

THE ECONOMICS OF SUSTAINABILITY

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Cynthia Figge, EKOS International: Good morning. Allen Hammond and I will be talking about the economics of sustainability, and – I think this is true for everyone that’s been here – talking about seeing ahead. The task is filled with change, velocity, and quite a bit of ambiguity.

I want to start with a story. Many years ago I was climbing Mt. Rainier, which may not be big relative to some of the mountains here in California, but after many hours of sucking thin air, the rope guide asked me if I wanted to go back down. And truthfully, I really did. I was really hurting, but I said no, I wanted to reach the top. I had no idea at that time we were only 1,000 feet from the top. You can’t see it from there. I’m very glad that I continued on. I think Rainier was a really good experience for me in that sense, of oftentimes we can be very close to reaching our goal without knowing it.

Sustainability is a little bit like that. It’s hard to know: five years ago if I would’ve made a prediction of where we’d be, I think I would have been fairly off. But we’re going to give it a go this morning.

I wanted to start with just my definition of sustainability, and I’ll turn it to Al and see what his thoughts are. I think that the emerging definition of sustainable business is one that’s operating at the nexus of our traditional economic framework and model, but also with the overlapping circle of the ecological system and the social system. So I think that there’s going to be a new place where companies will be finding competitive advantage.

I’m going to start with a couple of global trends that I think are important to think about in setting the landscape here. We’re all aware of the tremendous benefits that have accrued through the industrial and technological revolutions, but there are unintended environmental consequences. We’re just basically churning up physical and human resources. And we’re very affected.

Later we’ll hear about Orcas and other species, but I think that thinking about our own species – cancer incidence is up, of all types, 60% from 1950 to 2000, with the primary suspected cause industrial carcinogens. One billion people do not have access to clean water. The richest 20% of the world consume 86% of world production output. But I think the feeling is that to move from, as we grow from 6 to 9 or 10 billion people on the planet, that we must increase the standard of living in the developing world with an order of magnitude, less material, and energy throughput. *Or* add four planet Earths to provide the resources and metabolize the waste.

I think perhaps you know all of those quotes. One that I’ve learned recently that I was not aware of is the velocity of these changes. Robert Kates of Brown University was speaking recently at the [University of Washington] and said that in his analysis of the 12 primary environmental systems, all of which are in decline, and analyzing the change over a 10,000-year time span, that

over 50% of the total changes have occurred in our lifetime, in nine of those 12 systems. So I think the pace of change has picked up, as well as the need to respond.

Just one trend I want to talk about and then I'm going to turn it to Al. I think that everyone knows that there has just been an enormous increase in transparency and corporate governance. I think what this is leading to that's potentially very positive is that companies are beginning on a voluntary basis to do things that really internalize externalized costs. By that I mean that they're moving to be accountable for things that traditionally they might have postponed or put off.

For example, IBM has reduced their CO₂ emissions by 20% from 1990 levels already, and have committed to a 4% reduction per year into the indefinite future, a pledge covering 30 manufacturing facilities in 14 countries. Swiss Re, which is one of the largest European DNO liability insurance companies, has announced that it will begin to deny DNO liability insurance if it decides that companies are not doing enough to reduce their output of greenhouse gases. California, you're probably aware, and Massachusetts have prohibited the dumping of monitors and televisions in municipal landfills. And so companies – at least on the manufacturing side – are moving toward zero waste. Ricoh is going to zero manufacturing waste. Sony is nearly there; and we've got a long way to go.

But I think beyond this whole area of governance and transparency and, really, customers' need to know, and that increasing trend, and looking for trustworthy companies, is really what Pat Gelsinger said at the end of his talk yesterday in response to global healthcare challenges. He said, "What an enormous business opportunity if we start to solve these problems."

I want to now turn it to Al. This is an area that has been very important to my company, Ekos, which I started after I left McCaw Cellular in '95. I've been working with companies to help them move in this direction of sustainability and really feel that the great upside here is in innovation and product services and new business models.

Al is the vice president – used to be chief scientist, so I have to give his correct title – he's vice president of Innovation at World Resources Institute. He also organized a conference in Seattle called "Creating Digital Dividends." He has written a very important book, back in '98, called *Fortress World*, and talking about scenarios for the future, this has come back into some currency. And he also is the author of a recent *HBR* article on serving the poor and addressing markets at the bottom of the pyramid.

Al, if you could, tell me a little bit about World Resources Institute and your work there.

