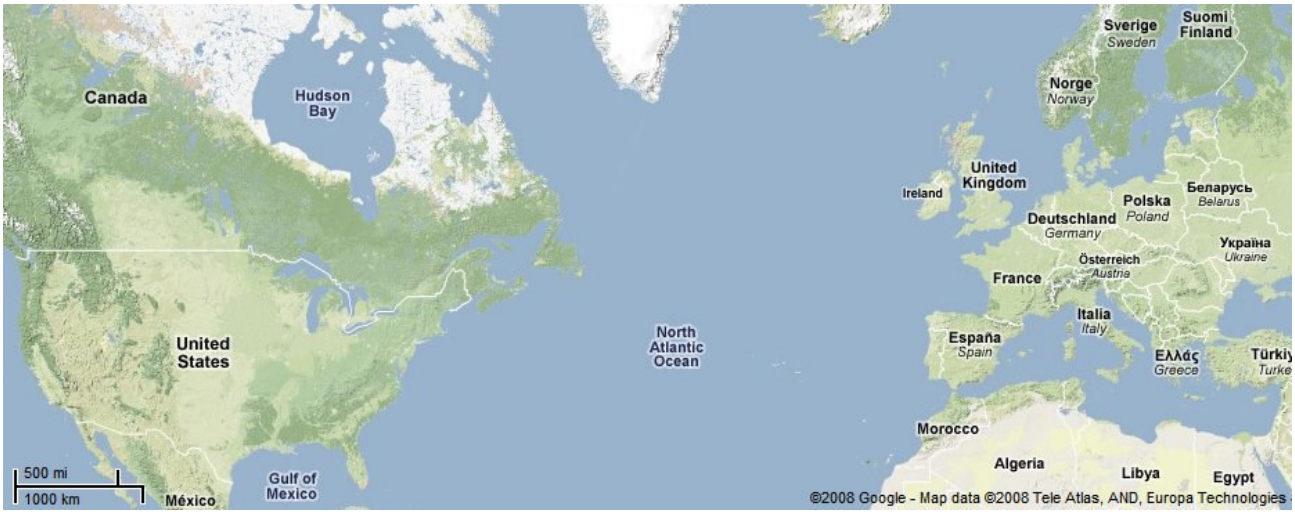
Across the Pond

ASSESSING REACH'S FIRST BIG IMPACT ON U.S. COMPANIES AND CHEMICALS



September 2008
Updated January 2009

ENVIRONMENTAL DEFENSE FUND
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Acknowledgments
I wish to thank Allison Cobb who assisted in editing the report and Leslie Valentine who developed the webpage for the report and associated documents.

Of course, the views expressed herein, as well as any mistakes and omissions, are solely my responsibility.

Finally, I wish to gratefully acknowledge funding support from the Beldon Fund and The Johnson Family Foundation.

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ASSESSING REACH'S FIRST BIG IMPACT ON U.S. COMPANIES AND CHEMICALS

SEPTEMBER 2008
UPDATED JANUARY 2009

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ENVIRONMENTAL DEFENSE FUND
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Preface—Why the Update?

This report was updated in January 2009 to incorporate new data from the 2006 reporting cycle under the Inventory Update Rule (IUR), which was finally released by the U.S. Environmental Protection Agency on December 30, 2008. The new data reflect production and import for calendar year 2005. The first version of *Across the Pond*, released in September 2008, utilized data from the 2002 IUR reporting cycle, reflecting production and import in calendar year 2001. Following this preface, the remainder of this updated report, as well as the accompanying data tables, now reflect data from 2006 IUR reporting cycle.

This preface and Appendix 1 describe differences and changes between the two data sets. Two major changes in the reporting rules from 2002 to 2006 are important to understand:

- The volume threshold for reporting was raised from 10,000 pounds per site in the 2002 reporting cycle to 25,000 pounds per site in the 2006 cycle. Companies below these thresholds were not required to report their production or import. For this reason, the number of chemicals reported dropped significantly in the 2006 cycle.
- For the first time in the 2006 cycle, inorganic as well as organic chemicals were required to be reported (if above the volume threshold). Hence many additional inorganic chemicals (including some on the SIN List) appear in the new data, although not enough to offset the reduction in number of chemicals reported due to the raising of the volume threshold.

With respect to the SIN List chemicals, the overlap with the IUR chemicals changed considerably between the 2002 and 2006 cycles. Some SIN List chemicals reported in 2002 were not reported in 2006, and vice versa. While some of the observed differences are likely explained by the changes in reporting rules just noted, others are more mysterious.

Appendix 1 provides more details on the comparison of SIN List chemicals reported in 2002 and 2006.

Summary

The European Union's new chemicals regulation—Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)[1]—will require companies to *register* all chemicals they place on the EU market in amounts above one metric ton. EU government officials will have authority to *evaluate* these registrations to determine whether companies have demonstrated that production and use of their chemicals is safe. REACH's requirements apply not only to EU-based chemical producers and importers, but also to U.S. companies that export to the EU.

A hallmark of REACH is its identification of so-called "substances of very high concern" (SVHCs). REACH's intent is ultimately to subject SVHCs to *authorization*—that is, to allow them to be used only where each use has been specifically authorized. Chemicals meeting the criteria for SVHCs—whether made in the EU or imported from the U.S.—are to be placed on a "candidate list" of chemicals intended eventually to be subject to authorization.

As one of the first formal activities taking place under REACH, EU officials recently proposed an initial candidate list of SVHCs. The initial list contained only 16 substances, however, and while the list is expected to grow over time, 15 of the proposed chemicals were retained on the final version of the initial list.[2] In response, European environmental NGOs developed a longer list of nearly 300 chemicals that meet the SVHC criteria, which they have dubbed the "SIN List 1.0." SIN stands for "Substitute It Now," reflecting the groups' interest in promoting safer alternatives to SVHCs wherever possible.[3] The "1.0" suffix denotes that the list is not exhaustive and is a work in progress. This list is also the first public attempt to identify specific chemicals that qualify as SVHCs under REACH.

This report explores one of the first and most significant ways that REACH will impact the U.S.: It uses the SIN List to determine which chemicals and companies in the U.S. are likely to be affected by the development of the REACH candidate list and ultimately by authorization.

The analysis presented in this report supports the following findings:

Many, and likely most, SIN List chemicals are in active commerce in the U.S.

- **At least 80% of the SIN List chemicals appear on the U.S. Toxic Substances Control Act (TSCA) Inventory.**
- **A minimum of 37% of the SIN List chemicals are currently being produced or imported in the U.S. above 25,000 pounds annually.**

At least 77 SIN List chemicals are produced annually in amounts of one million or more pounds, and at least 14 exceed one billion pounds annually.

At least 235 companies are producing or importing SIN List chemicals in the U.S.

