Filthy frequencies

A form of electromagnetic pollution known as 'dirty electricity' may be responsible for an array of common health problems—from asthma and ADHD to diabetes and depression

Dirty electricity is an ubiquitous pollutant that has largely escaped the attention of the general public and scientific community. It refers to surges of high-frequency voltage or electromagnetic radiation that contaminate the normal 50–60 Hz power lines around us. These surges are generated by electrical equipment such as computers, plasma TVs, energy-efficient lighting and dimmer switches.

Dirty electricity was thought to be a problem only for utility companies, costing the industry around $5 billion in the US alone (Electromagn Biol Med, 2006; 25: 259–68).

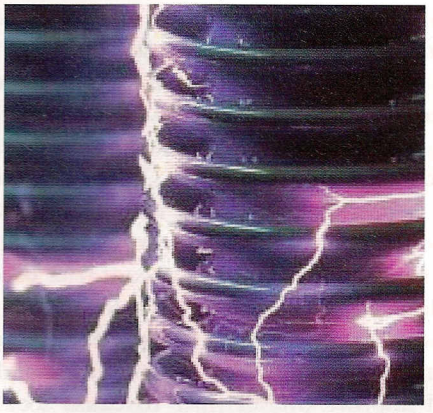
But emerging evidence suggests that it's also a serious public-health issue. Advances in technology have allowed scientists to measure dirty electricity, and it appears that this form of electrical pollution is 'biologically active'—in other words, it's potentially harmful to health.

Studies carried out by Magda Havas, of Trent University in Ontario, Canada, have demonstrated just how damaging dirty electricity can be.

Wide-ranging health effects

In the first study, involving four case studies, Havas looked at electrically sensitive diabetics and analyzed their blood-sugar levels in relation to dirty electricity in their environment. She found that, in an electromagnetically 'clean' environment, type 1 diabetics required less insulin and type 2 diabetics had lower levels of blood sugar. Exposure to dirty electricity, on the other hand, rapidly increased their blood sugar.

According to Havas, these results, along with mounting laboratory and observational evidence, suggest a third type of diabetes, triggered by environmental factors such as dirty electricity. "Unlike true Type 1 and Type 2 diabetics whose blood sugar is not affected by dirty electricity," Havas explains, "Type 3 diabetics may be better able to regulate their blood



sugar with less medication, and those diagnosed as borderline or pre-diabetic may remain non-diabetic longer, by reducing their exposure to electromagnetic energy."

She estimates that as many as five to 60 million diabetics worldwide may, in fact, be type 3 diabetics who will benefit from limiting their exposure to dirty electricity (Electromagn Biol Med, 2008; 27: 135–46).

Her second study used Graham–Stetzer (GS) filters, specially designed to reduce dirty electricity, to investigate the impact of power quality on teachers' wellbeing and students' behaviour in three schools in Minnesota, USA.

A total of 541 GS filters were installed in an elementary school, middle school and a high school. The teachers completed a questionnaire each day regarding their health and the behaviour of their students for eight weeks. As a control, dummy filters were also installed, and the teachers didn't know which filters were in place at any given time.

What Havas found was that dirty electricity in the schools was reduced by more than 90 per cent by the GS filters and that, when these filters were in place, both teachers' health and students' behaviour improved in the elementary and middle schools. Of the 44 teachers who took part, 64 per cent felt better, 30 per cent felt worse and 6 per cent felt no different with the GS filters installed. In par-

What is dirty electricity?

- "Just as clean water can become polluted when it travels through a contaminated environment, electricity becomes increasingly polluted when it comes into contact with assorted types of electronic equipment. Regular or 'clean' electricity enters buildings at a frequency of 50–60 Hz; power becomes 'dirty' or polluted when it develops scattered higher-frequency signals as a result of contact with equipment such as computers, plasma televisions and some appliances. NIR [non-ionizing radiation] generated by dirty power may radiate to contaminate the adjacent environment and is alleged to be potentially harmful."

  Dr Stephen Genuis, University of Alberta, Canada
  (Public Health, 2008; 122: 113–24)

- "Dirty electricity refers to electromagnetic energy that flows along a conductor and deviates from a pure 60-Hz sine wave . . . It is generated by electronic equipment such as computers, plasma televisions, energy-efficient appliances, dimmer switches, as well as arcing on electrical conductors caused by loose wires or contact with trees. Dirty electricity is thus produced within buildings but can also enter buildings from neighbours who share the same transformer. Mobile or broadcast antennas, if not properly filtered, can also contribute to high frequencies on electrical wires in nearby buildings."

  Dr Magda Havas, Trent University, Canada
  (Electromagn Biol Med, 2006; 25: 259–68)

ticular, headaches, asthma, general weakness, dry eyes/mouth, facial flushing, skin irritations and overall mood, including depression and anxiety, were significantly better among staff at these times.

