The re-designed system prototypes were presented to user testing groups, consisting of representatives from state and territory jurisdictions and industry.

User feedback at these prototype demonstrations was recorded and a risk assessment was carried out for a select number of suggestions to understand whether their inclusion would improve or harm system stability.

In early 2008, a redesigned web-based NPI reporting system was introduced. The system could be run from a single server maintained by the Australian Government, rather than requiring the states and territories to maintain multiple databases.

The system re-design is depicted in Figure 1

Single system on server maintained by Australian Government

- Consolidates data - reduces no. of databases and data transfer, one database for collection and public disclosure
- Eliminates technological obstacles and the need to install software on user's computer
- Reduces data management and administrative overheads
- Uses technologies available to Australian Governement- interface with GIS
- Improves data quality - standardised validation
- Makes reporting easier through the use of calculation tools, pre-population of data, etc.
- Enables a step-by-step data collection process
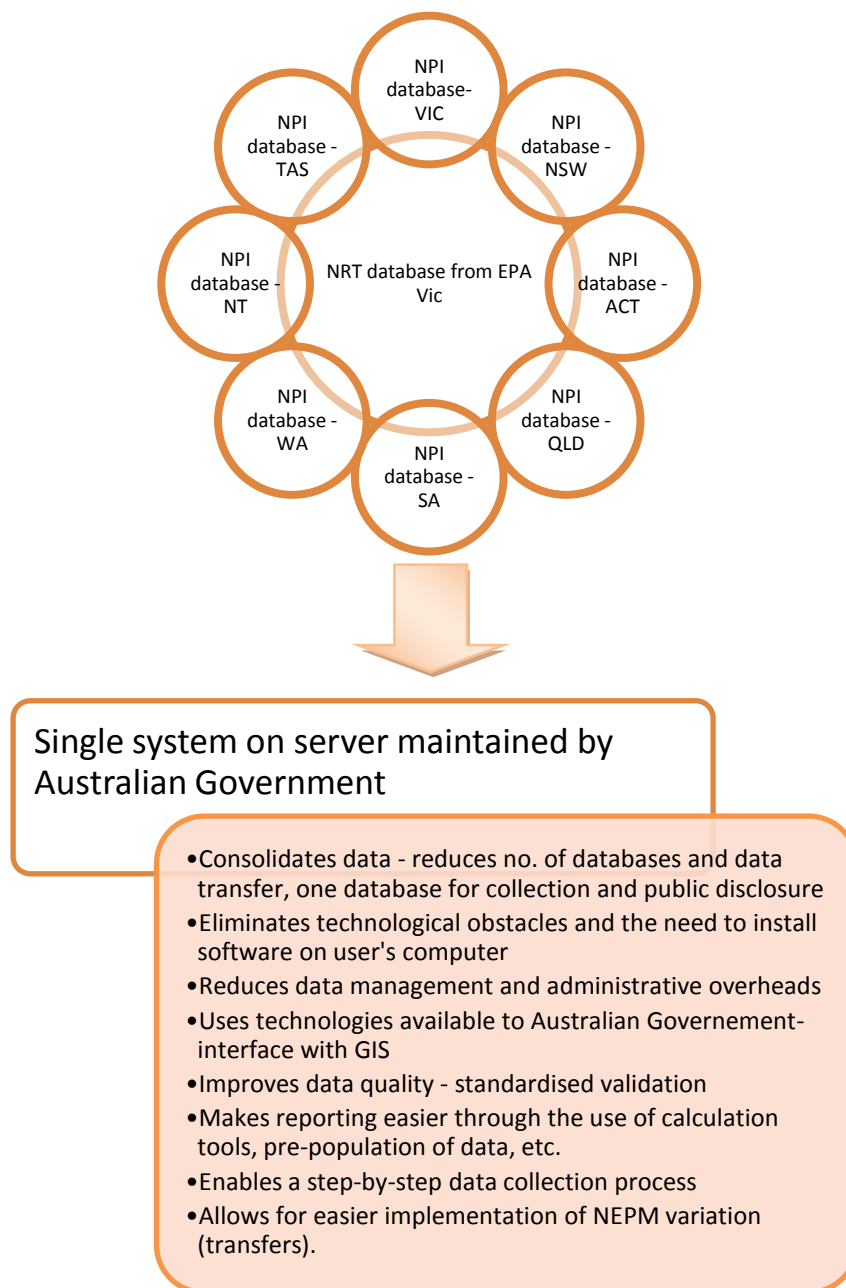- Allows for easier implementation of NEPM variation (transfers).

