

2013

Industry Cluster Strategy Report



Prepared for

The City of Fort Collins

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BACKGROUND

In 2006, the City of Fort Collins commissioned a study to identify promising industry clusters to target for growth as part of its economic health initiative. This report also provided recommendations on specific actions the city could take to enhance its capacity to sustain employment opportunities through the development of viable industry clusters.

This study highlighted four sectors – Agricultural Technology, Computer and Electronics Manufacturing, Information Technology / Software, and a cluster termed “Uniquely Fort Collins.” At this time, it was recognized that active efforts were already underway to organize initiatives to encourage growth in the Bioscience and Clean Energy sectors.

The recommendations were related to the general business environment as well as to enhancing capacity to support cluster development. The recommendations regarding the general business environment pertained to matters that affected all or most of the businesses in the City. Many of them have been incorporated into the City’s over-all economic health initiatives and were reinforced in the 2012 Economic Health Strategic Plan. The cluster recommendations pertained to ways the City could support cluster development in general and provided specific recommendations for the clusters highlighted in the report.

Over the course of the last six years, the City has taken great strides to address many of the recommendations from this first report. It has significantly improved its responsiveness on development review, ensuring more predictability, and enhancing its relationship with the business and developer community. The City has also continued to refine its direct business assistance policy and better define its economic development toolbox. It hired a dedicated marketing professional, created an informative website geared

Industry clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region. Clusters arise because they increase the productivity with which companies can compete.

Michael Porter, Institute for Strategy & Competitiveness

toward economic and business development, and communicated regularly with stakeholders regarding its economic health and industry cluster initiatives.

More specifically, for industry cluster development, the City has strengthened its relationship with Colorado State University (CSU) and CSU Ventures to produce an uncommonly close relationship around technology transfer, business formation, and industry clusters.

Fort Collins’ incubation capacity has grown significantly with the opening of the Rocky Mountain Innosphere (Innosphere), CSU’s Research & Innovation Center (RIC), and the expansion of CSU’s Powerhouse Energy Institute. The City has also collaborated closely with Innosphere and CSU to expand and strengthen the region’s entrepreneurial ecosystem in support of industry cluster growth in the region.

In addition, the City has launched a conference strategy in coordination with Visit Fort Collins to link tourism with the industry cluster initiative, recognizing the link between tourism and talent recruitment and relocation.

Most of all, the City of Fort Collins has invested a great deal of time and resources on launching industry cluster organizations. The city has played a lead role in organizing the Computer and Electronics Manufacturing and Software Cluster and provided support for the Bioscience, Clean Energy, and Uniquely Fort Collins Clusters. The City has also organized industry cluster groups around GIS and Water Innovation.

This report will function as an evaluation of the City's industry cluster initiative, providing an overview of the City's current activities and recommendations for improving the effectiveness of the strategies.

PRIMARY ACHIEVEMENTS

1. From 2011 to 2012, for every dollar the city invested in the industry clusters, other sources contributed **\$43**.
2. In 2012 alone, the Rocky Mountain Innosphere served **35 companies** that employed **178 employees**. These companies have raised **\$54.2 million** to date.
3. In 2012, cluster companies were awarded **\$3.1 million** in Small Business Innovation Research (SBIR) grants and **255 patents**.
4. The **FortZED demonstration project** was successfully completed.
5. **8 monitoring stations** were installed along the Cache La Poudre River to pilot **the Water Innovation Network**.
6. The **International CleanTech Network** was launched and now has 13 members from 12 countries.

OVERVIEW OF THE CURRENT INDUSTRY CLUSTER INITIATIVE

The City of Fort Collins’ Economic Health Office participates in industry cluster development through the allocation of staff-time for cluster-related activities and the dedication of funds. The industry clusters supported in 2011 and 2012 included hardware, clean energy, bioscience, water, and emerging sectors.

City staff participates in industry cluster development in the following ways:

- Organizing initial industry cluster meetings
- Participating in regular industry cluster organization meetings, in some cases serving as industry cluster managers
- Cultivating relationships with industry cluster participants
- Managing relationships with “triple helix” partners

The use of city funds can be divided into the following categories:

- Direct business support in the form of tax rebates to companies in industry clusters (Note: manufacturing use tax rebates are provided to all companies that qualify, regardless of industry.)
- Sponsorship of industry cluster organizations and projects
- Incubation support through direct investment in Innosphere

A summary of the 2011 and 2012 expenditures are included in the table to the right.

SUMMARY OF 2011 & 2012 CITY EXPENDITURES

	2011	2012	Total
Hardware	2,082,691	4,500,000	6,582,691
Direct Support	2,082,691	4,500,000	6,582,691
Sponsorship	-	-	-
Clean Energy	40,833	96,000	136,833
Direct Support	833	-	833
Sponsorship	40,000	96,000	136,000
Bioscience	61,137	40,000	101,137
Direct Support	21,137	-	21,137
Sponsorship	40,000	40,000	80,000
Water	26,579	56,817	83,396
Direct Support	-	-	-
Sponsorship	26,579	56,817	83,396
Emerging / Other	5,000	10,189	15,189
Direct Support	-	-	-
Sponsorship	5,000	10,189	15,189
Incubation	65,000	73,500	138,500

SOURCE: City of Fort Collins, Open Book.

The hardware cluster received the largest dollar amount of support over the course of the two years. This support was largely in the form of rebates related to Avago’s two expansion projects. Together, these two projects included the private investment of \$253 million and the addition of 227 jobs in the sector. The sector does not currently have an active industry cluster organization and does not receive any support in the form of sponsorships.

The clean energy cluster received the second largest level of support over the course of the two years. Direct business assistance played only a minor role, providing manufacturing rebates to Advanced Energy. These rebates refunded a portion of the use tax paid on the purchase of qualified manufacturing equipment. The majority of the City’s support for the clean energy cluster was in the form of membership dues to the cluster organization and project support. The primary projects were the supply chain initiative and the NetZero Cities Symposium. More information on these projects is provided in the cluster profile on page 12.

The bioscience cluster received \$101,137 over the course of 2011 and 2012. The majority of this was in the form of sponsorships to the industry cluster organization. However, the City did provide direct business assistance of \$21,137 to TolMar and Value Plastics. These manufacturing rebates were related to private investments of \$1.4 million and 47 jobs.

The water cluster received just over \$83,000 in support from the City over the course of 2011 and 2012. This support was for dues to the industry cluster organization and for the Lake Canal Project.

The GIS cluster received \$10,000 in support for an industry cluster organization, and the biking cluster received a \$5,000 sponsorship in 2012 to cover a Fort Collins consortium’s attendance at InterBike, an international industry trade show. These contribution are accounted for in the “Emerging / Other” category.

