

Green Residential Cleaning

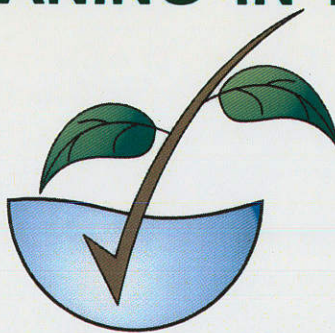
GREEN RESIDENTIAL CLEANING

Your Complete

Green Cleaning Guide

For Healthier Residential Living

GREEN CLEANING IN EVERY WAY!



ENVIRONMENTALLY PREFERABLE SOLUTIONS

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LEADER

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Definitions

Definitions

A "GREEN" CONCEPT:

The concept of "GREEN", especially in regards to "CLEANING", is an overall philosophy, mind set, or objective to move away from synthetic, "toxic" and "hazardous", petrochemical products and towards natural, bio-based ones which provide health and safety benefits to indoor environments while enhancing air quality.

"Petrochemical" means any product derived from "crude oil" or a "petroleum distillate". "Bio-based" means a product which is derived from a renewable source such as the extracts or oils from fruits, vegetables, plant matter, seeds, or nuts.

"GREEN" is NOT just a single or handful of cleaning products which are environmentally responsible. This "GREEN" concept can also apply to the purchasing and use of adhesives, carpeting, copying machine fluids, flooring, furniture, office supplies, paint, stationary supplies... just to name a few... in the workplace.

DEFINING HEALTH:

"Protecting the sanctity of the Human Immune System".

The immune system is the body's main system to fight disease. Any defect in the immune system decreases a person's ability to fight infections. Our immune resistance is compromised and lowered by constant exposure to chemical fumes & residues, irritant dust, molds, mildew, & bacteria. However, many factors in the environment - both controllable and uncontrollable- overload the immune system and causes it to breakdown and be less protective. Factors that we can easily control should become our main focus and starting point because the only individuals that are affected by them are us!



Environmentally Preferable

The Explanation of "Environmentally "GREEN" Preferable" Cleaning Product Alternatives.

A "GREEN" CONCEPT:

In February 1993, Public Building Services (PBS) of the federal government's General Service Administration (GSA) began the "Cleaning Products Pilot Program". At that time, the objective was to identify specific "ENVIRONMENTALLY PREFERABLE" (the only viable, legally-binding environmental cleaning chemical term assigned by the federal (and state) governments for products with credentials regarding testing/performance criteria and impact on the environment and health / safety of individuals) cleaning products with reduced health and safety concerns for use in cleaning over 7,000 federal buildings.

Up to that date, most of the publicly available environmental information on products consisted of UNSUBSTANTIATED VENDOR CLAIMS OR "HOME REMEDIES" (with descriptions like "Environmentally Friendly" and "Environmentally-Safe"). PBS officials wished to define and identify "GREEN" cleaning products. Product usage was chosen as the key focus for assessment since it was indicative for the greatest direct health risk from the cleaning products to custodial workers to occupants. Consequently, specific environmental attributes were identified to help assess the environmental preferability of commercially available cleaning products (OR THE INACCURATE DESCRIPTION, "ENVIRONMENTALLY-SAFE", or, "ENVIRONMENTALLY-FRIENDLY" which really should be described ONLY as "Environmentally-Preferable" as defined by the federal and state government with such programs). These attributes were:

- 1) Skin irritation potential;
- 2) Chronic health risks from skin and inhalation exposure;
- 3) Quickness of ultimate biodegradation;
- 4) Accumulation Factor (Bio-Concentration Factor of an ingredient to accumulate into the food chain);
- 5) Percentage of V.O.C. (volatile organic compounds) which increases the potential for off-gassing;
- 6) Amount of product packaging waste;
- 7) Presence of ozone depletes;
- 8) Dispensing Method in regards to potential exposure to concentrated cleaning solutions;
- 9) Degree of flammability;
- 10) Amount of cosmetic additives (fragrances and dyes); and
- 11) Impact on energy requirements.



