

WRITING A SUCCESSFUL SBIR / STTR COMMERCIALIZATION PLAN

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About Ed Kase

- BS in mechanical engineering from Clarkson University
- MBA from Colorado State University
- 20+ years of business development experience
- 10+ SBIR / STTR commercialization
- Areas of expertise
 - Aerospace systems
 - Scientific instrumentation
 - Software
 - Medical devices
 - Pharmaceutical technologies

FEDERAL GRANTS

SBIR / STTR

Poll Question

- Have you had experience with the SBIR program?
 - Yes
 - No

What is SBIR / STTR?

- SBIR – Small Business Innovative Research
- STTR – Small Business Technology Transfer

- Funds early stage R&D at small companies
- Largest source of early stage financing for small business in the U.S.
- Three phase program

Three Phase Program

- Phase I
 - Purpose to test the scientific, technical, and commercial merit and feasibility of a concept
 - Usually 6 months long (potential option periods) and up to \$150,000
- Phase II
 - If Phase I proves successful, may be invited to propose on Phase II to further develop concept, usually to prototype stage.
 - Usually 2 years long and up to \$1,000,000 depending on agency

Three Phase Program (cont.)

- Phase III
 - Purpose is commercialization
 - Non-SBIR/STTR funds used to bring the technology to military/government/private sector markets
 - The SBIR program does not fund Phase III.
 - Some Federal agencies, Phase III may involve follow-on non-SBIR funded R&D or production contracts for products, processes or services intended for use by the U.S. Government.
- **GOAL – always should bring to bring a Phase I to Phase III**

Advantages & Disadvantages

- Benefits
 - Non-dilutive funding
 - Intent of Phase I is proof-of-concept
 - Intent of Phase II is prototype
- Considerations
 - Proposal must be responsive to a research topic
 - 3-year process through all proposals, awards, and execution
 - Requires innovation
 - New invention
 - New application
 - Expectation of achieving non-SBIR revenue
 - Government contract
 - Complex
 - Subject to audits, reporting

SBIR Results

- Program has existed for 35 years
 - \$41 billion dispersed
 - 70,000 patents issued
 - 700 public companies created
 - 450,000 STEM researchers
- Successes include:
 - Qualcomm
 - iRobot
 - Symantec
 - Intuitive Surgical

TECHNOLOGY COMMERCIALIZATION

SBIR / STTR

What is Commercialization?

- Any revenue related to the technology not from an SBIR source:
 - Selling product to a customer (B2B, B2G, B2C, or B2B2C)
 - Receiving license fees or royalties from a partner
 - Selling a product line (or company) in an acquisition
 - Deploying with an agency
 - Operational use in the field (including space)

YOUR COMPANY

What is your Core Competency?

- What is your focus?
 - What do you do really well?
- Decide which agencies might be interested in your technology
- Match your core competency against SBIR topics

Solicitations

- Agencies post solicitations describing the technical areas of interest (topics)
- Each agency has its own proposal submission guidelines.
- A few agencies follow an annual solicitation proposal cycle, while others float solicitations as the need arises.
- Agencies post solicitations on their sites (www.dodsbir.gov) (sbir.nih.gov) as well as grants.gov.

SBIR Participating Agencies

- Participating Agencies:
 - [Department of Agriculture](#)
 - Department of Commerce - [National Institute of Standards and Technology](#)
 - Department of Commerce - [National Oceanic and Atmospheric Administration](#)
 - [Department of Defense](#)
 - [Department of Education](#)
 - [Department of Energy](#)
 - [Department of Health and Human Services](#)
 - [Department of Homeland Security](#)
 - [Department of Transportation](#)
 - [Environmental Protection Agency](#)
 - [National Aeronautics and Space Administration](#)
 - [National Science Foundation](#)
- Each agency administers its own individual program within guidelines established by Congress.

THE TECHNOLOGY

What is your Technology?

- Describe it in terms of the problem it solves or the need it meets
 - What it does, not what it is
 - Try describing it without actually using your product / technology name
- This is the first step towards creating the value proposition

Who Has the Problem?

- Answer this for your original idea
 - What prompted the idea?
- Broaden it to describe other applications
 - What are similar problems?
- Name specific potential users
 - Companies or organizations
 - Functional area
 - Job title
 - An actual person

Competition

- How do they solve the problem today?
 - Commercial products
 - Home-grown solutions
 - Substitutable products
- How are you differentiated from these other solutions?
 - Better
 - Cheaper
 - Faster

Cost Benefit

- How much does it cost to not solve the problem (or solve it inadequately)?
 - Dollar cost
 - Efficiency cost
 - Opportunity cost
- This is part of your value proposition.
- Pricing should be based on value, not cost.

REQUIREMENTS

What Is Being Asked For?

