

## Answer These Questions Before Investing In A Potential Solyndra

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Much has been written about investigations by Congress, the Treasury and the FBI about the \$535 million loan guarantee the Department of Energy made to Solyndra before its recent bankruptcy. One untold story is how decision makers at the DOE appear to have failed to ask basic questions every investor should resolve before putting money into an early-stage company.

In the spirit of treating this situation as a timely “learning opportunity” rather than speculating further about the motivation of people involved, Fahrenheit Consulting Group offers a few diagnostic questions (and some initial thoughts about answers) for you to consider. The goal is to share a simple framework you can use the next time YOU need to make a major investment decision. However, before we do, let’s recap the investment landscape surrounding Solyndra.

### Investment Landscape

- Solyndra manufactures solar energy systems for retrofit or new construction on the roofs of commercial buildings.
- The company sells to value-added resellers, who in turn sell to building owners/managers and provide installation and maintenance services.
- Solyndra wanted money to build a large-scale factory, including all the equipment and infrastructure needed to increase its effective production capacity by 5X or more.
- The goal was to become the lowest cost provider in its target market, with a cost advantage derived from its solar energy capture system design which reduces the need for high-cost polysilicon materials.
- The potential market is huge and the value proposition is compelling -- “electricity for less than you would have to pay to buy it off the local utility grid.”
- However, competition in this market is intense, with many large and well-financed entrants in the U.S., Europe and China expanding rapidly.

### Questions to Inform Your Investment Decisions

In the following sections, keep a cumulative score in which each “Yes” answer earns +1, “Maybe” earns 0, and “No” earns -1. High-potential investments will have positive scores; negative scores mean trouble ahead; use your management judgment to weigh the individual scores appropriately, and to reach an overall decision.

## How proven is the company's Competitive Advantage?

- ***Is manufacturing cost and price competitive with the market?*** No. Solyndra's production cost per unit (~\$4/watt) was above its product selling price (~\$3.25/watt), which in turn was far above the end-user installed cost (~\$1.75) needed to compete with the readily available substitute (electricity bought from the local electric utility, with little or no up-front investment required). Solyndra's production costs suffered from high variable costs, low yields, small production scale and a high-cost production location. From experience, until variable cost and yield problems are solved at small scale, working on a massive production scale-up will turn small-scale losses into large-scale losses. (-1)
- ***Does the company's production system have a reasonable chance of achieving cost parity or cost advantage against large-scale commodity competitors?*** Unlikely. Even if the company could solve its process yield problems, the inherent complexity of its system design may make it more costly to produce than simple flat panels. (-1)
- ***Is there a credible theory for gaining and sustaining a competitive advantage?*** No. Compared with its solar energy system competitors, Solyndra's cylindrical system configuration was supposed to reduce the need for high-cost polysilicon photoelectric materials. However, polysilicon prices plunged more than 80% from more than \$400 per kilogram in 2008 to slightly more than \$50 per kilogram in September 2009, essentially erasing one of the company's key potential cost advantages over solar peers. Despite the dramatically lower input costs, Solyndra's unit production costs still needed to fall by ~4x to approach those being reported at the time by US rival First Solar. (-1)
- ***Does the company's product pass a basic sanity check against the laws of physics?*** No. Solyndra's claim that the cylindrical product design would be more efficient than competing systems does not hold up mathematically. The solar energy that hits a square meter of the earth's surface each day defines the maximum recoverable electric potential, so a cylindrical design will not necessarily extract more solar energy than a well-designed flat panel, but it will certainly be more complex to manufacture than a flat panel, and therefore probably cost more. (-1)
- ***Has the company proven that its system works reliably for at least a year in actual end use with more than one customer, regardless of cost?*** Yes. Solyndra installed commercial systems in 2008 and had an installed base of customers. However, it is often valuable to interview early adopters to learn about customers' actual experience and to validate important claims (e.g., Solyndra's system was lighter and potentially easier and cheaper to install). (+1)

Competitive Advantage Score (-3): Solyndra's Competitive Advantage was unproven and gaining Competitive Advantage in the near term is unlikely.

## How proven is the Growth Engine (can a venture grow sales rapidly and cost-effectively while sustaining ROIs above the cost of capital)?

