# Innovation to Reduce Poverty

## An Interview with Paul Polak

*Paul Polak talks with James Euchner about innovation for those living on $2 a day.*

**Paul Polak with James Euchner**

For the last three decades, Paul Polak has dedicated himself to an idea that many find radical: the proposition that corporations can help the 2.6 billion people in the world living on less than $2 a day—and make a profit doing so. His various ventures, including International Development Enterprises (IDE), D-Rev: Design for the Other 90%, and Windhorse International, are all dedicated to finding practical solutions to attack poverty at its roots, designing and pricing those solutions to meet the needs of the $2-a-day market, and scaling them to profitability. His work with small farmers in Bangladesh and elsewhere has already produced solutions, such as small-scale, low-cost drip irrigation systems and $25 treadle pumps, that have increased poor farmers' net income, lifting millions out of poverty. I spoke with Paul recently about his approach to innovation and design and about the role of developing markets in the future of innovation.

**Paul Polak** is founder and CEO of Windhorse International, a for-profit social venture corporation with the mission of leading a revolution in how companies serve the 2.6 billion people who live on less than $2 a day. Prior to founding Windhorse International, Dr. Polak founded D-Rev: Design for the Other 90%, a nonprofit development organization with the mission of creating a revolution in design to reach the 4 billion poor people bypassed by the current design process, and International Development Enterprises (IDE), a nonprofit organization that has ended poverty for 20 million of the world's poorest people by making radically affordable irrigation technology available to farmers through local, small-scale entrepreneurs and opening access to markets for their crops. Dr. Polak has been recognized by *Scientific American* as one of the world's leading 50 contributors to science, named Ernst and Young Entrepreneur of the Year for the western states, and awarded the 2008 Florence Monito Del Giardino award for environmental preservation. In 2009, he was named one of the world's "Brave Thinkers" by *Atlantic Monthly*. His book, *Out of Poverty: What Works When Traditional Approaches Fail*, has become a renowned resource for practical solutions to global poverty. www.paulpolak.com; paulpolakconsulting@gmail.com

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**JAMES EUCHNER [JE]:** I'm familiar with IDE, but would you mind starting with a little background on the organization?

**PAUL POLAK [PP]:** IDE is a non-profit 501(c)3 organization that operates as a business. It treats poor people as customers instead of as recipients of charity, and its mission is to double and triple the income of the dollar-a-day, one-acre farmers. When I started IDE 28 years ago, my clear intent was to learn from dollar-a-day, one-acre farmers as *customers* first. I set the goal for myself of interviewing in some depth at least 100 customers every year, and I've done that. At this point, I've personally interviewed some 3,000 families in Asia and Africa who earn their livelihood from one-acre farms and who live on a dollar a day or less.

**JE:** What inspired you? It was a career left-turn for you, wasn't it?

**PP:** Not so much as you might think. I was working as a psychiatrist, and I was creating and scaling radically different models of care for people with major mental illnesses. For people who were chronically mentally ill who were homeless, for example, I quickly learned that poverty was a more important predictor of their future adjustment than the course of their mental illness. We started implementing poverty strategies for the chronically mentally ill in the community. They included strategies to gain access to improved housing, work strategies, therapeutic businesses, and a whole series of semi-sheltered living settings.

These poverty strategies provided people with improved self-esteem, more regular work and income, and improved housing. This proved to be much more effective in improving the adjustment of people who were chronically mentally ill [than other treatments alone]. But I realized after a while that people who are considered poor in Denver, Colorado, were surviving on maybe $600 a month, while there were people in Bangladesh living on $30 a month. I became curious about how those two different types of poor populations lived and worked and what their problems were.

In 1980, I went to Bangladesh and started interviewing people who were one-acre farmers in Bangladesh, much as I had learned to interview chronically mentally ill people.

**JE:** The principles you derived from your experience are summarized very well in your book, *Out of Poverty*. It seems to me that you outline some universal practices for anyone who wants to innovate to make something sustainably better. Your first principle is to "Go where the action is and listen to the people who are there." How do you teach people to do that well?

