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NREL Industry Growth Forums—Lessons Learned

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Foreword

I have been associated with the development and commercialization of new technology for the last 24 years. For much of that time, I have been exposed to, or led, decision making regarding investments for developing or acquiring new technology or technology-based companies. Through this exposure, I have gained a perspective that allows me to draw some conclusions and make some generalizations about small companies seeking to commercialize new technology, as well as the associated investors that finance these companies. The following is a short list:

Investors want:

- To invest in businesses that will achieve their desired rate of return; they do not invest in technology
- Management that has experience in starting or running a business—they do not want management without business experience
- A business plan that defines the market need that the company's product (technology) will meet, who the customers are, the size of the market, the profitability expected in that market, a competitor analysis, a financing plan, a market entry strategy, a manufacturing and distribution plan, an overall management approach, and staffing plan.
- Confidence that all aspects of running the business have been considered and will be managed.

Unfortunately, small business managers usually don't meet the needs and desires of investors. All too often they don't have a viable business plan (sometimes no business plan at all). They often do not staff themselves with managers having experience in startups and operational aspects of running a business. And, they generally, have not evolved their thinking beyond research and development and philosophical justifications as to why everyone should want their technology. They need to address market considerations much earlier in the technology commercialization process, understanding what characteristics their technology must have in order to be the *right technology* to meet market needs and wants. They need to identify markets large enough to meet their profitability objectives (*right market size*) and they need to identify market entry approaches that will give a low enough cost of commercialization to ensure profitability (*right cost of commercialization*). They also need to have a business approach to ensure that they can deal with the inevitable uncertainty in their plans and markets, and analysis that establishes a reasonable degree of certainty (*right market certainty*).

NREL's experience with more than 100 firms in eleven Industry Growth Forums (IGFs) and documented in this Lessons Learned document, reinforces my observations and experience and validates the need for mechanisms to educate and assist renewable energy and energy efficiency entrepreneurs and small business managers in overcoming these common pitfalls. The IGFs and similar mechanisms are essential tools for increasing the probability of small business success and thereby accelerating deployment of renewable energy and energy efficiency technologies.

This Lessons Learned document also provides an essential message to all researchers with respect the need to respond to market drivers and understand market needs throughout the technology development and commercialization process in order achieve the ultimate goal of deploying new technology into the marketplace.

Jon Pietruszkiewicz
Associate Director, National Renewable Energy Laboratory

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NREL Industry Growth Forums—Lessons Learned

Summary

NREL's Industry Growth Forum Program brings small, or start-up companies in the renewable energy and energy efficiency industries[1] together with venture capitalists and senior business executives to catalyze learning about business growth strategies as well as facilitating new linkages and possible partnerships. The purpose of this report is to consolidate lessons learned from eleven Industry Growth Forums held from 1995 to 1998.

The forums focus on the needs of small renewable energy companies. They provide an opportunity for these companies to improve their business "cases"—core business concepts and overall strategies. The program allows the managers of these small companies to explore financing options, and get expert insight and advice into resolving the business-related development issues they face. The forums also allow the financial community to assess potential investments in renewables companies and to start a dialogue within the renewables industry. In addition, the forums provide a good opportunity for NREL and DOE to learn where renewable energy companies are in their "business growth"[2] development process, as well as what is needed to grow healthy companies that can successfully bring technology into the marketplace.

The forums have facilitated the formation of at least seventeen strategic partnerships. They have also helped to identify and put focus on a number of "business growth" weaknesses that appear to be common to many start-up companies. Key findings include:

- Many participating renewable energy firms are still in the process of making the transition from a technology-driven R&D or project-based company to a commercial market-driven manufacturing (or processing) enterprise. This transition is very important, as it is virtually always a necessary prerequisite to attracting equity financing.
- The most pronounced business growth weaknesses evidenced in the forums are in the marketing and market development areas. In particular, these firms typically wait far too long—well into the technology development process, and beyond—before paying serious attention to marketing and marketing strategies as well as market and customer development issues.
- While recognizing that equity financing issues may not currently be the most pressing deterrent to growth for many renewable energy companies, financial issues are—and will remain—daunting even as the more fundamental "business growth" issues are addressed.
- The forums provide a key—previously missing—piece of the "facilitating commercialization" puzzle. In particular, the forums have given many of the companies their first live experience with a cadre of venture investors, and the forums have created what is essentially a financial marketplace for renewables.

The forums have also produced insights that may assist in improving the number and rate of commercial successes, including what NREL and DOE might do better to manage and maximize return on technology development investment.

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[1] For convenience we will often just say renewable energy companies, but the Industry Growth Forum Program works with many energy efficiency companies as well.

[2] For lack of a better descriptor we will use the term "business growth" to describe the process of growing the small business into a commercial enterprise capable of sustaining itself and thriving over time.

To complement the forums in helping to address the business growth needs of renewable energy companies, we have also developed a small database and Web site of existing resources (http://www.nrel.gov/technologytransfer/resourceguide.html). The Web site is “hot-linked” to some 29 other sites.

Introduction

NREL’s Industry Growth Forums (IGFs) catalyze necessary linkages between new small businesses or start-up companies in the renewable energy and energy efficiency industries and larger established businesses and financial organizations. The forums do this by bringing the managers of small renewable energy companies together with venture capitalists and senior business executives to learn about business growth strategies and to investigate possible partnerships. Eleven forums were held between mid-1995 and the end of 1998. The forums provide a venue for participating companies to present and receive feedback on their summary business plans to a panel of venture capitalists (VCs) and other senior business executives that have a potential interest in the businesses and the corresponding technologies being discussed. The forums have created what might be called a marketplace for financing and collaborating with companies that are commercializing renewable energy, energy efficiency, and related technologies.

The most distinguishing characteristic of the IGFs, relative to more traditional venture forums, is the robust interaction and feedback process with the panel. In a typical venture forum, the industry presenter may get only 10-12 minutes to make a business case in the form of a summary business plan, frequently receiving little feedback. The IGF provides roughly an hour of formal interaction and considerable opportunity for additional informal interactions. The forums, therefore, provide participating small renewable energy companies a more meaningful opportunity to get constructive feedback from venture financiers and senior business managers on how to grow their businesses. Details of the process, a summary of the findings, some comments from the panelists, and other insights that have emerged from the forums are presented here.

This report is organized into six sections. The first section presents the forum objectives. The second provides a profile of the companies that have presented at the forum. The third section identifies the areas of the business plan that the panelists focus on. The fourth section addresses in detail the issues most frequently discussed with respect to the business plans: business model, management, product, markets, and financing. For each of these issue areas, the main questions that the panelists like to see addressed are listed, followed by a discussion of common comments and issues raised by panelists.

The fifth section provides a brief summary of the results from a survey sent to the presenting companies in Forums One through Ten. The survey provides general information on what was helpful and not helpful in the forums, but does not address the specific business growth issues[3] that arose in the forums as part of the dialogue process. The sixth section draws some conclusions regarding the status of the renewable energy and energy efficiency companies from a business perspective, based on the feedback obtained from these forums.

[3] These are considered business sensitive.

Section One—Forum Objectives

The purpose of the Industry Growth Forums is to provide a mechanism to assist new small renewable energy and energy efficiency businesses to grow into successful commercial enterprises. Participating new business managers receive the following:

- Broad-based business coaching, advice, and insights
- An opportunity to acquire capital or other strategic resources
- Dialogue with potential strategic partners and investors, and access to a wider contact network
- Practice in making their business case in front of a live audience of investors.

Participating panelists receive the following:

- Information on the status of renewable energy and energy efficiency technologies
- An opportunity to invest in, and establish a working relationship with renewable energy and energy efficiency industry members
- An opportunity to follow-up and enter into business relationships with presenters
- An opportunity to mentor small-business entrepreneurs, and work with other venture capitalists and equity investors.

DOE, NREL, and co-sponsoring partners have an opportunity to develop the following:

- A constituency of more effective industry members
- A better understanding of business and financial needs and requirements
- Reality checks on the commercialization status of specific technologies
- Accelerated commercialization of renewables.

Achieving these outcomes, especially those for the presenters and the panelists, is crucial because the success of the presenting companies is ultimately tied to their ability to establish effective working relationships with the equity financing community.

