SEVEN COUNTY INFRASTRUCTURE COALITION
EVALUATION METHODOLOGY UPDATE   9/1/2017

ENERGY
FINANCE &
GOVERNMENT
CONSULTING

EFG provides this summary to describe the methodology being deployed to evaluate emerging technologies and start-up companies as outlined in the scope of services and RFQ.

POTENTIAL MARKETPLACE COMPETITION

Understanding the competition in the marketplace frames the viability of any emerging technology. Competition is broken into two major categories 1) cost/unit comparisons in the broad market both currently and in the future, and 2) potential direct competitors in the same or very similar market space.

Cost/Unit Comparison

An example of cost/unit comparison for transportation would be cost/mile/ton or in other words what does it take to transport one ton one mile. If the new technology can transport for less than the current cost/unit then the technology has potential to be viable. This analysis must be compared both now and forecast into the foreseeable future (5 years).

Potential Direct Competitors

Supposing cost/unit makes sense, the next level of comparison is the direct competition in the space. Are there large market-share holders using the new technology that will likely have deeper market penetration than a start-up?

ADEQUATE TECHNOLOGICAL EXPERTISE

Our team relies upon Idaho National Laboratories to evaluate the maturity of the technology process using the Technology Readiness Level (TRL). The TRL is a scale from 1 to 10 with 1 being an idea and 10 being an idea fully ready to reach the market. See the end of this report for a summary of TRL.

ADEQUACY OF FUNDING NEED

The questions asked in this section determine if the new business has a full grasp of the expenses needed to bring the technology to market. Have they been broad in their business planning to take into account costs related to marketing, insurance and risk mitigation, overhead, legal, and all other business maters needed to be fully viable?

APPROPRIATENESS OF PUBLIC PRIVATE PARTNERSHIP

This area is a critically important component in the evaluation for SCIC. Private goods and services are most successfully delivered by private parties. Public goods and services are generally those goods and services that the private sector cannot provide because of the cost of entry or the inability to exclude and charge for use.

Government enters into the private sector only when there is a compelling need but must do so with caution. Circumstances when public investment in private goods is compelling include:
1) moving the time to market forward (i.e. private sector would get there in 5 years but government can accelerate),
2) expanding the size of a project when private capital is constrained,
3) rescuing a business or business sector to maintain market stability (i.e. GMC or AIG), or
4) enhance local economic development or job growth to overcome natural market asymmetry (rural job growth versus urban job growth)

Our analysis will determine the availability of private sector funding and whether there is a compelling government interest to invest in the private sector technology.

BUSINESS EXPERIENCE

In this section, our team evaluates both the specific business and its history in the market as well as the key principals of the business and their past experience in this or other businesses. In addition, we evaluate whether the combination of key players provides the technological and business breadth to be successful.

LEGAL ACTION

Our team will rely upon the expertise of SCIC's legal counsel as the primary investigator of legal actions. If legal information comes to our attention in our course of due diligence, this will be promptly brought to legal counsel.

SWOT

Our team will fold many of the items above into a SWOT analysis to evaluate the current strengths and weaknesses of the business opportunity in the current market as well as the opportunities and threats as future looking criteria for the business opportunity.

RECOMMENDATION

The goal of our team is to help the SCIC board make excellent long-term financial decisions. We will provide a thorough review based upon the criteria listed above and will make a clear, fact-based recommendation.

TRL 1	Basic principles observed and reported: Scientific problem or phenomenon identified. Essential characteristics and behaviors of systems and architectures are identified using mathematical formulations or algorithms. The observation of basic scientific principles or phenomena has been validated through peer-reviewed research. Technology is ready to transition from scientific research to applied research.
TRL 2	Technology concept and/or application formulated: Applied research activity. Theory and scientific principles are focused on specific application areas to define the concept. Characteristics of the application are described. Analytical tools are developed for simulation or analysis of the application.
TRL3	Analytical and experimental critical function and/or characteristic proof of concept: Proof of concept validation has been achieved at this level. Experimental research and development is initiated with analytical and laboratory studies. System/integrated process requirements for the overall system application are well known. Demonstration of technical feasibility using immature prototype implementations are exercised with representative interface inputs to include electrical, mechanical, or controlling elements to validate predictions.
Mid-Stage RD&D (TRL 4-6)	
TRL 4	Component and/or process validation in laboratory environment- Alpha prototype (component): Standalone prototyping implementation and testing in laboratory environment demonstrates the concept. Integration and testing of component technology elements are sufficient to validate feasibility.
TRL 5	Component and/or process validation in relevant environment- Beta prototype (component): Thorough prototype testing of the component/process in relevant environment to the end user is performed. Basic technology elements are integrated with reasonably realistic supporting elements based on available technologies. Prototyping implementations conform to the target environment and interfaces.
TRL 6	System/process model or prototype demonstration in a relevant environment- Beta prototype (system): Prototyping implementations are partially integrated with existing systems. Engineering feasibility fully

	demonstrated in actual or high fidelity system applications in an environment relevant to the end user.
Late-Stage RD&D (TRL 7-8)	
TRL 7	System/process prototype demonstration in an operational environment- Integrated pilot (system): System prototyping demonstration in operational environment. System is at or near full scale (pilot or engineering scale) of the operational system, with most functions available for demonstration and test. The system, component, or process is integrated with collateral and ancillary systems in a near production quality prototype.
TRL 8	Actual system/process completed and qualified through test and demonstration- Pre-commercial demonstration: End of system development. Full-scale system is fully integrated into operational environment with fully operational hardware and software systems. All functionality is tested in simulated and operational scenarios with demonstrated achievement of end-user specifications. Technology is ready to move from development to commercialization.
Commercial I (TRL 9-10)	
TRL 9	Some commercial units in operation, but not widely manufacturing is custom or tailored to project needs.
TRL 10	Many commercial units in operation- Nth-of-a-Kind, standard design is replicated and used.