**PP:** It often requires a total reorientation of people's normal practices. In psychiatry, of course, you work with a patient in the hospital, but the *action* is really in the real-life setting that they came from. Mental health professionals have the assumption that the problem is a mental illness inside the patient's head. But quite often, there is something else going on—a kind of separation crisis going on between a man and his wife, for example—that results in somebody being depressed. You have to go to where the action is, which may be in the home or workplace, to understand this. It was quite a challenge getting mental health professionals to be comfortable outside their offices, to have a cup of coffee in the kitchen of the family of the person who's mentally ill. We taught it by doing it.

It's exactly the same in the development field. People are used to designing projects, like psychiatrists are used to treating mental illness, within the comfort of their offices. One of the most difficult things to overcome when you see somebody as a mental health professional is the power differential. It's clear who you are when you're sitting behind the desk, and that you have the power. The patient is sort of a supplicant, in a sense. But when you go and have a talk with a patient and the patient's wife and the mother-in-law in the kitchen, you are the person who is uncertain about the power status and whoever runs the kitchen is in power. So, you have to be comfortable with being a person with curiosity, trying to learn the relevant information you need in order to be helpful. You go from being the all-knowing, all-powerful person giving prescriptions to being a learner who discovers along with other people what the problem is and brainstorms what the solution might be.

You often find out that things are very different from what you expect, but to do this, you have to hang around and talk to the right people. If you're selling drinking water to people in villages, you go to their homes and you find out what kind of container they're keeping their drinking water in. That may surprise you. You may find out that not everybody in the family is really drinking the [potable] water, so they're really getting sick because they're drinking the water only part of the time. It's a simple process. It doesn't matter whether it's in development or in technology innovation; you have to understand how a product is actually being used.

**JE:** Let's jump to the next principle, "Think big." What do you mean by that?
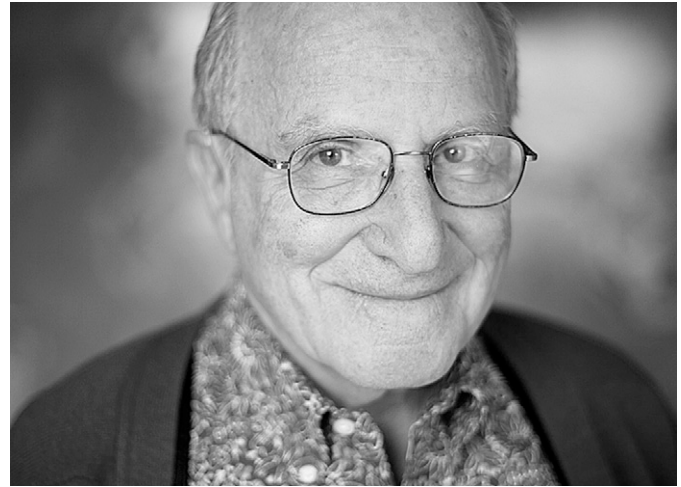
Paul Polak, founder of Windhorse International and International Development Enterprises, focuses on the "ruthless pursuit of affordability" to create products to lift those living on $2 a day or less out of poverty while delivering profitability.

**PP:** Thinking big to me has to do with scale. One of the biggest challenges in development is that the scale achieved by the few approaches that do work is still pitifully small. IDE, the organization I started, has helped something like 20 million one-acre farmers move out of poverty. That, from some perspectives, is a real accomplishment, but from my perspective, it's a drop in the bucket. There are a billion people who live on less than a dollar a day, and we've helped 20 million of them. How do you reach 500 million?

**JE:** I like that broad vision, but how do you even think about such an audacious goal? How will you go to the next level?

**PP:** One of the things that I've done since I turned over IDE to others is to create a for-profit company. In essence, I think the way you reach scale in development is by releasing market forces. You have to design in scale from the beginning. Designing the technology is only one piece of the design puzzle—it's maybe 20 percent. Designing the marketing and distribution and bringing the concept to scale is the difficult 80 percent. I'm convinced that the way we can reach scale in development is to create a revolution in big business by demonstrating that big business can enter markets serving $2-a-day customers at scale and be highly profitable.

