

## WOOD SMOKE IS RICH IN DIOXINS and PCBs

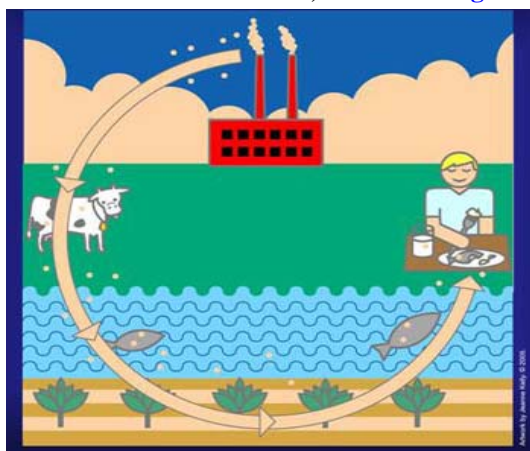
“Dioxins are byproducts of paper bleaching, smelting, and waste incineration. They are widespread in the environment because they break down very slowly. They also accumulate in fat cells. Most of our exposure to dioxins comes from eating dairy products, fish, and meat.” (National Cancer Institute, US National Institute of Health)

**Notice—no mention of wood smoke. Why???**



Above illustration is from Bay Area Air Quality Monitoring District Wood Burning Handbook

Illustration below is from the National Cancer Institute Website, [www.cancer.gov](http://www.cancer.gov).



**Wood smoke is rich in chlorinated dioxins and PCBs**, toxins that disrupt our endocrine systems and the way our bodies work. When smoke falls to the ground, dioxins get into the water and into the food chain along with cadmium, lead, arsenic and other poisons. First we breathe the bad chemicals—then we eat them. ([burningissues.org](http://burningissues.org)) Dioxin is a potent carcinogen and endocrine disrupter. Scientists say it is exceeded in toxicity only by radioactive waste. (US East Coast Ash for Radioactive Wood Ash)

**Dioxin from Wood Burning . . .** is one of the dozen deadly air pollutants. It is a repeat offender and keeps getting recycled in the environment for years. It lasts in the human body for seven years after exposure.



**Wood burning is the third largest source of dioxin in the United States.** (California Air Resources Board, 1999)

**In the San Francisco Bay Area residential wood burning is the second largest source of dioxin** and accounts for as much dioxin as 100 factories and industrial sites, including landfills, incinerators, foundries, cement kilns, coke ovens and hazardous waste furnaces. (Meltzer, Lawrence Livermore national Lab 2001 Report) San Francisco wood burning is estimated to produce 0.424 grams of dioxin per year. Compare to nonspecific source fires at 0.097 grams of dioxin per year, or hazardous waste incineration at Shell and Chevron of 0.063 grams of dioxin. (California Air Resources Board, 1999)

**Dioxin Poisoning** September 5, 2004, Ukrainian opposition leader and presidential candidate Victor Yushchenko was **poisoned with a near lethal dose of Dioxin** thought to have been placed in the food and/or beverage of his evening meal. His face is now ravaged, as you can see in pictures from the following abridged article.

### **Ukrainian Candidate Poisoned By Dioxin**

**Doctors In Vienna Confirm Diagnosis of Yushchenko's Illness; Police Reopen Case**  
By ELISABETH ROSENTHAL, Published on 12/12/2004. [Abridged]

London (NYT) — Tests done at a hospital in Vienna, Austria confirmed that Viktor A. Yushchenko, the Ukrainian opposition candidate, **had been poisoned with dioxin**, doctors there said Saturday, providing an explanation for a broad array of painful and disfiguring conditions that plagued him during the past three months of the presidential campaign. Dioxin, a waste product of various industrial chemical processes, is a highly toxic chemical that **remains in the body for years after exposure**, so doctors were able to test their patient Friday, long after the near-fatal poisoning occurred. Initially the poison often produces severe abdominal pains, nausea and vomiting — and, in

the long term, very high doses can produce the kind of skin cysts and discoloration that have disfigured Yushchenko.

**...dioxin exposure most often comes from industrial accidents where it is inhaled or absorbed through the skin.**



The picture combo shows Viktor Yushchenko in file photos dated March 28, 2002, left, and Dec. 6, 2004, right. The Ukrainian opposition leader and presidential candidate's mysterious illness that scared his face was caused by dioxin poisoning, doctors said Saturday in Vienna, Austria.

