

Schmidt-Bleek

Friedrich Bio Schmidt-Bleek
Factor 10 Institute
Carnoules/Provence
www.factor10-institute.org

The Story of Factor10 and MIPS

It all started on Sylvester 1989 in Biedermannsdorf near Laxenburg, south of Vienna.

We had some Russian friends with us that night. There was Vodka, of course, and later many songs about old mother Russia and such. Marie's food was français pur, as always. "Stash" Shatalin, at that time chief economic advisor to president Gorbachev, was in a reflective mood. Somewhat tipsy I proposed to him that we could jointly tackle introducing the western environmental policies in Russia next year. After a little while he answered: " No no. Lets first make the market economy work Then we get rich in Russia. And after that we may afford your kind of environmental protection" ¹.

From then on I was possessed with the question how sustainability - just introduced into the political debate - could possibly be approached worldwide if more than 150 poor countries could not afford to apply our well conceived and functioning environmental protection measures ? Had they all to become rich first – and consume untold quantities of natural resources in the process - before they were rich enough to begin protecting the environment properly and we could jointly begin the process toward ecological sustainability ? Would that not be far too late, considering for instance the already threatening climatic changes ?

After that brief exchange with Shatalin it began to dawn on me that we had managed to establish a multi-billion-dollar *secondary* economy – a kind of *planned* economy if you wish - by governmental edict. The principal purpose of it was at that time to stave off dangers to human health arising from deleterious emissions and wastes emanating from the *real* economy, namely the one that was (and is) responsible for creating growth and wealth for people.

Even today many people continue to believe that a healthy economy is one that consumes increasing quantities of energy and natural resources in order to generate increasing prosperity. Even today the principal yardstick for monitoring the vigor of economies is GDP. Even today environmental protection efforts consume additional energy and natural resources, over and above the "real" economy ².

So what is the way to avoid ever-increasing costs for protecting the environment? Or is there perhaps even a way to reward increasing protection efforts within the "real" economy through market forces while simultaneously decreasing the resource use ?

The "Gedankenblitz" (the illuminating thought) occurred to me at a silent location: If too much environmentally dangerous material escapes at the back-end of an economy, one should curb the input streams of natural resources at the front end of the wealth machine ³.

Of course some questions had had to be answered before this simplistic idea could be taken seriously.

¹ P. O. Aven, S. S. Shatalin and F. Schmidt-Bleek, "Economic Reform and Integration", Proceedings of 1-3 March 1990 Meeting, IIASA, CP-90-4, 1990

² "1997 Carnoules Statement to Government and Business Leaders", International Factor 10 Club

³ F. Schmidt-Bleek, - „Wieviel Umwelt braucht der Mensch – mips, das ökologische Mass zum Wirtschaften“, Birkhäuser, Basel, Boston, Berlin, 1993; appeared in Japanese, Chinese and Finnish. English version in www.factor10-institute.org under the title "The Fossil Makers".

The first one is: Could technology provide goods and services that offer undiminished end-use satisfaction with substantially less natural resources?

The answer is yes, in principle. It is a question of engineering intelligence how much and what kind of energy and mass one invests for generating a certain quantity of value or utility. Today, some 35 kg of non-renewable nature are used on the average to produce 1 kg of product, and many times this quantity is used in the form of water. Moreover, the stuff we call *high tech* consumes at least ten times more solid nature than the average technology today. A service oriented knowledge society, supported by (dematerialized) information technology, can go a long way to replace mass and energy by brain power. In fact, how else can growth be had on a planet with limited resources in the face of a growing population with increasing demands?

So far so good, I thought. But then the question arose, what is the *required* reduction in using nature as input into the *worldwide* economy in order to approach sustainability? I did a very simple computation based on available evidence and arrived at about a *Factor 2* as the best possible estimate. Nobody has as yet contested this rough number to my knowledge.

But surely the poor of this world, some 80% of its population, were not ready to reduce the little they had access to. They dream of proper health care, shelter, washing machines and cars – not the least because we beam these dreams into their huts incessantly by satellite. We call this stimulating consumption in order to keep the throughput economy running (see above). So if the worldwide take of nature must be reduced by a *Factor 2* and equity demands that 5 or 8 billion people must have a better life than now, the rich must reduce their current take *at least* by a *Factor 10*. In my opinion, anybody suggesting less than *10* should clarify the underlying assumptions.

When I first published the *Factor 10*, people called me a fool. In particular engineers thought such acrobatics in numbers were far away from real life - until they discovered that I was *not* talking about 1000 % improvements in efficiency of existing technology, but rather meant the sharp reduction in use of nature for satisfying defined needs of people. The focus of my concept is on *service* or *utility*, not goods. As Aristotle remarked already more than two thousand years ago: "True wealth is the use of things, not their possession".

I said above that a future service oriented knowledge society should be capable of dematerializing the economy. But what about reality? Is *Factor 10* a pipe dream or not?