Some companies are associated with multiple SIN List chemicals—as many as 16 per company.

Many SIN List chemicals are produced or imported by multiple companies at numerous sites—as many as 41 companies at 62 separate sites.

SIN List chemicals are produced or imported in 42 states as well as Puerto Rico and the Virgin Islands, at as many as 100 sites per state. The number of SIN List chemicals per state varies from 1 to 48.

Only about one-third of the SIN List chemicals on the TSCA Inventory have been subject to testing or other data development programs under TSCA.

Only two SIN List chemicals have been subject to any regulation under TSCA, and even these only under narrow conditions.

Nearly all of the SIN List chemicals have already been formally designated by EU officials as meeting the criteria used to define substances of very high concern under REACH. REACH's stated intention is ultimately to allow the use of such substances only when specifically authorized on a use-by-use basis. In marked contrast, the U.S. Environmental Protection Agency (EPA) has undertaken only very limited activity to address these chemicals.

Taken together, our findings suggest that REACH's focus on SVHCs can be expected to have a major impact on chemical production and use in the U.S. and on the companies that make, export or import chemicals. Hundreds of companies in the United States produce or import hundreds of chemicals designated as dangerous by the European Union (EU), and hence will be directly impacted by controls imposed on such chemicals under the EU's new chemicals regulation.

Introduction

REACH, the European Union's sweeping chemicals policy reform, took effect last year. A hallmark of REACH is its identification of so-called "substances of very high concern" (SVHCs). REACH's intent is ultimately to subject SVHCs to *authorization*—that is, to allow them to be used only when specifically authorized.[4]

SVHCs are chemicals identified by REACH as:

- Carcinogenic, mutagenic or toxic to reproduction (CMR),[5]
- Persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB),[6] or
- Identified, on a case-by-case basis, as causing effects to human health or the environment of an *equivalent level of concern* as those above (e.g. endocrine disrupters).[7]

Chemicals meeting these criteria are eligible to be placed on a "candidate list" of chemicals intended eventually to be subject to authorization.

One of the first formal activities taking place under REACH is the development of the initial "candidate list." The European Chemicals Agency (ECHA) intends to publish the first version of this list by the end of October 2008. To that end, in June ECHA proposed 16 substances for listing, presented dossiers developed by various EU member states, and invited public comment.[8] ECHA indicates that each of these chemicals meets the CMR, PBT or vPvB criteria.[9] All of them already have been so designated officially by the EU authorities.[10]

The 16 chemicals proposed by ECHA for the first edition of the candidate list represent only a small fraction of the chemicals on the EU's official lists of SVHCs, however.[11] The International Chemical Secretariat (known as ChemSec), a Sweden-based nongovernmental organization (NGO), in cooperation with other EU NGOs, has developed its own version of the candidate list, in an effort to speed up the process of adding SVHCs to the official list. Representing the first public attempt to identify specific chemicals that qualify as SVHCs under REACH, and in acknowledgment that the list will change over time, ChemSec has dubbed its list the "SIN List 1.0".[12] SIN stands for "Substitute It Now," reflecting ChemSec's interest in promoting safer alternatives to SVHCs wherever possible.

The SIN List includes primarily CMRs, PBTs and vPvBs already designated by EU authorities, but also includes additional chemicals that ChemSec determined meet these criteria or those for substances of equivalent concern.[13]

The SIN List includes 267 entries, each for an individual chemical or a group of closely related substances:

- 220 are CMRs,
- 11 are PBTs, two of which are also vPvBs,
- six substances are both CMRs and PBTs and
- 30 are "equivalent concern" substances.

Why this report?

REACH's requirements will apply equally to EU-based chemical production and to import of chemicals into the EU. For this reason it will directly affect many U.S. chemical producers and users.

ChemSec's SIN List identifies chemicals that—based on already available data—can reasonably be expected to be subject to authorization under REACH. This report uses the SIN List to elucidate the potential impact of the candidate list and of REACH authorization on chemicals and companies in the U.S. We do so by exploring the following questions:

- Which of the SIN List chemicals are in commerce in the U.S.?
- In what amounts are these chemicals produced or imported in the U.S.?
- Which companies have reported producing or importing them, and at how many sites?
- In which states are SIN List chemicals produced or imported?

We also look at the extent to which SIN List chemicals have been or are being scrutinized or addressed by the U.S. Environmental Protection Agency (EPA). Specifically, we ask:

- Which of the SIN list chemicals have been tested in the U.S.?
- Which SIN List chemicals have been regulated by EPA, resulting either in limits placed on their production or use or in imposition of notification requirements? How many have been exempted from regulatory requirements?

Appendix 2 describes how we conducted our analysis and the sources of data we used.

Limitations to our analysis

Our analysis is based on the latest publicly available U.S. information provided by EPA (see Appendix 2). Unfortunately, this reliance constrains several aspects of our analysis. The three main limitations are the following:

- The most recent public data on U.S. chemical production and import are somewhat dated, as they were collected by EPA in 2006 for activity during the single calendar year 2005. Given the dynamic nature of the chemical market, both from year to year and between 2005 and the present, **some of the data we report here on chemicals, their production/import volumes and their associated companies may well have changed.**
- Any chemical produced or imported in the U.S. in an amount below 25,000 pounds per year at a given site was not required to be reported at all. Hence, EPA's data and our analysis do not include such chemicals or their producers/importers.
- Under TSCA, U.S. companies have wide latitude to claim information they report to EPA as confidential business information (CBI). EPA rarely challenges such claims and must not publicly disclose information claimed as CBI. Thousands of chemicals are not included in the public version of the TSCA Inventory because their producers have claimed the chemical identities to be CBI. Similarly, companies can also hide their own identities by claiming

their production or import of a chemical to be CBI. **Hence, the chemicals and companies we list in this report represent only the subset that are not claimed CBI**.

It is important to bear these limitations in mind when reading this report.

Analysis

1. Which SIN List chemicals are in commerce in the U.S.?

Finding: Many, and likely most, SIN List chemicals are in active commerce in the U.S.:

- **At least 80% of the SIN List chemicals appear on the U.S. TSCA Inventory.**
- **At least 38% of the SIN List chemicals were reported as produced or imported in quantities exceeding 25,000 pounds in 2005 (the most recent year for which EPA has collected data).**

Details: Our analysis utilized 283 distinct CAS numbers representing SIN List substances (see Appendix 2 for details). Of the 283 CAS numbers on the SIN List, 226 (80%) appear on the latest (July 2008) public version of the U.S. TSCA Inventory.[14] Hence, these chemicals have been in U.S. commerce at some time since the Inventory was developed in 1979. A list of these CAS numbers is provided in Table 1.[15]

This figure is likely an underestimate of the number of SIN List chemicals in the U.S. because:

- Certain types of chemicals are exempted from TSCA and hence would not have been reported at the time the Inventory was established.
- The identities of many chemicals on the TSCA Inventory are claimed confidential and hence do not appear on the public version.[16]

On the other hand, not all of these chemicals may currently be in commerce in the U.S. Because it is a cumulative listing over time, the TSCA Inventory contains an unknown but likely significant number of chemicals no longer in active production or use.

