Busting Myths, **Leading Transition**

The architect of Germany's successful renewable energy law describes what it will take to effect a global shift.

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REVIEWING THE STATE OF THE GLOBAL ENERGY SUPPLY, we see good news and bad news. The bad news is that oil reserves are running out. The good news: Oil reserves are running out.

Oil scarcity is good news because we face another deadline approaching more quickly than nonrenewable energy reserves are being depleted: The race to mitigate climate change through a global transition from polluting, finite sources to clean, sustainable energy resources. There is no more doubt; we are at a turning point. During the next few decades, we must come to depend entirely on renewable energy if we are to avoid catastrophic climate-change consequences. Despite this "inconvenient truth," we have much to gain from the transition. Renewable energy sources create so many benefits and new hopes for the world's societies that they present much more than a last option. They are the best possible choice.

Al Gore's movie "An Inconvenient Truth" thrills the public and creates momentum. Big challenges require big solutions. People left with the awareness of a gigantic danger and no clear plan for addressing it adopt no-future mentalities. The perception that there exist no overall alternatives to conventional energy supplies therefore spiritually pollutes peoples' minds. They can be activated against these dangers only if we can demonstrate convincing solutions to overcome the problems of the fossil and atomic age. To succeed in this task is the first and foremost objective of all renewable energy advocates.

Moving Beyond Lip Service

These days everyone claims to be a proponent of renewable energy. As sure as the sun shines on each of us, every government and every powerful energy company positions itself as a close friend of renewable energy. But it only demonstrates the fact that they can no longer ignore this viable option as they did for decades. Is it their first, second, third or maybe even their last political "priority"? Do they rank it high on their political agenda or as a major priority within their international organizations or investment strategies?

We must look beyond the words and identify those who pay only lip service. Empty words lull the public into the impression that the challenges we face are in the right hands — in the hands of those who will do whatever is necessary to advance renewables.

But in fact this impression does not hold true. Worldwide, only a few pioneering nations have an outstanding practical commitment to renewable energy. They demonstrate how and by what means a dynamic expansion of renewables is possible. Among the businesses committed to renewable energy, not a single big transnational company can be found. In my home country, Germany, we have three new firms that each has a greater capacity for photovoltaics (PV) production than BP has worldwide. Siemens left this business after pocketing more government money for PV research and development than all the other German PV companies combined. But new German firms that are free from the vested interest in fossil and atomic energy have been able to produce larger quantities of PV with higher productivity. In Germany we have 20,000 megawatts (MW) of wind energy capacity — of the 60,000 MW total worldwide — installed on only 220,000 square miles. And in 2005, 50 percent of the annual world production of PV modules was installed in my country. We created 170,000 new jobs.

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The total annual investment for renewables in the electric power sector in Germany is $8 billion (€6 billion). That is more than Germany's four big conventional power companies invest in nonrenewable energy technologies. Most importantly, more than 90 percent of the renewable energy investment is made by small private and municipal power players. This fact clearly shows what kind of action is needed: We have to leave space for new players to join the energy field. We should not wait for the big conventional power players to offer new strategies. The existing energy system —

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that is, the conventional energy economy as a whole — is not neutral regarding different energy options. Moreover, each energy system has to be tailored to the chosen energy sources, following their entire energy flow — from their places of mining or extracting to the places of energy consumption. One in fact has only one choice in the matter — the choice of a specific energy source. This choice determines whether mining or extraction technologies are necessary, what kind of infrastructure for the transportation of primary energy must be employed, and which conversion and distribution technologies are needed.

For decades, more than $400 billion (€305 billion) of investment went into the existing world energy system annually. It created long energy chains from a few giant oil fields in a handful of countries to billions of customers worldwide. This chain can only be organized by multinational corporations, which in turn become imprisoned by their own chain: It is impossible to come to a specific point in time when all existing investments achieve payback at the same time. That is why the multinational corporations tend to continue their businesses as long as possible, postponing the inevitable shift to renewable energy. But society simply cannot tolerate such delay.