Figure 1: NPI System Re-design

Key objectives and design attributes

Tracking pollution through the NPI is essential to:

- enhance environmental quality

- increase public and industry understanding of the types and quantities of toxic substances emitted into the environment and transferred off-site as waste

- encourage industry to use cleaner production techniques to reduce emissions and waste generation

- track environmental progress

- meet community right-to-know obligations

- assist government in identifying priorities for environmental decision-making[2].

The NPI is designed to be a resource that enables emitters to determine and submit information about emissions, and allows the community to access this information. The NPI database is hosted on an Australian Government website at www.npi.gov.au. The NPI consists of an:

- online reporting system which is accessible only to registered users and system operators

- the public website through which emissions data is retrieved by interested parties.

A range of information is published on the public website to inform and educate users and other readers on pollution and the purpose and functions of the NPI, for example, user guides, links to other relevant websites, resources for teachers and students.

Data system structure, architecture and business requirements

The NPI provides access and information based on the rights of the user, as determined by the system operator. The different user groups include:

- State and territory jurisdictions- can access data for facilities in their jurisdiction once submitted, records where the user has indicated that they require assistance, and has search and report functionalities.

- System operators- the Australian Government has full access rights.

- Registered users- typically emitters who must submit emissions data to the NPI. These users must apply for registration, and are then provided with a username and password to access the Online Reporting System on the NPI website to submit emissions data. There are two levels of access – reporters can enter data and coordinators can enter data and submit the report[3].

- Other users, such as the community, industry and other areas of government. These users have access to emissions data that is published on the NPI website.

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[2] http://www.npi.gov.au/npi/index.html

[3] http://www.npi.gov.au/reporting/index.html#lodging

Online reporting system

The NPI online reporting system enables registered users to view, edit and submit their NPI report via the internet. The online reporting system pre-populates data in the report template based on the report entered by the user for the previous year, which the user must check, and if necessary, edit before submission. The system also contains a suite of calculation tools (in Microsoft Excel format) for download to estimate emissions from the facility. Standardised, nationally consistent validation alerts the user to any potential problems in their report[4].

The NPI reporting period is from 1 July to 30 June each year. Most facilities are required to submit data to the NPI by 30 September each year[5].

Technical support for the Online Reporting System and calculation tools is available through help files accessible through each screen of the system, a user guide and by contacting the state and Commonwealth governments[6].

Paper reporting forms are available for users who cannot or do not wish to use the online reporting system[7]. These forms are submitted to the state or territory jurisdiction for manual data entry. The majority of registered users submit their data using the online reporting system.

It is possible for registered users to directly integrate their in-house data systems with the NPI online reporting system. Users can upload their report to the online reporting system, and then log in to the online reporting system to validate, certify and submit reports. This functionality is particularly useful for registered users who submit large numbers of reports each year or users who already have in-house systems in place[8].

Public website

The public website enables the user to access current and historical data by:

- location

- industry (Australian and New Zealand Standard Industrial Classification [ANZSIC]group)

- company

- substance

Data can also be searched for by map and by form.

Data is transferred from the online reporting system to the public website in March each year. The data entered into the online reporting system is filtered to remove any data that is commercial- in-confidence or related to national security. The functioning of the NPI system is depicted in Figure 2.

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[4] http://www.npi.gov.au/reporting/index.html#lodging

