

Chittenden County, VT Strategic Industry Sector Analysis

2/11/2013

An ECOS Analysis Report

Based on an Economic Base Analysis and Competitive Assessment of Chittenden County provided in separate reports, this Strategic Industry Sector Analysis identifies industry sectors, clusters and types of operations that hold the greatest promise for improving the County's future economy and economic opportunities.



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HIGHLIGHTS

Based on the Economic Base Analysis and Competitive Assessment performed as other portions of this project, the following 12 initial target clusters and industries for attraction and development efforts were identified and submitted to GBIC for consideration:

- Information Technology
- Value Added/Sustainable Agriculture
- Digital Media
- E-Commerce
- Clean Tech/Green Technology
- Tourism
- Retail
- Non-profit Organizations
- Health Care
- Business and Administrative Services
- Value-Added Manufacturing
- Higher Education

From this initial selection, five primary targets, one of which is a combination of three of the initial recommendations, were selected as value-adding industries with high location quotients and are profiled in this report:

1. Information Technology, Communications, and Media
 - Information Technology
 - E-Commerce
 - Digital Media
2. High Value-Added Manufacturing
3. Higher Education
4. Clean Tech/Green Tech
5. Health Care and Wellness

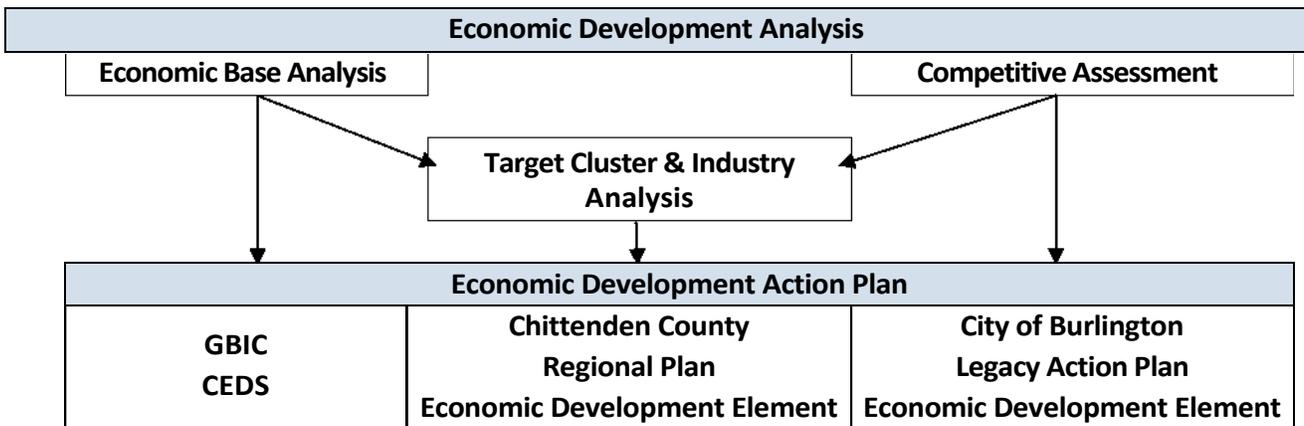
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INTRODUCTION

This portion of the ECOS Sustainable Communities project provides an identification of target clusters and industry sectors that will likely be significant economic drivers for Chittenden County. The recommended targets in this report have emerged from the extensive analysis performed and reported on in two other elements of this project:

- A detailed Economic Base Analysis that provides an understanding of the County's economy and trends that have been shaping it up to this point in time; and
- A comprehensive Competitive Assessment that provides an objective evaluation of the competitive strengths and weaknesses of Chittenden County as an economic development product.

The following graphic shows the interrelationship of the three research and analysis elements and the Economic Development Action Plan that will result.



This Target Cluster and Industry Analysis is the product of a contract between the Chittenden County Regional Planning Commission (CCRPC), with management oversight by GBIC, and a team of economic development consultants headed by Garnet Consulting Services, Inc. Other members of the consulting team include Wadley-Donovan GrowthTech, LLC; Harold & Associates; and Jeff Blodgett, Vice President of Research Emeritus of the Connecticut Economic Resource Center.

The ECOS Project Steering Committee is a broadly-based 60+ member partnership committed to implementing strategies to improve Chittenden County's long-term sustainability: economically, environmentally and socially. The Steering Committee has committed to a five-phase project:

1. Adopt common goal statements
2. Analyze reports regarding economic development, housing, energy, land use and transportation, natural resources and health/human services/education
3. Develop indicators tied to the goal statements
4. Prioritize implementation actions for the next five, ten and twenty years
5. Invest in high priority implementation actions.

The results will inform regional, municipal and other plans as they are updated. This report is part of ECOS' Phase Two.

This assessment is part of a Sustainable Communities project funded by the U.S. Department of Housing and Urban Development, and is one of three project elements intended to lead to the creation of a new economic development Action Plan for the county.

The use of target clusters and sectors should not overly limit Chittenden County's business development efforts – that is, this is not a matter of the County limiting its interests to only those clusters and sectors recommended herein. Rather, it should reflect the facts that:

- There are certain types and clusters of business that best meet the economic and community development goals of the County, and should therefore be a priority; and
- Marketing budgets are not infinite and should be focused on those types of business that offer the best return on investment in terms of meeting the County's economic and community development goals.