The City provided almost \$140,000 to Rocky Mountain Innosphere for incubation support. In 2011 and 2012, the organization provided support to

21 companies in the target industry clusters, 17 of which are current clients and 4 of which have graduated. The 17 companies who are currently clients of Innosphere employ 127 and have raised \$43.6 million in capital.

The City of Fort Collins has realized returns on its investments in each of the 4 primary clusters. In every case, the City’s investment has been only a small portion of the total dollars invested in the clusters. In the Hardware, Clean Energy, and Bioscience Clusters, companies directly benefiting from the City’s investments have been able to leverage those investments with large investments by the private sector. In the Water and Clean Energy Clusters, the cluster organizations have been able to raise considerable funds from sources other than the City to support their projects and initiatives.

2011-12 LEVERAGE RATIOS

	Other \$ Invested / City \$ Invested
Hardware	38
Clean Energy	86
Bioscience	309
Water	18
Emerging / Other	n/a

SOURCE: City of Fort Collins, TIP Strategies Calculation.

This section provides an overview of the City’s specific investments. The industry profiles that begin on page 9 provide more details about how this use of public resources translated into private investment and growth in the industry clusters.

CLUSTER STRATEGY 2.0

As demonstrated in the previous section, the City of Fort Collins' focus on industry clusters has no doubt bolstered the economy and increased the region's depth in most of these sectors. The impact of this focus is presented in more detail in the individual cluster profiles. Yet, the City's strategy is somewhat nebulous, and its investments have not been as effective as they could be.

In this section, we will more clearly articulate the City's industry cluster strategy to provide better guidance for the City to make its investment decisions. We will also make recommendations on how to increase the effectiveness of the City's investments in the industry clusters.

PROGRAM GOALS

Through the industry cluster program, the City of Fort Collins aims to support the growth of these key sectors. This support will facilitate cluster companies' access to:

- **Peer networks:** opportunities to interact with peers. Examples include CEO roundtables; occupation-specific professional development workshops; and industry-specific, topical symposia.
- **Suppliers and inputs:** better access to supplies or suppliers to reduce costs. Examples include recruitment of suppliers, purchasing cooperatives, and shared storage facilities.
- **Talent:** increased access to qualified workers. Examples include customized training programs for key occupations, marketing to build the

Fort Collins brand in industry, informative relocation-oriented website geared at specific talent segments, collaborative recruitment.

- **Markets:** increased visibility in market segments and improved market penetration. Examples include export/trade assistance, co-marketing opportunities at trade shows, trade delegation trips, and general marketing activities that promote a Fort Collins brand for the industry.
- **Capital:** improved access to capital networks – local and beyond. Examples include local angel investor network, local revolving loan fund, networking opportunities with venture capitalists, events to raise awareness of Fort Collins entrepreneurs.
- **Industry intelligence:** access to data and market research to inform business planning and strategic decision-making. Examples include shared access to industry databases and news sources, research assistance, industry conferences.
- **Space to grow:** access to sites in the City of Fort Collins to accommodate the growth of companies in the industry clusters. Examples include maintaining an inventory of available sites, encouraging local developers to develop sites to accommodate growing companies, assistance to companies to help with relocation in the city limits.

STRATEGIES

To realize these goals, the City will focus its activities around the following strategies:

- 1. Coordinate the city’s cluster activities with education, workforce, and economic development partners.**
 - 1.a. Hold regular meetings with these stakeholders to share information and stay abreast of each organization’s activities as they pertain to the industry clusters.
 - 1.b. Coordinate the pursuit of relevant Federal and foundation grants that can help resource cluster organizations or cluster-related blue-ribbon projects.
- 2. Support the start-up and expansion of cluster participants and the targeted recruitment of vital components of the industry cluster.**
 - 2.a. Visit in-person with industry cluster participants to forge relationships, understand trends shaping their businesses and industries, and to connect them with resources needed to grow.
 - 2.b. Continue to provide support to Innosphere for incubation services.
 - 2.c. Continue to offer direct business assistance to support the expansion of companies in the target clusters.
 - 2.d. Coordinate recruitment activities with NCEDC and MetroDenver to ensure that vital components of the industry clusters are present in the greater metro area.
- 3. Fund a staff position that develops and manages the city’s industry cluster program.**
 - 3.a. Hire a program manager that would be charged with the following tasks:
 - i. Creating systems for implementing the strategies below and for tracking outcomes.
 - ii. Designing a work plan for implementation.
 - iii. Rolling-out and managing programs as defined by the workplan.
- 4. Create an investment program to fund requests submitted by cluster organizations.**
 - 4.a. Define request guidelines to include the following components:
 - i. A statement of how the grant helps cluster member companies access one of the areas outlined within the program goals on page 5.
 - ii. A list of member companies that will participate or benefit (at least 3 cluster members should be listed).
 - iii. A description of the project or activity.
 - iv. A list of other sources of funding for the project (the city’s grant should not be more than 50% of the funding).
 - v. A list of expected outcomes.
 - 4.b. Grant recipients should provide regular status reports at industry cluster meetings (if applicable) or to the City.
 - 4.c. Upon the conclusion of the project or activity, the grant recipients should provide a wrap-up that reports the specific outcomes in as concrete terms as possible (e.g. \$ sale, number of new clients, \$ of research grants, etc.).
- 5. Ensure that cluster companies have the sites and buildings they need to grow in Fort Collins.**
 - 5.a. Maintain an inventory of available sites suitable for cluster companies.
 - 5.b. Work with Fort Collins business incubators and accelerators to define the needs of their near-term graduates.

- 5.c. Through Business Retention and Expansion visits and surveys, keep a pulse on companies that are likely to need new space in the near future.
- 5.d. Keep the broker and developer community informed of the opportunities around these growing companies.

6. Promote Fort Collins industry clusters to build visibility for the industry both within Fort Collins and beyond.

- 6.a. Continue to update industry cluster brochures and assist cluster managers in maintaining websites.
- 6.b. Support industry-specific publications, such as InnovatioNews, that provide higher visibility for Fort Collins’ cluster activity and companies.
- 6.c. Participate at industry conferences in Fort Collins to ensure that conference participants know of Fort Collins’ competitive advantages.
- 6.d. Provide industry cluster participants with talking points and marketing materials for them to act as ambassadors.
- 6.e. Work with national media outlets to ensure that Fort Collins’ success in industry clusters is touted wherever possible.

7. Support Visit Fort Collins in its cluster-related conference strategy.

- 7.a. Assist Visit Fort Collins in attracting key conferences in each cluster.
- 7.b. Selectively sponsor cluster-related conferences in Fort Collins.
- 7.c. Use conferences as opportunities to market Fort Collins’ industry clusters and build awareness of the clusters to an external audience.

