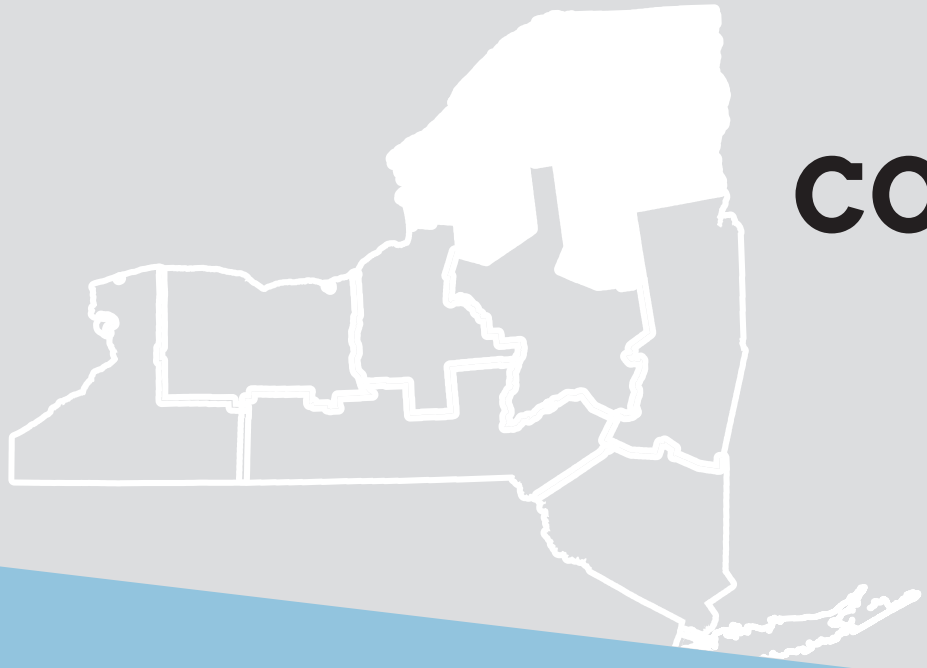

NORTH COUNTRY

University at Buffalo
The State University of New York

School of Architecture and Planning
UB Regional Institute

Prepared by the UB Regional Institute with O-H Community Partners in support of the New York Upstate Revitalization Initiative

JULY 2015

TARGETED ANALYSIS & BEST PRACTICES FOR TWO INITIATIVES

INITIATIVE #1

Renewable Energy Powered Food

Becoming a top producer of renewable energy powered food

INITIATIVE #2

Transportation Equipment & Materials

Developing a transportation equipment center of excellence and innovation

The seven regions included in the Upstate Revitalization Initiative (URI) will be developing plans for how they will invest and strategically leverage $500M in state funding on concentrated enterprises that will create and maintain well-paying net new permanent private sector jobs, attract and retain private sector investments, and contribute to the growth of widespread wealth. In their plans, regions will work to identify a suite of projects and initiatives that, taken together, will transform the region.

The North Country Region selected two initiatives focused on Renewable Energy Powered Food and Transportation Equipment & Materials for a closer study.

NEW YORK STATE OF OPPORTUNITY. North Country Regional Economic Development Council

University at Buffalo The State University of New York
School of Architecture and Planning
UB Regional Institute

INITIATIVE #1
Renewable Energy Powered Food

TARGETED RESEARCH

4 ***What is the market for selected crops and farm-related activities?***

6 ***What baseline exists for agriculture and energy production in the North Country?***

8 ***What is the potential for greater renewable energy production in the North Country?***

BEST PRACTICES

10 ***Backyard Farms, Madison, ME***

12 ***Holland, the Netherlands agricultural sector, The Netherlands***

14 ***AeroFarms, Newark, NJ***

INITIATIVE #2
Transportation Equipment & Materials

TARGETED RESEARCH

16 ***What does the cluster contribute in terms of jobs, establishments and wages?***

17 ***What regional specializations exist?***

18 ***Are there businesses in Ontario or Quebec in the Transportation Equipment and Materials Cluster?***

BEST PRACTICES

20 ***Automation Alley, Troy, MI***

22 ***Quebec Ground Transportation Association, Drummondville, Quebec***

24 ***Chennault International Airport, Lake Charles, LA***

26 ***Data Sources & Notes***

Developing transformative and sustainable initiatives based on reliable data and best practices.

Becoming a top producer of renewable energy powered food

INITIATIVE #1
Renewable Energy Powered Food
TARGETED RESEARCH

What is the market for selected crops and farm-related activities?

In planning for a renewable energy-powered food project, the North Country has the opportunity to grow crops that are being imported into New York State from California and will potentially be affected by the drought in California. These imports include staples like beans, tomatoes, grapes, walnuts and lettuce. California farmers are being forced to change the amount of land they dedicate to their crops in response to the decline in surface water and the costs of pumping groundwater for irrigation.[1] The drought, which began in 2012, has been described as the state's worst in the last 1,200 years[2] and is expected to cost $2.6 billion in lost revenues in 2015. Lost revenues in vegetables and non-tree fruits are expected to reach $108 million this year, while losses for feed and other crops are expected to exceed $300 million.[3] If drought conditions continue, groundwater supplies are exhausted, and supply is not shifted to producers elsewhere, prices may increase if they haven't already.

Decreased production of certain crops in California opens the market for the North Country, enabling it to fill the gap with regionally grown foods. Certain crops that are grown in California and shipped to New York began increasing in wholesale price in 2010, just before the drought in the West began. The price increase may be the result of California's constrained supply of these crops.

Between 2005 and 2010, inflation-adjusted wholesale prices for beans, tomatoes, kale, grapes and walnuts coming from California into NYS via the New York Terminal increased by 40% or more. Beans experienced the largest percent increase since 2010, increasing 65% in price since 2010 and more than doubling in price since 2000. Walnut prices have also consistently increased since 2003, more than doubling in price per pound overall. With the exception of kale, which saw a 47% price jump since 2010, other California grown leafy greens like chard and lettuce experienced much smaller price increases since 2010.

Prices for other foods have not yet been negatively affected by the drought. Peppers and squash both decreased in price by significant margins since 2010. Onions, carrots, beets and potatoes also experienced declines ranging from 4% to 17%.

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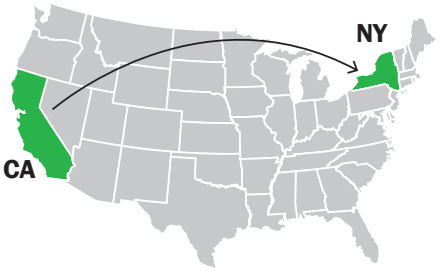
[1] Howitt, R.E., Medellin-Azuara, J., MacEwan, D. and Lund, J.R. (2012). Calibrating disaggregate economic models of agricultural production and water management. Environmental Modelling & Software 38, 244-258. Retrieved on 06/30/2015 from http://dx.doi.org/10.1016/j.envsoft.2012.06.013.

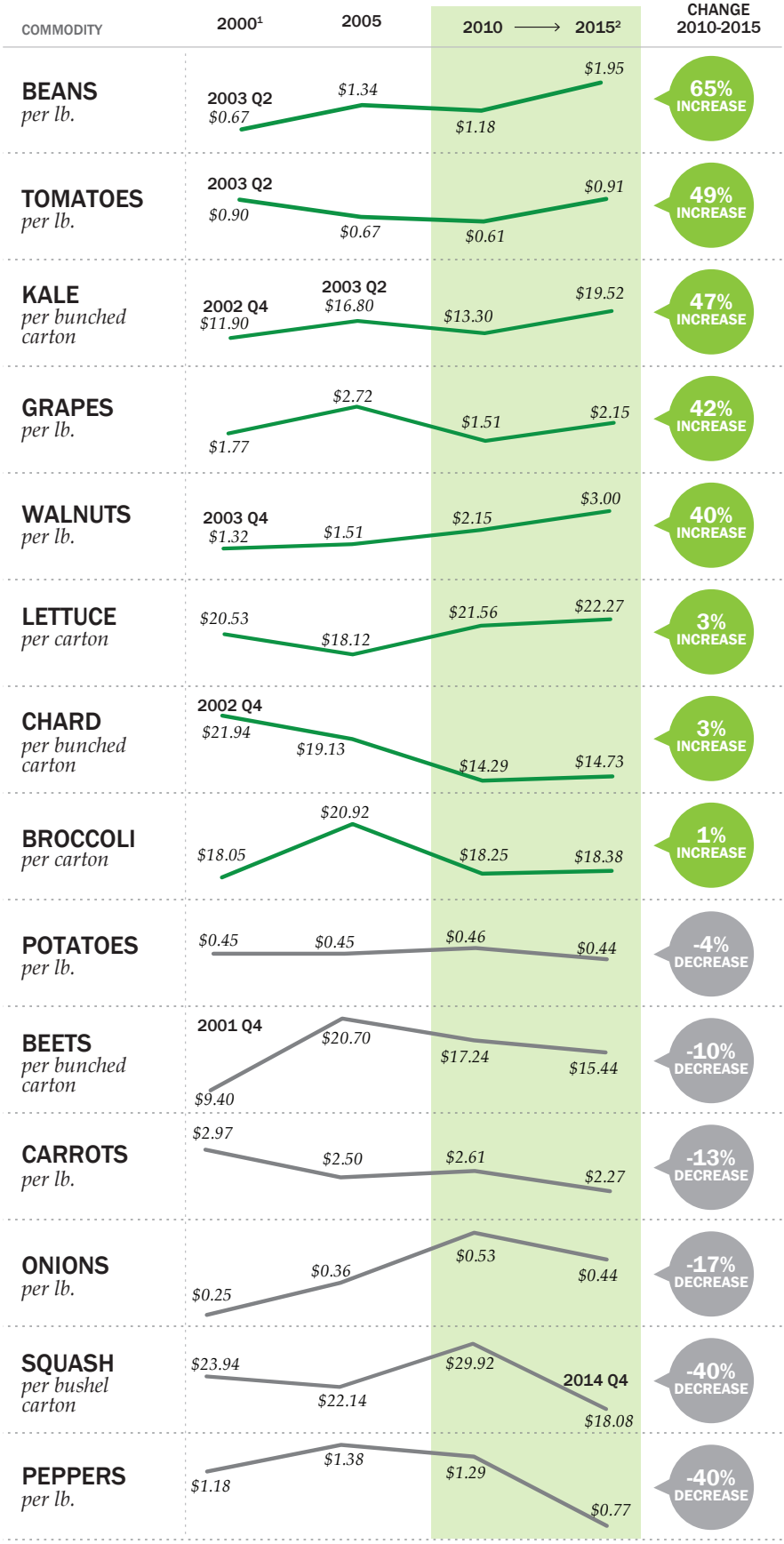
[2] Griffin, Daniel and Kevin J. Anchukaitis. (December 28, 2014). How unusual is the 2012-2014 California drought? Geophysical Research Letters, 41 (24). Retrieved on 07/01/2015 from http://onlinelibrary.wiley.com/doi/10.1002/2014GL062433/full.

