

NURTURING ENTREPRENEURSHIP AND EMPLOYMENT GROWTH: *INITIATIVES ON AND BEYOND CAMPUS*

**Lessons From the University of New Hampshire's
Green Launching Pad**

Ross Gittell

*James R Carter Professor
Whittemore School of Business and Economics
University of New Hampshire*

The most difficult challenges, including job creation in a weak economy, will require market-based solutions undertaken by entrepreneurs most of whom start as self-employed and need help to grow

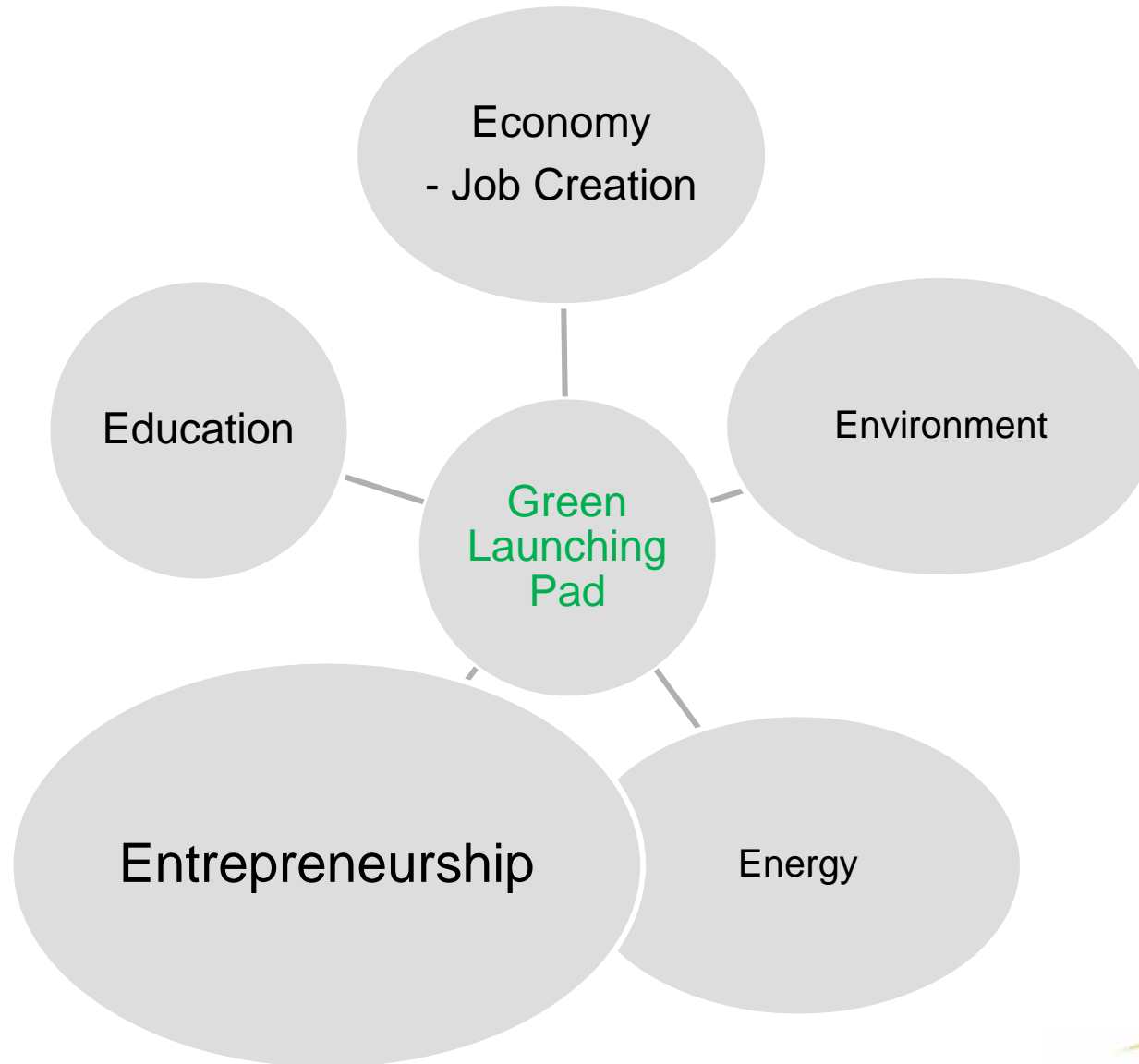
Green Launching Pad

- Collaborative Partnership of Key Stakeholders



- Founded at the Intersection of Entrepreneurship and Economic and Environmental Concerns
 - *to use Entrepreneurship to Advance State Economy and in Support of the State Climate Action Plan*

Five “E”s of GLP



Entrepreneurship & “Green/Clean Jobs”

- It is an area of growth opportunity, especially, if tied to regional economic and technological strengths and environmental concerns
- The Brookings (2011) analysis – *Sizing the Clean Economy* -- shows more jobs in clean industries in 2010 than in 2007 nationally and in many states in the Northeast
- Can use entrepreneurship to improve environment and economy at same time

“Green” Growth Industry Segments, Brookings (2011)

Job Growth and Median year of Establishment Birth by Clean Economy Segment

Segment	Absolute Change in Jobs, 2003-2010	Annual Average change, 2003-2010 (%)	Median Year of Establishment Birth
Wave/Ocean Power	273	20.9	2005.5
Solar Thermal	3,732	18.4	2001
Wind	15,110	14.9	2004
Carbon Storage and Management	228	13.3	2002
Solar Photovoltaic	12,286	10.7	2005
Fuel Cells	3,499	10.3	2000
Biofuels/Biomass	9,296	8.9	2004
Smart Grid	7,001	8.6	1999.5
Conservation	121,147	7.2	1996
Professional Energy Services	18,702	6.9	2001
Professional Environmental Services	51,793	6.8	1996
Geothermal	998	6.7	1998
Green Architecture and Construction Services	19,678	6.4	1989
Renewable Energy Services	687	6.3	2002
Electric Vehicle Technologies	5,447	6.3	2001.5
Regulation and Compliance	46,826	5.9	1995
