



# Can PV sustain its **exploding growth?**

Asks **Roger G. Little**, Chairman and Chief Executive Officer of Spire Corporation.

**S**olar PV has grown at greater than 40 percent per year for the past seven years. Dominated by crystalline silicon technology, it has voraciously consumed more than half of the polysilicon supply and now is using more than the entire semiconductor industry put together. With the market for PV now greater than 2.5GW per year and representing more than \$15 billion, demand for PV modules continues to outstrip the supply. But the question is, can the industry sustain this explosive growth?

Over the past few years, the growth of PV resulted in a shortage of polysilicon that has limited expansion throughout the supply chain. However, this shortfall of silicon is projected to be resolved by new capacity additions; in fact, capacity should more than double in the next three years and, based upon new capacity announcements, it is likely there will be a glut of silicon. This will cause price reductions and stimulation of the market.

This isn't the only issue, however. The next bottleneck will be the ability to produce manufacturing equipment at the rate demanded by industry growth. Resolution of the capital equipment bottleneck depends a great deal upon new entrants into the industry. Having the capital to advance manufacturing technology and produce multiple units of reliable equipment at the rate demanded by the industry is critical.

We have already seen the entrance of applied materials into PV. They are likely to be others. Current manufacturers are small by comparison. However while the financial markets have been very responsive to the module manufacturers, little attention has been paid to the equipment suppliers. This is about to change. IPO plans have been announced by some and more will come.

PV involves a broad manufacturing infrastructure. This infrastructure of equipment and material suppliers as well component suppliers and system integrators represent the next wave of investment opportunity in the solar energy industry.

## Sustaining PV growth

One way Spire facilitates growth is by making entry into the PV manufacturing business easier. Having a long history of providing PV manufacturing equipment, Spire has developed the unique ability to "put you in the PV business and keep you there". We provide new entrants to the business everything needed to be successful, quickly. This includes business planning assistance, facility layout, turnkey production lines, materials procurement, full training and assistance in meeting international quality certification requirements.

As the market expands, current manufacturers and new entrants will demand efficient, large-scale production. To meet the anticipated demand, Spire has partnered with KUKA robotics company to provide automation expertise. This partnership enables us to offer fully automated turnkey production lines that produce in excess of 100MW of PV per year. At these production levels, economies of scale have a significant impact on lowering PV production costs, thus fueling further growth.

Another way Spire is driving industry growth is by expanding its integration offerings. Vertical integration of module, cell and wafer production reduces the total cost of production. With over 38 years of innovation, Spire is recognized as having deep process knowledge that is critical in integration. We are currently providing quotes for integrated module, cell and wafer lines for production up to 250MW/year.

Additionally, Spire has maintained and is growing its solar systems business. Ultimately, wafer, cell and module production leads to installed systems. The knowledge gained as a systems provider has been invaluable for improving our proprietary PV production processes, which yield high quality products. By participating directly in the systems business we are a consumer of the product produced by our customers, adding additional value to our customer partnerships.

Finally, our R&D in the utility segment further contributes to the sustainability of PV growth. The utility market is currently small, about 30MW installed through 2006. But, Spire has developed a 1kW utility-scale module and associated production equipment that can be used to build renewable energy power plants. With our design we intend to cut the current installed system cost per watt in half, resulting in significant opportunity in the utility segment.

## Reaching critical mass

The PV market has reached the critical mass necessary for high growth. With announced polysilicon production capacity to more than double in the next three years, PV manufacturing equipment is the next challenge to industry growth. Spire is an established company with deep experience providing PV manufacturing equipment solutions. Based on our history, process knowledge, customer base, technology and experience throughout the value chain, Spire is uniquely positioned to add value to new entrants, as well as manufacturers planning to expand, as the market grows. ■



**Roger G. Little** founded Spire Corporation in 1969 as a small research and development company. Since then, he has guided the commercialization of Spire's technology and directed Spire's growth from a government research and development operation to a diversified solar energy company with installations in more than 150 facilities in 48 countries worldwide.