Taking regional action?

Understanding networks in the local food, green energy & creative sectors in Waterloo region

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A research paper prepared for the
Economic Developers Council of Ontario (EDCO)
February 2012
The views represented in this paper are those of the authors and may not necessarily reflect the views of the Economic Developers Council of Ontario (EDCO), its affiliates or its funding partners. Any omissions or errors remain the sole responsibility of the authors. Any comments or questions regarding the content of this report may be directed to the Principal Investigator.

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Executive Summary

Innovation, creativity and sustainability are increasingly viewed as drivers of change in local and regional economies. The ability to foster innovation, creativity and sustainability rests on the ability of places to leverage their existing territorial assets to improve the economic competitiveness, social well-being and overall prosperity of communities. The increasing interest and recognition of the importance of place and place-based policy is influencing the scale at which economic development activities are organized and delivered. This has positioned regions—and the urban and rural communities that comprise them—as central organizing units of contemporary economic development.

There is growing recognition that regional actors are well positioned to identify and leverage shared strengths and potential opportunities that exist across jurisdictions. In Ontario, this recent interest in the organization and governance of activities at the regional scale, coupled with an on-going trend in senior levels of government towards the decentralization of responsibilities, has resulted in the promotion of regional economic development initiatives such as the Ontario East Economic Development Commission and the Southwest Economic Alliance (SWEA).

The potential benefits of collaborative approaches to regional economic development are grounded in
their ability to leverage assets in both urban and rural communities. However, there remain open questions about the models of regional collaboration and governance that best facilitate economic development across different sectors of the economy.

This research advances our knowledge of models of regional collaboration and governance through a case study of the Waterloo region, with a focus on local food systems, clean technologies, and the creative and cultural industries. The project focuses on understanding the models of governance and collaboration in each of these three sectors in Waterloo region, and examines if, and how, regional approaches facilitate economic development.

**The objectives of the study are to:**

1. Identify models of regional governance and collaboration;

2. Understand the opportunities for collaboration that exist between jurisdictions;

3. Identify organizational models that foster economic development across jurisdictional boundaries;

4. Identify the challenges and barriers to regional action; and

5. Investigate and develop new tools and methods to capture and analyze regional collaboration.

Given the centrality of knowledge exchange, sharing and interaction in the practice of economic development, we have developed and applied new, innovative social network analysis tools to understand these regional and sector-based economic development dynamics. These social network analysis tools are used to document interactions amongst the economic development community, as well as their interactions with industry-specific actors in the Waterloo region. The analysis is complemented by 86 key informant interviews with regional actors, as well as extensive background research and an in-depth review of the current academic and policy literature.

Overall, our research identifies two overarching models of regional governance and collaboration: a conventional model, based on a leading regional agency, and a network model, based on strengthening existing regional and sector-based networks. Both models exist in Waterloo region and the effectiveness of each is mixed, due to organizational mandates and sector dynamics. Our research also identifies that the barriers to regional action often relate to the lack of clear, recognized leadership, either from an agency or from elsewhere in the community; the lack of connections between existing community leadership and the economic development community; and a lack of understanding related to sector-specific development challenges. Conversely, regional action can be enhanced by the effective use of cross-sectoral networks that enable individual actors to leverage the knowledge and resources of other actors in the network. Finally, our research highlights the value of using new tools and techniques such as social network analysis, alongside other methods.

**Four central themes emerge from our analysis:**

1. The critical role that local networks play in fostering development in emerging and knowledge-intensive industries;

2. The important role that regional identity plays in shaping regional approaches and outcomes;

3. The value that coordination and consultation have in creating regional vision and leadership; and

4. The barriers and challenges that must be overcome in taking regional action.
The most striking findings related to the four themes; their relevance to the local food, clean technologies, and creative and cultural sectors; and their implications for economic development, are outlined below.

1. **The importance of local networks:**
   Networks allow for the exchange of ideas and knowledge amongst individuals leading to problem solving, innovation and the formation of new business ventures. However, the drivers of network structure and formation vary by sector. Networks are shaped by sector-specific social, learning and innovation dynamics, and by the types of information and knowledge required for innovation and business development. They are also shaped by the strength of pre-existing relationships and the social capital and trust embedded within them.

- **Local food systems**
  • Value is created through the quality associated with how and where a product is produced. For this reason, trust is important, and without it, the reliability of information embedded in a given product is questioned.
  • Trust is developed through long-term relationships, often based on longstanding, pre-existing personal relationships that shape the structure of local food networks.
  • Networks need to be horizontal (rather than focused on a single commodity or crop) and place-based, including a diversity of actors. This allows for a more comprehensive approach to local food issues.

- **Clean technologies**
  • Local networks were identified as critical to building regional capacity in the sector, both to identify local industry players and to attract new businesses to the region.
  • The formation of ‘pipelines’ to global communities was also identified as important. Such pipelines allow for access to critical sector-specific information and knowledge, including leading edge technologies.

- **Creative and cultural industries**
  • Social and professional networks are critical to allowing firms and individuals to gain access to new projects and determine future partnerships.
  • Place-based networks are used to develop reputation and trust through face-to-face interactions. However, reputation and trust can be gained or lost quickly depending on the quality or success of a firm or individual’s previous projects, especially their most recent work.

2. **Regional identity:**
   A dominant regional identity—such as one reflecting advanced manufacturing and technology—can facilitate, shape and sometimes hinder sector development. This is evident in all three sectors under study in the Waterloo region. Moreover, economic development is path dependent: the past shapes the present.

- **Local food systems**
  • The Waterloo region’s Mennonite presence and a long history of agriculture and food provide the basis for today’s local food system. However, economic development efforts focus on Waterloo’s strengths in advanced manufacturing and high-tech industries. This has led to a narrow focus on traditional food processing, overlooking artisanal processing and small-scale production. This misses the potential value and contribution of the local food system to the regional economy.
  • There are differences within the economic development community, with urban and regional economic developers articulating a narrower view of the food sector compared to their rural counterparts. This reinforces the focus on traditional food manufacturing.
Executive Summary

Clean technologies
• The Waterloo region has a long history of civic-based environmental activism and leadership, which coupled with the region’s high-tech and advanced manufacturing identity, combine to facilitate the emergence and growth of the clean tech sector.

• The historic presence of a large manufacturing sector in the region provides a base of skills, technologies, supply chains and other assets that the clean tech sector draws upon. This is well-recognized amongst the economic development community and has led to efforts such as the Solar Innovation Networking Group (SING), which has helped to facilitate the transition of manufacturing firms into new areas, such as the solar energy sector.

Creative and cultural industries
• The Waterloo region’s focus on high technology both shapes and limits the development of the creative and cultural industries.

• The region’s strengths in technology are well recognized in the community and are viewed as an opportunity for specialized content creation, particularly related to digital media.

• However, the economic development view of the creative and cultural industries focuses on technology-oriented, rather than arts-based activities, leading to a narrow view of creative and cultural activity that excludes some parts of the arts community.

3. Vision and leadership:
Our findings point to the necessity of strong regional leadership, capable of integrating and coordinating diverse interests. While the Waterloo region has a regional economic development agency, Canada’s Technology Triangle, (CTT), its mandate (focused on investment attraction) limits its ability to take on a broader leadership role. Other economic development efforts are often uneven and fragmented; rural communities—in particular—are often less connected to their urban and regional counterparts. However, important sector-based, regionally oriented civic and industry organizations do exist, but they are not always well connected to the region’s economic development network. As a result, valuable community vision and leadership assets are underutilized by the region and the economic development community. This leads to missed opportunities to access critical knowledge and information, develop leadership assets and learn from these regional organizations.

Local food systems
• Economic development approaches to developing Waterloo region’s local food system are fragmented and lack regional coordination. As a result, current efforts support pre-existing local networks, preventing the development of a regional understanding of local food system issues.

• Two organizations have been established: Foodlink Waterloo Region and the Waterloo Region Food System Roundtable, each focused on horizontal networking with separate mandates. Despite possessing distinct regional mandates, tensions have developed as a result of perceived competition for funding and overlap in mandates.