The venture capitalists (VCs) are "quick studies" in terms of identifying strengths and weaknesses of businesses and bringing a high level of credibility to delivering their messages. The VCs also provide an introduction to the “due diligence process”—proving of assertions and assumptions of the business plan—that the presenters will experience with increasing frequency as they grow their businesses and work with a wide range of strategic partners. Moreover, the forums offer an opportunity for the VCs to develop working relationships with other VCs having similar investment interests (i.e., in sustainable technology), and to share risks in new ventures, while starting to mentor the presenting companies.

The other panelists, such as senior executives from utilities and large businesses, bring much needed additional perspectives to the presenters, including those of the user community. They are also a potential source of partnerships for the presenting companies. Their willingness to enter into partnerships with the presenting companies also provides credibility with the investor community.

Section Two—Typical Profile of Companies Presenting at the Forums

While renewable energy and energy efficiency industries include large companies, there are many more "small" companies. The forums are focused on facilitating the growth of these small businesses. The following summarizes additional characteristics of these participating organizations:

- Within this group of "small" companies presenting, there is still a spectrum of sizes and stages of development represented. The median stage of development is beyond the seed stage and towards the end of the start-up phase,[4] and at the beginning of the growth stage for new companies.
- Many are quite small with only a few employees and revenues in the one-million-dollar range. (A few only have revenues from R&D grants, while others have many millions of dollars in revenue beyond the R&D grants.)
- Many have been in business for a number of years (a few more than 15 years), and are exploring how to take the next step in growth (e.g., from an R&D company to a manufacturing or supplier company).
- Many have had considerable R&D support from DOE, Small Business Innovation Research (SBIR), and other sources. Some still have this kind of support, and perhaps because of that, often do not feel urgency to move into the manufacturing or production stage.
- Many have had considerable founders' (and family) seed investment in addition to that from government contracts and grants. Although they frequently have had at least a small level of private investment, they have typically not investigated private-placement opportunities to any significant extent.
- Many are slowed in their development by concerns about "giving up too much equity or too much control," to obtain financing, but are unsure of what to do about it.
- Some are not aware that they need financing to take the next step in growth.
- Some have strong management teams and boards of directors, but most do not.
- Although inventors are often involved with these companies and they often have significant influence, they do not necessarily dominate the companies.
- Frequently, however, these companies are dominated by technologists, some of whom are "in love with their technology;" and correspondingly, many want to remain the "boss."
- Many do not have a comprehensive business plan.
- The most glaring weakness of their business plans, when they exist, is often the marketing plan and strategy, along with the assessment of the competition (often they feel that they don't have competition or have too limited a perspective on who the competition is).
- Some are moving into international markets for renewables which, in general, are currently much more robust than domestic markets.
- Some would be well served by considering strategic partnerships and strategic licensing, but are unsure of what to do about it; the bulk of these companies have not seriously looked at strategic partnerships or licensing as an alternative for financing.

[4] They are in general much more advanced than new start-ups but they may want, or need, to address important steps in their development process that have not been adequately addressed.

Section Three—Venture Capital Panelist Perspectives

Venture capitalists typically have a common set of perspectives. Although they frequently do not find companies that meet their ideal characteristics, venture capitalists seek companies that

- Are poised for rapid growth
- Have a large market potential for the product—frequently stated as at least $100 million per year
- Have breakthrough technologies that the company will manufacture and that will dominate the market (especially for smaller markets)
- Have great people—especially a strong management team
- Have an exit strategy with an acceptable rate of return (typically returns of 35%–40% annually[5] for a five-year span, at which point the VC likes to exit).

A few VC's have also noted that they like to see a product that can be sold for five times what it costs to make.

Venture capitalists are also **not** typically interested in

- Companies with an R&D focus
- Companies with a project focus
- Service businesses such as systems installers. (Some obvious notable exceptions like software exist.)

These types of companies are less attractive to VC firms because their returns on investment are typically too low, and because they generally do not offer an adequate exit strategy.[6] More and more venture capitalists work together to perform due diligence and jointly fund projects to mitigate risks. More details, including references, on how VC firms look at investment opportunities are provided in the next section and in Appendix B.

[5] At a 40% return on investment (ROI), an investment's value will increase 5.4 times over a five-year period.

[6] This is not to imply that such businesses are not viable enterprises; they often are, and the risk in starting up one of these businesses can be relatively much lower than for businesses producing a product. There are different types of investors that focus on these kinds of enterprises.

Section Four—Discussions of Industry Business Plans

Companies participating in the Industry Growth Forums are asked to describe what they would like to get out of the forum and then present a summary of their business plan[7] (in nonproprietary terms). The business plan is crucial to the overall commercialization effort, and as one incubator executive described it, "the only real commercialization plan is a good business plan."[8] In fact, the importance of having a strong business case that encompasses a credible marketing plan and strategy to penetrate the market, and thus commercialize the technology, is crucial to all the issues discussed here.[9] The elements of the business plan that the majority of forum dialogue focuses on are

- Business model
- Product
- Management personnel
- Markets and competition
- Financing.

Each of these elements—which are also typical discussion topics in venture conferences—are discussed below. It should be noted that a major difference between the forums and many venture conferences is that the forums provide more time for each presenter and they provide for extensive interaction between the presenters and the panel.

Business Model—*Key Questions:*
What is the business concept and value proposition (e.g., faster, cheaper, otherwise better)?
How will the business generate sustained superior profits? That is, what will allow it an "unfair" advantage in the market place in the long run?

Business Model—*Discussion:*
One frequent panelist comment is that the presenters need to better define their business models and clarify their basic business concepts and value propositions. The panelists often recommend that a company better understand the factors that drive the business. In some cases panelists observe that the business is not a good investment because it is technology driven rather than market driven. Investors want to invest in businesses, not technologies.

Panelists are generally eager to know whether businesses are really R&D companies or manufacturing companies. They often comment that they will not invest in R&D companies because such firms are unlikely to generate a sufficient return. They also frequently suggest that managers of technology-focused businesses need to decide whether their goal is R&D or manufacturing. Several panelists have noted that the technology development focus of NREL and DOE may lead to a lack of focus on business and market issues within these companies and within the presentations.[10] Panelists also frequently want to know what the ownership of a company is, because if it is difficult for investors to influence business decisions, it will also usually be harder for them to make an adequate return on their investment.

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[7] A sound business plan effectively addresses a wide number of issues including planning for the enterprise, overall strategy, management, marketing, market development (and the competition), intellectual property, valuation, financing (debt and equity), exit strategies for investors, and legal issues.
[8] Jerry Donahue, President, Boulder Technology Incubator. Personal communication.
[9] There are a large number of excellent "business plan" resources that are widely available to help the entrepreneur. (See for example, "How to Write a Great Business Plan." (July-August 1997). *Harvard Business Review*. pp. 98–108).
[10] We emphasize to the presenters that the focus of their presentation should be on business rather than technical issues, and that their audience is the panel not NREL/DOE—a recommendation that is often not followed.

Product—*Key Questions:*
What is the product, and how is the product differentiated in the market place?
How will the intellectual property associated with the product be protected (such as by patents or trade secrets) and how will the owners and investors derive value from the business?
What are the economic and other customer benefits of the product?

Product—*Discussion:*
Panelists frequently ask for the equivalent of a tabular comparison of the company's product with that of the competition, together with key economic and other product benefits. Panelists frequently comment that economic and other customer benefits should be the focus, rather than, for instance, energy savings (a common R&D goal).

A common—and detrimental—pitfall for many presenters is to focus on the technology rather than the customer benefits of their product in their presentation. Panelists typically become impatient when this occurs. At the level of discussion within the forums (and in most early discussions), venture capitalists usually suspend judgement—giving the presenter the benefit of the doubt—on the technical adequacy of the product. Of course, if venture capitalists become seriously interested in a business concept, they will then apply "due diligence" to verify technical adequacy as well as market projections and a host of other assertions.

