

How to Do Environmental Innovation Journalism

Birgitta Forsberg

Reporter

Veckans Affärer, Stockholm, Sweden

Vinnovafellow at San Francisco Chronicle Jan. 10 - May 10, 2005

E-mail: birgitta.forsberg@va.se

1 PURPOSE..... 3

2 INTRODUCTION..... 3

3 DEFINITION..... 4

4 NEW PRODUCTS – THE EXAMPLE OF DUST NETWORKS 5

5 ENVIRONMENTAL INNOVATION WITHIN COMPANIES – EXAMPLES 9

6 REGULATIONS – THE EXAMPLE OF SOLECTRON 14

7 NO HEROES – THE EXAMPLE OF APPLE 19

8 CONCLUSION 20

9 ACKNOWLEDGEMENTS..... 21

1 Purpose

To give other journalists ideas of how to do environmental innovation journalism and to define the field of environmental innovation journalism. The paper is full of examples and partly describes what is happening with companies' environmental work. My hope is that readers will find interesting threads that will become embryos of new stories.

As this paper is aimed at journalists, the reader is expected to have journalistic skills and to know how to do research, how to be critical, balanced and accurate and how to handle ethical dilemmas. Basic journalism is beyond the scope of this paper.

2 Introduction

Some bitter jokes about the European Union flutter around in the U.S. technology industry. Here's one about EU's ban on lead and the questionable reliability of lead-free solder: "Who wants to be on the first lead-free airplane? Put the EU Commission on it."¹

Well, U.S. companies are known to lobby hard against environmental regulations so that might just be what to expect. But many U.S. companies don't actually want the EU Commission to crash with a plane that short-circuits. On the contrary, they express deep concerns about the environment, even though they acknowledge that the EU's regulations put a strain on them.

"EU's intentions are well-founded considering the amount of electric scrap the world is creating. Our children will thank us for it, but it places a significant burden on the industry and the supply chain," said Eric Austermann, project manager of environmental initiatives at U.S. electronics contract manufacturer Jabil Circuit.²

¹ Unpublished material from interviews for the article "Getting the lead out European rules force electronics companies to clean up" by Birgitta Forsberg, Thursday, January 20, 2005, The San Francisco Chronicle.

² Unpublished material from an interview for the article "Component compliance Manufacturers start phasing out solder containing lead" by Birgitta Forsberg, Sunday, February 27, 2005, The San Francisco Chronicle.

Quietly, many companies – but far from all – are working hard to both meet environmental regulations worldwide and to make their products “greener,” regardless of regulations.

You could argue that this is pure lip service, to lure customers and to mollify critics, but then you are missing one crucial point: Money. To quote Pamela Gordon, an environmental consultant who is well respected in the electronics industry:

“Reducing materials is always good for business. Getting rid of hazardous and toxic substances is almost always better for the bottom line. It’s less expensive to use, less expensive to ship and less expensive to store.”³

3 Definition

The processes that Pamela Gordon describes can be reflected in environmental innovation journalism – reporting that describes the commercialization of “green” inventions.

For the purposes of this paper, we will define an invention as a novel device, material, or technique and an innovation as an invention that has been put into practice, usually as a new process or product on the market.⁴

You can divide environmental innovation journalism into two areas. One, possibly the more obvious, covers new “green” products coming to the market, such as water purifiers or fuel-cell cars. This field is called clean technology nowadays. This kind of environmental innovation journalism includes the invention, the market and the combination of the two, how the product is commercialized.⁵ And, of course, what benefits there are for the environment. New products are quite often reported on. The more spectacular the product, the more coverage it tends to receive.

³ Unpublished material from an interview for the article “Component compliance Manufacturers start phasing out solder containing lead” by Birgitta Forsberg, Sunday, February 27, 2005, The San Francisco Chronicle.

⁴ The distinction, not always upheld, is stressed by David Nordfors, who coined the term Innovation Journalism in 2003 and described it as journalism covering technical, legal and political aspects of innovation and innovation systems. His thoughts about innovation journalism can be found in D. Nordfors. “The Concept of Innovation Journalism and a Programme for Developing it”, *VINNOVA Information* VI 2003:5, ISSN 1650-3120, Nov. 2003. Also published in *Innovation Journalism*, Vol. 1 No. 1, May 2004. <http://www.innovationjournalism.org/archive/INJO-1-1.pdf>

⁵ David Nordfors, see footnote 4

The other area is the environmental development within companies. Gordon addressed inventions or new ways of doing things that make enterprises both “greener” and leaner, that is, more competitive. The innovation would then be the competitive advantage the new processes give the company.

