University of Utah, Energy Commercialization Center
Final Scientific/Technical Report

PROGRAM PERFORMANCE REPORT

1) **DOE Award Number:** DE-SC0005480
   Recipient: University of Utah

2) **Project Title:** Innovation Ecosystem Development Initiative
   Project Director/Principal Investigator: Robert C. Bell - Robert.Bell@utah.edu

3) **Report Date:** January 17, 2014
   Period Covered: October 1, 2010 – December 31, 2013

4) **Comparison of actual accomplishments with the goals and objectives**

During the Energy Commercialization Center's (ECC) three years in operation, the only thing constant was change. The world of commercialization and cleantech evolved significantly during the time the ECC was formed and operating, including: the availability of cleantech funding lessoned, the growth of incubators and accelerators skyrocketed, the State of Utah created an office dedicated to energy development, the University of Utah was both praised and criticized for its success in commercialization, and the Federal government temporarily shut down. During the three-year grant there were three principle investigators on the grant, as well as three directors for the University's Commercialization Office. Change can be hard for an organization, but as we instruct the companies we support, "Fail fast and fail often, because it is the fastest path to success."

Although there were some unanticipated challenges along the way, the local ecosystem is stronger because of the ECC's efforts. Perhaps the greatest lesson learned was the importance of aligned incentives between key stakeholders in the commercialization process and the need for resources at the company and individual entrepreneur levels. The universities have systems and incentives to commercialize technologies, but creating value and companies generally rest with the individuals and entrepreneurs. Unfortunately the ECC was unable to create a viable mechanism to transfer the commercialization process that successfully aligned incentives and achieve a more effective ecosystem within the Rocky Mountain West. However, the ECC was successful in adding value to the individual ecosystems, and connecting national resources to regional and local needs.

Regarding the ECC's effectiveness in developing a cleantech commercialization ecosystem,

initial inroads and relationships were established with key stakeholders. However, incentives, perceived or real competition, differences in commercialization processes, and culture all played a role in inhibiting the development and distribution of a regional ecosystem and commercialization process. Had the University and the ECC been able to develop a software platform, some of these challenges may have been overcome, but without the final development and release of the Western Innovation Network, the ECC realistically could not scale and distribute a commercialization platform. Further, cleantech startups need to engage in a more intensive customer validation process, and establish strong community connections if they are to succeed in commercializing their products. The university system incentivizes research and access to research funding and risk capital is competitive, so by nature collaboration on commercialization was difficult.

Each of the local ecosystems within the Rocky Mountain West was unique. Utah did not, and does not, have a system outside of the universities to support entrepreneurs and cleantech commercialization. Through the ECC's efforts developing a regional ecosystem, it became clear that successful ecosystems had a community and associated mechanisms that supported local entrepreneurs and startups.

Most importantly the ECC aided in the creation of Utah's cleantech ecosystem, one that supports entrepreneurs and startup companies that need help and support in their efforts to commercialize clean technologies. The absence of support for clean tech from state government and local organizations was a significant impediment to cleantech commercialization. To overcome this challenge, the ECC has formed Sustainable Startups. Sustainable Startups is a new non-profit organization designed to build a culture and community in Utah that supports and understands the importance of cleantech and sustainable development.

While the ECC generated mixed success in building a regional commercialization ecosystem for cleantech, the organization did provide tremendous benefit to startups and the broader public. Over 60 companies were given direct business development support by the ECC, many of whom then generated direct economic development impacts. In addition, the ECC served an important role as community convener, educator and relationship builder through hosting numerous public and private events including: Energize 2013; Millennial Train whistle stop; business plan competition supporter; Clean Tech Open Accelerator organizer; Sustainable Startups Series developer, and much more.

While the ECC did not fully apply, develop, and transmit the University of Utah's TCO commercialization model to cleantech, it nevertheless assisted numerous inventors, entrepreneurs and institutions in furthering the growth of clean energy and energy efficiency technologies. The TCO's commercialization model was not applied to regional clean tech initiatives for several main reasons. First, flaws with the commercialization model were realized after the ECC's formation. Second, leadership changes within the TCO and ECC hampered early organizational development and implementation initiatives. Third, misaligned incentives between the ECC, regional universities, institutions, and the State of Utah resulted in a lack of collaboration and knowledge transfer regarding commercialization. In principle, everyone was aligned and willing to collaborate, but reality was much different and challenging.

Original Objectives

Main Objectives

a) Apply and further develop the commercialization model that has been successfully developed at the University of Utah Technology Commercialization Office (TCO) to clean energy and energy efficiency technologies.

b) Transfer that model to other universities and institutes in the western United States, and build collaborative ties with these universities, private sector capital, and strategic industry players to develop marketable clean energy and energy efficiency technologies.

Specific Objectives

(1) Make the ECC a self-funded entity. This is to be accomplished through fee-based initiatives with industry associates, venture capital, and revenue generation through commercial sponsored research and liquidity events. ECC will eventually be restructured as a private partnership with affiliate institutions, which will contribute to its support by providing deal flow and expertise to sustain operations.

(2) Assist participating Western Universities to increase their rate of commercialization. ECC will screen promising technologies to reduce waste in the technology transfer process and increase efficiency in technology licenses and startups per dollars of research funding.

(3) Share TCO's early stage assessment system. The system will be shared with affiliate institutions to rank, prioritize and bundle the most promising energy-related technologies for commercialization.

(4) Replicate the University of Utah's commercialization ecosystem. Engage key stakeholders required for successful energy commercialization throughout the West. This requires active participation from state officials, venture capitalists, angel groups, entrepreneurs, students, education centers, universities, researches and service providers.