Cleaning National Parks

Using Environmentally Preferable Janitorial Products at Yellowstone and Grand Teton National Parks:

PROJECT OBJECTIVES

- ◆ Eliminate or greatly reduce the use of toxic, hazardous and environmentally harmful cleaning chemicals, and potential human health risks.
- ◆ Reduce the quantity and variety of cleaning products by consolidating and standardizing product purchases.
- ◆ Choose the safest and "greenest" janitorial products with a proven record in commercial operations.
- ◆ Involve top management, first line supervisors and janitorial staff in all aspects of this process to ensure long term success.

Source:

[Http://www.epa.gov/Region8/conservation_recycling/yellowstone.pdf](http://www.epa.gov/Region8/conservation_recycling/yellowstone.pdf)

Prepared for:

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WHY CHANGE TO ENVIRONMENTALLY PREFERABLE CLEANING PRODUCTS?

Many common cleaning products contain chemicals which, in their pure form, have been shown to have health effects and/or which pose storage and disposal concerns. The potential for a cleaning product to cause problems depends on the concentration and formulation of the ingredients, and on how the product is stored, used and disposed.

While indoor air quality problems can arise from inadequate housekeeping that fails to remove dust or other contaminants, cleaning products themselves produce odors and emit a variety of chemicals that can contribute to poor indoor air quality. The U.S. Environmental Protection Agency's Total Exposure Assessment Methodology (TEAM) studies indicate that while people are using products containing organic chemicals, they can expose themselves and others to high pollutant levels. Elevated concentrations of pollutants can persist in the air, particularly in enclosed spaces and poorly ventilated areas. Selecting cleaning products that minimize these emissions can provide a clean environment while protecting the health of workers and occupants.

There is growing evidence that some chemicals in cleaners are agents that cause asthma or make it worse. In a June, 1999, surveillance of work-related asthma in selected US states - California, Massachusetts, Michigan, and New Jersey - using surveillance guidelines for state health departments showed that in 4.6% of work related asthma cases (51 cases out of 1,101), the putative agent was cleaning materials.

An occupational lung disease bulletin issued by the Massachusetts Department of Public Health in April, 1998, reported that more than 10% of the work-related asthma cases reported list cleaning agents as the suspected asthma agent. These cleaning agents included bleach, chlorine, floor stripper, ammonia, sodium hydroxide, muriatic acid, detergents and disinfectants.

Finally, in the preamble to Occupational Safety and Health Administration's (OSHA) revised Hazard Communication Standard (59 FR page 6151), OSHA cited data from the Consumer Product Safety Commission's (CPSC) National Electronic Injury Surveillance System (NEISS). These data concerned work-related chemical injuries from consumer products where the injury was treated in an emergency room in 1986. The data were provided by emergency rooms to the National Institute for Occupational Safety and Health. According to CPSC, soaps, detergents and "cleaning compounds not classified elsewhere" were cited as responsible for 10, 252 work related emergency room visits. These limited data suggest that users of cleaning products should look for the least toxic product that can do the job in order to minimize potential health and safety risks.





U.S. Department of Interior's Environmentally - Preferable "Green" Cleaning Chemical Model

<http://greeninginterior.doi.gov/sustain/trad.html>

Below is a list of environmental attributes set forth by the U.S. Department of Interior to define an environmentally-preferable cleaning chemical:

- Must not contain any carcinogens, mutagens, or teratogens designated by federal law. ("Carcinogen" is a cancer-causing agent; "Mutagen" is any agent, such as ultraviolet light, radioactive element, or chemical ingredient which can induce or increase the frequency of mutation in an organism; "Teratogen" is any agent such as a virus, a drug or radiation, that adversely affects and causes malformations of a developing fetus or embryo.)
- Must be biobased (i.e., utilize biological products or renewable, domestic agricultural [plant, animal, or marine] or forestry materials).
- Must not contain petrochemical-derived fragrances.
- Must not contain petro-dyes.
- Must be biodegradable. (Means 60% to 70% of product's ingredients break down and return to the environment within 28 days, for each organic component above 1% in the ready to use product).
- Must not contain petroleum distillates.
- Must not contain chlorinated solvents.
- Must not contain any ozone-depleting compounds, greenhouse gases, or substances that contribute to photochemical smog and poor indoor air quality.
- Must have a pH between 4 and 9.
- Must have a flash point higher than 200° F.
- Must not be corrosive or irritating to the skin or eyes.
- VOC levels must meet or be less volatile than the California Code of Regulations maximum allowable VOC levels for appropriate cleaning product categories.
- Must not be delivered in aerosol cans.
- Must not contain ingredients included on the "Chesapeake Bay Program's Toxics of Concern list".
- Must be dispensed through automatic systems in order to reduce employee contact with the concentrate and to ensure proper dilution ratios.
- Must not contain any chemicals under "Section 313" of the "Emergency Planning and Community Right-to-Know Act (EPCRA)".
- Must not constitute hazardous wastes, as defined in 40 CFR (Code of Federal Regulations) Part 261, when offered for disposal.
- Must not be toxic to humans or aquatic life.
- Must not contain endocrine modifiers, alkyl phenyl ethoxylates, dibutyl phthalate, or heavy metals. (e.g., arsenic, lead, cadmium, cobalt, chromium, mercury, nickel, selenium).
- Must not be combustible.
- Must not contain more than 0.5 percent by weight of phosphorous.
- Must not contain persistent or bioaccumulative substances.