Interestingly, however, the behaviour of high-school children did not improve, whereas younger students were assessed as being more active in class, more responsive and more focused, with fewer health complaints and a better overall learning experience with GS filters than with dummy filters in place (Sci Total Environ, 2008 Jun 13, Epub ahead of print).

These studies contribute to the accumulating body of evidence that dirty electricity has harmful effects on people. According to previous research by Havas, a variety of other disorders—including asthma, multiple sclerosis, tinnitus and electrical hypersensitivity—also improve when exposure to dirty electricity is reduced (Electromagn Biol Med, 2006; 25: 259–68).

Of particular interest is a study by Havas conducted at a school in Toronto, Canada. It found that when GS filters were installed to reduce dirty electricity, the behaviour of the students, especially the younger ones, also improved. This suggests that younger children may well be more sensitive to and affected by poor power quality. Moreover, the affected symptoms were those seen with attention-deficit disorder (ADD) and attention-deficit/hyperactivity disorder (ADHD).

As Havas points out, this raises an important question: How much of the increase in ADD/ADHD seen among young people nowadays is due to electromagnetic pollution and poor electromagnetic hygiene?

Although, clearly, more research is needed to truly address this question, Havas speculates that, given the continued promotion of computers in the classroom—and the general move towards wireless computer and communication technologies—the situation is very likely to get worse.

The cancer connection

Even more worrying, however, is that dirty electricity has also been linked to cancer. A recent study by American researchers Samuel Milham and L. Lloyd Morgan investigated the incidence of cancer in teachers who had worked at a school in California between 1988 and 2005. Specifically, they were looking for a connection between cancer and dirty electricity by measuring the incidence of 'high-frequency voltage transients' on the school's electrical wiring.

Of the 137 teachers involved, 16 were diagnosed with 18 cancers, including malignant melanoma, breast cancer, thyroid cancer, uterine cancer, multiple myeloma, Burkitt's lymphoma (a type of non-Hodgkin's lymphoma), and cancers of the colon, pancreas, ovary and larynx. Two of these teachers had two primary cancers each.

Milham and Morgan reported that 60-Hz magnetic fields—'clean' electricity—showed no association with cancer incidence. However, high-frequency voltage transients—'dirty' electricity—were positively correlated with cancer. Indeed, the higher the exposure, the higher the chances of developing a tumour. Alarmingly, being employed at this school for just one year increased a teacher's cancer risk by 21 per cent (Am J Ind Med, 2008; 51: 579–86).

Although no other published studies have specifically measured dirty electricity and risk of cancer, the authors note that a study of electric-utility workers exposed to transients from pulsed electromagnetic fields found an increased, cumulative incidence of lung cancer (Am J Epidemiol, 1994; 140: 805–20).

Based on the evidence so far, it is safe to conclude that dirty electricity may be "a universal carcinogen, similar to ionizing radiation" (Am J Ind Med, 2008; 51: 579–86).

Cleaning-up bad energy

Although research into dirty electricity is still in its early stages, it is already apparent that this form of electromagnetic energy could be a significant health problem, and not just in the US and Canada, where most of the research has been so far conducted.

According to Havas, who measures power quality wherever she goes, dirty electricity is an issue in the UK and the rest of Europe as well. In fact, it's likely to affect most developed countries. Schools, colleges and workplaces are at particular risk as they are prime candidates for poor power quality.

The future looks clean

The good news is that there is a solution. The GS filters used by Havas and others in scientific studies are now commercially available (from www.stetzerelectric.com). This filter, the brainchild of Professor Martin Graham, at the University of California at Berkeley, and power-quality expert Dave Stetzer, can clean up both the power that enters a building as well as the dirty electricity generated within that building by shorting out the high-frequency spikes. As studies have shown, installing these filters results in numerous health benefits—from fewer headaches and more energy to lower blood-sugar levels in diabetics (Electromagn Biol Med, 2006; 25: 259–68).

Indeed, former voice and data communications consultant Glynn Hughes was so impressed with the filters that he and his wife have set up a UK distributorship. As they have happily reported on their website (www.grahamstetzer.co.uk), "almost all of our clients have had dramatically improved health and, to date, not one person has taken advantage of our money-back guarantee".

If the GS filters are as effective as they appear to be, they could be a valuable addition to the homes of millions of electrically sensitive individuals around the world.

Joanna Evans

Sources of dirty electricity

- Computers
- Variable-speed motors
- Television sets
- Entertainment units
- Energy-efficient lighting
- Energy-efficient appliances
- Dimmer switches
- Power tools
- Arcing on power lines
- Shared transformers
- Mobile-phone antennas
- Broadcast antennas.