Green Computing: Devices

Floyd (Bud) E. Smith

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Floyd (Bud) E. Smith
Writer, Oakland, California, U.S.A.

Abstract
This entry describes what to look for from specific kinds of devices. It summarizes green buying criteria for devices; suggests green buying criteria for suppliers; showcases Hewlett Packard and Dell’s green claims; describes how to give feedback to suppliers; and discusses purchase considerations for desktops, laptops, and tablets.

KEY CONCEPTS
This entry describes what to look for from specific kinds of devices:
- Summarizing green buying criteria for devices
- Reviewing green buying criteria for suppliers
- Comparing Hewlett Packard and Dell
- Giving feedback to suppliers and vendors
- Looking at purchase considerations for desktops, laptops, and tablets

WHAT MAKES A DEVICE GREEN?
This entry will help you answer questions, such as: Once you’ve decided you need to buy a bunch of laptops, how to pick the greenest model?

The buying criteria for a device are mixed up with the selection criteria for suppliers. I’ve provided buying criteria for devices in this section and selection criteria for suppliers in the next section. If you have a formal supplier selection and approval process, use the criteria for choosing suppliers first, then use the device-specific criteria for choosing devices. The greenest suppliers will, of course, usually produce the greenest devices.

If your purchasing process is a mix of supplier and device selection, use both lists at once. A lot of what a supplier does in making a device green is infrastructure work, which is unlikely to happen just for one isolated device. For instance, a supplier is more likely to have product take back at the end of a device’s useful life for all of their products (or for most of them), than for just one or two.

There are exceptions, of course. I have a Samsung Replenish cell phone that’s largely made with recycled plastics—a very green choice. But Samsung only ranks in the middle of the pack in the latest Greenpeace Guide to Greener Electronics, below Sony Ericsson and Nokia, among others (http://www.greenpeace.org/international/en/Guide-to-Greener-Electronics/18th-Edition/). And Samsung ranks 22nd among technology companies in the latest Newsweek Green 500 rankings (http://www.thedailybeast.com/newsweek/2012/10/22/newsweek-green-rankings-2012-u-s-500-list.html).

With all this in mind, you need to look at the supplier as well as specific devices every time you make a purchasing decision. Let’s sum up green buying criteria in a checklist:

- Smallest class of device that will do the job. (Be creative!)
- Smaller size for a device of its class.
- Lower weight for a device of its class.
- Longer battery life (especially where the battery size is the same as a competing device, which means the device itself runs lean).
- Lower power usage per hour. (Criteria on this can vary, so don’t decide based on manufacturer’s assertions alone.)
- Slimline packaging—standard, or as an option.
- Slimline or electronic documentation—standard, or as an option.
- Volume purchase options for minimal packaging, documentation per shipment rather than per device, etc.
- Meets or exceeds Energy Star standards. (This is almost de rigueur these days.)
- Products free of hazardous substances: polyvinyl chloride plastic, brominated flame retardants, antimony, beryllium, and phthalates.
- Use of recycled plastics. Evaluate this for specific products, and as a percentage of plastics in all products from a given manufacturer.
• **Durability.** Look for statements about, and evidence of, a product being more durable than competitors.
• **Ease of repair.** Look for evidence of, and statements about, a product being easier to repair than competitors. Are spare parts available? Will a manufacturer support on-site repair against large purchases of a specific device?
• **Product take back.** Is the manufacturer willing to cheerfully take back anything they’ve sold you at the end of its life cycle? Do they publicize this energetically? Do they share how they put returned devices back to use, either as complete devices or as components? Does the manufacturer sell previously used—and, hopefully, refurbished—devices?
• **Reusability.** Look for efforts by the manufacturer to put returned devices back to use—through refurbished product sales, donations, and donations of refurbished components.
• **Supplier green goodness.** Even if you’re considering a purchase on device-specific grounds, sum up supplier goodness and add it to the criteria for the specific device.

For additional criteria, and specifics on these criteria, see the Greenpeace ranking guide. The latest version can be found at the following: http://www.greenpeace.org/rankingguide.

Take these criteria, Greenpeace’s criteria, and your own concerns and create your own evaluation ranking system. Include standard business concerns, such as cost, supplier reliability, and past performance of a device and/or supplier.

When in doubt, keep it simple; a few criteria can stand in for a longer list (as with the “supplier green goodness” bullet above).

Apply the system to all device purchases. It will quickly become second nature and will contribute strongly to your green computing efforts.