Unfortunately, EPA updates the TSCA Inventory infrequently and in a partial manner. Starting in 1986, when EPA promulgated the Inventory Update Rule (IUR), companies were required to report to EPA once every four years the identity of and volume of each non-exempt organic chemical substance they produced or imported in annual amounts of 10,000 pounds or more at each site they owned or controlled. Beginning in 2006, however, the reporting frequency was reduced from once every four to once every five years, and the volume threshold was raised from 10,000 to 25,000 pounds per year per site. IUR information applies only to the one year preceding the reporting year.[17]

Based on the most recent publicly available IUR data, collected in 2006 and reflecting 2005 activity, 107 (38%) of the SIN List CAS numbers were reported as produced or imported above the IUR threshold of 25,000 pounds. See Table 1.

This number is likely an underestimate of the number of SIN List chemicals in active commerce in the U.S. because:

- It is very likely that some of the SIN List chemicals are produced or imported in amounts below the 25,000 pound reporting threshold. In general, the number of chemicals produced or imported is greater for smaller volumes.
- Some categories of chemicals and companies have been exempted from IUR reporting.[18]
- Chemicals with identities claimed confidential do not appear on the public version of the IUR database.[19]

Changes in production volume since 2005 may also influence our count. Some chemicals below the reporting threshold in 2005 may now be above it, and vice versa. Extensive fluctuations have been documented in which chemicals are reported from one IUR reporting cycle to the next.[20]

2. In what amounts are SIN List chemicals produced or imported in the U.S.?

Finding: Many SIN List chemicals are produced or imported in substantial quantities in the U.S.

Details: Under the IUR, EPA requires companies to report the quantity of each chemical they produced or imported in amounts exceeding the reporting threshold. However, EPA only reports *aggregate* volume data to the public, summed up across all reporting producers and importers. Moreover, these data are only provided in broad volume ranges, further limiting their utility. Nevertheless, the IUR data do provide a rough estimate of the level of production and import of SIN List chemicals in the U.S.

For the 226 SIN List CAS numbers on the TSCA Inventory, Table 1 provides a breakdown of the number in each aggregate volume range. These can be assigned to EPA's even broader volume classifications of high-, medium- and low-production volume (HPV, MPV and LPV, respectively), as follows:

Production volume	Pounds per year	# of CAS numbers	% of total
High	>1 million	77[21]	34%
Medium	25,000—1 million	30	13%
Low	<25,000	119*	53%

* may include chemicals not currently in commerce

Note that, because LPV chemicals are not required to be reported under the IUR, some of the SIN List chemicals identified as LPV may not be in active commerce in the U.S.

Fourteen of the SIN List chemicals are produced and imported in the U.S. in huge quantities, exceeding one *billion* pounds annually. These chemicals are listed below:

Chemical name	CAS #
Bisphenol A	80-05-7
Styrene	100-42-5
Ethanol, 2-ethoxy-, 1-acetate	111-15-9
Formaldehyde	50-00-0
Aniline	62-53-3
1,3-Butadiene	106-99-0
1,2-Dichloroethane (aka Ethylene dichloride)	107-06-2
Acrylonitrile	107-13-1
2,4-Dinitrotoluene	25321-14-6
Carbon monoxide	630-08-0
Benzene	71-43-2
Vinyl chloride	75-01-4
Ethylene oxide	75-21-8
Propylene oxide	75-56-9

3. Which companies produce or import SIN List chemicals in the U.S.?

Finding: Many companies are involved in production or import of SIN List chemicals in the U.S. Some companies are associated with multiple SIN List chemicals, and many SIN List chemicals are produced or imported by multiple companies at numerous sites.

Details: A total of 235 companies reported producing or importing one or more SIN List chemicals in the U.S. in 2005. Of these, 114 companies reported producing such chemicals, while 135 reported importing them. Thirty-eight companies claimed as CBI the information as to whether they manufactured or imported a given chemical.[22]

Across the 235 companies, the number of SIN List CAS numbers publicly reported per company varied from 1 to 16. The top eight companies were as follows:

Company	# Manufactured	# Imported	# CBI	Total*
BASF Corporation	3	13	0	16
The Dow Chemical Company	11	11	0	14
E. I. du Pont de Nemours and Co.	9	5	0	12
Huntsman Corporation	4	6	0	9
Chemtura Corporation (formerly Great Lakes Chemical)	0	0	9	9
ICC Chemical Corporation	0	8	0	8
Ferro Corporation	5	2	0	7
Albemarle Corporation	4	4	1	7

* Numbers do not add to total because a chemical may be produced and imported by the same company.

Table 2 provides a full list of companies and the SIN List CAS numbers they reported producing or importing in 2005.[23]

One or more companies publicly reported producing or importing all but two of the 107 CAS numbers on the SIN List that exceeded the reporting threshold. For those two chemicals, the company or companies producing or importing them evidently opted to hide their identities by claiming their association with the chemicals confidential. It is also possible that additional companies produce or import other SIN List chemicals, but chose to mask their identity.

Finally, it is likely that the companies shown in Table 2 or companies not listed produced or imported these or additional SIN List chemicals, but cannot be identified because they fell below the reporting threshold or qualified for a reporting exemption.

This analysis demonstrates that a large number of companies are involved in production or import of SIN List chemicals in the U.S. Some companies are associated with many SIN List chemicals.

Similarly, many SIN List chemicals are produced or imported in the U.S. by many different companies and at numerous different sites. Below are listed the 12 SIN List chemicals for which production or import was reported at 13 sites or more:

Chemical name	CAS #	# Companies	# Sites
Benzene	71-43-2	41	62
Styrene	100-42-5	19	25
1,3-Butadiene	106-99-0	17	22
Formaldehyde	50-00-0	16	42
Ethylene dichloride	107-06-2	15	22
Nickel monoxide	1313-99-1	14	24
Hexane	110-54-3	13	15
Bisphenol A	80-05-7	10	13
Vinyl chloride	75-01-4	9	13
Ethylene oxide	75-21-8	9	13
Nonylphenol ethoxylate	9016-45-9	7	23
Carbon monoxide	630-08-0	4	14

Once again, these numbers should be viewed as minimums; they do not reflect companies or sites that hid their identities by claiming their association with these chemicals to be confidential.

Table 1 shows the number of companies manufacturing and importing each SIN List CAS number in the U.S., as well as the total number of sites involved.