Recycling and Reuse	39,668	5.4	1993
Remediation	15,539	4.7	1996
Air and Water Purification Technologies	6,858	4.7	1993
Public Mass Transit	82,601	3.9	1989
Waste-to-Energy	754	3.7	1990
Waste Management and Treatment	79,401	3.3	1994
HVAC and Building Control Systems	14,946	3.3	1993
Energy-saving Building Materials	25,985	2.5	1993
Organic Food and Farming	15,025	1.8	1987
Nuclear Energy	7,813	1.6	1994
Battery Technologies	1,524	1.4	2002
Green Building Materials	7,081	1.4	1989.5

It is the combination of entrepreneurship and technology innovation that creates employment growth...

- Gittell, Sohl and Tebaldi (2010) use panel data regression analysis to analyze the influence of entrepreneurship and technology concentration on employment growth in U.S. metropolitan areas (MSAs) over the course of the last full business cycle from 1991 to 2007. The findings are in support of the efficacy of entrepreneurship together with high technology expansion in job creation.
- The findings question the view that entrepreneurship in and of itself or a high but not growing high technology concentration can be strong contributors to employment growth.
- *Entrepreneurship index is calculated as the percent of individuals ages twenty to sixty-four in each metropolitan area who do not own a business in the U.S. Census Current Population Survey that start a business in the following month with fifteen or more hours worked per week.*

Business Accelerators

- Major challenge facing technology startups:
 - Seed stage support to:
 - Develop and test prototypes
 - Conduct market research and identify market opportunities and strategies
 - Develop marketing and business plans
 - Connect with private funders and public and non-profit resources
 - Foster outreach and business development

Green Launch Pad

Business Accelerator Model

- “Accelerator” Models have proven track record in addressing challenges facing technology start-ups
- Successful Academic Models in Practice at MIT & UCSD
- Successful Private Models in Practice in Venture Industry