Having said that, this does not mean that business development efforts should be limited to just the identified targets. There are two types of targets that Chittenden County may be able to capitalize on in the future:

1. Targets of intent – those clusters and industry sectors (the term “industry” is used here generically to mean any form of business – for instance the tourism or agricultural industries – not just manufacturing) that have been specifically identified as highly desirable for the County; and

2. Targets of opportunity – those individual companies and types of business that fall outside the rather narrow target group intended for aggressive marketing and recruitment, but are nonetheless of interest and value to the County.

The primary difference between the two is that the approach to the first group is proactive, whereas the approach to the second group is reactive. Both groups are of potential value to Chittenden County.

These marketing and business assistance efforts are not limited to business recruitment or attraction; rather, they should apply to the entire range of business attraction, retention, expansion, creation and transition programs, services and initiatives.

SOME FUNDAMENTAL PRINCIPLES

Sustainability

Vermont in general and Chittenden County and its communities have a commitment to sustainability that predates this Sustainable Communities program and grant. Sustainability is the long-term maintenance of well-being as it cuts across the various environmental, economic and social dimensions of human life. From this perspective, the economic and community development targets recommended in this report must have the potential of longevity, be environmentally sensitive, contribute to the improved standard of living for the County's residents, and be socially equitable.

Balance

There is no "one size fits all" correct approach to the complexities of a regional economy. While every County resident may share the need for common quality of life factors, there are vast differences in experiences, abilities and desired employment types.

- Intended targets must provide an appropriate balance between a primary motivation of maximizing value-added, livable wage jobs and creating employment opportunities for residents of all abilities and desired employment type.
- While "green is good" and environmental sensitivity must be a foundation of the County's future economy and economic development efforts, not every new job created must be in a cluster or sector considered to be green.
- Jobs based on innovation and creativity must be balanced with "nuts and bolts jobs" that match the skills, experiences and desires of some of the County's residents.

Diversity

Local economies based on a limited number of industries, type of operation, or clusters are at risk if short-term or structural changes impact the economic base. A healthy economy will be diverse, offering a variety of types of jobs and job structures in a cross-section of industries, clusters and operational types. Chittenden County's economic base is currently very diverse (see the separate Economic Base Analysis). This diversity must continue.

Build on the Vermont Brand

There is no single definition of the Vermont brand, yet multiple sources said Chittenden County's future business development efforts should build on that brand. Key descriptors of the Vermont brand mentioned by a variety of interview sources or included in relevant documents include:

- Clean
- Sporty
- Interconnected
- Environmentally conscious
- Accessible government
- Locally focused
- Safe
- Unhurried
- Unpretentious
- A little rebellious
- Natural
- Friendly
- Unspoiled
- Hard working
- Thrifty
- Productive
- Outdoorsy
- Creative
- Practical
- Value and values
- Community-minded

These descriptors look through different “lenses.” Some are from the viewpoint of a resident; some from the viewpoint of a tourist; and some from the viewpoint of a business. Those that have most relevance to the business and economic development process, which is the subject of this portion of the County’s Sustainable Communities project are: hard working, productive, creative, value and values, and environmentally conscious.

STRATEGIC INDUSTRY SECTORS

The consulting team’s typical approach to target identification is to first identify the broad spectrum of target industries, clusters or sectors that would fit well in the client community or region and have the potential of helping that community or region achieve its economic development goals. This generally results in a list of potential targets that is too long to function effectively for targeting purposes. The next step is to work with the client to select a shorter list – generally four to six targets – that will actually comprise the primary list of targets.

Based upon these principles, the findings detailed in the Economic Base Analysis and in the Competitive Analysis, our secondary and primary research, our knowledge of industry trends, and the desire to maintain an economically diversified county economy, we initially identified 12 preliminary targets of intent and opportunity for the county. From these 12, working with the CCRPC, GBIC and others as appropriate, we identified five primary and five secondary targets. One of the primary targets consists of a combination of three of the initial targets.

Combined or alone, these targets would contribute to the County’s economic diversification; its overall wealth and high quality of life; its goals for economic, environmental and social sustainability; and the retention, development and attraction of a workforce that matches the skill needs of current and future industry, and the skill sets that exist or can be developed in the County.

The five primary targets are:

1. Information Technology, Communications, and Media
 - Information Technology
 - E-Commerce
 - Digital Media
2. High Value-Added Manufacturing
3. Higher Education
4. Clean Tech/Green Tech
5. Health Care and Wellness

Profiles of the five primary targets follow, with NAICS codes provided where possible.

Primary Target Profile: Information Technology, Communications and Electronic Media

This industry is complex, consisting of many different sectors and subsectors. Those that are recommended for the County’s business attraction and development efforts are listed in Table 1.