(5) Provide resources for the inventor/entrepreneur. This includes mentoring, proof-of concept validation, prototype guidance and legal expertise. The Center will also provide access to the University's Venture Bench Program. The ECC will also access external resources including the Oregon State Accelerator, The Energy Dynamics Lab at Utah State and the Cleantech Open. Additional resources will be added as affiliate institutions are added to the center.

(6) Create the necessary organizational infrastructure. We will hire a Director and support staff, build a website, create a database, create a brand, develop a marketing plan, host a regional conference and develop education and outreach programs to involve other universities, institutes, colleges and students.

(7) Complete partnership agreements between the ECC and western universities. This will be done in order to assess and commercialize CE and EE technologies.

(8) **Implement the "Energy *Well*Invested" (EWI) initiative.** This will bring industry, end users, and venture capital early-on into the commercialization process.

(9) **Develop meaningful metrics to help understand the impact of university-originated EE and RE technologies on society**. This will include impacts on job creation, fossil energy dependency, global climate change, and factors that contribute to the successful commercialization. This will include technologies assessed, licenses executed, start-ups created, and dollar-cost efficiency in commercialization of state and federal grants.

Comparison of Objectives

Specific Objective 1: Create a self-funding mechanism for the ECC.

The ECC was successful in achieving this objective, however not through the structure first proposed. The ECC's initial ever-green plan was to develop a public-private partnership between participating venture capitalists, institutions and universities, utilizing a fee and/or membership structure. This plan was ultimately unsuccessful. The value proposition seemed to be confusing. Most organizations, again, agreed in principle but aligning incentives to commercialize technologies appeared to be of interest, aligning incentives and value was difficult. Participating institutions and universities did not have the incentive and could not justify the value in a financial relationship with the ECC. Essentially, for free some partners were willing to engage in the process, but a financial relationship proved unappealing.

While this fundraising scenario proved unproductive, the ECC was able to raise some private funds in 2013 to start a follow-on organization, Sustainable Startups. Sustainable Startups has incorporated as an independent non-profit outside of the University of Utah and is pursuing a number of opportunities to generate revenue through grants, donations, membership fees and consulting services. Sustainable Startups narrows the geographical scope of the ECC to Utah, and expands its entrepreneurial support to companies looking be both environmentally and fiscally sustainable.

Specific Objective 2: Assist participating Western universities by increasing their rate of commercialization.

The ECC had mixed success in assisting other universities with commercialization efforts. While most Western universities proved difficult to engage, the ECC proved more successful with assisting a number of non-western universities.

The engagement process with Western universities was mired with mistrust and misaligned incentives. Many western universities saw the ECC's direct affiliation with the University of Utah as competition and did not trust the ECC's intentions. Specifically, there was confusion and conflict over IP rights that made collaboration even more difficult. The techs that were received from Western universities were often opportunities that had already proved difficult to commercialize and likely already failed ventures.

However, under the leadership of Varun Gowda, the ECC was able to build relationships with some non-western universities including: Penn State; Michigan State; and Rutgers. The ECC

engaged with a number of their technologies and helped to review, analyze and de-risk the technologies resulting in effective knowledge transfer. This de-risking process proved costly however, as it required immense resources and produced no revenue. The initial partner universities were more than willing to have the ECC add value to their IP at no cost to themselves. However, the innovation ecosystem was larger, but it was not scalable especially without revenue to support the value.

Commercialization assistance was also hampered due to numerous changes and developments within the University of Utah's Technology Commercialization Office (TCO), which was recently rebranded to better reflect the activities of the Technology Venture Commercialization (TVC) as the office was refocused under Bryan Ritchie's direction. This refocusing of efforts was a priority for the University and it appears to have made a significant improvement over the office's ratings and effectiveness. Although the leadership changes at the TCO were imperative, these changes resulted in a succession of leadership changes within the ECC as well, ultimately causing lost time, organizational confusion, inefficiency and stagnation in development.

During one of these transitions, ECC relocated within the University to the Energy and Geosciences Institute (EGI) during the first two quarters of 2012. This move was initially made to improve access to industry and build on the success that EGI had bridging the gap between industry and energy research, but ultimately it impaired commercialization efforts, because the EGI corporate partners perceived value for EGI was in the research realm, not the commercialization realm.

Specific Objective 3: Share the TCO's early stage assessment system.

The ECC was unable to achieve this goal for two principle reasons. First, a significant amount of internal change occurred within the University of Utah's commercialization process, resulting in a less effective system than initially perceived. Second, the inability of the ECC to establish solid partnerships with other western universities prevented successful knowledge transfer of the early stage assessment system.

By 2010, the University of Utah's TCO was seen as a commercialization powerhouse and was recognized as a leader in startup creation, over rivals such as MIT and Stanford. However, criticisms began surfacing soon after the ECC was formalized, asserting that the TCO and its leader, Brian Cummings, were creating shell companies containing no commercial viability, funding or management. After these criticisms appeared, Brian Cummings left the University of Utah and the TCO was reorganized as Technology Venture Commercialization (TVC). Hence, much of the stated success of the TCO's commercialization process proved shallow, and the importance of sharing the early-stage assessment was reduced.[1] That said, the restructuring and rebranding of the TCO into the TVC has begun to fix the initial flaws of the original commercialization system, and positive results are on the rise.

While components of the TCO's commercialization process were less effective than initially perceived, there remained good knowledge to be shared with other universities. However, due to

[1] This analysis is based upon ECC board meeting notes and news articles. No current ECC staff members were present and engaged during these events.

the inability of the ECC to generate meaningful partnerships with western universities (as discussed in Objectives 2 and 7), the sharing of commercialization knowledge was limited. Within Utah specifically, the three major research universities (Utah, BYU, and Utah State) and state government do cooperate on research initiatives. However, both real and perceived competition issues remain, making partnership difficult.