• These two organizations were rarely identified in our network analysis or interviews with economic developers. This suggests that these organizations are not adequately recognized within, or integrated into, the region’s economic development network. This represents a missed opportunity for leveraging community and sectoral leadership assets, including the organizations’ robust knowledge of the challenges and opportunities confronting the region’s local food system.
Clean technologies
• Despite shared priorities amongst municipalities, there is no overarching regional approach to sector development. There is unevenness in terms of the capacity and resources of municipalities to support this emerging and growing sector.

• Several not-for-profit organizations, such as Community Renewable Energy Waterloo (CREW), REEP Green Solutions, and the Local Initiative for Future Energy (LIFE) support the development of local firms and play important roles in stimulating the underlying conditions for green economic development.

• None of these community-based organizations were identified in our network analysis. This suggests that, while community organizations are regarded as important for cleantech development, they are not well-integrated into the current cleantech economic development network.

Creative and cultural industries
• The creative and cultural industries are prioritized in Cambridge, Kitchener and Waterloo’s economic development strategies. Yet, despite shared priorities amongst municipalities, there is a lack of coordination in programs and funding, resulting in private sector uncertainty and missed opportunities for leveraging relationships across jurisdictions.

• Individual municipal approaches to creative and cultural development serve to duplicate efforts and provide a complex terrain of programs and funding. This is compounded by the not-for-profit nature of many organizations in the sector. For these organizations, funding is usually obtained through grants, sponsorship programs and earned revenue (e.g. ticket sales, consulting). Limited funding options, as well as uncertainty regarding funding levels, has led to competition amongst organizations rather than cooperation.

• A regional organization has been established: the Creative Enterprise Enabling Organization (CEEO). Despite shared priorities between the economic development offices and CEEO, and the recognition of CEEO’s potential leadership role, our network analysis revealed little connection between this organization and the economic development community. Other arts-based organizations were also not identified, underscoring the biases of economic development in this sphere.

4. Barriers to regional action:
Regional action is most influential when informed by a comprehensive understanding of sector-specific issues, challenges and tensions. In our study, the most commonly identified challenges include a lack of access to land, physical space and spaces for networking, as well as difficulties in navigating a complex funding landscape. Although common to all three sectors, the details are different in each case. Understanding sector-specific challenges and dynamics allows for a platform for regional action.

Local food systems
• Local food systems require a local food-processing infrastructure. However, our interviews identified onerous financial and bureaucratic burdens placed on small-scale food processing firms by federal and provincial food safety regulations. This represents a considerable barrier to establishing new processing facilities, which limits the potential for value-added opportunities and prevents the development of local food processing infrastructure.

• Land use policies introduce other tensions. Such policies prevent farmland loss but also limit the extent of on-farm, value-added opportunities. For example, core retail infrastructure for small-scale agricultural producers would no longer be permitted under current size restrictions for on-farm, farm-related businesses in the region’s municipal official plans.

• Overcoming these barriers requires regional action and coordination. However, the existing regional organizations do not have the appropriate capacity to address these issues.
Clean technologies

- A barrier to development in the sector results from uncertainties in the provincial policy environment. This produces uncertainty for private sector investors.

- Local action helps to overcome this barrier. For example, the City of Kitchener’s Local Environmental Action Fund (LEAF), designed to fund local community environmental and sustainability initiatives, fills a gap in funding and stimulates growth. Scaling up such initiatives to the regional level would provide foundational regional support for the sector. However, a lack of regional oversight and coordination prevents this from happening.

- Other barriers such as a lack of knowledge and linkages between local firms are overcome through the formation of regional organizations such as the Solar Innovation Networking Group (SING), which provides space for networking between new entrants and existing firms.

Creative and cultural industries

- Municipal funding rules make regional approaches to supporting creative and cultural activity exceedingly difficult. The structure of most funding programs includes jurisdictional stipulations, thus making it difficult for organizations to create programs and initiatives that have a wider regional focus.

- Sector participants identify the lack of affordable spaces for work and spaces for informal networking as key challenges. This has been addressed informally through the activities of not-for-profit organizations operating at the regional scale, thereby circumventing the political challenges of working through formal government.

Overall, our findings suggest that to foster regional approaches to economic development, it is necessary to understand the social, innovation and knowledge dynamics of sectors and the networks that underpin them. In doing so, it is critical to engage a comprehensive and inclusive stakeholder group, which includes the private sector, civil society, institutions, government and other related organizational actors. We have underscored the benefit of using several techniques to achieve this understanding: a) conduct stakeholder interviews to identify regional and sectoral organizations that have the potential to be regional leaders or champions; and b) use emerging social network analysis (SNA) tools to document the formal and informal relationships between economic developers in a region and better understand interactions between regional and sector-specific actors. In combination, this allows for the identification of gaps in regional leadership and missed opportunities for regional collaboration.

Based on our findings, we identified a series of challenges and opportunities related to each of the four overarching themes. Given these challenges and opportunities, we identify actions that economic developers can take to support both broad-based and sector-based regional approaches to economic development. In general, regional approaches can be supported through: a) the development of a regional agency, or b) through strengthening existing networks in the region. There are three areas for regional action: broad-based regional leadership and vision, regional identity, and sector-specific regional networks. Actions related to these three areas are outlined below:
1. Taking regional action through regional vision and leadership

- Ensure that economic developers from across the region are well-connected to one another.

- Identify, engage and mobilize key leadership assets, including the public, private and civic sectors across the region.

- Tools such as social network analysis can help to identify whether the economic development community is well-connected to each other across the region, as well as to other regional leaders.

- For individuals and organizations that are well-connected, strengthen and support identified regional leaders in addressing key regional challenges and issues.

- For individuals and organizations that are less connected, ensure that they become better integrated into regional networks.

2. Taking regional action through developing a regional identity

- Understand how prevailing regional identities shape and constrain the development of the region.

- Develop a consistent regional identity.

- Engage a broad network of regional actors.

- Integrate diverse, local identities. This entails recognizing the unique histories and strengths of different localities and being inclusive of all jurisdictions.

- Regularly review the perceived image of the region among actors to ensure consistency and in order to refine future actions.

3. Taking regional action through sector-specific regional networks

- Identify sector-specific civic and private sector leaders and organizations. Leverage their in-depth knowledge to ensure that policy and funding initiatives are designed to effectively overcome sector-specific obstacles rather than creating them.

- Gain insight into sector-specific dynamics to support and develop regional networks.

- Support sector-specific networks to foster innovation and knowledge exchange at the regional scale.

- Tools such as social network analysis can help to identify civic leadership and the connections (or lack thereof) between these individuals and organizations and the economic development community.

Overall, the findings from this report provide insights, lessons, and practical knowledge that can be applied in many communities. The study also identifies and develops new tools based on social network analysis that economic developers in southern Ontario and elsewhere can use to better identify and understand regional and sector-based networks. By taking regional action, economic developers can support innovation, creativity and sustainability in urban and rural communities and work towards enhancing the long term prosperity of communities across Ontario.
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Innovation, creativity and sustainability are increasingly viewed as drivers of change in local and regional economies in Ontario, Canada and across advanced economies. The ability to foster innovation, creativity and sustainability rests on the ability of places to leverage their existing territorial assets to improve the economic competitiveness, social well-being and overall prosperity of communities. The increasing interest and recognition of the importance of place and place-based policy is influencing the scale at which economic development activities are organized and delivered. This has positioned regions—and the urban and rural communities that comprise them—as central organizing units of contemporary economic development.¹

There is growing recognition that regional actors are well positioned to identify and leverage shared strengths and potential opportunities that exist across jurisdictions. This recent interest in the organization and governance of activities at the regional scale, coupled with an on-going trend in senior levels of government towards the decentralization of responsibilities, has resulted in the promotion of regional economic development initiatives. In Ontario, this is exemplified by regional development initiatives, such as FedDev, southern Ontario’s regional development agency, as well as collaborative, regional economic development alliances like
the Southwest Economic Alliance (SWEA) and the Ontario East Economic Development Commission. However, it should be noted that while a regional approach to economic development in Ontario has only recently gained favour amongst policymakers, debates about the importance of regions to contemporary economic development have been ongoing for several decades.\textsuperscript{11}

This regional understanding of economic development has focused attention on the influence that a region’s norms, values, and institutions have on the local social dynamics of innovation, learning, and knowledge exchange, including the structure and function of local and regional networks. Interest in regional approaches to economic development has also generated dialogue regarding urban-rural dynamics. While cities are now viewed as central to economic development and prosperity in the 21st century\textsuperscript{13}, recent employment growth, nearly double the Canadian average, in urban-adjacent rural communities has led to renewed interest amongst scholars and policymakers in the role that rural areas play in regional economic development.\textsuperscript{14} The potential benefits of regional approaches to economic development include their ability to connect urban and rural communities, leverage their collective assets and engage in more collaborative forms of economic action to overcome common barriers and solve common issues and problems. However, there remain open questions about the models of regional collaboration and governance that best facilitate economic development across different economic sectors and that best integrate urban and rural interests and activities.