EPA's Final Guidance on Environmentally Preferable Purchasing

<http://www.epa.gov/oppt/epp/guidance/finalguidancetoc.htm>

On September 14, 1998, President Clinton signed Executive Order (EO) 13101, entitled "Greening the Government through Waste Prevention, Recycling and Federal Acquisition." Executive Order 13101 (EO 13101) supersedes EO 12873, Federal Acquisition, Recycling and Waste Prevention, issued on October 20, 1993, but retains a similar requirement for the U.S. Environmental Protection Agency (EPA) to develop guidance to "address environmentally preferable purchasing".

"Environmentally preferable" is defined in Section 201 of EO 13101 to mean products or services that "have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance or disposal of the product or service".

In addition to promoting environmentally preferable purchasing, EO 13101 encourages Executive agencies to purchase bio-based products. (Section 504 (b)). Under the EO, "bio-based product" means "a commercial or industrial product (other than food or feed) that utilizes biological products or renewable domestic agricultural (plant, animal and marine) or forestry materials".

Guiding Principle 1:

Environment + Price + Performance = Environmentally Preferable Purchasing

Environmental considerations should become part of normal purchasing practice, consistent with such traditional factors as product safety, price, performance, and availability.



...Continues (EPA's Final Guidance on Environmentally Preferable Purchasing)

The manufacture, use, and disposal of certain products might have adverse impacts on human health and the environment. These impacts impose costs that the purchasing entity, and ultimately, society as a whole, end up paying for in one way or another. For the Federal government, the hazardous or toxic nature of a product or service can result in significant cleanup or liability costs, as well as in less directly quantifiable, but cumulative and persistent environmental damage. Even non-hazardous waste is associated with ever-increasing disposal costs that can be avoided or reduced. Responsible management, beginning with the initial purchase of products and services that minimize environmental burdens, can diminish the Federal government's raw material, operating, maintenance, and disposal costs. In addition, a product or service's environmental preferability can often have positive impacts on its overall performance.

For these reasons, the Federal government's purchasing decisions are no longer confined to considerations of price and functional performance but should include considerations of environmental performance as well. Today agencies can obtain improved environmental attributes not at the expense of, but instead may operate in concert with, other traditional factors like price and functional performance. Those product or service providers who can optimize all these factors will capture and maintain the largest market-share of government customers.

Just like price, performance, and health and safety, environmental factors should be a subject of competition among vendors seeking government contracts.



Interesting

On Average Americans spend about 90% of their days indoors. EPA study indicates that human exposure to air pollution is 2-5 times & occasionally up to 100 times higher than outdoors.

today
Sick's are efficient from weather
Falls that with the indoor
injury
injury
injury
etc
in
EPA
a
micro
environment
The
Tues
Cancer
+
Cancer
all
airborne
contaminants

Interesting Facts

1. Allergic reactions to "Sick" Indoor Environments account for more than 10 million workdays missed by U.S. employees each year.
2. One (1) Sick Day per year X the average U.S. salary X the Total U.S. Working Population = \$27 Billion Dollars!
3. Allergic reactions to "Sick" Indoor Environments keep 10,000 American children out of school each day. Asthma is the # 1 cause of absenteeism in schools today.
4. A U.C.L.A. study indicates that "adverse health effects have been identified regarding common chemical ingredients found in 222 cleaning products".
5. According to a latest medical report, conventional cleaning chemicals are "NEUROTOXINS" which may impair a "chemically sensitive" individual's ability to concentrate and focus at his/her job
6. Forty-one percent (41%) of Health-related "housekeeping" complaints are related to airborne indoor dust and the biological bodily functions of breeding dust mites.