Finally, the State of Utah chose to focus its energy efforts through USTAR and created the Office of Energy Development, within a year of the ECC's founding. This created local commercialization competition for the ECC, as well as confusion. The state's stance and action on energy development resulted in conflict from previously supportive stakeholders, including ECC board members.

Specific Objective 4: Replicate the University of Utah's commercialization ecosystem.

Although substantial efforts were undertaken by the ECC to replicate the University of Utah's commercialization ecosystem, it was ultimately unsuccessful.

The ECC and the TCO were co-located and this appears to be a key component of why western universities viewed the ECC with some degree of suspicion. There was some concern that the Western Innovation Network (WIN) and the ECC were being comingled and the value propositions between the two were confusing. Comments from ECC board members indicated that the lines separating WIN and ECC were blurred and that this perception existed both internally and externally.

The ECC was relocated to Energy and Geoscience Institute (EGI), whose focus was research and commercialization for energy projects, but they were primarily for fossil fuel based conventional and unconventional projects. EGI had a strong alignment with industry and memberships, but again the value proposition was misaligned and EGI's board and members weren't interested in collaborating or shifting focus to renewable energy or energy efficiency.

Specific Objective 5: Provide resources for clean tech inventors and entrepreneurs.

The ECC demonstrated success in providing business development resources to inventors and entrepreneurs, especially during the second and third year of the grant period. The ECC worked with over 60 companies and entrepreneurs on product and milestone development and connected them to additional business development resources. Consultations varied from one-time meetings on customer development, strategy, milestone development and product viability, to intensive mentoring and introduction to strategic partners and investors.

In 2013, the ECC held its Energize Summit, within which it organized a business competition focused on emerging ventures with clean energy technologies. The top ten finalists for Energize Emerging Venture Competition (EVC) pitched on day two of the summit to be selected for the $10,000 cash award plus $7,500 of in-kind services. Energize EVC had 22 applicants, which included 16 from Utah and 2 each from Arizona, Colorado, and Idaho.

Also in 2013, the ECC facilitated an entrepreneurial roundtable with DOE Deputy Secretary

Daniel Poneman and 12 local clean energy companies and entrepreneurs. The roundtable gave local entrepreneurs an opportunity to showcase their work, express insights regarding ecosystem needs and better understand DOE priorities and resources. Later in the year, the ECC held the Sustainable Startups Series, a three-part panel discussion series with local entrepreneurial leaders running established, sustainably minded businesses. The Series attracted over 200 attendees and was designed to inspire and educate local entrepreneurs about the successes and challenges of sustainable business development.

Specific Objective 6: Create the necessary organizational infrastructure.

Overall, the ECC demonstrated success in creating a strong organizational infrastructure. Throughout the project, the ECC maintained a director and strong support staff. (Although, leadership changes within the TCO impacted ECC leadership and hampered organizational consistency.) The ECC developed two websites designed to encourage collaboration, build ecosystem connections and disperse valuable information for inventors, entrepreneurs and the general clean tech community.

The ECC was able to develop strong branding as a leader in clean tech development in the state and the region, along with a detailed database of clean tech initiatives within Utah, and to some extent the Rocky Mountain Region. In April of 2013, the ECC hosted its Energize Sustainable Energy Summit at Snowbird Ski Resort, bringing together over 200 regional clean tech leaders together for collaborative planning and discussion.

While the organization had difficulty conducting educational and outreach initiatives with other western universities, it did lead and participate in a number of educational and community-building opportunities within Utah including: the Millennial Trains Project, Solar Day Salt Lake, Green Drinks SLC, the Sustainable Startups Series, and developed a blog and newsletter centered on both local and regional clean tech issues. Finally, the ECC engaged numerous students at the University of Utah through classroom lectures, organizational internships and collaboration with the University's Foundry Program.

Specific Objective 7: Complete partnership agreements between the ECC and western universities

The ECC had mixed success in completing partnership agreements with western universities. After initial results appeared promising the effort stalled. The ECC made changes to the partnership agreement in an attempt to make it more attractive, but most western universities proved difficult to engage. The ECC had greater success partnering with a number of non-western universities, but the effort to execute partnership agreements with universities was ultimately abandoned.

The Nevada Institute of Renewable Energy Commercialization was the first partner to sign the ECC's Associate Membership Agreement but the ECC struggled to bring on additional partner universities. Three changes were made to the partnership agreement in an effort to make partnership with the ECC more attractive. These changes included waiving partnership fees, no longer requiring partner attendance at ECC events, and reducing the number of individual technologies universities were required to submit to the ECC.

These changes failed to make a difference, however as the ECC engagement process with Western universities was mired with mistrust. Many western universities saw the ECC's direct affiliation with the University of Utah as competition and did not trust the ECC's intentions. Continued confusion and conflict over IP rights made collaboration even more difficult and the techs that were received from Western universities were often opportunities that had already proved difficult to commercialize and likely already failed ventures.

However, under the leadership of Varun Gowda, the ECC was able to sign partnership agreements with some non-western universities including: Penn State; Michigan State; and Rutgers. The ECC engaged with a number of their technologies and helped to review, analyze and de-risk the technologies resulting in effective knowledge transfer. This de-risking process proved costly however, as it required immense resources and produced no revenue. Hence, the success seen here was not scalable and the effort to execute partner agreements with other universities was abandoned.

Specific Objective 8: Implement the "Energy *Well*Invested" (EWI) initiative.

The ECC had mixed success in implementing the EWI initiative. Initial engagement with industry and venture capital was promising, but the lack-luster results in attracting promising technologies through university partner agreements hampered this initiative.