OUTCOMES

In general, the desired outcomes of the City of Fort Collins’ Industry Cluster Initiative are the following:

1. Growth in the targeted industries in terms of employees, wages, private investment, and establishments.
2. Continued innovation as measured by patents, start-ups funded, and research funded.
3. Greater visibility of Fort Collins’ clusters. This will only have activity measures.

Metric	Source
Employees	QCEW
Wages	QCEW
Private Investment	City of Fort Collins
Establishments	QCEW
Patents	USPTO
SBIR Grants	http://www.sbir.gov/
Capital Investment	Innosphere
Leverage Ratio (\$ Other Investment / \$ City Investment)	Cluster Organizations, Innosphere, City of Fort Collins

These general outcome measures should be tracked, summarized, and reported on a regular basis.

At the same time, project specific metrics should be measured and reported. These should be defined for each project based on the project goals as they relate to the industry cluster initiative goals laid out on page 5 of this report. These would include metrics such as sales, number of customers gained, research grants, capital investment, companies retained, attendees at conference, etc.

IMPLEMENTATION / NEXT STEPS

To begin the implementation of this strategy, the City will need to invest in the capacity of the Economic Health Office. The revised strategy will require additional human resources, but should yield higher returns on the city's investment in the end. It will also provide opportunities for companies in a wider range of industries to participate in the initiative by encouraging collaboration between companies. In the end, the revised strategy should allow for more funds to be dedicated directly to projects with well-defined returns and will enable more human resources to be dedicated to implementing the strategy, building relationships vital to industry growth, and ensuring companies have the resources they need to grow in Fort Collins.

The next steps for implementing this strategy are outlined below:

1. Hire a program manager to design and implement the revised industry cluster program.
2. Implement all strategies (except 4) as soon as staff capacity allows.
3. Roll-out Strategy 4 gradually, honoring current commitments to existing industry cluster organizations in 2014 and then shifting resources over to the investment program by 2015.

EXISTING INDUSTRY CLUSTER PROFILES

BIOSCIENCE

CLUSTER PROFILE | FORT COLLINS, CO

The Bioscience Cluster is comprised of companies that research, produce, and distribute medical devices, medical instruments, pharmaceuticals, and biofuels. The cluster is rapidly becoming one of the driving forces behind the Fort Collins innovation-based economy with almost 50 firms, the majority of which are start-ups with less than 10 employees. With research expertise at CSU, affordable access to lab space, dedicated bioentrepreneur resources, and a backbone of well-established bioscience companies, Fort Collins is attracting the attention of the bioscience community in Colorado and beyond.



The City of Fort Collins supports the bioscience cluster primarily through its sponsorship of NoCo Bio (see next page) and Rocky Mountain Innosphere. Although Innosphere is not exclusively focused on bioscience companies, its wet laboratories and incubation services attract bioentrepreneurs. In addition, bioscience companies have benefited from the City's rebates on the manufacturing use tax for qualifying equipment purchases.

From 2011 through 2012, the City invested \$80,000 in the bioscience cluster initiative and \$21,000 in manufacturing use tax rebates to bioscience companies. They also invested a total of \$120,000 in Rocky Mountain Innosphere. These investments helped stimulate private investments in bioscience companies of just over \$35 million, which resulted in 102 new jobs in the sector. In addition, eight companies were client companies of Innosphere in 2012. In summary, for every \$1 the City invested, others invested \$309.

2011-2012 NEWS & ACHIEVEMENTS

- **TOLMAR**, which was awarded the Colorado Bioscience Association's Company of the Year in 2012, expanded to a 146,000 square foot facility.
- Two CSU spinoffs, **VetDC** and **KromaTiD** were selected as finalists in the prestigious Biowest Venture Showcase in 2012. VetDC won the \$7,500 competition.
- In 2012, **DVM Systems** graduated from the Innosphere and moved into its permanent space in Greeley.
- **St. Renatus** received approval and entered into Phase 3 FDA Clinical Trials in 2012.
- Nordson Corporation completed its acquisition of Fort Collins-based Value Plastics in August 2011.

SPECIALTIES: MYCOBACTERIAL • ANIMAL CANCER • MEDICAL DEVICES & THERAPEUTICS • CARDIOVASCULAR • IMAGING & DIAGNOSTICS • INFECTIOUS DISEASE • REGENERATIVE & REHABILITATIVE MEDICINE

RESOURCES & ASSETS

RESEARCH

- ◆ CSU's Infectious Disease Research Center
- ◆ CSU's Animal Cancer Center
- ◆ Rocky Mountain Magnetic Resonance
- ◆ Rocky Mountain Regional Biocontainment Laboratory
- ◆ CDC's Division of Vector-Borne Diseases
- ◆ Medical Center of the Rockies' Research and Education Foundation

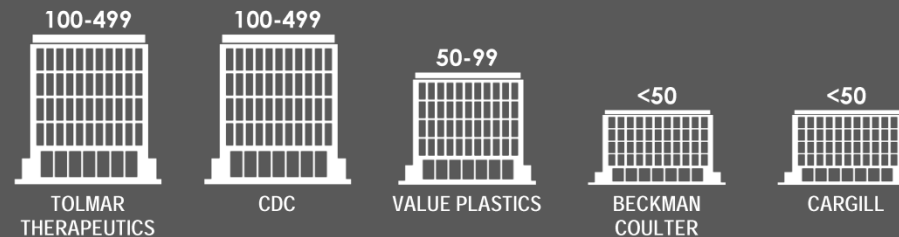
INCUBATION & COMMERCIALIZATION

- ◆ CSU's Research Innovation Center
- ◆ CSU Ventures
- ◆ NoCo Bio
- ◆ Rocky Mountain Innosphere

FUNDING & TECHNICAL ASSISTANCE

- ◆ NoCo Capital / Angels
- ◆ Bioscience Discovery Evaluation Grant Program
- ◆ Colorado Institute for Drug, Device and Diagnostic Development (CID4)

TOP 5 EMPLOYERS (BY NUMBER OF EMPLOYEES)



Source: QCEW

BY THE NUMBERS

AS OF DECEMBER 31, 2012:

OF FIRMS



44

EMPLOYMENT



926

EMPLOYMENT CHANGE 2011-12



+43

EARNINGS PER WORKER



\$72,032

NON-CITY \$ TO CITY \$ INVESTED



\$309

Source: QCEW, City of Fort Collins

INNOVATION

2011-12 SBIR AWARDS: \$3.5 MILLION

PHYSICAL ACTIVITY INNOVATIONS received a Phase II SBIR grant to develop a device that can be easily incorporated into conventional footwear and can accurately measure body weight, posture allocation, physical activity, and daily energy expenditure.