# Bay Area Study of Wood Smoke Plumes and Particulate PAHs

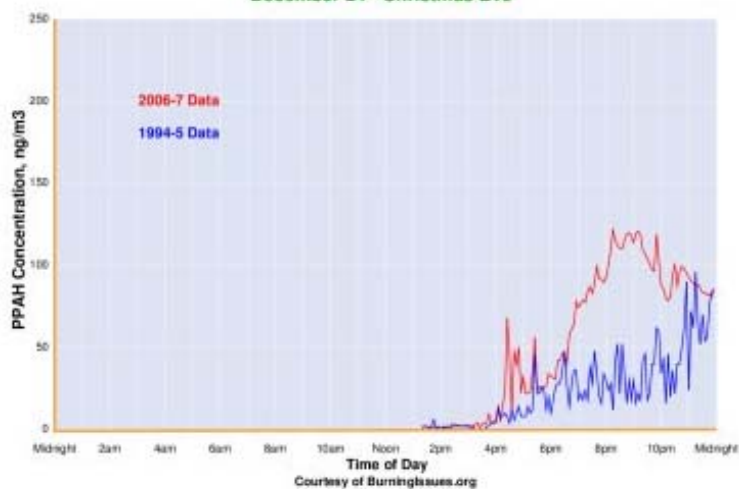
## BASIS FOR RESEARCH

These findings are from a study of fine particulate polycyclic aromatic hydrocarbons (PPAHs) measured at 7 homes in the San Francisco Bay Area by Stanford University researcher Wayne R. Ott. The research was sponsored by the U.S. Environmental Protection Agency, and the measurements were made with state-of-the-art continuous air monitoring instruments that use ultraviolet light to irradiate the particles, which then are measured by their electric charge. This measurement principle is called *photoionization*.

Portions of the study describing the state-of-the-art measurement method are discussed in a published paper by W. R. Ott and H. C. Siegmann, "Using Multiple Continuous Fine Particle Monitors to Characterize Tobacco, Incense, Candle, Cooking, Wood Burning, and Vehicular Sources in Indoor, Outdoor, and In-Transit Settings," *Atmospheric Environment*, Vol. 40, 2006, pp. 821-843. For more information on wood smoke pollution, visit <http://burningissues.org>, Clean Air Revival, Inc.

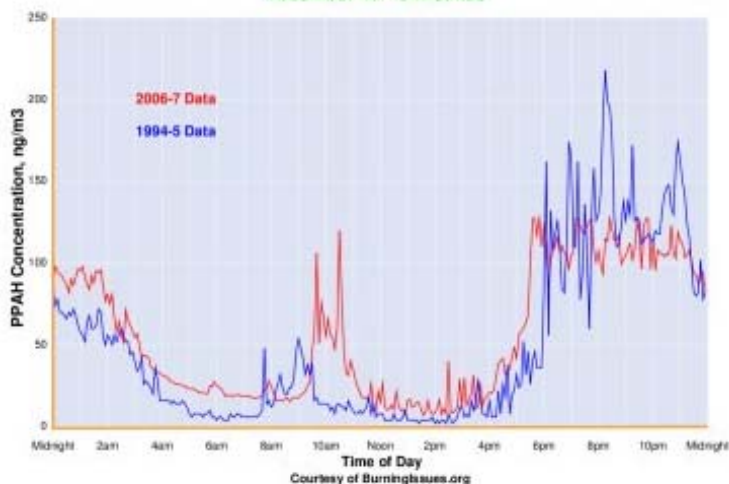
### Christmas Week Day 1

December 24 - Christmas Eve



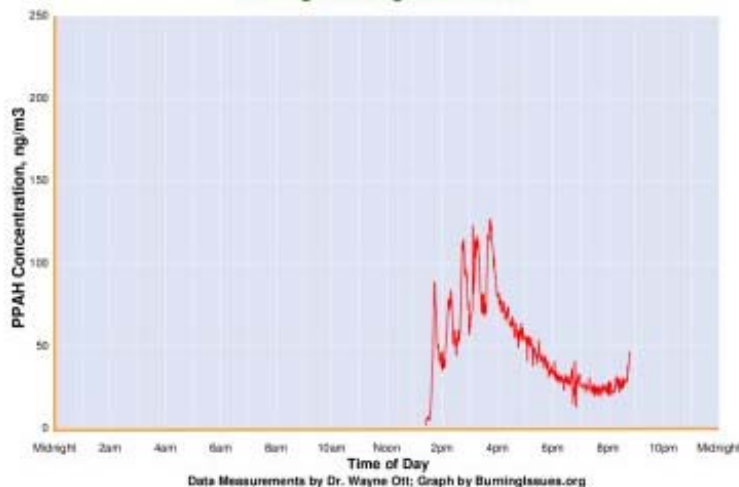
### Christmas Week Day 2

December 25 - Christmas



### Five Cigarettes Smoked in a Large House

First Cigarette Begins at 1:31 PM



The above charts show data for the **outdoor** concentrations of PPAH pollutants. The indoor reading for this house was approximately 50% of the outdoor values.

For comparison, consider the chart showing the pollutants from **five cigarettes smoked inside** the same house on a day with no wood burning.

**All charts are drawn to the same scale.**

Since about half the outdoor PPAHs infiltrate indoors, **residential wood smoke on Christmas day caused indoor concentrations equivalent to more than 5 cigarettes smoked indoors.**