Stakeholder interest was strong early on and the ECC found support from industry and venture capital institutions including Pacificorp, Questar, Schlumberger and Renewable Tech Ventures (RTV), each of whom had representatives on the ECC's Advisory Board. An instance in which Schlumberger provided valuable feedback early in the process of vetting a water treatment technology demonstrated the potential of this approach and venture capitalists expressed excitement at having a platform for getting early exposure to promising new technologies.

Stakeholder interest waned as the ECC struggled to acquire promising technologies and no clear process was established for engaging stakeholders early in the vetting processes. Stakeholders began to doubt the value of the initiative and without demonstrable successes the ECC found it difficult to attract additional support from industry, finance and end-users.

The leadership changes at the TCO and ECC were highly disruptive in the effort to implement this initiative, as well. New leadership was required not only to re-establish previous relationships, but now had to overcome the disillusionment of early stakeholders and the ECC's failure to gain traction.

Specific Objective 9: Develop meaningful metrics to help understand the impact of university-originated EE and RE technologies on society.

The ECC had mixed success in developing meaningful metrics to help understand the impact of university-originated EE and RE technologies on society. This objective was addressed early on in board meetings, but no concrete metrics were adopted until the metrics developed jointly by the five ecosystems funded by the DOE were completed.

These metrics captured much of the economic impact of commercialization efforts, including

companies established, private and public funding obtained, and jobs created. However, the ECC was not able to capture whether and how these technologies had an impact on other aspects of society such as health, environment, and cost of living.

5) Key Accomplishments Under These Goals:

Following are highlights of some of the ECC's key accomplishments in the past three years.

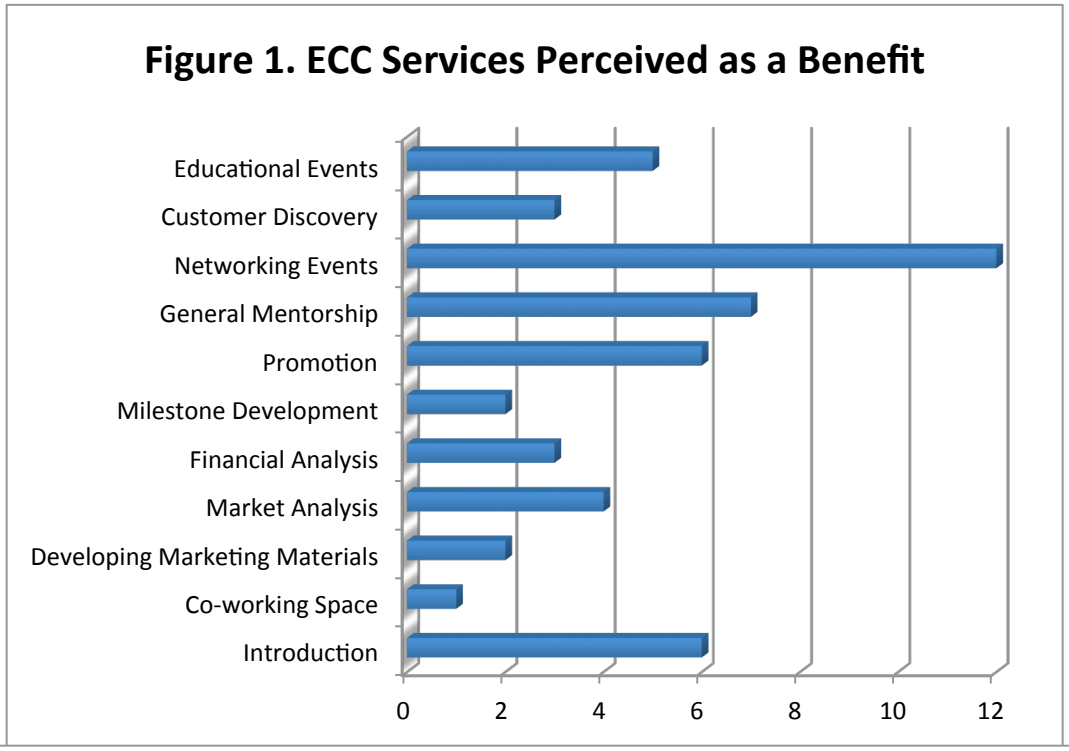
- Signed Associate Member Agreements with The Nevada Institute of Renewable Energy Commercialization; Penn State; Michigan State; Boise State and Rutgers.
- Brought 52 Technologies under its umbrella, including 10 energy efficiency technologies and 42 renewable energy technologies.
- Helped organize a regional renewable energy summit that evolved into the annual Utah Governor's Energy Summit headed by the Utah Office of Energy Development.
- Organized Energize 2013, a two-day sustainable energy ecosystem summit and business competition, focused on bringing together a diverse and influential set of stakeholders for interactive networking, collaborative problem solving, and inspiring dialogue. Over 160 people attended the two-day summit on April 11th and 12th.
- Organized a business competition focused on emerging ventures with clean energy technologies. The top ten finalists for Energize Emerging Venture Competition (EVC) pitched on day two of Energize 2013, for an opportunity to be selected for the $10,000 cash award plus $7,500 of in-kind services. Energize EVC had 22 applicants, which included 16 from Utah and 2 each from Arizona, Colorado, and Idaho.
- Supported and hosted events to provide the local community an opportunity to learn more about the ECC's mission and highlight the momentum behind clean energy development in Utah. Our largest event had over 200 people from the local business, academic and environmental communities attended the event; this was the largest gathering during the 6 years of the event's history.
- Hosted an entrepreneurial roundtable with DOE Deputy Secretary Daniel Poneman and 12 local clean energy companies, entrepreneurs and community ambassadors. The roundtable gave local entrepreneurs an excellent opportunity to showcase their work, express insights regarding ecosystem needs and hear from Deputy Secretary Poneman regarding DOE priorities and resources. We also took a quick tour of