**WHAT MAKES A SUPPLIER GREEN?**

The first thing that makes a supplier green is making green products, as per the criteria above. Avoid suppliers who make “feel-good” statements about the environment, or one-off efforts such as product donations to environmental groups. (This is a notorious practice by software vendors who make donations valued at millions of dollars when the product cost to them for CDs and manuals might be pennies on the dollar.)

A positive example of a financial donation is an effort a few years ago by leading global bank HSBC. One year, HSBC donated $50 million (!) to a coalition of green groups, such as the World Wildlife Federation. The partnership was called Investing in Nature, and it focused on environmental research (http://www.hsbcusa.com/ourcompany/bankarchives/bk2002/news--hbarch022102.html).

This is, of course, impressive. But by itself, it might have been merely a particularly expensive form of greenwashing. HSBC, however, has a strong commitment to green causes and sustainability. HSBC is “the world’s first carbon-neutral bank” and has made reasonably strong efforts to introduce green and sustainability criteria into its lending policies as well (http://news.bbc.co.uk/2/hi/business/4071503.stm).

All this makes for a good example of what is, and isn’t, greenwashing. Bold statements about what a company is going to do, or exaggerated descriptions of what a company has done, fall into the greenwashing bucket. Reasoned descriptions and case studies of what a company has already done tend to be taken as evidence of a serious commitment, especially when supported by third-party verification, such as the Greenpeace Guide and the Newsweek Green 500.

You need to be especially careful to not give the appearance of greenwashing if you’re a “sinner” by nature of the business you’re in. Tobacco companies, arms dealers, and furriers are going to suffer disapproval from most of the activist community, and many from the public at large. Such companies can recoup something by “going green,” but strong efforts with measurable results have to lead, and exceed, generic statements about your commitment to the environment.

So look out for greenwashing when evaluating suppliers—and apply the same criteria to your own green efforts, and the way that you talk about them in public.

Here are some of the key criteria for selecting green suppliers:

1. **Leadership commitment.** “The fish rots from the head,” as the saying goes, and the opposite is true as well. You want to hear from the top about a company’s green commitment—and, hopefully, see signs in leaders’ resumes that they’ve been onto this for a while. (The long-time Chairman of the Board of HSBC Bank was also a part-time pastor and had been speaking out about corporate social responsibility for decades.)
2. **Company-wide commitment.** As you’ll find in implementing green computing, you need the commitment of the whole company to get very far. Look first for a company-wide commitment to sustainability and low environmental impact.
3. **Long-standing commitment.** Pressure to go green is increasing, so commitments might be more reactive than sincere. Companies that made the commitment earlier, saw the problem earlier, and have had more opportunity to get at least some things right.
4. **Green supply chain.** You can’t go very green all by yourself. A company that’s greening its supply
chain—not just its upstream suppliers, but its partners, distributors, and customers—is starting to do the hard work of becoming green for the long term.

5. **Leading point in marketing.** Marketing green credentials before you have any is a huge problem, and not marketing them once you do have them is a problem as well. Truly sustainable sustainability efforts make up a virtuous circle, including innovative efforts, cost savings, promotion, and ongoing improvements in the organization’s efforts.

6. **Promotion to employees, new hires, and other audiences.** College graduates are a discerning audience. A company that can, and does, credibly market its green efforts to the most exciting college graduates has accomplished something and is hiring the very people who will help it accomplish more. Look for the use of sustainability in the company’s hiring efforts.

7. **Case studies.** Look for published case studies of sustainability efforts that are spaced out over a period of time, described in detail, and build on each other. Few companies get this right; those that do are highly likely to be reflecting a sustained commitment.

8. **Carbon footprint assessment.** “That which gets measured gets done,” says management guru Peter Drucker, yet there are few hard measures for green computing and overall sustainability. For example, a carbon footprint assessment is hard to do, so doing it is a sign of seriousness. Tracking and improving the numbers over time is a strong validation of long-term commitment.

9. **Industry leadership.** Look for an organization to assert industry leadership on sustainability in groups of like-minded organizations, professional bodies, at trade shows and conferences, and in other venues. If there’s truly good news here, it will be repeated to small, focused groups as well as to the public at large.