This study is designed to advance our knowledge of models of regional collaboration and governance and examines if, and how, regional approaches facilitate economic development in urban and rural communities.
The objectives of the study are to:

1. Identify models of regional governance and collaboration;

2. Understand the opportunities for collaboration that exist between jurisdictions;

3. Identify organizational models that foster economic development across jurisdictional boundaries;

4. Identify the challenges and barriers to regional action; and

5. Investigate and develop new tools and methods to capture and analyze regional collaboration.

These objectives are explored through a study of the Waterloo region, a two-tiered municipality encompassing both urban and rural municipalities in southern Ontario. At a formal government level, the region of Waterloo includes three core cities (Kitchener, Waterloo, Cambridge) and four rural townships (Wilmot, North Dumfries, Wellesley, Woolwich). Given the presence of both urban centres and rural communities, the Waterloo region provides an ideal living laboratory for understanding how urban and rural communities can benefit from their proximity to, and build collaborative relationships with, one another in order to stimulate regional economic development and work regionally towards future, long term social well-being and economic prosperity.

Waterloo is often recognized for its collaborative regional governance model.\(^5\) Regional efforts to collaborate in the area of foreign direct investment attraction through Canada’s Technology Triangle, (CTT), are well-known, as are regional activities intended to promote and support the vibrant technology sector.\(^6\) However, regional strategies and approaches have been applied in a broad range of economic development initiatives in the region. Yet, we know less about the structure, organization and
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The governance of these regional initiatives and how they vary across different sectors of the regional economy.

Waterloo region has maintained economic growth through recent and previous economic downturns, and represents a thriving, diverse economy.\textsuperscript{VII} Waterloo’s resilience positions it as an ideal study region for the exploration of how institutions and local knowledge networks can contribute to regional economic development. Thus, this project evaluates regional economic development activities in three broad sectors of the regional economy: the local food system, clean technologies, and the creative and cultural sector. These sectors were chosen for several reasons. First, these sectors are of primary interest within academic, policy and economic development practitioner circles and are frequently identified as having high economic development and growth potential. These sectors often represent prospective targets for investment and intervention by economic development practitioners in both urban and rural communities. Thus, this project has high potential to yield insights and lessons useful in addressing local and regional economic development challenges across the province. Second, and related to the previous point, these sectors—identified in Ontario’s Innovation Agenda\textsuperscript{VIII}—are viewed as integral to the future prosperity of the province. Finally, each of these sectors is prominent in Waterloo region’s economy and has received significant attention within the community.

This study involves an in-depth, multi-method comparative case study to understand Waterloo region’s local food, clean technology, and creative and cultural sectors. The research draws on an array of research methods, including in-depth, semi-structured interviews and social network analysis, complemented by extensive background research and an in-depth review of the scholarly and policy-related literature.

The remainder of the report is structured as follows:

* Chapter 2 introduces the research methods and tools used in the study;
* Chapter 3 provides an overview of the case study region (Waterloo);
* Chapter 4 presents our key findings structured around four central themes: the importance of local networks, regional identity, vision and leadership, and barriers to regional action. We discuss each theme with respect to the local food, clean technologies, and cultural and creative sectors. We identify challenges and opportunities that confront economic developers in taking regional action;
* Chapter 5 provides a summary and recommendations for how economic developers can apply these findings to regional economic development efforts in their own communities. We identify actions that help develop and foster the regional and sector-based networks necessary for economic development in today’s economy.

Overall, the findings from this report provide insights, lessons, and practical knowledge that can be applied in other communities. The research also identifies and develops new tools based on social network analysis that economic developers in southern Ontario and elsewhere can use to better identify and understand regional and sectoral networks. The project advances our knowledge of the models of organization and collaboration in regional development initiatives that support innovation, creativity and sustainability in urban and rural communities and work towards enhancing the long term prosperity of communities across Ontario.
2
Research design, data and methods

The research draws upon a combination of qualitative and quantitative methods and tools. Semi-structured, key informant interviews were conducted in order to gain an in-depth understanding of regional economic development and sector specific dynamics. Social network analysis (SNA) was used to understand interactions between economic development officials in the region and their interactions with individuals in the local food, clean technologies, and creative and cultural sectors. Initial preparation included an extensive review of the academic literature and secondary data. Primary research was conducted between April and October 2011. All research instruments used in this study have been reviewed and approved by the University of Waterloo’s Office of Research Ethics.

Relationships between the University of Waterloo and local community partners provided the research team with opportunities to leverage pre-existing connections with leaders and other important individuals in private, public and civil society organizations, as well as the economic development community. Through their research and community engagement, the senior research team members have an intimate understanding of the sectors under study. Additionally, the research team attended local events and trade fairs, participated in sector-based initiatives, and attended relevant provincial and national conferences to understand current regional
and sector trends. This allowed the team to identify key individuals and firms in the region, gain insight into the nature of interactions and network dynamics within each sector and the broader regional economy, as well as place Waterloo’s experience in broader perspective.

2.1 Key stakeholder interviews

In total, 86 interviews were conducted with individuals from local, regional, and provincial government; private firms; academic institutions; industry organizations; and community organizations (Table 2.1). Of the 86 interviews, 17 were exclusively focused on the food sector, 16 on the clean technology sector, and 10 on the creative and cultural sector. Interviewees were selected based on their extensive knowledge of the Waterloo region and/or their involvement in one of the local food, clean technologies, and creative and cultural sectors. Municipal economic development officers and other municipal and regional government actors were identified to understand their roles and broader regional governance structures. In addition, executives and senior managers within the private and civil sectors were identified for their intimate knowledge of sector-specific dynamics and challenges. Semi-structured interviews focused on regional collaboration, networking, and identifying regional assets within the respective sectors of interest. Two interview guides were developed to understand how firms, organizations and governments interact to facilitate sectoral and regional development (Appendix A and B). Interviews were 30 minutes to 2.5 hours in length and were digitally recorded and fully transcribed. Direct quotes from these interviews appear in this report; however, individuals are not identified to protect the anonymity of the respondents. All transcripts have been reviewed, coded, and compared to identify common themes.
Table 2.1: Number of interviews by category

<table>
<thead>
<tr>
<th>Category</th>
<th># of Interviews</th>
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<td>Other Regional Government</td>
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<td>Community Organizations</td>
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<td><strong>Total</strong></td>
<td><strong>86</strong></td>
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2.2 Social network analysis
The increasingly knowledge-intensive nature of the global economy has focused attention on the role of informal networks in knowledge exchange, circulation and innovation processes. Social network analysis (SNA) provides a unique method to understand and interpret these networks. As such, SNA offers a way to determine, measure, and analyze relationships and networks and provides a powerful new tool for understanding how knowledge transfer and collaboration occurs within a sector or region. By visually mapping the connections between actors in a network, we can improve our understanding of which actors are connected to each other, the nature and level of interaction, as well as identifying gaps or missed connections. Table 2.2 provides an overview of key terms and concepts that are important for understanding how to interpret SNA visualizations and analysis.