[5] http://www.npi.gov.au/reporting/index.html#lodging

[6] http://www.npi.gov.au/reporting/index.html#lodging

[7] http://www.npi.gov.au/reporting/forms.html

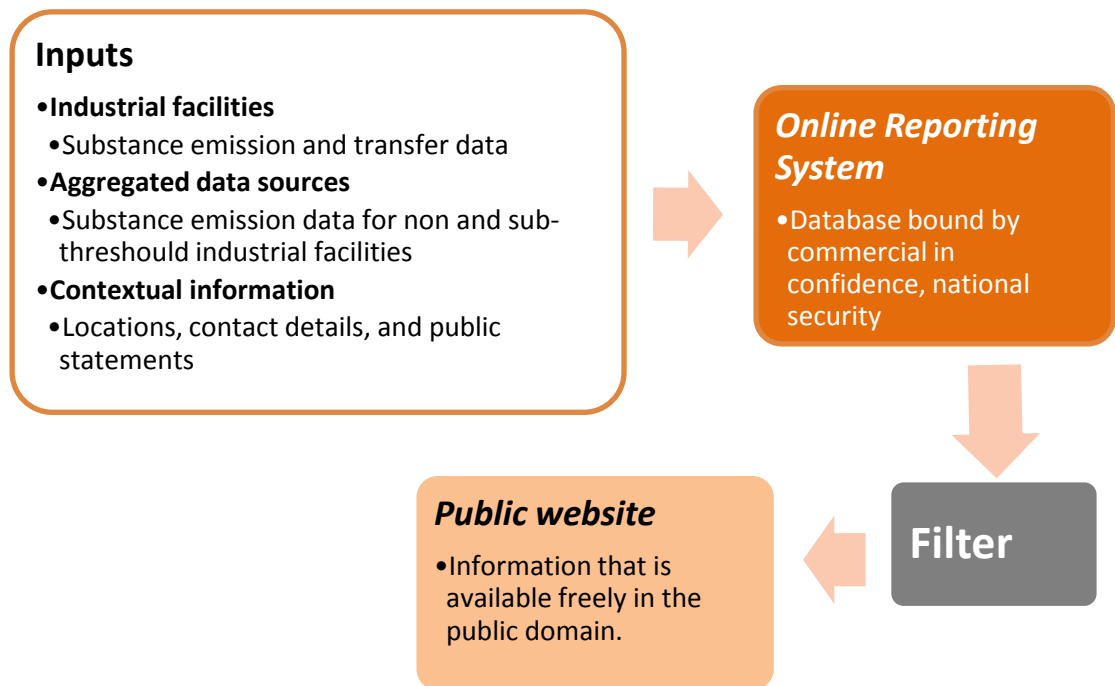[8] http://www.npi.gov.au/publications/pubs/web-service.pdf

Figure 2: The functioning of the NPI system

Supportive legislation

Each state and territory environment protection agency across Australia is responsible for implementation of the NPI NEPM in their jurisdiction. State and territory environment protection agencies have their own legislative frameworks to ensure there is compliance with the NEPM. These frameworks are outlined in Figure 3.

NPI NEPM - provides the framework for the development and establishment of the NPI

ACT
- Implemented NPI through amendments to the *Environment Protection Act 1997*.
- Responsibility lies with ACT Dept. of Environment, Climate Change, Energy and Water.

NSW
- Responsibility lies with NSW Dept. of Environment, Climate Change and Water (DECCW).
- Implements NPI under provisions of the *Protection of the Environment Operations (General) Regulation 1998*.

Northern Territory
- Implemented through an Environmental Protection Order (EPO) established under the *Waste Management and Pollution Control Act 2003.*
- Responsibility lies with Environment Protection Agency Program, Dept. of Natural Resources, Environment, the Arts and Sport.

QLD
- Implemented under the *Environmental Protection Act 1994* and Environmental Protection Regulation 1998.

SA
- Implemented under the *Environment Protection Act 1993 (SA)*. SA Equivalent is *Environment Protection (National Pollutant Inventory) Policy 2008.*
- Responsibility lies with the Environment Protection Authority (EPA).

TAS
- Implemented under Section 12A of the *Tasmanian State Policies and Projects Act 1993 and* Environmental Management and Pollution Control Act 1993.

VIC
- Implemented under the *Environment Protection Act 1970 and the* Industrial Waste Management Policy (National Pollutant Inventory) 1998.
- Responsibility lies with EPA Victoria.

WA
- Implemented through the Environment Protection (NEPM NPI) Regulations 1998, under the *Environmental Protection Act 1986*.
- Responsibility lies with the Department of Environment and Conservation.

Figure 3: Legislation system backing the NPI

All jurisdictions must report annually to the National Environment Protection Council on their progress in implementing the NEPM. This information is published in an annual report[9].

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[9] http://www.npi.gov.au/npi/review/index.html

Roles and responsibilities of system operators

Industry
- Report their emissions and transfers if they exceed the NPI thresholds.

State and territory environment departments
- Validate the data and develop the aggregated emissions data which is used to provide context to the industrial emissions.

