Point of View

The Energy Equation

William H. Page
Senior Vice President & Portfolio Manager
Essex Investment Management, LLC
Essex Global Environmental Opportunities Strategy (GEOS)

The hurdles for clean technology (clean tech) equities have been steep and numerous lately. A continued lack of global climate change legislation with associated low carbon prices has been a clean tech headwind, as have decreased government incentive structures in the European Union. As the United States continues with election year antics and limited Washington comity, hope for any substantial U.S. energy policy has been vanquished. The term *climate change*, while common parlance in most regions of the world, is now treated with disgust in some developed markets by those with interests in incumbent fossil fuel extraction and distribution. Despite these hurdles, I remain not only constructive on the near- and long-term prospects for clean technology investing, but believe clean tech will be the key solution for global economic expansion.

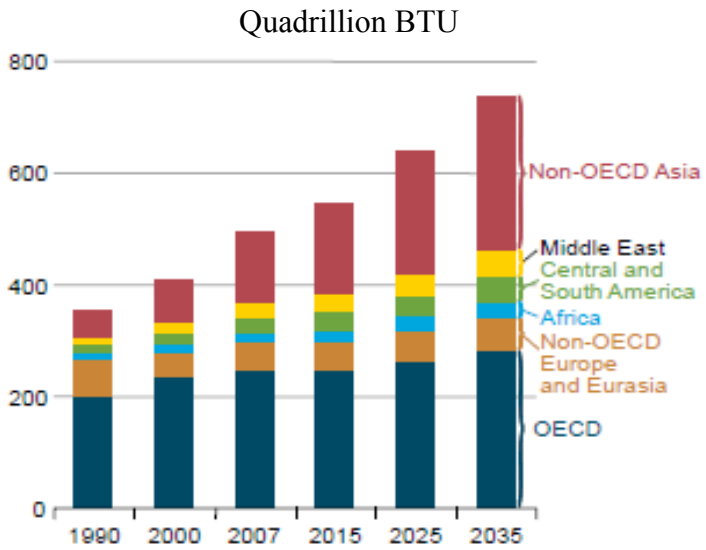
In managing the Essex Global Environmental Opportunities Strategy (GEOS), we utilize a broad thematic approach and believe that listed equity companies that recognize the opportunities and costs associated with de-carbonization and resource scarcity will deliver strong shareholder returns over time. Our thematic approach, modeled after findings such as the Stern Review and the Intergovernmental Panel on Climate Change, invests across commercially viable leading technologies that increase the efficient use of scarce resources. While politicians and bureaucrats bicker about climate change policy, I believe our world is experiencing a secular shift greater than that of the Industrial Revolution. The case for clean-technology equity investing is based on our observation that as the economic baton is passed from the established Organisation for Economic Co-operation and Development (OECD) economies to the emerging growth *establishing economies*, the global economic levers are increasingly being pulled by the non-OECD regions. I agree with IMF projections that by 2014 the emerging markets will have overtaken the OECD countries in total share of global gross domestic product (GDP).

This economic shift is compounded by demographics and climate change, as well as by associated trends such as the global rise of the middle class and urbanization. Many of these trends have been manifesting for years, yet are now rising to the fore in concert and providing ample boosts to newfound supply-demand imbalances. In the end, I believe the main driver for clean tech can be summarized by a short yet complex equation:

$$GDP = BTU;$$

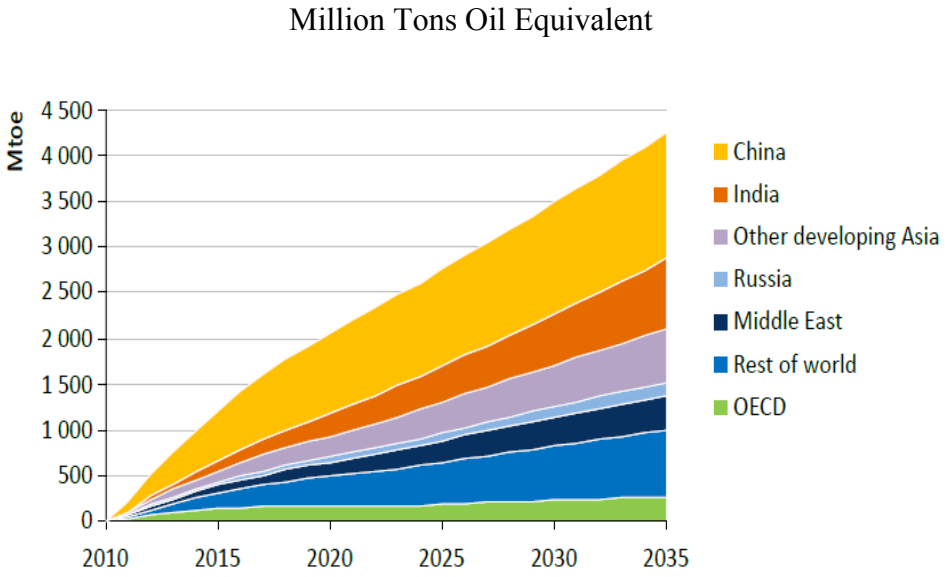
Without British Thermal Units (BTUs) of energy, and the expansion of those units, there can be no growth in GDP. Energy is the key ingredient for economic expansion, and the superior economic growth experienced in non-OECD regions is the reason their energy appetite surpassed that of the OECD countries back in 2006. The Energy Information Administration (EIA) projects a 50% increase in global energy consumption from 2009 to 2035, with over 84% of growth in world energy use coming from non-OECD regions and driven by the economic trajectories of China and India (Figure 1). International Energy Agency (IEA) models concur, projecting an increase in global energy demand by one-third over the next twenty years, with China and India accounting for 50% of said growth (Figure 2).

Figure 1: World Energy Consumption by Region



Source*: EIA Annual Energy Outlook 2011.*

Figure 2: Growth in Primary Energy Demand



Source*: IEA World Energy Outlook 2011.*

While this shift in energy demand is driven by economic growth, the trend is secular in nature since these establishing economies develop middle-class domestic consumption bases. In China, domestic consumption contributed to over 50% of overall GDP growth in 2011, very close to the record-high 53% in 2009. As China's economy transitions, the labor surplus is declining and wages are rising. This astonishing trend can be summarized in a recent Ernst & Young study (*Growing Beyond: Innovating for the Next Three Billion*) addressing the rise of the consumer class in the emerging economies, which is projected to increase from almost two billion middle class consumers today, to five billion by 2030.

The economic growth trends in these developing economies, coupled with secular catalysts such as the rise of the middle class, have exacerbated demand for resources beyond energy. A supply and demand imbalance in total grain production, which has not kept pace with global consumption, has been present since 2000. The USDA is projecting that global food demand could rise up to 50% over the next twenty years, largely driven by heightened protein consumption by the *next three billion*. This consumption shift could be exacerbated by declining agricultural yields since many regions with high agricultural productivity are at risk of long-term drought from global climate changes. We view water scarcity as an investment opportunity, since irrigation and other agricultural productivity technologies are applied to areas experiencing long-term drought and decreased water tables.

De-carbonization and resource scarcity technologies exist across our economy and can be applied with commercial viability now in the absence of climate change legislation,

government incentives, or energy policy. GEOS invests in global growth equity companies that provide solutions to the world's challenges through the efficient use of scarce resources. These solutions include: improvements in agricultural productivity, increased energy efficiency, water conservation and reuse, greater use of renewable energy, sustainable living, and more efficient transportation. Applied broadly and across economic sectors and industries, clean technologies can assist in lowering energy and other operating costs. Most of the revenue growth generated by GEOS portfolio holdings stems from leveraging the hunger for energy sources and efficiencies in China and other emerging regions. China is aggressively scaling and deploying energy technology in every form since it desperately needs BTUs and natural resources for energy deployment. The well-reported solar dominance of China, leveraging what was initially Western technology, has allowed China a growth export and distributed energy source for domestic consumption. The same holds true for Chinese wind turbine manufacturers, who are rapidly encroaching on European and U.S. technological leadership.

Many multinational corporations are also developing, purchasing, and leveraging clean technologies as they seek to limit operating costs and risks stemming from these trends. Natural gas is rapidly becoming a complementary transport fuel to diesel for commercial fleets, as shipping companies move to hedge against higher oil prices. Light emitting diode (LED) technologies are being deployed in industrial settings with 24-hour, 7-day-a-week lighting usage, given paybacks that average less than 18 months before any potential energy efficiency incentives.

The establishing economies are transforming the global economic landscape and are now driving demand for energy and natural resources. To meet this demand shift, hedge this risk, and benefit from this great long-term opportunity, clean technology will be a well-positioned beneficiary. Clean tech is broadly adaptable and commercially viable for solving an extremely complex equation: GDP = BTU.

William Page is a Senior Vice President and Portfolio Manager for the Essex Global Environmental Opportunities Strategy (GEOS). He can be reached at wpage@essexinvest.com (www.essexinvest.com).