[3] Howitt, R.E., Duncan MacEwan, Josue Medellin-Azuara, Jay Lund, and Daniel A. Sumner. (2015). Preliminary Analysis: 2015 Drought Economic Impact Study. Retrieved on 07/07/2015 from https://watershed.ucdavis.edu/files/biblio/2015Drought_PrelimAnalysis.pdf.

INFLATION-ADJUSTED WHOLESALE PRICES OF SELECTED FRUITS AND VEGETABLES SHIPPED INTO NYS FROM CALIFORNIA, 2000-2015



Prices for many fruits and vegetables shipped into NYS from drought-stricken California have been on the rise in recent years.



Source: UBRI analysis of data from the U.S. Department of Agriculture.
[1] 2000 unless otherwise noted.
[2] 2015 unless otherwise noted.

INITIATIVE #1
Renewable Energy Powered Food
TARGETED RESEARCH

What baseline exists for agriculture and energy production in the North Country?

In planning for a food production project powered by renewable energy, it is important to understand regional strengths. North Country is a leader in renewable fuel, which accounts for 97% of all fuel produced in the region and 31% of renewable energy produced across NYS. The region ranks second in the state in overall capacity of renewable fuel plants and is leading the state in the generation of wind and hydroelectric energy, with over 50 plants actively producing clean electricity.

A number of agricultural specializations exist in the North Country, with the region's share of cropland for corn, rye, alfalfa, apples and other hay exceeding what exists nationally. Between 2009 and 2014, acreage for apples and alfalfa grew 296% and 140%, respectively, contributing to the region's specialization.

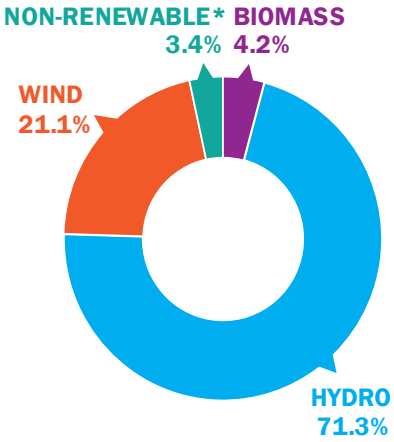
Maple syrup production is another niche market in the North Country. The region produces 32% of all maple syrup in NYS and is home to 27% of maple syrup producing farms in the state. Maple syrup production has been on the rise since 2007, regionally, statewide and nationally. With the region's growth of maple-syrup producing farms and maple syrup taps meeting or exceeding statewide and national growth rates, the North Country may be poised to further increase production and capture an even greater share of the market for this specialty product.

Forestry and logging is another specialty. Although the industry is fairly small, the North Country is home to 50% of the forestry jobs and 35% of related firms in the state. It also pays $8,000 above the regional average annual wage. Compared to the nation as a whole, the North Country has a higher concentration of employment and wages, and its forestry and logging industry tends to generate more income per worker than the national average. It is a unique specialization that could be further leveraged to support agricultural initiatives and value added food processing.

A strong agricultural sector can support the livelihoods of many local farm workers, operators and distributors while strengthening local food security, and it can also support local value added businesses in the food processing industry. An in-depth look at the North Country's specialization in the segments that make up the food processing industry reveals some potential areas for growth. While the region has a very strong specialization in Dairy Product Mfg, all other segments are underrepresented in the region when compared to the rest of the nation. Targeting additional growth in crop production could be done in a way that also grows value added production in the Animal Food Mfg, Grain & Oilseed Milling, Sugar & Confectionery Product Mfg, Fruit & Vegetable Preserving, Bakeries, and Other Food Mfg industry segments.

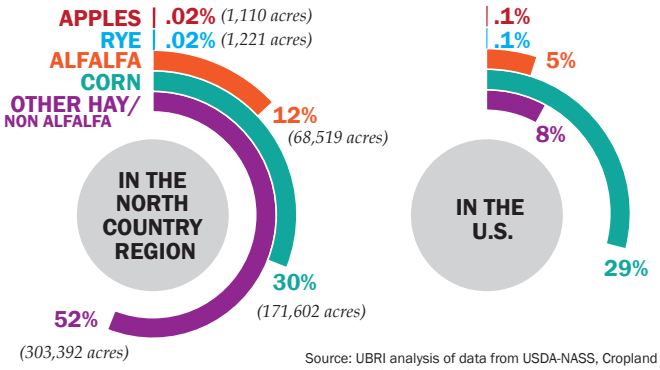
The North Country produces 31% of NYS's renewable energy.

SHARE OF RENEWABLE ENERGY PRODUCTION IN THE NORTH COUNTRY BY TYPE, 2014



*Non Renewable fuel sources include: Coal, Petroleum Based fuels, and Tires
Source: UBRI analysis of data from the U.S. Energy Information Administration.

% OF CROPLAND USED FOR SPECIALIZED CROPS



Source: UBRI analysis of data from USDA-NASS, Cropland Data Layer, 2014.

Cropland for selected products is up to 7 times more plentiful in the North Country, as compared to the nation.

For many crops, acreage in the North Country has grown 60% or more in recent years.

	ACREAGE 2014	% CHANGE 2009-14
TRITICALE	266	525%
APPLES	1,110	296%
SORGHUM	501	206%
ALFALFA	68,519	140%
SOYBEANS	15,413	110%
WINTER WHEAT	1,628	95%
RYE	1,221	85%
DRY BEANS	62	60%

Source: UBRI analysis of data from USDA-NASS, Cropland Data Layer, 2009, 2014.

	2007	2012
MAPLE SYRUP PRODUCTION FARMS	351	390
GALLONS OF MAPLE SYRUP	84,177	113,492

The North Country produces 32% of maple syrup statewide and 5% of the national total.

Source: UBRI analysis of data from USDA National Agricultural Statistics Service.

FORESTRY AND LOGGING IN THE NORTH COUNTRY, 2013

324 JOBS

$12,290,652 TOTAL WAGES

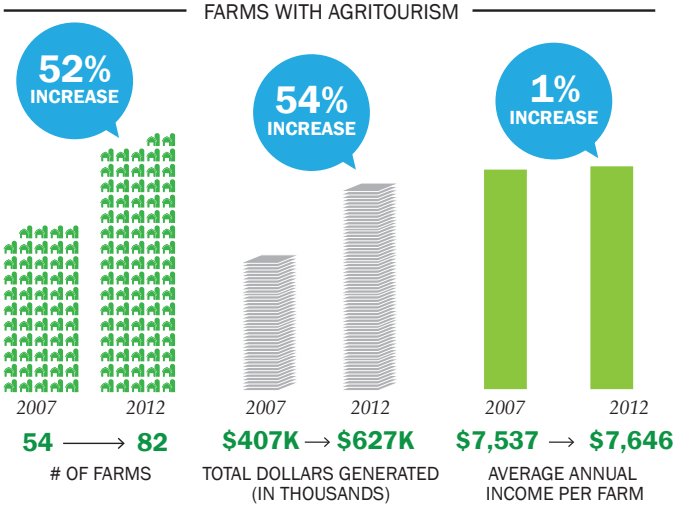
Forestry and logging in the North Country captures over 5 times the share of jobs and over 8 times the share of wages that the industry captures nationally.

FORESTRY AND LOGGING BY THE NUMBERS **70** FIRMS **$37,934** AVG ANNUAL WAGE

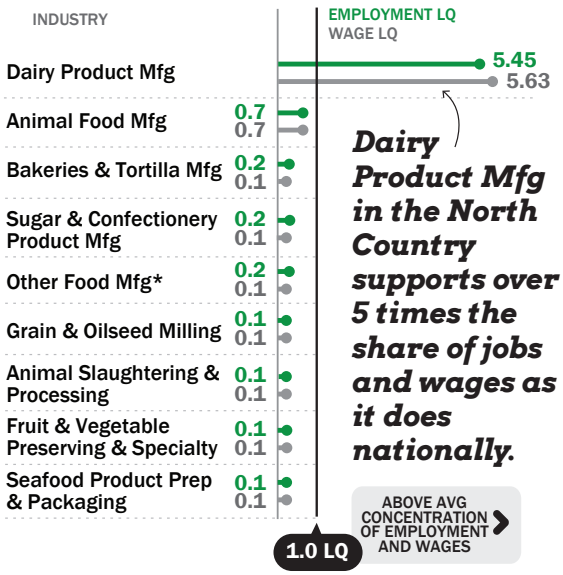
Souce: UBRI analysis of data from NYS Department of Labor, 2013

Agritourism is a growing opportunity in the North Country, with 52% more farms participating and aggregate revenues growing 54% in recent years.

