

No more inefficiency



American physicist Amory Lovins, Founder and Chairman of the Rocky Mountain Institute, lives not in utopia but in the here and now. Accordingly, his proposals for how to create a more sustainable world are realistic. Carrying them out, however, requires that we jettison our old habits and ways of thinking – and adopt instead integral thinking.

“When it comes to energy policy, government and the media often present us with a stupid multiple-choice test,” said Amory Lovins: “Were the question put clearly, it would be something like this: Would you rather die from global warming, oil war, or a nuclear disaster?” Lovins marked none of these three choices as correct: “I want nothing of this!” Instead, he wants a world that doesn’t run on oil, coal, or nuclear energy, “because energy is being used to save money – instead of to cost money.”

Lovins sees light-handed energy measures as completely insufficient because climate change demands totally new approaches. “If we start today to reduce energy consumption by one percent a year, in 2100 we will still all be toast,” he warned, and asked why it seems to be so hard to stop wasting energy. More and more energy is being consumed in countries like China and India, where completely new infrastructure is arising that could take advantage of the newest technology. “Building things properly from the start is much easier than fixing them later,” told Amory Lovins. “I’m getting tired of upgrading buildings that somebody else designed inadequately.”

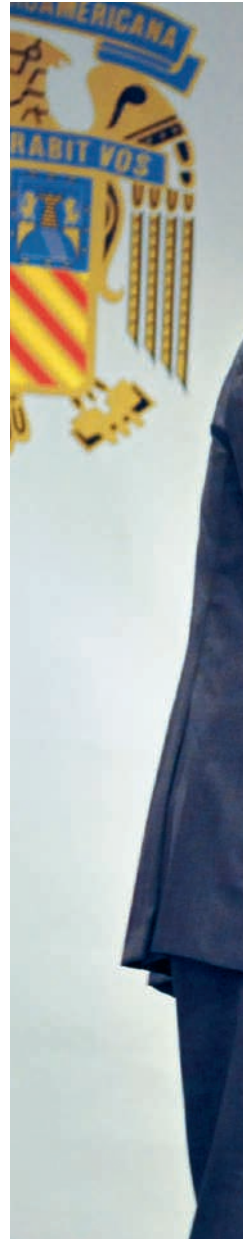
“In conventional practice, the more you save, the more it costs you.”

In his presentation, spiced with wit and optimism, Lovins dealt primarily with two energy sources: oil and electricity. In 2004 his team wrote a study mandated by the Pentagon called “Winning the oil end game.” The study shows how oil consumption in the USA could be eliminated by 2040 by making automobiles and airplanes lighter and more effec-

tive and by substituting oil with cheaper biofuels and natural gas. Lovins' team designed an SUV that is much lighter, much more efficient (with its hybrid motor), and significantly safer than conventional models. He sees the car of the future made mainly of carbon fiber; the material is more expensive but it is ultra light and very strong. Toyota has already designed a carbon fiber car that offers the same room as a Prius at a third of the weight, and accordingly requires much less fuel. "If we would build all our cars and light trucks in this way, it would be like discovering a second Saudi Arabia under Detroit," said Lovins, "because the USA alone could save that much oil."

“We can triple the efficiency of cars, trucks, and planes without compromise and with better safety by making them lightweight and more aerodynamic and equipping them with advanced propulsion.”

Lovins sees enormous savings potential in electrical power consumption. In the USA some 70 percent of all electricity is used for buildings. Today the market offers countless innovative technical devices that can be elegantly incorporated into building renovations. But more important than any technical aid is the correct key concept – “integrative design,” said Lovins. The scientist drew an easy-to-understand comparison with cooking: “You can’t just take the ingredients, no matter how good they are, throw them in a pot, add heat, and wait for a wonder to happen. You need a good recipe that tells you which ingredients in which order are to be prepared in which way – only then will the dish taste good when it is served.”



Rolf Soiron, one of the Forum hosts, presented all keynote speakers with a *Freitag* bag, made out of used truck tarpaulins, recycled bicycle inner tubes, and old car seatbelts. The environmentally friendly and virtually indestructible all-purpose bag has become Zurich's most famous fashion icon and has been displayed at the New York Museum of Modern Art.



“Optimizing not building components but whole buildings as systems delivers high efficiency and yields the expected return on investment – and of course the lowest-risk investment is the one you don’t need to make.”

As an example of a building created with a good recipe he cited his own house, situated 2,200 meters above sea level in the Colorado Rocky Mountains. Such a location is a great challenge for engineers because the temperature differentials are extreme. Nonetheless, Lovins’ home and workplace requires no fossil fuels, is 99 percent solar heated, and has no conventional heating or air-conditioning system. The building technology he used has been available for a long time, and the energy-saving construction is also no financial feat – because the cost is quickly amortized, said Lovins. He also mentioned the current renovation work on the Empire State Building in New York, which is being fitted with new high-performance windows that let in more light but less heat – helping cut the cost of cooling the building by a third. New glass technology is also being used at the Twin Towers of the Deutsche Bank in Frankfurt to better transmit and distribute daylight and thereby reduce lighting energy.

If new technologies show such unequivocal advantages, why haven’t they gained wide acceptance? “Because in conventional practice one still hears that the more you want to save the more it’s going to cost you,” believes Lovins. But the case is different if you optimize a building as a total system rather than optimizing individual components. In doing so, one must beware of “infectious repetitis,” and not rely on trusted rules of thumb, but instead measure and analyze the relevant

conditions. Efficiency down to the smallest detail is the motto of the physicist. Because the more (mostly low-cost) details you optimize, the more efficient the (cost-intensive) larger upgrade becomes. And in the end, that means the upgrade pays off quicker.

“This is the lean-thinking element, no rules of thumb – you actually measure things and do analysis, no infectious repetitis – this means we don’t just copy the old drawings. And no incrementalism.”

Ultimately, the crux is to create a modern energy system – from the smallest innovation to revolutionizing our use of oil and electricity. Lovins is convinced that “there must be more modern ways for an industrialized society to meet its energy needs than by burning primeval swamp deposits and dinosaur excrement.” But at the same time, he is aware that the adherents of conventional thinking are still many: “Not all fossils have become fuel,” he quipped.



Amory Lovins is Chairman and Chief Scientist of Rocky Mountain Institute (RMI) – an independent nonprofit resource-policy center located in Snowmass, Colorado, USA. RMI advises firms and governments worldwide on advanced resource productivity and environmental issues. His work focuses on transforming the automobile, real estate, electricity, water, semiconductor, and several other sectors of the economy to achieve advanced resource productivity. He is the author of numerous books and has received the MacArthur Fellowship, Heinz and Lindbergh Awards, World Technology Award, Right Livelihood Award (the “alternative Nobel Prize”), and the Delphi Prize by the Onassis Foundation. He has been a Member of the Advisory Board of the Holcim Foundation for Sustainable Construction since its inception.