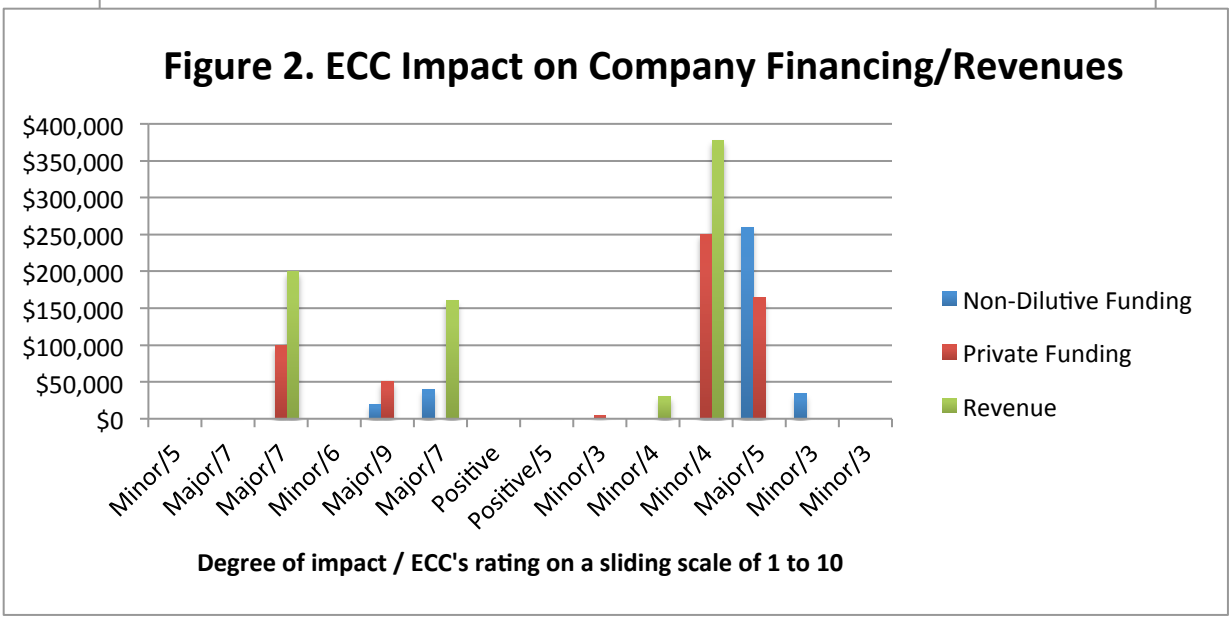
  PK Clean's 10 ton/day plastics to oil pilot plant.
- ECC Executive Director, Robert Bell was appointed as the Utah State Director for the Clean Tech Open and provided support to Utah companies applying to the accelerator/business competition.
- Consulted over 60 entrepreneurs on product and milestone development and connected them to additional resources. Consultations varied from one-time meetings to discuss customer development, strategy, milestone development and product viability to intensive mentoring and introduction to strategic partners and investors.
- Produced the Sustainable Startups Series, which consisted of three separate educational and networking events that took place in September, October and November of 2013. The series attracted over 200 attendees to hear from founders and executives from companies such as Black Diamond, Adobe, eBay, Powdr Corp, Goal Zero, Power

Practical, Space Monkey, PK Clean, EcoScraps and Momentum Recycling about their efforts to strengthen environmental sustainability through their business practices, services and product offerings.

- Established a co-working office space in downtown Salt Lake City for entrepreneurs committed to environmentally sustainable business practices.

Following are the self-reporting results from 14 companies that responded to the ECC's final request for information. Unfortunately with the turnover at the ECC, supported companies from year 1 and 2 didn't provide feedback. Figure 1 illustrates the areas in which respondants believed the ECC was benefial to their commercialization goals. Figure 2 shows how those same respondants scored the ECC (x-axis labels), compared to the financial benefits (y-axis). Figure 2 shows the sources of funding for private, dillutive, and revenue that the repondants on the same graph.





6) Cost Status:

The ECC was unable to find a sustainable model during the time of the grant. However, Sustainable Startups completed a successful spin out from the University of Utah and incorporated as a Utah-based non-profit entity. Sustainable Startups' mission is to continue building an innovation ecosystem by fostering sustainably focused entrepreneurship in Utah. Below is the final summary of the ECC's budget through the completion of the grant. Although we are slightly over budget, the remaining money raised from Wells Fargo was used to cover the expense. The remaining funds were than granted to Sustainable Startups as seed money for growing the non-profit.

Award Nbr - DESC0005480 - ECC Cumulative Cost Status as of December 31, 2013						
	Projected Expenditures			Actual Expenditures		
	Total	Federal	Non-Federal	Total	Federal	Non-Federal
Direct Costs						
Salaries				$528,222.09	$449,545.62	$78,676.47
Employee Benefits				$166,698.88	$145,995.92	$20,702.96
Total Salary, Wages and Fringe:	**$728,196.00**	**$646,680.00**	**$81,516.00**	**$694,920.97**	**$595,541.54**	**$99,379.43**
Travel	$48,000.00	$33,000.00	$15,000.00	$61,504.54	$49,358.14	$12,146.40
Materials and Supplies	$9,000.00	$0.00	$9,000.00	$1,372.13	$0.00	$1,372.13
Lab & Technical Supplies	$2,400.00	$0.00	$2,400.00	$12,216.84	$9,364.14	$2,852.70
Publication Costs	$100.00	$0.00	$100.00	$0.00	$0.00	$0.00
Consultant Services	$19,322.00	$15,822.00	$3,500.00	$18,500.00	$15,000.00	$3,500.00
Professional Development	$0.00	$0.00	$0.00	$0.00	$0.00	-
Business Meals/Entertainment	$0.00	$0.00	$0.00	$0.00	-	-
ADP/Computer Services	$3,000.00	$0.00	$3,000.00	$11,474.23	$4,987.00	$6,487.23
Equipment or Facility Rental	$22,500.00	$0.00	$22,500.00	$15,001.46	$13,426.46	$1,575.00
Regional Event	$45,000.00	$0.00	$45,000.00	$44,606.98		$44,606.98
Other Direct Costs	$0.00	$0.00		$26,414.30	$15,463.79	$10,950.51
Subtotal Direct Costs:	$877,518.00	$695,502.00	$182,016.00	$886,011.45	$703,141.07	$182,870.38
Indirect Costs					-	-
F&A	$434,979.00	$351,228.00	$83,751.00	$431,553.05	347,802.05	$83,751.00
Totals	**$1,312,497.00**	**$1,046,730.00**	**$265,767.00**	**$1,317,564.50**	**$1,050,943.12**	**$266,621.38**
Budget Remaining	($5,067.50)	($4,213.12)	($854.38)			