FARMS WITH AGRITOURISM



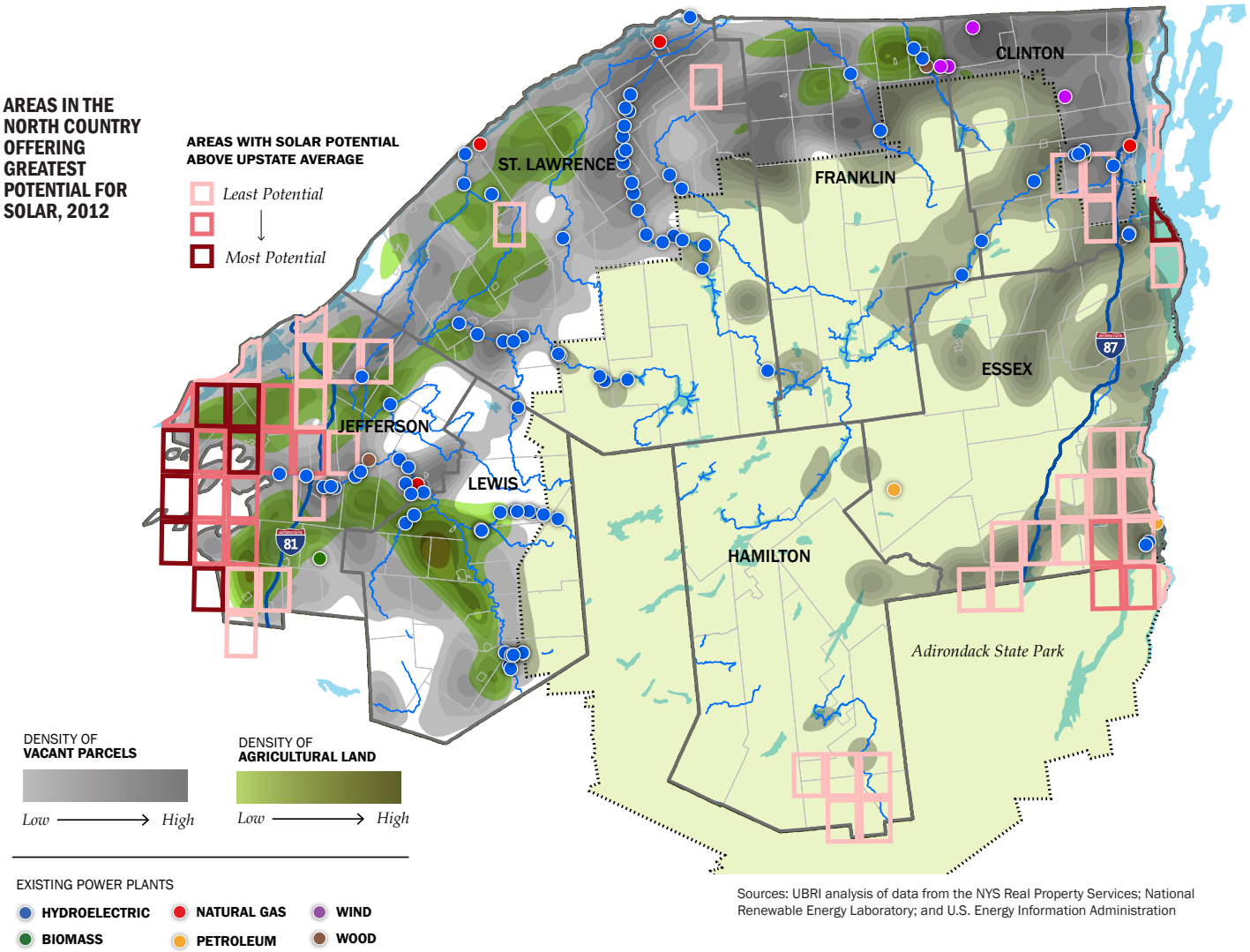
Source: UBRI analysis of data from USDA National Agricultural Statistics Service.



Dairy Product Mfg in the North Country supports over 5 times the share of jobs and wages as it does nationally.

* Other Food Mfg includes: Snack foods, peanut butter, coffee and tea, flavoring syrup, dressing and prepared sauces, and spices and extracts

Source: UBRI analysis of data from NYS Department of Labor, 2013; U.S. Bureau of Labor Statistics, 2013.



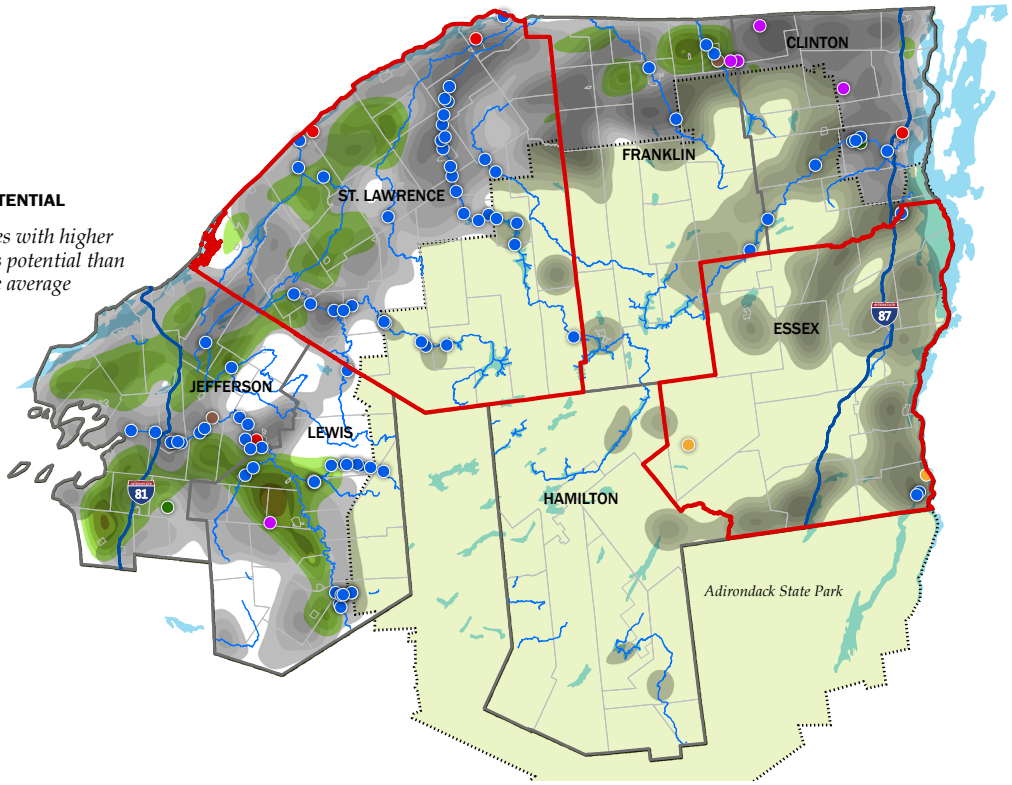
Sources: UBRI analysis of data from the NYS Real Property Services; National Renewable Energy Laboratory; and U.S. Energy Information Administration

What is the potential for greater renewable energy production in the North Country?

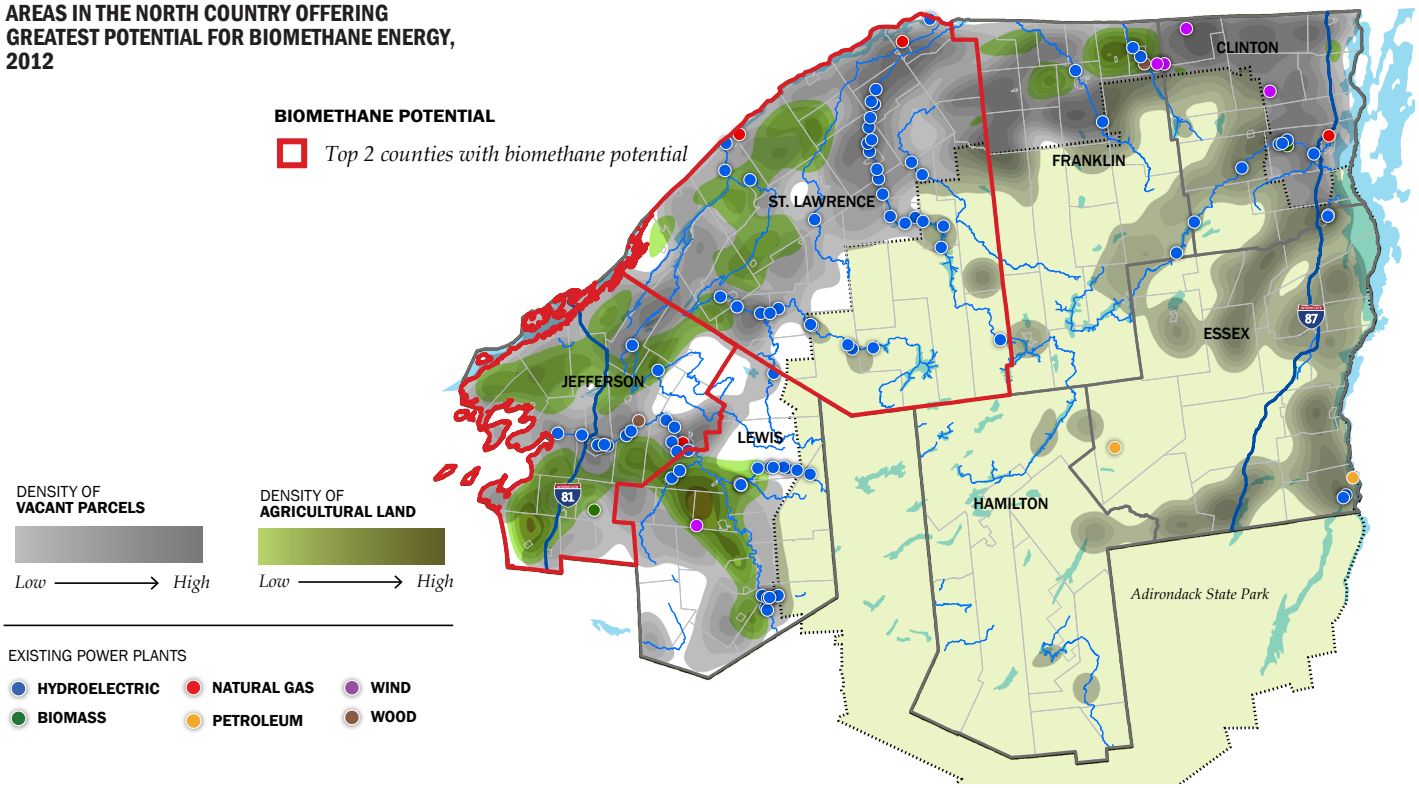
Existing vacant or agricultural land in the North Country offers potential sites for the development of renewable energy (particularly solar, biomass and biomethane) to power a 12-month vertical agricultural project in the region. The location of existing renewable power plants sheds further light on the potential for development.