There is now a wealth of published examples that demonstrates that *Factor 10* and much more can be achieved without reducing end use satisfaction ⁴.

In 1993 we started at the Wuppertal Institute in Germany to get involved in practical approaches of dematerialization. Starting in 1997 my newly created *Factor 10* Institute in the Provence continued practical work in Europe and Japan, and since 1998 the *International Factor 10 Innovation Network* has shown in more than 100 enterprises how systematic new design and sensible management approaches can profitably increase the resource productivity of goods and services ^{5 6 7 8}.

⁴ See, for instance, books by Paul Hawken, Walter Stahel, Claude Fussler, Willy Bierter, E.U. von Weizsäcker, Leo Jansen, Ryoichi Yamamoto, F. Schmidt-Bleek

⁵ F. Schmidt-Bleek, Ursula. Tischner, "Produktentwicklung – Nutzen gestalten – Natur schonen", Austrian Chamber of Commerce, Wien, 1995

⁶ Walter Stahel, Willy Bierter, F. Schmidt-Bleek, "Ökointelligente Produkte, Dienstleistungen und Arbeit", Birkhäuser, Basel, Boston, Berlin, 1997

⁷ F. Schmidt-Bleek, "Ökodesign – Vom Produkt zur Dienstleistungserfüllungsmaschine", Austrian Chamber of Commerce, Wien, 1999

⁸ F. Schmidt-Bleek, Ch. Manstein and G. Weihs, "Klagenfurt Innovation", Klagenfurt, ISBN 3 900743 74 6, 1999. Report on a training program for 50 SMEs for the Design of sustainable products, services, and management.

When designing products for improved resource productivity, the resource intensity of raw material plays an important role. For instance, we figured out that 1 kg of copper requires 500 kg of non-renewable nature before it is available for constructing something. The ratio for aluminum is 85, for paper 15, for steel around 10 and for most plastics considerably less than 10. Depending on its composition, a product can thus have a much larger - or smaller - "*ecological rucksack*" than its competitor and still weigh the same ⁹.

While painstakingly working through dozens and dozens of supply chains in order to evaluate the rucksack ratios for raw materials we discovered that it is the rucksack of finished products rather than the process of manufacturing that determines the overall resource intensity of the economy: Sustainability is won on the market or not at all.

Since nothing can be managed without a measure I began early to search for practical and robust indicators that could safely guide the design of *all* goods and infrastructures on the micro level, and *all* policies on the macro level in the direction of higher resource efficiency. Such measures had to be easy to understand and apply in a world market where perhaps 50 million different products and services are traded every day. They had to be cost-effective in their application, directionally true, and cover the whole life span of products.

In view of the discourse above it should not come as a surprise that I proposed to use the "input of natural materials (including their rucksacks) per unit service or utility" – MIPS- as an indicator to be used on the micro level and "the total yearly material flow (including their rucksacks)" –TMF- as an indicator on the policy level. I have also suggested that COPS, the "costs per unit service or utility" would be a suitable kind of price for *all* goods and services in a service oriented society ¹⁰.

As we all know, trends based on indicators are what the mass media transport best when it comes to complex issues. Public attention needs to be drawn to the fact that everyone of us is needlessly wasting natural resources every day. Without this there will simply not be a meaningful public debate on sustainability and no agreement on the "*landing place*" we wish to approach for a more sustainable future.

The national German statistics office is now collecting TMF information on a routine basis. And the German federal ministry responsible for research has expressed interest in establishing a national center for information on material flows and resource productivity, including MI and MIPS data. I was recently informed that the Japanese Academy of Science has developed similar plans.

One more puzzling question must be answered before policies can be designed for approaching sustainability through increased resource productivity. And that is: Why are natural resources wasted today? Why is it that resources play hardly any role as a production factor in "modern" economic theory?

The simple answer is: Because the price of many natural resources is so low that it does not pay to optimize their use or increase their productivity. At the same time, great efforts are made by manufacturers to increase the labor productivity in order to survive in a competitive market since human labor is expensive. To the extent that machines are replacing humans in the production and service sector, this development puts even an additional strain on the natural resource base ¹¹.

This situation is *not* the fault of the market. This situation is a perfectly logical consequence of the old paradigm where increasing flows of resources through the economy were spawning increased wealth. Accordingly, fiscal policies, subsidies, R&D priorities, standards, norms, requirements for securing venture capital, property rights and many other factors are shaped to support the "throughput economy". In short, the economic boundary conditions are squarely in the way of sustainability. Or, to put it the other way around: If politicians are really interested in approaching

⁹ F. Schmidt-Bleek and Co-workers: "MAIA, Einführung In Die Material-Intensitätsanalyse Nach Dem MIPS-Konzept", Birkhäuser, Basel, Boston, Berlin, 1999

¹⁰ F. Schmidt-Bleek, „Das MIPS-Konzept – Faktor 10“, Droemer, München, 1998

¹¹ Franz Lehner and F. Schmidt-Bleek, "Die Wachstumsmaschine – der ökonomische Charm der ökologie", Droemer, München, 1999

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sustainability (and lowering unemployment in the process) they need to start a systematic analysis of the economic boundary conditions soon and get prepared to adjust them step by step. In doing so, they can use the *Factor 10/MIPS* Concept as a guide.