- Phase I
 - Market Opportunity
 - Company / Team
 - Intellectual Property
 - Revenue Forecast
- Typically limited to 2 – 3 pages
 - Depends on agency
- Estimate 3 – 12 hours

What Is Being Asked For?

- Phase II
 - Market Opportunity
 - Company / Team
 - Competition / Intellectual Property
 - Finance / Revenue Model
- Typically limited to 12 – 15 pages
- Estimate 50 hours
 - Should occur during the Phase I effort
 - Be specific with all claims
 - Use footnotes / endnotes with sources

Start with the Phase II Plan

- Your goal is to achieve Phase III – commercial revenue
- Have the entire roadmap thought out at Phase I
 - Your Phase I plan will be more thorough
 - Your program manager will see consistency with your Phase I plan when you propose Phase II
- Many agencies provide some form of commercialization assistance during Phase I
 - They choose: Dawnbreaker, Foresight, etc.
 - You choose: \$5,000 above and beyond grant award to investigate market potential

MARKET OPPORTUNITY

Phase I

Describe the product or service that you plan to bring to market and also describe your competitive advantage or value proposition to the customer. Please note you do not need to go into detail about the technology in your commercialization plan; that information should already be provided in the project narrative of your Phase I proposal.

- What you're proposing
- Market size / market growth / market drivers
- Brief description of incumbent technology
- Discussion of competitors and/or substitutable products

Market Landscape

- Size, growth & market drivers
- Major companies in the market
- Market research reports
 - Purchase for \$\$\$\$
 - Access through public or academic library
 - Access through industry / trade group
 - Skim highlights from press releases by market research companies
- Bottom up sizing for Total Addressable Market
 - Based on price and unit sales
- Letters of support always help

Phase II

- a) Describe succinctly what product or service you are planning to deliver based on your innovation.
- b) Address Market Opportunity
- c) Describe the channels you would employ to reach the targeted customer.
- d) What business model will you adopt to generate revenue from your innovation?
- e) If there are potential societal, educational, or scientific benefits beyond commercial considerations that will generate goodwill for your company or the product or service, they should be included here and explained in sufficient detail to convey the significance of the effort.

Talk to Potential Customers & Partners

- Interview potential end-users
 - What do they do now?
 - How could it be better?
 - What do they pay?
 - Or would they pay for your solution?
 - Where do they learn about new technologies?
 - Would they beta test?
 - Can you get a letter of support?
- Interview potential partners
 - Channel partners
 - Manufacturing partners
 - Service partners
- Lack of letters of support hurts a lot

COMPANY / TEAM

Phase I

You should describe the capabilities of your team specifically as they relate to the commercialization of your technology; there is no need to repeat their technical qualifications which are covered adequately elsewhere in your application.

The relevant commercialization capabilities of your team will depend on your commercialization path. In this case the company will work with a manufacturing partner with experience relevant to that path as described. If you are pursuing other approaches such as in-house manufacturing or licensing, then experience in those areas would be most relevant. If you are starting out with no personnel with commercialization experience, you should describe what your plans are to add this capability (new personnel, consultants, contractors, etc.) in the future.

- Do you have sales / marketing / business development resources?
- Can you start with consultants, then scale as you get closer to commercial release?
- Can you leverage a partner?

Recognize the Gaps (Phase I)

- Identify any expertise that is missing
 - Business development
 - Market knowledge
 - Scalable manufacturing capability
- Have a plan to fill the gaps
 - Use consultants
 - Recruit and leverage board members / advisors
 - Relationship with business partners
 - Relationship with research partners
 - Use resources like SBDC / trade groups

Phase II

- a) Provide a short description of the origins of the company.
- b) What type of corporate structure is in place?
- c) What is the current capitalization and is it sufficient for implementing your Commercialization Plan?
- d) What is the revenue history for the past three years? What is your anticipated revenue history through Phase II? Provide a table with percentages or sums of operating capital or revenue: product sales, consulting/services, license revenues, research and development grants/contracts, and others.
- e) What is the current employee count?
- f) Give a brief description of the experience and credentials of the personnel responsible for taking the innovation to market and clarify how the background and experience of the team enhance the credibility of the Commercialization Plan.
- g) What specific experience does the team lack and how will this be addressed during the Phase II effort and beyond? From what additional resources do you have commitments to address these limitations e.g., Board of Directors, technical advisors, or retained legal counsel? Please provide details on names, affiliations, and expertise of these resources.

Recognize the Gaps (Phase II)

- Same as Phase I, only more specific
 - Identify specific people or organizations
 - Reference conversations you had during Phase I
 - Explain any agreements / contracts in place

COMPETITION / INTELLECTUAL PROPERTY

Phase I

You should describe both the state of the intellectual property that exists in your intended market and plans to protect your intellectual property. In this particular case there is extensive patent literature with some important existing patents. There are probably significant amount of intellectual property protected by trade secret as well. The applicant has reviewed the existing patent literature and finds that their approach is novel and not covered by prior art. Note that patenting is not required for all markets and there will be other markets where trade secrets or copyrights will prove sufficient.