VENTRIA BIOSCIENCE received one Phase I SBIR grant and two Phase II grants to further research on lactoferrin as a medical food, to develop an alternative to animal-derived components in vaccine production.

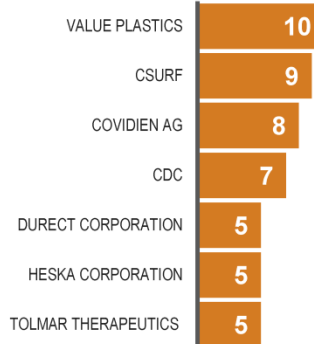
Note: SBIR awards refers to the Federal Government's Small Business Innovation Research program.

Source: SBIR.gov

PATENTS AWARDED 2011-2012



Top Patent Producers



Note: Patent Producers are identified based on the assignee name.

Source: US Patent Office

BUSINESS FORMATION & EXPANSION

2012 INCUBATION & ACCELERATION

Companies	8
Employees	55
Venture Capital Raised	\$34 million
City Investment	\$53,714

Note: City investment is the share of the overall contribution to Innosphere dedicated to bioscience companies and the contribution specifically to the bioscience initiative
Source: Rocky Mountain Innosphere, City of Fort Collins.

EXPANSION & RELOCATION:

Companies	2
New Jobs	47
Capital Investment	\$1.4 million
City Investment	\$21,000

Source: City of Fort Collins



The Northern Colorado Bioscience Cluster began as a membership organization designed to support growth in the bioscience industry in Fort Collins.

In 2013, the organization was re-launched with a focus on supporting bioentrepreneurs in their quest to move their innovations from idea to product. By bringing together the region's bioscience community, NoCo Bio will help strengthen the innovation pipeline, attract capital, and empower bioentrepreneurs to take the next step. It is a partnership of Colorado State University, the University of Colorado Health System, the Rocky Mountain Innosphere, the Research Innovation Center, and the City of Fort Collins.



CLEAN ENERGY

CLUSTER PROFILE | FORT COLLINS, CO

The Clean Energy Cluster is comprised of companies who develop, produce, and distribute technologies that promote more efficient and sustainable production and use of power. The dominant player in the Fort Collins Clean Energy Cluster is Woodward. Advanced Energy and its subsidiary AE Solar are also global leaders in clean energy. Anchored by the research at CSU and its Powerhouse Energy Institute, the Clean Energy Cluster is active in its pursuit of innovative energy solutions. The City of Fort Collins and Fort Collins Utilities further support the cluster as a large purchaser and by providing access to the power grid for testing purposes. A true triple helix partnership is what makes this cluster tick.



The City of Fort Collins supports the Clean Energy Cluster through its sponsorship of the Colorado Clean Energy Cluster (CCEC) and the Rocky Mountain Innosphere. In addition, the City has offered direct business assistance to Clean Energy companies in the form of rebates on the manufacturing use tax for qualifying equipment purchases.

From 2011 through 2012, the City invested \$50,000 in the CCEC. Other members contributed a total of \$157,582 in the cluster organization. In addition, the CCEC raised \$210,000 to support the supply chain initiative, of which the City contributed \$10,000. In 2012, the City contributed \$33,500 to the Net Zero Cities Symposium. The City also invested a total of \$120,000 in Innosphere. The five clean energy client companies in Innosphere raised \$8.4 million and created 57 jobs in 2012. Finally, the City invested \$833 in tax rebates for a private investment of \$55,500. In all, the City spent \$1 for every \$86 other private and public participants invested.

2011-2012 NEWS & ACHIEVEMENTS

- In 2012, the White House honored CSU's Amy Prieto, founder of **Prieto Battery**, with the Presidential Early Career Award. Dr. Prieto is working to commercialize a new battery technology.
- *Popular Science* listed the **CSU Powerhouse Energy Institute** as one of the nation's top 25 academic laboratories.
- **Stewart Energy** and **VanDyne Super Turbo** graduated from the Innosphere and moved into permanent spaces in Fort Collins.
- **FortZED**'s demonstration project proved able to reduce peak-load demand in the Zero Energy District by more than 20% by using a distributed power system and demand side management.

SPECIALTIES: SMART GRID • DISTRIBUTED POWER • ENGINES & ENERGY CONVERSION • WATER / ENERGY NEXUS • BIOFUELS • ENERGY STORAGE

RESOURCES & ASSETS

RESEARCH

- ◆ Colorado Renewable Energy Collaboratory – includes CU-Boulder, Colorado School of Mines, and the National Renewable Energy Laboratory
- ◆ CSU's Clean Energy Supercluster
- ◆ CSU's Powerhouse Energy Institute
- ◆ CSU's Center for the New Energy Economy
- ◆ CSU's Center for Networked Distributed Power
- ◆ CSU's Hydromachinery Laboratory & Turbine Research

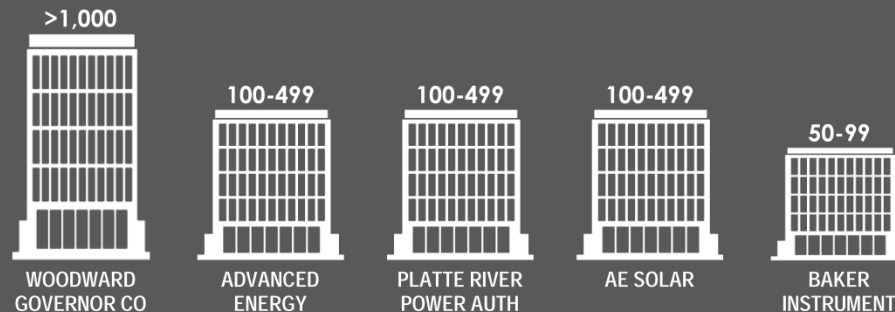
INCUBATION & COMMERCIALIZATION

- ◆ CSU – Powerhouse Energy Institute – Integrid Lab
- ◆ Colorado Renewable Energy Collaboratory
- ◆ CSU Ventures - Cenergy
- ◆ Rocky Mountain Innosphere

FUNDING & TECHNICAL ASSISTANCE

- ◆ NoCo Capital / Angels
- ◆ CSU Clean Energy Supercluster Seed Grants

TOP 5 EMPLOYERS (BY NUMBER OF EMPLOYEES)



Source: QCEW

BY THE NUMBERS

AS OF DECEMBER 31, 2012:

OF FIRMS



20

EMPLOYMENT



2,200

EMPLOYMENT CHANGE 2011-12



-139

EARNINGS PER WORKER



\$89,534

NON-CITY \$ TO CITY \$ INVESTED



\$86

Source: QCEW, City of Fort Collins

INNOVATION

2011-12 SBIR AWARDS: \$2.1 MILLION

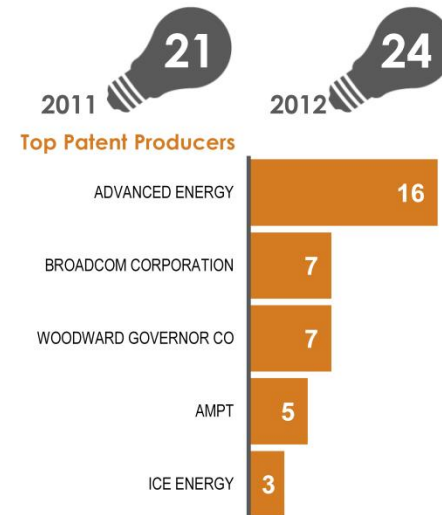
COLORADO POWER ELECTRONICS received a Phase I and a Phase II SBIR grant for their work on a modular power processing unit for Hall thrusters.