4. In which states are SIN List chemicals produced or imported?

Finding: SIN List chemicals are produced or imported in 42 states as well as Puerto Rico and the Virgin Islands, at as many as 100 sites per state. The number of SIN List chemicals per state varies from 1 to 48. The number of states producing or importing a given chemical varies from 1 to 22.

Details: SIN List chemicals are produced or imported in more than four-fifths of U.S. states, as well as Puerto Rico and the Virgin Islands, typically at multiple sites within a state. Below are listed the eight states with the most SIN List chemicals; also listed are the number of sites of production or import for such chemicals in each state:

	# of Chemicals				*# of Sites*			
	Produced	Imported	CBI	Total*	Produced	Imported	CBI	Total*
Texas	29	31	10	48	65	35	8	100
New Jersey	8	26	3	35	6	12	3	21
Ohio	11	19	2	30	12	15	2	27
Louisiana	21	7	4	27	31	6	4	38
New York	2	22	3	25	2	12	2	15
North Carolina	8	9	6	22	10	5	2	16
Pennsylvania	12	13	2	20	10	11	2	21
Michigan	5	12	1	15	3	2	1	6

* Numbers do not add to total because a chemical may be produced and imported in the same state or site.

Table 3 shows the same data for all 42 states, Puerto Rico and the Virgin Islands.[24]

Some SIN List chemicals are produced or imported in many different states. Below are the six SIN List chemicals produced or imported in the most states:

		# of states			
Chemical name	CAS #	Produced	Imported	CBI	Total*
Formaldehyde	50-00-0	19	8	2	22
Nonylphenol ethoxylate (NPE)	9016-45-9	1	16	1	17
Benzene	71-43-2	13	8	3	16
Styrene	100-42-5	3	12	1	13
Di-(2-ethylhexyl) phthalate (DEHP)	117-81-7	3	6	1	10

* Numbers do not add to total because a chemical may be produced and imported in the same state.

As before, the numbers above should be viewed as minimums; they do not reflect companies or sites that hid their identities by claiming their association with these chemicals to be confidential.

Table 4 shows the SIN List chemicals produced or imported in each state, along with their associated companies.[25]

5. Which of the SIN list chemicals have been tested under TSCA?

Finding: Only about a third of the SIN List chemicals on the TSCA Inventory have been subject to testing or other data development programs under TSCA.

Details: Of the 283 SIN List CAS numbers, 234 (83%) are drawn from official EU lists of CMRs, PBTs or vPvBs.[26] These findings indicate that these chemicals have already been assessed, based on data deemed sufficient by EU authorities to determine that they meet the criteria defining SVHCs. The remaining 49 SIN List CAS numbers were added based on evidence that ChemSec deemed sufficient to indicate that the substances either meet CMR, PBT or vPvB criteria or satisfy the criteria for "equivalent concern." Of these, 13 have already been formally prioritized by EU officials as likely or potential endocrine disruptors.[27]

To what extent have data been developed for these chemicals under TSCA?

Mandatory testing
Since TSCA was enacted, EPA has subjected about 200 chemicals to mandatory testing using its Section 4 authorities, either through issuing test rules or including testing requirements in Enforceable Consent Agreements.[28] We found that 38 SIN List CAS numbers are among those subjected to mandatory testing by EPA (see Table 1 and Appendix 2 for details).

The amount of testing required for these chemicals has varied widely, from a test for single endpoints to more extensive testing. In very few cases, however, has EPA required the development of even a minimal base set of hazard data.

Voluntary testing
EPA has also pursued voluntary efforts to develop data, most notably through its HPV Challenge program.[29] We found that 77 of the SIN List CAS numbers are among the chemicals eligible for sponsorship under the Challenge (see Table 1 and Appendix 2 for details). Here is the status of these 77 CAS numbers:

- 72 have been sponsored:
  - 42 have been sponsored under the Challenge.
  - 30 more have been sponsored under a sister HPV program that operates under the auspices of the Organization for Economic Cooperation and Development (OECD).
- Five are not sponsored and are so-called "orphans."

Of the 72 sponsored HPV CAS numbers:

- 61 have final data sets (for those under the Challenge) or agreed assessments (for those under the OECD program).
- Nine are in the pipeline but have not been finalized.
- Two have not had even initial information submitted.

Both the Challenge and the OECD HPV programs are intended to develop a basic set of hazard data for each HPV chemical, called the Screening Information Data Set, or SIDS. This data set was developed through an international consensus process to constitute the minimum amount of data needed to conduct a screening-level hazard assessment for a chemical.[30] While most HPV chemicals with completed assessments appear to have such a minimum dataset, significant data gaps remain. Of the first 300 HPV chemicals assessed by EPA using the Challenge data, EPA found gaps remaining in the supposedly final data sets submitted for at least 35% of them.[31]

These two lists—38 CAS numbers subject to mandatory testing and 70 CAS numbers with completed or in-progress data development under the Challenge—overlap, with 28 CAS numbers on both lists. Taken together, then, 80 of the SIN List CAS numbers have been subject to a mandatory or voluntary testing or data development program under TSCA.

In sum, of the 226 SIN List CAS numbers on the TSCA Inventory, data have been or are being developed under TSCA for 35% (80 of 226) of them. Little or no data development appears to have occurred under TSCA for the remaining SIN List CAS numbers. This number is much smaller than the 234 SIN List chemicals already deemed by EU authorities to be sufficiently well-characterized to designate them SVHCs.

Fourteen additional SIN List CAS numbers that are not part of the HPV Challenge are sponsored under the OECD HPV program (see Table 1). Nine of these have final OECD assessments, while the other five are in earlier stages of data development.[32] Counting these, 94 of the SIN List chemicals have been or are being subject to some type of data development either in the U.S. under TSCA or through the OECD voluntary HPV program.

6. Which SIN List chemicals have been regulated by EPA, resulting in either limits placed on their production or use or notification requirements? How many have been exempted from regulatory requirements?

Finding: Only a small number of SIN List chemicals have been subject to any regulation under TSCA, and even these only under narrow conditions.

Details: A total of 12 CAS numbers on the SIN List have been subject to regulation under Section 6 of TSCA (see Appendix 2 and Table 1). These CAS numbers correspond to only two groups of related substances, however:

- seven CAS numbers covering various forms of asbestos; and
- five CAS numbers covering various chromium compounds.

Moreover, the regulations covering both of these substance groups are very limited in scope:[33]

- **Only uses of asbestos in products no longer in commerce** are regulated under TSCA; EPA attempted to ban all uses of asbestos, but its regulation was vacated by the Fifth Circuit Court of Appeals in 1991.
- EPA banned **only those hexavalent chromium-based water treatment chemicals for use in comfort cooling towers** in 1990. The regulation does not apply to any other uses of these compounds, to any other hexavalent chromium compounds, or to any trivalent chromium compounds.