Traditionally, SNA has not been used in the field of economic development. However, SNA has the potential to offer insight into the network dynamics that support economic development. In this research, we developed a unique set of SNA tools to understand how economic development networks operated in the Waterloo region, at the municipal and regional level. As this research illustrates, the combination of SNA and stakeholder interviews allows for a holistic and informed perspective on the networks that underpin the development of specific sectors and regional economies. Examining connections to regional organizations and intra-municipal connections adds a depth of analysis that complements the insights gained through in-depth interviews.

A full list of economic development officials in the region was developed from the key informant interviews and scanning public websites. In rural townships, identifying economic developers is more challenging, as some townships do not have a dedicated economic development position. In these cases, the individual with economic
development responsibilities was identified (e.g. Chief Administrative Officer (CAO), Planner). Through this process, 23 economic development officials were listed. A survey was created to capture the interactions amongst these economic development officials in the region (Appendix C). First, the survey asked respondents to identify the economic development practitioners within the region with whom they interacted. Second, respondents were asked to identify if these interactions were related to the local food, clean technologies or creative and cultural sector. For example, Economic Developer A (Municipality X) indicated that they interact with Economic Developer B (Municipality Y) to share information relevant to local food issues. Third, the survey asked the respondent to identify the top five key individuals in addition to economic development practitioners that they interact with in relation to each of three sectors included in the study. For example, Economic Developer A (Municipality X) interacts with the President (Firm Z) on issues related to the local food sector.

The survey was sent to all 23 economic development officers identified in the survey instrument. Of the 23 surveys, 17 were completed, equating to a 74% response rate that included representatives from each municipality. Despite some of the limitations associated with social network analysis, this survey tool provides a wealth of information regarding economic development networks in the region. A freely available, open source software program, Gephi Graph Visualization and Manipulation, was used to map and analyse the results.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition / Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node</td>
<td>Represents an actor (e.g. firm, organization, individual) within a network</td>
</tr>
<tr>
<td>Edge</td>
<td>Indicates a relationship or interaction between two nodes</td>
</tr>
<tr>
<td>Network</td>
<td>Refers to a group or community of actors that are tied together through a series of interactions and relationships</td>
</tr>
<tr>
<td>Network density</td>
<td>Reflects how integrated and connected nodes are within the overall network. Density is measured from 0 to 1, where 0 indicates that there are no connections between nodes in a network and 1 indicates that all nodes in a network are connected to each other.</td>
</tr>
<tr>
<td>Degree Centrality</td>
<td>Measure used to identify important actors in a network. Using this measure, an actor can be considered more central if they have a large number of connections to other actors. In other words, they are a 'key player'. In this analysis, this is depicted based on the size of the node.</td>
</tr>
</tbody>
</table>
Research design, data and methods
3 Overview of the Waterloo region

In recent years, the Waterloo region has received widespread attention from scholars, policymakers and the popular and business press for its high levels of innovation, entrepreneurship and economic resiliency. This reputation rests on the presence of strong universities; a track record of producing entrepreneurial start-up companies, university spin-offs, and globally successful companies; and having a set of active regional organizations that help to create a supportive local environment. The Waterloo region, located approximately an hour west of the Greater Toronto Area, is comprised of three mid-size cities (Kitchener, Waterloo, and Cambridge) and four rural townships (Woolwich, North Dumfries, Wilmot, and Wellesley) (Figure 3.1). Data from the 2006 Census indicate that the population of the Waterloo region is 478,121 and is expected to grow to 729,000 by 2031; 89% of the region’s population resides in the three cities, with the remainder residing in the rural townships. The region of Waterloo estimates that the total population of the region was 543,700 at the end of 2010. Like many communities in Ontario, it is expected that the region’s population will be shaped by several trends, including population aging, declining household size, workforce shortages and a steady increase in immigration and migration.
3.1 Economic history and profile

Waterloo region’s economic resilience, industrial diversity and strong civic engagement have come to be known as ‘The Waterloo Way’\textsuperscript{XII}. Authors point to the region’s legacy of entrepreneurialism, its appetite for innovation, and its penchant for community-oriented action as critical ingredients resulting in its leading economic position in Canada. The Waterloo region community is observed as one that “…actually does things, rather than engage in endless debates about change.”\textsuperscript{XIII}

While the region is recognized in Canada for its dynamic technology sector and its post-secondary education institutions, the region has a very diverse industrial base, particularly for its size\textsuperscript{XIV}. Figure 3.2 shows the relative strengths of the regional economy. It depicts a ‘bubble chart’ comparing the performance of the region’s main economic sectors in terms of growth, specialization and size. The horizontal axis shows the employment location quotient, which compares the proportion of the region’s employment
that is in the specified sector to the Canadian average; this is an indicator of specialization. The vertical axis shows the average annual employment growth rate between 2001 and 2006. The diameter of each ‘bubble’ is proportional to regional employment in the specified sector (size). Sectors that appear in the upper-right quadrant have high growth rates and have a higher-than-expected proportion of sectoral employment. Appendix D provides a summary of other key demographic and socio-economic indicators.

These contemporary strengths reflect the region’s industrial past. The region has an established history of manufacturing and agricultural production. This long-standing tradition of manufacturing and agriculture is largely attributed to early waves of migrants to the region, who were primarily of German, Mennonite, British and Scottish descent. Early industries that emerged in the region included food manufacturing, brewing, textiles, wood processing, and rubber manufacturing. The location and concentration of these traditional industries within the region varied, as distilleries and agricultural manufacturing were primary located in the City of Waterloo, while rubber and woodworking were more established in the City of Kitchener (formerly Berlin). Early industrial success is attributed to the varied skill sets and artisanal expertise of many of the early settlers and immigrants in the region. The legacies of these industrial successes are still present in the contemporary regional economy. The industrial heritage of the region is apparent in the contemporary urban fabric of the region. For example, the Breithaupt Tannery, a large 19th century tanning facility located in downtown Kitchener, now known simply as The Tannery, is home to a number of technology firms (e.g. Google, Desire2Learn), startup companies, and the Communitech Hub, a facility dedicated to the growth and commercialization in Ontario’s digital media industry.
Taking regional action?

Utilities Administrative, waste mngmt & remediation
Real estate, rental & leasing
Health care & social assistance
Information & cultural industries
Accommodation & food services
Transportation & warehousing
Public administration
Arts, entertainment & recreation
Agriculture, forestry, fishing & hunting
Other services Manufacturing
Finance and insurance
Construction
Educational services
Retail trade
Wholesale trade
Professional, scientific & technical services
Public administration
Other services
Agriculture, forestry, fishing & hunting
Figure 3.2: Growth, size and specialization in the Waterloo regional economy, 2001-2006

3.2 Government, governance and economic development structures

The 1973 Regional Municipality of Waterloo Act, which created the Regional Municipality of Waterloo, marked a significant change in the region’s governance. The Act centralized many government responsibilities and reorganized the region into seven lower-tier municipalities: Cambridge (an amalgamation of the City of Galt and surrounding communities), Kitchener, Waterloo, Wellesley, Wilmot, Woolwich, and North Dumfries. As a result of this restructuring and the formation of the regional municipality, many municipal functions were streamlined and a number of municipal services were consolidated, including police, fire, health services, transit, waste and water management, and community housing. However, economic development is still a municipal responsibility.