PLASMA CONTROLS received a Phase I SBIR grant for their effort to develop a thermoelectric generator module appropriate for water heat recovery applications.

SYMBIOS received a Phase I SBIR grant and two Phase II grants to further their work on the Symbios Plasma Reactor for nanoparticle research and water remediation.

Note: SBIR awards refers to the Federal Government's Small Business Innovation Research program.
Source: SBIR.gov

PATENTS AWARDED 2011-2012



Note: Patent Producers are identified based on the assignee name.
Source: US Patent Office

BUSINESS FORMATION & EXPANSION

2012 INCUBATION & ACCELERATION

Companies	5
Employees	57
Venture Capital Raised	\$8.4 million
City Investment	\$8,571

Note: City contribution is the share of the overall contribution to Innosphere dedicated to clean energy companies.

Source: Rocky Mountain Innosphere, City of Fort Collins

EXPANSION & RELOCATION:

Companies	1
New Jobs	n/a
Capital Investment	\$55,500
City Investment	\$833

Source: City of Fort Collins



Launched in 2006, the Colorado Clean Energy Cluster is a non-profit, member-based organization that is focused on growing the clean energy sector through projects and initiatives that directly benefit Colorado clean energy companies. Central to the CCEC's success is the collaboration between the private sector, the public sector, and academia – the Triple Helix.

The CCEC's current projects are FortZED, the International Cleantech Network, and the Supply Chain Initiative. FortZED is designed to be a high profile demonstration project to show the potential for distributed power systems and demand side management in a Zero-Energy District. The International Cleantech Network aims to provide global access to Colorado clean energy companies. The Supply Chain Initiative is meant to increase the competitiveness of local companies.



HARDWARE

CLUSTER PROFILE | FORT COLLINS, CO

The Hardware Cluster is part of Fort Collins' larger technology sector. Companies in this cluster are involved in the research, design, and production of computers, computer storage devices, computer peripherals, and other related equipment. This sector is one of the most established sectors in Fort Collins, with Hewlett Packard opening a facility in 1978. Now, Hewlett Packard, Intel, Avago, AMD, and Texas Instruments all conduct research and development activities in their Fort Collins locations. This private-sector research expertise combined with the talent from Colorado State University makes Fort Collins a computer hardware innovation hub.



The City of Fort Collins is an active supporter of the Hardware Cluster. Between 2011 and 2012, the City provided \$6.6 million in direct business assistance to companies in this cluster. This support was in the form of manufacturing use and property tax rebates, as well as integrated design assistance, energy efficiency implementation, and job training assistance.

The City's investment of \$6.6 million resulted in private investment of \$253 million and the creation of 227 high-wage jobs in Fort Collins.

In other words, for every \$1 the City spent, the private sector spent \$38.

2011-2012 NEWS & ACHIEVEMENTS

- **HP** constructed a state-of-the-art research facility in Fort Collins to advance sustainable data center technologies. The 50,000 square foot facility was built in collaboration with HP Labs. Research there will focus on gaining efficiencies around data center cooling and capacity.
- **Avago** completed an \$82 million expansion, adding wafer fabrication capacity and 92 jobs. The company announced another \$165 million expansion of its Fort Collins facility, adding another 135 jobs.
- **Texas Instruments** completed its acquisition of National Semiconductor and now has offices in Fort Collins.

SPECIALTIES: CHIP DESIGN • DATA STORAGE • SYSTEMS ON A CHIP • RF I/C & MICROWAVES • REMOTE SENSING •

RESOURCES & ASSETS

RESEARCH

- ◆ CSU – Information Science & Technology Center
- ◆ CSU – Extreme Ultraviolet Science and Technology Center
- ◆ Intel's Fort Collins Design Center
- ◆ HP (R&D and Design)
- ◆ AMD (R&D and Design)
- ◆ Avago (R&D and Design)
- ◆ Texas Instruments (R&D and Design)

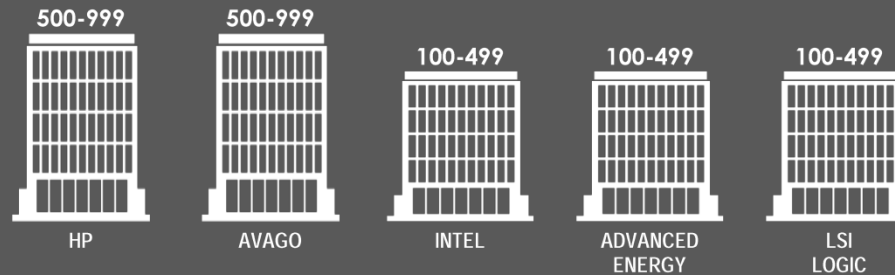
INCUBATION & COMMERCIALIZATION

- ◆ CSU Ventures
- ◆ Rocky Mountain Innosphere

FUNDING & TECHNICAL ASSISTANCE

- ◆ NoCo Capital

TOP 5 EMPLOYERS (BY NUMBER OF EMPLOYEES)



Source: QCEW

BY THE NUMBERS

AS OF DECEMBER 31, 2012:

OF FIRMS



19

EMPLOYMENT



2,715

EMPLOYMENT CHANGE 2011-12



-434

EARNINGS PER WORKER



\$123,752

PRIVATE \$ TO CITY \$ INVESTED



\$38

Source: QCEW, City of Fort Collins

INNOVATION

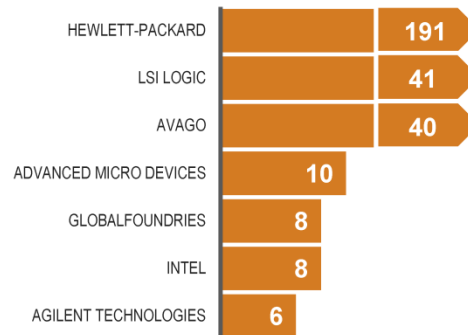
The Hardware Cluster is one of the most prolific producers of intellectual property in Fort Collins. With five Fortune 500 companies conducting their R&D and design work in the region and a major research university with a strong engineering program, it is no wonder.