- Name competitors to demonstrate you understand your market.
- Do a patent search using Google Patents or similar
- Are trade secrets sufficient?
- If software, copyright, patent, or both?

For Phase I

- Mention incumbent solution and how your innovation compares
- Name significant players in market
- “Do It Yourself” patent search is OK
- If you identify a problem, consult an attorney / expert / professional
 - Call out the strategy for mitigating problem in your plan
- Explain what you did, what you assumed, and what conclusions you reached

Phase II

- a) Describe currently existing products or services that are found in the patent literature (and if relevant, copyright and trademark literature) or that is emerging from research or R&D which may be substitutes for your product or service.
- b) Describe IP rights you have secured for your technology to date and if any procedures are underway to expand or enhance the protection provided by those rights. Please describe your actions to protect these rights.
- c) Describe which IP is closest and which is most threatening to your “freedom to operate” and how you are different enough to be able to secure your freedom to operate.
- d) What other IP will you need to secure rights to make, use, or sell in order to address the market opportunity described above?

For Phase II

- Competition includes current products as well as potential future competitors
 - Google Patents – recent patents
 - Google Scholar – recent research
- Intellectual Property
 - Have an opinion from an attorney / expert / professional
- Regulatory hurdles (FDA approval, ITAR / export restrictions, etc.)
 - Have an opinion from an attorney / expert / professional
- Incorporate opinions from end-user interviews conducted
- If it's a barrier to entry or protection for your differentiated ability, have a strong story.
 - Letters can help here

FINANCE & REVENUE MODEL

Phase I

A revenue forecast is requested so we can understand the size of the market you plan to address. We ask for the revenue during the first 10 years of commercialization because in some cases, certain companies may begin commercialization immediately after their Phase II award, in other cases commercialization may not start for many years beyond the Phase II grant.

A recent National Academy of Sciences study of the DOE SBIR program found that 1/3rd of DOE Phase II SBIR/STTR awardees stop working on their technology after their Phase II award because they discover the market for their technology is too small. We don't want companies making this discovery after they complete their Phase II grant, but before they submit their Phase I proposal. We realize that you will need to make some estimates at this stage to arrive at a revenue forecast, especially for emerging markets, but we would like you to go through this exercise and provide the basis for your forecast in your discussion of the market opportunity.

- Brief is better.
- List your assumptions.

Have a Plausible Story

- All Department of Energy requires:
ABC LLC estimates sales revenues of \$_____ and licensing revenues of \$_____ during the first 10 years of commercialization.
[DOE General Comments: The revenue forecast statement above is mandatory in a Phase I application.]
- You can provide more details beyond this, but make sure it is a believable conclusion based on what you presented in the previous 3 sections.

Phase II

- a) Describe an appropriate staged finance plan given the market opportunity. Outline the level of funding required for each stage along the path to commercialization.
- b) Provide a table with anticipated costs identifying the anticipated source of each detailing revenues or other operating capital you can devote to these. If there is a shortfall, explain how you will raise or access the appropriate funds. If no additional cash is needed explain why you are confident that is the case.
- c) Provide specific contacts, leads, previous relationships, and agreements already in place. Are any other commitments in place which will affect your ability to raise Phase III follow-on funding?
- d) Provide an estimate of the DOE Return on Investment (ROI) or Net Present Value (NPV) for this project. This estimate should incorporate the profit before taxes (positive cash flow) for the first 10 years of commercialization and treat the DOE SBIR or STTR funding as an investment (negative cash flow). Describe the revenue streams (licensing, product sales or other) associated with your Commercialization Plan. When do you anticipate “first revenues” from each stream? When do you expect to reach “break even”?
- e) Provide annual pro formas for the next five years (two years of the Phase II effort + three years post Phase II). Income Statements are required. Cash Flow and Balance Sheets may be included if they are considered critical for your strategy. If not included, Cash Flow and Balance Sheets should be made available, upon request from DOE.

Have a Business Plan

- Complete a business planning process
 - Business Model Canvas
 - Others works as well
- Department of Energy provides Excel workbooks for Return on Investment (ROI) and Net Present Value (NPV).
- Present credible numbers to justify an investment on the order of \$1.5 million

SUMMARY

Commercialization Plan

- Specify target customers
- Identify the need being met
- Establish the value proposition
- Understand market size, growth & drivers
- List competitors
 - Exact competitors
 - Substitutable technologies
 - Incumbent solutions
 - Emerging technologies
- Differentiate your technology
 - Why are you better, cheaper, faster?
- Understand pricing and channel
 - How does the customer want to buy?
- Identify barriers to entry
- Clearly state Go-To-Market strategy

Questions?

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