

Moving Toward a Clean Economy

Clean Economy Network Annual Summit

Washington, DC

January 23, 2011

Carter F. Bales

Chairman

NewWorld Capital Group, LLC

Science tells us that the world is fast going to hell—that it is already well beyond its “carrying capacity”—probably 30% beyond it—and is rapidly moving toward an unsustainable future.

Here in America, despite four decades of environmental effort, a third of Americans live in areas that fail to meet minimum EPA air standards. A fifth of the nation’s drinking water systems violate safety standards. Per capita solid waste has grown a third over the past 40 years, with much land pollution and little advance in waste management technology. Fully half our lakes and a third of our rivers fail to meet the swimmable standard of the Clean Water Act. Each year we release more than 25 million tons of toxic chemicals, which find their way into our lives and our bodies.hardly a clean economy.

As a nation, we have done little to curb our wasteful energy habits and staggering CO₂ emissions. At 5% of the world’s population, we produce nearly a quarter of the world’s greenhouse gases despite having transitioned toward a service economy—22 tons per capita compared with China’s 6 tons.

We have been terrible stewards of our natural world and are now on the brink of ruining the planet. Indeed, all we need to do to destroy the world’s natural systems that sustain us is keep on doing what we are doing. Impoverish ecosystems, release toxic chemicals, and spew greenhouse gases—all at current rates—and the world will not be fit for humanity by mid-century. But, as we know, human activity is not holding at current levels—it is accelerating rapidly.

Indeed, there are no simple environmental problems any more. There are giant, interrelated, comingled problems of food supply, freshwater availability, weather-caused physical destruction, water-borne disease, migrating tropical diseases, resource exhaustion, energy

security, overwhelmed and obsolete infrastructure, and regional conflicts arising from the above forces—all exacerbated by the scourge of climate change.

The current development path in the United States—characterized by inefficient energy use, primary reliance on hydrocarbon energy sources, aging and inefficient infrastructure, heavy reliance on depleting resources, and high levels of pollution—is surely unsustainable. Because of this, most energy-intensive and resource-dependent industries will have to undergo dramatic change in the years ahead as they respond to new market demands and industry standards and comply with a growing body of laws and regulations, all driving them toward more sustainable and eco-friendly practices.

Aside from inefficient use of energy and energy-driven pollution, natural resource scarcity is becoming a recognized reality, leading to higher prices and a consequent quest for improved resource efficiency, materials reuse and recycling, and substitutes for scarce resources. The growing concern over security of both energy sources and supplies of key natural resources, such as rare earth elements central to many technologies, provides additional impetus to these trends. Substantial direct savings to producers and customers can be found in energy- and resource-efficiency, which gives yet further animus to these trends.

Pollution of the air, water, and land is increasingly perceived as a major problem, as are dwindling supplies of fresh water and resultant water stress and the growing costs and environmental burden of waste management.

These trends are creating business opportunities across the clean economy sector and along the entire value chain from technology and business innovation (the role of venture capital), to rapidly growing businesses in the post-venture phase (the role of firms like NewWorld), to the large-scale investment needs of more mature businesses (the role of large institutional capital providers).

Clean economy markets can be defined as encompassing businesses operating in an increasingly energy-efficiency-oriented and resource-constrained economy. These markets fall broadly into three categories:

1. *Investments for a more energy-efficient economy.* These markets are largely driven by near-term economics, either direct business cost savings or growing market demand, supplemented by the expectation of increasing regulation in the future.
2. *Investments in sustainable solutions:* efficient use of depleting resources, recycling, innovative re-use, longer service life products, sustainable technologies that reverse or soften the trend toward depletion of natural resources. These markets are also largely

driven by near-term cost savings, supplemented by gradually expanding end-market demand, and the search for predictable feedstock costs.

3. *Investments for human health and welfare:* clean air, clean and ample freshwater, unpolluted soil, reduced release of toxic substances, and clean and efficient waste management. These markets illustrate the externality effect, so are driven largely by stronger enforcement of laws and regulations and the emergence of “good citizen” companies that want to get in step with inevitable long-term change.

So, let’s take a look from another perspective at the end markets for clean economy businesses.....

1. Energy Efficiency

Energy efficiency represents an enormous opportunity for the American economy. The United States is among the least energy efficient of all developed nations, using 75% more electricity per capita than every major market except Canada. For example, in industrial processes, energy costs today can reach 35% of product cost, a growing reality in the years ahead.