There are a number of actors involved in economic development in the region of Waterloo. While the regional municipality does not have an economic development office, some economic development functions are fulfilled by the non-profit organization, Canada’s Technology Triangle. CTT was founded in 1987, through a partnership with municipalities and private sector actors in order to promote the Waterloo region for the purpose of inward investment attraction. While CTT is responsible for attracting foreign direct investment (FDI) to the region, the lower tier municipalities are responsible for all other forms of economic development. For example, the City of Kitchener, the City of Cambridge and the
Overview of the Waterloo region

3.3 Challenges in the Waterloo region

Coordination among the lower tier municipalities, duplication of services, and regional competitiveness remain key issues for the region. These are reflected in an ongoing debate about the amalgamation of the cities of Kitchener and Waterloo. Some feel the amalgamation of the two cities would improve the region’s capacity to act by removing superficial political boundaries, while others feel amalgamation would result in the loss of community identity. In the November 2010 municipal election ballot, voters were asked if they would support further exploration of the issue. The majority of voters in Kitchener voted in favour, while Waterloo voters rejected a continued discussion on the topic. This difference can be interpreted as a reflection of underlying political tensions within the region. In many ways, this complex and tense political context, coupled with a high degree of civic capital, has given rise to collaborative approaches that ‘work around’ the constraints of local government. It is this approach that makes investigating regional economic development in the Waterloo region most interesting. By focusing on the interactions and networks of economic development actors, this study seeks to understand if, and how, these regional governance and collaboration models and approaches create the conditions for economic development and growth in the local food, clean technologies and creative and cultural sectors.

City of Waterloo have taken a cluster-based approach to economic development. Unlike the formal strategies developed by the urban centres, the rural townships traditionally have not created economic development strategies or employed dedicated economic development staff. Of the four townships, Woolwich has the most coordinated economic development program, offering a business visitation program and is currently creating an economic development action plan. The other rural townships rely heavily on CTT for their economic development needs, and there is great unevenness in the economic development efforts between the region’s lower-tier municipalities.

Beyond CTT and the municipal economic development offices, there are a number of organizations and institutions that support the development of the regional economy. The region is home to three post-secondary institutions: the University of Waterloo (UW), Wilfrid Laurier University (WLU), and Conestoga College. In particular, UW and Conestoga College provide a pool of highly skilled labour pool for the region, and are especially important to the local information, communications and technology sector. In addition, a number of organizations have developed through partnerships between private and public sector actors:

- Communitech: a regional industry association working to improve the cohesiveness and competitiveness of the Waterloo region’s technology cluster;
- The Prosperity Council: a partnership between local chambers of commerce, CTT, and Communitech that supports initiatives and programs for wealth creation and enhancing quality of life in the region; and
- Capacity Waterloo region: provides community leadership to support and add capacity for social change in the region.
Given that this study focuses on the local food, clean technologies, and creative and cultural sectors, it is important to understand the key issues and trends related to each of these sectors. This chapter provides a brief overview of each of these three sectors, including:

- a definition of each sector;

- a discussion of the transition being experienced by the sector, including key drivers and the sector’s importance to contemporary regional economic development;

- a quantitative overview of the size and relative importance of the sector in Waterloo region and Ontario; and

- a description of the local sector dynamics that operate in Waterloo region, highlighting key actors, local and regional priorities, and on-going challenges.
4.1 Local food

4.1.1 Definition

Despite increasing popularity and interest in local food systems, the term is highly contested and difficult to define. There is a lack of consensus in the academic and policy literature about the most appropriate label for this emerging food economy. A local food system often denotes a shift towards new forms of production in the agri-food industry, which fall under a variety of labels including the ‘new’, ‘quality’, ‘craft’, or ‘alternative’ food economy. For the purposes of this study, the widely recognized label of the ‘local food system’ will be used to denote the regional manifestations of this economy.

Regardless of nomenclature, an increasingly knowledgeable public has driven this shift through their desire for differentiated products unavailable through the mainstream food industry. This demand has been supplied by a ‘specialist’ group of firms that are equally difficult to identify due to the intangible qualities that differentiate their products and processes. It is these knowledge-laden qualities that distinguish their products from generic, commodity-based products. These associational qualities can relate to physical aspects of the product, but also to information conveyed by the product, such as environmental and animal welfare implications, traceability, craftsmanship, and the social embeddedness of their supply chains. The variety of processes, products, and qualities involved suggests that local food systems are best conceived of as specific networks of specialist firms within the agri-food system, rather than completely distinct systems.

Much like the products they develop, the firms involved in a local food system possess varied motivations that range from purely commercial to the idealistic motivations often ascribed to them.
This diversity is further reflected in the firms’ business activities, which often include multiple supply chain functions (e.g. processing, distribution), while others operate in a variety of different food supply chains. These functions may limit supply activities to a specific territory, but many use hybrid supply chains that incorporate both local and extra-local supply linkages to diversify their revenue. These varied supply networks limit the applicability of supply chain analysis in distinguishing between ‘local’ and ‘non-local’ firms.

The lack of a clear distinction delineating firms inside and outside a local food system makes analyses by product, sector, or traditional industry classifications challenging. However, whereas firm characteristics within a local food system vary, local food systems are recognizable through some common network elements. Interactions based on direct marketing and informal relationships close consumer-producer connections, ecological-embeddedness, decentralized power, and the prioritization of firm-based control, all reflect network dynamics common to local food systems. Thus, defining a region’s local food system requires an in-depth understanding of that region’s networks of interaction, and the dynamics that characterize those networks.

4.1.2 Transition

Since World War II, a commodity-based approach to food production has seen American based branch-plant dominate the Ontario food sector, with government policies structured to support them. To serve this commodity-based approach, the Canadian retail and food processing industries have also become highly consolidated, and in doing so have created supply chains that cater to larger-scale production. However, recent food scares, branch-plant closures, environmental concerns, decreasing farm numbers, and the decline of rural communities, have contributed to growing concerns over the environmental, social, and ecological implications of this approach. These same factors have also increased interest in the safety and health implications of our food system; the industry’s ability to embed local jobs; and the environmental implications of production, processing, and distribution processes, which have driven demand for food products differentiated by quality and/or locality, thus supporting food system ‘localization’ to some degree.

However, this demand for differentiated forms of production requires trust-based forms of interaction that bring food production and consumption closer to reliably convey knowledge-intensive product qualities. These trust-based forms of interaction have supported “new market, state, and civic practices and visions” that shift power from hierarchical structures to decentralized, place-based networks of knowledge-workers and extra-firm institutions. This shift in practices and visions has seen a recent proliferation of novel supply chain relations, as seen by the growth of farmers’ markets, community gardens, models of community-shared agriculture, and forms of collective purchasing.

In terms of economic development, local food systems focus “attention back on the primary producer, with positive opportunities for food SMEs to (among other things): create and retain value
locally as an innovation strategy; strengthen regional identity; improve associational capacity, clustering and localized learning; and benefit wider local businesses linked to the food enterprise. XXXIII The local and regional benefits associated with local food systems, coupled with the recent federal and provincial governments’ interest in decentralized government services and regional economic development approaches, position local and regional government as the ideal space for government support. However, the support for local food systems requires a shift in the structure of institutional supports, from pre-existing vertical rural development networks that are generally sector-based and involve large-scale production and consumption networks, to horizontal development networks that foster growth by linking small-and medium-scale producers to learning and innovation networks. XXXIV

4.1.3
Size and relative importance

Ontario

As seen in Table 4.1, Ontario’s food industries account for a substantial proportion of the Ontario economy and represent 6.7% of provincial GDP. XXXV The food and beverage processing industry is the province’s second largest manufacturing industry and produces over 200 agricultural commodities. XXXVI Industry estimates place the annual growth of Ontario’s specialty food industry between 15 and 25 percent, a rate far exceeding the province’s overall food sector growth of 2 to 3%. XXXVII

The lack of quantitative data specific to local food systems at the federal, provincial, and regional levels means that standardized measurements of the local food system do not exist. Thus, the most appropriate, available metrics include recent Ontario consumer trends and data illustrating the proliferation of local food oriented retail venues, such as farmers’ markets and direct, on-farm marketing.