Table 1: Information Technology, Communications and Electronic Media Target Sectors

Target and Components	NAICS	
	Codes	Definitions
1. Information Technology		
Software design	541511	Custom Computer Programming Services
Web design	541511	Custom Computer Programming Services
Management of information systems	541512	Computer Systems Design Services
Management of information databases	541512	Computer Systems Design Services
Network systems and design	541512	Computer Systems Design Services
Management, Scientific and Technical Consulting	5416	Management, Scientific and Technical Consulting
2. Digital Media		
Games	54151	Custom Computer Programming Services
E-music	54151	Custom Computer Programming Services
	51222	Integrated Record Product/Distribution
	51223	Music Publishers
	51229	Other Sound Recording Industries
Wireless and mobile data services		
	51721	Wireless Telecommunication Carriers
E-learning		
	611	Educational Services
Modeling and simulation		
	54133	Engineering Services
	54142	Industrial Design Services
	54143	Graphic Design Services
	541511	Custom Computer Programming Services
3. Business and Commercial E-Commerce		
Non-store retail	4541	Electronic Shopping and Mail Order Houses
Wholesale electronic markets	4251	Wholesale Electronic Markets and Agents and Brokers

Definition

Information Technology

Information Technology (IT) refers to the digital management of data within audio, numerical, pictorial, graphical, and written textual formats. It involves the distribution and storage of this data via multiple media distribution systems. Components of IT play a critical role in virtually all economic sectors and activities, including environmental sustainability, and sustainability in industry sectors such as manufacturing, healthcare, information and communications, and agriculture, through

attention to energy consumption and efficiency, climate change, sustainable use of natural resources, personal information systems, and environmental risk management.

Digital Media

Digital Media is the combined elements of digital arts, science, and information technology within a variety of applications that serve informational, recreational, entertainment, social intercourse, and communication needs. Its applications include electronic books, digital video, video games, electronic magazines and newspapers, and interactive media. Applications in training and education (e-learning), and in modeling, simulation and training (MST) are key subsectors within this industry. MST is having particular growth in medical, industrial, and transportation training.

Consumer and Business E-commerce

E-Commerce (EC) consists of the electronic transaction of business and provision of services on the Internet and other computer systems. This industry is also referred to as E-Business, and within retail, E-tailing. The sector has six sub-classifications:

- E-tailing websites from which customers can purchase goods or receive services
- The assembly and application of demographic and other data
- Electronic Data Interchange (EDI) for business-to-business data exchange
- Medium for reaching business prospects and customers
- Business-to-Business (B2B) transactions
- Business transaction security, such as Secure Sockets Layer (SSL), and communications encrypting

Rationale for Selection

Information Technology

This sector was selected for the following reasons:

1. The target is within the Professional and Technical Services sector, a leading growth employment sector in the County.
2. The Vermont Software Developers Alliance and the Vermont Technical Council/Vermont Information Technology Center serve as a foundation for this sector's development and nurturing.
3. The County has a significant existing employer base within the industry, supporting expansion and diversified development, and as a magnet for additional talent attraction.
4. This sector has high forecasted national and global growth.
5. It is an environmentally clean industry in its operations and in the services it provides to end users.
6. There is a broad market applications and customer base.
7. The Computer Science and Computer Science Information Systems, and Management Information Systems and engineering programs at UVM provide a base of support for development and expansion.
8. The Managing Information Systems, web development, and computer & digital forensics programs at Champlain College also offer a supporting mechanism for local development and

expansion. Local industry employers report excellent experiences recruiting graduates from these programs.

9. Champlain College also offers IT related certificates and degrees in IT related fields.
10. The Vermont Technical Center's programs in computer engineering and information technology, computer software engineering, and electrical and mechanical engineering technology provide further support for skills development and training.
11. This sector is a Vermont target industry.
12. The average salary is high. The average county annual salary is \$70,622 in the Professional and Technical Service sector and \$45,255 in the data processing, hosting and related services subsector.
13. There may be a potential association with the Albany, NY area technical corridor.

Digital Media

This sector was selected for the following reasons:

1. The presence of workforce training, graduates, and technical support from Champlain College's Division of Communication & Creative Media and Management of Creative Media within the Division of Business; its on-line education program; and its programs in digital filmmaking, game art & animation, communications, creative media, and game design, provide an established support system for this sector's development.
2. The entrepreneurial philosophy of Champlain College and its Internship programs with area companies, indicate a creative mindset that can rapidly adapt to emerging opportunities and needs in this sector.
3. The presence of Vermont Technical College's computer engineering and information technology programs, its computer software engineering program, and its electrical and mechanical engineering technology programs provide additional workforce development support for growth of this sector.
4. It is a growing industry that is generating major changes in industry, business, communications, education, entertainment, and social interaction.
5. It is linked to the IT and e-commerce targets and to the county's existing business clusters.
6. It is within the Professional, Scientific & Technical services sector, a leading growth employment sector in the County.
7. It is a green industry.
8. UVM's new 9,000 square foot Clinical Simulation Laboratory may offer opportunities for development of medical simulation software.
9. Although average wages are not available in this specific subsector, the average annual county salary is \$70,622 in the Professional and Technical Service sector, of which it is a part.