Both new “green” products and “green” innovations within companies are partly driven by government regulations and partly by pure capitalism – whether it is to earn money or simply not to lose money by ending up on a consumer organization’s black list or as a Superfund⁶ site.

4 New Products – The example of Dust Networks

Walk into a room and the light goes on. When it’s sunny, the light dims automatically. And all for the fraction of the current cost, as it is not necessary to rewire the building. This is partly what the small start-up Dust Networks in the San Francisco Bay area does.

“In the U.S., we spend \$20 billion a year on lighting,” said Rob Conant, vice president marketing and business development at Dust.⁷ “This is the highest cost in a building, even higher than maintenance. On a sunny day like this, I get enough light from the windows at my office, but nobody thinks of turning the light off. You can get a 40 percent reduction of electricity use if you manage your lighting.”

Dust makes wireless mesh networks that can save energy by controlling light, heating and cooling. Dust was co-founded by Kris Pister, then a professor at University of California Los Angeles (UCLA), who coined the term “smart-dust” because of the communicating device being dust-size, hence the name of the company.⁸

Instead of rewiring an entire building and put in light-saving devices such as sensors that turn the light on when you step into a room, Dust just puts in the sensors with a built-in wireless router. The sensors then transfer information from one to another

⁶The U.S. Congress established the Superfund Program in 1980 to locate, investigate and clean up the nation’s worst hazardous waste sites.

⁷ All quotes from Rob Conant stem from an interview with him on March 11 for a future San Francisco Chronicle article.

⁸ Kris Pister is now a professor at University of California, Berkeley, while remaining on the board of Dust.

without wires until the information reaches the terminal, where everything is being compiled and controlled.

And this is the invention. While sensors have been able to “talk” to the base station, or terminal, for a long time, it has not been possible for information to be transmitted from sensor to sensor. If every sensor is only able to talk to the base station, you have to have several base stations in a large building, or powerful sensors that reach far.⁹

“You could put our sensors along the US-Canadian border to see how people move across the border. The sensors would just communicate from one to the other,” Conant said. And if one sensor breaks down, it doesn’t matter as each sensor always talks to three or four others.

Dust’s sensors are part of a hot trend, wireless networks, that is expected to sweep our world both at home and at work. Analysts estimate that the potential market for wireless mesh networks will be a multi-billion dollar market in five to ten years.

The technology can be embedded in a lot of products. For instance you can already find sensors from Dust’s U.S. competitor Ember in U.K. marine electronics company Raymarine’s wireless boat autopilot.

Or, in the future, you could use your mobile phone to lock or unlock the door to your house. Many people, especially in Asia and Europe, see their mobile phone as their personal hub. The phone is something they always carry, where they have their calendars, their photos and their friends’ phone numbers. Why not their house key as well?

There is even a standard, called ZigBee, for wireless networks. But Dust, which just received around \$20 million in fresh venture capital, only uses the hardware part of the protocol ZigBee is based on, not the whole standard. This could mean trouble for Dust. Companies with their own protocol often have difficulty surviving if the standard gains common acceptance.

Dust also has at least three U.S. competitors, Ember, Millennial Net and Crossbow.

And so far Dust has few customers. One of them, the food chain SuperValu, tries Dust’s network to control the temperature and energy costs in freezers and refrigerators in one of its stores.

“Before they just got one bill and didn’t know what costs were going up or down,” Conant said. “It wasn’t itemized. It’s as if you would just get a credit card bill with a

⁹ All information about Dust stems from an interview with Rob Conant on March 11 for the San Francisco Chronicle and from information on Dust’s website. General information about wireless mesh networks stem from the websites of Dust, Millennial, Crossbow, Ember and the standard ZigBee.

sum and you would just look at that and say, right \$350, not knowing what you paid for.”

While rewiring is fairly expensive, a wireless mesh like Dust’s is much cheaper. Enterprises can get their money back on energy savings in one or two years, according to Conant.

From an environmental perspective, lower electricity consumption sounds positive, as power generation often is detrimental to the environment. And for companies it would also be a relief, both for cost-cutting and for performance. California enterprises have been hit with rolling blackouts in the summer when extensive air-conditioning use made the state’s electricity demand exceed its own available power by 15 gigawatts or 50 percent, according to Conant.

Dust is, however, not an idealistic firm. Its business model is based firmly on common business principles: You have a product that you think you can sell. “It was more technology-driven and market-driven than based on environmental concerns,” Conant said.

