

The Age of Biology and New Energy

By Daniel Osmer, Sebastopol, CA

HARVARD BUSINESS REVIEW EDITORS ARE DEMANDING THAT THE UNITED STATES INVEST STRATEGICALLY IN ITS “CREATIVITY” INFRASTRUCTURE IN THE SAME WAY WE BUILT THE CANALS, RAILROADS AND HIGHWAYS TO POWER INDUSTRIAL GROWTH.

Green technology, both renewable and biological, is the key to the future economy and will require capital, human creativity, and innovation. If we do not pursue green technology and renewable energy, China and India will, because they must. Subsidies for renewable energy development (non-nuclear) in the U. S. cumulatively totals to only 5.7 billion dollars over the past 53 years. Oil, coal, natural gas and nuclear subsidies amount to almost as much as that in just one year. This continuous subsidy was designed and reserved for new alternatives not mature industries. Why not put that several billion dollars into accelerated development of renewable and alternative energy and at the same time challenge American youth to help make us energy independent by 2020? An all out national effort, like the Moon Shot in the 1960's, for the accelerated development of Renewable Energy could capture the imagination of the next generation in America. They can become the independent energy generation instead of the lost generation.

Who will join me in calling for the equivalent of a Marshall Plan for retooling our outdated energy infrastructure and creativity infrastructure? The Marshall Plan spent \$13 billion in 4 years and restored the infrastructure and hope for 270 million people in 16 nations in West Europe. The kind of effort that saved Europe could now be used to save us from fossil fuel addiction that threatens our national security and economic stability. Let's insist that our politicians refocus the entire nation, young and old, by challenging the country by calling for a massive transition to renewable energy use and development. Who will stand up to be counted and call for the “G.I. Bill for Creativity” suggested by Harvard Business Review editor, Richard Florida?

In America's Looming Creativity Crisis (Oct. 2004) he says that as a nation we are losing our creativity and innovation leadership in the world, while at the same time we are facing the greatest economic challenge since the dawn of the Industrial revolution. As the baby boomers retire over the next ten years we no longer graduate enough “knowledge workers” to replace them. “The talent shortage will hit every sector of the U. S. economy, but it will be felt most acutely at the cutting edges of science and engineering. Creativity drives economic viability and strength.” Every County in America needs to focus on renewable energy development and training in the form of a Science and Ecology Center. It is potentially a talent and prosperity magnet for the entire region. Sonoma County can set the example for the nation by establishing the first County Renewable Energy Lab that provides hands-on training for enhancing science teacher's skills as well as students.

After World War II federal funding for basic research and people pursuing higher education increased rapidly due to the “best government program ever”, the G. I. Bill. In ten years 7.8 million veterans were trained through colleges, schools, on-the-job training, and farm training. This \$14.5 billion spent allowed the economy and employment to grow and then upon returning to the work force late they were better prepared to contribute to themselves and society. Most historians would agree that the ripple effects of the G. I. Bill *made* modern America. Herb Dwight (Former CEO, Optical Coating Lab, Inc.), Allan Greenspan (Fed. Chair), Andy Grove (Intel Corp. Founder), and Robert Rueben (Former Sec. Of Treasury) all point to student education, learning how to learn, collaborating with colleagues, and life long learning as the most important task for ensuring future economic growth and social stability. The *economic function* of education and culture is to consume economic value while its *economic effect* is to create new economic value. After all, it is the Father of modern economics, Adam Smith, that asked the question in 1776, “What is the Cause of the Wealth of Nations? His answer: Human creative intelligence!

New York Times columnist Thomas Friedman believes that we need to challenge every young American to study mathematics, biology, physics, and engineering in order to make us energy independent in ten years. “Green is the new red, white, and blue.” Ross Gelbspan, in his book *Boiling Point* (2005), proposes nothing less than a “Manhattan Project” to dramatically speed up technological innovation for renewable energy and changing personal behavior and energy use by American citizens. This high-leverage strategy would ignite enthusiasm in our youth for developing their talents and applying them in the world. While creating skilled jobs and boosting the economy, it would also reduce global warming and end our dependence on imported oil.