7) Approx 10 million Americans have Asthma
has 30% in the last 10 years - significant

8) 33 million Americans suffer from
sinusitis - inflammation
or infection of sinus passages

9) Approx 50% of all allergies are
caused by Aggravation
by indoor pollution

10) Dust + dirt
could cause

11) Typical Home carries 3-10 billion of harmful microorganisms
in housekeeping dust & debris





Janitorial Products Pollution Prevention Project

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[Http://www.wrppn.org/Janitorial/jp4.cfm](http://www.wrppn.org/Janitorial/jp4.cfm)

Each year about six out of every hundred professional janitors are injured by the chemicals that they use. Burns to the eyes and skin are the most common injuries, followed closely by breathing toxic fumes.

One third of the cleaning chemicals used today have ingredients that can harm you. These ingredients are in products for cleaning glass, restroom fixtures, metal, kitchens, carpets, and hard floors, to name only a few.

Are you cleaning safe?

In 2000, the Environmental Protection Agency; the State of California, and Santa Clara County began the "JANITORIAL PRODUCTS POLLUTION PREVENTION PROJECT" In the San Francisco Bay Area, and continued In Southern California. The findings were disturbing. It was determined by this 18 month study that 41 percent of cleaning chemicals are dangerous, and 6 percent are so dangerous to use such as floor strippers, high-strength degreasers, drain openers, and bowl cleaners that they have no right to be in a building, especially with children.

This study of an evaluation of custodians found that the 27,000 custodians working In Santa Clara County sustained approximately 1,200 Injuries annually 20 percent of which are mostly chemical burns to the eyes or skin. A further review of Just 25 percent of the county's custodians found that they used approx. 400,000 pounds of hazardous materials annually in cleaning, or approximately 60 pounds a year per custodian.

One of the most common petrochemical ingredient used in cleaning products is "2 butoxyethanol", better known as "butyl cellusolve". This Ingredient is easily absorbed into the skin and widely used in glass cleaners (such as WINDEX, GLASS PLUS); general purpose cleaners (FANTASTIK, FORMULA 409, SIMPLE GREEN, SPRAY NINE); and carpet spotters (RESOLVE). According to this report, this ingredient, "2-BUTOXYETHANOL", poisons your blood, liver, and kidneys; and may cause pregnancy problems in women over an extended period of time.



Pollution Prevention Project

What Cleaners Have The Most Risk?

Product Type	Hazardous Ingredients	How These Can Harm You
Glass Cleaner General Purpose Cleaner Carpet Spot Remover	A solvent called "Butoxyethanol"	Butoxyethanol absorbs through your skin and poisons your blood, liver, & kidneys. Wear gloves when you use cleaners with this ingredient.
Toilet Cleaner	Hydrochloric Acid Phosphoric Acid	These acids are very good for removing hard water rings, but they can also blind you in seconds. Wear your gloves and goggles, or better yet change to a milder product (one with Citric Acid - strong lemon juice).
Oven Cleaner Heavy Duty Degreaser	Sodium Hydroxide	Oven cleaner in a spray can -very convenient, but also very dangerous. Sodium hydroxide can blind you, and the vapors can harm your lungs. Use it with care - wear gloves & goggles, and provide lots of fresh air.





U.S. Environmental Protection Agency

Indoor Air Quality

[This information originates from the EPA publication "The Inside Story - A Guide to Indoor Air Quality".]
[Http://www.epa.gov/iaq/voc.html](http://www.epa.gov/iaq/voc.html)

Sources of Indoor Air Pollution:

Organic Gases (Volatile Organic Compounds - VOCs)

Organic chemicals are widely used as ingredients in household products. Paints, varnishes, and wax all contain organic solvents, as do many cleaning, disinfecting, cosmetic, degreasing, and hobby products. Fuels are made up of organic chemicals. All of these products can release organic compounds while you are using them, and, to some degree, when they are stored.

EPA's Total Exposure Assessment Methodology (TEAM) studies found levels of about a dozen common organic pollutants to be 2 to 5 times higher inside homes than outside, regardless of whether the homes were located in rural or highly industrial areas. Additional TEAM studies indicate that while people are using products containing organic chemicals, they can expose themselves and others to very high pollutant levels, and elevated concentrations can persist in the air long after the activity is completed.

