



**Bernhard Erdl:** "The aim of any ecological and financial consideration obviously has to be waste avoidance!"

**The best way of actively promoting environmental and climate protection is undoubtedly to avoid unnecessary energy consumption and to use resources responsibly. That thinking and acting in an ecologically sound manner can also have its rewards is demonstrated by power supply manufacturer Puls, whose corporate philosophy seeks to avoid waste. The company's founder and owner, Bernhard Erdl, explains the rationale behind it.**

## Power Supplies

### How a power supply manufacturer combines environmental protection and cost-effectiveness

Translated reprint of an interview with Mr. Erdl in the German trade magazine ELEKTRONIK PRAXIS

**ELEKTRONIK PRAXIS: Mr. Erdl, when you, as a power supply manufacturer, talk about energy efficiency, surely the degree of effectiveness is one of the key issues?**

Bernhard Erdl: Yes, of course. Because even back in the 1970s developers were trying everything they knew to improve the efficiency of linear regulated power supplies. But it wasn't until the late 70s that the breakthrough came with switching power supplies. That was why we set up Puls, too. From the very beginning, we aimed to make power supplies that were as efficient as possible.

**Climate change and CO2 emissions weren't an issue back then. So why was greater efficiency so important to you?**

At the time, the issue wasn't actually energy conservation. The aim was rather to build devices that were as small

as possible but didn't get too hot. So greater efficiency was required to restrict heat generation. In this respect, at Puls we have always been a bit ahead of the pack, as comparison tests with rival products have repeatedly shown.

**What has changed over the last few years in this respect?**

For a long time, energy conservation was a subject for eco-obsessives, while conventional thinking was that environmental protection was just an unnecessary cost. But lately it has been recognised that it can actually make good financial sense to go for products that are ecologically beneficial. The aim of any ecological and financial consideration obviously has to be waste avoidance!



The PULS "Power-Factory" in the Suzhou Industrial Park provides 5,500 m<sup>2</sup> of office- and production space. A further 4,500m<sup>2</sup> are planned.

**How does this philosophy impact on you in terms of technology?**

In the case of power supplies, it is simple - energy lost through heat is wasted. But there's much more to it than that! For example, ineffective use of raw materials is also wasteful, and an unnecessarily large product wastes space. So you've got wastage criteria on many different levels, but they are often difficult to convert to figures. However, in terms of energy costs the degree of waste can easily be calculated because I know exactly what a kilowatt hour costs – and then efficiency comes into it again.

**But isn't it true that these days the priority is less the cost than the CO2 emissions per kilowatt hour?**

That's right, you can clearly see here, too, how the sector's thinking has altered. Companies feel morally obliged to use resources sparingly, and that doesn't only involve raw materials but also issues such as CO2 emissions and global warming. But now there are also publications that clearly demonstrate that it's cheaper to invest a little bit in CO2 avoidance now than to fix things later – and now even the big power companies are cooperating on this. And, of course, we heartily welcome this development because it fits in with the corporate philosophy that I've always promoted at Puls.

**How much money can be saved through having a high level of efficiency – can it really pay off?**

Absolutely! We've even priced it with real examples and published a brochure with the figures. If you compare the energy consumption of a highly efficient Puls power supply

with that of a relatively simple one, you will see that, after five years, the additional energy costs of simple devices will exceed the purchase price.

But it's not only about energy costs. You have to remember that the heat generated from power loss has somehow to be dissipated, too, either using a fan or cooling units – and that requires even more power! Studies have shown that, for every watt less power lost by the power supply, you save 2.8 W in the system as a whole.

**What level of efficiency are you achieving with your current power supplies?**

We first need to clarify what efficiency level we're actually talking about, because it depends hugely on the operating conditions involved. When people talk about efficiency levels, they normally assume full-load operation, and based on that we are achieving around 95 to 96% with some of our power supplies.

But the efficiency at the point where the unit usually operates is far more intriguing. So let's look at the issue of partial-load efficiency, which is a real challenge for our developers.

The good level of full-load efficiency has been achieved using increasingly complex switching power supply topologies with a great deal of control – and using microcontrollers has helped us enormously in this. Microcontrollers are ever more powerful, inexpensive and energy-efficient while, at the same time, the demands made on them by power supplies are growing due to increasingly complex topologies. Now, if we want to achieve a good level of partial-load efficiency, very different swit-

ching and control strategies are required, which have to be delivered digitally. I believe this digitisation is going to be the next big thing in power supply technology.

**But microcontrollers have been used in switching power supplies for years – what's new in this?**

That's right, putting microcontrollers into power supplies is nothing new. But up till now they'd only been used for relatively unintelligent functions, for example for simple interface switches, slow processes and time controls. Now, though, the task is to digitise the very heart of the power supply. We took our first step in this direction some years back and saw the benefits it could give us. We're soon going to be launching some new devices that are far better than our previous models, in terms of partial-load efficiency too.