10. **External verification.** Look for awards earned by the company. Two excellent resources are the Newsweek Green 500, shown in Fig. 1, which ranks the Fortune 500 by green-related criteria, and the aforementioned Greenpeace Guide to Greener Electronics. These are two resources that cut through the blather by clearly stating their criteria, stack ranking the companies involved—not everyone gets to be above average—and repeating the exercise over and over again. If a given supplier isn’t included in the published rankings, use the same criteria that Greenpeace and Newsweek use to assess the company yourself.

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**Fig. 1** Newsweek Green 500.

I don’t mean to suggest that you are going to build the perfect green supply chain, green company, or green computing effort. The supply chain effort, for instance, is generally referred to as “greening the supply chain,” suggesting an ongoing process. You do want to achieve steady improvement.

Use other criteria to narrow down the list before applying green criteria. Your company has external commitments that require it to meet many specifications, while seeking out the lowest cost (even if the lowest cost supplier doesn’t always win). Use green criteria to reward potential suppliers who get all the basics right—and manage to meet green criteria as well.

Of course, these are not mutually exclusive. Greener companies tend to be better suppliers for three major reasons:

1. **The peacock effect.** Male peacocks with dramatic tail feather arrays are attractive to females because only a healthy male can afford the resources to grow such a striking display. Only a healthy company can meet green criteria while also being fully competitive on traditional criteria as well. Hewlett Packard (HP), for instance, is the world’s largest vendor of personal computers (PCs)—and a perennial leader in green assessments.

2. **The serendipity effect.** Green efforts are costly at first, taking up time, effort, and management attention. However, they often yield surprising savings while also helping attract and retain top employees, executives, business partners, and supply chain partners. So the green company gradually finds it easier to excel on traditional criteria as well (not the least of which is price competitiveness).

3. **Longer-term orientation.** Green concerns reflect an interest in the longevity of an organization and the systems in which it plays a part. These concerns suggest that the company will also take its relationship with you as a customer more seriously, investing the extra effort needed to create a sustainable “win-win.”

As you implement green computing, and green your own supply chain, you’ll benefit from these effects as well.

Create a supplier checklist for all aspects of your selection criteria, nongreen as well as green. Then rank suppliers on it. Build and deepen relationships with the best of them, entering into long-term supply contracts, seeking large volume discounts, and helping them understand your business. For other purchasing decisions, use the supplier checklist as a short-term tool. You’ll steadily green your supply chain.

**CASE STUDY: HP VS. DELL**

Two of the biggest suppliers of PCs are HP and Dell. Let’s take a quick look at some of the supplier-level considerations for choosing one over another. The following comparison holds as of mid-2012:

![Fig. 2 HP's website is sparse, but dramatic. Source: From http://www.hp.com.](Fig. 2 HP’s website is sparse, but dramatic. Source: From http://www.hp.com.)
Greenpeace Guide rating. The Greenpeace Guide to Greener Electronics ranks HP #1 overall, with a ranking of nearly 6 out of 10; Dell is #2, with a ranking of just over 5 out of 10. (Apple is third among computer vendors, with a ranking somewhat below 5 out of 10.) It’s no accident that the leading vendors are also green leaders (http://www.greenpeace.org/international/en/Guide-to-Greener-Electronics/18th-Edition/).

Newsweek Green 500 ranking. The Newsweek Green 500 ranking ranks HP #2 in its segment, Technology Equipment, and Dell #5. Apple, by contrast, is #50 (!) (http://www.thedailybeast.com/newsweek/2012/10/22/newsweek-green-rankings-2012-u-s-500-list.html).

Website review. HP has a simplistic website (see Fig. 2). Searching in the About section yields an Environment mini-site, including information on recycling, carbon footprint, and more. Dell has a much richer site, but Environment is pushed down a level to a heading under Corporate Responsibility in the About Dell section of the site. The Dell Environment area is somewhat richer, with areas of focus including recycling, energy efficiency, and green information technology (IT), with case studies. Both seem representative of a solid green commitment.

Classes of devices. Both companies offer a full range of desktop and laptop computers. Both are weaker in tablets (neither offers the leading device, the iPad), and neither offers much in the smartphone arena.

Clearly, both companies are leaders; and clearly, HP has the overall edge on green criteria. You would, of course, complement the company-level study with a look at specific computers that meet your criteria, and Dell might win at that level. You’d then have to compare the vendors on having the products you want, support, price, and other factors.

If you go through this process, make the purchase decision, and let the vendors know why, you’ll contribute quite a bit to the green computing cause.

GIVING SUPPLIERS AND VENDORS FEEDBACK

Choosing green suppliers helps green your own organization. Giving feedback to suppliers helps green every organization.