Green Launching Pad

- A **competitive grant program** in entrepreneurship that helps to achieve **environmental and economic objectives**
- Grants help entrepreneurs to assess markets, and commercialize new products and services in growing energy and energy efficiency markets.
- Based at UNH with state-wide reach
- Teams interested in engaging in technology commercialization efforts may apply for awards with or without faculty researchers

GLP Selection Criteria

- Entrepreneurial business potential
- Market feasibility of product or service
- Experience/capability of entrepreneur
- Technology capability
- Potential to increase energy efficiency, reduce energy use and lower carbon emissions
- Potential for economic development—job creation and growth opportunities

GLP Entrepreneurs

- Selection is on a competitive basis and done by Advisory Council members serving as judges from industry and non-profit sector
- Winning teams are combinations of entrepreneurs, faculty, and students
- Receive funding (up to \$90K each)
- Receive assistance in:
 - Accelerated business development
 - Mentorship and coaching from experts in scientific, technical, business, legal disciplines
 - Funding for student interns

First Round--GLP 1.0

- First Round Funding of \$750K from ARRA-DOE funding with strong support from Governor's Office
- Program launched in February 2010
- More than 70 proposals received (expected 30)
- Ten finalists identified for full proposals
- Presentation by the finalists in April 2010
- Five Winning teams announced in May 2010
- More than 60 graduate and undergraduate students from UNH and Dartmouth applied for internships with GLP, 7 selected

GLP 1.0, continued

- Teams “at work” in Summer... All worked with mentors, using interns and accessing network of GLP faculty and business resources
- Green Business Development Seminar Series – Entrepreneurship, Financing, Marketing, Intellectual Property Management, and Business Plan
- Roundtable Meeting with Governor Lynch
- Student interns in different disciplines assisted companies and program (UNH and Dartmouth)

Winning GLP 1.0 Teams Profile

- **EnerTrac.** Smart metering technology and a corresponding monitoring service that can reduce CO₂ emissions by 30% or more. <http://www.enertrac.com/>.
- **Air Power Analytics.** Improves energy efficiency of industrial compressed air systems, reducing electric consumption, and saving money while reducing upstream greenhouse gas emissions. <http://www.airpoweranalytics.com/>.
- **Innovacene.** Manufactures high performing organic semiconductors (OSCs) for flexible organic photo-voltaics (solar cells) and organic light emitting diodes (OLEDs, lighting and displays. <http://www.innovacene.com/>.
- **Revolution Energy.** Develops renewable energy projects in New Hampshire using third-party financing and creative incentive leveraging. <http://www.rev-en.com/>.
- **Green Clean Heat.** Designs and builds fully-integrated turnkey efficient Wood Fired Heating Systems for commercial, municipal, and industrial facilities. <http://www.greencleanheat.com/>.

GLP 1.0: Promoting GLP companies and green entrepreneurship

- Energetic Conversations Tours at individual companies with media and public officials
- Green Community Day. Public “coming out” and introduction of companies after they have been launched by GLP
- Both help ventures develop market presence and provide good media exposure and public relations..

GLP 2.0

- Second Round Funding of additional \$750K from ARRA-DOE
- 50+ proposals received (overall quality significantly improved from first year)
- Twelve finalists identified for full proposals
- Presentation by the finalists in March 2011
- Winning Teams announced on April 28, 2011 by Energy Secretary Chu, NH Governor Lynch, and UNH President Huddleston
- More than 60 graduate and undergraduate students from UNH and Dartmouth applied for internships

Winning GLP 2.0 Teams Profile

- **SustainX** provides a new non-toxic technology for low-cost utility scale energy storage. The company's new technology enables efficient storage of renewables (e.g., wind and solar) and can potentially be a game-changer in the economics of renewables. The energy storage technology is modular and allows for siting anywhere, from low-scale to grid-scale storage (www.sustainx.com).
- **Blue2green** promoting hydroelectric power production by restoring dams to produce renewable energy and attracting investors to suitable dams and mill-restoration projects. The revitalization of hydroelectric power in small- to medium-sized former industrial mill towns can help produce renewable energy, create jobs and preserve community history (www.blue2greenllc.com).
- **Holase** has developed self-contained, solar-powered LED traffic signal lights that are low-cost and easy to set up and operate (www.holase.com).

