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Implementation of the Strategic Approach to International Chemicals Management: Information exchange and scientific and technical cooperation

Submission by the American Petroleum Institute on Progress in Implementing the Strategic Approach

Note by the secretariat

1. The secretariat has the honour to circulate, in the annex to the present note, a document outlining the contributions of the American Petroleum Institute (API) and its member companies to implementation of the Strategic Approach to International Chemicals Management (SAICM).

2. The present document highlights some of API and member company activities related to chemical management in selected SAICM Global Plan of Action Work Areas. The highlighted activities range from hazard data generation, to human health protection, to cleaner production, to removal of lead in motor vehicle gasoline, to prevention and response for chemical emergencies, among others.

3. The document has been reproduced as received without formal editing.

* SAICM/ICCM.3/1.

Annex

GLOBAL CHEMICAL MANAGEMENT
API Supporting SAICM

American Petroleum Institute (API)

API represents more than 500 oil and natural gas companies, leaders of a technology-driven industry that supplies most of America's energy, supports 9.2 million U.S. jobs and 7.7 percent of the U.S. economy, delivers more than $86 million a day in revenue to the federal government, and, since 2000, has invested more than $2 trillion in U.S. capital projects to advance all forms of energy, including alternatives and renewables.

www.api.org

Strategic Approach to International Chemicals Management (SAICM)

SAICM is a policy framework to promote chemical safety around the world. SAICM has as its overall objective the achievement of the sound management of chemicals throughout their life cycle so that, by 2020, chemicals are produced and used in ways that minimize significant adverse impacts on human health and the environment. This "2020 goal" was adopted by the World Summit on Sustainable Development in 2002 as part of the Johannesburg Plan of Implementation.

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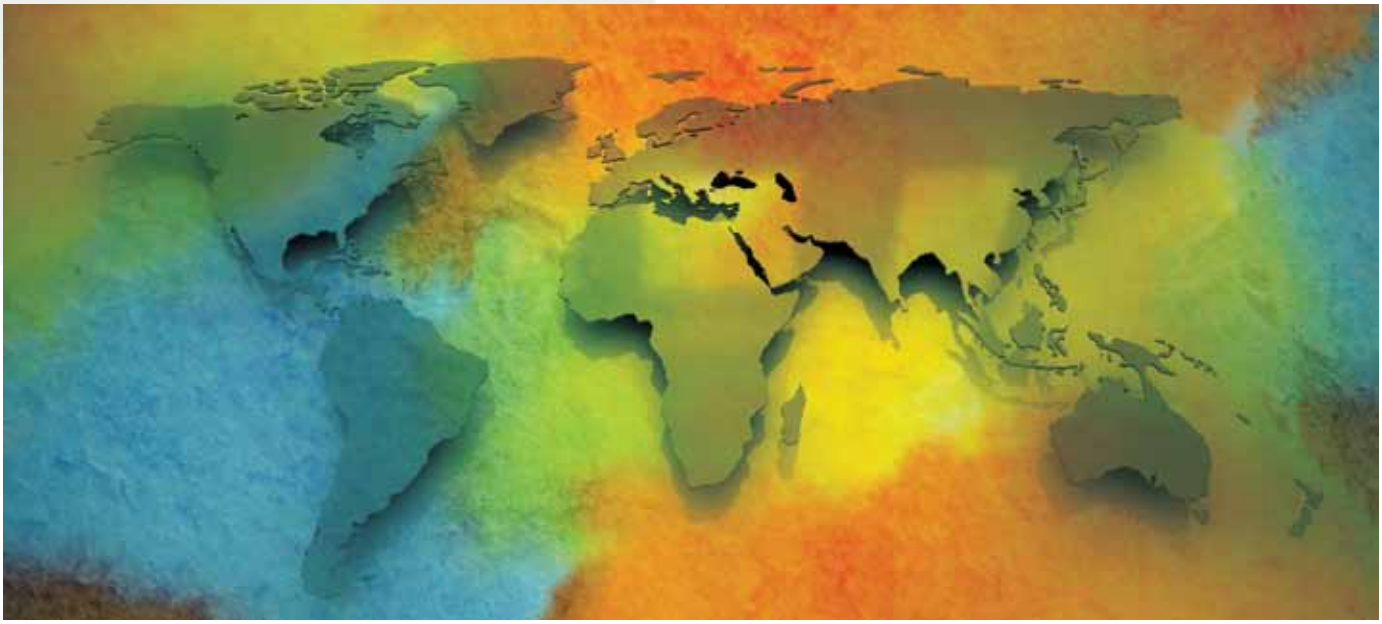


What is API?