Since 1977, the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) has promoted Ontario produce through its Foodland Ontario brand, which can be used to proxy Ontario consumers’ demand for other localized food products. Foodland Ontario’s 2008 brand awareness study found that preference for Ontario products increased from approximately 66% in 2006 to 75% in 2008. XXXVIII This preference for local products is further illustrated by the recent increase in business at Ontario’s farmers’ markets and on-farm markets (Table 4.2). This growth in demand has been recognized by the Ontario government, with the 2008 Ontario budget allocating $56 million over four years to the Pick Ontario Freshness Strategy and the Ontario Farmers’ Markets Initiative. XXXIX

<table>
<thead>
<tr>
<th></th>
<th>Firms</th>
<th>Jobs (billions, CDN$)</th>
<th>Annual Revenue (billions, CDN$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producers</td>
<td>59,278</td>
<td>130,000*</td>
<td>$9.1</td>
</tr>
<tr>
<td>Food, beverage, and tobacco processing</td>
<td>3,500</td>
<td>120,000</td>
<td>$32.5</td>
</tr>
<tr>
<td>Food Services</td>
<td>36,436</td>
<td>298,200</td>
<td>$19.5</td>
</tr>
<tr>
<td>Food Stores</td>
<td>13,731</td>
<td>178,000</td>
<td>$24.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>112,945</td>
<td>726,200</td>
<td>$85.2</td>
</tr>
</tbody>
</table>

Table 4.2 Ontario farm market growth statistics, 2008

<table>
<thead>
<tr>
<th></th>
<th>Number of Markets</th>
<th>% Reporting Increased # of Customers</th>
<th>Estimated Gross Annual Sales (millions, CDN$)</th>
<th>Estimated # of Annual Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario Farmers’ Markets</td>
<td>154</td>
<td>62%</td>
<td>$627-641</td>
<td>15,000,000</td>
</tr>
<tr>
<td>Ontario On-farm Markets</td>
<td>750*</td>
<td>72%</td>
<td>$210</td>
<td>8,000,000</td>
</tr>
</tbody>
</table>


Waterloo region

The region of Waterloo, with both urban and rural communities, diverse agricultural and food production, and smaller-than-average farms, provides an ideal case to consider the rural and urban implications of local food systems relating to: SME growth, local value creation, regional identity, local associational capacity, clustering, and benefits to other local businesses. Table 4.3 provides an overview of recent food sector growth in Waterloo region; the Waterloo region food sector is growing at a rate well above the Ontario average. Other recent estimates suggest high growth in crop and animal production, especially amongst small scale producers with fewer than 5 employees. This growth suggests a strong production base for local food system development. However, as identified above, understanding the dynamics of a local food system requires a qualitative understanding of the region’s network dynamics.

Table 4.3: Industry growth in Waterloo and Ontario’s food sector, June 2009 to December 2010

<table>
<thead>
<tr>
<th></th>
<th>Waterloo Absolute Change (# of Firms)</th>
<th>Waterloo % Change</th>
<th>Ontario Absolute Change (# of Firms)</th>
<th>Ontario % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Production</td>
<td>85</td>
<td>36.0%</td>
<td>694</td>
<td>6.5%</td>
</tr>
<tr>
<td>Animal Production</td>
<td>327</td>
<td>40.2%</td>
<td>92</td>
<td>0.5%</td>
</tr>
<tr>
<td>Food Manufacturing</td>
<td>6</td>
<td>5.5%</td>
<td>-99</td>
<td>-3.6%</td>
</tr>
<tr>
<td>Beverage Production</td>
<td>8</td>
<td>61.5%</td>
<td>20</td>
<td>4.1%</td>
</tr>
<tr>
<td>Food, Beverage and Tobacco Wholesale and Distributors</td>
<td>4</td>
<td>3.5%</td>
<td>-124</td>
<td>-3.0%</td>
</tr>
<tr>
<td>Food and Beverage Stores</td>
<td>15</td>
<td>3.2%</td>
<td>-70</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Food and Beverage Services</td>
<td>51</td>
<td>5.0%</td>
<td>-164</td>
<td>-0.5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>496</td>
<td>5.0%</td>
<td>349</td>
<td></td>
</tr>
</tbody>
</table>

4.1.4 Local dynamics
Despite growth in the region’s food sector, small-scale farming has faced difficulty in accessing the mainstream food retail environment. This environment is controlled by a small group of dominant companies with central purchasing models and stringent quantity and consistency regulations that make local sourcing difficult, if not impossible, for many smaller producers. However, a number of key local food outlets provide retail access for local producers, visibility for the region’s local food producers, and the trust-based producer interactions that are sought out by local food consumers. The proximity to urban centres in the region facilitated the development of now well-established retail outlets such as St. Jacob’s Farmers’ Market in 1963 and Herrle’s Country Market in 1988; and more recent retail developments from established local producers, such as the Mennonite community’s Elmira Produce Auction Co-operative, Martin’s Fruit Farm Retail Store, and Oakridge Acres Country Meat Store.

In addition to the private sector activities in the region, the local food system has seen a series of public supports, including:

• Regional land-use policies supporting farmland preservation;
• On-going financial or staff support for the Cambridge and Kitchener farmers’ markets, respectively;
• Public Health support for seasonal neighbourhood markets selling produce from the Elmira Produce Auction Co-operative in several low-income neighbourhoods in Kitchener and Cambridge;
• Public Health-led development of two independent, horizontal networking organizations (Foodlink Waterloo Region and the Waterloo Region Food System Roundtable); and
• Local post-secondary institutions supporting industry-specific skills development, such as Conestoga College’s Institute of Food Processing Technology (see Appendix E for a complete list of important actors).

Since its inception over a decade ago, Foodlink Waterloo Region has been pivotal in promoting the region’s local food assets through its ‘Buy Local, Buy Fresh’ map (revised yearly), and has acted as a conduit for intra-regional supply chain development. Meanwhile, the more recently established Waterloo Region Food System Roundtable has acted as a forum for discussion and networking around local and regional food system issues, including the development of priorities for building a healthy local food system. It has also acted as a catalyst for initiatives addressing these priorities.

However, a lack of coordinated economic development support for the region’s food system has resulted in a loss of capacity and missed opportunities to leverage these benefits. Some examples of this lost capacity are:

• limited physical space for on-farm value-added opportunities;
• stringent municipal farmers’ market regulations regarding stall size and time requirements that prevent the inclusion of smaller-scale businesses;
• limited cooperation between civil society organizations, preventing citizen-driven initiatives; and
• the lack of branding for regional food products.

Based on our interviews, some of these missed opportunities have been acknowledged by the Waterloo Regional Tourism Marketing Corporation. However, to date, this recognition has not led to the marketing of a clear regional food identity, strategy or a practical means of leveraging this lost capacity.
4.2 Clean technologies

4.2.1 Definition

The clean technologies sector (cleantech) refers to products and services that leverage technologies that are designed to mitigate environmental impacts while being commercially viable. The evolving cleantech sector is being shaped by advances in a number of industry segments including energy generation, storage, infrastructure, and efficiency; transportation; waste and water management; air and environment; agriculture; and manufacturing. Advances in research and commercialization in the energy generation industry has led to greater importance being placed on renewable energy technologies such as solar photovoltaic (PV), solar thermal, wind, geothermal, and bio-energy sources. Renewable energy, in particular, has become an area of growing interest for energy policy and economic development. While many of the associated products and technologies are not new, changes in the technologies, markets and associated policies have created new opportunities for commercialization.

The dynamics of the cleantech sector must be understood within the context of the transition to a green economy and its importance to economic development and broader public policy. The common theme in cleantech and the green economy is clear: mitigating environmental impact while working towards sustainable economic development.

Growing interest in climate change, energy security and sustainable development have led to new and innovative approaches to economic development. The green economy offers a different perspective for examining and understanding how regions and nations can move towards more sustainable models of development by integrating sustainability and environmentally oriented approaches within traditional and emerging economic sectors.

4.2.2 Transition

Climate change, energy scarcity and security, and economic uncertainty are all factors combining to form critical drivers for the development of the cleantech sector and the green economy. There is compelling scientific evidence that climate change is occurring, accompanied by detrimental impacts on the environment. In particular, the increase in greenhouse gases (GHGs) in the atmosphere is causing changes to ecosystem and climates with (sometimes devastating) impacts on local communities. Issues arise due to reliance on incumbent forms of energy, such as oil, gas, and coal, some of the largest generators of GHGs. Since these traditional energy sources predominate, they have actively shaped our current energy infrastructure, creating formidable challenges, both political and resource oriented, for economic development and change in this arena. Moreover, concerns regarding peak oil, energy security and the affordability have arisen. Thus, despite Canada’s position as a resource rich country with respect to energy, there are a number of drivers promoting the expansion of renewable energy.