Virtually all environmental products are based on normal business principles: You have a product that you *think* you can sell on a market, that might be created by environmental regulations.¹⁰ Whether you actually can sell the product or not, is an open question.

To figure out whether Dust will be a success, a journalist would have to estimate how many potential customers would be willing to make this investment.

Let’s look at food stores. For a U.S. food store, energy costs are the second largest cost, after stocking shelves, so large food chains could make the investment – if the product delivers what it promises. But the big stores could choose a competitor’s sensors and small stores would probably not invest a lot of money in the sensors.

On the positive side, the U.S. Department of Energy, which wants to slash energy consumption by half, has chosen Dust for an advanced lighting control project, so some devices will be sold.¹¹

There is also not likely to be any problem with legislation, because radiation is very low. Radiation from a mobile phone is a thousand times stronger, according to Conant.

¹⁰ From interviews with several people involved in environmental/cleantech businesses, one of them Rob Conant at Dust, another Jon Guice at GreenMountain Engineering and a third Cheryl Blain, director of business development at Cleantech Venture Network.

¹¹ According to a press release from the U.S. Department of Energy

If you write a story about Dust, it is of course important to describe the full picture: competition, the market, standards, costs for buyers, environmental benefits, and possible bans or dangers with the product.

Apart from talking to Dust, other possible phone calls could be:

- Dust's investors. How much money have they put into the company? Why do they believe in it? When do they expect some returns? How much more are they willing to invest? Have they also invested in other wireless network companies?
- Dust's customers, SuperValu and component manufacturer Honeywell. How are the sensors working? Any problems? What are the advantages/disadvantages?
- Dust's competitors: Crossbow, Ember and Millennial Net. How are they doing? What is their view on Dust?
- The ZigBee standard. How established is the standard? What are Dust's chances of succeeding when using another technical solution?
- Industry experts. There have been problems with analyzing and understanding data from wireless networks. How is this going? What do they think about Dust?
- The co-founder Kris Pister. Why is he only on the board of the company? Ask him to tell you The Dust story.
- Department of Energy. Why did it choose Dust? Has it also chosen to work with Dust's competitors? What are the benefits to the environment?
- Environmental Protection Agency (EPA)/environmental organizations. What are the benefits to the environment? How about radiation, is it really not a problem?
- Industry analysts. How can this become a multi-billion dollar market in five to ten years? What are Dust's chances compared with its competitors' chances?

Of course, virtually all of these people have their own agenda. Dust's customers are not likely to say that the sensors are useless, the ZigBee people are not likely to say that you can do very well without the standard, analysts are not likely to say that Dust is a loser. As a journalist, you have to weigh all this and use your common sense to write a balanced article.

You could even decide not to write about Dust, instead focusing on wireless mesh networks in general.

Overall, clean technology products are getting hot, so there are a lot of stories to write in this field. Many enthusiastic management people from the Silicon Valley Internet-boom are actually moving into clean technology, along with a lot of money from the Internet era, according to Jon Guice, director of business development at the clean technology consultant GreenMountain Engineering.

“The advantage is that these are people who are going to build well-funded, enormous companies. The disadvantage is that they do not know a lot of details about their technology domain and they will make mistakes,” he said.¹²

While it is fairly straightforward to do environmental innovation journalism on new products, the second field, the environmental development that is happening within companies, is somewhat trickier as what is going on isn't always obvious for outsiders.

5 Environmental Innovation within Companies – Examples

One day some people at U.S. computer maker Hewlett-Packard had an idea: Why don't we recycle and reuse some of the chemicals that are used to make the pen head in the inkjet cartridges?

Inkjet cartridges are one of HP's most profitable products. The pen head where the ink comes out is the functional part. It is similar to a thin film semiconductor and it takes different types of chemicals to make it.

“This was good for the environment and it had a cost savings effect as well as a quality effect,” said Ken Sutherland, environmental health and safety audit manager at HP. “If you are able to recycle and reuse some solvents you know what you are getting back. You know the quality of that material. And the savings go on and on.”

HP is saving a couple of hundred thousand dollars by doing this, which might sound like nothing for a giant corporation with close to \$80 billion in net revenue in its fiscal year 2004 and a \$3.5 billion profit.

“When looking for ways to save money in a highly competitive business, every little bit counts,” Sutherland said.