EPA has subjected 20 of the SIN List CAS numbers to so-called Significant New Use Rules, or SNURs (see Table 1 and Appendix 2 for details).[34] SNURs do not themselves restrict production or use. They only require that companies that produce or use a chemical covered by the SNUR notify EPA if such production or use does not comport with conditions specified in the SNUR. This notification requirement provides EPA with an opportunity to review the conditions of production or use and decide whether or not to impose restrictions.

Finally, EPA has exempted manufacturers and processors of eight SIN List CAS numbers from requirements to report their activities under the TSCA IUR (see Table 1). These chemicals are all octyl- and nonylphenol ethoxylates, which are toxic to aquatic organisms and break down into octyl- and nonylphenols that are both more persistent and more toxic than their parent compounds and exhibit endocrine-disrupting activity.[35] EPA exempted these chemicals because they are polymers, which are generally exempt from IUR reporting based on the presumption that they are unlikely to be bioavailable—an assumption that, at least for these chemicals and their breakdown products, is not supported by the available evidence.

From this discussion it is clear that only a small number of SIN List chemicals have been subject to any regulation under TSCA, and even these only under very narrow conditions.

Conclusion

Our analysis has documented that there is substantial production and use in the U.S. of over 100, and likely many more, chemicals already identified by the EU as "substances of very high concern" (SVHCs). Many of these chemicals are produced in very large quantities in the U.S., by many different companies at many sites and in many states. The intent of REACH, the EU's new chemicals policy, is ultimately to allow the use of such substances only when specified authorized on a use-by-use basis.

In marked contrast, EPA has undertaken only very limited activity to address these chemicals. Only about a third of SIN List chemicals on the TSCA Inventory have been subjected to any degree of either mandatory or voluntary testing under TSCA. Only the various forms of asbestos and certain hexavalent chromium compounds have been subjected to any regulation, and even then only for very narrow uses of these dangerous substances.

Taken together, our findings suggest that REACH's focus on SVHCs can be expected to have a major impact on chemical production and use in the U.S. and on the companies that make, export or import chemicals. Hundreds of companies in the United States produce or import hundreds of chemicals designated as dangerous by the European Union (EU), and hence will be directly impacted by controls imposed on such chemicals under the EU's new chemicals regulation.

Appendix 1: Comparison of SIN List chemicals reported in 2002 and 2006 under EPA's Inventory Update Rule (IUR)

As described in the Preface, with respect to the SIN List chemicals, the overlap of SIN List chemicals with the chemicals reported under these two successive cycles of reporting under the IUR changed considerably. Numerous SIN List chemicals reported in 2002 were not reported in 2006, and vice versa. While some of the observed differences are likely explained by the changes in reporting rules described in the Preface, others are more mysterious.

SIN List chemicals appearing in one IUR reporting cycle but not the other are shown in the Table below. The comparison can be summarized as follows:

- 18 SIN List CAS numbers that are on the 2006 IUR were not on the 2002 IUR. Some possible explanations:[36]
    - 12 of these are inorganic chemicals and hence were likely reported for the first time in 2006.
    - All but one of the remaining six CAS numbers were reported in the lowest volume range (<500,000 pounds aggregated across all reporting sites), while the last one was reported in the second lowest range (between 500,000 and 1 million pounds). It is possible that the production volume for these CAS numbers was below the reporting threshold in 2002 but rose above it in 2006.
- 29 SIN List CAS numbers that were on the 2002 IUR are not on the 2006 IUR. Some possible explanations:
    - Two of these chemicals are Perfluorooctane sulfonic acid (PFOS), CAS# 1763-23-1, and Perfluorooctane sulfonamide (PFOSA), CAS# 4151-50-2, both of which were phased out of production in 2002 by their only U.S. producer, 3M Company.[37]
    - Another of these chemicals is Octabromodiphenylether, CAS# 32536-52-0, which was phased out of production in 2004 by its only U.S. producer, Great Lakes Chemical (now Chemtura).[38]
    - A fourth chemical is a polymer, and was likely erroneously reported in 2002. Polymers are exempt from IUR reporting.[39]
    - Of the remaining 25 CAS numbers, 15 were reported in 2002 in the lowest aggregate production/import volume range (between 10,000 and 500,000 pounds), and hence may not have met the higher reporting threshold that applied in the 2006 cycle.
    - 9 of the remaining 10 CAS numbers are for chemicals that were reported as high production volume (HPV) chemicals exceeding 1 million pounds of aggregate production/import in 2002.
        - 5 were in the 1-10 million pound aggregate volume range.
        - 2 were in the 10-50 million pound aggregate volume range.
        - 1 was in the 50-100 million pound aggregate volume range.
        - 1 was in the 100-500 million pound aggregate volume range.

      No clear explanation for the "disappearance" of these HPV chemicals is apparent, especially as they include a number of quite common chemicals (see Table below).[40]

SIN List Chemicals reported on the 2006 but not in the 2002 IUR reporting cycle

CAS #	Name(s)	2006 Reported Volume	Comment (see text)
87-61-6	1,2,3-trichlorobenzene	<500K	--
94-59-7	safrole; 5-allyl-1,3-benzodioxole	<500K	--
556-52-5	2,3-epoxypropan-1-ol; glycidol; oxiranemethanol	<500K	--
1303-28-2	diarsenic pentaoxide; arsenic pentoxide; arsenic oxide	10M - <50M	inorganic
1304-56-9	beryllium oxide	<500K	inorganic
1313-99-1	nickel monoxide	10M - <50M	inorganic
7440-41-7	beryllium	<500K	inorganic
7440-43-9	cadmium (pyrophoric); cadmium (non-pyrophoric); cadmium oxide (non-pyrophoric)	1M - <10M	inorganic
7646-79-9	cobalt dichloride	1M - <10M	inorganic
7758-97-6	lead chromate	<500K	inorganic
7789-06-2	strontium chromate	<500K	inorganic
9002-93-1	4-tert-octylphenolethoxylate	<500K	--
9036-19-5	nonidet P-40	500K - <1M	--
10124-43-3	cobalt sulphate	1M - <10M	inorganic
12035-72-2	nickel subsulphide; trinickel disulphide	1M - <10M	inorganic
16812-54-7	nickel sulphide	<500K	inorganic
24613-89-6	dichromium tris(chromate); chromium III chromate; chromic chromate	<500K	inorganic
25154-52-3	nonylphenol	<500K	--

SIN List Chemicals reported on the 2002 but not in the 2006 IUR reporting cycle

CAS #	Name(s)	2002 Reported Volume	Comment (see text)
57-14-7	N,N-dimethylhydrazine	10K - 500K	< 2006 threshold?
60-09-3	4-aminoazobenzene; 4-phenylazoaniline	10K - 500K	< 2006 threshold?
75-12-7	formamide	>1M - 10M	--
79-16-3	N-methylacetamide	10K - 500K	< 2006 threshold?
79-46-9	2-nitropropane	>10M - 50M	--
91-94-1	3,3'-dichlorobenzidine; 3,3'-dichlorobiphenyl-4,4'-ylenediamine	10K - 500K	< 2006 threshold?
95-80-7	4-methyl-m-phenylenediamine; 2,4-toluenediamine	10K - 500K	< 2006 threshold?
96-09-3	styrene oxide; (epoxyethyl)benzene; phenyloxirane	10K - 500K	< 2006 threshold?