Winning GLP 2.0 Teams Profile

- **New England Footwear** has developed a sustainable solution to footwear manufacturing and a way to revive shoe manufacturing in the region through new technologies that use organic materials, molds (instead of stitch and sew) and modular design to allow for easy replacement and re-use (www.newenglandfootwear.com).
- **Therma-HEXX** invented an invisible low-cost paver solar collectors and heat exchangers with a diversity of potential applications. Applications include winter time melting of snow and ice off of roofs and summer time cooling pool side pavements while heating pools (www.therma-hexx.com).
- **Walker Wellington** has developed a hydrokinetic turbine power that can generate energy with variable flow. This will capture and produce off-grid renewable energy for on-site use. Primary users will be municipal waste water treatment facilities and drinking water delivery systems (www.walkerwellington.com).

GLP Results... in 18 months

- Helped launch 11 ventures
- All the companies have created jobs, ranging from 2 to 27 at each venture
- Two companies have secured venture capital funding
- Two have been awarded highly competitive DOE grants based on performance
- All have used student interns

Developing effective academic-practitioner sustainable business relationships from university base

Lessons from UNH Green Launching Pad experience

- There are unique possibilities for and many outcomes from business school faculty and student engagement in technology-based entrepreneurship initiatives
- There is value in working with multiple stakeholders on- and off-campus on program formulation, implementation and continuous innovation,
- It is beneficial to continuously extend and enliven academic/practitioner entrepreneurship networks
- Have a environmental/social contribution in addition to job creation can be beneficial

Lessons/Observations

- With broadening concern about sustainability comes market opportunity and opportunities for multi-stakeholder engagement with business schools or engineering programs often in the lead
- There are significant numbers of students and faculty at business schools and in other departments across university campuses (engineering, science, etc.) interested in “green” and other areas of entrepreneurship
- There are also large numbers of independent entrepreneurs with ideas for green and other businesses

Lessons/Observations

- And there are also many stakeholders interested in entrepreneurship, including
 - Public sector economic development agencies
 - Private sector business organizations
 - Environmental groups/organizations
 - Utility companies
 - Service support community – lawyers, bankers

Benefits for Universities

- Public Service and positive media
- Faculty can use companies and program experience for research, class projects, internships for students, surveys and case studies
- Student learning and career development & job opportunities ... training the next generation for entrepreneurs

A Role for University led entrepreneurship initiatives

- There are gaps in:
 - “Putting the pieces” together, particularly engineering with business/market development and private with public sector resources support of ventures
 - Focusing on the specific needs and opportunities of entrepreneurs
 - Distinguishing among the entrepreneurs (e.g., the viable and not so viable and the green and not so green)
- *Multi-stakeholder initiatives based on campuses can help fill the gaps.....*

What the Ventures Need

- Business know-how
- Connections to legal, marketing advise to help them “open up” markets,
- Seed and working capital

Important criteria for entrepreneur selection

- A novel idea that has both market potential and positive social and environmental impact
- Have identified new or underserved market niche
- Specific focused knowledge set that is unique

Lessons/Observations

- Public sector role is very important
 - in supporting effort in a variety of ways... “legitimizer”(internally and externally), leader, supporter
 - in defining and adjusting regulations to help entrepreneurs and changing some of the rules to help create new markets, (e.g., RPS and renewables, DES and environmental rules for hydropower)
 - as a customer for entrepreneurial ventures
 - to access agency/public sector resources
 - opening up “doors” to utilities and larger companies as customers of entrepreneurs
- It is hard to overestimate the need for “basic” marketing help for ventures
 - Assistance needed to identify target customers and figure out how to convince them to buy product or service that they often do not know they need