I will go one step further and say this: If national governments are interested in reasonably sustainable economic and social conditions in the long run, and in particular if they care for a strong export showing of their country in the future, they would be well advised to begin the process of increasing the resource productivity at once. There are simply not enough resources on this planet to globalize the western life-style. And worse, long before we run into physical resource scarcities, the environmental services will be largely in shambles if we continue operating our “throughput economies”. And the life-sustaining services of the environment cannot be generated by technology – at any costs.

Pro-active business leaders are aware of this situation. And they are pretty upset because the present price situation allows only rather limited dematerialization moves under profitable conditions. For instance, business and opinion leaders at the B 21 meeting in May 2000 at Tokyo agreed that the present resource depletion is undermining our economy and our future. They called for fundamental changes in our present economic systems, corporate activities, and lifestyles. They agreed that corporations should take the leading role in encouraging governments to change the economic framework and incentive structures. In their view, *restructuring the global economy to make it environmentally sustainable represents the greatest investment opportunity in human history* ¹².

In June 2000 the “*Alliance for Global Eco-Structuring*” was founded at Carnoules with the aim to draw industry’s attention to the fact that it would be in their own best interest to support governments pro-actively in undertaking appropriate changes of the current economic boundary conditions. We issued the “*Carnoules Appeal*” ¹³ to that effect which enjoys increasing attention and support. However, prior to changing economic boundary conditions the consequences of such changes must be analyzed. This has not happened yet. Therefore I have suggested that a systemic and well-focused major research effort be launched in order to develop realistic options for change. Encouraging first discussions have taken place.

We plan to finalize a short document at this year’s September meeting in Carnoules, addressed to the United Nations “RIO plus 10” Conference on Environment and Development in Johannesburg next year. In this document our concept for approaching sustainability and our collected experiences are cast into a set of basic recommendations.

Factor 10 and more, MIPS, COPS, TMF, ecological rucksacks, design and management experiences, as well as some first ideas about the most important changes in the economic boundary conditions have been presented in publications and can be further explained and put to use by a growing number of experts.

Thanks

I am deeply indebted to my former co-workers at the Wuppertal Institute for their sustained courage to get involved in and stick with a research effort without much precedent. Even within the institute, jokes about the “MIPS-gang” were quite frequent and the scientific advisory committee of the institute did not spend much time in encouraging our work. Without the devoted and intelligent efforts of my co-workers it would not have been possible to underpin the *Factor 10/MIPS* Concept with sufficient data for making it defensible.

In 1994 I created the *International Factor 10 Club* in Carnoules/Provence. It is still amazing to me how quickly and unanimously these highly experienced experts from many walks of life agreed with the basic ideas of *Factor 10* and *MIPS*. Their contributions toward making the *Factor 10/MIPS*

¹² GREB 21 Meeting, Tokyo, 22. May, 2000; Organizer B-LIFE 21-Business Leaders’ Inter-Forum for Environment 21; Secretary General and Founder of B-LIFE 21: Tadahiro Mitsuhashi, Senior Editorial Writer, NIKKEI-Nihon Keizai Shimbun, Inc. For the text of the B21 Tokyo Statement see: www.factor10-institute.org and Annex

¹³ See www.factor10-institute.org

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Concept known worldwide, and taken seriously, are immense.

From 1993 to 1997 I had the privilege of working at the newly created Wuppertal Institute. I am grateful for the generous financial resources extended by its former president, Ernst Ulrich von Weizsäcker. His well known book, published in 1995,¹⁴ is based on our work, even if this may not be entirely obvious to the reader. While he barely mentions MIPS, and while I still must admit that I fail to understand the logic of "*Factor 4*", there can be no doubt that the enormous success of Ernsts' book has promoted significantly the conviction of many in leading positions that increased resource productivity is a central issue when attempting to approach economic, social and ecological sustainability.

And finally - with tongue in cheek - I would also like to offer my appreciation to President Bush for his unprecedented frankness in March 2001 when he made it clear that ultimately not even the richest country can afford the kind of environmental protection policy that we in the OECD countries have developed since the early 70's.

So, 12 years after that night in Austria I find that Stash Shatalin intuitively - though I suppose unintentionally - put me on the track for what may well turn out to be a realistic path to a sustainable human society.

Thank you Stash.

¹⁴ E. U. von Weizsäcker, A. B. Lovins and L. H. Lovins, "Faktor Vier" Droemer Knaur, Munich, 1995 (translated into a number of Languages, incl. English and Japanese)