The Australian Government
- Publication of the data each year.
- Provide support including the development, maintenance of systems.
- Provide manuals to help industry report.

Implementation Working Group (IWG)
- Each of the states and territory governments and the Australian Government provide a representative to be part of the IWG. This group is responsible for dealing with implementation and technical issues with the program. On average, the group meets about 3 times per year.
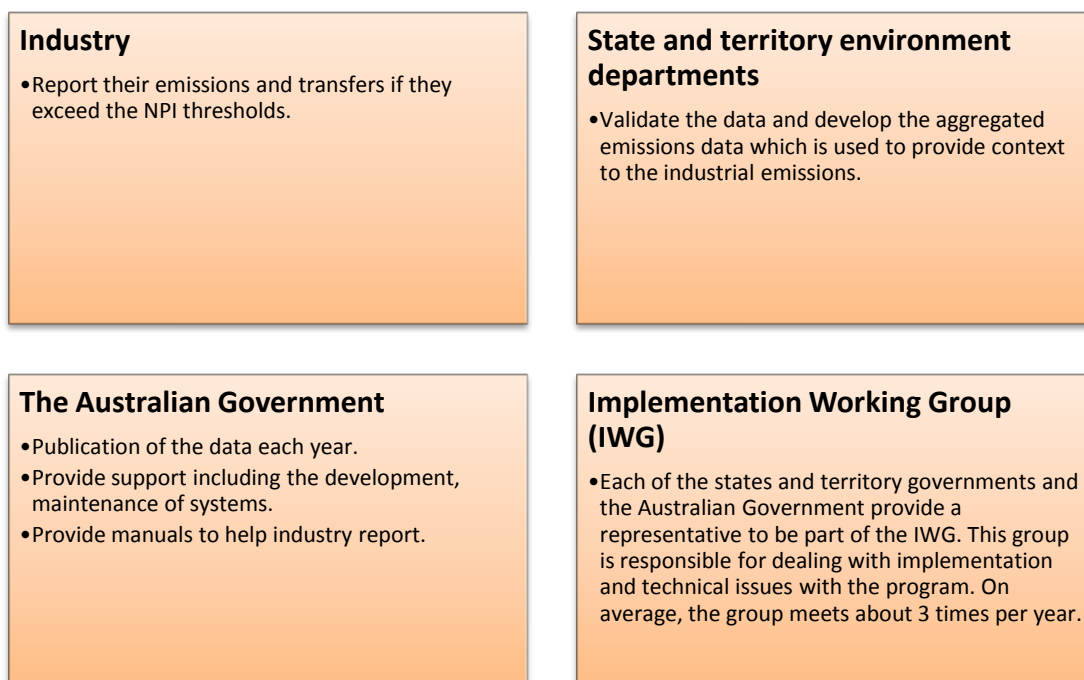
Figure 4: Roles and responsibilities within the NPI

Costs associated with system operation and maintenance

Cost to government

Nominally, the NPI receives approximately $2.2 million funding annually. Approximately 55% of which is from the Australian Government, with the remaining funding requirements divided between the states and territories, with larger states providing the bulk.

The development of the system required a multi-million dollar investment covering the development of the system, servers for hosting the IT system and establishment of the public website and public database. A 2005 report lead by Environment Link[10] states that costs to governments from 1997–98 to 2001–2002, which is nominally the establishment phase, totalled $14million (p51).

The Environment Link report[11] indicates that there was a strong perception across jurisdictions, industry and community groups that the program was under funded. An independent assessment conducted for the system operator indicated that annual expenditure was half what was considered necessary and that the shortage of resources had contributed to current system issues.

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[10] Environment Link in conjunction with CH Environmental and JD Court and Associates, April 2005, Review of the National Pollutant Inventory, http://www.npi.gov.au/publications/pubs/npi-review290405.pdf.

[11] Environment Link in conjunction with CH Environmental and JD Court and Associates, April 2005, Review of the National Pollutant Inventory, http://www.npi.gov.au/publications/pubs/npi-review290405.pdf.

Cost to industry

Some costs have been reported by industry: the 2005 report by Environment Link estimated that a cost to industry of $3000 per facility was a reasonable approximation. Based on this assumption and a nominal facility count of 4000, the cost to industry was estimated to be approximately $12 million annually.

Limitations

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