- ***Does forecasted demand required to deliver a reasonable return on the proposed investment pass the "common sense" test?*** Unlikely. It depends on whether the company can deliver systems at installed prices that are low enough to give end users an economic incentive to buy and maintain them (~\$1.75/watt) at production costs that are far enough below that point to enable the company to generate attractive ROIs. One question that needs to be answered is -- "What share of the available market is implied by required demand?" For example, Fahrenheit recently helped a client decide to pass on a major alternative energy investment after discovering that the sellers' demand forecast implied an unrealistic >15% share of the available commercial electricity market by 2015. (-1)
  - ***Is the product competitive without subsidies?*** The answer appears to be NO. A dependence on federal and/or state subsidies is a dangerous assumption, particularly in light of today's economic and political environment. (-1)
  - ***Will it be reasonably easy and cost-effective for this company to ramp up sales of its products or services each year?*** Probably. While it would take 50 years or more to convert the entire installed base of buildings to solar power, there are so many prospects that it should be possible to create a big business using a combination of web, value-added resellers, and direct selling, provided that the company can meet the unit cost targets needed to make its system economically attractive to building owners, and reasonably easy to install, maintain, and use. However, Solyndra currently uses only value-added resellers and still needs to develop web and direct selling capabilities. (0)
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Growth Engine Score (-2): Unfortunately, the Growth Engine can't be proven until a Competitive Advantage is demonstrated. Many other formidable competitors have emerged, are producing at large scale, and are growing rapidly, so the company is behind and it may be impossible to catch up.

### Does the company have a proven management team?

- **Does the management team operate with high integrity to find and respond quickly and sensibly to field intelligence about market opportunities and problems?** Apparently. Solyndra had an experienced management team that attracted over \$1.0 billion in private and institutional financing over the past 4 years. However, the company's production processes clearly were not ready for scale-up, so the fact that they were seeking major new financing suggests overconfidence or haste or both. In these situations, potential investors should observe the organizational behaviors carefully, watching for signs of "management by edict" leading to suppression of unpleasant truths. (-0)
- **Has the management team met its past projections?** Unclear. In July 2009 a press release said that Solyndra had a "contractual backlog of more than \$2.0 billion" in orders. This figure was not based on firm orders, but primarily on "framework agreements" allowing customers to walk away or renegotiate these agreements. Meanwhile, company sales in 2010 totaled just 65 megawatts. Based on Fahrenheit's experience, it is essential to assess management's track record meeting its commitments. Companies tend to fail if they exhibit a pattern of under performing versus stated expectations. (-0)
- **Does the management team seem focused primarily on overcoming commercial hurdles and achieving commercial viability?** Maybe not. In December 2009, Solyndra made its initial IPO filing with Goldman Sachs and Morgan Stanley as its lead underwriters. According to the WSJ (9/16/11) one investor with knowledge of the Company said, "There was a perceived halo around the (DOE) loan. If we get the loan, then we can definitely go public and cash out". In addition, some critics have charged that the DOE loan represented a one-way-bet with tax payers' money to build a brand new factory to gain scale economies and lower production costs. In addition, take a look at the other investors to see if their motives are in line with yours. Regardless of an investment group's track record and pedigree, later stage investors should always be suspicious of insiders "putting lipstick on a pig" before they exit. High profile marketing campaigns aimed at company awareness rather than product sales, famous board members with no industry or market expertise and extremely secretive behavior about product are potential warning signs to later stage investors.(-1)
- **Can we bring significant competitive advantage to this situation?** Maybe. On one hand, the DOE's involvement enhanced Solyndra's competitive credibility, at least as long as the Company was moving forward on a clear path toward success. However, the DOE had little incremental knowledge about the commercial aspects of the solar energy business. (0)

Management Team Score (-1): The management team's apparent failure to resolve its production process problems before seeking out significant new capital raises serious red flags.

### Interpreting the Results

When we add up all the pluses and minuses above, we get an aggregate score of (-6), against a possible maximum of (+12). However, the raw score does not mean much before applying judgment, because the various answers deserve different weights depending on the situation.

In any case, this score raises serious questions about the DOE's assessment of the commercial risks associated with Solyndra. Each negative score represents a red flag. How many of these are you willing to overlook? Most deals have one or more. You might overlook one or more if you have strong faith in the integrity of management. However, you also need to have strong faith in the company's Competitive Advantage and its Growth Engine before overlooking multiple red flags. Since the management team's integrity is uncertain here, one should not invest in this situation before, at a bare minimum, confirming that the management team and its systems are working well and with high integrity. Even then, there may be too many negatives for the team to overcome. Keep in mind, *when a good management team meets a bad business, the business usually wins.*

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## Making the Decision

If the aggregate score is below (+5), just say no to a major investment decision. If you aren't fairly certain that it not only CAN work, but that it WILL work, say NO. Most ventures are sunk by unpleasant surprises that pop up AFTER launch, so ventures that don't start off with lots of room for things to go wrong, don't survive.

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- Assessing the nature of customer demand for a technology based venture-backed start-up
- Developing a go-to-market strategy for a leading manufacturing company
- Identifying market growth opportunities for a supply chain integration software and sourcing company
- Assessing potential market demand for an alternative energy company
- Identifying market growth opportunities for a boutique professional services firm

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