When HP makes inkjet cartridges, it also uses water as part of the cleaning process. That way the water gets contaminated with small amounts of ink and can't be released back without treatment. HP's plants in Dublin, Ireland, and in Puerto Rico started

¹² From an interview with Jon Guice on March 17, 2005, for this paper.

reusing a lot of this mixed liquid waste and reduced its use of fresh water. The U.S. Environmental Protection Agency (EPA) gave the idea an award.¹³

Let's turn to the semiconductor company AMD. Semiconductor manufacturing processes use a lot of hazardous substances and also perfluorocarbons (PFCs) such as C2F6 and CF4, which are regulated under the Kyoto protocol, as they contribute to global warming.

"They only contribute to a small percentage of total greenhouse gas emissions, but they have long atmospheric lifetimes and much higher global warming potentials compared to CO2," said Reed Content, senior environmental, health and safety manager at AMD. "This led to the innovation of using nitrogen trifluoride NF3 – which also is a global warming gas but has a much smaller effect and is not regulated under the Kyoto protocol – as well as octafluorocyclobutane C4F8. These are also less expensive to use and they increase total through-put."

Although AMD did not eliminate the use of C2F6 and CF4, it reduced its use of them. In general, AMD has a goal to reduce PFC emission by 50 percent from the 1995 baseline by 2010. This is actually an environmental target, but the changes described also happened to reduce costs.¹⁴

Other examples can be found in Pamela Gordon's book "Lean and Green", one of them from U.S. technology company Agilent Technologies, another from U.S. multimedia company Thomson and a third from Dutch electronics company Philips:

An engineer named Werner Gauss in Agilent Technologies' plant in Boeblingen, Germany, had an idea for cooling buildings for free. The system runs as if two car radiators are placed back to back, transferring heat from one to the other. A loop runs from the site through one radiator and the other radiator is connected to the cooler. There, the heat evaporates off a large shower. The system reuses electricity and replaced a system that used ozone-depleting CFC chemicals. The free cooling system cost about £45,000 and saves £8,000 a year.¹⁵

At Thomson, the mechanical development group devised of a new molding process for television cabinets that would not require paint. Normally, television cabinets are painted to produce a smooth finish on the set. The new equipment was expensive, but the previous systems for capturing air emissions, treatment of water and waste as well

¹³ The information and the quotes stem from an interview with Ken Sutherland for this paper.

¹⁴ The information and the quotes stem from an interview with Reed Content for this paper.

¹⁵ Page 36 in Pamela J Gordon's book *Lean and Green*, Berrett-Koehler Publishers, Inc. San Francisco, 2001

as the paint itself were even more expensive. The new process also used less plastic. In total, it gave the company less cost, less impact on water and air and less waste.¹⁶

For marketing purposes, Ton Mober's and his team at Philips' Nijmegen site in the Netherlands added a feature to the company's GreenChip family of semiconductors: they made improvements for the standby mode. Standby is when a television, stereo or computer is plugged in but not turned on, which is on average 50 percent of the time. When used in a TV, their improvement:

- made the TV use ten times less power in the standby mode than a standard product.
- cut the heat generated from the TV by half, which increased the lifespan of the TV and required fewer components, such as heat sinks, to dissipate the heat. This meant the TV could be smaller, lighter and cheaper.
- increased product reliability as 40 fewer components were needed to run the TV, which made it simpler to design. There was also less to purchase, stock and track, and less to fail.
- increased safety by reducing the number of components needed (increasing speed and reducing both power consumption and generation), which meant the product was more robust and reliable.
- decreased manufacturing costs because of fewer parts to assemble and reduced transportation costs.

“You can look at it this way: switching to energy-efficient products would allow the United States to close four nuclear power plants,” Ton Mober's said in the book, although he noted the improvement in the standby mode was not done for environmental reasons.

Also among the environmental benefits were that Philips used fewer parts in that TV—our natural resources won't last forever — and the TV became lighter and therefore used less fuel when shipped.¹⁷

¹⁶ Page 27 in Pamela J Gordon's book *Lean and Green*, Berret-Koehler Publishers, Inc. San Francisco, 2001

¹⁷ Page 113-115 in Pamela J Gordon's book *Lean and Green*, Berret-Koehler Publishers, Inc. San Francisco, 2001

Environmental changes within a company can also be about “badwill”. Many companies fear that they will end up on the black list of a consumer or environmental organization. Name and shame works. And if company A is shamed and not company B, company B has a competitive advantage and its environmental investments are paying off.