When you buy a green or greener device, no one knows why you did it—unless you tell them. Not only do you need to tell them, you need to make sure you’re heard. There are two main ways to do that. The first is to use the old model that speakers use to organize their talks:

1. Tell them what you’re going to tell them.
2. Tell them.
3. Tell them what you’ve told them.

This means a lot of repetition. Here’s one way to implement this model:

1. Tell them what you’re going to tell them. Create a statement of principles as to how you buy, including green principles that you rely on. Put it on your website. Vendors research potential customers; they’re likely to see this statement. If not, direct them to it.
2. Tell them. When you create a request for quotation, include your principles. Raise them in conversations with vendors. Note what they tell you and use it in your buying decision.
3. Tell them what you’ve told them. When you make a purchase, let the winning and losing vendors know why, at the same time as you tell each vendor “yes” or “no.” Refer back to your statement of principles. You’ll give your vendors powerful incentives to do better with the next customer—and with you, the next time around.

Another way to make sure you’re heard is to ask vendors to repeat back what you’ve told them. You can do this literally, and in person: Describe your buying criteria and ask vendors to repeat the key points back to you. Also, in quotations, ask vendors to spell out how they meet—or don’t meet—each of your key criteria.

This can be an eye-opening experience for vendors. I know from experience that there’s not much worse than having nothing to say when a potential customer asks you about one of their key criteria. If several of your key points have to do with green computing, you’ll make a powerful and lasting impression on vendors.

Even when you say “no” to most vendors, it may still not be the end of the story. Don’t be surprised if vendors who lose out on one purchasing decision start keeping you up to date on their green efforts, with their eyes on your next request.

You can also take advantage of the dynamic summed up in the old expression, “A rising tide lifts all boats.” Share your approach with other companies—even competitors. If your industry segment gets a strong reputation with vendors for using green criteria, you’ll all get better offers. If your industry segment gets a strong reputation with customers for using green criteria, you’ll all get more sales.

Ironically, your communications around your green buying principles may make as much, or more, of a difference than the simple fact of having and using them, because good examples can resonate far and wide. So pay attention to all parts of the process.
PUBLICIZING YOUR SELECTION PROCESS
AND THE WINNER

You have many degrees of freedom in how much you publicize all your green computing efforts, and device purchases are part of it. There are some special considerations around device purchases, though, that are worth thinking about.

You can actually do marketing and PR around a purchasing process, especially if (1) it’s a relatively large purchase (or a supplier review); and (2) there’s a “hook” that the public at large can get interested in—like, say, green computing!

The normal urge is to go through the purchase process and then share the results, not only with internal audiences and vendors, but with the world. However, doing your first publicity at the end of the process is likely to come across as self-congratulatory. Green marketing about an event like this is likely to work better if it ties into an ongoing story. And you can create that story yourself. Consider publicizing the entire process, creating an arc of interesting and engaging communications along the way.

What might be the benefits of such a process? Here are a few:

- **Enhanced vendor participation.** Your business might be valued more highly by suppliers if they’re going to get good publicity as well as money from a win. And suppliers who see you being thoughtful will also conclude that they might be able to build a longer-term relationship, not just make a one-off sale.

- **A greener offer.** Highly motivated vendors will go the extra mile to win your business. For instance, they might offer you specialized packaging options and product take back that might not otherwise have been forthcoming.

- **Better financial terms.** Vendors will sharpen their pencils while creating your quote if there’s a lot at stake for them in a win. Not only lower prices but better financing terms and “extras” included for free might be part of a deal.

- **Better support.** You may well receive better support after the completion of the deal if the vendor perceives that there’s benefit in keeping you saying good things about them.

- **Better products.** A vendor might offer you early access to products after development, or give you early input into an upcoming generation of devices that you might consider in a future deal.

Note that I’m not recommending you pursue green devices just to get these benefits; it’s unlikely to work. But if you are making a sincere effort, which will cost some money (at least up front) and management time, you might as well get all the benefits you can from it. The benefits you create for yourself will serve as an incentive to do even more on later rounds of purchases, and on other parts of your green computing effort.

Here’s an example of how to publicize a major purchasing event. Let’s assume that you’re going to take a year to go through the whole purchasing cycle, for a purchase process that starts in the spring and needs to be budgeted in the fall, for delivery in January of the following year:

- **Spring:** Decide what you need. Do you want to buy specific equipment, create a flexible master purchase agreement, create an approved vendors list? Decide on your overall goal. Share what you’re doing—including the use of green criteria—internally. You might consider a small, low-key press release describing the overall process you’re entering into, just to lay the groundwork.