The movement towards new, more sustainable, energy generation technologies is not only being driven by climate change and energy security, but also economic benefit. The recent economic downturn had a large impact on manufacturing industries. The automotive sector in particular faced challenges, resulting in a large number of jobs lost.
and leaving many regional economies searching for new opportunities. Cleantech has been identified as a timely opportunity for the manufacturing sector to redirect its capacity. Commitments to this transition were made most clear during the injection of stimulus funds by governments around the world during the recent recession. Stimulus funding, totalling nearly $472 billion (USD) across the OECD countries were directed towards investment in green sectors.\textsuperscript{XLVI} This funding created opportunities to make significant structural changes to prevailing economic systems through investments in new energy generation technologies, transportation, and infrastructure.

4.2.3 Size and relative importance

\textbf{Ontario}

Between 2008 and 2010, Ontario made a series of policy decisions intended to secure its future as a major player in the emerging cleantech sector. The \textit{Green Energy Act} has been regarded as an innovative, forward-looking policy that promotes green economic development in the province. Central to the Act is the Feed-In Tariff (FIT) program, which offers a premium price and reasonable rate of return on electricity generation from renewable sources (i.e. biomass, biogas, wind, solar PV, hydro)\textsuperscript{XLVII} Building upon previous incentive programs for renewable energy, the goal of the FIT program is not only to increase Ontario’s clean, sustainable energy capacity, but also to stimulate the creation of green jobs. Submitted applications can be interpreted as an indicator of the demand for future energy projects. \textbf{Table 4.4} provides the number and capacity of applications that have been submitted, approved or are in operation since the inception of the FIT and microFIT programs across a variety of renewable energy sources; this indicates strong demand for Solar PV Rooftop and Ground mounted projects. Similarly, \textbf{Table 4.5} shows the economic impact and growth in jobs expected to be created in the solar energy industry in Ontario. This growth and demand have important implications for the development of the green energy sector in Ontario. An important element of the FIT and microFIT program is that it contains domestic content requirements, which ensures that a portion of the project’s value must be sourced using Ontario based goods and labour.\textsuperscript{XLVIII} This has resulted in foreign and domestic cleantech firms establishing and expanding operations in Ontario in order to meet growing demand.\textsuperscript{XLIX}
### Table 4.4: Number of applications and capacity in the Ontario FIT and microFIT programs

**FIT Program: Number of Applications and Capacity (MW)—as of December 9th, 2011**

<table>
<thead>
<tr>
<th>Energy Group</th>
<th>Source Type</th>
<th>Submitted</th>
<th>To be brought online</th>
<th>Commercial Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td># MW</td>
<td># MW</td>
<td># MW</td>
</tr>
<tr>
<td>Bioenergy</td>
<td>Biogass</td>
<td>14 9</td>
<td>17 20</td>
<td>5 2</td>
</tr>
<tr>
<td></td>
<td>Biogass (on Farm)</td>
<td>7 2</td>
<td>17 4</td>
<td>2 0</td>
</tr>
<tr>
<td></td>
<td>Biomass</td>
<td>13 33</td>
<td>5 18</td>
<td>0 0</td>
</tr>
<tr>
<td></td>
<td>Landfill</td>
<td>7 29</td>
<td>3 9</td>
<td>1 6</td>
</tr>
<tr>
<td>Solar PV</td>
<td>PV Rooftop</td>
<td>4,824 859</td>
<td>1510 281</td>
<td>130 20</td>
</tr>
<tr>
<td></td>
<td>PV Groundmount</td>
<td>1,240 3,358</td>
<td>152 939</td>
<td>1 0</td>
</tr>
<tr>
<td>Hydroelectric</td>
<td>Hydroelectric</td>
<td>12 12</td>
<td>49 189</td>
<td>0 0</td>
</tr>
<tr>
<td>Wind</td>
<td>Wind On-Shore</td>
<td>38 1,135</td>
<td>75 2,833</td>
<td>1 1</td>
</tr>
<tr>
<td></td>
<td>Wind Off-Shore</td>
<td>1 2</td>
<td>1 300</td>
<td>0 0</td>
</tr>
<tr>
<td><strong>Total Count of Applications/Sum (MW)</strong></td>
<td><strong>6,156 5,439</strong></td>
<td><strong>1,829 4,593</strong></td>
<td><strong>140 29</strong></td>
<td></td>
</tr>
</tbody>
</table>

*projects pending Notice to Proceed and/or final application approvals

**microFIT Program: Number of Applications and Capacity (kW) - as of December 9th, 2011**

<table>
<thead>
<tr>
<th>Energy Group</th>
<th>Source Type</th>
<th>Submitted</th>
<th>Contract Executed</th>
<th>Connected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td># kW</td>
<td># kW</td>
<td># kW</td>
</tr>
<tr>
<td>Bioenergy</td>
<td>Biogass</td>
<td>7 54</td>
<td>0 0</td>
<td>0 0</td>
</tr>
<tr>
<td></td>
<td>Biomass</td>
<td>3 30</td>
<td>0 0</td>
<td>0 0</td>
</tr>
<tr>
<td></td>
<td>Landfill</td>
<td>2 20</td>
<td>0 0</td>
<td>0 0</td>
</tr>
<tr>
<td>Solar PV</td>
<td>PV Rooftop</td>
<td>6,465 19,988</td>
<td>2,812 21,963</td>
<td>429 3,598</td>
</tr>
<tr>
<td></td>
<td>PV Groundmount</td>
<td>2,012 57,990</td>
<td>3,968 38,562</td>
<td>219 2,126</td>
</tr>
<tr>
<td>Hydroelectric</td>
<td>Hydroelectric</td>
<td>1 10</td>
<td>0 0</td>
<td>0 0</td>
</tr>
<tr>
<td>Wind</td>
<td>Wind On-Shore</td>
<td>8 80</td>
<td>5 28</td>
<td>0 0</td>
</tr>
<tr>
<td><strong>Total Count of Applications/Sum (kW)</strong></td>
<td><strong>8,498 78,173</strong></td>
<td><strong>6,785 60,553</strong></td>
<td><strong>648 5,724</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Ontario Power Authority, 2011. Bi-weekly FIT and microFIT Program Reports. Available at [http://fit.powerauthority.on.ca/bi-weekly-fit-and-microfit-program-reports](http://fit.powerauthority.on.ca/bi-weekly-fit-and-microfit-program-reports)
The Green Energy Act is also reshaping the role that municipalities play in renewable energy development.

Increased municipal accountability and new ownership abilities are creating new areas and giving more power to municipalities to shape local energy development. Municipalities are able to invest in and own renewable energy projects that take advantage of the FIT program. While still subject to the approval of provincial agencies, the Act allows municipalities to act proactively in developing renewable energy projects. On the other hand, many municipalities are concerned about the loss of local approval authority for green energy projects.

However, the FIT program is not without challenges and debates during the 2011 provincial election raised uncertainty regarding the future of the program. Effects were felt throughout the supply chain as end customers were unsure whether they would be able to secure a FIT contract leading to inventory challenges, project delays and suspension, and deferral of hiring new staff, and in some cases, the loss of jobs. Instilling certainty back in the market has been complicated by the scheduled bi-annual review of the prices offered within the FIT program. A decrease in prices has been expected and is an important part of the program as it encourages innovation to reduce the cost of renewable energy technologies in the market, thereby increasing market penetration. Structural challenges have also hindered the success of the program. For example, gaining access to the existing electricity grid, governed by the OPA, has been proved to be challenging and a source of delay in some areas.