The reason the market is not delivering major increases in energy efficiency is the presence of well-known market imperfections (split incentives, information asymmetries, and the like) but mostly irrational buying behavior by energy consumers (applying unreasonably high discount rates on energy savings investments). In addition, energy has traditionally been a low-cost “entitlement” in America, thanks to the low price of coal-fired power and continuing government fossil fuel subsidies approaching a whopping \$15.0 billion annually and stretching back more than 40 years.

Energy efficiency includes smart buildings and more energy-efficient appliances, energy management systems, distributed cogeneration, electricity and thermal storage, smart grid applications, and energy engineering for industrial applications.

The energy efficiency market is growing at 8% to 10% annually, with some sub-segments growing as much as 50%, driven largely by direct cost savings and supplemented by government support.

Demand for green building materials is projected to be \$100 billion by 2018, nearly doubling from today’s level, and Green Construction is expected to be 25% of total construction by 2013. Segments of the market exhibiting notably high growth include compact fluorescent lighting (estimated 40% annually), Energy Star products (estimated 33% annually), and development of LEED-certified buildings (estimated 104% annually).

2. Clean Energy

Renewable energy as a percent of total U.S. electricity production is a mere 11% today (including hydro) and projected to grow by 50% in the coming decade. In the short run the market will likely be inhibited, on the assumption that natural gas prices stay low, capital markets constraints continue, and little progress is made in creating effective incentives to use renewable energy. Natural gas will replace the majority of the up to 100 GW of planned coal and nuclear plant retirements this decade and State Renewable Portfolio Standards (RPS) will be the primary driver for renewable energy capacity additions.

Because hydrocarbon energy is less costly than renewable energy (and is supported by \$15 billion in annual government subsidies), clean energy (even with its puny subsidies) cannot compete against fully depreciated coal- and natural gas-fired facilities, particularly in light of difficulties in extending the transmission grid to reach renewable energy sources. The playing field is not level.

Over time, significant support at all levels of government, growing public awareness and demand, and grid parity in an increasing number of markets (e.g., retail solar in California can be economic versus traditional energy sources) will drive demand, but it will likely be slow.

3. Water Resources and Reclamation

A coming water supply crisis faces the United States. The United States passed “peak water” back in the 70s. Fresh water is being used far faster than it is being regenerated and water tables in major cities across America are falling rapidly, down from 30% to 60% in some urban areas. Drought is becoming a permanent fixture in many locales, particularly in the Southwest and areas in the Midwest and the West where much of the nation’s food is grown.

Water pollution has not been solved and water recovery facilities are at capacity in many locales without capital to fund expansion or modernization. Industry, in particular, is facing new demands to treat and re-use its own wastewater. Desalination expenditures are expected to grow 10x from today’s level by 2016 and spending on water membranes is expected to increase at 15% annually over this time period.

The total U.S. private sector annual market size of Water Resources and Reclamation is estimated at \$53 billion and includes wastewater treatment and reclamation, water treatment/purification, precision irrigation, desalination, and supply/distribution. This segment has strong and sustainable market growth (4% to 5% annually through 2016), growing end-consumer demand, increasing government support, and a near-term need for improved efficiency, infrastructure management, and treatment for municipal, industrial, and agricultural users.

4. Waste-To-Value

Waste generation in America has exploded in recent years without a corresponding increase in ability to recover and dispose of the waste. Per capita waste generation is now 4-1/2 pounds per person per day, almost double the 1960 number. Today, more than half of waste generated in the U.S. still goes directly into landfills, polluting the land, generating methane gas emissions, and failing to recover valuable reusable materials. E-waste and other high-value industrial waste pose special problems of recovery.

Waste-to-value includes waste-to-energy such as biodigestors/anaerobic digestion and landfill gas operations, fugitive emissions control, waste stream management, and waste-to-fertilizer. This segment has large scale, moderate-to-strong growth prospects (waste-to-energy is forecast to grow at 9% annually through 2014, and the industry overall represents roughly \$79 billion in annual revenue and is growing at 3% to 4% annually) and a moderate but increasing level of government support.

What are characteristics of these clean economy markets?