Sources

Household products including: paints, paint strippers, and other solvents; wood preservatives; aerosol sprays; cleansers and disinfectants; moth repellents and air fresheners; stored fuels and automotive products; hobby supplies; dry-cleaned clothing.



Indoor Air Quality

Health Effects

Eye, nose, and throat irritation; headaches, loss of coordination, nausea; damage to liver, kidney, and central nervous system. Some organics can cause cancer in animals; some are suspected or known to cause cancer in humans. Key signs or symptoms associated with exposure to VOCs include conjunctival irritation, nose and throat discomfort, headache, allergic skin reaction, dyspnea, declines in serum cholinesterase levels, nausea, emesis, epistaxis, fatigue, dizziness.

The ability of organic chemicals to cause health effects varies greatly from those that are highly toxic, to those with no known health effect. As with other pollutants, the extent and nature of the health effect will depend on many factors including level of exposure and length of time exposed. Eye and respiratory tract irritation, headaches, dizziness, visual disorders, and memory impairment are among the immediate symptoms that some people have experienced soon after exposure to some organics. At present, not much is known about what health effects occur from the levels of organics usually found in homes. Many organic compounds are known to cause cancer in animals; some are suspected of causing, or are known to cause, cancer in humans.

Levels in Homes

Studies have found that levels of several organics average 2 to 5 times higher indoors than outdoors. During and for several hours immediately after certain activities, such as paint stripping, levels may be 1,000 times background outdoor levels.



Vulnerable Populations to Asthma

Who gets Asthma?

Susceptible populations for asthma include:

Children

- Children 5 to 14 years of age are the most affected by asthma.
- Asthma usually has its onset in early life for the majority of asthmatic children.
- Up to 50 percent of babies experience at least one episode of wheezing during the first few years of life. Two-thirds of these are babies who are born with "small airways" and wheeze with viral infections but otherwise do not seem to develop asthma. The remaining one-third are eventually diagnosed with asthma. These are children who become sensitized to the allergens in their environment early in life.

Ethnic minorities

- Blacks and Latinos / Hispanics also seem to be at the greatest risk.
- African American children, are 3-4 times more likely to be hospitalized than their white counterparts and 4-6 times more likely to die from the disease than their white counterparts.
- Puerto Ricans in the United States suffer from asthma far more frequently than other ethnic groups. One in every five Puerto Rican children (20%) in the United States had asthma in 1982-1984 compared to 4.5% of Mexican-American, 8.8% of Cuban, 9.1% of black and 6.5% of white children.

Good asthma care can be a difficult, labor-intensive, and costly process. Financially hard-pressed families need support and resources to help them manage their disease and avoid using the emergency room as primary care.



Household Products

Household Products

♦ Many household products contain potentially harmful chemicals. Cleaning products may contain bleach or ammonia which are strong airway irritants. Moth balls contain naphthalene and solid air fresheners often contain formaldehyde. Some of these products release toxins into the air right away; others do so gradually over time. Not only are you exposed to these toxins during use, but they can stay trapped inside your home until they can escape through an open door or window. Vapors can build up undetected and create dangerous levels of pollutants. Health effects from household products include dizziness, allergic reactions and respiratory tract irritation. Some household products may cause cancer.

♦ Avoid aerosol sprays such as air fresheners and furniture polish. Aerosol particles are small enough to travel deep within the lungs. These particles can carry many toxic chemicals with them. Use pump sprays.

♦ One of the easiest things to change...

The warning is as follows:

WARNING: Store all household products safely away from children.

In case of accidental poisoning contact the **Poison Control Center at (800) 764-7661.**

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Plant-Based Chemicals

Plant Bio-Based Chemicals "Biochemicals"

<http://www.carbohydrateecology.org/html/biochem.htm>

What are Biochemicals?

In industry the term "biochemical" often refers to the category of petrochemicals that are used on agricultural crops. At the Institute for Local Self-Reliance (ILSR), we use the term to refer to chemicals that are produced from plant matter. These biochemicals are derived from renewable resources such as vegetable oils, fiber and grain crops, citrus fruits, nuts and trees. Plant matter-based chemicals such as soy methyl esters, ethyl lactate and grain-derived alcohol are used to produce a variety of industrial products for processing and manufacturing operations. Examples of applications for plant-based chemicals include industrial solvents, equipment lubricants, paints and coatings and plastics.