In Japan, customers are even willing to pay more for green products, something few people in the U.S. or Europe actually do – whatever they say in questionnaires.¹⁸

The Japanese electronics device maker Sony tries to use vegetable-based plastic, a biomass resource, in some of its products. Sony was also the first to commercialize mercury-free silver oxide batteries this year – something the industry had said was all but impossible.¹⁹

But let’s return to the environmental changes within companies that give them a competitive edge. I have chosen to give numerous examples to stress that much is happening; environmental innovations are not rare phenomena. Still, not much has been written about such “greening” processes within companies or within industries. And when something is written, the articles seldom explain both the new ideas and their effect on the company and its competitiveness.

If you write about HP’s chemicals reuse or its reuse of contaminated water, or AMD’s reduction of greenhouse gases, or Agilent’s cooling system, Thomson’s new molding process or Philips new TV, some of the questions to the companies could be:

- What is the invention?
- How much has it cost to implement it?
- How much/what do you gain from it?
- What does it mean for your competitiveness?
- What is the benefit for the environment?
- Did the invention lead to something else? (Often a smart solution can mean eliminating some of the previous manufacturing steps, as it did when Philips needed 40 components fewer.)
- How did you think of it? Ask them to tell you the story behind the idea. Having that story in your article usually makes it more appetizing for readers.

¹⁸ Information obtained in interviews with numerous people in the U.S. electronics industry.

¹⁹ Information about Sony stems from its website.

Competitors:

- Call them and find out how they do these processes. Maybe they have smarter ways of doing things or maybe they just do them the way they have always done them. Why do you do things that way?

Environmental and consumer organizations:

- Ask them what they think. Maybe the company can do much more, or is lagging in another, more important environmental field.

Trade associations:

- How is your industry doing in this field? Could you point to which companies are in the vanguard?

The examples from HP, AMD, Agilent, Thomson and Philips would only generate fairly small stories, unless you are working for a local newspaper. If you would like to do a large feature, you could call environmental organizations and ask them which blue chip companies are in the vanguard of environmental innovation, or which ones are lagging behind. You could also browse around on companies' websites to get a feel for which ones seem to take a serious interest in the environment by having very specific and stricter than required environmental targets with thorough follow-ups.

You could pick one of these companies and describe its major environmental innovations and check whether all the nice words on its website hold true. Why not write about HP's environmental innovations? The company seems to take part in quite a few environmental initiatives. Or check out the French-Italian semi-conductor company STMicroelectronics, which also seems to be on the forefront of environmental innovations.

You could also take several companies in the same industry and rank them.

If you choose to write about one environmental change, pick one that has had significant effects on company costs or on the company's products, as well as benefiting the environment. Or you could describe how several environmental innovations have made a company both lean and green. Or write about how environmental innovations have made an entire industry greener and more competitive.

Some of the internal environmental changes are not only about a combination of cost savings, goodwill and environmental benefits, but also about legislation. Big companies have staff that track environmental legislation and try to be ahead of the game. Even if the companies lobby against regulations, they are often prepared for them.

6 Regulations – The example of Solectron

At the Milpitas, CA, plant of Solectron, the giant electronics contract manufacturer, a small stack of silvery bars of solder gleam on a white shelf. The triangular bars are lead-free; the rectangular ones contain lead.²⁰

Picking the wrong bar could mean huge liability and the loss of a valued customer for Solectron, which manufactures on a contract basis for such companies as Cisco Systems, Lucent Technologies, IBM and Ericsson.

In the electronics industry, lead has long been used as an ingredient in solder, used to “glue” every piece to a product. A few products, like networking routers, will be allowed to continue using lead-based solder. Most will not.

Solectron has hundreds of staffers going through all of its 22,000 suppliers, making sure they don’t use any lead, mercury, cadmium, hexavalent chromium and neither PBB nor PBDE – two types of brominated flame retardants. Many suppliers don’t even know themselves exactly what hazardous substances they use, so the task is almost Herculean.

But it is of the utmost importance that Solectron and the other electronics companies succeed in this, because the European Union is banning those six hazardous substances, mainly in consumer electronics and electrical products, as of July 1, 2006. This is the so-called RoHS directive, the Restriction of Certain Hazardous Substances in electrical and electronics equipment.

"We have addressed the technical issues for six years, traced legislation for four years and worked with our suppliers for compliance for the last two years," said Jennifer Shepherd, Solectron's senior manager of corporate environmental affairs.