The 327 patents granted covered a wide range of topics from cryptology to heat exchange. The largest number of patents granted over the 2011 and 2012 time frame were for inventions related to electrical computers and digital processing systems. Computer-aided design and analysis of circuits and semiconductor masks was another area with a large number of patents. Error detection/correction and fault detection/recovery was another area of focus.

PATENTS AWARDED 2011-2012



Top Patent Producers 2011-2012



Note: Patent Producers are identified based on the assignee name.

Source: US Patent Office

BUSINESS FORMATION & EXPANSION

INCUBATION & ACCELERATION

Companies	n/a
Employees	n/a
Venture Capital Raised	n/a
City Investment	n/a

Source: Rocky Mountain Innosphere

EXPANSION & RELOCATION:

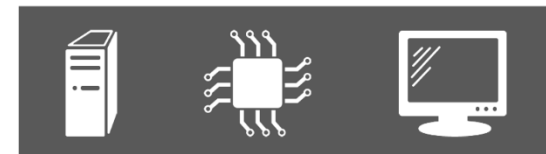
Companies	1
New Jobs	227
Capital Investment	\$253 million
City Investment	\$6.6 million

Source: City of Fort Collins



Avago Technologies is a designer, developer, and supplier of a broad range of analog, mixed signal, and optoelectronics components and subsystems. Avago originated as a unit of Hewlett Packard, becoming its own company in 2005. Over its 50 year history, it has developed and assembled a portfolio of approximately 4,200 patents and pending applications.

Avago's Fort Collins campus is one of the company's co-headquarters sites and conducts research, development and design. The recent expansions have created the company's only US wafer fabrication capacity. Currently, the company is expanding its proprietary RF processes at the Fort Collins facility as part of its global strategy to expand its RF capacity.



WATER INNOVATION

CLUSTER PROFILE | FORT COLLINS, CO

The Water Innovation Cluster consists of companies who develop, design, produce, and distribute technologies that promote the more efficient use of water. The sector is a healthy mix of mature companies such as In-Situ, Water Pik, and Riverside Technologies and start-up companies such as Advanced Microlabs, Synaptic Sensors, and OptiEnz Sensors. Supported by research capabilities at CSU and innovative initiatives of the Colorado Water Innovation Cluster (CWIC), the water technology sector in Fort Collins is poised for growth.



The City of Fort Collins supports the water innovation cluster primarily through its sponsorship of the Colorado Water Innovation Cluster and Rocky Mountain Innosphere.

From 2011 through 2012, the City contributed \$40,000 to CWIC for membership dues and \$43,000 for special initiatives and projects, including the Lake Canal Project and Water Innovation Network. Other members and organizations contributed almost \$400,000 to CWIC and its initiatives. The City contributed \$120,000 to Rocky Mountain Innosphere. In 2012, Innosphere served four companies in the water cluster that created 15 jobs and raised \$1.2 million.

In all, for every \$1 the City of Fort Collins invested in the water cluster, other participants invested \$18.

2011-2012 NEWS & ACHIEVEMENTS

- **Advanced Microlabs** graduated from Innosphere in 2012. In 2011, the company received almost \$1.0 million in grants from the National Institutes of Health Superfund Research Program and the National Science Foundation to develop a water impurities test.
- In 2011, the **Colorado Water Conservation Board** contributed \$135,000 to the Colorado Water Innovation Cluster to help fund the **Lake Canal Demonstration Project**.
- The **Water Innovation Network** pilot project was launched in 2012 with eight monitoring stations along the Cache la Poudre watershed, which were donated by In-Situ.

SPECIALTIES: REMOTE MONITORING • WATER / ENERGY NEXUS • WATER REMEDIATION • WATER MANAGEMENT •

RESOURCES & ASSETS

RESEARCH

- ◆ The Colorado Water Institute
- ◆ CSU's Waste Water Treatment Research Pilot Plant
- ◆ CSU's Hydrologic & Water Resource System Computing Laboratory
- ◆ CSU's Hydraulic Research Laboratory
- ◆ CSU's Groundwater Advanced Visualization and Engineering Computer Laboratory
- ◆ Metropolitan State University of Denver's Center for Urban Water Education and Stewardship

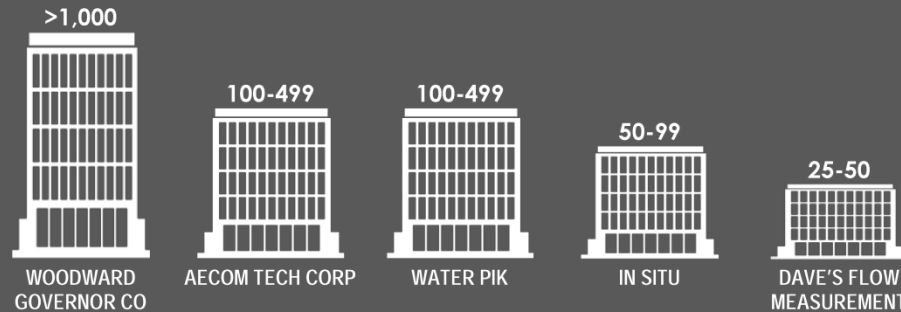
INCUBATION & COMMERCIALIZATION

- ◆ CSU Ventures
- ◆ Rocky Mountain Innosphere

FUNDING & TECHNICAL ASSISTANCE

- ◆ NoCo Capital / Angels
- ◆ Colorado Water Innovation Cluster
- ◆ Imagine H2O

TOP 5 EMPLOYERS (BY NUMBER OF EMPLOYEES)



Source: QCEW

BY THE NUMBERS

AS OF DECEMBER 31, 2012:

OF FIRMS



26

EMPLOYMENT



1,958

EMPLOYMENT CHANGE 2011-12



+132

EARNINGS PER WORKER



\$87,152

PRIVATE \$ TO CITY \$ INVESTED



\$18

Source: QCEW, City of Fort Collins

INNOVATION

2011-12 SBIR AWARDS: \$1.0 MILLION

ADVANCED MICROLABS received a Phase I SBIR grant to develop a prototype online ion monitor for water monitoring.

RIVERSIDE TECHNOLOGY received a Phase II SBIR grant to further the development of a Climate Information Management Toolkit for use by local water organizations.

SYMBIOS received a Phase I SBIR grant and two Phase II grants to further their work on the Symbios Plasma Reactor for nanoparticle research and water remediation.