- **Early summer:** Get details for the initial purchase. Survey affected departments about their needs. Work with them to meet needs with a smaller class of devices, where possible. For example, some departments might get inspired about having fewer support costs and hassles by having some employees use smartphones or tablets instead of full computers.

- **Late summer:** Send out a Request for Proposal. Now’s the time to kick the publicity machine into gear. Consider creating a news release, with supporting web content, about your green computing focus. Include early wins, such as choosing smaller-footprint devices. Publicize your criteria. Don’t be surprised if a better class of vendors than usual responds!

- **Fall:** Get proposals and quotations back from vendors. Have vendors come in to present. Stick with all your criteria—cost and other suitability requirements, as well as green requirements. Without naming names, you can challenge each vendor to match the best aspects of other vendors’ proposals. You can also rough out your budget for the purchase using the information you’ve gathered.

- **Winter:** Winnow quotations down to finalists and decide. Consider having you and the winning vendor issue separate, but complementary, press releases. (Joint press releases raise too many issues for most companies.) Highlight traditional criteria—cost, performance, etc.—as well as green criteria. You can also include the process as a case study in your annual report or other communications.

- **January:** Receive the shipment—or the initial, partial shipment of devices. Consider a small press release to mark the occasion and finish your messaging.

Here are a few suggestions to follow in publicity efforts of this sort:
• **Keep it low key.** It might have taken a lot of effort for your organization to start adopting green computing, but that’s “inside baseball” that no one outside cares about (or needs to know about). Be businesslike and matter-of-fact in your announcements and statements.

• **Keep it positive.** Don’t say anything bad about anyone in your communications. Talk about how you want to “improve” the environment and “reduce” negative side effects. Focus on the good qualities of the winning vendor; don’t mention the bad qualities of the losing ones. (Keep in mind that you may be buying from one or more of them at a later date.)

• **Measure success.** Note the public impact of your announcements—web page hits, media mentions, and so on. Write an after-action report describing the positives and negatives of the effort. This will prove invaluable for colleagues in your organization seeking to make similar efforts of their own.

### A SAMPLE STATEMENT OF GREEN BUYING PRINCIPLES

It’s much easier to create any kind of marketing or purchasing statement if you have an example to work with, so I’m providing one here. You don’t have to use the example as is—heck, you might go in an entirely different direction. But having something to start with will save you a lot of time, even if it only serves as a model of what you don’t want to do.

So the following is an example statement, incorporating the major points from the Greenpeace Guide to Greener Electronics:

We at Bud Smith Consulting have incorporated green computing principles into our IT buying process. We have made a commitment to pursue green computing, and that includes buying the lowest-impact devices that meet our needs.

Our criteria reflect a wide variety of business needs as well as green-specific requirements. They include the following eight points:

1. **Supplier commitment.** We want to buy from suppliers who have made an ongoing, visible, and long-standing commitment to green computing, in their own operations and products. We particularly value efforts suppliers make to measure, publicize, and reduce their carbon footprint.

2. **Smaller classes of devices.** We use the smallest class of device that will do the job. We won’t buy a laptop if a tablet can do the job, and we won’t buy a tablet if a smartphone can do the job.

3. **Smaller devices within a class; recycled materials.** When we do buy a laptop, for example, we lean toward smaller and lighter ones. And we lean toward devices that include recycled materials.

4. **Battery life.** Other things being equal, we prefer devices with longer battery life.

5. **Rare earth and other hazardous materials usage.** We ask that you avoid or minimize use of rare earth minerals and other materials that are hazardous, or that generate hazardous waste in their production.

6. **Light packaging and documentation.** We prefer that standard packaging and documentation be as small and low-impact as possible, and that lighter packaging and documentation options be available, especially for bulk purchases.

7. **Labor and legal issues.** We prefer that suppliers treat workers fairly and well within the bounds of locally applicable laws and internationally accepted principles.

8. **Take-back policy.** Please include product take back in your proposal for our purchase requirements. This should include take back for complementary products, such as additional batteries or power cords for laptops, even if not made by you. We prefer that you have a uniform product take-back policy for all your customers.