Management Personnel—*Key Questions*:
(Management, Management, Management—the top requirement and mantra of panelists)

- What is the relevant experience of the management team in business start-ups, and in the markets served?
- Will they keep their eye on the moneymaking aspect? (business focus versus technology focus)

Management Personnel—*Discussion:*
Venture capitalists invest in people first. Further, given the choice of lending to or investing in a business that has a good management team with a mediocre technology versus one that has a superb technology with a mediocre management team, investors (and lenders) will be more attracted to the good business team most every time. Venture capitalists indicate that they like to see successful management experience in start-ups and feel that good business management people will find a way to make the business successful. Moreover, in any venture, the investors want to go with proven successful people; they don't want the entrepreneur to be doing on the job training on their nickel.[11]

To this end, panelists will frequently recommend that the industry presenter round out the management team with strong expertise in financial management and marketing, and/or recruit a president who can raise money. If the presenting company is not comfortable with this,[12] the interest of investors often dissipates quickly.

Another point is that both VC firms and "angels" (discussed below) indicate they may want to play a significant role in the management team, sometimes as a board member and sometimes in other ways. For instance, venture capitalists can also and often like to, provide valuable mentoring to their partners.

[11] Trust in the management team is also a key element that typically has not been addressed in the forums.
[12] Sometimes the principals are too comfortable in being their own boss regardless of the impact on the growth prospects for the company.

Finally, these investors look for management commitment, in the form of ownership of the company by the principals; some even like to see ownership by all employees in the business. Investors look negatively at safety nets for the entrepreneurs such as options to return to a national laboratory if the venture does not work out.

Markets, Marketing, and Competition—*Key Questions:*

- Who are the key customers? And from where does market pull come?
- Are the markets robust and what are industry trends?
- How are these markets going to be reached?
- What is the competition and how will it be beat?

Markets, Marketing, and Competition—*Discussion:*

A common issue for many of the companies that present at the growth forums is that their business plans contain a weak market development and marketing plan and strategy. Panelists frequently note that the markets are not well defined or well understood by the presenters or that the presenters need to look at different markets.

Panelists frequently probe for strong alignment of the presenting company's product with market needs. They want to know who in the marketplace wants this technology and what specific needs does it fill? To this end, the panelists have frequently discussed the need for renewable energy companies to diligently seek out and develop profitable niches where there is strong alignment with the needs of the market or special situations (e.g. "green power" markets[13] and distributed generation opportunities), as a market entry strategy.

Panelists like to see lots of key and other customers identified—but many presenters do not address this fundamental business need. Panelists also frequently ask for more details on the size of the markets, the approach to reaching those customers, and the value proposition for each niche.

Investors also want to know about competition, and that the presenting company has a good understanding of the competition, as well as a plan for dealing with it. For a company to say that they have no competition, as some do, is considered a "fatal flaw" to venture capitalists.[14] Many companies see (usually incorrectly) their competition as being only other renewable energy companies rather than the "conventional" energy industry as well. Moreover, it is often not recognized by the presenters that even within well-defined niches, competition can potentially be fierce from newly emerging competitors (e.g., from fuel cells and micro-turbines in the electric sector).

The need for strong marketing strategies and plans for renewable energy companies, is highlighted by the conclusion of a number of panelists that "the jury is still out on <u>when</u> renewables can create significant markets." Also, for example, relative to the electricity sector, a number of panelists have noted that numerous presentations seem to implicitly assume that "a premium electricity market is boundless, thus ignoring market realities."[15] Finally, the weakness of the "market" elements in many of these presentations may be partially due to the company's overreliance on early historic DOE renewable energy program goals for technology

[13] These markets are driven by issues in addition to price.

[14] Alternately, "If competition does indeed not presently exist—it will shortly if a good market exists" and this needs to be addressed. If nothing else, "customer apathy is competition."

[15] Bulk energy markets in the United States frequently inexpensive energy available to them where renewables are generally not economically competitive.

development. These early goals assumed that large-scale commercialization of renewable energy would occur as the cost of conventional energy rose sharply—an expectation, which obviously is no longer realistic for the foreseeable future.

The panelists have not commented much about international markets, although there is clear recognition that there are benefits as well as additional problems and uncertainties with these markets.[16]

Financing—*Key Questions:*
- How much is needed?
- How will it be used?
- How will it be repaid? (exit strategy)
- Are financial projections such as markets, sales, net profit, and return on investment internally consistent?

Financing—*Discussion:*
New businesses are commonly undercapitalized and their assets are frequently both quite limited and illiquid. This creates a major hurdle for a company poised for rapid growth, even if all the other pieces of a good business plan are in place. An under-capitalized company will not have sufficient collateral or cash flow to either attract or service a significant amount of debt, so it will be forced to look for equity financing to support the anticipated rapid growth.[17]

Securing equity financing for a new business is arguably the most daunting task that the entrepreneur will face. And, it is not necessarily because there is a lack of money.[18] All of the necessary pieces for business growth must be in place and fit together nicely with minimal risk, for a new business to be an attractive investment within the mind frame of the equity investor. Minimal risk to a financier is the risk that still exists with a "rock-solid/bullet-proof" business plan with an acceptable rate of return. Even if it achieves all these criteria, a small company must still find prospective investors with whom the investment size, technology preferences, and overall management philosophy are compatible. Thus, both business substance and fit are quite important. On top of all that, the most important element of fit is trust. Without trust between the management and the investor, getting financing is a "non-starter."

The presenting companies are frequently vague about the amount of funding needed. Investors have noted that presenters often don't provide a realistic estimate of what is actually needed. Also, a point frequently expressed in the forums is that although it is not good to get too much funding, too early, it can also be quite problematic to ask for too little. Hence, panelists have advised: "ask for what you really need to get to some particular stage of development, and have a sound rationale for it."

Investors also want to know how the money will be used in the context of the over-all business strategy. For example, if a company wants a capital infusion to expand manufacturing volume so as to reduce per unit costs, the managers must also show how market demand will be

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[16] For example, an opportunity is presented by the fact that international markets often lack existing, large infrastructure support systems such as transmission and gas lines for conventional technologies, which in turn makes renewables more competitive. Similarly international markets may present challenges such as lack of distribution infrastructure, inability of end-users to pay, or inadequate financing mechanisms.

[17] It should be recognized that there are a number of sources of equity and debt financing depending on the stage of business development and the panelists frequently call attention to this and make appropriate recommendations; see Appendix A for a brief discussion of these sources.

[18] See, for example, "The New Way to Start UP in Silicon Valley: Where Too Much Money Is Chasing Too Few Deals," *Fortune*. March 2, 1998, p. 169.

increased. This is often not shown and reflects a lack of thoroughness of the marketing element of the business plan as discussed above.

Investors need to know how their investment will be repaid and how they will profit. The timing and approach to the exit strategy is key to getting financing. Here again, the importance of a good business plan (with a strong marketing plan and marketing strategy that support strong anticipated cash flows and business valuation[19]) cannot be overemphasized.[20] Investor repayment is also key to supporting estimates of cash flow, generally referred to as "the lifeblood of a business," and is also very important in the valuation in the business (discussed in Appendix B).

The investor's perspective on cash-flow projections from government grants and R&D contracts is also vital and possibly surprising. While government support can be helpful in the overall business growth strategy and even crucial in the start-up phase of the business, equity financiers do not necessarily look at it positively beyond the short term. In the long term, government funding is often seen as a liability (i.e., as a dependency on subsidies) that will negatively affect cash flow if the subsidy goes away[21]. It may also indicate that the renewable company is focused on technology and R&D or projects rather than on developing a profitable enterprise based on a product serving a market need or want.

The forums rely heavily upon venture capitalists as panel members because of their broad business and market perspectives and the expertise that they have to share in helping the presenting companies. Traditional large venture-capital firms may not, however, be the most likely fit for investment in the companies that present. This is because many typical venture capitalists focus on larger funding opportunities and later stage (and less risky) deals than the presenting companies typically represent. Nevertheless, many of the venture capitalists serving on the Forum's panel do focus on smaller and earlier-stage deals, so are similar to "angel"[22] financiers in this respect. Many of these forum panelists also have contact with individual angels and networks of angels.

[19] Valuation, although not specifically addressed in the forums, is ultimately a very important issue relative to the amount of equity given up for a given amount of investment; see Appendix B for a short discussion and references on this topic.
[20] This is true with either equity or debt financing.
[21] There are exceptions, of course, such as if the government funding supports manufacturing improvements.
[22] "Angel" financing is possibly the most accessible means of financing for many renewable energy companies with characteristics resembling those of IGF participants. Business angels are financiers that are willing to invest in a small company earlier than traditional venture capitalists, because they have a more focused interest in specific technology or type of company. The characteristics and requirements of "angels" are discussed in more detail in Appendix C.