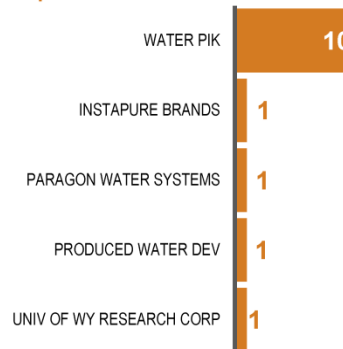
Note: SBIR awards refers to the Federal Government's Small Business Innovation Research program.

Source: SBIR.gov

PATENTS AWARDED 2011-2012



Top Patent Producers



Note: Patent Producers are identified based on the assignee name.

Source: US Patent Office

BUSINESS FORMATION & EXPANSION

2012 INCUBATION & ACCELERATION

Companies	4
Employees	15
Venture Capital Raised	\$1.2 million
City Investment	\$6,857

Note: City contribution is the share of the overall contribution to Innosphere dedicated to companies in the water cluster.

Source: Rocky Mountain Innosphere, City of Fort Collins

EXPANSION & RELOCATION:

Companies	n/a
New Jobs	n/a
Capital Investment	n/a
City Investment	n/a

Source: City of Fort Collins



The Colorado Water Innovation Cluster is a member-based, non-profit organization that aims to drive market development for new solutions addressing current and future water challenges. Through its projects and initiatives, CWIC aims to create opportunities for Colorado's water technology companies and to enhance the competitiveness of these cluster companies.

The primary projects are currently the Lake Canal Alternative Agricultural Practices and In-Stream Flow Demonstration Project and the Water Innovation Network. **The Lake Canal Project** proposes to demonstrate how an Interruptible Water Supply Agreement is a valuable management tool. **The Water Innovation Network** aims to facilitate the development and demonstration of technologies for sound water management.



EMERGING CLUSTERS

To identify any emerging clusters, TIP conducted an analysis of which industries are growing in Fort Collins, where the highest concentration of workers is relative to the nation, and which industries are outperforming the nation locally. The analysis reinforced the focus on the current industry cluster with a few additions:

- Information technology (541511, 518210)
- Breweries (312120)
- Measuring & controlling devices (334519, 334516)

NAICS Code	Description	2012 Establish-ments	2008 Jobs	2013 Jobs	2013 Nat'l LQ	2013 Wages, Salaries, & Proprietor Earnings	Top Ranking Export-Oriented Industries			
							Competitive Effect (08-13)	Change in Jobs (08-13)	Change in Jobs (%) (08-13)	Change in LQ (08-13)
541511	Custom Computer Programming Services	168	542	1,085	1.43	\$89,524	●	●	●	●
518210	Data Processing, Hosting, & Related Services	18	259	553	2.14	\$45,318	●	●	●	●
611430	Professional & Management Dev. Training (Private)	13	121	201	4.63	\$40,971	●	●		●
326199	All Other Plastics Product Manufacturing	11	247	778	2.84	\$70,882	●	●	●	●
312120	Breweries	10	991	1,079	37.24	\$70,840		●		
541370	Surveying & Mapping (except Geophysical) Services	8	47	82	2.00	\$61,125			●	●
334413	Semiconductor & Related Device Manufacturing	6	319	490	2.49	\$112,999	●	●	●	●
334519	Other Measuring & Controlling Device Manufacturing	6	67	160	4.96	\$67,979	●	●	●	●
237120	Oil and Gas Pipeline & Related Structures Construction	5	119	186	1.34	\$66,030		●		
326122	Plastics Pipe & Pipe Fitting Manufacturing	5	110	139	5.08	\$59,816			●	●
334516	Analytical Laboratory Instrument Manufacturing	4	702	797	23.43	\$77,595	●	●	●	●
325412	Pharmaceutical Preparation Manufacturing	4	246	429	2.00	\$68,264	●	●	●	●
335211	Electric Housewares & Household Fan Manufacturing	3	183	156	18.13	\$70,335				●
333618	Other Engine Equipment Manufacturing	2	1,322	1,667	36.81	\$72,633	●	●	●	●

SOURCE: EMSI 2013.2, TIP Strategies Research.

BENCHMARKS

As part of this industry cluster study, TIP also conducted interviews with peer cluster organizations and cluster initiatives to collect best practices. The peers chosen were the Pittsburgh Technology Council, the Milwaukee Water Council, and Portland Development Commission. From the interviews and research conducted as part of this, three primary best practices emerged.

Buy-in from private industry: Success of these industry cluster initiatives hinges on the participation and buy-in of the private sector. The industry cluster organizations felt a key to their success was that the initiatives were private-sector led. The cities were partners and supporters but not the leaders. In the PDC model, private industry participates through industry councils and interacts regularly with PDC's industry leads. The PDC industry cluster initiative began by getting to know the industry's primary influencers, then bringing them together. Through their business assistance program, the PDC was able to cultivate more private-sector buy-in.

Clear value proposition: To engage the private sector, the industry cluster initiatives have had to develop clear value propositions that they can communicate with private industry. The value propositions of the three benchmarks were essentially the same: the cluster initiative will help businesses succeed. They have positioned themselves to become indispensable partners to private industry.

Sustainable funding sources: The PTC and Water Councils both had relatively diverse funding streams, drawing on membership dues, fund-raising, grants, and event revenues. The PDC initiative is entirely funded by PDC and is experiencing budget cuts at the moment. However, some of their industry cluster projects generate revenues and some are supported by industry participants.

The specifics of the cluster initiatives are detailed on the following pages.

Case Study: Pittsburgh Technology Council

At-A-Glance

Value Proposition:	"We help our region's technology companies succeed."		
Founded:	1983	Membership dues:	\$395 (entrepreneurs) - \$10,000
Structure:	501(c)(6)	Members:	1,400 companies
Board of Directors:	28 members, all private sector	Member employees:	270,000
Staff:	20	Website:	http://www.pghitech.org/

The Pittsburgh Technology Council (PTC) is a trade association that provides valuable services to its members while spearheading the region's economic transformation, with a cluster-based approach to technology-based economic development. They focus on four areas:

- **Business development:** making "hard connections" for members to new customers and business opportunities, capital, and mentors. They provide one-on-one introductions to other members, plan events, offer meeting space and other resources to support members' business development initiatives.
- **Talent retention:** The Pittsburgh Career Connector is a region-specific online jobs board that connects members with talent. Aside from Career Connector, the PTC hosts recruiting events and helps members with talent acquisition marketing. They provide health and business insurance as well. They also provide professional development to entrepreneurial leaders to groom the region's CEO talent pool.
- **Government relations:** The PTC tracks legislation, regulations, and other policies that influence the business climate. They also help member companies connect with elected officials.
- **Visibility services:** The PTC promotes its members and raises the visibility of the region's tech sectors through its multimedia platform that includes hard and online magazines, blogs, and a radio show.