Business and Commercial E-Commerce

This sector was selected for the following reasons:

1. It is a growing industry sector across many business lines.

2. There is an established local and state company base to serve as a core from which this industry can expand.
3. It is linked to retail, sustainable agriculture (local products, heirloom seeds, VT cheese gift baskets, African ethnic foods), digital media, and information technology targets.
4. E-commerce retailers (e-tailers) can operate in the County, even though it is geographically removed from most of the national markets, as distribution and fulfillment centers can be located in other sections of the country. Operational headquarters, technical support systems and other non-distribution related operations can be located in the County.
5. It is a green industry.
6. It is an industry that requires high level technical, financial and administrative talent.
7. It supports business growth of local retailers through multi-channel marketing.
8. It offers e-commerce opportunities for green or natural products such as health and beauty aids and other consumer and business products.
9. The average annual county salaries range from \$43,909 in the non-store retail sector to \$68,452 in the electronic markets and agents and brokers sector, to \$70,622 in the Professional and Technical Service sector.

Employment and Real Estate Implications

Because of the diversity and complexity of this target sector, employment by establishment will vary greatly from very small (two to five) to very large (200 – 500). Taken in the aggregate, growth of this sector can generate substantial employment over time, with desirable wages. The fact that this sector will grow over time, rather than explode in a short period, matches the County's current population and workforce growth trends and projections.

Initially most new establishments in this sector will seek to lease space. This will be a mix of office, manufacturing/distribution, and retail needs. The County's current inventory of available space can meet these needs in the short-term. As companies in this sector grow, demand for new sites, particularly in fully-serviced (good access roads, full utilities, and advanced voice and data transmission) master-planned business park environments for construction of custom-designed facilities, will increase. The County's inventory of available land in this type of environment is currently relatively limited and will need to be expanded in the future.

Primary Target Profile: High Value Manufacturing

High Value Manufacturing (HVM) cannot be confined to any specific manufacturing sectors based upon the evolving definition of HVM. Traditional sectors used in the past were limited to the electronics, printing, medical device, biotech, aerospace, automotive, energy, and advanced materials, including nanotechnology. Now the definition spans the entire manufacturing spectrum, reflecting the fact that large batch, low value products generally do not make sense in the United States. For this reason, this Strategic Industry Sector does not lend itself to a definition by NAICS code. Therefore, any manufacturing sector focused on high value productivity (dollar value produced per employee hour worked) can fall into this sector, as can companies whose focus is on adding a variety of other types of value to both the economy and society.

Definition

The definition of HVM has changed during the past decade. Formerly it referred to manufacturing processes that produced finished products with a value that was much higher than the value of the material, research, labor, transportation, financial, and other inputs that went into its production. Newer definitions are less precise. They expand on the older one to include the benefits accrued to society overall; by the provision of high quality, well compensated interesting work to employees; environmentally sustainable operations; and the contribution level to national R&D investment. High Value Manufacturers, by this definition, can have their value measured by the uniqueness of their processes, a highly recognized brand, rapid product delivery times, or highly customized services. This new definition recognizes that in today's very competitive global market, prosperity to a nation, to investors, and to employees is based on companies that delivery high value as defined by a more holistic definition.

Rationale for Selection

This sector was selected for the following reasons:

1. The new definition for HVM conforms to the County's sustainability goals, and there is a foundation of HVM facilities in the County that can serve as a foundation for target expansion.
2. Manufacturing wages in the County are high at a county overall annual salary average of \$72,515 in 2010.
3. Manufacturing has a high economic impact multiplier (i.e. high economic ripple effect throughout the area economy) that will support other sectors (housing, retail, services, etc.).
4. It is a dynamic sector, offering growing opportunities for small firms, and providing a source for innovation in the domestic and global economy.
5. Employment and production are increasing nationwide as the economic recovery expands and the U.S. competitiveness as a manufacturing center grows.
6. There is a current and increasing need for high workforce skills, which lead to higher wages.
7. The County can provide opportunities for suppliers and vendors to current employers, strengthening the supply chain relationship.
8. There are existing manufacturing skills in the County and its commute zone, and workforce development programs aimed at providing the new skills – generally more technical in nature – needed by the manufacturing workforce of the future.

Analysis

9. The County offers a good supporting infrastructure: rail, highway, utilities and communications.
10. Engineering programs as UVM offer a recruiting opportunity for area manufacturers.
11. The industry is linked to the clean tech/green technology target.
12. The County offers a non-union environment, which is highly desired by manufacturers.

Employment and Real Estate Implications

Establishment size by employment in this target sector can range from small startups (up to ten workers) to mid-size production plants (50 to 100 employees). The most critical employment need will be the ability to provide a workforce with technical skills that allow the rapid adoption to new production methods. Real estate needs will generally be for industrial space most typically in the 2,500 to 40,000 square foot range. Because of the high cost of production equipment in this sector, the majority of initial space needs will be for leased space. Successful growing companies will eventually look for space to own, either by purchasing on the open market, or for those with special needs, custom-designed facilities. The County has an adequate supply of industrial space for the short-term, but is likely to need land for new construction in the future.

Primary Target Profile: Higher Education

This target is not one designed or intended for recruitment efforts by the County, i.e. it is not being recommended that the County recruit one or more educational institutions to the area. Rather this target was selected as one that should be developed as a supporting agent for other sectors – in particular, the Information Technology, Communications and Electronic Media, High Value Manufacturing, and the Green Technologies targets, the secondary targets noted on page 7, and for overall economic development. The initiatives being taken by the University of Delaware in Technology Development within New Castle County can serve as a model of what a University in a small state can achieve.