The American Petroleum Institute (API) is the only United States (U.S.) trade association that represents all aspects of America's oil and natural gas industry. Our more than 500 corporate members come from all segments of the petroleum industry, including producers, refiners, suppliers, pipeline operators, and marine transporters of oil and natural gas, as well as service and supply companies that support all segments of the industry.

API conducts a variety of activities in addition to representing the oil and natural gas industry on public policy matters. For instance, API organizes seminars, workshops, conferences and symposia on public policy issues. We conduct or sponsor research ranging from economic analyses to toxicological testing on petroleum chemicals. For more than 80 years, API has led the development of petroleum and petrochemical equipment and operating standards. API maintains more than 600 standards, recommended practices and technical reports, many of which have been incorporated into government regulations around the world. API's standards program is accredited by the American National Standards Institute (ANSI). For many years, API licensed the International Organization for Standardization (ISO) to republish API standards as ISO publications. API also implements a certification program for manufacturers of equipment for petroleum production and refining.

Why is SAICM Relevant to API?

The United Nations Environment Programme (UNEP) Strategic Approach to International Chemicals Management (SAICM) is the main global forum to address chemical management issues. Petroleum and petroleum products—including but not limited to fuels—are chemical products. Many other petrochemical products are derived from petroleum substances. Thus, API's members are important participants in the global chemical supply chain—as producers, refiners, processors, distributors and users of chemicals.

API and its members are dedicated to continuous efforts to meet chemical management responsibilities while economically developing energy resources and supplying high-quality products and services to businesses, consumers and governments. We recognize our responsibility to work with other industries, the public, government and nongovernmental organizations to address potential risks or concerns that may arise during the lifecycle of our products. Our efforts to manage chemical risks are directly aligned with SAICM's aim to minimize harm to human health or the environment.

API supports SAICM's central aim that chemicals should be manufactured, used and managed safely at the international level in an efficient and cost-effective manner. API is contributing to the dialogue by developing industry positions on selective SAICM initiatives, coordinating with the U.S. Environmental Protection Agency (EPA) and others (including the chemical industry), and contributing directly in the SAICM process as an important stakeholder in global chemical management.

API Activities Related to Chemical Management

Many API members' operations are global and cover every stage of the chemical lifecycle from research and development through production, use and eventual disposition. API has established Environmental Principles that are a condition of membership and incorporate concepts of sound chemical management. Under API's Environmental Principles, members pledge to manage their businesses in accordance with the following management practices:

- To recognize and to respond to community concerns about our raw materials, products and operations.
- To operate our plants and facilities and handle our raw materials and products in a manner that protects the environment and the safety and health of our employees and the public.
- To make safety, health and environmental considerations a priority in our planning and our development of new products and processes.
- To advise promptly appropriate officials, employees, customers and the public of information on significant industry-related safety, health and environmental hazards, and to recommend protective measures.
- To counsel customers, transporters and others in the safe use, transportation and disposal of our raw materials, products and waste materials.
- To economically develop and produce natural resources and to conserve those resources by using energy efficiently.
- To extend knowledge by conducting or supporting research on the safety, health, and environmental effectiveness of our raw material, products, processes and waste materials.
- To commit to reduce overall emission and waste generation.
- To work with others to resolve problems created by handling and disposal of hazardous substances from our operations.
- To participate with government and others in creating responsible laws, regulations and standards to safeguard the community, workplace and environment.
- To promote these principles and practices by sharing experiences and offering assistance to others who produce, handle, use, transport or dispose of similar raw materials, petroleum products and wastes.