Allen Hammond, World Resources Institute: Sure. WRI is a research institute, basically, that focuses on sustainable development. But increasingly we're not just doing research, we're trying to create real solutions, and we do that by partnering with private sector, with governments, with international organizations, with groups of NGOs around the world. So we're essentially trying to be a catalyst that can put solutions together with real needs.

Figge: How would you frame the economics of sustainability? How do you define it, and what do you think is happening?

Hammond: I like to talk about sustainability as a problem, but I think it's even more interesting to talk about it as an opportunity, and in this context, a business opportunity. And I would like to sort of frame it in terms of thinking about what I call the "bottom of the economic pyramid": 4 billion people who live on less than \$2 or \$3 a day. Awful lot of people. And in that context, I

think it's pretty clear to frame sustainability in the following way: poverty is basically not sustainable. We really can't afford to have the instability and the potential for disruption and the anger and the fear that accompanies that much of humanity living in desperation.

The second part, as Cynthia said, is we can't really replicate the U.S. lifestyle for that many people. So we have to find other ways. We have to build economies based on knowledge and information instead of natural resources. And that's where this industry really comes in.

And I think the third perception is that governments aren't getting the job done. So I think we have to look for drivers that we know work. Like markets. And the private sector. So that's how I frame the economics of sustainability.

Figge: How did you lead to the conference in Seattle in 2000, and what do you think some of the results of that were?

Hammond: Well, we were basically: challenge the industry to think about whether we couldn't close the digital divide, not through charity but through business approaches. And we got a lot of interest. We had some 400 people there, and the result of that was people said, "Okay, you've got our interest; now go do your homework; prove it to us. Prove to us that there's really a business model." So that's what we've been doing for the last three years. We've been tracking innovative uses of digital technologies in poor communities around the world, and we have an online database that has some 800 of these enterprises in them. Some are nonprofit, some are for-profit, a few are large companies. And against that background, when we find things that look particularly interesting in terms of a business model, we send in a team of MBAs, students, and we do a classic kick-the-tires, talk-to-the-management-and-customers, business-case study.

By the end of the summer we will have finished about 20 case studies of models that we think are investable, replicable, scalable. They're businesses. And yet what they are doing is transforming poor communities.

Figge: So based on all that, what are your predictions for the future of the tech industry in the next five years?

Hammond: Well, I'm going to be bullish, in Mark's tradition, and stick my neck out. I think in the next five years we're going to see another billion people start using the Internet. And the bulk of those are going to come from the bottom of the pyramid. They're going to be poor people in China, and India, and Latin America, and Africa, who are going to start using the Internet.

Now, they're not going to use it in the way that you and I do. Most of those people are not, at least in the next five years, going to own their own computer. And they're not going to pay a monthly subscription for online access or other services. But they are, in fact, going to have their own I.D., and they are going to have – probably with a biometric guarantee by the end of those five years – a secure I.D. They're going to have their own address. They're going to have a transaction history, maybe even a credit history, that has value both to them and to commercial interests. And they're going to use a huge amount of digital services that actually improve their economic productivity and improve their lives.

It's worth just reflecting a second on what we know from economic history. If you want to get people out of poverty, that means you have to raise their incomes. To raise income sustainably, we know we have to raise people's productivity. And historically, the only thing that really has made a big difference in raising productivity is knowledge and technology. So we have to put

these tools in the hands of people so they can improve their own lives. That's what really works. And the interesting thing is, we can show you business models that work. People are making money doing that right now.

Figge: Any sense of how big this market is?

Hammond: Yeah. Our estimate is – and this is based on where we see the real demand, it's based on the actual purchasing power, household-level, in these countries, and it's based on what we see in many specific instances – that people are willing to spend as much as 5% of their income on digital services. In some cases, they're spending that much just for phone service. Gladly.

If you put that together, we see at the end of five years a market of \$35 billion a year in online services. And an infrastructure and equipment market that can support a billion people. So it's not a trivial market. In a funny way, my challenge to this industry is, "So, your markets aren't growing too fast? How would you like 4 billion new customers?"

Figge: As we talked about yesterday – and the real upside might be in services – what kind of services do you see being needed?

Hammond: Well, there's going to be some surprises there. People will use e-mail, but these are not fundamentally people who are used to communicating in writing. So voice mail is going to be much bigger, and much more commercially valuable. Picture mail is going to be big. Video mail is going to be enormous, because many of these people are semi-literate, and many are working away from home. They can't go home and see their family. And to be able to see or talk to their family is worth a lot. They'll pay for it.

