

## Solar Power: The Journey from Niche to Mainstream

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# SOLAR POWER:

## THE JOURNEY FROM NICHE TO MAINSTREAM

By Todd Foley and Kevin Gallagher\*

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### INTRODUCTION

Global climate change is here, and with it comes changes in the global energy industry. For companies like British Petroleum (“BP”) that are willing to accept that reality, global climate change and the switch to a lower carbon economy offer an opportunity to create profitable markets while reducing society’s negative impact on global climate systems. By moving quickly and effectively to develop renewable energy sources, energy companies can diversify their energy portfolios while at the same time promoting long-term sustainability. From solar power to biofuels and wind power, low carbon energy solutions exist but have yet to be successfully integrated into the global economy. In light of the changes facing the energy industry, how can energy companies bring these renewable energy sources into the mainstream? This article explores the current niche status of today’s sustainable energy markets, particularly solar photovoltaic power (“P.V.”), and BP’s efforts to develop a viable solar energy program.

### THE SOLAR INDUSTRY TODAY

The U.S. domestic solar power industry has grown significantly in recent years. Helped by over \$500 million in government support for a variety of different initiatives,<sup>1</sup> P.V. production grew by 32 percent in 2003, resulting in \$5 billion in sales in that year alone.<sup>2</sup> In addition, total demand for supplied P.V. continues to increase at about twenty percent per year.<sup>3</sup> Despite this solid expansion, the U.S. P.V. market remains insignificant in terms of total energy use. Last year’s total growth of six hundred megawatts equals the output of just a single natural gas-fired turbine or less than half of a coal-fired plant.<sup>4</sup>

The key to the industry’s past growth was successful cost reduction. Similar reductions will be essential if the industry is to grow beyond its current niche status. Over the last twenty years, industry cost reduction efforts spurred a six-fold decrease in the cost of installed systems.<sup>5</sup> However, BP’s recent estimates indicate that the total installed costs must at least be halved for P.V. to approach parity with conventional power sources.<sup>6</sup> The only way these costs reductions can occur is for the P.V. industry to grow and gain access to scale economies currently out of reach.

### BP’S ROLE: SUSTAINABILITY AND PROFITABILITY

As the first major energy producer to acknowledge the urgency of acting on global climate change, BP is taking steps to reduce its effects and facilitate the movement towards renewable energy sources. BP has already achieved significant reductions in greenhouse gas (“GHG”) production and plans to keep

its GHG levels the same in 2012 as they were in 2002.<sup>7</sup> These efforts are evidence of BP’s commitment to becoming a major player in the global renewable energy market and to promoting the dual goals of profitability and sustainability. In the short term, BP is working to create partnerships and foster trust with its stakeholders, including state and federal governments and consumers.<sup>8</sup> In the long term, BP is focused on reducing the effects of global climate change by developing the capacity to produce and supply sustainable energy solutions around the globe. Based on available research, BP has determined that stabilizing GHG concentrations at 550 parts per million is a realistic goal that would limit the global temperature rise to approximately two degrees Celsius.<sup>9</sup> Meeting that goal will require emissions in 2050 not to exceed today’s emission output, despite a forecasted doubling of energy consumption.<sup>10</sup>

Solar power’s tremendous potential as an alternative to GHG-emitting technology will help BP reach its goals. Researchers at Princeton University recently calculated that a one thousand fold increase in solar power could reduce total current GHG emissions by one-seventh.<sup>11</sup> BP believes that the foundations for a successful P.V. market must come from the developed world.<sup>12</sup> As a result, BP has focused on expanding its production in developed countries on its grid.<sup>13</sup> By focusing on the developed world in the areas of technological innovation and industry consolidation, BP hopes to achieve the scale necessary for P.V. to quickly become cost-competitive with conventional energy sources. To that end, the company has invested approximately \$500 million in P.V. since 2000.<sup>14</sup> BP’s pursuit of a stable and mature P.V. market has led it down several avenues of market development, including research and development, operations, and marketing. BP sees these areas as critical in the effort to bring P.V. into the mainstream.

The future of the P.V. industry depends on technological development. Without continued innovation, the industry will not be able to reach cost parity, and future growth will be severely limited. In an effort to foster technology research, BP has developed major partnerships and made significant invest-

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\* This article was compiled for Todd Foley, BP Director, Business Development & External Affairs, by Kevin Gallagher, J.D. candidate, May 2007, at American University, Washington College of Law. The article relies primarily on two speeches by BP employees discussing BP’s approach to the development of the solar industry. The first speech, titled “Bringing Solar into the Mainstream,” was presented by John Mogford, Group Vice President, Renewables and Alternatives, BP p.l.c. at the World Renewable Energy Congress in Denver, Colorado on August 30, 2004. The second speech was given by Mary Shields, Regional President, BP Solar at Solar Power 2004 on October 20, 2004.

ments in research and design. Through partnerships with research institutions such as the University of Delaware, BP can remain at the forefront of technological innovation while creating competitive advantages for its solar program. In addition to its partnerships with research institutions, BP has established a long-term federal research partnership that has invested over \$30 million into research and development.<sup>15</sup> One of the Company's research areas is "Building Integrated P.V.," which it hopes will provide an alternative way for making solar power systems more of a mainstream consumer product.<sup>16</sup> Another area of recent research has focused on cost reduction through the use of back surface field and silicon nitride processes.<sup>17</sup>