Section Five—Industry Presenter Surveys Summary

More than 100 technology companies presented in the first eleven Industry Growth Forums. In response to a formal survey of those companies, virtually all of the presenters (~93%) said that they found the forums to be quite useful, both to themselves and to the renewable energy community at large. The surveys also elicited considerable encouragement from the industry participants to "keep it up." The benefits that the presenters particularly noted included:

- Helping them to better define where they are in the business development cycle
- Helping them refine their "business story" to improve the effectiveness of subsequent business development activities.

In addition, the presenters found that they benefited from:

- Getting a better picture and understanding of other technologies
- Insightful business-oriented discussions and recommendations in response to their presentations.

On the whole, the survey responses indicate that the IGFs have been quite successful in bringing start-up companies together with venture capitalists and business community leaders in an effective venue. A number of people have suggested that this type of forum might work well for other sets of stakeholders such as project developers and investors or technology manufacturers and local distributors.

Forum participants were not inclined to respond to the survey about formal relationships and deals that resulted from the forums. Also, such developments tend to evolve over time in a way that does not fit survey schedules. Many firms have, however, shared information "off the record" about deals that were initiated as a result of a forum. The composite picture that follows—presented so as not to violate any confidences—was gleaned from that information.

- At least 17 operational partnerships have formed to date. Many of these partnerships are between presenting companies (mainly sharing technology), or between presenting companies and business community companies on the panel other than venture capitalists (numerous projects and one manufacturing partnership).
- Several business plans have been rewritten and presented again at subsequent forums; one of the industry participants has since successfully secured the financing he sought.
- Two companies have been bought.
- One company first developed a partnership with a large corporation (represented by a panelist at the forum) and subsequently went public.
- One venture capitalist panelist recently said that he knew of at least six companies that decided not to pursue what appeared to be good opportunities for financing because of the fear of giving up too much control of their companies.
- An ongoing stream of partnership and investment discussions continues.

Several participants told us informally that the forums were one of the best things NREL has done for the industry. On the flip side, about six presenters said that they felt quite "roughed up" by the directness of the panel. All but two of these, however, said that they still felt that the experience was valuable and would like to present again.

Section Six—Conclusions

After eleven Industry Growth Forums, we have drawn several general conclusions about the business "status" of participating renewable energy companies and about the opportunities uncovered by the IGFs. These conclusions are based on the themes discussed above, which came directly from the forums and the unpublished proceedings of the forums, as well as on the surveys. Recurrent themes from the first eleven forums provided us a unique snapshot of more than 100 businesses. In particular, the forums pointed out a number of weaknesses in the growth of these businesses. These weaknesses present opportunities for enhancing the commercialization and transfer of renewable energy technologies to the marketplace while nurturing the investment already expended by DOE. More specifically

1. **Many renewable energy firms are still in the process of making the transition from a technology-driven R&D or project-based company to a market-driven manufacturing (or processing) enterprise**. Most of the companies are viewed by venture capitalists as being too early in their stage of development for venture financing, even though most have been in business for a number of years (some in excess of 10 years). This is primarily because these companies have not adequately nurtured the business formation and growth foundations of their enterprises.[23] These foundations include a number of elements besides financing such as management team development, marketing, and planning. Addressing these other foundation elements is a prerequisite to getting financing, even if financing is otherwise available.

   Generally accepted reasons for failure of new businesses—primarily nontechnical—highlight the opportunity that addressing business formation and growth foundations can create. Most experts cite shortcomings in business management capabilities (including marketing skills) as the biggest reason (60% by some estimates) that new businesses fail. Financial reasons are seen as the second leading cause and technical reasons third.

2. **The most pronounced business growth weaknesses as evidenced in the forums are in the marketing and market development areas.** In particular, firms typically wait far too long—well into the technology development process—before paying serious attention to marketing and market development issues. Many presenters who are current or past participants in the DOE programs (which appropriately emphasize technology development) have tended to focus on continued cost and performance improvements that address long-term cost goals along with the corresponding long-term markets. These are in turn viewed as too generic, far off, and unrealistic by many of the panelists. Further, they do not set an agenda for the market-driven issues that start-up companies need to address—and early on—to succeed.

   In particular, there needs to be much more creative attention to matching their technologies to specific market needs, and the development of near term, entry markets, and customers, as well as dealing with competing technologies. Such near-term markets include those niches that provide additional value beyond what is traditionally seen in energy markets driven primarily by commodity prices; e.g. "green markets" and distributed generation. Without attention to the development of near-term markets and the drivers for these markets, the viability of many renewable energy businesses is at risk, even though they may have good

[23] Indeed, more than one panelist has noted that DOE's focus on technology, and the sustained funding offered for technology issues, probably abets this lack of focus on "business/market" issues.

technology.[24] This is also consistent with the fact that few businesses based on new technologies successfully enter the market in a frontal assault on major existing markets.[25] Such businesses are successful usually if they first define and attack niche, (often-low-margin) markets left unprotected by entrenched larger competitors.

Finally, with regard to markets, we have sound evidence that there is venture community interest in renewables if a compelling case can be made that there are robust markets for the technology. This interest, however, is liable to wane if the existence of these markets cannot be demonstrated in a reasonable timeframe. As several panelists concurred, "the jury is still out on when renewables can create significant markets."

3. **While recognizing that equity financing issues may not currently be the most pressing detriment to growth for many renewable energy companies, financial issues are—and will remain—daunting even as the more fundamental issues are addressed.** Although there are number of other financing sources that are appropriate at various stages of development (see Appendix A), the kinds of companies that participated in the forums will ultimately need some form of equity financing to develop robust enterprises.[26]

4. **We have barely tapped the value that the business and financial communities can bring to technology development.** One of the most valuable aspects of the IGF program is the set of relationships that we (DOE, NREL, and the energy efficiency and renewable energy [EERE] industry members) have established with members of the equity financing community and with other senior business executives. These relationships create an opportunity for systematic and rigorous consideration of financial and business issues with expert members of these communities in a way that has not been done before as part of the technology transfer process.

   These financial and business colleagues represent a rich source of advice and wide-reaching contacts that can be tapped in other ways. For instance, they can help mentor small businesses beyond the forum environment. They can also provide valuable insights and add credibility to DOE/NREL technology programs, especially in the planning and execution of technology deployment and commercialization efforts. Finally, they can be a source of advocacy for the technology and provide an early reading on commercial feasibility.

5. **Based on the forum surveys and other feedback, the forums have met their objectives well.** The forums have provided a good "live" introduction for EERE companies to a key subset of the financial community. The robust interaction and feedback process with panel members provided by the forums plays a vital role in this success.[27] This interaction has provided invaluable advice, helping to focus the presenting companies toward developing more robust business enterprises and corresponding markets, while also offering an opportunity for investments.

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[24] There are exceptions, of course. There are niche and international markets where renewables can compete on price, and there are also "green-pricing" markets now emerging that should provide some markets for renewable technologies. In the later case, when and how much is still an open question.

[25] See for instance "Danger, Stealth Attack" by Toni Mack and Mary Summers. *Forbes*. January 25, 1999, pp. 88-93.

[26] For completeness we have included, in Appendix D, the current resource information on our internet Web site at http://www.nrel.gov/technologytransfer/resourceguide.html. This is updated periodically.

[27] In a typical venture forum, an industry presenter may get only 10-12 minutes to make his/her business case and frequently receives little feedback. The IGF provides roughly an hour of formal interaction and opportunities for additional informal interactions.

6. **The forums provide a key, previously missing piece of the "facilitating commercialization" puzzle.** The biggest achievement of the forums may be that they have created what might be called a marketplace for the financing of renewables. There is now a cadre of investors that are generally familiar with a number of renewable technologies, plus a host of renewables companies that are more knowledgeable of, and better able to work with, the investment community.