For a much more detailed plan that we use as a model in our purchasing decisions, please see the Greenpeace Guide to Greener Electronics ranking criteria. The latest version of the ranking criteria is available as a PDF, which you can access at the following URL: [http://www.greenpeace.org/international/en/campaigns/ toxics/electronics/Guide-to-Greener-Electronics/](http://www.greenpeace.org/international/en/campaigns/toxics/electronics/Guide-to-Greener-Electronics/).

### DESKTOP COMPUTERS

Desktop computers are now a minority when it comes to computer purchases; laptops sales comprise more than half of computer sales worldwide.

Desktop computers can, however, be workhorses. A desktop computer typically has a larger power supply, more slots for add-in cards, and connectors for multiple monitors. It’s not by accident that many of the remaining customers for desktop computers are hard-core computer game players.

Desktop computers can also be inherently more secure: A computer that doesn’t leave the premises is far easier to protect from loss or theft than one that does.

One problem with buying desktop computers, however, is that employees will then ask for a laptop to complement the desktop machine. If you don’t give them one, they’ll keep sensitive company data on their
own computer, or on several of their own computers. All the cost, support, and security problems you solved by getting a desktop machine in the first place open up again if the desktop computer doesn’t really meet employees’ needs.

Another problem with buying desktop computers is that the advantages of a desktop machine militate against green computing principles. A desktop machine has more capacity and is more flexible—that’s because it has more electronic and physical “stuff” in it. Vendors who are creating a machine that never has to run on battery power can waste power freely without anyone noticing.

There are several steps you can take in “greening” your desktop computing purchases:

- **Get your specs right.** Take the time up front to understand the likely needs of each computer user you’re buying for. This will give you far more flexibility in planning your purchases.
- **Look at laptops first.** Try to downsize your desktop computing purchases to laptops, where possible.
- **Look at specialized “green” desktops.** Many vendors now make specialized “green” desktops. These are small and boast reduced power consumption. Some include recycled materials. They are almost as portable as laptops, making it easier to work at home, for instance.

The Planet Green website, shown in Fig. 3, highlights several green desktop computers: HP, Dell, Apple, and Lenovo are among the companies represented. One featured computer, the Zonbu Desktop Mini, from specialty maker Zonbu, is entirely cloud based and comes with carbon offsets to make the whole operation carbon neutral.

The Mac Mini is the most senior of major green desktop computers; Apple’s made them since 2005. That means you can get really good at buying and supporting them. It’s worth reading the history of the Mac Mini on Wikipedia (see Fig. 4) to get a sense of how general computer trends, as well as green computer trends, have shifted in the recent years or so. Along with standard computer uses, Mac Minis are often used as media servers in homes and as web servers by businesses.

**LAPTOPS**

Laptops are becoming the workhorse computers for most businesses. Many of them, ironically, rarely leave the desktop. Others travel regularly to meetings, to employees’ homes, and on business trips.

In my current workplace, most people have laptops in docking stations with at least one large-screen monitor attached. Some laptops are Macs (most of which also run Windows, using special software as a bridge);
the rest are Windows laptops. The laptops often accompany people to meetings and out of the office. There’s hardly a desktop computer in the building of this 5-year-old company.

Many employees, at my workplace and in many others, have their laptops in a holder that puts them in a strange-looking, wide-open, upright position, so the screen is at eye level, but the keyboard is nearly unusable. A separate keyboard is plugged into the base station for desktop use; some people also use a mouse. When the laptop goes with the employee, the laptop keyboard and trackpad are used.

Before you buy a laptop, consider several other possibilities:

- **Desktops.** A green desktop may do the job and can be greener (and cheaper) than some laptops. This is especially true for employees who can use tablets for meetings and short trips. Get in a few green desktops as examples, then ask employees to compare before deciding.

- **Tablets.** A tablet can replace a desktop or laptop, but you may need custom software development to make company-specific applications run on the tablet. A tablet’s footprint is far less than a laptop’s. Even using a tablet part-time results in savings, as hours of very low-power usage of the tablet replace hours of higher-power usage of the laptop or desktop.

- **”Dumb” terminals and stripped-down PCs.** If everything is in the cloud, a bare-bones machine may do the job. Many companies offer ways to run Windows on a server and mirror it on a tablet or dumb terminal. A stripped-down PC running Windows, or a Mac, may do the job if software and data are all, or almost all, in the cloud.

