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CHALLENGES AND PRESSURES ON THE WORLD ENERGY SUPPLIES: THE OPPORTUNITIES FOR NEW RESEARCH

Shaffiq Jaffer

VP Corporate Science and Technology Projects, Total American Services, Inc.

Current projections estimate that the world population will reach 9 billion in 2050, with 1 billion people currently on the path to modernization in the coming decades. This brings growing demands for energy and resources which is adding pressure on developed nations to reduce their share of the finite resources (energy / capita). As one looks at the outlook on world energy demand and sources in the coming decades, the data shows that even though there has been some great strides in the development and implementation of renewable energy sources, greater than 70% of energy will still derive from fossil fuel sources in 2030. Given that the costs to discover a barrel of oil has doubled in the last decade and new discoveries of oil have been flat in the last 30 years (20 GBoe/ year), and consumption of oil and gas continues to outpace discoveries, there is a need for new sustainable energy supplies. In addition, the current estimates to limit the effect of global warming (450 ppm CO_2 scenario) will require significant reduction in CO_2 emissions, 13.8 billion tons by 2030. This will partly come from renewable energy use but the majority of these CO_2 reductions will have to come from improved energy efficiency.

A review of current research trends clearly shows that academia, government and industry are pursuing new innovations for supply of energy (Wind, Solar, Bio, etc..). However research related to reducing demand, or increasing the efficiency of our use of energy, has seen little of the limelight. This presentation will highlight some of the challenges facing the solar photovoltaic industry, and dimension the needs for energy efficiency improvements show casing some areas of research required related to polymer processing.