Biochemicals enhance worker safety

Biochemicals offer a number of advantages for workers. Most importantly, they significantly reduce the health risks related to petrochemicals. Lower levels of health risk mean that less safety training and protective equipment may be required. Working with less hazardous chemicals reduces the stress associated with accidental spills and contaminations that could lead to uncontrolled reactions. A safer work environment also benefits the manufacturer by reducing work-related injuries or illness related to hazardous chemical exposures. This translates into fewer liability claims and increased productivity.



Plant-Based Chemicals

The following table compares the National Fire Protection Association (NFPA) ratings for components of common petrochemical-based products to components of biochemical-based products. Biochemicals exhibit far less health and safety hazards.

PETROCHEMICALS	HEALTH RATING	FLAMMABILITY RATING
Methyl Isobutyl Ketone (MIBK)	2	3
Methyl Ethyl Ketone (MEK)	1	3
Xylene	2	3
Toluene	2	3
Styrene	2	3
BIOCHEMICALS	HEALTH RATING	FLAMMABILITY RATING
Soybean Oil	0	1
Coconut Oil	0	1
Grain-derived alcohol	0	0
Rapeseed Oil	0	1
Terpene (pinene)	1	0

HEALTH RATING

0 = no hazard
 1 = caution (may irritate)
 2 = warning (if inhaled/absorbed)
 3 = corrosive/toxic
 4 = danger (possibly fatal)

FLAMMABILITY RATING

0 = not combustible
 1 = combustible if heated
 2 = combustible liquid
 3 = warning (flammable liquid)
 4 = danger (extremely flammable liquid/gas)

Note: Ratings from the NFPA and chemical manufacturers.

Benefits of Biochemicals

Manufacturing Benefits: The private sector benefits from biochemicals in several ways. Biochemicals provide an environmental compliance tool for manufacturers and end-users. Substituting biochemicals can be a permanent solution to regulatory problems by replacing chemicals listed or soon to be listed on the Environmental Protection Agency's (EPA) Toxic Release Inventory (TRI).

Environmental Benefits:

When compared to petrochemical alternatives, the use of biochemicals reduces upstream and downstream pollution. Utilizing plant matter in the manufacture of chemicals decreases the amount of upstream pollution generated from the extraction and processing of crude oil into chemicals. Chemical products derived from plant matter are highly biodegradable and in most cases can be disposed of safely and inexpensively, resulting in less downstream pollution.



PLANT-BASED

Chemicals

Health Benefits:

Businesses can improve the work environment for their employees by using biochemicals and thus reducing health and safety risks. Plant matter-derived chemicals are typically lower in toxicity, flammability and corrosivity than their petrochemical counterparts.

Cost Benefits:

The economics of replacing petrochemicals with biochemicals are increasingly favorable and, when all costs are considered, biochemicals are competitive with petrochemicals. Manufacturers can save money by avoiding costly permits and compliance penalties and through a dramatic reduction in hazardous waste disposal costs. Companies manufacturing or using biochemicals can appeal to "green" consumers, a growing portion of the market.

Biochemical Substitution

Companies interested in reducing environmental and worker safety regulatory pressures are seeking substitutes to petroleum-based manufacturing and operational chemicals. These replacement chemicals are derived from plant matter. Biochemicals can be used in place of petrochemicals at varying stages of product manufacturing to reduce pollution and create a safer work environment.



ADHESIVES
AUTO FLUIDS AND FUELS
DEICERS
CLEANERS
INDUSTRIAL SOLVENTS
LUBRICANTS
PAINTS AND VARNISHES
PLASTICS
PRINTING INKS

One hundred years ago, most of our society's fuels, construction materials, textiles, inks, paints, and even synthetic fibers and chemicals were made from plant matter. As petroleum flooded the market, plant matter-derived chemicals began to lose ground as the feedstock for industrial products and fuels. By the 1980's, less than 5 percent of our industrial products and fuels came from biological materials.

Today, however, industry is showing signs of shifting away from petroleum and towards plant matter. This is happening as new technologies lower the cost of deriving products from plant matter and environmental regulations raise the cost of extracting, processing, using and disposing of fossil fuel-derived products.