This Target includes all of the County's higher educational sectors. In addition, but more tangentially, the local public school systems need to address their roles in the area's economic expansion and diversification through workforce development, recruitment of highly educated residents from other locations, business attraction, and business retention and expansion.

The NAICS Codes for this target are:

- NAICS 61121: Junior Colleges
- NAICS 61131: Colleges, Universities and Professional Schools
- NAICS 6114: Business School and Computer and Management Training
- NAICS 61151: Technical and Trade Schools

Rationale for Selection

This sector was selected for the following reasons:

1. The County has a substantial higher educational base (University of Vermont, Champlain College, St. Michaels College, Burlington College, Vermont Technical College, Community College of Vermont) with diversified and innovative programs.
2. Vermont HiTech, Inc. is an innovative training model that is unique in the field of education and could serve as a valuable source of assistance to area companies seeking to ramp up workforce quickly. It also provides an avenue for residents not involved in the workforce to become employed.
3. There is a high use of interns by area business, many from local higher educational institutions. The use of interns is higher than what the Wadley-Donovan and Garnet consulting team has seen in other parts of the country, indicating a unique advantage for workforce development and graduate retention opportunities.
4. Area businesses rate the area's higher educational facilities and their programs very favorably.
5. There is an existing high interaction between area businesses and higher educational institutions, giving a solid base for enhanced industry-higher educational linkages and interface.
6. There is a potential for even stronger relationships between the business and higher educational communities including an increased focus on commercialization of ideas generated within the higher education sector.
7. The County is a moderate sized community in a small state, allowing for closer relationships among the education, business and economic development sectors, thereby putting the County in a competitive advantage versus other locations.

8. Higher education institutions can serve as a springboard for entrepreneurial development. Champlain College has a program dedicated toward entrepreneurial development, one of the few in the country of its sophistication. Similarly, UVM offers an entrepreneurship concentration within its School of Business Administration.
9. Higher educational institutions provide the opportunity for technology spin-offs to be generated and provide workforce training potential for area companies.
10. There are linkages between the area's higher educational intuitions and to the Vermont Technical Council and its members.
11. Technology transfer opportunities exist from higher educational institutions that can significantly impact economic development.
12. There are business service opportunities to provide the goods and services the County and area's higher education institutions require.

Employment and Real Estate Implications

This strategic sector aims at maximizing the value of the existing higher education system within the County. From that perspective, the direct employment and wages, and real estate occupancy needs will be small. However, the value added to the County's economic base and system can have a major impact across any other business sector that takes advantage of the higher education – business linkage, resulting in employment and space needs in these secondary sectors.

Primary Target Profile: Clean Tech-Green Tech

Clean or Green Technology is a broad-based target that can include most, if not all business sectors. Despite this pervasiveness, it has no single standard definition or national database on its industries or subsectors, and there is little information on its characteristics, size, or growth. NAICS Codes cannot be applied to this industry because of its broad scope.

Definition

Despite this absence of a standard definition, it is generally agreed that it can be defined as the sector of the economy that produces goods and services with an environmental benefit. Various states have created their own definitions of what industry or business sectors it includes. California's is one of the broadest and has identified six principal sectors containing 41 specific industries and clusters, many of which cannot be found by NAICS Code:

1. Renewable Energy, Energy Generation, System Installation & Storage
 - Solar power (thermal & photovoltaic systems)
 - Wind power
 - Water & hydro-electric power
 - Geothermal power
 - Hydrogen
 - Energy storage
 - Energy transmission/ distribution
 - Energy services (ESCO)
 - Utility-scale renewable energy plants
2. Green Building and Energy Efficiency
 - Green product manufacturing (Lighting; Construction materials; "Smart" systems and equipment; HVAC/R equipment)
 - Green construction materials wholesaling
 - Energy Services (ESCO)
 - Design and construction of new buildings
 - Retrofitting of existing structures
 - Retro-commissioning of existing buildings
 - Green building operations and maintenance
 - Deconstruction
 - Certifications (LEED)
 - Green landscaping
3. Biofuels Production and Farming
 - Biofuels production
 - Organic farming practices
 - Biomethane production (energy from animal waste; energy from landfills)
 - Sustainable fisheries
4. Transportation and Alternative Fuels
 - Transportation technology (hydrogen electrical, biofuels, hybrid systems)
 - Fuel efficient vehicle manufacturing
 - Repair & maintenance of alternative fuel vehicles: individual, mass transit, and trucking (hybrid/electrical; hydrogen/fuel cells; biofuels; natural gas, LNG & CNG)

- Logistics
 - Green infrastructure (ports, airports, etc.)
5. Water, Wastewater and Waste Management
 - Water shed conservation and management
 - Water treatment
 - Harvesting rainwater and recycling gray water
 - Wastewater treatment & management
 - Solid waste management/recycling
 - Hazardous waste management/recycling
 6. Environmental Compliance and Sustainability Planning
 - Air quality
 - Conservation and pollution prevention
 - Pollution prevention, rule development and enforcement
 - Cleanup/safety
 - Emissions control
 - Monitoring and compliance
 - Transportation systems