Nobody doubts that the EU is serious. Companies are already offering lead-detecting guns for sale, guns that the EU could decide to use. Just press the gun to a laptop and see if the surface contains lead.²¹

²⁰ All information about Solectron and all quotes from Solectron employees come from a visit to Solectron’s plant in Milpitas on February 9, 2005, where I interviewed six Solectron staffers for the article “Component compliance Manufacturers start phasing out solder containing lead” by Birgitta Forsberg, Sunday, February 27, 2005, The San Francisco Chronicle. Some quotes used here are published in the article, some are unpublished.

²¹ Usually they can only detect lead on the surface, not deep down. One lead detecting gun can be found on Niton’s website, www.niton.com. Niton makes portable x-ray fluorescence (XRF) technology devices.

Also, the harrowing story of Sony is haunting manufacturers. In October 2001, Dutch officials seized more than 1.3 million Sony PlayStation game consoles and accessories meant for the Christmas shopping season in Europe, because the cables contained much higher amounts of cadmium than allowed. Sony estimated that it lost more than \$100 million in sales.²²

While Solectron's staff sends forms out to its suppliers asking about the six banned substances, they take the chance to ask for another 29 substances as well, such as arsenic, asbestos, copper, formaldehyde and gold.

Solectron, along with many other blue chip companies, expects the list of banned substances to keep expanding, and companies will probably have to get used to disclosing more of their hazardous substances.

To quote Eric Austermann, project manager of environmental initiatives at Solectron's competitor Jabil Circuit: "This thing leads to the analogy of the food label. It's where we're heading."²³

Solectron's Shepherd said: "We actually talked to some people in the food industry to find out how they test and how they collect information."

And Michael Kirschner, president of Design Chain Associates, a supply-chain consulting firm said: "Companies will have to find a way to use this knowledge to their advantage."²⁴

Edward Quevedo, director of environmental management and sustainability programs at the North American branch of U.K.'s environmental consultant firm WSP, actually predicts that raw materials will be restricted in the not-too-distant future, like water is in the dry season in California when farmers can't use as much as they like. Companies would then only be allowed to use a certain amount of raw materials a year, so they would have to find ways of manufacturing with less raw materials. The EU is already looking at this, according to Quevedo, who is also president of the Pacific Industrial and Business Association (PIBA).²⁵

²² From a Sony press release and from several reports in the media.

²³ The unpublished quote comes from an interview with Eric Austermann for the article "Component compliance Manufacturers start phasing out solder containing lead" by Birgitta Forsberg, Sunday, February 27, 2005, The San Francisco Chronicle.

²⁴ The unpublished quote stems from an interview for the article "Component compliance Manufacturers start phasing out solder containing lead" by Birgitta Forsberg, Sunday, February 27, 2005, The San Francisco Chronicle.

²⁵ PIBA is a Silicon Valley-based association, which, among other things, provides businesses with environmental guidance.

And what the EU does matters. U.S. companies are not going to ship “green” computers to Europe and keep making “brown” for the U.S. market. As soon as one big area, like Europe, implements environmental legislation, companies will adapt all of their products.

"This is another side of the global economy, when high environmental standards have an effect outside EU's borders," said Bryant Hilton, a spokesman at computer maker Dell.²⁶

Companies making exempted products, such as telecommunications infrastructure gear, are also expected to switch over to lead-free components when supply and demand drive the price of lead components up and makes it hard to find suppliers.

"Even industries that are exempt will transfer to lead-free earlier than they want, based on demand," said Austermann at Jabil Circuit.²⁷

"Suppliers will not produce both tin-lead and lead-free versions of the same component," said Art Morgan, Solectron's director of technical marketing.

(But don't worry, airplanes are not expected to use lead-free solder until it is proven safe.)

Other parts of the world are already following suit with their own legislation. California will partly mirror the EU's ban on hazardous substances as of January 1, 2007. China is planning similar legislation to the EU. And in Japan, where customers are willing to pay more for a green product, companies are developing environmentally friendly products at a high speed, to get a competitive edge.

Solectron's Shepherd forecasted that RoHS “will turn into a global standard.”

"For us, it is good to hear. We want a harmonized standard," said David Lear, Hewlett-Packard's director of Environmental Strategies and Sustainability.²⁸

Companies tend to want the same rules worldwide. It is much less work for them than complying with different legislation for each region. Some are actually calling for U.S.

²⁶ From the article "Getting the lead out European rules force electronics companies to clean up" by Birgitta Forsberg, Thursday, January 20, 2005, The San Francisco Chronicle.