The region's border communities, particularly to the north, west and east, are where most vacant, underutilized and/or agricultural land exists, offering potential space for greater renewable energy production. Nearly all existing renewable energy sources (potential partners for a new high-tech agricultural project), particularly the region's hydro and wind power plants, are in these areas. A solar powered renewable energy farm would have the most success in west

AREAS IN THE NORTH COUNTRY OFFERING GREATEST POTENTIAL FOR BIOMASS ENERGY, 2012



AREAS IN THE NORTH COUNTRY OFFERING GREATEST POTENTIAL FOR BIOMETHANE ENERGY, 2012



Jefferson and southeastern Essex counties, both positioned to receive the most sun in the region and more sun than the Upstate average. St. Lawrence and Essex counties also have greater potential than the Upstate average for biomass energy, indicating notable amounts of raw materials like crop, forest and mill residues in these locations. St. Lawrence and Jefferson are the two counties in the region with the greatest biomethane potential, together accounting for more than half of regional biomethane potential. Landfills, animal manure and commercial organic waste provide the raw materials for this energy source. While no county in the North Country Region has above average Upstate potential for biomethane production (likely because of the major farming counties in Central NY) this does not necessarily rule out greater production, if the raw materials exist or could be assembled from other areas.

Backyard Farms

MADISON, ME

DATE ESTABLISHED
2007

ORGANIZATIONAL GOVERNANCE
Privately held LLC with 3 executives and 200 full-time staff

GEOGRAPHIC SCOPE
Madison, ME with reach across Northeastern U.S.A.

OPERATIONAL BUDGET
Undisclosed

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617-563-9462
Michael.aalto@fmr.com

Website: www.backyardfarms.com

OVERVIEW
Backyard Farms is a year-round greenhouse tomato producer and supplier to the Northeast. The for-profit company benefits from moving the typically outdoors growing process to a greenhouse because it enables year-round production of a seasonal business. Wanting to replicate the concept of a home-grown farm on a large scale, Backyard Farms is committed to shipping locally only. The idea was conceived because founding leaders noticed that American grocery stores were stocked with Canadian, Mexican, and Dutch tomatoes, while there were no American tomatoes. They determined this was at the expense of quality because travel time for the crop to hit grocery stores meant tomatoes were not optimally ripe. Community partnerships are a foundation of Backyard Farms' operations as the company is constantly in tune with freshness standards and regional concerns.

PARTNERSHIPS
Backyard Farms partners with industry associations and third-party certification organizations. They include the American Society for Quality; Certified Greenhouse Farmers; the Eastern Produce Council; the International Association for Food Protection; Good Agricultural Practices; Maine Food Producers Alliance; the Massachusetts Food Association; the New England Produce Council; the Non-GMO Project; the Produce for Better Health Association; and the Produce Market Association. These partnerships promote increased quality of final products; a shift against harmful additives; a foundation for US agricultural workers to find sustainable careers; and a platform for visibility.

FUNDING
Fidelity Investments' employees and executives invested about $70 million in Backyard Farms thereby making them the primary owners. Devonshire Investors is a private equity group who is an affiliate of FMRC LLC and Fidelity Investments' parent company. They also have a significant stake in ownership.

Madison, ME incentivized Backyard Farms to run its operation in Madison through a tax increment financing ("TIF") agreement. This agreement also implemented a partnership between Backyard Farms and Madison Electric.

SUCCESSES & CHALLENGES

Equipped with 42 acres of greenhouse land, Backyard Farms saves on packaging; water consumption; energy use; and land use with its sustainable model. Its irrigation system allows rainwater to be re-purposed. Because of its local shipping policy, Backyard Farms' carbon footprint is reduced as the need for transportation decreases. Packaging boxes use 100% recycled paperboard and a 35% minimum of post-consumer content. Their boxes are manufactured entirely through wind power and use soy ink print from nearby Augusta, ME. Master cases are fully recyclable and locally sourced, again minimizing the impact of transportation. Backyard Farms also collects master cases after customer use. Natural rain and snowfall nearly comprise Backyard Farms' entire water supply. With a hydroponic system, any unabsorbed plant water can be reused. The source of electricity is a locally owned utility company, and every effort is made to use natural light when possible, or artificial light during off peak hours. An outdoor farm would use ten times more acreage.

The Backyard Farms greenhouse system allocates personal gardeners their own 7,000 plant tomato growing area. Care, ownership, and attentiveness from personal gardeners allows for high quality tomato production. The allowance of certain insects beneficial to tomato growth, including bumblebees, also allows the crops to thrive.

Backyard Farms is committed to food safety, implementing Good Agricultural Practices ("GAPs"), Good Handling Practices ("GHPs"), and Hazard Analysis and Risk Based Preventative Controls ("HARPC"). Staff education, performance reviews, and equipment monitoring are a few of the ways Backyard Farms implements food safety precautions.

Retailers selling Backyard Farms' tomatoes include Hannaford, Whole Foods, and Walmart. Backyard Farms also works with Maine food banks addressing local hunger issues.

Labor is a challenge as there is a high employee turn-over rate. Also, the market is competitive with many knowledgeable people already in business.

Year-round greenhouses improve both local employment and food quality

Holland, the Netherlands agricultural sector

THE NETHERLANDS

DATE ESTABLISHED
A distinguished crop producer since the 1980s

ORGANIZATIONAL GOVERNANCE
The Netherland's Ministry of Economic Affairs

GEOGRAPHIC SCOPE
The Netherlands

OPERATIONAL BUDGET
2012 Dutch agro-food sector GDP: $29 billion. Over $71 billion in Dutch agricultural exports. The Netherlands Ministry of Economic Affairs 2014 expenses totaled over $5 billion.

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Website: www.hollandtrade.com/sector-information/agriculture-and-food/?bstnum=4909

OVERVIEW
The Netherlands is home to a strong agricultural economy due to geography; soil conditions; competition-inducing government policy; entrepreneurship; inexpensive natural supplies; and an expanding continental market. The Dutch Embassy has shared its services and expertise through international relationships with many countries, including the U.S. Compared to other regions, the Netherlands is especially attentive to environmental impact when growing and moderating agricultural production. For example, "Reward for Results" provides financial incentives for farmers to choose low pesticide care options. Utility companies can, in turn, reduce spending on water filtration. The Dutch agriculture industry has identified healthy food, sustainability, food security, food safety and quality as central themes to focus on in coming years. The processing of foods such as meat, baked goods, and cheese products also constitutes a significant portion of the Dutch agricultural economy.

PARTNERSHIPS
The Holland Food Partner website, operated by the Embassy of the Netherlands, is a pathway for American companies to become Dutch agricultural partners. The site provides resources and contacts beneficial for trade, investments, and research and development. The Wageningen University and Research Center in the Netherlands is testing new greenhouse design methods to explore improved sustainable energy options. Additional partners include other universities and research centers; food testing sites; food and beverage companies; machine manufacturers; agricultural entrepreneurs; digital technology companies; greenhouse companies; and irrigation companies.

FUNDING
The Dutch government and private investors provide most of the Netherlands' agriculture-related investments. The Dutch government receives revenue from the following sources: direct taxation such as salaries, income taxes, and more; indirect taxation such as environmental taxes and insurance premiums; national insurance contributions or employment taxation; employee insurance contributions; and natural gas revenue. Public and private investments go towards researching and developing improved agricultural methods and technology systems to maintain the Dutch standing as a leading global agriculture producer.

SUCCESSES & CHALLENGES

The Netherlands boasts Europe's second highest private agri-food research and development investment rate. It is the second largest agricultural exporter in the world after the United States and the highest global onion producer. In addition, they export one quarter of the world's tomatoes.

The government does not work alone in its push towards a robust global agricultural economy that is paired with safe environmental practices. The largest supermarket chain in the Netherlands, Albert Heijn, has been on board with pursuing green solutions since 1989 when it established itself as a pioneer in agricultural energy solutions and set an example that many of its partners now follow. Albert Heijn sparked a huge reduction in pesticide use internally and among its client-base. The Netherlands is constantly re-evaluating its environmental impact, encouraging less harmful solutions, and setting national environmental standards without compromising on competitiveness.

In two years, dairy farmers reduced their Environmental Impact Points ("EIPs")—a form of measuring pesticide toxicity—for ground water on grass and arable land by over 95%. Arable farmers cut their EIP score by over 50%. While this is a successful outcome, the Netherlands is not halting its green efforts there. Because of the Netherlands' greenhouse and logistical innovations, U.S. vendors can receive Dutch crops on the same day they were harvested. Greenhouses are an important showcase of Dutch agricultural achievements as they cover more than 25 square miles, house 7% of the country's horticultural production, and have become energy-neutral. The "Greenhouse as Energy Source" initiative is currently helping the country discover ways to create viable energy producing greenhouses, as typical greenhouses have historically been costly and climate-damaging.

An agricultural and environmental world leader using greenhouses as one of its new strategies

AeroFarms

NEWARK, NJ

DATE ESTABLISHED
2004

ORGANIZATIONAL GOVERNANCE
3 executives representing business and agricultural expertise

GEOGRAPHIC SCOPE
Headquartered in Newark, NJ with operations across the globe

OPERATIONAL BUDGET
Typical AeroFarms systems cost between $500,000 and $5 million

CONTACT
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Chief Marketing Officer & Co-Founder

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Website: www.aerofarms.com

OVERVIEW

AeroFarms specializes in indoor vertical farming and it operates multiple local, commercial-scale farms. Focused on cost savings and environmental impact reduction, AeroFarms produces healthy foods low in, or entirely void of, pesticides. Re-purposing empty warehouses in urban environments, AeroFarms works to reduce its transportation needs and employ technology such as aeroponics, which saves on land and water usage, calls for shorter crop cycles, and fosters nutrition recycling.

AeroFarms recognizes the global food crisis and aims towards sustainably producing healthy foods and justly operating its facilities. Year-round local, but commercial-scale, farming is its key to success. It is based in Newark, NJ where it is building the world's largest indoor vertical farming facility to serve as its flagship and headquarters. Its innovative farming techniques have shown promise and attracted many investment sources especially given that AeroFarms builds on existing technology and will likely find its concept replicated across the globe.

PARTNERSHIPS

Schools, clients, and foodbanks work with AeroFarms on educational initiatives, food distribution pathways, and humanitarian efforts. Goldman Sachs and Prudential have invested significant capital in the growing start-up venture, especially towards its vertical farm building. RBH Group and Ironbound Community Corporation are working to construct the vertical farming facility.

Saudi Arabia's Sheikh Saleh Boqshan implemented an AeroFarm unit in Jeddah. Students at Philips Academy Charter School in Newark benefit from vertical farming in their Junior High curriculum because of their relationship with AeroFarms. The whole school enjoys fresh lunch-time food coming from the vertical farm.