These many uses give rise to many needs for laptops, including specific twists on the green-related needs shared by all IT devices:

- **Low power use.** Laptops have to be efficient in their power use because they have to be able to run a long time on batteries—and battery life is one of the most-watched laptop specifications. So it’s easy to compare power use and weight of laptops.

- **Small screen size.** Check with your users as to what screen size they prefer; they might like a smaller model, as it’s easier to carry. When the laptop is used on the desktop, external monitors can carry the load for display power when needed.

- **Sufficiency.** Today’s laptops have to do a lot. They should be as small and as low-powered as possible, but not offer less capability than needed.

- **Durability.** A laptop that lasts twice as long means a lot less embedded energy gets thrown away. Use external reviews and other sources to identify makers.
and models of laptops that are more likely to last a long time.

- **Maintainability.** A laptop that’s easy to clean up after spills and easy to repair after, say, a drop may serve you better than a more disposable model.
- **Connectivity.** Laptops serve as hubs for numerous other devices. They need a strong assortment of ports and an excellent connection to a durable dock. The laptop and dock need to survive and thrive through potentially thousands of docking/undocking repetitions (some of which might be rough).
- **Safety.** Engineers push the limits of technology to make laptops work, and some laptops develop dangerous “hot spots” on the bottom or edges, or even burst into flames occasionally. Pay close attention to problem reports, and to whether manufacturers respond effectively to problems that do arise. (Safety is also green, as having to suddenly replace a bunch of new-ish laptops, among other problems, is not very sustainable.)
- **Home office and road usability.** Consider whether a laptop can easily support work-at-home days and travel. Consider making additional peripherals, such as docks and monitors, available to employees, so they can create consistent work and home-working environments while carrying the laptop back and forth.

Put a lot of time and energy into deciding when a laptop is the right choice and picking the right suppliers and models. Keep buying the same model, where possible, so as to negotiate a lower purchase price and keep accessory, maintenance, and support costs under control.

### SUSTAINABILITY AND FAILURE TO SUPPLY

"Failure to supply" is a way of describing a surprisingly persistent phenomenon: Customers often don’t leave suppliers; instead, suppliers, in effect, leave their customers. That is, customers, out of habit or laziness, will often stick with a supplier, or at least a type of solution, for a very long time, indeed. But if the supplier ever—even briefly—fails to supply the expected product, the customer can quickly, and permanently, go away.

A version of “failure to supply” is that the market can subtly shift away from a vendor or a type of solution. For instance, customers have gradually moved sustainability from a nice extra to a necessity. Their definition of an acceptable product has changed. (Laptops used to have red on black or green on black displays, and color screens became a necessity, in a similar shift.) Any vendor who wasn’t ready with reasonably sustainable products as this shift is occurring will have been caught out, and replaced by vendors who are ready.

Look out for this phenomenon with vendors, especially with regard to sustainability. It’s no accident that the two biggest Windows PC makers worldwide, HP and Dell, are the top two in the Greenpeace Guide to Greener Electronics. They see that the definition of a “standard” PC is changing, and that the new definition includes sustainability, so they’re leading the charge.

Actually, a similar definitional shift is happening to you with regard to your organization’s upper management and stakeholders. The definition of what an IT department provides an organization is changing to include at least a reasonable effort toward green computing. The definition of “reasonable” depends on many factors, including your competitors’ actions and the predilections of your upper management and Board of Directors. Exceeding these steadily rising expectations is likely to be rewarded; falling short of them, not so much.

### THE CASE OF WINDOWS 8

A potential future business school case study around “failure to supply” seems to be germinating in the market for Windows-compatible computers.

Since its launch in January 2010, the iPad has taken the tablet market by storm. Competitors have tried, and largely failed, to establish viable alternatives. At this writing, in mid-2012, the iPad is on its third generation—and Microsoft has just announced its first tablet—the Surface, and Windows 8—a new version of Windows for tablets and PCs. For the first time, Microsoft was selling a tablet—the Surface—directly. According to *ComputerWorld*’s Preston Gralla, after the first few months, Windows 8 sales were said to be sluggish. Partners were said to be concerned about the situation (http://blogs.computerworld.com/windows/21721/new-report-shows-windows-8-sales-remain-sluggish-no-significant-growth-sight). Windows 8 offers a new interface, called the Metro UI, based on tiles (see Fig. 5). For Microsoft’s new Surface tablet, it’s an attractive interface, and a first-time tablet buyer might consider it over an iPad. (The initial Windows 8 tablet, though, is behind the iPad on important specifications, such as screen resolution.)