Digital photography is going to be big – not just for the usual reason of showing Grandma the new grandchild who lives some distance away, but tele-medicine, tele-veterinary services, tele-agricultural consulting. There are kiosks in India right now where people are holding up a sick chicken and getting advice on what to feed it to cure that. And the cost of that consultation over the Net is less than one-tenth of what it would cost them to actually go in and see a vet or get a vet to come see them. So we think that's going to be a huge business.

Multimedia, education, and training. Nearly one-quarter of the enterprises we're tracking are offering education and training in one form or another, and people are paying for this. They understand their kids need some of these things to have a good future, and they're not getting it from the public schools, so they're shelling out cash to people who offer them real substance.

Healthcare, agricultural services, microfinance – all of these are basically lacking in rural areas, and even in many urban slums. And as people figure out how to do this profitably and using digital technologies, they can do it efficiently enough. And with an appropriate business model, they can do it at prices that people can afford to pay. And that's what we're tracking.

Figge: Al, what are your thoughts about "the pipes"? How are we going to do this?

Hammond: That's what's really sort of fascinating. The classic example here is a company called Grameen Phone, and its royal subsidiary, Grameen Telecom, in rural Bangladesh. Very poor country. And yet those cellphones, in those rural areas, are averaging \$104 a month in revenue. How is that possible? Because of the business model. One phone per village, owned and operated by a local entrepreneur, essentially renting it to her neighbors by the minute, in cash. So

the customer is really that whole village: 3,000 people who have no other means of connectivity and who can actually save money by using that phone, or increase their earnings.

So what we see as competing in the space right now is, of course, voice – and there are in fact some interesting plans to use 3G-like things in this space, but the bandwidth isn't so big. Wireless local loop is at the moment the leading candidate. There are companies building networks that already serve 10 million people in India on a wireless local loop basis. Some very interesting applications of WiFi and I think advanced versions of WiFi may turn out to be the real champion, but let me give you an example.

Some engineers in India started playing with WiFi, and they asked themselves first, "Why couldn't we run it at higher power? Because we don't have any spectrum congestion issues in rural India." And the government gave them permission to do that. So they've been running at 30 times U.S. power levels. So they get broadcast out past a kilometer.

And the second things they ask themselves is, "Why do we have to build an infrastructure out into rural areas? Because our customers are here, our potential customers aren't moving around." So they tried putting one of these high-power WiFi transmitters and a big data store on the back of a bus, run it off the bus power supply. As the bus goes down its route, it essentially hooks up with any WiFi-enabled device, for a kilometer on either side of the road, and does, you know, once a day, transmission of e-mails, once a day updating the cached websites, and essentially it's a big store-and-forward system, and it's very cheap. They've actually mapped the bus network in India: 50,000 buses go past any village with any significance in India, once a day. And if you do the math, that means for about \$15 million, you can build a network that will go past 600 million people. Well, at that price, a bank who wants to get to those customers can afford to build that network. You don't need the telco. Agricultural companies are starting to build networks right now in India to reach those customers.

So, some very interesting things. And when we get to, you know, 802.16, and its much longer reach, it turns out that 85% of the population of India is within 15 or 20 kilometers of an optical fiber drop right now. So the pipes, I think, are going to be there. And I think they'll see some competition between advanced versions of WiFi, wireless local loop, 3G, and similar things.

The same is true, by the way, in South Africa. There are optical fiber drops within advanced WiFi range of most of the rural population. It's true, in a certain sense, in most of Brazil – not the most remote parts – and China has a big rural network of optical fibers, but almost no users out there. So we think the pipes are going to be there; it's the business models that have been missing. And that's what we're seeing starting to emerge.

Figge: Great. Al [and I] were in a breakout workshop, and we had some 40 people in attendance, and found a very strong theme in that group, which is that many of us care deeply about these issues. We're not exactly sure on how to really move our companies along, and maybe more importantly, how to bring together our own head and heart. What's your thoughts about that and what we heard yesterday?

Hammond: I think it was fascinating yesterday, the outpouring of interest in wanting to do the right thing within the constraints of a business, and at the same time wanting to connect that to larger personal concerns of really wanting to make a difference in the world.

One of the things I find absolutely fascinating about the work that we've been doing is that it creates the possibility to put those two things together. We're starting to work with a number of

big companies, including several of the big companies in this room, to help the companies figure out bottom-of-the-pyramid businesses that would make sense to them. To use their innovation and their reach.

Quite apart from innovation, which is very substantial, one of the things big companies can do is scale and replicate. Even if there's a really wonderful business model in India for X, it's not happening in China yet, or in Brazil, or in South Africa. And that's where we think big companies have a real role. But there's also not a very effective use of the technology we already have in providing some of the services I mentioned. So there's a huge opportunity there.