Within this broad industry definition specific targets identified for Chittenden County are:

1. Green product and services engineering services
2. Architectural services related to green building design and LEED (Leadership in Energy and Environmental Design) Certification
3. Environmental, energy, smart grid, waste management, transportation, resource management and recovery, and other consulting services
4. Energy and other related management services
5. Environmental products and services
6. R&D on a broad spectrum of products and services
7. Manufacturing of clean tech products, such as monitoring equipment and sensors, and manufacturers using green manufacturing production processes (green manufacturing)
8. Alternative energy systems
9. Information Technology

Rationale for Selection

This sector was selected for the following reasons:

1. Vermont and Chittenden County are already established in this industry through a significant base of employers.
2. There is opportunity to position Chittenden County as a global hub for R&D and application/commercialization.
3. The target is rapidly growing and has a global focus.
4. UVM's program in environmental engineering and other engineering disciplines is an additional element in the County's existing industry base.

5. The Average County annual salaries range from \$67,228 in manufacturing, to \$70,622 in the Professional and Technical Service sector; Brookings Institution ranks the state's average green jobs annual salary at \$37,681.
6. Vermont's clean economy jobs make up 3.0% of all state jobs, a concentration that ranks the state 5th in the U.S. (Metropolitan Policy Program at Brookings).
7. The state's lean economy job growth 2003-2010 has been below the national average, needing a boost (data from Metropolitan Policy Program at Brookings).
8. Vermont Technical College has programs in construction practice and management, architectural and building engineering technology, architectural engineering technology, civil and environmental engineering, and sustainable design and technology.
9. Vermont Center for Emerging Technologies (VCET) could serve as a supporting organization for the development of this target.
10. Vermont Energy Investment Corporation is a large employer in this sector, as several others.

Employment and Real Estate Implications

Because of the diversity of this target sector, employment by establishment will vary greatly from very small (five to ten) to mid-size (up to 100). Given the rapidly emerging nature of this sector, rapid growth can be expected for some companies. Conversely, the "experimental" and rapidly changing nature of many of the subsectors and individual companies in this sector can be expected to result in failures and contractions. This underscores the importance of an effective business retention and expansion program by GBIC and others in the County, Nonetheless, it is likely that growth of this sector can generate substantial employment over time, with a diversity of job types and related wages.

Most new establishments in this sector will seek to lease space of a variety of types including office, manufacturing/distribution, and R&D. The County's current inventory of available space can meet these needs in the short-term although substantial renovations may be required. As companies in this sector grow, demand for new sites, particularly in fully-serviced (good access roads, full utilities, and advanced voice and data transmission) master-planned business park environments for construction of custom-designed facilities, will increase. The County's inventory of available land in this type of environment is currently relatively limited and will need to be expanded in the future.

Primary Target Profile: Health Care and Wellness

This is the least well-developed of the Strategic Industry Sectors selected for Chittenden County, but one that is exploding globally and has a strong foundation on which to build because of the various health care related facilities in the County. Development of this sector can head in many directions including biosciences/life sciences, pharmaceuticals, medical devices, health insurers, and wellness and specialty treatment centers and businesses. As more concrete examples, a form of this cluster could be the broad area of the manufacturing of medical instruments, devices and equipment, or a specialty niche such as gerontological products and services to meet the growing needs of an aging population.

It should be noted that there is significant competition in this subsector since many communities are already targeting the broad range, or elements of biosciences, life sciences, and related types of business.

The following profile describes two subsectors we believe have the greatest promise, but these are not the only possibilities.

Health Care

This sector of the target is not one designed or intended primarily for recruitment efforts by the County. It is not being recommended that the County recruit a hospital. Chittenden County is very well served by the Fletcher Allen Health Care Complex and hosts the UVM College of Nursing and Health Sciences and the Albany College of Pharmacy. It is, however, recommended that the County enhance its position even more as a regional medical center where possible and needed. Recruitment of top physicians in a variety of disciplines requires the quality of life sought by these individuals, which GBIC can address by teaming with Fletcher Allen and the University of Vermont Medical School to identify specific initiatives.

The primary NAICS Codes for this target subsector are:

- NAICS 6214: Outpatient Care Centers
- NAICS 6215: Medical and Diagnostic Laboratories
- NAICS 622: Hospitals
- NAICS 623: Nursing and Residential Care Facilities
- NAICS 541511: Custom Computer Programming Services, with customer support services (software for medical related applications, including software for such uses as e-learning, hospital and patient management systems, prescription tracking systems, medical simulation, diagnostic modeling, imaging and surgical robotic control systems)
- NAICS 541511: Website design and management for hospitals, clinics, nursing homes, rehabilitation centers, doctors and dentists and other healthcare providers and treatment facilities
- NAICS 541710: Health research and development laboratories and services
- NAICS:454113: Telephone and Internet prescription fulfillment centers
- Many other types of businesses serving health care facilities in Chittenden County and elsewhere

Wellness

Chittenden County has been identified as the healthiest county in the healthiest state. This is a truly unique trait that could be leveraged to brand the County as a center for wellness and healthy living for the northeastern United States and eastern Canada.