New discoveries in biotechnology and physics point to astounding possibilities for alternative methods of producing fuel and power. A retired scientist and educator from Sonoma County has written a ‘whitepaper’ on the feasibility of designing buildings all over the world with roofs that are made of mats of bacterial colonies. These microbes have been engineered for very high conversion efficiencies for the production of energy-dense liquid fuels such as methanol and ethanol for automotive use and the production of electricity. They are like great gills that breathe in the carbon-base gases from the atmosphere, rather like plants would do, and they also produce energy for us. We would now clean the air as we use energy. Carbon sucking energy producing microbes!

In another example, using the process of biolysis the metabolism of algae and other forms of life are made to release large quantities of hydrogen when they decay that could be utilized as an abundant energy source. Microbiologist Harold D. May was surprised to find the Gram-positive one cell membrane in these bacteria produced electricity with or without embedded proteins. *Desulfitobacterium* produce electricity that potentially can be stored in spores that can withstand extremes and act as storage (American Society for Microbiology, June 2005). The bacterium make electricity in a distinct way that still remains a mystery as to how it works.

Robert Kunzig’s article in *Discover* magazine 2005 reports methane hydrates in microbes beneath the sea floor may be equivalent in mass to one third of all living things on the surface and that it could produce methane in amounts greater than all the known reserves of coal, oil, and natural gas (Max Planck Institute). When these ice like methane crystals are brought to the surface the water melts and the gas escapes. Sea floor mud is alive, moving and very powerful! A microbial consortium of little critters specialize their function and in mutual cooperation create a natural equilibrium that we call life – abundant life. In human economic endeavor this is called the division of labor, which is the cause of the wealth of nations. Biomimicry at its best. All that is needed are the focused minds, hearts, and hands of our nations youth and teachers learning through applied research and development in Renewable Energy Labs all across the country.

In no uncertain terms, the Harvard Business Review editors are demanding that the United States invest generously in its “creativity” infrastructure in the same way we built the canals, railroads and highways to power industrial growth. All capital derives from applying human intelligence and innovation to the products of nature. The Age of Biology begins when we learn to learn and collaborate with each other as efficiently and beautifully as the kingdoms of Nature and the underlying reality behind it. Sonoma County has two world-renowned scientist-artists that could lead the effort to create a Sonoma County Renewable Energy Lab in the context of a Science and Ecology Center. Modern community economic development for the 21st Century.

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SUMMARY

Harvard Business Review editors are demanding that the United States invest strategically in its “Creativity” infrastructure in the same way we built the canals, railroads and highways to power industrial growth. Green technology, both renewable and biological, is the key to the future economy and will require capital, human creativity, and innovation. Subsidies for renewable energy development (non-nuclear) in the U. S. cumulatively totals to only a few billion dollars over the past 53 years. Oil, coal, natural gas and nuclear subsidies amount to more than that in just one year. This continuous subsidy was designed and reserved for new alternatives not mature industries. Why not put that several billion dollars into accelerated development of renewable and alternative energy, and at the same time challenge American youth to help make us energy independent by 2020? New York Times columnist Thomas Friedman believes that we need to challenge every young American to study mathematics, biology, physics, and engineering in order to make us energy independent in ten years. Who will join me in calling for the equivalent of a Marshall Plan (Another \$100 billion) for retooling our outdated energy and creativity infrastructure? The talent shortage will hit every sector of the U. S. economy, but it will be felt most acutely at the cutting edges of science and engineering. Creativity drives economic viability and strength. The economic function of education and culture is to consume economic value while its economic effect is to create new economic value. This will create skilled jobs and boost the economy, as well as reduce global warming and end our dependence on imported oil.

New discoveries in biotechnology and physics point to astounding possibilities for alternative methods of producing fuel and power. Creating micro research labs in every county would also fuel and power the imagination and creativity of the nations youth. A retired scientist and educator from Sonoma county has written a “Whitepaper” (available - oak@pon.net) on the feasibility of designing buildings all over the world that have roof mats of microbes engineered to extract carbon from the air to produce both fuel and electricity efficiently. We would now clean the air as we use energy. Bacterium make electricity in a distinct way that still remains a mystery as to how it works. A microbial consortium of little critters specialize their function and in mutual cooperation create a natural equilibrium that we call life – abundant life. The Age of Biology begins when we learn to learn and collaborate with each other as efficiently and beautifully as the kingdoms of Nature and the underlying reality behind it.

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