FUNDING

Goldman Sachs' Urban Investment Group is the primary funder of the vertical farm that will serve as AeroFarms' headquarters. The whole complex will cost between $30 and $40 million and multiple funding strategies are underway such as equity, debt, and bridge financing. Prudential has also contributed a significant portion of capital. City and State funds through tax credits and grants have awarded AeroFarms $9 million for their vertical farm headquarters. Funders are interested in AeroFarms because of its revenue projections.

SUCCESSES & CHALLENGES

AeroFarms employs the following technology: cloth mediums; LED lighting; aeroponics; and scalable modular design. Also, it offers the following techniques: pesticide-free growing, reduced risk of crop contamination, and elimination of the need to clean crops after harvest. Cloth medium was developed and patented by AeroFarms. The company employs a reusable, durable, and sanitary cloth for seeding, germinating, and harvesting maintenance. LED (light emitting diode) technology allows for customizable wavelengths that lead to more efficient photosynthesis and decreased energy consumption. LED lighting requires less space between the light source and the plant, increasing a vertical farm's crop capacity. Aeroponics is a type of hydroponic technology that emits nutritious, hydrating, oxygen-infused mist for quicker and larger crop maturity. AeroFarms' aeroponics design is unique because it requires less than 5% of the water an outdoor farm consumes by reusing emitted mist, and it requires less than 3% of land compared to conventional growing methods. AeroFarms' innovative and customizable vertical farm design allows for location flexibility, higher yield rates, and quick installation. Urban locations reduce transportation emissions by 98%.

AeroFarms helps Newark's revitalization efforts as it is creating new jobs and improving the local economy. Its indoor farm at Phillips Academy has enriched the school's curriculum and improved the cafeteria's food quality. It is dedicated to the communities it serves. Ironbound Community Center is helping AeroFarms employ locally. AeroFarms was the only agriculture company selected as one of the Circular Economy 100 by the Ellen MacArthur Foundation in recognition of environmental sustainability and social responsibility. Other honors include the Most Innovative Company from the Future of Agriculture Conference and the Best Growth Company to Invest In by the Wall Street Journal's ECO:nomics Conference. The newness of the industry, and high building, utility, and equipment costs are challenges the vertical farming business faces.

AeroFarms' vertical farming techniques allow for locally sourced and commercial scale environmentally efficient crop production

Developing a transportation equipment center of excellence and innovation

INITIATIVE #2
Transportation Equipment & Materials
TARGETED RESEARCH

What does the cluster contribute in terms of jobs, establishments and wages?

North Country's Transportation Equipment and Materials Cluster is a regionally significant manufacturing ecosystem that spans 24 distinct manufacturing, service and materials processing industry groups.

The cluster is a major employer in the North Country. In 2013, 6,374 workers were employed by 512 companies in industries related to the Transportation Equipment and Materials Cluster. The cluster was responsible for 6% of the regional private sector workforce, employing one in every 17 workers across the region. In addition to its contributions to a regionally significant employment base, the average annual wage for workers in the cluster is over $50,000 per year, almost $15,000 more than the regional average.

When compared to the state as a whole, the North Country employs a higher proportion of workers in the Transportation Equipment and Materials cluster—6% for North Country compared to 4% across the state. Additionally, the North Country's Transportation Equipment and Materials Cluster employment and wage location quotients (1.26 and 1.43 respectively) indicate a regional specialization for the cluster within New York State. This is a strength for the North Country considering the overall size and importance of the cluster to the state's economy.

The Location Quotient (LQ) is a number that measures the relative concentration of an industry's employment or total wages in the region, as compared to the state or nation.

Figures above 1.0 indicate an above average concentration, or a **regional specialization**; the greater the number, the greater the specialization.

BY THE NUMBERS: NORTH COUNTRY'S TRANSPORTATION EQUIPMENT AND MATERIALS CLUSTER, 2013

	NORTH COUNTRY 2013	% OF NORTH COUNTRY PRIVATE SECTOR TOTAL
ANNUAL EMPLOYMENT	6,374	6.0%
NUMBER OF FIRMS	512	5.4%
TOTAL ANNUAL WAGES	$319,427,086	8.8%
AVERAGE ANNUAL WAGE	$50,114	

THE NORTH COUNTRY'S CONCENTRATION OF EMPLOYMENT AND WAGES IN THE TRANSPORTATION EQUIPMENT AND MATERIALS CLUSTER, 2013

EMPLOYMENT

*The North Country has a **higher** concentration of **employees** (**LQ 1.26**) in the cluster compared to the state.*

*The North Country has a **lower** concentration of **employees** (**LQ 0.74**) in the cluster compared to the nation.*

WAGES

*The North Country has a **higher** concentration of total **wages** (**LQ 1.43**) in the cluster compared to the state.*

*The North Country has a **lower** concentration of total **wages** (**LQ 0.64**) in the cluster compared to the nation.*

Sources: UBRI analysis of data from NYS Department of Labor; Empire State Development; and U.S. Bureau of Labor Statistics.

INITIATIVE #2

Transportation Equipment & Materials

TARGETED RESEARCH

What regional specializations exist?

An analysis of industry segments in the Transportation Equipment and Materials Cluster reveals some regional specializations at the national level. While the cluster as a whole is not specialized compared to the nation (employment LQ=0.74, and wage LQ=0.64), nine of the North Country's industry segments within the cluster have a higher than average concentration of employment (employment LQ >1) and six have an above average concentration of total wages (wage LQ>1).

Further analysis of each industry segment's competitiveness reveals some potential targets for investment. Competitiveness is the combination of specialization and income generation. Specialization is determined by the regional concentration of employment or wages in an industry segment, and income generation is determined by an industry segment's ability to generate more dollars per worker when compared to other regions across the country.

Potential targets fall into three categories:

Highly Competitive

Highly specialized and above average income generating industry segments where the region currently has a strong competitive advantage.

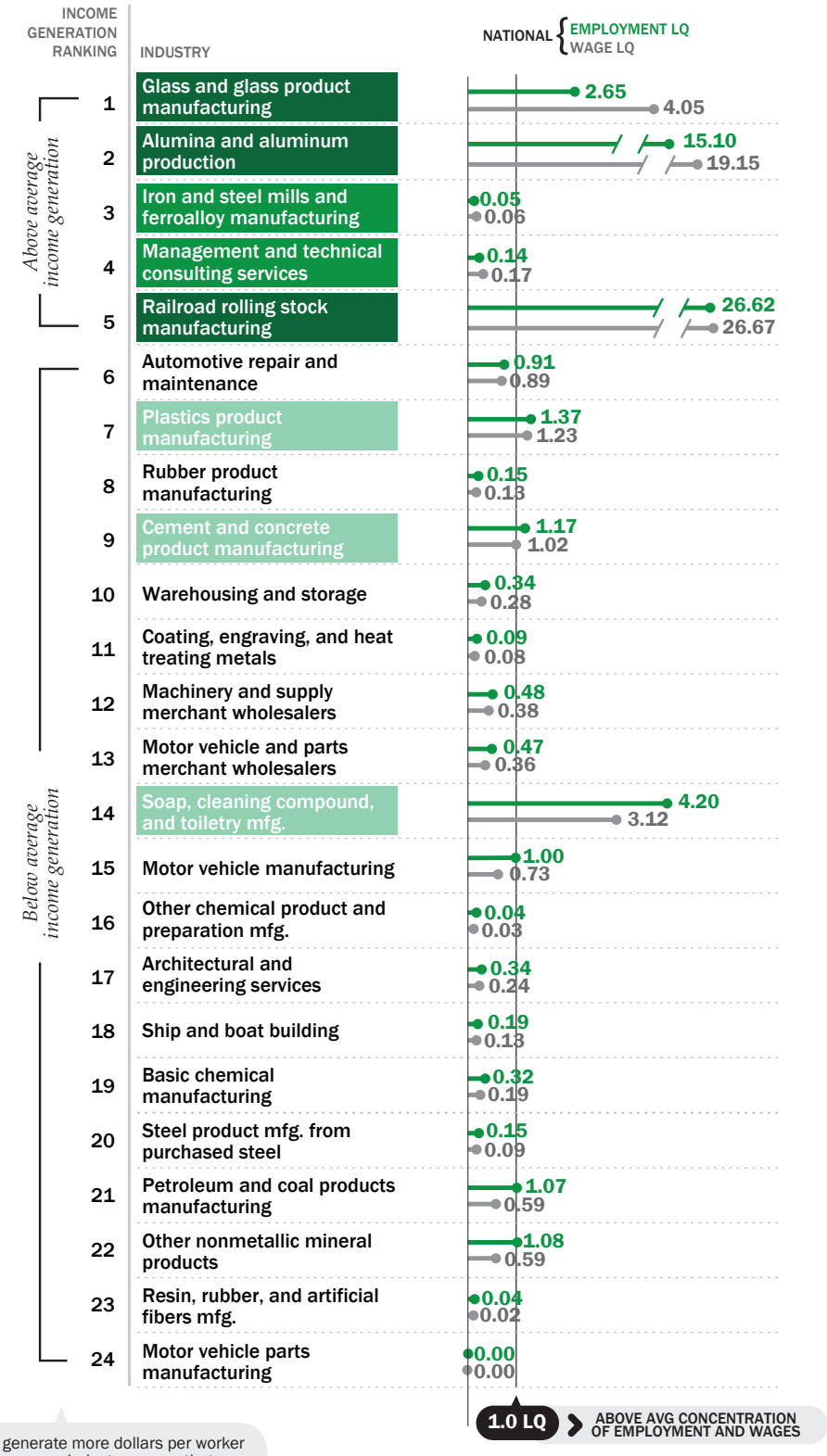
Opportunity for Specialization

Industry segments exhibiting an above average ability to generate income, but lacking specialization in the region. Investments could focus on increasing their regional specialization by growing employment and average wages.

Specialized with Potential

Industry segments with specializations in the region that are not capturing their fair share of wages per employee as compared to other regions across the country. Investments could focus on technology, workforce development, or capturing higher end functions of the industry such as headquarters or front office operations.

SPECIALIZATIONS WITHIN THE TRANSPORTATION AND MATERIALS CLUSTER, 2013



With the ability to generate more dollars per worker than the national average, industry groups that excel in income generation can pay higher wages, accumulating greater wealth for the region.