7) Schedule Status:

The ECC was on schedule with the funds and completed its research within the time frame allowed. The no cost time extension was important to help provide a buffer to properly allocate the funds.

8) Changes in Approach and Supporting Reasons:

The ECC has continued to refocus its approach on building a local and regional ecosystem and we have further narrowed our focus to filling Utah's sustainable business development gap through entrepreneurship in Salt Lake City. To accomplish this, Sustainable Startups was created, a non-profit organization independent of the University of Utah. Sustainable Startups looks to further Salt Lake City's sustainable development through entrepreneurship. Specifically, Sustainable Startups promotes the growth of sustainable businesses through a combination of development services for entrepreneurs, business and sustainability

education and community events.

The ECC took a number of steps to identify and secure its proper place within the innovation ecosystem as the DOE innovation ecosystem funding closes. As indicated in the draft peer review report, the University of Utah may not be an ideal home for regional or even local innovation ecosystem initiatives. The Energy Commercialization Center took that feedback seriously and discussed options and opportunities with the University. Through these discussions with the University it became clear that there was not currently an opportunity for follow-on funding for the ECC with the current direction and initiatives. In fact, the University's Technology Commercialization Office (TCO) also underwent and completed a pivot during this period as well.

Due to these reasons, Sustainable Startups is not directly associated with the University of Utah. However, it is engaging a number of community partners to achieve organizational goals including: Salt Lake City, Salt Lake Community College, Renewable Tech Ventures, the Community Foundation of Utah and others. Sustainable Startups plans to help build a strong community in Salt Lake supportive of environmentally sensitive businesses and clean tech, which will then provide the ecosystem necessary to develop clean tech at a regional scale.

9) Actual or anticipated problems or delays and actions taken or planned to resolve them:

No. The spin out was successful. The non-profit is alive and well. Things are moving forward based on lesson learned.

10) Any absence or changes of key personnel or changes in consortium/teaming arrangement:

There were multiple key personnel changes throughout the ECC's operation. The first key change was the retirement of Jack Hamilton in Q4 2011. About the same time there were some changes within the TCO office and Brian Cummings left for an opportunity at Ohio State. During those two major changes a number of the key personnel changed over, requiring the ECC to essentially reboot. Varun Gowda from EGI assumed the responsibility of the ECC at that point. Varun hired Michael Wellman and Robert Bell to help rebuild the ECC under EGI. Although the intentions were to more closely align the ECC with industry and EGI's corporate sponsors, EGI's board didn't believe the ECC's mission and objectives were a good fit. Hence, Robert Bell assumed responsibility for the ECC's direction at the end of Q1 2013 and moved it back to the TCO under Bryan Ritchie. In all there were 27 staff members through the ECC's operation. Three (3) of those were ECC Directors and Principle Investigators, fourteen (14) of them were support staff, and ten (10) were interns.

11) Products Produced and Technology Transfer Activities: None.

SPECIAL STATUS REPORT

1. **Developments that have a significant favorable impact on the project:** None
2. **Problems, Delays, or Adverse Conditions:** None