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BP's growth in operations has involved consolidation and a shift in focus to major markets. BP has exited from the thin film market, which it does not see as a profitable business line in the near future.<sup>18</sup> The company has also increased production by opening a \$100 million plant in Spain, expanding its Frederick, Maryland plant, and launching new product lines in India, Australia, and the U.S.<sup>19</sup> BP Solar is currently the largest solar silicon wafer producer in North America and its current round of expansions will build on that status.<sup>20</sup> Combined with this aggressive growth, BP has streamlined operations across the board by reducing its number of distributors, product lines, employees, warehouses, and offices.<sup>21</sup>

BP has also focused on developing a broad marketing program to increase awareness and understanding of P.V. BP has developed innovative programs such as Solar Home Solutions in California, where BP has gained a 25 percent market share.<sup>22</sup> BP has also created the Solar Neighbors Programs, which grew out of a partnership between BP Solar and actor Edward Norton.<sup>23</sup> Whenever a participating celebrity purchases a Solar Home Solution through the Company's program, BP will donate a solar home system to a low-income family in Los Angeles, California.<sup>24</sup> Thus far, celebrities participating in this program include Danny DeVito, Rhea Perlman, Larry Hagman, Don Cheadle, and Daryl Hannah.<sup>25</sup>

BP's marketing research has shown that fifty percent of all homeowners interested in solar power decline to purchase a solar power system because of the poor aesthetics of available P.V. systems.<sup>26</sup> BP has addressed this issue by developing a new "SunLux" solar power system that has been designed with the homeowner's interests in mind.<sup>27</sup>

BP will continue its focus on sustainability in the future and sees many opportunities for growth in the solar market. A key element of BP's commitment to sustainability is the development of a free-standing P.V. market capable of providing the economic and social benefits promised, but not yet delivered, by renewable energy. However, those benefits will not be realized without greater cooperation between business, government, and consumers.

Based on its deep involvement in the growth of global P.V. markets, BP has identified several areas where cooperative action between interested parties can help lay a foundation for future growth. First, state and national governments must provide predictable, consistent, and long-term support for the P.V. market and provide incentives through pro-green policies. This includes the development of simple and uniform net metering and interconnection policies. It also requires the establishment of renewable energy credits and energy offset policies that provide energy customers with the full-value of the retail power they offset. Similarly, governments need to create performance-based incentives and appropriate assurance mechanisms.

Another essential element to creating a viable P.V. market is "Real-Time-Pricing," a strategy that will inform consumers of their true costs for power. These changes will help governments recognize that the benefits of a large-scale P.V. market extend beyond just environmental sustainability, to include energy security and employment opportunities as well. The P.V. industry needs support now to provide the foundation and stability for a free-standing P.V. market in the future. For its part, business must continue to focus on cost-reduction and technological development. These improvements can best be achieved by establishing effective partnerships with local industry able to service local markets.

## CONCLUSION

BP is committed to the long-term development of the solar industry as a feasible alternative to conventional energy sources and is determined to bring about the day when solar power achieves parity with other power sources. BP is acting on its commitment to address the realities of global climate change by building a strong, global market for solar energy. It is doing so by developing cutting-edge solar technologies, streamlining its business operations through consolidation and increased production, and addressing current limitations by improving awareness of consumers and governments. By creating a stable market for solar power in the developed world, BP hopes to lay the foundation for a sustainable energy future.

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**ENDNOTES: SOLAR POWER** *Continued from page 60*

<sup>1</sup> Mary Shields, Regional President of BP Solar, Address at the Solar Power 2004 Conference and Expo (Oct. 20, 2004) (transcript available from Todd Foley, BP Director for Business Development & External Affairs) at 3.

<sup>2</sup> John Mogford, Group Vice President, Renewables and Alternatives, BP p.l.c, Speech at the World Renewable Energy Congress (Aug. 30, 2004) (transcript available from Todd Foley, BP Director for Business Development & External Affairs) at 3.

<sup>3</sup> Mogford, *supra* note 2, at 3.

<sup>4</sup> Mogford, *supra* note 2, at 3.

<sup>5</sup> Mogford, *supra* note 2, at 3.

<sup>6</sup> Mogford, *supra* note 2, at 3.

<sup>7</sup> Mogford, *supra* note 2, at 1.

<sup>8</sup> Shields, *supra* note 1, at 4.

<sup>9</sup> Mogford, *supra* note 2, at 1.

<sup>10</sup> Mogford, *supra* note 2, at 2.

<sup>11</sup> Mogford, *supra* note 2, at 2.

<sup>12</sup> Mogford, *supra* note 2, at 2.

<sup>13</sup> Mogford, *supra* note 2, at 2.

<sup>14</sup> Mogford, *supra* note 2, at 4.

<sup>15</sup> Mogford, *supra* note 2, at 5.

<sup>16</sup> Mogford, *supra* note 2, at 4.

<sup>17</sup> Mogford, *supra* note 2, at 2.

<sup>18</sup> Shields, *supra* note 1, at 5.

<sup>19</sup> Mogford, *supra* note 2, at 5.

<sup>20</sup> Shields, *supra* note 1, at 5.

<sup>21</sup> Mogford, *supra* note 2, at 5.

<sup>22</sup> Mogford, *supra* note 2, at 4.

<sup>23</sup> Shields, *supra* note 1, at 5.

<sup>24</sup> Shields, *supra* note 1, at 5.