SIN List Chemicals reported on the 2002 but not in the 2006 IUR reporting cycle (continued)

CAS #	Name(s)	2002 Reported Volume	Comment (see text)
96-18-4	1,2,3-trichloropropane	>1M - 10M	--
100-63-0	phenylhydrazine	>1M - 10M	--
107-30-2	chlormethyl methyl ether; chlorodimethyl ether	>10M - 50M	--
112-49-2	1,2-bis(2-methoxyethoxy)ethane; triethylene glycol dimethyl ether (TEGDME); triglyme	10K - 500K	< 2006 threshold?
120-12-7	anthracene, pure	10K - 500K	< 2006 threshold?
126-99-8	Chloroprene (stabilized); 2-chlorobuta-1,3-ciene	>100M - 500M	--
133-49-3	pentachlorobenzenethiol	10K - 500K	< 2006 threshold?
151-56-4	ethyleneimine; aziridine	>1M - 10M	--
625-45-6	methoxyacetic acid	>500K - 1M	--
764-41-0	1,4-dichlorobut-2-ene	>50M - 100M	--
1120-71-4	1,3-propanesultone; 1,2-oxathiolane 2,2-dioxide	10K - 500K	< 2006 threshold?
1461-22-9	tributyltin chloride	>1M - 10M	--
1589-47-5	2-methoxypropanol	10K - 500K	< 2006 threshold?
1763-23-1	perfluorooctane sulfonic acid (PFOS)	10K - 500K	phased out 2002
4151-50-2	perfluorooctane sulfonamide (PFOSA)	10K - 500K	phased out 2002
12656-85-8	lead chromate molybdate sulfate red; C.I. Pigment Red 104	10K - 500K	< 2006 threshold?
17570-76-2	lead(II) methanesulphonate	10K - 500K	< 2006 threshold?
21145-77-7	tonalid	10K - 500K	< 2006 threshold?
32536-52-0	diphenyl ether, octabromo derivative	>1M - 10M	phased out 2004
68412-54-4	poly(oxy-1,2-ethanediyl), alpha-(nonylphenyl)-omega-hydroxy-, branched	>1M - 10M	exempt from IUR reporting
90640-80-5	anthracene oil	10K - 500K	< 2006 threshold?

Appendix 2: How we did our analysis

The SIN List includes 267 entries, each for an individual chemical or a group of closely related substances:

- 220 CMRs,
- 11 PBTs, two of which are also vPvBs,
- six substances that are both CMRs and PBTs and
- 30 "equivalent concern" substances.

To conduct our analysis, we made three adjustments. First, we were not able to include eight entries for CMR substances that lack a Chemical Abstract System (CAS) Registry Number, because the cross-comparisons among lists that are the basis of our analysis require such identifiers. Second, some SIN List entries include more than one CAS number, one for each of two or more closely related substances grouped together in a given entry. Our analysis used all specified CAS numbers in such groups. Third, asbestos is listed on the TSCA Inventory as CAS# 1332-21-4 but not as any of the seven CAS numbers listed on the SIN List for various forms of asbestos (12001-28-4, 12001-29-5, 12172-73-5, 132207-32-0, 77536-66-4, 77536-67-5 and 77536-68-6). We therefore used CAS# 1332-21-4 instead of the seven SIN List CAS numbers.[41] Applying these adjustments yielded a total of 283 distinct CAS numbers.[42]

We compared this list of 283 CAS numbers to the following chemical lists:

- The TSCA Inventory. We used the most recent public version of the Inventory, dated July 2008.[43]
- Chemicals produced or imported in the U.S. We used the latest publicly available data from EPA on chemicals produced in or imported into the U.S. and the companies that reported producing or importing them, in 2005. These data are periodically collected by EPA under its TSCA Inventory Update Rule (IUR).[44] The IUR data provide:
    - the identity of reported chemicals, by name and CAS number;
    - the volume of production and import, aggregated across all reporting producers and importers and reported as a range in pounds for the reporting year;
    - the names of reporting companies for each chemical, and whether they reported producing or importing the chemical; and
    - the location of each facility of each company that reported producing or importing each chemical.
- Chemicals subject to mandatory testing under TSCA. We could find no single authoritative and complete list of such chemicals on EPA's website, so instead we compiled a list using four sources:
    - chemicals flagged on the TSCA Inventory as currently subject to a mandatory test rule issued by EPA under Section 4 of TSCA;
    - chemicals listed in a PDF document posted on EPA's website titled "TSCA Section 4 Chemicals" on a page that reports results of testing conducted under Section 4 test rules;[45]
    - chemicals listed on EPA's "Current List of Chemical Substances Subject to TSCA Section 12(b) Export Notification Requirements" that are indicated as currently

subject either to a test rule or to data development under an Enforceable Consent Agreement (ECA) issued under Section 4 of TSCA;[46] and
    - chemicals listed in a table posted on EPA's website indicating sunset dates for Section 12(b) requirements under TSCA, which are tied to completion of data development under Section 4 actions.[47]

  While these lists had considerable overlap, each also had unique listings. Chemicals indicated on any of these four lists as subject to testing requirements were included.
- Chemicals tested under voluntary programs. We used Environmental Defense Fund's HPVTracker[48] to determine the status of SIN List chemicals that fall under EPA's High Production Volume (HPV) Challenge Program. The HPVTracker draws data from EPA's Challenge webpages and from the database of the OECD HPV program.[49] The status of additional SIN List chemicals that do not fall under the HPV Challenge was determined using the OECD HPV database.
- Chemicals regulated under Section 6 of TSCA. We identified any SIN List CAS numbers that carried a flag on the TSCA Inventory indicating it is subject to a regulation issued by EPA under Section 6. Two classes of chemicals were so flagged:
    - various forms of asbestos (seven CAS numbers);[50] and
    - various hexavalent chromium compounds (five CAS numbers).[51]
- Chemicals subject to Significant New Use Rules under TSCA. We identified any SIN List CAS numbers that carried a flag on the TSCA Inventory indicating it is subject to a proposed or final Significant New Use Rule issued by EPA under TSCA. Companies that produce or use a chemical covered by a SNUR must notify EPA if such production or use does not comport with conditions specified in the SNUR.
- Chemicals exempt from reporting under the Inventory Update Rule. We identified any SIN List CAS numbers that carried a flag on the TSCA Inventory indicating it is exempt from IUR reporting.