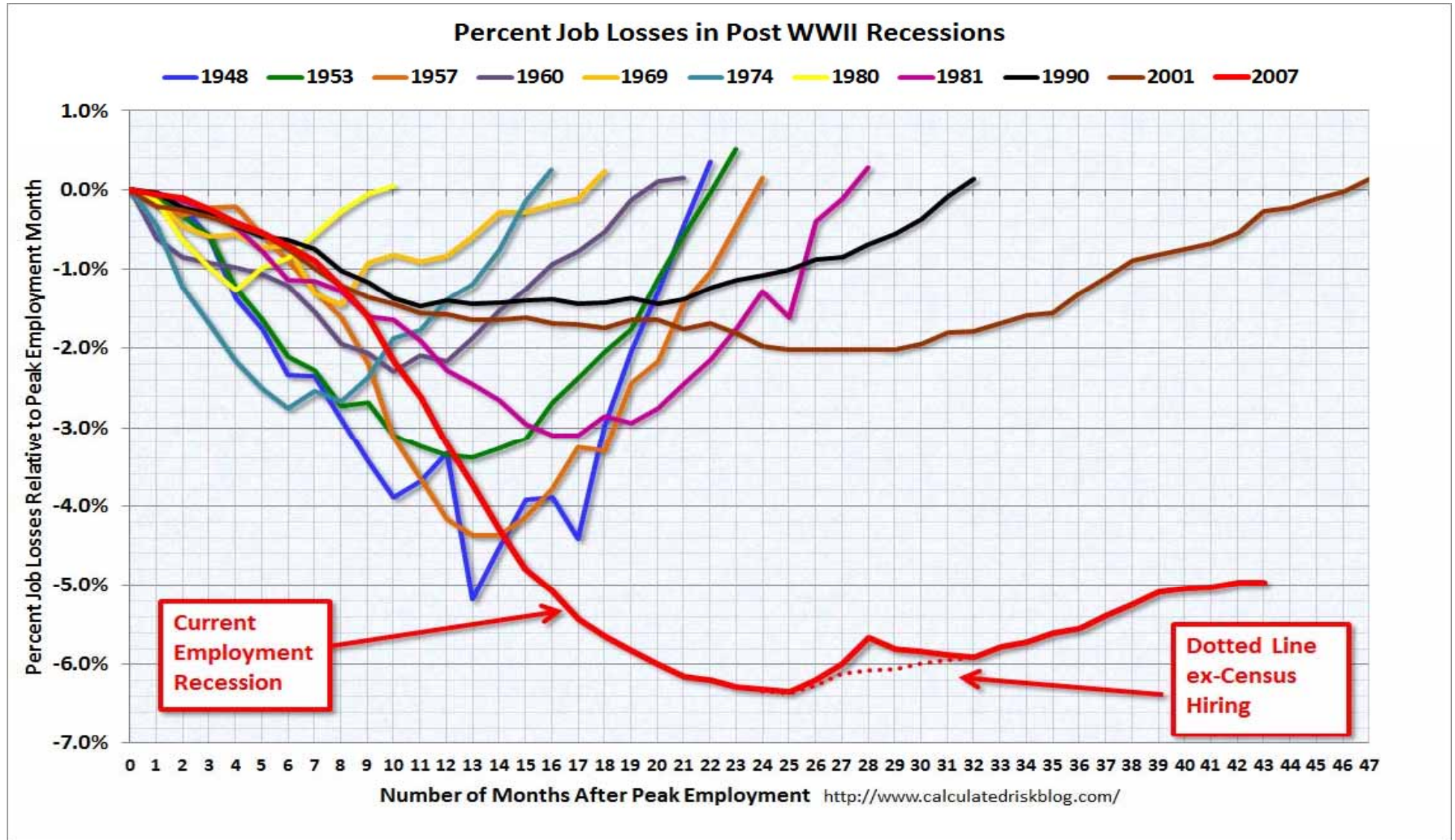
GLP Conclusion

- Keys to multi-stakeholder success with Universities as leader
 - strategically identify and engage a wide range of stakeholders on and off campus in entrepreneurial efforts
 - find leaders outside the business school and off campus to partner with in a substantive way
 - keep focus on launching successful ventures
 - engage students as training ground for next generation of entrepreneurs
 - continuously innovate and improve in collaboration with others
 - establish and then build on reputation for success (deliverables) and also for being a good partner (team player)
- Looking forward.. There can be benefits of having regional sharing of experience and best practices in multiple stakeholder University campus-based entrepreneurial development efforts...

WHAT'S OUT THERE NOW?

Where, beyond “green,” are opportunities in a weak economy?

Little Job Recovery...different than previous Recessions. Have to try to create jobs in new ways



“Other Entrepreneurial Opportunity Industries?”

What industries are adding employment during difficult times? *Using Pennsylvania employment growth in small establishments as example, County Business Patterns, Employment, 2007-09*

Pennsylvania Employment Changes(2007-2009)							
NAICS code	NAICS code description	Total establishments	1-4	5-9	10-19	20-49	50-99
7223	Special food services	31.1%	52.3%	18.7%	6.2%	12.5%	16.7%
6241	Individual and family services	18.5%	27.8%	14.4%	9.5%	-2.6%	25.9%
5613	Employment services	15.2%	44.0%	15.4%	50.8%	22.9%	-8.3%
6214	Outpatient care centers	9.9%	24.2%	3.4%	4.9%	12.5%	3.9%
5622	Waste treatment and disposal	7.1%	8.6%	31.6%	-2.6%	-10.0%	66.7%
8132	Grantmaking and giving services	7.1%	2.8%	16.7%	25.9%	5.0%	9.1%
