Abundant energy will power future growth

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**Lawrence Solomon**

Up! Up! Up! The world is consuming more and more energy and, as if by miracle, the amount left to consume grows ever higher. Never before in human history has energy been accessible in greater abundance and in more regions, never before has mankind had more energy options and faced a brighter energy future.

Take oil, the scarcest of the major energy commodities. In the Americas, proven oil reserves have increased from 170 billion barrels to 180 billion barrels over the last two decades, according to the 2008 Statistical World Review from British Petroleum. In Europe and Eurasia, proven oil reserves almost doubled, from 76 billion barrels to 144. Africa's proven oil reserves did double, from 58 billion barrels to 117. Even the Asia Pacific region, where China and India are reputed to be sucking up everything in sight, has increased its proven reserves. And the Middle East, the gas tank of the world, shows no sign of slowing down -- its reserves soared by almost 200 billion barrels, from a whopping 567 billion barrels to a super-whopping 756.

Bottom line for the world: an incredible 36% increase in oil reserves during the two decades that saw the greatest globalization-spurred oil consumption in the history of mankind. And that doesn't include the 152 billion barrels in proven oil reserves obtainable from Canada's tar sands. Is there any reason to doubt that the next two decades won't build on the steady growth of the last two?

These oil reserves aren't the end of it. These figures -- for the year ending December 2006 -- represent oil that's not only known to be available, but also economic at 2006 prices using 2006 technology. Since prices have soared in the last year, and technology has improved too, BP's annual assessment for the 2007 year will show greater proven oil reserves still.

But this is still not the end of it. Unconventional oil reserves are now in play. In 2005, the Rand Corporation estimated that the oil shale in America's Green River Formation, which covers portions of Colorado, Utah and Wyoming, contains 1.5 to 1.8 trillion barrels of oil, with as much as 1.1 trillion barrels of oil recoverable, an amount comparable to the reserves of four Saudi Arabias. Oil shale becomes recoverable at $95 a barrel, it determined. With oil now trading at $140 a barrel, oil shale

exploitation is now very much economic. Then there's Canada's tar sands, with its even greater potential--estimates of the total reserves that may be available top two trillion barrels, or eight Saudi Arabias.

This is still not the end to it. Most of the oil we know about lies in the well travelled portions of the globe. But most of the world remains unexplored -- the interiors of Africa, Asia and South America have seen relatively little oil exploration. Oil exploration in the oceans, too, is in its infancy. For all practical purposes, mankind has limitless oil supplies available to it. The story is similar for natural gas and coal, the other major nonrenewable sources of energy. And for nuclear power. And for the renewables.

The amount of solar power landing on Earth could supply our current needs 10,000 times over. This potential will soon start to be realized on a large scale thanks to breakthroughs in the U. S. and Israel that have dramatically brought down the cost of solar technology. Wind also represents an inexhaustible resource, as seen in a 2005 NASA-funded study at Stanford University of viable wind sites worldwide. It found that wind power could satisfy global demand seven times over, assuming a realistic capture rate of 20%. Some European countries already meet a significant portion of their power needs with wind.

The world is awash with exploitable energy, both renewable and non-renewable. Availability is not at issue and never has been.

The only issue is the cost --both economic and environmental --at which it can be exploited.

Nuclear currently fails on economic grounds. But most fossil fuel technologies don't need subsidies and soon, neither will most renewable technologies. That leaves the environment as the chief determinant of what energy we use, and where we use it. Thanks to environmental awareness and the high energy prices we now face, energy production has become ever cleaner, safer, and more efficient, giving us more meaningful options than ever before.

Whatever the outcome, whatever energy forms we ultimately rely on, the table is diverse and bountiful, allowing the world economy to grow large and to grow cleanly. And it will have been largely set by environmentalists.

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