So, I am creating four new global companies. One each for energy, health, water, and education. Each one of these companies is designed to reach 100 million customers who live on $2 a day or less and to make an attractive profit serving those customers. By demonstrating this, I hope to bring in big business. These are vast, untapped, virgin markets. They have high risk, but a potential reward commensurate with the risk. To my delight, I've talked to many corporations now who are keenly interested in innovation in emerging markets. This has been a very exciting part of what's going on in my life over the last three years.

Back to the nuts and bolts of it. I think that designing for scale is not as complicated as some people make it out to be. Here's an example that I find helpful. If you want to sharpen ten pencils, how you do this is fairly simple. If you want to sharpen 1,000 pencils, you have to come up with a different logic: it's not likely to be efficient to have one manual pencil sharpener. You may need different pencil sharpeners, and you may need different strategies. If you need to sharpen 100,000 pencils, your logical sequence will have to change again. It's not rocket science to figure out a plan to sharpen 100,000 pencils; it's just a different logical sequence.

I look at problems that can be solved profitably by reaching 100 million customers. The sequence for doing this is fairly straightforward. It usually requires some technical innovation, which then goes through a proof-of-prototype phase where we learn how to create the technological innovation. It then goes through a beta test in which the innovation is put in the hands of customers, and we get feedback from customers. We adapt the technology based on that experience. We go through that cycle several times. Once the beta-test phase is over, and the technology has successfully negotiated several field tests with actual customers—in the real-world context—then we're ready to scale.

We seek to implement a scaling strategy which is capable of reaching 100 million customers. Ususally, it involves a strategy that is applied in several countries. Perhaps the technology has to be adapted to fit different country contexts, but the whole process is not that different from the process that Procter and Gamble, for example, goes through when they introduce a brand. The difference is that you have to think totally differently to design a brand that will meet the needs of $2-a-day customers.

For instance, one of the brands that Procter and Gamble has is in the sanitary napkin market, but you can't simply take that brand and tweak it by lowering the market price by 40 percent. You have to change the whole set of assumptions around sanitary napkins. For instance, there would be a huge market for a one-cent or one-rupee sanitary napkin made out of biodegradable fibers. It's a different problem, and you'd have to experiment in designing that sanitary napkin. But you can have quite a large impact. When you talk to teenage girls in India, you find that many of them miss three days of school during their periods because they can't afford a sanitary napkin. And, of course, you have the global disposal problem.

**JE:** I think the radical price points you target make this very interesting. You're targeting a market that people haven't thought it was possible to serve profitably.

**PP:** [Look at it from the point of view of sustainability.] If you're going to provide things on a subsidized basis, they're unlikely to be scalable. But if you're going to market products at a fair-market price and make a profit doing it, then you need to understand what the customer is willing and able to

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pay for the product. That usually involves a different design process based on what I call the "ruthless pursuit of affordability." It doesn't mean dumbing something down to low quality. In fact, branding and aspirational branding is very important when you come to the marketing and distribution strategy. But it requires finding the acceptable tradeoffs to to enable you to reach a target price that is attractive.

**JE:** You talk about training yourself to think like a child and to see the obvious. That's sometimes hard for people. How do you do it?

**PP:** I'm of the age where I'm approaching my second childhood, so it gets easier. I think that, in essence, children are curious, and somehow I have an insatiable curiosity about everything. I think some people have it, and some people have lost it, but I think there is a process where people can be encouraged to rediscover that childlike curiosity. It involves getting things down to their essential elements. Let me give you an example. We are working on a process for creating green coal from agriculture waste. It's a process called torrefaction. The western industrial plants for torrefaction cost between 10 and 40 million dollars, but the process itself is simple.

When you distill it down to its basic elements, torrefaction involves heating biomass to between 200 and 350 degrees and keeping it at that temperature for a period of one to three and one-half hours in the absence of oxygen. When you think about it that way, that's about the same temperature that you use to bake a chicken in your oven. It shouldn't be that difficult to design a village-level torrefaction unit that heats two or three tons at a time in some kind of a simple enclosed kiln and holds it at 250 degrees for three hours. It shouldn't take 10 million dollars. And when you have $2-a-day labor available in the village, you should be able to do it fairly simply.