Index	Metric	Metric Description	Quantity Count #	Quantity Funding $	Metric Identifier	Metric Elaboration
A	**Commercialization Milestones**					
1	*Follow-on funding raised by startups nurtured by ecosystems*	Please list one funding instance per row, and include both the company name and the name of the funder, if disclosable.	1	$126,204	Other Competitions	Company: POWERPOT - www.powerpot.com, a Utah start-up was nurtured by ECC and also was awarded $500 award money as part of the Utah Entrepreneur Challenge - Cleantech Section to help participate in the DOE cleantech business plan competition by CU CLeantech. They have successfully raised over $100K till date through crowdfunding platform kickstarter. More info at http://www.kickstarter.com/projects/1203647021/the-powerpot
			1	$180,000	DOE EERE Program Funds	Company: NAVILLUM NANOTECHNOLOGIES LLC - http://www.navillum.com a University of Utah energy efficient quantum dot synthesis start-up won the regional National Business Plan Competition under CU cleantech and has NSF grant funding totalling $180K.
			1		Angel or Other Seed Funds	Company: SEASONAL ENERGY - University of Utah geothermal heating and cooling start-up received an undisclosed amount from angel investors/private. Not disclosed to ECC.
			1		Angel or Other Seed	Company: SOLON - University of Utah licensed solar cell
			1	$2,677,667	Non-DOE Federal	ARPA- e funding for ECC nurtured technology - ADVANCED
			1		Angel or Other Seed	HOT (Heightened Ozonization Technology) - A University of
			1	$750,000	VC - Series A	Power Practical received its first round of private equity
			1	$104,700	DOE EERE Program Funds	Inviroment won the $100k prize at CU Cleantech
			1	$150,000	STTR	Fluidtracer, Inc. received a phase I STTR grant
			1	$30,000	State Funds	Amaron Energy received funding from the Utah Biomass Resources Group
			1	$40,000	State Funds	Navillum - Q3 TCIP recipient for Quantum Dot development
			1	$40,000	State Funds	RTMSR - Q3 TCIP recipient for a closed loop geothermal efficiency development
			1	$40,000	Angel or Other Seed Funds	Amaron Energy private funding (no further details)
			1	$225,334	Non-DOE Federal Funds but not SBIR (explain in elaboration)	Portion of funds POTENTIALLY allotted to Amaron Energy for 2 year joint project with USU, UofU and Amaron Energy utilizing USDOT funds granted by Western Sun Grant Regional Center.
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	**TOTAL**	**14**	**$4,363,905**		
2	*Total number of startups incorporated*	List names and EERE program of firms not included elsewhere on this form if desired.	1	N/A	Advanced Materials	One of our winning teams - Quantum Nanotechnologies used their prize money to file their incorporation and the company is incorporated as a University of Utah start-up.
			1	N/A	Biomass & Biofuels	The second start-up is a joint-venture between University of Utah and BYU and funded by both Universities currently and actively looking at grant and private funding for demonstration of technology and commercialization.
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	**TOTAL**	**3**	**N/A**		
3	*Number of jobs created*	Please note number of FTE by company on individual rows.	2.0	N/A	Geothermal	Seasonal Energy
			2.0	N/A	Advanced Materials	Navillum Nanotechnologies
			1.0	N/A	Solar Photovoltaic	Solon
			1.0	N/A	Hydropower, Wave and Tidal	HOT is using their funding to hire an engineering grad student to help build a mobile pilot unit
			5.0	N/A	Vehicles and Fuels	PK Clean brought on 5 interns to further development of their patented process converting recycled plastics to oil.
			4.0	N/A	Electricity Transmission and Distribution	Simplure
			1.0	N/A	Building Energy Efficiency	Retrolux
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	**TOTAL**	**19.0**	**N/A**		
4	*Number of technologies licensed, revenues received*	Please include a brief description of the technology, the licensee, and the licensor in each case.	1		Solar Photovoltaic	Licensee didn't want to disclose this information
			1			HOT has an exclusive option with Jon Krupa of Clarke Capital Partners
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	**TOTAL**	**2**	**$0**		
5	*Number of patents and disclosures filed*	Please include a brief description of the subject of the patent or disclosure.	9	N/A		Various reported from our startups.
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	**TOTAL**	**9**	**N/A**		
B	**Entrepreneurial Services Provided**					
1a	Total number of applicants to competitions	Providing a list of applicants is optional.	6	N/A	N/A	Finalists and applicants through the 2012 Utah Entrepreneur Challenge in April were nurtured by ECC to apply for both CU cleantech and Cleantech Open.
			4	N/A	N/A	The ECC applied on behalf of Navillum, Vivint Solar, The ECC, and Wells Fargo for multiple categories in the Utah Governor's Energy Summit award process
			22	N/A	N/A	The ECC's first annual $10k business competion in conjunction with the Energize 2013 summit had 22 applicants - 16 from utah and two each from ID, CO, and AZ.
			2	N/A	N/A	Cool Angle applied to the Clean Tech Open and Dragonfly Solutions applied to Hawaii Excelerator
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	**TOTAL**	**34**	**N/A**		
1b	Total number of awardees of competitions, and amounts awarded to each winner	Fellowships count as awardees. Please list the names and amounts for all awardees.	3	$0		Navillum finished 2nd place in the efficiency category at Cleantech Open finals, Dragonfly Solutions was awarded Cleantech Open Alumni of the Year, Navillum was a finalist for the Utah Governor's Energy Summit innovation award
			1	$17,500		ADTec won the ECC's buinsess competition
			1	$0		The ECC won The Utah Business Magazine "Sustainability Award"
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	**TOTAL**	**5**	**$17,500**		
2	Total number of ventures served - if desired, please enumerate the general business area, and the name of either the venture or the principal individuals	For purposes of this document, a venture is any effort to commercialize one or more products or services, whether or not it is formally organized or incorporated. A startup is a venture that has formally filed for corporate recognition, whether for profit or otherwise.	60	N/A		Viologen, HOT, Navillum, Aerobic Solar, Amaron Energy, CLOU, Erik Midas BioEnergy, PK Clean, Cool Angle, Simplure, Inviroment, Via Motors, Space Monkey, Helix Hydro, RTMSR, Machtech Automotive Corporation, AD Tec, Bearing Analytics, Power Practical, Arbsource, Sustain3, Solar Steam Innovations, Amaron Energy, Echelon Engines, Enerlyte, Greenleaf Energy, Earth Renaissance Technologies, Empowerable.org, Environmental Certificate Exchange, Envoy Energy Corporation, Inotec, Nanosynth Energy Materials, Pure Current, Retrolux, Score Algae Co., Swift Tram, Chemical Looping, Goal Zero, [illegible]
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	**TOTAL**	**60**	**N/A**		