They have a close relationship with the region's public sector entities but do not accept money from them. They feel like being a private-sector led initiative is vital to their success.

Case Study: The Water Council (Milwaukee)

At-A-Glance

Value Proposition:	"Whether you are in industry, academia or government, you will find a confluence of expertise and resources in the Milwaukee region, needed to succeed in the world water marketplace."		
Founded:	2009	Membership dues:	\$500 - \$5,000 depending on annual revenues
Structure:	501(c)(3)		
Board of Directors:	21 members	Members:	190
Staff:	4	Website:	http://www.thewatercouncil.com

The Water Council grew out of a regional economic development initiative in 2006-07 – an industry cluster analysis that revealed the depth and growth (potential) of the water technology cluster. The potential for growth in this cluster to transform the Milwaukee economy is what brought people together. The initiative was driven by the private sector; the universities; and two non-profits, the Greater Milwaukee Committee and the Spirit of Milwaukee. Through research, loaned executives, and extensive collaboration, the Water Council was formed as a non-profit in 2009.

The Water Council generates revenues through membership dues, its annual summit, and grants from local foundations, the state, and the Economic Development Agency. Through its higher education partners, they also benefit from research grants. The Council holds member meetings on a quarterly basis. At the meetings, they host speakers and networking opportunities. They also have committees that members can join. There are currently four committees – talent & education, corporate-university linkages, communications, and water stewardship.

In 2009, the Water Council was inducted into the UN Global Compact Cities Programme, a program to help city leaders find solutions to urban issues with local capacity. The Water Council is focused on a set of defined research issues related to water technology as part of this initiative. They hold design challenges to encourage research around these issues.

In July 2013, the Global Water Center will open its doors. The center will be 100,000 square feet of offices, meeting spaces, labs, and an auditorium to accelerate research and development, business formation, and triple helix collaboration to promote growth in the water technology sector. The Water Center will be home to entrepreneurs, researchers, and business services and will be a convening point for the industry.

Case Study: Portland Development Commission

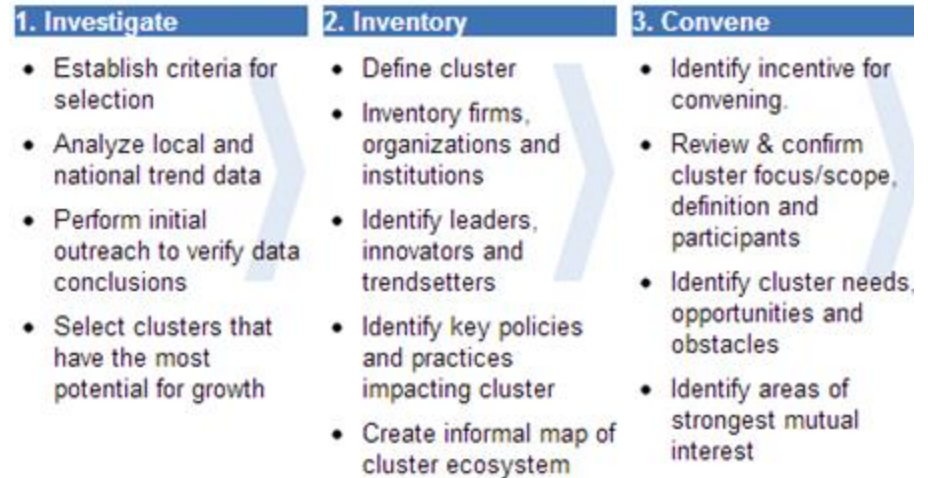
The Portland Development Commission is in the fourth year of its 5-year strategic plan. As part of this strategy, they adopted four clusters to target for industry cluster development. They developed a 6-part strategy for industry cluster development and have been moving their target industries through this development framework.

Each industry cluster is managed by an industry lead (a project manager employed by PDC) and advised by an industry council (made up only of private companies). Together, the project manager and industry council created an action plan. The industry action plans focus on high-value programs and projects. These plans are living documents that are continuously evaluated and updated. The industry leads and councils meet together 2 to 4 times a year to review the action plan and implementation of the plan. The industry councils also act as sounding boards for the industry leads.

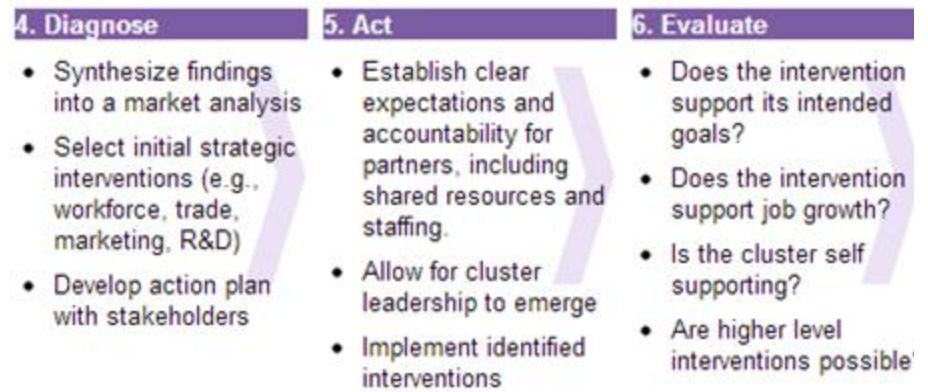
The primary focus of the industry lead is on visiting local companies in the industry cluster; they visit 50 to 75 companies each year. During these visits, the industry lead learns about the company and its needs and then connects it to available resources. They also participate in industry events and implement the action plan. Through these activities, the industry lead develops in-depth knowledge of the industry, the local and national industry trends, and industry needs. In addition, the industry lead cultivates relationships with industry participants, which helps PDC monitor the pulse of its clusters.

The PDC’s industry cluster initiative is closely linked to its entrepreneurship and export assistance initiatives. The three initiatives are the three components of PDC’s “traded-sector program.” The industry cluster initiative is also tied to the PDC’s urban renewal strategy. For example, projects to support the industry cluster initiatives are often located in targeted renewal areas. Likewise, renewal projects are often tailored to support the industry cluster initiatives. Rather than

CLUSTER ORGANIZING FRAMEWORK



Goal of these steps: identify and engage the cluster. Through engagement, confirm cluster focus/scope.



Goals of these steps: develop an initiative with cluster participants that they can take the lead in implementing, create growth in the cluster and create the conditions to assist the cluster to find a way to sustain itself.

renovate a building speculatively, the PDC now often invests in projects that directly support the needs of expanding cluster companies.

The industry cluster initiative has gained the most traction in the more entrepreneurial segments of the target industries. Successful projects include peer-to-peer networking groups, a seed fund, and industry events. The larger businesses have come together around workforce issues; however, these businesses, particularly the manufacturers, are harder to engage.