Now, there will be some quality tradeoffs. There will be some problems in getting uniform heating; there will be some challenges in keeping the temperature at the target level without huge temperature fluctuations; there will be some challenges in excluding oxygen from the chamber. But basically, when you break it down to the basic elements, all torrefaction involves is heating biomass to 250 degrees and holding it for a few hours in the absence of oxygen. You see what I mean? Looking at it like a child really means

thinking simply, breaking down the essential elements in order to design something that is much more affordable, that is robust, that can be handled by low-cost labor, and that produces a product of value. You can apply that same process to any problem.

**JE:** Another principle you advocate is to stay positive. There are often people who are naysayers in the world, whether you're in big business or trying to help the poor. Can you talk more about that principle? It sounds like you learned it from experience.

**PP:** I have had direct experience with many things where people told me it couldn't be done. When I first contracted with healthy families to take acutely psychotic patients into their homes, my psychiatrist colleagues told me that I would get in a pack of trouble and that it couldn't be done. The random assignment research study we did demonstrated that it was much more effective than getting people into acute hospital wards.

Psychiatry is what I spent the first 22 years of my life doing, but the same principle applies to other fields. Let me give you an example from IDE. It seemed to me that one-acre farmers could really benefit from drip irrigation, especially in places where water was very scarce. But drip irrigation is a technology that had been pretty much localized for use by big farms growing high-value crops, like in California vineyards. I said, "Why don't we create a low-cost drip system that is applicable to a quarter-acre plot or a 20-square-meter garden that is really cheap?" And people said, "Well, if there was a real need for that, the market would have produced it, and it would have been invented long ago." That's what people say fairly routinely.

We started playing around with how to make a small, low-cost drip system, and it took us a few years to really perfect it, but now there are 500,000 people who have bought them. Many of my colleagues in Nepal, where we first introduced it, said I'm not sure farmers in the hills of Nepal will have any use for this. I'm not sure there are water sources where you can get this water. Somebody had to stay positive about making this happen, through all of the obstacles and tribulations, or it never would have happened. Pretty much routinely, there are a lot of naysayers. There has to be a champion within a corporation or within any organizational structure who will chew through cement because they believe in a concept, and they want to get it done. Or it simply doesn't happen.

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**JE:** You talk a bit in the book about the World Bank and aid agencies. Do you find any shift in their thinking toward the practices you're talking about here?

**PP:** There's been a sea change in thinking, but I have to say, on the more negative side, that most of the aid still is based on a variant of the subsidy via charity model. When I started in Bangladesh 26 years ago, people believed that it was totally false and wrong to use business approaches for development. At that time, business was seen as the evil cause of poverty. There was a belief that it was commercial interests and multinational corporations that had impoverished poor people, and the idea of using business methods to solve the problem was seen as just outrageous.

There have been major changes over the years, and the concept of social entrepreneurship has taken hold. There's a microcredit revolution, for example. There is a whole social venture capital movement now. But be that as it may, in an area like providing safe drinking water for the poor, the major investments made by governments and by donors like UNICEF is strongly biased toward subsidized ways of bringing drinking water to poor people. Hand pumps, for example, are subsidized, and they can be effective, but we have seen a problem when a government or donor agency or an NGO installs a hand pump that is totally subsidized: the people don't own it, and when it breaks, it stays broken. Sixty to seventy-five percent are no longer operating after two years. But agencies are still installing hand pumps in the same way, without concern for this result.

**JE:** Do you take a purely principled view that any initiative to help the poor must be profitable from the start? Say you could find a way to drive the price of the sanitary napkin down to two cents, but not a penny. Do you feel like you should just keep working until you are able to get it to a penny? Or would you consider a hybrid model with some subsidies to try to accelerate the time to market?

**PP:** I believe that the effective way to proceed is to solve the problem by pure market forces. That is not going to solve all the problems in the world. At some point, there is a place for public investment and for some subsidy. For instance, it looks like we can sell water to a family at approximately four cents a day, which is cheaper than what they're paying to treat the illnesses they get from drinking bad water. But you're not going to get 100 percent market penetration in a village with that approach. Maybe you can get 50 percent penetration. There will be some people who can't afford to pay for the water even at 4 cents a day. Once you have really given the market approach a chance to work, there's room for subsidizing water for the people who can't afford it.