Sources: UBRI analysis of data from the NYS Department of Labor, Empire State Development.

INITIATIVE #2

Transportation Equipment & Materials

TARGETED RESEARCH

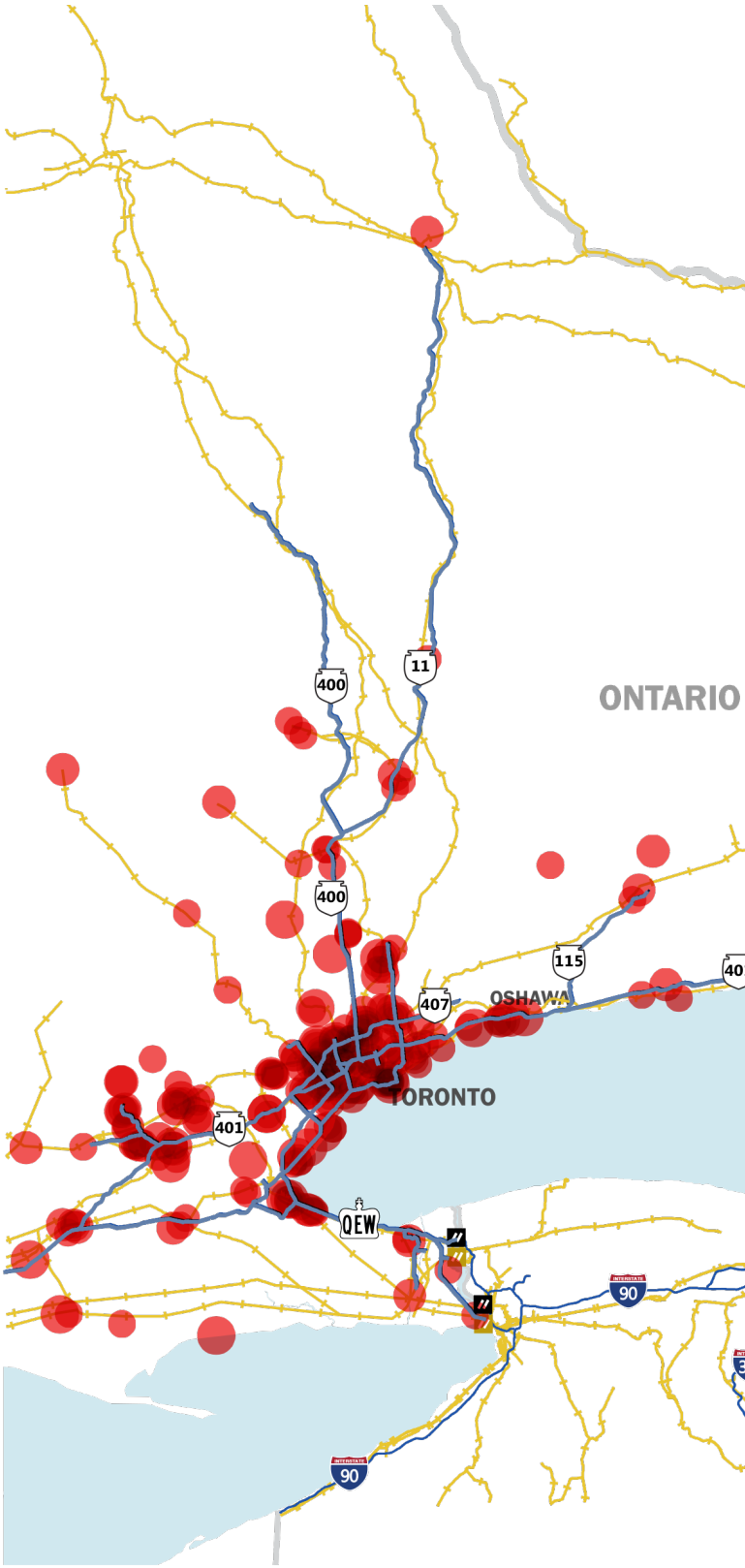
Are there businesses in Ontario or Quebec in the Transportation Equipment and Materials Cluster?

The areas in and around Montreal and Toronto present potential for the North Country to connect with Canadian companies in the Transportation Equipment and Materials Cluster. The large majority of companies are located within 90 miles of downtown Toronto and 150 miles of downtown Montreal. Situated at the western end of Lake Ontario, the area in and around Toronto has about 56% of the larger Canadian firms (100 or more employees) in the cluster. 35% of these larger firms are located in and around Montreal.

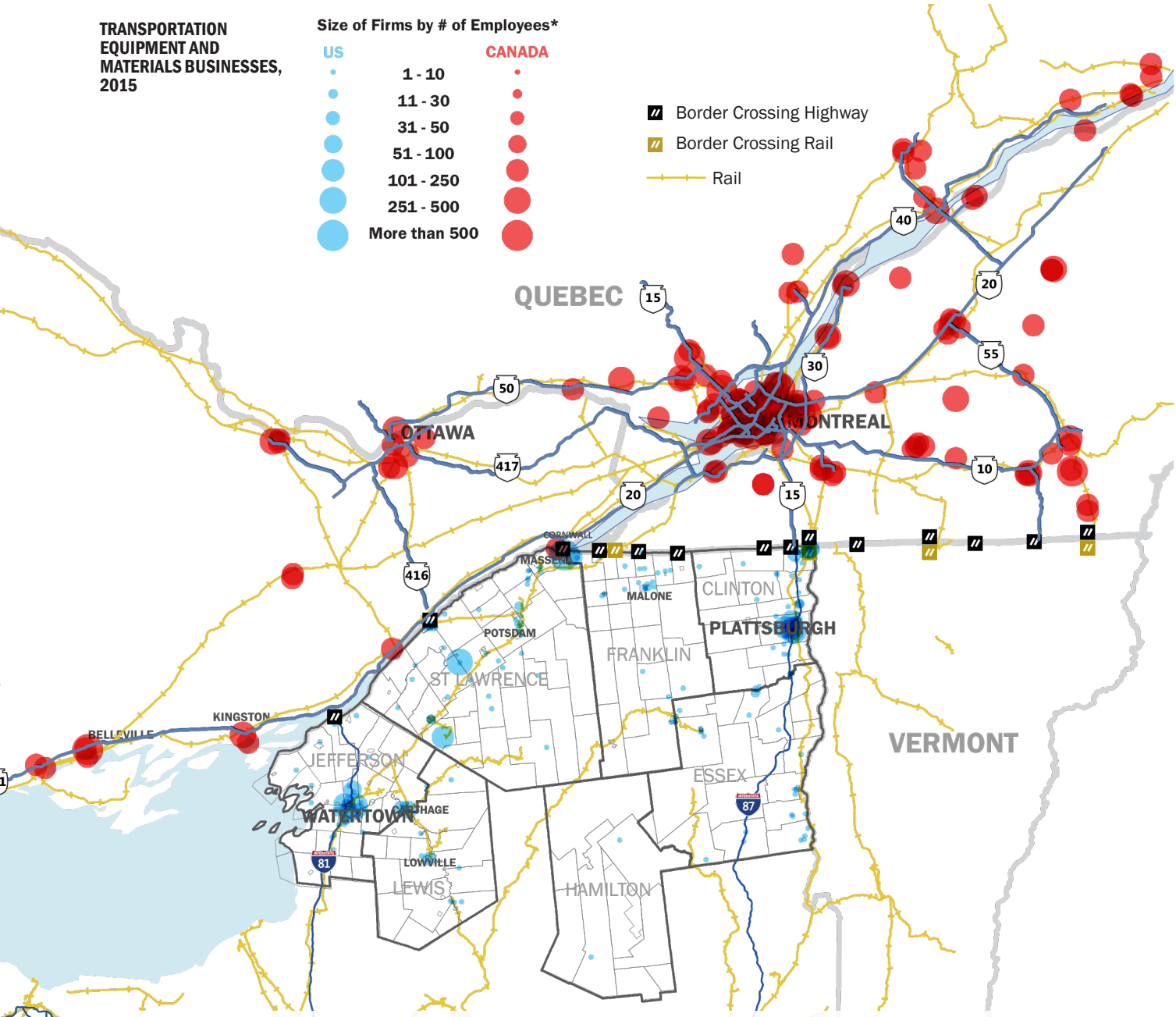
8 out of the 10 largest firms (based on number of employees) are located in and around Toronto, many of which are automobile or steel manufacturers. Meanwhile, the Montreal area is home to notable firms like Pratt & Whitney and Bombardier Aerospace.

In the Toronto area, the transportation industry with the most firms is Other Motor Vehicle Parts Manufacturing. Other top industries by firm number include those related to plastics manufacturing, distribution and logistics services, industrial machinery wholesalers, and iron and steel manufacturing. Montreal also has notable firm numbers in Iron & Steel Mills & Ferroalloy Manufacturing, only exceeded by the number of businesses in All Other Plastics Products Manufacturing.

In the North Country, Autobody, Paint and Interior Maintenance has more than 80 firms, presenting an opportunity for business partnerships with Canada's strong auto industry. Logistics, Industrial Machinery and Motor Vehicle Suppliers follow as the next strongest in the North Country. Industries similar to these also exist across the border.



TRANSPORTATION EQUIPMENT AND MATERIALS BUSINESSES, 2015



TOP 5 INDUSTRIES BY # OF FIRMS, 2015

GREATER TORONTO AREA INDUSTRIES	# OF FIRMS
Other Motor Vehicle Parts Manufacturing	58
All Other Plastics Product Manufacturing	41
Process, Physical Distr/Logistics Consulting Svcs	22
Industrial Machinery & Equipment Merchant Whlsrs	18
Iron & Steel Mills & Ferroalloy Manufacturing	16

GREATER MONTREAL AREA INDUSTRIES	# OF FIRMS
All Other Plastics Product Manufacturing	19
Iron & Steel Mills & Ferroalloy Manufacturing	14
Steel Foundries (Except Investment)	12
All Other Rubber Product Manufacturing	10
Industrial Machinery & Equipment Merchant Whlsrs	10

Sources: UBRI analysis of data from Reference USA.
* Canadian businesses with under 100 employees are not shown. Locations are approximated for certain businesses.
Employee volumes reflect estimates provided by Reference USA.