Today's definition of wellness goes well beyond the medical field to include spirituality, creativity, exercise and recreation, meditation, and many other things that lead to a high quality of life and sense of well-being. This focus matches well with the goals of the County and country's Sustainability initiative.

The National Wellness Institute identifies a six-dimensional model of wellness:

- **The social dimension** encourages contributing to one's environment and community and emphasizes the interdependence between others and nature. Enhancing personal relationships and fostering friendship is a critical tenet.
- **The occupational dimension** recognizes personal satisfaction and enrichment in one's life through work.
- **The spiritual dimension** recognizes our search for meaning and purpose in human existence.
- **The physical dimension** recognizes the need for regular physical activity and healthy eating habits.
- **The intellectual dimension** recognizes one's creative, stimulating mental activities and the importance of expanding one's knowledge and skills.
- **The emotional dimension** recognizes awareness and acceptance of one's feelings, and includes the degree to which one feels positive and enthusiastic about oneself and life.

These key aspects are also included in a definition of wellness created by Charles B. Corbin of Arizona State University, and the author of *Concepts of Fitness and Wellness: A Comprehensive Approach*.

The website www.definitionofwellness.com makes the concept even broader, to include four other elements, stating, "Wellness is an active process of becoming aware of and making choices toward a more successful existence." From that perspective, the website's wellness cluster includes 10 primary sub-clusters:

- **Social:** The social dimension of wellness encourages contributing to one's human and physical environment to the common welfare of one's community.
- **Occupational:** The occupational dimension of wellness is involved in preparing for work in which one will gain personal satisfaction and find enrichment in one's life through work.
- **Spiritual:** The spiritual dimension of wellness involves seeking meaning and purpose in human existence.
- **Physical** (includes nutritional management): The physical dimension of wellness encourages cardiovascular flexibility and strength and also encourages regular physical activity.
- **Intellectual:** The intellectual dimension of wellness encourages creative, stimulating

mental activities.

- **Emotional** (includes stress management): The emotional dimension of wellness emphasizes an awareness and acceptance of one's feelings. Emotional wellness includes the degree to which one feels positive and enthusiastic about oneself and life.
- **Environmental:** It is important to lead a lifestyle that is respectful of our environment.*
- **Financial:** Financial wellness is having an understanding of your financial situation and taking care of it in such a way that you are prepared for financial changes.*
- **Mental:** Mental health is defined by the World Health Organization as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community." Cultural differences, subjective assessments, and competing professional theories all affect how "mental health" is defined. *
- **Medical:** Medical wellness, as defined by the Medical Wellness Association, is the practice of health and medical care relating to wellness outcomes. The more specific definition of medical wellness is: an approach to delivering healthcare that considers multiple influences on a person's health and consequently multiple modalities for treating and preventing disease as well as promoting optimal well-being.*
- **Workplace Wellness.** Workplace wellness includes a broad range of programs, but generally are employer based initiatives that encourage employees to take preventive steps against worsening health conditions and the onset of sickness, and to adopt healthier lifestyles. Employers may implement a variety of workplace wellness programs, from onsite gyms to simple workplace wellness newsletters. Some companies across the country have instituted very comprehensive programs, while others have implemented a modest set of activities to promote healthier lifestyles. Employers engage workplace wellness programs to increase employee productivity, job satisfaction, and success, and to reduce health insurance related costs. *

** Additional to the National Wellness Institutes' list*

These wellness clusters contain many types of operations, or sub-clusters. Below are examples of sub-clusters and their NAICS Codes, where available.

- Social Wellness
 - 81321 – Grant Making and Giving Services
 - 81331 – Social Advocacy Organizations
 - 813311 – Human Rights Organizations
- Occupational Wellness
 - 621340 – Occupational Therapists' Offices and Services
 - 813920 – Occupational Therapist Associations
 - 926150 – Occupational Safety and Health Standards Agencies
 - Career Counseling Services
- Spiritual Wellness
 - 813110 – Religious Organizations
 - Organizations and services related to Meditation
 - Publishers of print or electronic books, newsletters or other periodicals focused on spirituality (links to the Internet Publishing target sub-cluster)

- Physical Wellness
 - 446191 and 621399 – Nutrition Stores and Nutritionists’ Offices
 - 621498 – Pain Therapy Centers and Clinics
 - 621999 – Physical Fitness Evaluation Services
 - 713940 – Physical Fitness Facilities
 - 813920 – Health Professional Associations
 - Organic foods research, production and marketing
- Intellectual Wellness
 - Organizations, businesses, and services focused on problem solving, creativity, and learning
 - Creators of puzzles and other mental activities/games (both physical and software)
- Emotional Wellness
 - 621340 – Recreational Therapists’ Offices
 - 621610 – In-house hospice care
 - Organizations and services related to Grief Counseling
 - Stress Reduction Research and Services
 - Relationship Counseling and Research
- Environmental Wellness
 - 541710 – Environmental Research and Development Laboratories or Services
 - 813312 – Environment, Conservation, Natural Resource Preservation and Wildlife Organizations
 - Alternative Energy Research, Development and Services
- Financial Wellness
 - 523930 – Investment Advisory Services
 - 813319 – Taxpayer Advocacy Organizations
 - Debt Counseling Services and Organizations
- Mental Wellness
 - 923120 – Mental Health Program Administration
- Medical Wellness
 - 813319 – Substance Abuse Prevention Advocacy Organizations
 - Cross-disciplinary approaches to patient care
 - Organizations devoted to the development and application of professional standards for wellness practices across clinical practices
- Workplace Wellness
 - Workplace initiatives for more healthy living
 - Cross-disciplinary approaches including nutrition, stress management, weight loss and management, exercise, and work-life balance