Endnotes

[1] REACH is an EU-wide regulation adopted in December 2006. The final text of REACH is available at eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_396/l_39620061230en00010849.pdf. For more information about how REACH works and how it compares to the U.S. Toxic Substances Control Act (TSCA), see Denison, R.A. (2007) *Not That Innocent: A Comparative Analysis of Canadian, European Union and United States Policies on Industrial Chemicals* (Environmental Defense, Washington, DC), at www.edf.org/chempolicyreport.

[2] REACH establishes a fairly extensive, multi-step process by which chemicals are to be identified and added to the candidate list. See REACH Article 59. The initial version of the official candidate list is available at echa.europa.eu/chem_data/candidate_list_table_en.asp.

[3] This intent is also one of the stated objectives of REACH; see REACH Preamble Recitals 12 and 70 and Article 55.

[4] See REACH Article 57.

[5] Chemicals meeting the criteria for classification in category 1 or 2 in accordance with EU Directive 67/548/EEC on Classification and Labelling of Dangerous Substances, available at eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31967L0548:EN:NOT.

[6] Chemicals meeting the PBT or vPvB criteria in Annex XIII of the REACH Regulation.

[7] See REACH, Article 57(f). EU's prioritization list of potential endocrine disrupting chemicals is available at ec.europa.eu/environment/endocrine/index_en.htm.

[8] See echa.europa.eu/doc/press/pr_08_18_pub_consultations_20080630.pdf.

[9] See echa.europa.eu/consultations/authorisation/svhc/svhc_cons_en.asp.

[10] CMRs are listed in Annex I to Directive 67/548/EEC on Classification and Labelling of Dangerous Substances, available at ecb.jrc.it/esis/index.php?PGM=cla. PBTs and vPvBs have been identified by a PBT working group under the European Chemicals Bureau; see ecb.jrc.it/esis/index.php?PGM=pbt.

[11] In Annex I, more than 800 chemicals have been designated as Category 1 (known) or Category 2 (likely) carcinogens, about 175 as category 2 mutagens and about 85 as Category 1 or Category 2 reproductive toxicants. A significant number of the substances on some of these lists may be exempt from REACH authorization, because they qualify either as fuels or pesticides; see REACH Article 56(4) and ChemSec's description of the methodology used to derive the SIN List, available at www.chemsec.org/documents/080917_SIN_List_methodology.pdf. The PBT working group has designated about 25 chemicals as PBT/vPvBs. The European Commission has identified 194 likely endocrine disruptors and 125 potential endocrine disruptors. See ec.europa.eu/environment/endocrine/index_en.htm.

[12] The SIN List and an explanation of its purpose and origins are available at www.chemsec.org/list.

[13] The CMRs, PBTs, vPvBs and endocrine disruptors ChemSec included on the SIN List are only a subset of the chemicals so designated by the EU; see endnote 11. To identify additional chemicals of equivalent concern, ChemSec applied the guidance that ECHA has developed to identify SVHCs based on equivalent concern; see Section 3.3.3 of the guidance available at reach.jrc.it/docs/guidance_document/svhc_en.pdf. For more information about ChemSec's process, see www.chemsec.org/list. Environmental Defense Fund has not independently evaluated the available data for SIN List chemicals or the decision to add them to the list.

[14] This count reflects the replacement of the seven SIN List CAS numbers for asbestos with the CAS number for asbestos that appears on the TSCA Inventory, 1332-21-4; see Appendix 2.

[15] Tables 1-4 are provided in a separate file, available along with this report at www.edf.org/AcrossThePond.

[16] The identities of about 15,000 chemicals on the TSCA Inventory are confidential and hence are not included in the public version. U.S. Environmental Protection Agency, "Inventory Comparison Project: Facts related to the TSCA Inventory." Office of Pollution Prevention and Toxics, Washington, DC. Draft dated 8/15/05.

[17] See www.epa.gov/oppt/iur/pubs/basic-information.htm.

[18] These groups include polymers, microorganisms, naturally occurring chemical substances, and certain forms of natural gas. In addition, reporting exemptions apply to chemicals that are: a) produced in small quantities for research and development; b) imported as part of an article; c) manufactured as an impurity, byproduct (under certain circumstances), or non-isolated intermediate; and d) manufactured by persons who qualify as small manufacturers. Several additional categories of chemicals are granted partial reporting exemptions. See www.epa.gov/oppt/iur/pubs/guidance_qanda.pdf.

[19] The identities of more than 1,300 chemicals reported under the IUR in 2002 were confidential and hence are not included in the public version. Personal communication to Environmental Defense Fund from EPA, September 2005. Analogous data for 2006 are not available but are expected to be similar.

[20] See U.S. EPA, National Pollution Prevention and Toxics Advisory Committee (NPPTAC), Broader Issues Work Group, "Initial Thought-Starter: How can EPA more efficiently identify potential risks and facilitate risk reduction decisions for non-HPV existing chemicals?" Draft dated October 6, 2005, pp. 3-4, at www.epa.gov/oppt/npptac/pubs/finaldraftnonhpvpaper051006.pdf; and Environmental Defense comments on Proposed Rule, TSCA Inventory Update Reporting Revisions (70 *Fed. Reg.* 3658, 26 January 2005), Docket ID No. EPA-HQ-OPPT-2004-0106, accessible at www.regulations.gov (search for docket number).

[21] This count includes hexabromocyclododecane, which is reported under the IUR using two CAS numbers—25637-99-4 and 3194-55-6—which are identified by EPA as corresponding to the same substance; see www.epa.gov/hpvis/rbp/HBCD.3194556.Web.RBP.31308.pdf. According to EPA: "There are two CAS numbers for HBCD: 1,2,5,6,9,10 hexabromocyclododecane (CAS 3194-55-6) is an HPV chemical that was manufactured or imported in the U.S. between 10 and 50 million pounds in 2005. Hexabromocyclododecane (CAS 25637-99-4) is a moderate production volume (MPV) chemical manufactured or imported between 10 thousand and 500 thousand pounds in 2005." In our tally we used the volume data reported for CAS# 3194-55-6.

[22] This breakdown of companies adds up to more than the total number of companies because some companies manufacture, import or make CBI claims regarding the same or different chemicals.

[23] Tables 1-4 are provided in a separate file, available along with this report at www.edf.org/AcrossThePond.

[24] Tables 1-4 are provided in a separate file, available along with this report at www.edf.org/AcrossThePond.

[25] Tables 1-4 are provided in a separate file, available along with this report at www.edf.org/AcrossThePond.