Automation Alley

TROY, MI

DATE ESTABLISHED
Automation Alley – 1999
Automation Alley Fund – 2008

ORGANIZATIONAL GOVERNANCE
Automation Alley – 501(c) (6) non-profit
Automation Alley Fund – 501(c) (3) non-profit

GEOGRAPHIC SCOPE
Eight Southeast Michigan counties including the City of Detroit

OPERATIONAL BUDGET
FY 2011 Automation Alley revenue, $5,839,322 (expenses, $4,522,015)
Calendar year 2013 Automation Alley Fund revenue, $427,723, (expenses, $500,294)

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OVERVIEW
Southeast Michigan's Automation Alley is a technology business accelerator and association dedicated to regional economic growth and establishing international recognition. To fulfill its mission, it focuses on defense and manufacturing; talent development; entrepreneurship; international business; and emerging technologies. Its 1,000 member entities benefit from networking opportunities, access to meeting spaces, and public relations resources. The defense and manufacturing subsector focus includes OEM consulting and a partnership with the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) on advanced ground vehicle technology projects such as robotics and visualization. Automation Alley credits itself with recruiting 14 high-tech companies to set up operations in the region, investing $8.95 million (generating $116.27 million from other sources) in 47 companies, and creating and supporting more than 5,915 jobs to date. The Automation Alley Fund ("the Fund") uses Automation Alley entrepreneurship tools towards disadvantaged and minority Southeast Michigan communities.

PARTNERSHIPS
The Automation Alley Product Lifecycle Management Center at Oakland University incubator was made possible with the help of Siemens; the Michigan Economic Development Corporation; Geometric Solutions; solidThinking, Inc; and Oakland University's School of Engineering and Computer Science.

The Fund partners with Incite Focus and Blanche Kelso Bruce Academy for youth STEM career exploration, and with the City of Detroit's IT department for a 24 hour app-developing hackathon challenge.

FUNDING
To fulfill its focus on entrepreneurship, Automation Alley offers a range of grants from as little as $10,000-$50,000, up to as much as $1 million over two years. The U.S. Department of Commerce provided Automation Alley with a 2001 trade mission program grant. The Department of Labor awarded Automation Alley a $5 million grant in 2012 to support high-level IT training through the Technical Talent Development Program ("TTDP"). TTDP has more than 1,000 active trainees, and has subsidized more than 30 companies to benefit from its programming.

SUCCESSES & CHALLENGES

Nearly 1,000 businesses; educational institutions; government entities; and non-profits are Automation Alley members. Automation Alley created the Automation Alley Lifecycle Management Center at Oakland University's Technology Center in 2014 to train and certify individuals in product lifecycle management ("PLM") at an affordable price. The Center uses computer-aided design; computer-aided engineering; computer-aided manufacturing; digital factory simulation; 3-D scanning; and 3-D printing for workforce improvements which are especially beneficial to small and medium-sized manufacturers.

The defense and manufacturing subsector partners with the Department of Defense by providing the Automation Alley VisCom, a database and communication tool, containing tens of thousands of American manufacturers and suppliers with detailed information on each. This tool is crucial for the Army to address "diminishing manufacturing sources and material shortages" (DMSMS) and to more easily obtain outdated parts. The relationship has brought millions of dollars in defense contracts to Southeast Michigan companies.

Immediately taking advantage of President Obama's recent relationship mending with Cuba, Automation Alley is planning a three to four-day trade mission to Cuba in the fall of 2016. It has already hosted 170 companies on 24 trade missions to countries including Saudi Arabia and Colombia. In summer 2015, at Automation Alley's "Cuba: The Next Frontier" seminar, speakers representing the U.S. Department of State and the Cuban-American Chamber of Commerce will discuss opportunities and challenges of working with Cuban businesses. Trade mission connections have raised local export sales by more than $472 million.

In 2012, Automation Alley was invited to the Detroit Business Leaders' Briefing at the White House. In 2013 Automation Alley became the first in the Midwest to receive the President's "E Star" Award for Export Service. In 2014, the Macomb County Department of Planning and Economic Development awarded Automation Alley the title of the Economic Development Partner of the Year.

A sector focus to advancing business and manufacturing opportunities for the Southeastern Michigan region

Quebec Ground Transportation Association

DRUMMONDVILLE, QUEBEC (CANADA)

DATE ESTABLISHED
2011

ORGANIZATIONAL GOVERNANCE
5 person team and a public company

GEOGRAPHIC SCOPE
Quebec, Canada

OPERATIONAL BUDGET
$468,000

CONTACT
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Vice President of Operations

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OVERVIEW

The goal of the Quebec Ground Transport Association ("QGTA" or "the Association") is to advance, strengthen, and unify the transportation manufacturing industry in the Province through events, networking, and trade missions. A hydro-power focus is an especially important piece of the Association, as the Province sees an opportunity to be a global leader in this market. With the goal of international recognition by 2025, QGTA works with local companies on global product promotion. It defines the ground transportation industry in five segments: recreational vehicles, electric vehicles, railways, buses, and commercial and special vehicles. The Association identifies hundreds of transportation manufacturing companies related to design; signaling; maintenance; light vehicles; military vehicles; and accommodations for elderly and disabled people. Member companies are exposed to major donors; foreign trade shows; peer businesses; research and development; and workforce enhancement opportunities with QGTA's industrial and regional approach to business.

PARTNERSHIPS

The Specialty Vehicles and Transportation Equipment Manufacturers Association, along with transportation associations in four Quebec regions – Monteregie, Centre-du-Quebec, Estrie, and Laurentieds – merged to form QGTA. It is a public organization and part of the City of Quebec's initiative to promote local business. Quebec's Ministry of Finance and Economy provides manufacturing industry research. Private partners include Productions du Palais, Lafond, Anges Quebec, Le Groupe Verrier, Votre Bonne Etoile, Alpha Assurances Auto et Habitation, Emplois Competences, Inc., and Maestria Gestion de Patrimoine. Local partners include workforce enhancement companies, insurers, and manufacturers. International Partners span Europe, the U.S. and Mexico, and include similarly focused organizations.

FUNDING

The Ministry of Higher Education, Research, and Science is one of QGTA's funding sources. Ministries in each of four Quebec regions contribute over $70,000 each, compensating QGTA's effective business coordination, for a total government commitment of over $280,000 annually. Forty percent of income is privately funded. Slightly over half of the private funding comes from membership dues that companies must pay in order to benefit from QGTA's services. Also, when QGTA engages in a collaborative project consortium, to build, for example, a bus, they collect fees. If QGTA engages in a government project, they collect 5% of the generated revenue.

SUCCESSES & CHALLENGES

QGTA has executed at least four important projects and events thus far. It secured a partnership with the MECATEAM Cluster which is a railcar construction, maintenance, and handling initiative in France. This arrangement expands QGTA's network given MECATEAM's eighty partner entities. Collaboration is expected to result in a 25 year project worth billions of dollars towards an additional Canadian railroad. The Les Rendez-Vous du Transport 2014 Conference, another QGTA accomplishment, predicted international market trends, conducting training sessions, workshops, recruitment initiatives, and networking events. The Consortium Inno-Vee, a third significant achievement, is focused on collaborations towards electric vehicle research. Lastly, Quebec hosted the Electric Vehicle Systems symposium of sixty participants promoting the region as a destination for electric transportation research and manufacturing.

QGTA has three initiatives currently in progress. The Lea Welding Diagnosis is a three year study of fifteen companies that will help improve understanding of manufacturing operations and needs. The Virtual Showroom is a digital trade fair to enhance business connections and improve resources for the industry. The Suite Deal gives manufacturers instruction to make their assembly process more efficient.

Additionally, as an industry information provider, QGTA has detailed data on the size, number of employees, geographic scope, revenues, and stakeholder engagement within the region's manufacturing community. Members can perform a comprehensive search in QGTA's Dynamic Directory System to find industry leaders and experts with which to partner. Regularly publishing newsletters, QGTA is an international voice for Quebec's transportation manufacturing community, a thorough resource to industry leaders, and a one-stop-shop for member companies needing development assistance. QGTA is almost ready to launch a supply chain tracking and mapping system application which is expected to be an invaluable resource for industry professionals.

An emerging global leader, QGTA improves opportunity for local manufacturers

Chennault International Airport

LAKE CHARLES, LA

DATE ESTABLISHED
1986

ORGANIZATIONAL GOVERNANCE
Owned by the Chennault International Airport Authority. Has a Board of Commissioners.

GEOGRAPHIC SCOPE
Louisiana

OPERATIONAL BUDGET
$12 million annually without grants
FY 2015 $23 million (including grants)

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Executive Director

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Website: www.chennault.org

OVERVIEW

The Chennault International Airport ("Chennault" or "the Airport") is a hub for maintenance, repair, overhaul, and refueling of commercial and military aircraft. The Airport is a former Air Force Base which was able to channel the capabilities of a military site into providing needed technical services for its five primary tenant companies. Tenants are attracted through a broad range of financial incentives; surrounding transportation infrastructure; and development opportunities. Collaborations with the City of Lake Charles, Calcasieu Parish, and the State of Louisiana are central to developing its economic incentive programs.

Chennault is committed to workforce development of its surrounding community. Prior to its opening in the 1980s, the region's employment was stagnant and heavily concentrated in the petrochemical industries. The creation of the Airport helped stabilize and diversify employment opportunities through generating over 1,400 jobs. The Airport also aims to stimulate the development of a surrounding industrial park rooted in commerce, industry, and research.

PARTNERSHIPS

Chennault has five partner companies, or tenants, which rent space in order to expand or relocate their operations. The tenants include AAR, a commercial airline supplier and defense contractor; Northrop Grumman, a defense technology company that maintains Air Force surveillance aircraft at the Airport; Million Air, a fixed base operator for charter flights and general aviation services; and Louisiana Millwork, a building materials manufacturer and supplier. The Airport also partners with Habitat for Humanity, an organization committed to addressing housing issues of area residents. Financial and legal collaborations with the city, county, and state governments are maintained through various avenues.

FUNDING

Chennault is primarily funded through rents received from tenant companies, as well as property taxes collected by Calcasieu Parish. These sources generate about $12 million per year. The Airport also receives sizeable amounts of grant funding from the state and federal government every year. In 2015, grants totaled $11 million. Chennault has a contractual agreement to do maintenance and make repairs for the local fire department's equipment. This partnership generates about $1.5 million per year in revenues.