Rationale for Selection

1. This target builds on the presence of Fletcher Allen Hospital/UVM College of Medicine Medical Center, UVM College of Nursing and Health Sciences, and Albany College of Pharmacy to more fully develop a regional health and wellness cluster.
2. UVM’s College of Medicine has numerous departments, including:
 - Anatomy and Neurobiology

- Anesthesiology
 - Biochemistry
 - Family Medicine
 - Medicine
 - Microbiology and Molecular Genetics
 - Molecular Physiology and Biophysics
 - Neurology
 - Obstetrics, Gynecology and Reproductive Sciences
 - Orthopedics and Rehabilitation
 - Pathology
 - Pediatrics
 - Pharmacology
 - Psychiatry
 - Radiology
 - Surgery
3. UVM also has 14 Centers, such as the Clinical Research Center, Office of Health Promotion Research, and the Vermont Cancer Center; and it has six programs, such as the Program in Integrative Health.
 4. Vermont Technical College offers an Associate degree and certificate programs in nursing, and an Associate degree program in respiratory therapy.
 5. UVM has a Master's degree in bioengineering, a BS degree in nuclear medical technology, a BS/MS in nursing, a Masters and PhD in pharmacology, and a Bachelors degree in radiation therapy.
 6. UVM's new 9,000 square foot Clinical Simulation Laboratory offers potential linkages to the High Value-Added manufacturing and Clean Tech - Green Technology Strategic Sectors and opportunities for development of medical simulation software.
 7. UVM's Transdisciplinary Research Initiative is an asset for the development of this target.
 8. Champlain College has a Healthcare Management Program, and offers a Bachelor's and Master's Degree in HealthCare Management, as well as certificates in Healthcare Management, Information Systems and Quality Improvements.
 9. Chittenden County's ranking as the most healthy county in the healthiest state can be used as a lever for Quality of Life and Health Care branding. Only one place can claim this distinction - the County can be positioned as a regional leader for the growing interest in "wellness".
 10. The County can leverage its ranking as the most healthy county into a Wellness Center brand, and develop a broad sector under the banner of that brand.
 11. The target employs a range of skills within a broad spectrum of wages. The average county annual salary in healthcare is \$51,915.
 12. The residents of the county are concerned about environmental wellness and other forms of wellness defined above, creating a sympathetic and supportive environment for the

development of wellness related operations and businesses within the county. This established characteristic can serve as a magnet for attracting people from around the country and world to the County, creating a nexus of talent for diversified target development.

13. This Strategic Cluster can relate directly to other primary targets – High Value-Added Manufacturing, Higher Education, and Clean Tech-Green Tech – as well as to the secondary targets of Value Added/sustainable Agriculture and Non-profit Organizations.

Employment and Real Estate Implications

The Health and Wellness cluster has a wide variety of labor and business-space needs. The sectors or activities of this Strategic Sector that are attracted to Chittenden County will determine the resources needed.

From an employment perspective, a common theme will be the need for scientific and technical skills, and a need for life-long learning to maintain those skills. These will likely be good paying jobs. However, every facility in this sector will also need services (for instance, clerical, janitorial, facility maintenance) that will be available for those without a scientific or technical background.

From a real estate perspective, there are many possibilities:

- Some facility needs will be production-oriented and need manufacturing space, which can be found in Chittenden County.
- Some space needs will be service-oriented and require office space that exists in Burlington and its suburbs.
- Some will be “intellectually oriented”, and may prefer a location close to UVM and Fletcher-Allen.
- Some are creatively oriented and may be drawn to the live/work environment in downtown Burlington.
- Some are headquarters of not-for-profit associations serving members across the country and globe, also needing office space.
- Some may be research and development functions and require laboratory space.

Most target-office establishments will be small in size, but some may be larger, particularly if insurance companies become more deeply involved in aspects of wellness that improve health and reduce claims, and decide they need a northeast or New England location.

Specific uses will range in size from small (1,500 – 5,000 square feet) to moderate (up to 25,000 square feet) size, with the possibility of larger office uses for national or international associations, although the lack of direct air service to Boston may limit interest by operations seeking to serve an international market. While most space will be used for offices, there is also the likelihood of space being needed for clinics, spas, large open participation space, research facilities, and other uses. There could be a need for larger manufacturing facilities. Chittenden County is well positioned to meet these types of needs, although some of the uses may require a higher level of conversion work and cost than others, or new construction.

The majority of operations in this cluster will require fully serviced properties with good utility (water, sewer, natural gas, and electric service) and telecommunications services. In particular, any R&D or treatment related lab space must have robust public water and sewer capability. National and international associations will have significant voice and data transmission needs.