Appendix A

Sources of Private Financing for Business Development

Appendix A: Sources of Private Financing for Business Development

The financial community (and even the venture community within the financial community) is far from monolithic. A number of financing options are available depending on the stage of development of the business. Table A-I shows different kinds of financing that are available at different stages of development. The table is based on one in *Pratt's Guide to Venture Capital Sources*,[28] the leading source of information on the topic. We added only angel financing—discussed in Appendix C—to the start-up and early growth phases. It is important to also point out that most of the venture capitalists that have supported Industry Growth Forums focus on earlier-stage and smaller deals than is typical of many venture capitalist firms.

Table A-1: Sources of Business Development Financing
Opportunity and Complexity—Numerous Contributing Solutions

Stage of Development	Risk Profile and Principal Risk Elements	Financial Characteristics	Typical Financing Instruments
Start-Up	Highest: Management Product Market Financial	Losses Minimal assets Negative cash flow	Founders' equity Angel equity
Growth	Moderate: Management Financial	Breakeven to profitable Rapidly growing assets Negative or modestly positive cash flow	Bank loans (mid-later growth) Leases (equipment) Private equity (early growth) Angel equity (early growth) Public equity (later growth) Strategic alliances
Maturity	Lowest: Competition	Profitable Stable asset levels Positive cash flow	Bank loans (working capital) Leases (equipment) Public & private equity Strategic alliances Mezzanine debt Private & public debt Placements
Decline/ Turnaround	High: Financial Management Product strategy Market strategy	Losses Declining asset values Cash flow positive or negative (asset liquidation)	Asset-based financing Public equity (dilutive) Turnaround investors

[28] *Pratt's Guide to Venture Capital Sources*. Published by Securities Data Publishing/Venture Economics. New York, NY. Updated periodically. There is no such guide to angels.

Appendix B

Some Thoughts on Debt and Equity Financing, Valuation, and Risk Perception by Equity Investors

Appendix B: Some Thoughts on Debt and Equity Financing, Valuation, and Risk Perception by Equity Investors[29]

To obtain debt financing, cash flow must be sufficient to service the debt. Debt financiers use various ratios such as debt-to-equity as yardsticks for gauging if the debt is likely to be repaid, but all boil down to the likely adequacy of cash flow (or, more correctly, free cash flow) to service the debt. Different lenders will require different levels of return for various levels of risk, which will also depend on how the money is going to be spent. As the lender looks at higher and higher levels of debt financing—issuing bonds, for instance—due diligence will become increasingly stringent and will address many of the same issues that are addressed for venture and other equity financing.

Equity financing, on the other hand, is appropriate when a company is poised for rapid growth, but needs a substantial cash infusion that is larger than can be debt serviced by current and anticipated near-term free cash flow. The amount of equity given up will be directly related to the amount of cash needed and the present value of the enterprise, including the estimated stream of anticipated free cash flows for at least the next several years. Though straightforward in concept, valuation can be quite contentious because judgement must be applied in many areas.[30, 31] A strong business case and plan will help support the entrepreneur's position on the company's valuation.

Table B-1: Discount Rate Ranges in Valuing Businesses
(Real and Perceived Risk and High Illiquidity at Early Stages Drives Up Discount Rates)

Development Stage	Discount Rate Range (%)	Characteristics
Seed Capital	>80	Concept exploration with no defined business plan
Business Start-Up	50–80	Product or concept with commercial application has been demonstrated
Initial Stage Business	40–60	Product revenues recorded, but not necessarily profits
Middle-Stage Business	30–50	Product viability demonstrated in marketplace
Pre-Initial-Public-Offering Financing	25–35	Established product and market, emphasis on revenue growth
Historical Market Average	12–13	Mature business

29 For a more complete and recent perspective see "How Venture Capital Works" by Bob Zider. *Harvard Business Review*. November-December 1998. pp.131-139.
30 Including, for example, opportunity cost of capital, risk premiums, and anticipated market size and share.
31 See also *High Tech Start Up: The Complete How-To Handbook for Creating Successful New High Tech Companies* by John Nesheim. 1997. Saratoga, CA.

The perception of risk tends to lead equity financiers to discount cash flows quite aggressively, especially estimates beyond eighteen months.[32] Therefore, the valuations are going to be very conservative and weighted toward that front end of the cash flow. This can be seen in Table B-1 above as provided by Coopers and Lybrand,[33] where much higher discount rates are applied at earlier stages of the business development associated with this perception of much higher risk. That is why it is important that the company delay equity financing until it is absolutely needed. That is also one reason why many small entrepreneurs have a fear that venture capitalists will take too much equity in their company. Venture capitalists forthrightly acknowledge that this is a valid concern.

Evidence supporting the perception of risk by VCs in funding new enterprises can be seen by looking at the results of a typical venture-capital portfolio and the relative numbers of winners and losers. Consider that a fund depends on a small number of winners to make a return. Columbine Venture Funds[34] presented results from a typical early-stage fund portfolio that they ran. To help reduce risk, the portfolio typically includes a minimum of 20 deals. For each of the deals selected, the company may have looked at 100 to 200 proposals. Performance expectations, as provided by Columbine, are given in Table B-2. The example is for a $30M fund with 30 investments of nominally $1M each. If one assumes for a moment, in this same example, that all the deals were consummated at the same time, and that all were exited five years after initiation, then the annual compound rate of return for this portfolio is about 22.6%. This is a respectable return but it is also considerably lower than the 35%–40% that VCs typically aim for.

Table B-2: Typical Portfolio Fund (Provided by Columbine)

		Number of Deals	**Return ($Millions)**
50%	Total or Partial Loss	14	3
30%	Living Dead: 1-2X	9	10
12%	Reasonable: 3-10X	4	20
8%	Winners: 10X	3	50
	Total Portfolio	30	83

[32] Although many VCs do not believe the longer-term projections, they like to see that the entrepreneur has been thorough and done them.

[33] Karyl Misrak, Coopers and Lybrand. Private communication.

[34] Duane Pearsall, retired president of Columbine Venture Funds. Private communications.

Appendix C

Angels

Appendix C: Angels[35]

As noted within the text, venture capital financing is not usually obtainable for start-ups. This is because the stage of development of many current renewable companies is not appropriate for many venture firms. Private "angel" financing is much more likely. But the angels themselves can be difficult to find. This is because they often do not want to deal with a lot of unwanted contact and they don't have to invest. (A venture firm must seek out new clients to stay in business.) Angels typically look for a 25% return on investment (versus 35%–40% for VCs). As compared to venture capitalists, angels typically

- Represent a much larger (about two orders of magnitude greater) source of funds for investments (under $1M)
- Are many more in number (~250,000); and there are numerous groups of angels (see Table C-1)
- Are harder to find—there is no analog to "Pratt's Guide"
- Do not have to invest
- Tend to invest in what they are more technically and operationally familiar with
- Have a longer time constant and are less risk averse (because they are typically more familiar with the business)
- Lend at smaller levels (often under $1M)
- Require less equity (smaller piece of business)
- Require a somewhat lower return on investment, typically about 25% vs. about 35%–40% for the venture community
- Are less involved in the day-to-day business operations
- Are located physically closer to the business entity they are involved with (often within a 50-mile radius)
- Often work together to share risks and do formal due diligence and require a solid business plan
- Accept a relatively higher percentage of deals.

Many angel networks are nonprofit, but may still require from $150–$1,500 to network your business plan with investors. There are a number of networks that can make finding the right angel, matched to the needs of the company, a less daunting chore. The folks at Equitus (a private, for-profit company) have a database on about 8000 angels, including profiles of the corresponding investment style and requirements for each.

[35] For an excellent discussion of angel financiers, see *Finding Your Wings: How to Locate Private Investors to Fund Your Venture*. By Gerald Benjamin. 1997. John Wiley and Sons. Available in bookstores. It describes ten different types of angels along with their perspectives and operational approaches. See NREL's "Resource Guide for EERE Entrepreneurs," on the Web at: http://www.nrel.gov/technologytransfer/resourceguide.html.