Each API member implements programs appropriate to the particular company for pollution control, occupational health and safety, emergency response, transportation safety and other aspects of chemical management. Furthermore, many API members voluntarily engage in sustainability reporting based on the *Oil and Gas Industry Guidance on Voluntary Sustainability Reporting*[1], which was developed by API and IPIECA (the global oil and gas industry association for environmental and social issues). The Guidance allows for the reporting of sustainability indicators important to the oil and gas industry, as shown in Table 1.

In addition, many of our member companies are also members of the International Council of Chemical Associations (ICCA), and thus are participants in Responsible Care and the Global Product Strategy (GPS). API supports member company activities in chemical management and also directly participates in chemical management activities. Below we discuss some of our specific activities related to chemical management, with examples for the work areas defined under SAICM.

Table 1 Indicators and Issue Categories

Environmental Issues
Climate change and energy [4 indicators]
Ecosystem services [2 indicators]
Local environment impacts [4 indicators]
Health and Safety Issues
Workforce protection [3 indicators]
Product health, safety and environmental risks [1 indicators]
Process safety and asset integrity [1 indicators]
Social and Economic Issues
Community and society [4 indicators]
Local content [3 indicators]
Human rights [3 indicators]
Business ethics and transparency [4 indicators]
Labor practices [4 indicators]

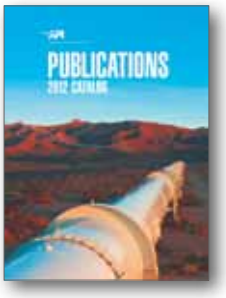
Examples of API Activities in SAICM Work Areas

The SAICM Global Plan of Action includes 36 work areas comprising almost 300 specific activities. The work areas cover virtually every aspect of chemical management, and API has a direct or indirect interest in virtually all of them. Selected SAICM Global Plan of Action Work Areas are listed below with discussion of API activities in each area.

Assessment of National Chemicals Management

API is participating actively in the legislative process in the U.S. in which there is legislation in progress that would result in a modernized chemical management law. For national chemical management laws, API supports an evidence-based science and risk-based chemical management framework that includes working in partnership with other countries and global harmonization, as appropriate. Since our member companies operate globally, they also have expertise in the chemical management laws of other jurisdictions, such as the European Union, China, Japan, Korea, Australia and other countries and regions.

Hazard Data Generation and Availability



API has conducted toxicity, hazard, and environmental studies on petroleum substances since the 1970s, striving to enhance safety operations, improve quality assurance and promote best practices with an inventory of more than 600 standards and recommended practices. Much of this information is publicly available through an extensive publications catalog, easily available online at http://www.api.org/Publications/.

Our industry has participated in several important U.S. government programs to evaluate chemical substances, including the U.S. High Production Volume (HPV) Chemical Challenge program. Under the HPV program, participating companies sponsored toxicity testing for chemicals manufactured or imported in the U.S. in total quantities over 1 million pounds per year. API was the administrator of the Petroleum HPV Testing Group, a consortium of 70 member companies from API, the American Fuels and Petrochemicals Association (AFPM, formerly NPRA), the Gas Producers Association (GPA) and the Asphalt Institute. The consortium sponsored approximately 400 specific chemicals in the HPV program, assigning them to appropriate categories for

data fulfillment. Sponsorship included summarizing existing data, developing a test plan to fill data gaps and making the data generated available to the public. API is working on electronically publishing the data submitted to the HPV program at http://apitox.api.org.

API has conducted numerous studies on acute toxicity; chronic toxicity; genotoxicity; immunotoxicity; and cancer, reproductive and development toxicity; as well as irritation, absorption and other health aspects of gasoline, gasoline streams (e.g., naphthas) and chemical constituents of gasoline (i.e., hexane). API has also conducted environmental fate and effects studies on many petroleum products and components. Examples include but are not limited to the following:

- API sponsored research on benzene topics including DNA binding, effects of toluene co-exposure and correlation between health effects and levels detected via biomonitoring.
- API sponsored research on toxicology topics related to naphthalene, including the mode of action of carcinogenicity, upper respiratory tract uptake, metabolism and effects in nasal epithelium.
- API helped sponsor key studies on hydrogen sulfide including evaluation of potential neurological effects, biochemical effects on tissues, including the brain, and sensory and cognitive effect of acute exposure in human volunteers.
- In compliance with the U.S. Clean Air Act Section 211(b), the petroleum industry has sponsored extensive toxicology testing for baseline fuel and fuel additive registration, including various testing for potential carcinogenicity, reproductive and developmental toxicity, subchronic toxicity and other toxicological endpoints.
- API developed and sponsored a project to examine the environmental impacts of synthetic muds that are used during offshore drilling. The project included field study of the deposition of muds on the ocean bottom and developing tests for biodegradation and toxicity.
- API provides scientific information to U.S.-based government and standards organizations to support development of American Conference of Industrial Hygienists (ACGIH) exposure guidelines; U.S. Occupational Safety and Health Administration (OSHA) regulatory threshold limit values (TLVs); Integrated Risk Information System (IRIS) profiles; and other reference and regulatory levels.

Risk Assessment, Management and Communication

Identifying and addressing potential risks associated with petroleum raw materials and products involve ongoing evaluation of their potential hazards and of the scenarios in which people and the environment may be exposed to them. Many of our member companies employ toxicology, epidemiology and industrial hygiene experts who identify the risks of their products and ensure that risks are communicated and mitigated throughout the supply chain. The results of product risk assessments are incorporated into business decision making through workflow processes in which potential health, safety, and environmental impacts are identified and considered at each phase of product development. All member companies implement hazard communication programs (see below under “Occupational Health and Safety”).

Human Health Protection

Our member companies have environmental, health and safety programs at production sites, refineries, storage facilities, distribution terminals and all other company locations that involve chemical management. They implement comprehensive programs to prevent pollution and control emissions to air, water and land. In the area of workplace safety, they comply with U.S. OSHA, global equivalents and company safety standards that aim for continual improvement of workforce safety and process safety programs. Over the years, our industry has established proven programs for pollution prevention, emergency preparedness and response, and community outreach.

In 2011, API issued a report on expenditures by the U.S. oil and natural gas industry related to pollution prevention, control, abatement or elimination in the U.S. and its territories.[2] It concluded that the industry invested more than $239 billion between 1990 and 2010 to improve the environmental performance of its products, facilities and operations.

The oil and gas industry faces a complex agenda that increasingly requires an evaluation of health, social and environmental impacts throughout all of its operations. API supports the International Association of Oil and Gas Producers (OGP) and IPIECA’s *Guide to Health Impact Assessments in the Oil and Gas Industry*[3], which is a useful tool for business, communities and government policymakers.

Occupational Health and Safety

The petroleum industry has numerous programs to address the safety and health of workers. Petroleum companies have worker safety systems that comply with U.S. OSHA and analogous requirements in other countries covering employees in all work environments. Standard setting organizations such as ACGIH and the U.S. National Institute for Occupational Safety and Health (NIOSH) have developed standards, programs and safe exposure limits for workers engaged in all aspects of the petroleum industry.

Hazard communication efforts are a key component of occupational health and safety programs. All U.S. petroleum companies have hazard communication programs in compliance with requirements of the U.S. OSHA and various regulatory schemes around the world. U.S. hazard communication in the workplace includes the elements presented in Table 2.

Table 2 U.S. Hazard Communication in the Workplace

Have a written hazard communication plan available to all employees.
Maintain a hazardous chemical inventory and a safety data sheet (SDS) for every hazardous chemical on site.
Ensure that each chemical container is labeled with the identity of the material and its hazard warnings.
Provide employees with information and training on the hazards of materials in their workplace.

In a typical major petroleum company, SDSs are authored by a multidisciplinary staff of experts in fields such as toxicology, industrial hygiene, environmental science and regulatory compliance. They use state-of-the art scientific information to characterize the hazards of each material and to accurately communicate the associated warnings and precautions on the SDS. API member companies have central repositories of SDSs, which are used both at sites internal to the company and for providing SDSs to customers and other requestors. Hazard communication goes two ways—i.e., petroleum companies have systems for receiving as well as distributing hazard information. Major petroleum companies have processes for receiving, evaluating, and responding to incident reports or any new health, safety or environmental information about their products.