SUCCESSES & CHALLENGES

Chennault, with the help of state redevelopment funds, successfully transformed a shut down military base into one of the nation's largest aircraft service centers. The Airport has worked with municipal, regional, and state governments to build a wide range of financial incentives used to attract tenants to Chennault. Policy development is conducted through frequent communication between Airport staff and state legislative and congressional delegations as well as with the FAA.

Successful initiatives include the Industrial Tax Exemption (ITE) which provides a 10-year property tax abatement on manufacturing-related investments. The ITE facilitates improvements to land, buildings, and equipment used in manufacturing. Additional tax incentives are employed to encourage businesses to establish or continue R&D activities, as well as activities related to commercialization of Louisiana technology.

Chennault is committed to workforce development of its surrounding community. Many of the economic incentive programs created by Chennault and its regional governments support expansion of employment opportunities by Airport tenant companies. Effective initiatives include a tax exemption offered to manufacturers which demonstrate that the funds will help maintain current employment levels. This commercialization incentive also provides credits to new companies based on the number of new jobs created.

In August 2013, AAR (one of Chennault's tenants) and the Governor's office created a Maintenance, Repair, and Overhaul (MRO) program designed to generate 500 new direct jobs and over 500 indirect jobs in the surrounding area.

An ongoing challenge faced by the Airport is securing efficient grant fund delivery. While the state is often able to offer annual awards, the bulk of grants are classified as "low priority," and thus are not available for use for one to two years after being awarded the grant. Working with state offices to increase the priority level of a grant so that projects can be developed on the timing as planned is a central focus of the Airport. Despite these obstacles, Chennault is working to expand the amount of space available for future tenants. Its most recent success was securing an Economic Development site certification from the state for the 343-acre Chennault Southwest expansion project.

Collaboration between corporations and regional government leads to a center for airport services innovation and growth

Data Sources & Notes

INITIATIVE #1
Renewable Energy Powered Food

NORTH COUNTRY RENEWABLE ENERGY PRODUCTION, 2014

U.S. Department of Energy, The Energy Information Administration (EIA), "EIA-923 Monthly Generation and Fuel Consumption Time Series File, 2014 December".

PERCENT OF CROPLAND USED FOR SPECIALIZED CROPS AND CHANGE IN CROPLAND BY CROP TYPE (2009-2014)

U.S. Department of Agriculture, National Agricultural Statistics Service, Research and Development Division, Geospatial Information Branch, Spatial Analysis Research Section, "2014 Cropland Data Layer (CDL)" and "2009 CDL". Statistics from USDA CropScape tool at www.nassgeodata.gmu.edu/CropScape/

MAPLE SYRUP PRODUCTION

U.S. Department of Agriculture, National Agricultural Statistics Service, Census of Agriculture, 2007, and 2012.

FORESTRY AND LOGGING IN THE NORTH COUNTRY, 2013

NYS Department of Labor, "Quarterly Census of Employment and Wages (4-digit NAICS)," unsuppressed dataset, 2013.

AGRITOURISM

U.S. Department of Agriculture, National Agricultural Statistics Service, Census of Agriculture, 2007, and 2012.

LOCATION QUOTIENTS OF FOOD PROCESSING INDUSTRIES

NYS Department of Labor, "Quarterly Census of Employment and Wages (4-digit NAICS)," unsuppressed dataset, 2013.

INFLATION-ADJUSTED WHOLESALE PRICES OF SELECTED FRUITS AND VEGETABLES SHIPPED INTO NYS FROM CALIFORNIA, 2000-2015

U.S. Department of Agriculture, Custom Average Tool (CAT). Pricing data are sourced from the USDA Custom Average Tool (CAT), which collects and synthesizes daily farm commodity reports from the Agricultural Marketing Service. The prices shown reflect only selected products shipped from California to New York City and are adjusted for inflation. The CAT prices are an average of the highest and lowest price points per quarter, however, the prices used in this report are an average of each year's four quarters. During instances where there are missing price points (when selected products were not shipped from CA to NY) the most recent quarterly price points available were averaged. Crop prices were adjusted to 2015 dollars using the CPI Inflation Calculator available from the U.S. Bureau of Labor Statistics.

WHAT IS THE POTENTIAL FOR GREATER RENEWABLE ENERGY PRODUCTION IN THE NORTH COUNTRY?

Areas of vacant and agricultural land were obtained through the NYS Office of Real Property Services, Parcel Data for the year 2010 and selected by property class code (300-399= vacant land; 100-199= agricultural land). The GIS parcel point data was weighted by acres when calculating density with ArcGIS software to display high concentrations of vacant and agricultural land.

AREAS IN THE NORTH COUNTRY OFFERING GREATEST POTENTIAL FOR SOLAR ENERGY

National Renewable Energy Laboratory: Renewable Energy Potential Database, 2012. The National Renewable Energy Laboratory makes available Solar Reflectivity data in a GIS grid form for the U.S. Higher reflectivity rating means better areas for solar capture. All areas on the map represent areas where the reflectivity is above the Upstate average rating. All above average areas are then symbolized from low to high for the North Country.

AREAS IN THE NORTH COUNTRY OFFERING GREATEST POTENTIAL FOR BIOMASS ENERGY

National Renewable Energy Laboratory: Renewable Energy Potential Database, 2012. The National Renewable Energy Laboratory makes available total solid biomass resources by county including: crop residues, forest residues, primary mill residues, secondary mill residues, and urban wood waste. Data for 2012, in dry metric tons/year. The selected counties have total biomass potentials above the Upstate average.

AREAS IN THE NORTH COUNTRY OFFERING GREATEST POTENTIAL FOR BIOMETHANE ENERGY

National Renewable Energy Laboratory: Renewable Energy Potential Database, 2012. The National Renewable Energy Laboratory provides total methane generation potential by county from the following biogas sources: landfills, animal manure; wastewater treatment; and industrial, institutional, and commercial organic waste. Data in metric tons/year. No county in the North Country had an average biomethane potential above the average, so the selected areas are the top two counties with the most biogas source potential in the region.

INITIATIVE #2

Transportation Equipment & Materials

BY THE NUMBERS: NORTH COUNTRY'S TRANSPORTATION EQUIPMENT AND MATERIALS CLUSTER, 2013

New York State Department of Labor, "Quarterly Census of Employment and Wages." 2013.

TRANSPORTATION EQUIPMENT AND MATERIALS CLUSTER (LOCATION QUOTIENTS)

New York State Department of Labor, "Quarterly Census of Employment and Wages." 2013. The transportation and materials cluster includes businesses categorized under the following four-digit NAICS codes: 3241, 3251, 3252, 3253, 3255, 3256, 3259, 3261, 3262, 3271, 3272, 3273, 3274, 3279, 3311, 3312, 3313, 3314, 3315, 3328, 3361, 3362, 3363, 3364, 3365, 3366, 3369, 4231, 4238, 4931, 5413, 5416, 8111. Location quotients are calculated using public and private employment and wages.

SPECIALIZATIONS WITHIN THE TRANSPORTATION AND MATERIALS CLUSTER, 2013

New York State Department of Labor, "Quarterly Census of Employment and Wages." 2013. Income generation is defined as an industry group's ability to generate more dollars per worker than the national average, calculated by dividing an industry group's wage LQ by its employment LQ.

TRANSPORTATION EQUIPMENT AND MATERIALS BUSINESSES

The businesses shown on the map are derived from the same list of 4-digit NAICS codes in the transportation and materials cluster shown above in the location quotients section. (Shown above) NAICS codes for businesses are classified by Reference USA's "Canadian Businesses" data system and may not reflect official government NAICS classifications.

NORTH COUNTRY REGION

TARGETED ANALYSIS

Prepared by the UB Regional Institute with O-H Community Partners in support of the New York Upstate Revitalization Initiative

JULY 2015

NEW YORK STATE OF OPPORTUNITY. | Empire State Development

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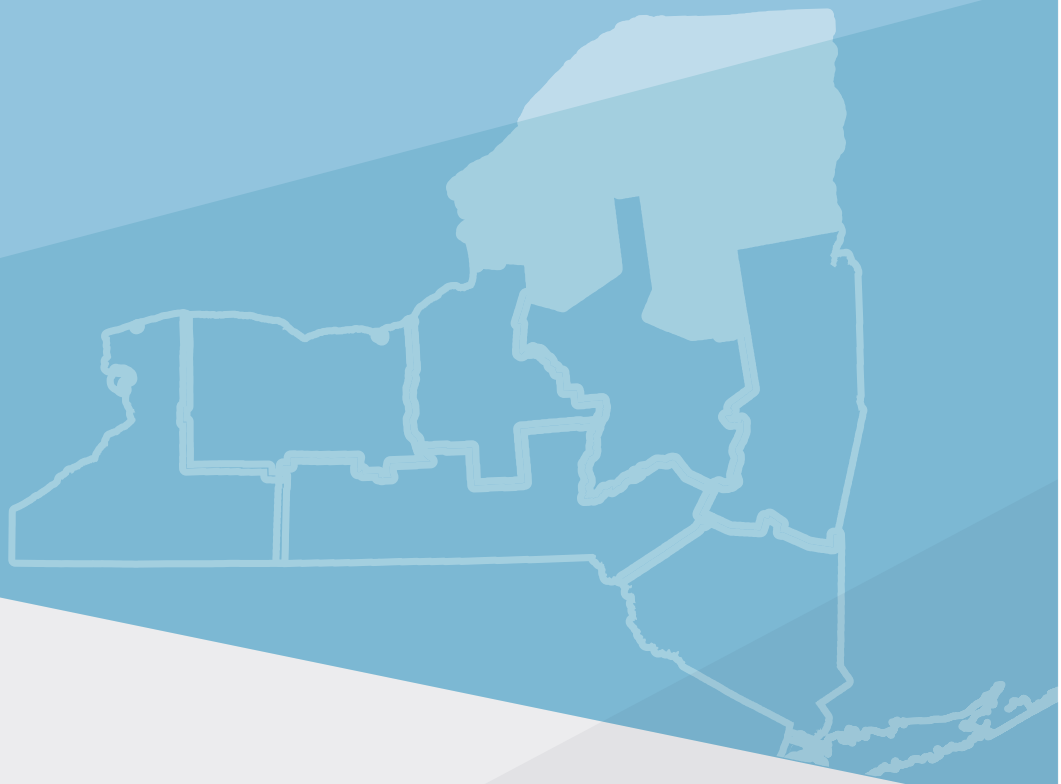

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