**You mentioned that your aim of avoiding waste goes far beyond efficiency issues. What other issues are involved?**

One example might be the use of raw materials, which you can tell just from the weight of the device - the less a product weighs, the less material it uses. Less weight also means lower transport costs, cheaper packaging, simpler handling in production and much more. "Avoid waste" is one of the Puls corporate guidelines. But we don't just think in terms of the product itself but also the way in which it's produced – because the production process also consumes energy and resources. Which is why we incorporated a whole range of energy-saving measures into the plant we opened in 2007 in the Czech Republic.



**PULS power supplies are highly energy efficient and achieve an efficiency of up to 96%**

We also get some of the energy from the soil using heat pumps, therefore using geothermal energy. The technology in the building is also highly sophisticated. For example, there is controlled lighting which sets the brightness based on the day's needs and which only generates light when there's somebody nearby.

Another measure is the energy recovery system used with the burn-in test that our power supplies undergo for several hours before they are shipped.

**So how much does this environmental commitment cost and what will the benefits be?**

The investment in the new production building itself – excluding machinery – is around 4.5 million Euros, of which the additional amount spent on environmental measures is almost 1 million Euros. Our engineers have calculated that, compared with a conventional building, energy consumption can be cut by 70%. Which means that the additional costs will pay for themselves in around four to five years. I think that, as a result of our new building's environmentally-friendly design, this is no mean feat and clearly shows that if you invest a bit more up front, you'll have lower running costs afterwards.

**Last year you began building a new production facility in China where, as is well-known, environmental issues are not a major issue. Are you keen to put your philosophy into practice there, too?**

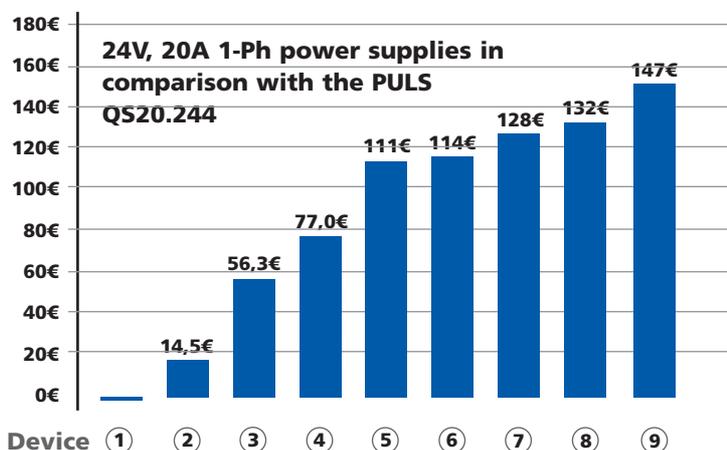
Yes, of course! In fact, we actually go one step further with our Puls "Power-Factory" in the Suzhou Industrial Park. We intend for the plant to get a certification under the USA's LEED scheme. LEED stands for "Leadership in Energy and Environmental Design". It's a system for classifying environmental construction that was drawn up by the US Green Building Council and which defines standards for environmentally-friendly, resource-efficient, sustainable construction. A huge variety of

environmentally-friendly measures that we drew up in collaboration with an engineering company that specialises in this area have been put in place in the building.

**Could you give us some examples of these measures?**

Some of them are very simple, inexpensive solutions. For example, we take in the fresh air for the building via a large ground channel. In the summer the soil is cooler and in the winter warmer than the intake air, so in the winter the air is heated up by around 5°C and in the summer it is similarly cooled. This way we save energy on the air-conditioning system and on heating.

- 1- PULS: QS20.244
- 2- PULS: QS20.241
- 3- Phoenix: Quint SFB
- 4- Phoenix: Trio
- 5- ABB: CP-C20/20.0
- 6- Chinfa: DRA-480-24
- 7- MURR: MCS20
- 8- Siemens: Sitop 20 modular
- 9- MeanWell: DRP 480-24



**Additional costs (forecast over 5 years on the basis of 24/7 operation at an energy cost of 10,5 ct/kWh)**

**Are you limiting yourselves to measures that reduce the energy demand or does your environmentally-friendly construction go a bit further?**

It goes much further and the LEED assessment will duly take this into account. For example, we have made sure that no materials are being used in the new building that could harm any site workers or harm staff in the building in the future. Recycling is also an issue. Therefore, we have to see what will happen with the old flooring if it is replaced by a new one at some point. LEED also assess what happens to the building site rubble of which there is already a substantial amount - can it be re-used on the site itself or does it have to go through the energy-intensive process of being taken away and disposed of?

**What responses have you been getting from "outside" to your unusually serious commitment to the environment - from business partners, for example?**

The feedback is completely positive. For example, last year we won the Frost & Sullivan "Green Excellence Award" for upgrading the energy-efficiency of the DIMENSION series switching power supplies. This is an award given to companies that exploit innovative ideas to design and make new products with a high degree of environmental awareness. I regard the award as a major success for Puls.

Given the company's strategic ecological focus we are, of course, particularly appealing to customers who are themselves involved in issues such as renewable energies and, for example, themselves sell energy-saving products. These include, for example, customers from the sectors of energy distribution, process control, and indu-



**By using an energy recovery system for the burn-in test area, the energy consumption can be tremendously reduced. A similar system is already in operation in the production facility in the Czech Republic.**

ustrial process measurement and control. It's particularly important to companies such as these that their suppliers share the same philosophy.

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