²⁷ From the article "Component compliance Manufacturers start phasing out solder containing lead" by Birgitta Forsberg, Sunday, February 27, 2005, The San Francisco Chronicle.

²⁸ From the article "Getting the lead out European rules force electronics companies to clean up" by Birgitta Forsberg, Thursday, January 20, 2005, The San Francisco Chronicle.

president George W. Bush to get a federal standard into place, so companies don't have to deal with one law in California, another in Michigan and a third in Texas.²⁹

Both the EU and California have a recycling directive for electronics and the EU will require companies to register chemicals they use and test them for safety. Even as environmentalists complain that the directive – the Registration, Evaluation and Authorization of Chemicals (REACH) – is watered down, companies still seem intimidated by it. And California is looking into whether to copy REACH as well, although the EU version is not yet finalized.³⁰

Thanks to environmentally concerned Japanese customers, Sony and its Japanese colleagues are ahead when other companies scramble to adapt to this kind of legislation. Japanese companies are, for example, at the vanguard of lead-free production with Europe coming in second and U.S. companies lagging. U.S. companies could have been at the forefront, as the U.S. Senate considered restrictions on lead in solder in 1991 and 1993, but the U.S. electronics industry successfully lobbied against the legislation.

Now U.S. companies have to decide what to replace lead with. Kim Hyland, Solectron's director of process integration, is strongly advocating his suppliers to replace tin-lead solder with an alloy of tin, silver and copper. He of course wants all his suppliers to use the same kind of solder, to avoid technical difficulties when assembling the products.

Silver is a precious metal that is more expensive than lead, which makes silver-based solder more costly. But experts say any increase in the price of the finished product will be small.

Lead-free solder melts at a higher temperature than lead solder. This means other components, such as plastics, have to be made to withstand higher temperatures. It also means lead and lead-free solder can't be used together without creating technical difficulties.

There are some technical problems with lead-free components, such as tin whiskers, a crystalline growth that could make products short-circuit. The problem already exists with tin-lead solder in extreme environments such as space, but it is aggravated in lead-free parts.

²⁹ From interviews with numerous people in the U.S. electronics industry.

³⁰ From an interview with Michael Wilson, an assistant research scientist at University of California at Berkeley, who is writing a report on California's chemical policy options for California law makers. I interviewed him for the article "Getting the lead out European rules force electronics companies to clean up" by Birgitta Forsberg, Thursday, January 20, 2005, The San Francisco Chronicle.

Still, the electronics industry is confident it can make the transition.

"We can handle the technical issues," said Solectron's Hyland.

To write about these processes, you would include the new legislation, what new materials/devices companies choose and what advantages/disadvantages each option carries.

Some phone calls/website checks could include:

- The regulatory authority, such as California or the EU (which is all but impossible to call and has a maze of a website, check a member country's website and find the correct EU link to the legislation you want to write about). Read the entire legislation. Toward the end of California's recycling directive it is mentioned that California will copy part of EU's RoHS directive, something not many reporters have discovered.
- The companies mostly affected by the legislation, in this case Solectron and other contract manufacturers, such as Jabil Circuit. You could also call the companies with their brands on the goods, such as US computer maker IBM or Swedish telecoms group Ericsson, or the component manufacturers, such as U.S. semi-conductor company Intel. Ask them what they are doing. Will they be ready on time? How much are they spending on the changes? Can they retrieve the money? (Usually they can, while the patient is open they can fix bugs, streamline, reduce the number of suppliers and components etc.) How long will it take them to retrieve the money? Are the changes they are making in connection with the legislation giving them any competitive advantages, apart from not being left behind and fined? What are the innovations? What new materials/devices/components/processes do they use to comply with the new legislation? What are the advantages/disadvantages.
- Consultants, such as Michael Kirschner, Pamela Gordon and Edward Quevedo. Large environmental legislative changes usually create a number of consultants. How is the industry doing? What is going on? Will some companies be put out of business because of the legislation? How much is companies spending on compliance?
- Analysts. You could try local analysts or the large investment banks, such as Merrill Lynch or JP Morgan. Ask them the same questions as you ask the consultants.
- Environmental organizations, such as the Silicon Valley Toxics Coalition or Center for Environmental Health. What is the benefit to the environment? What do they think about the legislation? How do they think the companies are doing?

The processes triggered by environmental regulations are often poorly reported in the business press and in the general news media, even though they can be crucial for a company's future competitiveness.

If a company doesn't take lead out of its products today, it could actually be put out of business tomorrow – or at least in a few years, when no one will support it with materials for a leaded process.