Some petroleum companies produce hazard summary documents that supplement the required SDS, in addition to GPS safety summaries. These summary documents highlight key points such as required personal protective equipment and what to do in case of a spill. Some of our member companies follow the International Programme on Chemical Safety program to promote the use of International Chemical Safety Cards (ICSCs). An ICSC includes standard phrases summarizing health and safety information, which are verified and peer-reviewed by internationally recognized experts and take into account advice from manufacturers and Poison Control Centers.

The OGP and IPIECA *Guide to Health Impact Assessments in the Oil and Gas Industry*[4] recommends a systematic approach to protecting workers' health. OGP and IPIECA have developed an assessment process designed to help employers identify, measure, and deal with heath risks. The committee has also produced a set of performance indicators for promoting employee health.

To enhance safety and improve process safety performance, API and AFPM are offering new programs to further advance process safety improvements by providing industry with more opportunities to communicate and share experiences and knowledge – vital components of the industry's commitment to improve process safety performance. The new programs are as follows:

- Process Safety Performance Metrics;
- Training and Certification;
- Site Assessments;
- Regional Networks;
- Event Sharing; and
- Hazards Identification.


“Petroleum companies have worker safety systems that comply with U.S. OSHA and analogous requirements in other countries covering employees in all work environments.”

Implementation of GHS

API actively supports implementation of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). API members are moving toward GHS format for SDSs in advance of full GHS implementation in individual countries, to the extent possible while still maintaining compliance with current local laws.

To facilitate appropriate classification and labeling of petroleum substances, including crude oil, API with IPIECA has developed guidance on the application of the GHS to petroleum substances, in consultation with the UN Subcommittee of Experts on the GHS. The IPIECA *Guidance on the Application of Globally Harmonized System (GHS) Criteria to Petroleum Substances*[5] identifies the constituents of concern for crude oil, for example, as hydrogen sulfide, benzene and PACs. It guides the user through the GHS criteria to meet national and international standards for classification and labeling. From there, appropriate risk management actions can be designed to minimize human health risks from potential exposure to crude oil and other petroleum chemicals. This guidance seeks to facilitate appropriate classification and labeling of petroleum substances around the globe.

API has also worked with international organizations such as the International Maritime Organization (IMO) and the Asia Pacific Economic Cooperation (APEC) Chemical Dialogue to support harmonized hazard communication requirements in general and GHS implementation in particular.

Cleaner Production

API and its members continually strive to minimize the health and environmental impacts of oil and natural gas production and to produce cleaner-burning fuels that result in cleaner production in global industry. Regarding oil and natural gas production itself, there are more than a million oil and natural gas wells operating in the U.S. Advances in technology allow our members to conduct many aspects of production operations far more efficiently than they could just a few years ago. This means smaller “footprints” (the amount of surface area disturbed), less waste generated, cleaner and safer operations and greater compatibility with the environment. Today’s oil and natural gas producers are applying a host of new technologies and strategies to minimize the environmental impact of their operations.

Technological advances in production of natural gas are making a huge contribution to the ability of other industries, including electric utilities, to achieve cleaner production. Recent innovations have unlocked vast new supplies of natural gas, which burns cleaner and more efficiently than alternatives.

Many of our member companies are investing in active research and development of products with potential environmental benefits, e.g., biofuels, alternate sources of fuels and environmentally preferable solvents and other chemicals. Petroleum company scientists are well-positioned to contribute to the next generation of energy and chemical innovations that enable sustainable product solutions.

Lead in (Motor Vehicle) Gasoline

In 1995 petroleum companies completed the removal of leaded gasoline in the U.S. (where leaded gasoline has not been available since 1995). Furthermore, petroleum companies have removed lead from gasoline in more than 175 countries worldwide—representing near-global elimination of lead in motor vehicle gasoline. API is a member of IPIECA, a founding member of the international Partnership for Clean Fuels and Vehicles, which is helping developing countries eliminate lead from gasoline, reduce sulphur levels in transportation fuels and introduce cleaner motor vehicles that use these fuels.