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Renewable energy technologies have a different flow. They enable us to link the sites of energy harvesting and energy consumption again. Doing so will result in energy autonomy for every nation and help overcome global energy conflicts. There will be more equality and less poverty in the world if the shift to renewable energy is implemented everywhere. After all, no conglomerate can control the power of the sun, wind and other renewable sources.

Getting to the Facts

Participants at the G8 Summit last July once again postponed the issue, as recommended by the International Atomic Energy Agency (IAEA) and the International Energy Agency (IEA). The summit called for new technologies to promote oil and gas production and for an atomic renaissance, including pursuit of atomic fusion. But whoever aims at the worldwide revival of nuclear power has to cope with the increasing dangers of the proliferation of atomic weapons. These partisans of the nuclear "option" should tell the whole truth about atomic power. Because of the scarcity of uranium reserves, fast-breeder reactors have to be built and made ready for use. But no one has been able to construct a single functioning reactor of this type. And should it be achieved one day, the energy generated in the fast breeder would be much more expensive than renewable energy. Moreover, mankind can't wait as long as mid-century for energy from nuclear fusion; even if they succeed with this technology, nobody will want it because it would cost much more than renewable energy.

Even the protagonists of "clean coal" fail to tell the whole story. They promise less polluting coal technologies, but they cannot give a straightforward, responsible answer as to where the sequestered carbon dioxide should be stored. If it is stored in the ocean, tremendous new climate change risks will emerge. And if it is stored in underground caverns, it has to be secured there forever, like nuclear waste, because it can never be allowed to leak into the atmosphere.

The goal of such strategies is to keep the existing supply monopolies in the hands of a few international players and out of the democratic control of our societies. That is why we are faced with a greenwashing of these polluting energy sources. These attempts play on peoples' misperceptions about renewable energy — that renewable energy does not have enough potential capacity to completely replace nuclear and fossil energy;

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their increased production will be too expensive and require unaffordable subsidies; and that these technologies have long ramp-up requirements.

These arguments are wrong. Consider the facts.

Fact: The total worldwide subsidy for fossil and nuclear energy is about $500 billion per year (€380 billion), 10 times more than what has been spent for renewable energy technology in the last 20 years.

Fact: Nothing can be installed faster than renewable energy: A windmill can be erected and operational within one week, a large fossil or nuclear power plant only after several years.

Fact: To overcome these misperceptions, it is necessary to demonstrate that renewables can substitute for fossil and atomic energy completely. If people recognize this, they will call for aggressive, immediate strategies. To respect human values, however, any debate about renewable energy must go beyond comparing costs. Human values are never competitive economically, so we should not leave the issue only to energy technocrats and economists. These decisions concern the span of societies worldwide. Dürrenmatt said in *The Physicists*: "The method of physics is only of concern to physicists, its impact concerns everyone. What concerns everyone is something only all of us can solve."

Fact: We should not wait for international treaties. Based on my experience with international governmental conferences over the last 35 years, these events always follow the hidden motto: "Talk globally, postpone nationally." Their participants always have to reach a consensus. But an unbridgeable gap exists between consensus and acceleration. In history we find no example of a technology breakthrough that was promoted by an international treaty. The common rule is to be faster than others, because the speediest will have most opportunities. Why not in the case of renewable energy technology?

COURTESY OF VESTAS WIND SYSTEMS A/S

Because of its commitment to renewable energy, Germany has installed 20,000 megawatts of energy capacity.

Establishing International Leadership

Renewable energy requires pioneers — in the spheres of technology, industry, and national and international policy. These pioneers will emerge from private industry, as well as from federal, state and municipal agencies. Internationally, there is a strong need to establish an International Renewable Energy Agency (IRENA) to balance the IAEA the IEA, which obviously are biased in favor of nuclear and fossil energy. The German government in its coalition program, inspired by me, initiated the establishment of this IRENA. But to support the establishment of this agency, it is imperative to build a new "coalition of the willing." If the U.S. government signed on, the IRENA would be established in short order.

Renewable energy advocates can help overcome the efforts of those vested in the status quo energy system. It will take education to correct the misperceptions about renewable energy, as well as efforts to press policymakers to take aggressive, immediate action to promote these technologies. Advocates must do everything possible to have the United States join the pioneers for renewable energy — for your county's and the world's benefit. ●

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