Except for Microsoft and Windows 8, no other major vendor tries to have the same interface from the smartphone all the way up to the desktop. Apple has one operating system (OS) for PCs—OS X, and one for tablets and smartphones—iOS; Google offers Android for smartphones and tablets and doesn’t have a strong PC entry. Unix is available for PCs, but not for smartphones or tablets.

In fact, no other vendor differentiates the user interface (UI) from the underlying OS the way Microsoft is...
trying to do. All the other vendors have a different UI for different OSs. (While it’s true that there’s some blurring between versions of Apple’s OS X and iOS, that’s “blurring,” not “the same as,” and Apple users are far more used to change than Microsoft users.)

Let me summarize the “use case” for the Metro UI, on two different OS’s, on different platforms:

- **Smartphones** (Windows Phone OS plus Metro): Strong entry, almost no one uses it.

- **Microsoft’s Surface tablet** (Windows 8 for tablets plus Metro): The Surface line of tablets has received mixed reviews and is not yet a rival to the iPad, the market leader.

- **Laptops and desktops** (Windows 8 with Metro): Windows 8 is a big change from Windows 7 and earlier versions of Windows, presenting challenges for adoption.

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**Fig. 5** Microsoft Windows 8 in action.  
TABLETS

Buying tablets is a good thing. They cost much less than PCs and are easier to use, more portable, and far less impactful environmentally. It’s worth buying tablets instead of PCs, whenever it is possible to do so. It’s even worth buying tablets in addition to PCs, because they cost less, there is less software to purchase, and much less per hour to run (environmentally and in terms of power usage).

There are a few things to look out for, though, with tablets:

- **Obsolescence.** A tablet’s battery(ies) may wear out after as little as 18 months of heavy use. Look for longevity in the product descriptions and reviews of tablets you’re considering.

- **Durability.** The iPad, the industry standard, seems pretty rough and tough. I’ve almost managed to break my iPad 1: It developed an ugly bulge around the volume rocker after I dropped it, and steam got in there while I was taking a bath and shorted it out for a while. It still works, though. So durability is an important issue.

- **Scrubbing and finding.** It’s very easy for tablets to be lost or stolen; make sure a tablet can be easily “wiped” and locked remotely, and that it has a remote findability service. The iPad has all of this; if you consider competing tablets, they should too.

- **Connectivity.** Tablets are very low on connection options, both for physically plugging things in, and software drivers for making them work once you do. One of the main advantages of a non-iPad solution may be enhanced connectivity.

- **Accessories.** Carefully consider tablet accessories. I’m one of the millions of people, for instance, who bought a Bluetooth keyboard for my iPad, and now rarely use it.

- **Custom software development.** Employees are going to want to use their iPad to get through short trips. Make certain they can access e-mail and their calendar, and be aggressive about giving them at least partial access to other applications as well.

An example of partial access to an application is the development by cloud marketing software vendor Marketo of a check-in app for the iPad. You can’t, at this writing, run the Marketo interface on an iPad; what you can do is run a special iPad app that helps check people into an event, such as a tradeshow. The app then synchronizes with Marketo software in the cloud to update the records of these present and potential customers with their check-in status.

Salesforce, which makes cloud software for salespeople, offers more—a version of their software with fairly full capability for the iPhone and iPad. Use these considerations in your hardware as well as your software choices.

“LESS COMPUTER” AND “COMPUTER-LESS” SOLUTIONS

It sounds radical, but some employees won’t need a computer at all—and some won’t even need a tablet. A smartphone can be used as a Personal Digital Assistant to automate many tasks.

Also consider a smartphone capability that many people overlook—the phone part. If you can avoid giving tablets and/or laptops to 20 or 40 field employees by having them call into or text one or two internal phone support people for updates, you’re ahead of the game. (And, you can train the phone support people to use your full array of software.)

There are also exciting options around using “dumb” terminals and accessing a Windows interface from an iPad or Android tablet.

Be creative. People weren’t created to use computers and consumer electronics devices; computers and consumer electronics devices are there to help people. Helping people help themselves using a minimal device, or even no additional device, has the potential to be the greenest solution of all.

SUMMARY

This entry described what to look for from specific kinds of devices. It summarized green buying criteria for devices; suggested green buying criteria for suppliers; showcased HP and Dell’s green claims; described how to give feedback to suppliers; and discussed purchase considerations for desktops, laptops, and tablets.