When we work with the companies, one of the things we're finding is that whether people have a legitimate mission at the moment that fits this, virtually everybody we talk to wants to get involved. So I think that by finding ways to use our business skills and our technology in service of doing something substantial about poverty and sustainable development is a tremendous way to fuse these personal and business interests.

Figge: Great. Do we have a couple minutes, Mark, to open it up? Are there any questions?

Denise Caruso, Hybrid Vigor Institute: You've talked a lot about your creating this database and all these – there are people who are creating these innovative uses. It would be really helpful to me and maybe to other people to hear some of the examples that you're seeing in this database, because that might help people track to it.

I'm also curious about what kinds of business models you're seeing. I mean, one of the things that lit me up about multimedia – quote-unquote, when that was actually a word that was in use, before we had anything else to call it – was that for education it was clearly a very powerful educational tool. But in this country, where we have plenty of money, the education market sucks for digital media. It's almost impossible, and people have not adopted it for that reason. So how on earth does that work in –

Hammond: Poor countries?

Caruso: In developing countries.

Hammond: Well, one of the reasons it doesn't work here is because we think we have lots of alternatives. Right? We do have schools that, whatever their "goodness" or "not-goodness," exist. And you can send your kid to them without having to pay for it, if you want to. In India, the schools are often such that there are no textbooks, the teacher doesn't show up, and your kid doesn't get an education. So you're actually much more motivated to pay for things. In fact, basically the problem is that poor people are so ill-served, and so inefficiently served, that that's what creates a huge opportunity.

Now, let me give you just a couple of quick examples. There's a software company that came out of Peru called Voxiva. What it did is simply leverage the existing cellphone and Internet infrastructure to create an interactive voice system that put front-line health providers into an interactive voice system, and from that into a database of the Health Ministry. So, essentially, you get overnight surveillance – I'm seeing some yellow fever out here; I've run out of supplies; I see something I don't know what to do about; I need backup – and what was an antiquated, paper-driven system that took months to see a pattern is now an electronic system. And it's transformed healthcare delivery in that country.

Interestingly enough, the second and third customer for this country are the U.S. FDA, which needs a blood-scanning system that actually works, and the Defense Department, which wants a surveillance system now, for smallpox. And so this company is going global. A very simple idea.

A second example is a company called Inlog, in India. It's building an infrastructure business in rural India. It puts a kiosk in each village, owned by a local entrepreneur. That kiosk is already offering not only Internet services, they're also doing video mail and video conferencing and voice mail and digital photography and tele-medicine, and they're starting to offer micro-banking and other things like that. The kiosk is connected by wireless local loop, about 500 villages to a central node, which is owned also by an entrepreneur, so it's doubly leveraged, and that's plugged into the optical fiber. And they're already in 10,000 villages – that's roughly 10 million people. And by the end of this year they'll be in twice that. They're profitable, and they're scaling very rapidly. I could give you 20 such stories.

But if you look on our website, www.digitaldividend.org, we post the case studies there. There are some up now; there will be a lot more in a couple months, and we're glad to share what we're learning with any company, because we think the business opportunity is truly a win-win opportunity.

Sig Hutchinson, Sig Hutchinson & Associates: Your model tends to be, or it seems to be, top-down – corporations offering products and services to poor people, as opposed to bottom-up, which is offering resources and allowing people to build economies within their own –

Hammond: It's really both.

Hutchinson: My question was, then – go ahead, then, from that perspective. How do you see top-down in addition to bottom-up?

Hammond: The top-down comes in providing the infrastructure. The bottom-up is what people do with these tools. For example: you're a farmer. You can't take your goods to market; you don't have a truck. So you have to sell them to a middleman. If you have access to the Net, you can not only figure out "what about the new seeds and the new fertilizer," but you can find out what the fair price is. So you'll probably double or triple your income because you have access to market information.

In fact, what we're seeing is that agricultural markets in particular are starting to rationalize where there is Net penetration, and that farmers are getting a bigger share of the net results from that, and their yields are going up. And their wives start using it to find out about healthcare issues and things like that. So we're seeing real transformation. The idea to do video mail didn't come from a big company; it came from a villager who said, "Is there some way I can see my cousin who's working in Abu Dhabi that I haven't..." you know – so these services are emerging from indigenous local demand. We're finding that most of these ideas are coming from local entrepreneurs who are figuring out how to use these technologies in ways that serve problems that they see all around them.

Mark Anderson: I think we should probably call it a day. Thank you very much. Thank you.