- *Significant, growing markets.* Most clean economy segments are forecast to grow 2 to 4 times faster than U.S. GDP, with some sub-segments growing much more rapidly, placing the sector among the fastest growing in our economy. Much of this growth is fueled by the pervasive energy inefficiency of the American economy, rather than by government incentives. Leading corporations are putting a sharp pencil to energy cost analysis and seeking major improvements in energy efficiency.
- *Less competitive intensity.* Most industry segments in the clean economy sector feature limited competition, owing to the “youth” of these segments, rapid expansion of underlying market demand, and continuing technology and business innovation. As these industries develop, companies will increasingly compete for fresh opportunities. Indeed, growth in companies in the sector may be limited more by capital availability and skill in business-scaling than by the force of head-to-head competition.
- *Resistant to recession.* Clean economy industry segments should be less affected by recession than most sectors of the economy, because of strong demand factors driving market growth, the less cyclical nature of some of these segments (e.g., water, waste management), and increasing government regulation and financial incentives that, for example, stimulate growth through higher energy efficiency standards.
- *Advantaged by inflation.* Clean economy businesses generally meet inflation-beneficiary criteria. Many such businesses have strong cash flow with significant operating leverage and pricing power, high barriers-to-entry and customer switching costs, and hard assets that should increase in value and keep pace with inflation.

Accelerating development of the clean economy sector are four additional forces:

- *Rapid growth in volume of venture capital investments* increasing the number of young companies in the sector—e.g., \$28.0 billion in venture funding raised for environmental investments in the past decade.
- *Legislative and regulatory “push” at all levels of government*—e.g., State-level Renewable Portfolio Standards (RPS), copycatting of California’s stringent building codes by other states, emergence of energy-certified buildings as a standard in many cities.
- *Government incentives to “pull” desired investment activity*—e.g., U.S. House of Representatives passage of Rare Earths and Critical Materials Revitalization Act of 2010 in response to China’s rare earths monopoly and increasing stringent export policies.
- *Changes in corporate behavior by leading companies* (beginning of the “pre-compliance market”), stimulated by the expectation of energy and clean economy legislation and regulation at all government levels over the next several years. 60% of corporate leaders now say they view environmental issues as strategically important for their companies.

In light of the dynamics that govern these markets, we are beginning to see the possibility of what I call “4-Plex” opportunities. These appear when huge existing markets (such as energy, water, waste, raw materials) face strong, growing demand that will transform them over time; in the case of energy, the increase in energy prices and other market factors impacting demand will drive technology disruptions over the coming 5 to 20 years that enable business model innovations and disproportionate economic value capture.

A **4-Plex** Win is defined by: (i) significantly lower product lifecycle cost; (ii) new features/functions or services of direct benefit and visible to the end customer; (iii) certain environmental benefits in multiple dimensions—less energy required and reduced resource inputs that serve to restrain future price increases and volatility; and (iv) ‘backward compatibility’ with existing business systems and infrastructure to promote ease of acceptance.

So how does all of this stuff net out for us as Clean Economy advocates?

I personally believe that **an industrial transformation** has begun in the American economy, which over time will move industry practices toward more sustainable and cleaner operations. The motive force behind this transformation is changing market demands and business economics, more so than government action.

Increasingly, factors such as inefficient energy use, primary reliance on hydrocarbon energy sources, rising and volatile energy prices, aging and inefficient resource infrastructure, heavy reliance on depleting resources, and high levels of pollution are posing challenges for corporations: problems of product cost, customer value, business competitiveness and by-product cost and health effects on society, aggravated by growing pressure from constituencies.

These problems are leading to broader problems of competitive best practice, standardized business practices across differing markets, capital productivity, competitiveness in the global marketplace, offshore job loss, and economic growth and quality of life issues for the nation's citizens—especially when viewed against more rapidly growing nations in an increasingly competitive world economy. The common view is that other countries, notably China but others as well, are leading—and, indeed, widening their lead—in energy efficiency, resource efficiency, and products and services that serve energy and environmental markets. America's competitiveness is slipping badly, particularly in the energy and environmental arena.

Seen against these trends is a rise of new, fast-growing corporations that economists call “attackers”—that's you in the audience, entering with innovative products and services aimed at these clean economy markets. We count on you to make a big difference.

In my judgment, the American economy is beginning the transition toward a clean economy. ...Toward more energy-efficient practices and alternative forms of energy to respond to these changes and offset growth in energy costs. ...Toward limiting consumption of finite resources, such as freshwater and commodities in short supply, by becoming more resource-efficient and substituting renewable resources where possible. ...Toward developing more cost-effective approaches to reducing and eliminating pollution of the air, water, and land. ...Toward protecting, allocating and regenerating limited freshwater supplies and controlling and recycling the rising volume of waste. And, eventually, our economy and our broader society must come to understand the challenge of carbon emissions arising from hydrocarbon energy sources and begin the journey toward a low-carbon economy, but apparently not yet.

As a result of these trends, we are seeing significant opportunities ahead for businesses like yours in the years just ahead.

The future can be managed if we get on to it strongly..... Otherwise, the world will surely go to hell.