Table C-1: A Sampling of Angel Networks
(many are nonprofit; fees generally required)

Angel Network	Phone	Internet Address http://www. +
ACE-NET: Angel Capital Electronic Network. A national network of angels in operation since late 1996. Part of Small Business Administration Office of Advocacy. Not many deals have been done yet.	**202-205-6983**	**sba.gov/ advo/acenet.html**
Technology Capital Network. Cambridge, MA. Affiliated with the Massachusetts Institute of Technology. Earliest capital network (started in 1984).	**617-253-7163**	**Web page currently under development**
The Capital Network. Austin, TX. Mostly early-stage technology ventures. Some investors are corporations looking for strategic alliances. Offers an array of services. A node on ACE-Net. Affiliated with U. Texas.	**512-305-0826**	**thecapitalnetwork. com**
Environmental Capital Network. Ann Arbor, MI. Concentrates on businesses with an environmental connection.	**313-996-8387**	**BizServe.com/envir onmental.capital. network/**
Investors Circle. San Francisco, CA. Concentrates on businesses operating in such "socially responsible" areas as health, education, energy conservation, and community development. Has about 180 investors.	**415-929-4900**	**no Web site**
Western Investment Network. Seattle, WA. Concentrates on businesses in the Northwest.	**206-441-3123**	**no Web site**
Equitus. Specializes in structuring development stage and expanding companies to acquire capital. They are a member of Tushchner & Co. Inc. (a full-service security brokerage firm) and have a proprietary database of some 7,500 private investors. For profit company. (See Benjamin, 1997).	**303-377-4580**	**equitus.com**
Pacific Venture Capital Network. Irvine, CA. Part of an array of services for the entrepreneur, all affiliated with the Graduate School of Management at the University of California at Irvine. A node on ACE-Net.	**714-509-2990**	**accelerate.uci.edu/**
Colorado Capital Alliance, Inc. Boulder, CO. Works closely with local incubators and other state agencies.	**303-499-9646**	**angelcapital.org**

Appendix D

Resource Guide for EERE Entrepreneurs

Appendix D: Resource Guide for EERE Entrepreneurs

See Web site http://www.nrel.gov/technologytransfer/resourceguide.html

Resource Guide for EERE Entrepreneurs

Information For Renewable Energy Business Entrepreneurs: A Sampling of Capital, Financial and Other Available Resources

The following information is provided by NREL as a service only and implies no endorsement of any organization described below; also, the fact that a specific organization is not cited below implies no judgment, on NREL's part, about its effectiveness or value. Its purpose is to provide an indication and a sampling of the kind of information available to small entrepreneurial businesses; moreover the information here, though representative, constitutes only a very small portion of the available resources.

The internet addresses that we have cited often are linked to a plethora of other sites which represent additional resources. Hence it can often be worthwhile to explore these in more depth, depending on the individual's needs. Also, many, but not all, of the web sites noted are useable free of charge. Some sites allow a limited introductory look, but then require registration and/or a fee to further use their on-line resources. One final note. Where we mention specific local resources, we deliberately chose to cite Colorado examples, though many (if not most) other states have corresponding resources.

Financing & Other Strategic Alliance Resources/Databases

Garage.com is a Web site for entrepreneurs that was developed by garage.com CEO Guy Kawasaki. Before founding garage.com, Kawasaki was an Apple Fellow at Apple Computer, Inc. and a noted writer of The Software Horizon column for Forbes magazine. Kawasaki is the author of seven books, including "How To Drive Your Competition Crazy" and "Rules for Revolutionaries." A recent press release noted that "Garage.com offers entrepreneurs and investors an innovative, Web-based approach to high-tech and medical sciences venture financing and investing. In conjunction with its broker/dealer affiliate, garage.com helps entrepreneurs attract the high quality investors they need, and helps investors find the outstanding startups they want to fund." Find out more by visiting the Web site at www.garage.com.

Angel Investors; The Angel Capital Electronic Network (ACE-Net), which was announced by President Clinton in 1996, is a nationwide, Internet-based listing service that provides information available to angel investors on small, dynamic and growing firms seeking equity financing (in the $250K-$1000K range). ACE-Net contains much relevant information for small businesses (the Web site includes numerous useful hot links and references under Sites Of Interest button; also see SBA'S Office of Advocacy ACE-Net and The Process and Analysis Behind ACE-Net).

The Capital Network, a founding member of ACE-Net, also has its own database list of providers who can assist entrepreneurial ventures with various types of business expertise including attorneys, accountants and other business consultants. Entrepreneurs or investors needing expert business advice can call the TCN office to receive a list of three to five experts who may be able to provide assistance to match their needs. They also hold venture seminars and Continuing Education Seminars. Contact Paul Myers, Program Manager, phone 512-305-0830; fax 512-305-0836.

NBIA's Business Matchmaker Database; a service of the National Business Incubation Association (NBIA) and Coopers and Lybrand, L.L.P. This database profiles more than 1000 early stage (recent graduates of business incubation programs), mid-sized and large corporations interested in forming strategic alliances. Check out the NBIA and membership requirements and the matchmaker database.

Colorado Capital Alliance, Inc. is a not for profit organization created to facilitate the match between private investors looking for opportunity and entrepreneurs seeking capital. CCA is a collaboration among the public and business leaders from the Rocky Mountain region devoted to meeting the developmental needs of the small business community. Contact Marcia Schirmer, Executive Director, phone 303-499-9646; fax 303-494-4146.

UNISPHERE is an international organization based in Washington, DC and supported by public & private partners in 23 countries. Unisphere, which has been used by NASA, operates a virtual venture market for firms with advanced technology products and services. All firms entering the market are subject to expert evaluation by UNISPHERE or one of its partners. To participate, firms must have good management and good technology and provide a standard abstract on their history, technology, management, and business objectives.

Small Business Forum, a new Web site for entrepreneurs by *Forbes*, a popular business magazine, focuses on issues entrepreneurs face. The site features columns such as "Follow the Money," on venture capital by Silicon Valley correspondent Rita Koselka, and "Growing Pains/Startup Clinic," which addresses entrepreneurial problems. They invite readers to participate in their interactive forum by e-mailing problems/issues where experts will help work through a solution, and where you can network with other entrepreneurs and small business owners. See the Forbes Web site at www.forbes.com.

National and Local Small Business Programs

For Small Businesses see the Web site based on the weekly public television show The New American Heroes - Entrepreneurs And Small Business Owners.

The Sustainable Business Network is a Web site for the full range of environmental business sectors, from recycling to green building, from renewable energy to organic products, from social investing to certified forestry. The site supplies information and connection to accelerate momentum toward a green economy.

The Colorado Office of Business Development (OBD) works with companies starting, expanding or relocating in Colorado. OBD offers a wide range of services to assist new and existing businesses of every size.

A number of related sites are hotlinked, including the site for The Colorado Small Business Development Center (SBDC) Network. The SBDC Network combines information and resources from federal, state and local governments with those of the educational system and the private sector to meet the specialized and complex needs of the small business community.

The Colorado Guide to Financing Sources, for the Entrepreneur and Small Business Owner. Financial Education Publishers, Inc., Littleton, CO, 1995. Contact Margot Adam Langstaff 303-797-3734.

Government Grant and Other Funded Programs

FEDIX Opportunity Alert(FOA). This federally funded, free e-mail service is designed to automatically deliver research and education funding opportunities in specific areas of interest.

CBDNet is the official FREE online listing of Government contracting opportunities which are published in the Commerce Business Daily including contact names and closing dates. It has full-text and data searching capabilities.

The Small Business Innovative Research(SBIR) program has the goals of increasing private sector commercialization of technology developed through federal R&D, increasing small business participation in federal R&D, and improving the federal government's dissemination of information concerning the SBIR program. Federal agencies with extramural R&D budgets of over $100 million participate including DOE's SBIR program and NASA's program.

The Department of Commerce's and NIST's Advanced Technology Program (ATP's) mission is to stimulate U.S. economic growth by developing high risk and enabling technologies through industry-driven cost-shared partnership.

See information on Grants and Awards from the National Science Foundation (NSF).

Information on Contracts, Grants, and Financing from the Environmental Protection Agency (EPA) includes: Access to the EPA procurement procedure from the Office of Acquisition Management about current and closed contracts and Requests for Proposals (RFPs); information from various departments within the agency about research grants and graduate fellowships; and information for state and local governments and small businesses on financing environmental services and projects.

Two additional programs of the U.S. DOE which provide funding for inventions and their development are the Energy-Related Inventions Program (ERIP), and the Innovative Concepts Program (InnCon).