I don't think the market will solve all the problems in the world, but I don't think the market has been given a good enough opportunity to work. For instance, the government is regarded as necessary to providing education. But we have a situation in India where in some of the slums, 60 percent of the schools now are private schools, and parents pay $4 a

month. They've got lots of problems, but people in the slums prefer them to the government schools that are available. I think there's an opportunity to produce a scalable network of $5-a-month schools. You could add distance learning by mobile phone and markedly improve it. The fact is that it needs to be given a real shot, and public education should fill in. Or perhaps public education should be improved so that there isn't a need for private schools.

I don't hold a rigid view that only the private sector works, but I do know that kids are getting very badly educated in India. The private sector approach is a real opportunity, and it's a profit opportunity.

**JE:** It's fascinating to hear you talk about for-profit companies. It'll be interesting to see whether there is a reverse innovation effect. Do you see innovation from these companies in emerging markets migrating into the developed markets?

**PP:** As a matter of fact, one of the real big opportunities in energy will have to come from rural areas in emerging markets. The single biggest contributor to carbon emissions in the world is coal. It's 40 percent [of world energy consumption]. Seventy percent of India's electricity comes from coal; something like 45 percent of U.S. electricity comes from coal. What's available as an alternative to coal is agricultural waste that is treated to create a carbonized version through the process I was describing, torrefaction. The world burns 6 billion tons of coal, and there is 4 billion tons a year of agricultural waste, but it's in scattered locations in rural areas. A radically affordable torrefaction plant could take advantage of this and solve the last-mile distribution problem. That technology could migrate back to the developed world to help reduce carbon emissions.

**JE:** That makes sense. Is IDE connecting with universities in the more developed markets so students can start learning how to think differently about these issues and about innovation?

**PP:** Oh, yes. When I moved on from IDE three years ago, I started two organizations to address this. One of them is called D-Rev for Design Revolution. That's a nonprofit based in Silicon Valley. It's mission is to foment the design revolution. As part of that, one of the things I've been doing is to help create courses at universities in the West as well as in developing countries that will teach engineering students and other students how to do this kind of innovation.

I was involved in helping to create a course called Design for Extreme Affordability that has been pretty successful. It puts together multidisciplinary teams of students from business, engineering, the humanities, health sciences, and so on. They go to the villages, they define the problem, they come up at the end of the course with a transformative strategy or technology. They develop a business plan that is persuasive to investors. There are other courses at CSU in Colorado, at Cal Tech, at MIT, and we've launched a movement called the DR100. It's the Design Revolution to take place at 100 universities around the

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world, and its goal is to graduate 3,000 students every year that know how to do this kind of work.

There's tremendous interest on the part of the students. This is a movement that's unstoppable. Students want to learn to make a difference as part of their degree, whether or not they actually go into the field as a career. A student team from Stanford created a company called D-Light, which raised 6 million dollars. It's selling $12 solar lanterns around the world. I apologize for a long-winded answer to a simple question, but I think that there needs to be a global movement in which students, both in the West and in developing countries, learn how to design in this way. There is already a network of 200 universities, called NCIIA (which stands for National Collegiate Inventors and Innovators Alliance), that is taking a leadership role in making this happen.

**JE:** That's wonderful. Are there any other messages you want to leave with people who are leading innovation and technology organizations in the Fortune 1000?

**PP:** At this particular point in history, we're trying to recover from a global recession by using the same approaches to innovation that we have used all along. These are the approaches to innovation that have evolved in Western markets. But Western markets are increasingly difficult places to achieve growth, and they're highly competitive. At the same time, there are virgin markets that are untapped in emerging countries, and they are the path to the future. There are several corporations that are very much involved in trying to find a path to scalable profitability in emerging markets, and I think that they are focused on the right problem.

When I look at the earnings and profit margins of corporations, emerging markets are leading the way to the future in many of them. I really believe that innovation to find profitability at scale with the world's 2.6 billion $2-a-day customers is the major opportunity for growth and profitability for most corporations in the future. And the converse of that is also true; if corporations don't find a way to be profitable at scale in those markets, they risk going the way of General Motors.

**JE:** It was delight to get a chance to meet with you.

**PP:** Well, thanks. I enjoyed this discussion.