[26] The SIN List's CMRs are all listed in Annex I to Directive 67/548/EEC on Classification and Labelling of Dangerous Substances, available at ecb.jrc.it/esis/index.php?PGM=cla. The SIN List's PBTs and vPvBs have been identified by a PBT working group under the European Chemicals Bureau; see ecb.jrc.it/esis/index.php?PGM=pbt.

[27] EU's prioritization list of potential endocrine disrupting chemicals is available at ec.europa.eu/environment/endocrine/index_en.htm.

[28] EPA has used its TSCA Section 4 authority to issue test rules for about 140 chemicals. For about 60 additional chemicals, EPA has obtained data through Section 4 Enforceable Consent Agreements (ECAs), which it uses as an alternative to test rules in cases where there is agreement with industry on the need for, and scope of, testing. See U.S. Environmental Protection Agency, *Overview: Office of Pollution Prevention and Toxics Programs*, January 2007, prepared by OPPT for the National Pollution Prevention and Toxics Advisory Committee, p. 4, available at www.epa.gov/oppt/pubs/oppt101c2.pdf.

[29] EPA's HPV Challenge web site is at www.epa.gov/chemrtk/index.htm. For more information on the HPV Challenge, its status and what it has and has not achieved, see Environmental Defense Fund's report *High Hopes, Low Marks*, available at www.edf.org/hpvreportcard.

[30] According to OECD: "The SIDS is regarded as the minimum information needed to assess an HPV chemical to determine whether any further work should be carried out or not." See www.oecd.org/document/21/0,3343,en_2649_34379_1939669_1_1_1_1,00.html.

[31] Source: Environmental Defense Fund analysis of EPA's hazard characterizations of HPV Challenge chemicals posted through September 2008 at iaspub.epa.gov/oppthpv/hpv_hc_characterization.get_report?doctype=2. Details are available upon request.

[32] Twelve of the 14, including eight of the nine with final OECD assessments, and four of the five without, are on the TSCA Inventory.

[33] Government Accountability Office, Report GAO-05-458, *Chemical Regulation—Options Exist to Improve EPA's Ability to Assess Health Risks and Manage Its Chemical Review Program*, 2005, p. 58, available at www.gao.gov/new.items/d061032t.pdf.

[34] See www.epa.gov/opptintr/newchems/pubs/cnosnurs.htm.

[35] See, for example, this Canadian government factsheet on nonylphenol (NP) and nonylphenol ethoxylates (NPEs): www.ec.gc.ca/CEPARegistry/subs_list/NPE_BG.cfm. Canada's assessment also found "that Octylphenol (OP) and its Ethoxylates (OPEs) have similar toxicological properties and possibly greater estrogenic properties than NP and NPEs." See canadagazette.gc.ca/partI/2004/20041204/html/notice-e.html#i5.

[36] Some of the observed changes may reflect changes in the confidential business information (CBI) status of specific chemicals. The identities of many chemicals on the TSCA Inventory and reported under the IUR are claimed CBI and hence are not revealed to the public; see endnotes 16 and 19. Companies may have changed their CBI designations between the two cycles, or a different mix of companies may have reported the same chemical.
[37] See solutions.3m.com/wps/portal/3M/en_US/PFOS/PFOA/.
[38] See www.epa.gov/oppt/pbde/.
[39] This chemical is Poly(oxy-1,2-ethanediyl), alpha-(nonylphenyl)-omega-hydroxy-, branched, CAS# 68412-54-4. See endnote 18 and associated text for more on polymers and other classes of chemicals exempted from IUR reporting.
[40] The author has inquired with EPA as to why so many HPV chemicals, including those SIN List chemicals reported here, appear to have disappeared between the 2002 and 2006 reporting cycles. It is of course possible that the reported volume did change dramatically. EPA's infrequent reporting system (once every four years, recently extended to once every five years), which also entails reporting of only a single year's production or import, may well miss real fluctuations in the year-to-year volumes of specific chemicals; see endnote 20 and associated text.
[41] The TSCA Inventory also has four other related listings for asbestos, none of which match the SIN List CAS numbers: CAS# 68526-78-3 Asbestos, reaction products with silica and triethoxyoctylsilane; 69278-68-8 Asbestos, reaction products with tert-butylphenol-formaldehyde polymer; 71011-15-9 Asbestos, reaction products with triethoxyoctylsilane; and 72623-76-8 Asbestos, reaction products with calcium oxide and silica.
[42] For one SIN List chemical, Hexabromocyclododecane, we did all searches in our analysis using two CAS numbers: 25637-99-4, which is that used on the SIN List; and 3194-55-6, which is identified by EPA as corresponding to the same substance. See www.epa.gov/hpvis/rbp/HBCD.3194556.Web.RBP.31308.pdf.
[43] We purchased the July 2008 version of the TSCA Inventory on a CD-ROM from the National Technical Information Service (NTIS), available at www.ntis.gov/products/tscatrack.aspx.
[44] See www.epa.gov/oppt/iur.
[45] See www.epa.gov/oppt/chemtest/pubs/sumindex.htm.
[46] The Section 12(b) list is posted at www.epa.gov/oppt/import-export/pubs/12blist.htm, and is indicated to be current as of February 29, 2008.
[47] See www.epa.gov/oppt/chemtest/pubs/sunset.htm.
[48] See www.edf.org/hpvtracker. Data were current through June 30, 2008.
[49] EPA's HPV Challenge web site is at www.epa.gov/chemrtk/index.htm; the data we used were current through June 30, 2008. The Organization for Economic Cooperation and Development (OECD) operates a sister voluntary HPV data development program. The OECD HPV database is at cs3-hq.oecd.org/scripts/hpv/; the data we used were current as of August 12, 2008.
[50] As previously noted, asbestos is listed on the TSCA Inventory as CAS# 1332-21-4 but not as any of the seven CAS numbers listed on the SIN List for various forms of asbestos. In Table 1 we flagged all seven of these CAS numbers as being subject to Section 6 regulation. The TSCA Inventory also has four other related listings for asbestos, none of which match the SIN List CAS numbers: CAS# 68526-78-3 Asbestos, reaction products with silica and triethoxyoctylsilane; 69278-68-8 Asbestos, reaction products with tert-butylphenol-formaldehyde polymer; 71011-15-9 Asbestos, reaction products with triethoxyoctylsilane; and 72623-76-8 Asbestos, reaction products with calcium oxide and silica.
[51] A total of 14 SIN List CAS numbers contain chromium, all but one of which appear on the TSCA Inventory, but only five of these carry flags indicating Section 6 regulation. EPA's regulation covers only *hexavalent* chromium compounds, and only the subset of those that can be used for water treatment in water cooling systems. Presumably most or all of the nine unflagged CAS numbers either do not contain the hexavalent form of chromium or are not used as water treatment chemicals. It is also possible that differences between EU and U.S. lists in CAS numbers for these chemicals accounts for some of the unflagged CAS numbers.

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