A company might also do very well in one environmental area and poorly in another. Journalists have to be careful not to hail a company as an overall environmental champion. The positive examples from HP, AMD, Agilent Technologies, Thomson and Philips in this paper do not mean that these companies are doing well in all environmental areas.

7 No Heroes – The example of Apple

"From initiating recycling programs worldwide to phasing out banned substances, we are succeeding in our goal to minimize our environmental impact," it says on U.S. computer maker Apple's website.

And the site goes on for page after page about Apple's high environmental standards. Apple gives itself a gold, or maybe shining green, star.

But at the same time, environmental picketers outside Apple's Macworld Conference & Expo at the Moscone Center in San Francisco in January protested that Apple does not have a free recycling program for its customers, instead dumping old computers in Asia.³¹

The protestors from several environmental organizations involved in the nationwide computer takeback campaign stood around a pile of old Apple computers. On the monitors on some of the computers were pictures of Asian children and adults picking through equipment in dumps of toxic electronic waste containing lead, mercury and brominated flame retardants.

Those pictures gave a new, unintended, meaning to Apple's banners promoting its iPod, which say "Life is random."

³¹ I was there, covering the event for the article "Demonstrating concern Environmentalists picket at Macworld over Apple policies" by Birgitta Forsberg, Wednesday, January 12, 2005, The San Francisco Chronicle.

8 Conclusion

The methods of environmental innovation journalism — thorough research, accuracy and critical thinking — are identical to those in mainstream journalism. The difference is that the niche you're writing in, environmental innovation, requires combining technical reporting, business reporting and environmental reporting by including the invention, the market (or the internal invention's competitive effect on the company) and the effects on the environment — all in one article.

Talk to companies, environmental groups, consultants and analysts. Go to conferences, bookmark interesting websites, cultivate your sources. Keep track of legislation like the Kyoto agreement and EU's regulations RoHS, REACH and WEEE (the recycling directive) and the coming directives on energy usage and, possibly, raw materials. Read trade magazines, they are often full of details that few people outside the industry have a clue about. Call the trade associations, almost all industries have them.

For example, if you are working in San Francisco and writing about environmental innovation in the electronics industry, read trade magazines such as Electronics Supply & Manufacturing and call trade associations such as Electronics Industries Alliance (EIA). Talk to Dell, Intel, Apple, Hewlett-Packard. Check with the Silicon Valley Toxics Coalition and the Center for Environmental Health. Talk to consultants like Pamela Gordon, Michael Kirschner and Edward Quevedo about changes within companies and to Jon Guice about new products within clean technology. Keep track of Californian legislation as well as legislation in other parts of the world that affects U.S. companies. Why isn't that report about California's REACH directive out? It was supposed to be ready at the end of February. Call and ask if you can have it ahead of time and write an exclusive about it.

If you are working in Sweden and writing about clean technology or environmental innovations at blue chip companies, call small clean technology companies (search for miljöteknik) and big companies such as Ericsson, Volvo, Stora Enso, Astra Zeneca. Read trade magazines. Check with environmental organizations such as Svenska Naturskyddsföreningen, try its Secretary-General Svante Axelsson, or Greenpeace, talk to its Nordic Secretary-General Lennart Daléus, former Swedish Center Party leader. Talk to environmental consultants, such as Magnus Hedenmark, who specializes in chemicals. Keep track of EU regulations as well as Swedish legislation and be aware that Japanese and Chinese legislation very well can affect Swedish companies. Subscribe to press releases from Hugin and Waymaker, try to tailor them to your needs so you don't get bombarded with all of their releases. Hopefully, this will also get you releases about new clean technology products.

Remember, if you have written one story in a field you are considered an expert. As soon as the word is out that you are on this beat, people will start contacting you. And there are many stories out there waiting to be written.

9 Acknowledgements

I wish to thank Ken Howe, Business Editor at the San Francisco Chronicle, for taking me on board for four months and letting me write so many stories, my colleagues at the San Francisco Chronicle for being so friendly, Vinnova for financial support during my stay in San Francisco and Weje Sandén, Editor-in-Chief of Veckans Affärer, for granting me a four-month leave.

©2005 Innovation Journalism. Personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution to servers or lists, or to reuse any copyrighted component of this work in other works must be obtained from Innovation Journalism. (The authors of this material may reproduce or authorize others to reproduce the material in accordance with the terms in the copyright agreement between the authors and Innovation Journalism. See the copyright agreement for further information.)