PBTs and Other Chemicals of Concern

API member companies have experience addressing issues related to toxic chemicals such as persistent, bioaccumulative, and/or toxic (PBT) chemicals and other chemicals of global concern. Air pollution prevention and mitigation efforts are key activities where chemical concerns are addressed because many of the chemicals of global concern have the potential to be air pollutants. Advances by API companies in the U.S. in reducing toxic air pollutants have been made as the industry has complied with regulations under the U.S. Clear Air Act. In the 1990 amendments to the Act, provisions were added to regulate the emissions of 188 hazardous air pollutants (HAPs) from stationary and mobile sources.

The 1990 amendments also require the installation of technology-based control measures, defined as Maximum Achievable Control Technology (MACT) for all industrial sectors. Most MACT standards affecting the petroleum industry have been promulgated, and the U.S. EPA reviews and updates MACTS every eight years if new technology has become available. In addition, CAA Section 112(f) requires EPA to evaluate whether there is any remaining residual risk eight years after each MACT standard is promulgated, and to implement additional controls, if necessary, to protect the public health with an ample margin of safety.

The oil and natural gas industry is covered by a large number of regulations, tailored to specific industry categories, or source categories. The industry is subject to MACT rules to reduce hazardous air pollutant (HAP) emissions for source categories including hazardous organics; gasoline distribution; marine vessel loading operations; petroleum refineries; natural gas transmission and storage; site remediation; organic liquids distribution; reciprocating internal combustion engines; industrial, commercial, and institutional boilers and process heaters; and combustion turbines.


“Our members operate under the various regulatory schemes around the world for prevention of and responding to chemical emergencies.”

Waste Management (and Minimization)

Responsible waste treatment, storage and disposal is a given for our member companies. In addition, waste minimization – including extensive reuse and recycling – is a key component of petroleum production and refining operations. Petroleum companies maximize product recycling and encourage others in the value chain to do so as well. Some companies formulate petroleum products to extend product life—which means a reduction in energy consumption and waste. Petroleum companies routinely provide customers instructions for proper disposal on SDSs and other materials.

Used oil collection and recycling is an important example of our industry's effectiveness at waste minimization and recycling. Most people are familiar with recycling newspapers, aluminum cans, glass and plastic, but may not be aware of the efforts of the petroleum industry to promote recycling of used motor oil. API reminds consumers and industry to recycle used motor oil, thereby keeping it out of waterways and ground water supplies. Additionally, we provide educational materials on how to recycle used oil.

API's Engine Oil Licensing and Certification System (EOLCS), a voluntary licensing and certification program that authorizes engine oil marketers who meet specified requirements to use the API Engine Oil Quality Marks, is another example of waste minimization. Many of these oils are formulated to help improve fuel economy and protect vehicle emission system components in passenger cars, sport utility vehicles, vans and light-duty trucks powered by gasoline engines.

Remediation of Contaminated Sites

Petroleum companies have been involved in many successful remediation projects and have expertise in the most current remediation technologies. One example of collective involvement in this issue is the Total Petroleum Hydrocarbon Criteria Working Group, which was formed as a voluntary initiative of industry and other stakeholders to develop a set of clear, science-based health benchmarks for use during cleanup at sites with petroleum/hydrocarbon contamination. The Working Group was formed to address the use of diverging cleanup requirements by various federal, state and local agencies in the U.S. The Working Group was guided by a steering committee consisting of representatives from industry, government, and academia.

Prevention and Response for Emergencies Involving Chemicals

Petroleum industry best practices include operating procedures and employee training to manage risk through storage, handling, transportation and distribution of our raw materials and products. Because of the flammable nature of many petroleum products, safety and risk management have always been essential components of storage and handling. These safe practices also mitigate health and environment hazards.

It is a fundamental business objective to maintain petroleum product integrity through the whole chain of custody of a product. Thus, many petroleum companies have strict requirements for distributors that cover both product quality and facility conditions. Some companies implement facility assessment programs to ensure that products are handled properly at all points from the refinery to eventual delivery to the end user. These controls during storage and distribution serve to prevent potential emergencies involving our products.

Many petroleum companies are members of Chemtrec, which was established in 1971 by the chemical industry as a public service hotline for emergency responders, such as firefighters and law enforcement personnel, to obtain information and assistance for emergency incidents involving chemicals and hazardous materials. Oil transportation companies in the U.S. have developed oil-spill response co-ops known as Oil Spill Removal Organizations (OSROs). These organizations, on contract with oil companies, provide equipment, personnel and the skills needed to respond to an oil spill.