6244	Child day care services	5.8%	2.4%	10.2%	4.9%	9.5%	4.0%
5629	Remediation and other waste management services	5.5%	5.9%	21.0%	-16.7%	17.1%	14.3%
6232	Residential mental health facilities	4.3%	1.5%	9.8%	-4.1%	-6.7%	35.6%
5415	Computer systems design and related services	4.1%	2.5%	8.6%	15.9%	14.2%	-20.4%
7212	RV (recreational vehicle) parks and recreational camps	3.2%	5.4%	8.6%	-18.9%	0.0%	N/a
5616	Investigation and security services	3.0%	1.5%	16.5%	1.0%	-9.2%	10.2%
6242	Emergency and other relief services	2.8%	2.8%	5.6%	-1.5%	4.0%	23.1%
5614	Business support services	2.6%	3.6%	4.7%	-4.2%	4.8%	19.6%
6213	Offices of other health practitioners	2.3%	1.8%	3.9%	4.4%	-6.5%	2.3%
8133	Social advocacy organizations	1.4%	2.1%	2.7%	-8.1%	17.8%	8.3%
6215	Medical and diagnostic laboratories	0.8%	-7.1%	32.9%	0.0%	-12.5%	15.0%
7221	Full-service restaurants	0.7%	-3.1%	6.7%	1.9%	3.6%	-0.6%
7211	Traveler accommodation	0.4%	-1.8%	6.1%	9.0%	-2.7%	-3.5%

Conclusion.. Very difficult environment to launch firms and grow jobs.

- What Works

- Identification of market opportunities -- which industries are doing best in difficult times
- Identification of new or underserved market niches
- Novel venture ideas that have both market potential and positive social and/or environmental impact
- Specific focused knowledge set that is unique in entrepreneurs
- Networking, across public and private sections and higher education
- Collaboration, engage new partners
 - multi-disciplinary faculty and students engagement
 - governmental agencies including beyond those traditionally involved in economic development (e.g., environmental, transportation and utility regulators)
 - Non-profits along with venture capitalists