An excellent source of information on state (tax, loan, grant, and other) incentives is a DOE and North Carolina State University program called the National Database of State Incentives for Renewable Energy (DESIRE). Electronic resources available on-line include:

> 1. A Table of State Financial Incentives showing all incentives by state and type with links to Incentive Summary Pages. The Incentive Summary Pages contain links to the full text of applicable state statutes and forms when available;
>
> 2. Searchable On-line Database of State Financial Incentives with state energy contacts and links to the state legislative statute; and
>
> 3. Links for downloading the database application, DSIRE on Diskette, or spreadsheets.

The Manufacturing Extension Partnership (MEP) and its affiliated centers is a partnership of the U.S. Department of commerce's National Institute of Standards and Technology and a network of affiliated service providers throughout the country. MEP is dedicated to bringing technology and business assistance services to America's small and medium-sized manufacturers, and provides funding for its regional extension centers that help manufacturers use the latest and most appropriate manufacturing technology. The NREL Library has also compiled a selection of several more non-NREL Web sites useful for finding information about possible grants and funding.

Incubator Resources

For business incubators, see the National Business Incubation Association (NBIA) Web site that is devoted to the business incubation industry; this Web site includes membership information, contact information, publications, press releases and numerous other information resources including, links to members' incubation facilities, and business hotlinks.

Local Incubators Nearly every metropolitan, and some rural areas have business incubators; big cities frequently have several in their areas, and very often the more established ones have a focus on particular technologies. The most effective ones tend to have a high technology focus, offer a wide range of services beyond housing or a place to nurture the development of the small business.

Such full service incubators offer a spectrum of business and education services that include help in developing a sound business plan and in finding financing partners, as well as providing access to a rich know-how network of business experts in marketing, sales, high tech business management and operations, financing, and patent and corporate law. For instance, the Denver, Colorado, area has two well established incubators with a high technology focus: one is the Boulder Technology Incubator (BTI); the second is the Colorado Venture Centers (CVC) which represents the recent merging of two prior incubators into a single entity: phone 303-237-3998; fax 303-237-4010.

Books and Other Written Materials

As with organizations and their corresponding Web sites, as noted above, there are a large number of books and other materials to help the small business and entrepreneur; often these resources are available from the organization you may work with (e.g. local Small Business Development Centers). Another good source of information is available at the online NBIA bookstore.

An excellent source for books published by major publishers is through the Amazon Web site. They bill themselves as The World's Biggest Bookstore, and offer more than 2.5 million titles. They also can get books from smaller publishers but will often note that these are hard to find. Discounts can often be found for books ordered over the net.

We include below a representative listing of reading materials that are aimed at helping small businesses and entrepreneurs.

Start-Ups

Engineering Your Start-Up: A Guide for the Hi-Tech Entrepreneur, by Michael L. Baird; 1997; Professional Publications, Inc., Belmont, CA. The book jacket describes the contents this way: "You are a high technology professional. You have an idea, a dream, for a new company. This company would be your own, a start-up based on technology and ideas you developed. Before you can pursue this start-up dream, however, you have to be armed with the facts. Today's competitive global economy calls for a detailed analysis of the business environment you seek to enter. To give yourself the best chance for success, you must carefully examine the myriad issues involved. Engineering Your Start-Up is a no-nonsense guide that breaks down these complex start-up issues and explains them in light of the tough decisions facing today's aspiring high-tech entrepreneurs."

You'll find information on these and other topics:

- Start-up opportunities-where are they?
- How to secure start-up financing
- Dealing successfully with venture capitalists
- Writing a winning business plan
- How to derive your company's technology strategy
- Creating a management team
- Employment and compensation-who to hire and how to pay them
- Stock ownership, grant, and award practices

High-Tech Startup: The Complete How-To Handbook for Creating Successful New High Tech Companies, by John L. Nesheim, 1997.

Book description: "to help creative people be more successful in the process of converting a good idea into a financable business. The book focuses on high-tech startups, typically venture backed. The lessons presented also apply to creating new enterprises within existing corporations. The book walks the reader through the stages of the startup process, from idea to venture negotiations to initial public offering and reveals secrets of creating a new high-tech enterprise."

Incubators

The NBIA has published a book, ***The Art & Craft of Technology Business Incubation,*** which provides a compilation of best practices used in incubators across the country, and it identifies the incubators that carry out these practices; its scope is limited by the number of incubators (some 50) that participated in the study. Many of the references cited below can be found in this book, as well as on the NBIA bookstore site noted above. For *The Art & Craft....* book, contact: NBIA Publications, 20 East Circle Drive, Suite 190, Athens, OH 45701; phone 614-593-433; fax 614-593-1996.

Financing Materials

Business Angels: Securing Start Up Finance, by Karl Moore, Patrick Coveney, John Wiley & Sons, June 1998.

Amazon.com says: "Featuring new findings from a landmark Oxford University study of the informal venture capital market, this book gives clear and essential advice for entrepreneurs seeking funds to facilitate their plans. While much has been written about financing through the formal sector (banks), this is the first book to focus exclusively on the informal market—family, friends, and private investors, the real "business angels."

Business Angels: A Guide to Private Investing, by Robert Keele, Jeffery Cooper, and Gary Bloomer was published in 1998, and is available through the Colorado Capital Alliance (CCA). According to the CCA, "this book provides the tools required to evaluate, structure, and exit a venture investment. A useful tool to slip in your briefcase and refer to again and again! This guide doles out sage advice on how to get the most out of angel investing."

Finding Your Wings: How to locate Private Investors to Fund Your Venture, is a recent book by Gerald Benjamin about angel financing, and has been recognized as one of the best business books in 1997 by the *Financial Times* of London. Notably, besides providing insights on locating angels, the book also provides ways to characterize and analyze the different kinds of angel investors, and provides ways for the entrepreneur to screen investors consistent with her/his needs. The book is published by John Wiley & Sons; cost is about $35.00, and it is widely available in book stores. The author claimed in 1997 that this is the first book on angel investing produced by a major publisher in the last ten years.

Entrepreneur Magazine Guide to Raising Money by Entrepreneur Magazine, Paperback, John Wiley & Sons - 256 pages (October 1997). The publisher, John Wiley & Sons says, "The 'small business authority' shows new and would-be entrepreneurs how to find money to grow their businesses. The book describes the pros and cons of a wide variety of funding sources, including banks, SBA offices, venture capitalists, online sources, and even some quirky nontraditional sources of capital."

Capitol Capital: Government Resources for High-Technology Companies is a 214-page book that describes in a comprehensive, easy-to-read manner federal and state government programs that companies can access. These include funds for research and development (Chapter 1), tapping into federal laboratories (Chapter 2), defense conversion and dual-use programs (Chapter 3), manufacturing programs (Chapter 4), sources of domestic financing (Chapter 5), and international financing (Chapter 6). There is also a chapter of seven case studies describing success stories of companies that have accessed programs and services. Contact: AEA Customer Service Center, 5201 Great America Parkway, P.O. Box 54990, Santa Clara, CA 95056-0990; phone 800-284-4232; fax 408-970-8565.

Pratt's Guide to Venture Capital Sources has been widely hailed as the leading reference to the worldwide venture capital industry for entrepreneurs and growing companies. The 1995 edition contains investment, operating, and management data on more than 950 venture capital firms. Each listing includes contact name, phone and fax number, geographic and industry preferences, recent investment data, management rosters, and project preferences, including the roles played in financing, types of financing provided and preferred investment sizes. The price is $249. Contact: Securities Data Publishing/Venture Economics, 40 West 57th Street, 11th Floor, New York, NY 10019; phone 212-333-9274; fax 212-765-6123.

New Jersey Financing Resources Manual (1994), published by the South Jersey Entrepreneurs Network, provides new or growing businesses with a broad overview of the various aspects of business financing. The manual contains chapters on preparing a business plan, developing a relationship with a banker, lease financing, private investors and networking, later-stage financing, and federal/state financing sources. The contributing authors are experts in their respective fields, including corporate and securities attorneys, corporate executives, and commercial loan officers. The book explains each type of financing and includes sections detailing what to expect when approaching bankers, leasing companies, venture capitalists, or other financial sources. The cover price is $25. Contact: The South Jersey Entrepreneurs Network, Longwood Center, Suite D-2, 600 Route 38 West, Cherry Hill, NJ 08002; phone 609-665-8855; fax 609-665-6767.