Our members operate under the various regulatory schemes around the world for prevention of and responding to chemical emergencies. For example, under oil-pollution prevention regulations in the U.S., petroleum facilities prepare and implement programs for preparing for and responding to a worst-case discharge. As another example, many petroleum facilities must comply with the chemical accident

prevention provisions of the U.S. Clean Air Act. These provisions require a risk-management program, and aim to prevent accidental releases of substances that can cause serious harm to the public and environment from short-term exposures, and to mitigate the severity of releases that do occur.

Consistent with transportation requirements in the U.S. and other countries, petroleum companies implement programs to mitigate the risks to life, property and the environment inherent in the transportation of hazardous materials by strategies related to shipping papers, packaging materials, hazard communication, safe handling, incident reporting, training and security. Numerous standards, including API standards, have been developed to cover all aspects of gasoline storage, transporting and handling. These standards cover the design, construction and operation of virtually every piece of equipment from aboveground and underground storage tanks, to piping, terminals and loading racks, to tank trucks, rail cars and barges.

Pollutant Release and Transfer Registers (PRTRs)

Petroleum refineries, bulk stations, and terminals have extensive experience with PRTR-type reporting through compliance with the U.S. Toxics Release Inventory (TRI) requirements - the world's first PRTR program. Petroleum facilities in subject sectors in the U.S. file annual TRI reports and have been stakeholders in the TRI program since its inception. API supports the community's right to know about chemical releases, and our members actively work to minimize waste and releases. The companies have valuable insight on the practical application of PRTRs and ideas for how to maximize their accuracy and effectiveness.

Lifecycle

The petroleum industry has experience using the life-cycle management concept as a tool in risk assessment and product stewardship. The first stage in the life of a petroleum product is exploration and production, in which crude oil is drilled from land wells or offshore – in many countries around the world. In the U.S., crude oil is processed in one of the nation's 142 refineries, which process more than 15 million barrels of crude oil every day into hundreds of products including gasoline, heating oil, diesel fuel, engine oils, jet fuel, kerosene and many others. Petroleum products are distributed by rail, road, water or pipeline through distribution terminals and storage facilities to the U.S. and to other countries.

Eventual destinations for petroleum products include service stations, homes and direct-served users such as airports. Some refinery outputs are intermediate products that are used to manufacture other products, and petroleum serves as the feedstock for the production of diverse petrochemicals which support solutions for a healthy and plentiful food supply, clean air and water, safe and comfortable living conditions, efficient and affordable energy sources, as well as lifesaving medical treatments in communities around the world. (Many petroleum products do not have a disposal phase because they are burned as fuel, but others (e.g., oils) do have a post-use stage in which the product or its residuals are treated, recycled, and/or disposed.)

API and its members have deep expertise on chemical lifecycle issues. We are a unique industry trade association in the scope and variety of global activities our members undertake—from drilling crude oil, to refining it into various petroleum products, to the distribution and sale of our products. The international nature of the trade and commerce of petroleum makes SAICM an important issue for API and our members. We have a long history understanding and addressing the various chemical management issues which are inherent in our fundamental business activities. API remains supportive of the SAICM process, and we hope our knowledge and experience have and will continue to make a valuable contribution to the Strategic Approach.

1. IPIECA, API, and OGP. *Oil and Gas Industry Guidance on Voluntary Sustainability Reporting.* 2nd edition, 2010.
2. American Petroleum Institute. *Environmental Expenditures by the U.S. Oil and Natural Gas Industry 1990 – 2010.* 2011.
3. IPIECA and OGP. *A Guide to Health Impact Assessments in the Oil and Gas Industry*. 2005.
4. IPIECA and OGP. *A Guide to Health Impact Assessments in the Oil and Gas Industry*. 2005.
5. IPIECA. *Guidance on the Application of Globally Harmonized System (GHS) Criteria to Petroleum Substances*. Version 1, 17 June 2012. Also, see http://www.ipieca.org/good-practice/guidance-application-globally-harmonized-system-ghs-criteria-petroleum-substances.

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