Index	Metric	Metric Description	Quantity		Metric Identifier	Metric Elaboration
			Count #	Funding $		
3	Total number of technologies vetted	Listing the specific technologies in separate rows is desirable, but not required. Entering only the most important subset is also an option.	10	N/A		All companies we are working with are in continuous vetting and derisking and identification of "the ask"
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	TOTAL	10	N/A		
4	Number of mentors/Executives In Residence (EIRs) placed with clients	Inserting a list of mentors, mentees, and general type of advice/services provided on individual rows would be ideal.	3			Rob Wuebker, Ken Krull, Andy Buffmire
			3			Jack Hamilton, Tim Loftis, Jack Brittain
			2			Don Mapes - Roofing Materials Expert, Priyanka Bakaya - Clean Tech Open mentorship,
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	TOTAL	8	$0		
C	**Ecosystem Development**					
1	Number, amount, and source of funds raised by ecosystem	Please provide a list of funders, amounts, and type of funding source using separate rows.	1	$50,000		Awarded by Wells Fargo
			1	$7,500		Sponsorships in conjunction with Energize 2013
			1	$23,700		Funding acquired from ticket sales and sponsorships for "Energize 2013"
			1	$3,174		Funding acquired from ticket sales and sponsorships for "Sustainable Energy," the first event in the "Sustainable Startups Series
			1	$2,000		Office of Energy Development towards bringing in outside sponsors for the Governors Energy Summit in Salt Lake City, Utah
	To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Rows"	TOTAL	5	$86,374		
2	Significant collaborations with other organizations/partners, whether a university, industry partner, non-profit, government agency, or otherwise	Please describe the nature of each collaboration and its signifcance to the ecosystem using individual rows	40		N/A	See Mind Map in appendix A
			1		N/A	Wayne Brown Institute, WBI- WBI programs assist companies in shaping themselves into fundable entities; help them develop a strategy to obtain the funding they need; and, when appropriate, provide introductions to the investment or banking communities.
			1		N/A	Penn State University - Research Partner providing energy technologies
			1		N/A	Michigan State University - Research Partner providing energy technologies
			1		N/A	University of Wisconsin Madison Research Foundation - Research Partner providing energy technologies
			1		N/A	Rutgers University - Research Partner providing energy technologies
			1		N/A	Marsh - Strategic Partner providing emerging technology risk and advisory solutions to the ecosystem
			1		N/A	Navigant - Strategic Partner providing emerging technology investment risk analysis and consulting practice for the VC community and energy coporations
			1		N/A	NJIT - Research Partner providing energy technologies
			1		N/A	Colorado State University, CSU Ventures - Strategic Partnership to accelerate energy technology commercialization by cross promoting and cross leveraging resources and opportunities
			1		N/A	ATI Incubator - University of Texas, Austin : Strategic Partnership to provide operational guidance and infrastructure support for ECC start-ups as and when required and also to leverage ATI network to source entreprenuers.
			1		N/A	DRI, Desert Research Institute, Nevada- Regional Research Partner providing energy technologies
			1		N/A	Clean Tech Open - CTO - Strategic Partner to provide platform for Utah Entreprenuer Challenge participants and others nurtured by ECC in the clean energy space.
			1		N/A	DOW Chemicals - Industry Partner interested in sourcing technologies with commercial potential and engaging in energy innovation
			1		N/A	Siemens - Industry Partner interested in sourcing technologies with commercial potential and engaging in energy innovation and commercial sponsored research
			1		N/A	Energy Strategies - Industry Partner interested in providing commercialization consulting advice on technologies with commercial potential and engaging in energy innovation
			1		N/A	Solar Reserve - Industry Partner interested in seeking assitance for solar thermal commercialization in the state of utah through various solar thermal projects in development and engaging in energy innovation
			1		N/A	ETS Partners - Industry Partner interested in sourcing technologies with commercial potential and engaging in energy innovation
			1		N/A	Polar Star - Darthmouth Company- Industry Partner interested in seeking assitance for commercialization and engaging in energy innovation
			1		N/A	NUCOR - Regional Industry Partner interested in seeking assitance for commercialization and engaging in energy innovation
			1		N/A	Rocky Mountain Power - Industry Partner interested in sourcing emerging energy technologies with commercialization potential that impact the utility sector and engaging in energy innovation
			1		N/A	US BioRemediation, Inc. (USBRI) Industry Partner interested in seeking assitance for commercialization and engaging in energy innovation
			1		N/A	The Nevada Institute for Renewable Energy Commercialization , NIREC - Strategic Partner working with ECC to transform clean energy ideas into sustainable enterprises in the Mountain West region with a special focus on Nevada.
			1		N/A	Oregon State University, OSU - Research Partner providing energy technologies
			1		N/A	USTAR, Utah Science Technology and Research Initiative in Utah - Strategic Regional Partner. USTAR has created a number of research teams at the University of Utah and Utah State University. Spearheading these teams are world-class innovators who are working with ECC to collaborate with industry to develop and commercialize new technologies

To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Row".	**TOTAL**	**64**	**$0**		
3 Number of new outreach activities launched	Please list the specific activities, and provide a brief description of each by inserting separate rows.	1	N/A		Relaunch of website
		1			ECC Blog
		1			Linkedin Discussion Group
		1			Salt lake Green Drinks
		1	$23,700		Energize Summit and Business Competition
To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Row".	**TOTAL**	**5**	**N/A**		
4 Target audience responses to outreach activities	Quantitative metrics in this category will probably be easier to obtain from online tools, but that does not preclude the inclusion of responses from activities that do not require an iPhone in order to participate.	160	N/A	Real	Energize 2013 attendees
		200	N/A	Real	SLC Green Drinks attendees (best attended event in organization's 6 year history)
		310	N/A	Virtual	Facebook Likes
		99	N/A	Virtual	Linkedin Discussion Group members
		95	N/A	Virtual	Twitter followers
		144	N/A	Virtual	Unique visitors to website
		126	N/A	Virtual	Unique visitors to blog (These are only the unique users directed from Facebook to our blog as we are still setting up analytics).
		126	N/A	Virtual	Newsletter subscribers
		250	N/A	Real	Sustainable Startups Series - Sustainable Energy
To create new rows, select this cell then on the "Home" tab, under "Cells" select "Insert" then "Insert Sheet Row".	**TOTAL**	**1,510**	**N/A**		