The Guide for Venture Investing Angels: Financing and Investing in Private Companies (1996), by Arthur Lipper III has as a primary objective to assist the individual angel investor in making better decisions as to whether or not to invest in private companies and how to do so more effectively. Thus, although it is not directed at the small business and entrepreneur, it can provide some valuable insight on the criteria and the corresponding rationale which venture and angel investors use in making investment decisions. Contact: Missouri Innovation Center, Inc., 5650A South Sinclair Rd., Columbia, MO 65203; phone 573-446-3100; fax 573-443-3748.

Winning Strategies for Capital Formation: Secrets of Funding Start-Ups and Emerging Growth Firms Without Losing Control of Your Idea, Project, or Company, by Linda Chandler, 1997.

Marketing Materials

The Innovators Dilemma: When New Technologies Cause Great Firms to Fail, by Claytom M. Christensen, 1997. This book is especially relevant to how renewables might be "disruptive technologies" in the deregulated utility environment.

Commercializing Technology: A Hypertext Manual is an updated version of a popular manual created for the U.S. Department of Energy's Small Business Innovation Research (SBIR) Program. Originally written in 1988, the SBIR manual has been provided to countless SBIR awardees. Revised in 1994, the manual is a step-by-step guide through the commercialization process, which includes an extensive discussion on how to use commercial databases and Internet news groups to facilitate market research and marketing.

The manual is produced in the form of computer software by Foresight, Inc., a technical marketing firm that provides commercialization assistance to small and large companies, universities, federal agencies, and nonprofit labs. The manual has been formatted as a hypertext document to facilitate use. Templates can be easily downloaded by users. The cost of the manual is $95. Contact: Foresight Science and Technology, Inc., 1200 W. Sims Way, Suite 201, Port Townsend, WA 98368; phone 206-385-9560; 3446234@mci.com.

The Marketing Plan: Step-by-Step is published nationally and is available through the Center for Innovation and Business Development (CIBD) at the University of North Dakota, which provides business and technical support services to hundreds of individuals and businesses a year who have product ideas. The *Marketing Plan* book, published in 1992, is targeted to new and expanding ventures with new products, technologies, or services but with little or no market history. It was developed specifically for manufacturers launching a product who don't need a business plan for financing but who do need a well developed marketing strategy. The book is a step-by-step guide with seven chapters to help entrepreneurs with researching, analyzing, writing, and implementing an effective marketing strategy. The book costs $30. Contact: Center for Innovation & Business Development, P.O. Box 8372, University of North Dakota, Grand Forks, ND 58202; phone 701-777-3132; fax 701-777-2339.

The popular ***Guerrilla Marketing*** series by Jay Conrad Levinson offers entrepreneurs help in marketing and advertising their products. The series includes the following texts:

Guerrilla Marketing: Secrets for Making Big Profits from our Small Business (1993) is an updated edition of the first best-seller in this series. The new edition discusses how to identify and reach the fastest-growing markets, develop a creative marketing program, select marketing methods, save money, and obtain free market research.

Guerrilla Marketing Excellence: The Fifty Golden Rules for Small Business Success(1993) contains rules to guide the entrepreneur's thinking, effectiveness, marketing materials, and actions.

The Guerrilla Marketing Handbook (1994) is co-authored by Seth Godin, a marketing expert and recognized author of business manuals. The handbook provides ways to unlock the secrets of direct mail, cut advertising costs, generate word-of-mouth, expand market share, increase telephone sales, and reposition the competition.

Guerrilla Advertising: Cost-Effective Tactics for Small Business Success (1994) shows small businesses how ads must be integrated into the total marketing strategy to maximize their effectiveness. Also explored are topics such as how to stay within a budget, how to polish a look and pitch, and how to adapt tactics to appropriate media.

Guerrilla Marketing On-line: The Entrepreneur's Guide to Earning Profits on the Internet (1995) is co-authored by Charles Rubin, a computer hardware and software expert. This book helps readers get oriented to Internet culture, develop knowledge about the audience that uses the Internet, apply Levinson's marketing techniques to the Internet, discover low-cost ways to market on-line, and stay ahead of the competition.

Contact: Guerrilla Marketing Online
Houghton Mifflin Co., 215 Park Avenue South, New York, NY 10003; phone 800-255-3362; fax 212-420-5850.

Business Planning Materials

Growth Company Starter Kit, published by Coopers and Lybrand (1992) is designed to help founders and managers of growth companies launch their businesses. The kit's purpose is to provide the entrepreneur with easy, comprehensive checklists needed to develop a strategy for the future success of a company. The manual provides a roadmap for writing a business plan, also in checklist form, including do's and don'ts. The appendices contain information on information/support sources such as trade and industry associations, SBA programs and contact numbers, model financial statements, and instructions on tax filing requirements. The cost is $8 for NBIA members and $10 for non-members. Contact: NBIA Publications, 20 East Circle Drive, Suite 190, Athens, OH 45701; phone 614-593-433; fax 614-593-1996.

Start-Up: An Entrepreneur's Guide to Launching and Managing a New Business (1994) focuses on entrepreneurship and the problems commonly associated with starting and maintaining new businesses. *Start- Up* addresses issues such as developing business plans, dealing with venture investors, accountants, bankers and lawyers, marketing and obtaining loans, and seeking government assistance. The author, Bill Stolze, is a Sloan fellow at the Graduate School of Management at MIT, the founder of several successful businesses, an investor and director of numerous start-up companies, and the founder of the Rochester Venture Capital Group. Several additional authors contributed to the latest edition, including a chapter on "25 Entrepreneurial Death Traps" written by Frederick J. Best, CEO of the General Partners of NEPA Venture Funds. The book's cover price is $16.95. Contact: Career Press, 180 Fifth Avenue, P.O. Box 34, Hawthorne, NJ 07507; phone 800-CAREER-1; fax 201-427-2037.

"How to Write a Great Business Plan." *Harvard Business Review*, (July-August, 1997) pp. 98-108, provides a concise description of what a business plan should contain by addressing four critical success factors; i.e. the people, the opportunity, the context, and the possibilities for both risk and reward. The author, a professor in the Harvard Business School, has been closely connected with more than fifty entrepreneurial ventures.

Three sets of training materials, ***NxLevel Guide for Business Start-Ups*** ($45), ***NxLevel Entrepreneur Set*** ($65), and ***Small Business Guide to International Trade*** ($35), are available from the Western Entrepreneurial Network (sponsored by the US Foundation), at the University of Colorado at Denver. The training materials, used in their NxLevel Entrepreneurial Training Programs, are based on feedback from more than 4000 entrepreneurs in 12 states who have recently taken entrepreneurial training programs

NxLevel Entrepreneurial Training Program materials and curriculum have been used in some 20 states. The materials mentioned above may be purchased without taking the training programs. More information on the programs and the materials can be obtained from: Western Entrepreneurial Network, University of Colorado at Denver; Campus Box 128, P.O. Box 173364; Denver, CO 80217-3364; phone; 303-620-4666; fax 303-620-4670.

Strategic Alliances and Partnerships

Strategic alliances and partnerships are becoming increasingly important in today's business development environment. Three resources that discuss this important topic are:

Alliance Advantage : The Art of Creating Value Through Partnering, by Yves L. Doz, Gary Hamel, Harvard Business School Pr. (June 1998). An excerpt from the Amazon.com Book Description says, "A fundamentally new approach to the value created through alliances, Alliance Advantage challenges the assumption that the economics of an alliance are the same as those of a joint venture. By exploring the underlying reasons why companies enter alliances, the unique opportunities for value creation such alliances provide, and the processes through which each stakeholder learns from its interactions, the authors help bridge the gap between expectations and outcomes."

Joint Ventures and Corporate Partnerships, A Step-by-Step Guide to Forming Strategic Business Alliances by Jennifer Lindsey. Probus Publishing Co., 1989., and

Business Alliances Guide : The Hidden Competitive Weapon by Robert Porter Lynch. New York, NY. John Wiley & Sons. 1993.