**Waterloo region**

Since the inception of the FIT program, Waterloo region has experienced growth in the number of renewable energy projects. Table 4.6 shows the number of FIT and microFIT projects according to coverage areas of the three utilities that operate in the region. There is a larger number of microFIT projects in the Waterloo-Woolwich-Wellesley service area, whereas FIT projects are greatest in number in the Cambridge-North Dumfries service area. However, the development of additional FIT projects in Cambridge-North Dumfries is being challenged by transmission line capacity limits.

### Table 4.6: Number of FIT and microFIT projects in the Waterloo region

<table>
<thead>
<tr>
<th></th>
<th>FIT Projects (&gt;10kW)</th>
<th>FIT Projects (kW)</th>
<th>microFIT (&lt;10kW)</th>
<th>microFIT (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterloo-Woolwich-Wellesley&lt;sup&gt;1&lt;/sup&gt;</td>
<td>2</td>
<td>0.2</td>
<td>152</td>
<td>1,174</td>
</tr>
<tr>
<td>Kitchener-Wilmot&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3</td>
<td>1.0</td>
<td>115</td>
<td>840</td>
</tr>
<tr>
<td>Cambridge-North Dumfries&lt;sup&gt;2&lt;/sup&gt;</td>
<td>8</td>
<td>1.5</td>
<td>60</td>
<td>486</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
<td><strong>2.7</strong></td>
<td><strong>327</strong></td>
<td><strong>2,500</strong></td>
</tr>
</tbody>
</table>

**Source:** Local Distribution Companies, Personal Communications, 2011

<sup>1</sup> as of December 2011

<sup>2</sup> as of September 2011
4.2.4 Local dynamics

A number of strengths have been identified in the Waterloo region’s cleantech sector, including solar energy. The region’s solar energy supply chain, including solar manufacturing, integration and installation, are areas that have rapidly emerging capacities. For example, ARISE Technologies has operated in Waterloo region since the mid-1990s. Leveraging research assets at the University of Waterloo, ARISE initially produced innovative technologies for solar thermal panels and then entered the solar photovoltaic market. The firm also launched a silicon producing division, although its future is uncertain. Two other major solar photovoltaic manufacturers are located in the region: Photowatt Ontario (a subsidiary of ATS Automation) and Canadian Solar Solutions. Market growth resulting from the Green Energy Act enabled both Photowatt and Canadian Solar to create divisions dedicated to the Ontario market. Beyond the strong solar manufacturing capabilities in the region, there is a long-standing presence of geothermal suppliers in the region. NextEnergy and GeoSmart are major geothermal distribution companies that serve as the foundation of the regional supply chains for geothermal products. In addition to upstream product and development firms, there are a growing number of consulting and installation companies that are emerging in the region in response to growing commercial and residential demand.

The regional cleantech sector has also witnessed an increase in new entrants, including firms transitioning from the declining automotive sector. In particular, automation and machine shops are leveraging their capacities and strengths to service the cleantech market. Two local organizations, the Waterloo Manufacturing Innovation Network (WaterlooMIN) and Solar Industry Networking Group (SING), are facilitating this transition. The WaterlooMIN was created through a partnership between urban municipal economic developers to provide an online platform for the manufacturing sector to collaborate and share information. The intent was to create supply linkages and networks that would create business opportunities for local firms experiencing challenges due to the decline in the automotive industry. SING, which operates through the WaterlooMIN, was established in response to local solar firms along the supply chain voicing the need to connect with one
another. This networking space has assisted some firms making the transition from an automotive focus to the cleantech sector, by providing supply chain linkages and a forum for knowledge transfer.

Beyond the industry assets in the region, there is a strong research and community effort to support the cleantech industry; Appendix E provides a full list of cleantech-related actors in the Waterloo region. The Waterloo Institute for Sustainable Energy (WISE, at the University of Waterloo) was created to advance the research agenda in sustainable energy generation and conservation. The Institute is a combination of 15 different labs and research groups across campus. One of these is the Centre for Advanced Photovoltaic Devices and Systems (CAPDS), which is dedicated to creating new, innovative solar PV systems and devices. Conestoga College’s newly formed Renewable Energy Technician Program is training students in the latest methods in renewable energy project development and construction.

Community organizations also play an important role. Community Renewable Energy Waterloo (CREW) arranges public meetings and provides web space for interested individuals who are seeking more information and advice on renewable energy projects. A bulk purchase was arranged for households who wanted to invest in a standard solar thermal or solar photovoltaic system. The organization is also promoting the development of solar and wind projects on community sites. REEP Green Solutions is a non-profit providing programs and services designed to increase energy awareness and efficiency in the residential sector in the region. Over 13,000 households have participated in REEP’s energy evaluations, enabling the region to be an early leader in participation rates for national energy efficiency programs (EnerGuide for Houses and ecoENERGY).
4.3.2 Transition

Many regions and municipalities have turned to cultural development as an investment in economic competitiveness in the knowledge economy. On the one hand, culture and cultural production are viewed as amenities critical for attracting and retaining highly skilled workers. Such human capital, or talent, is seen as essential to economic development in the knowledge economy and jurisdictions have gone to great lengths to win the ‘battle for talent’. This paradigm is central to the amenity approach to the development of art, culture and creative industries where the products of cultural production are seen as amenities that serve to attract knowledge workers to a particular location. As the knowledge economy is based on the development, application and transfer of knowledge, human capital is its basic resource. Therefore, the attraction of human capital is essential to business investment attraction. This shift underscores the importance of amenities and quality of life to regional competitiveness. Highly skilled knowledge workers value artistically rich environments and culturally authentic atmospheres, and make location decisions accordingly.\textsuperscript{LXV}

Therefore, regions with a variety of cultural experiences and amenities are conferred advantage in the global competition for human capital.

On the other hand, creative and cultural industries are also viewed as valuable economic sectors in and of themselves. As the knowledge economy has grown, so too have creative and cultural activities; it is now well-documented that the creative and cultural industries are expanding and growing rapidly, contributing to employment and the tax base.\textsuperscript{LXVI} The basic contribution of creative industries to economic development is in the formation of a competitive advantage or what is sometimes referred to as the ‘artistic dividend’.\textsuperscript{LXVII} This ‘artistic dividend’ can be defined as “the additional economic impact that would not occur without the presence of artists.”\textsuperscript{LXVIII}

In other words, the presence of cultural producers in a particular location may encourage the formation of new enterprises and may attract “other arts-using firms”.\textsuperscript{LXIX} In this perspective, creative industries are viewed as industrial agglomerations, which generate economic and employment growth and are particularly promising given recent growth trends.
4.3.3 Size and relative importance

Waterloo region and Ontario

The Conference Board of Canada estimates that, in 2007, the economic footprint of Canada’s creative and cultural industries was $84.6 billion or 7.4% of GDP, including direct, indirect and induced contributions. In Ontario, the creative, cultural and new media industries are estimated to employ 224,195 people and employment growth in the sector has consistently outpaced the rest of the labour force in the past two decades. This trend is reflected in Figure 4.1 which compares growth in the creative, cultural and new media industries to that of all industries in the region of Waterloo and Ontario between 2001 and 2006. During this period, total employment growth in the region of Waterloo outpaced total growth in Ontario. Similarly, employment growth across the creative, cultural and new media industries in the region of Waterloo outpaced employment growth in these industries provincially. However, while growth across the creative, cultural and new media industries exceeded growth across all industries in Ontario, the region of Waterloo experienced similar employment growth in both these categories. Table 4.7 provides additional detail by providing the breakdown of employment by sub-sectors in the creative and cultural industries for the Waterloo region.

Figure 4.1: Employment growth in the creative, cultural and new media industries, Waterloo and Ontario, 2001-2006
## Table 4.7 Employment in Waterloo region’s creative, cultural and new media industries, 2006

<table>
<thead>
<tr>
<th>Industry</th>
<th>Employment</th>
<th>% Creative Sector</th>
<th>% Labour Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>3346 Manufacturing and reproducing magnetic and optical media</td>
<td>45</td>
<td>0.65</td>
<td>0.02</td>
</tr>
<tr>
<td>5110 Newspaper, periodical, book and database publishers</td>
<td>2,545</td>
<td>36.62</td>
<td>1.07</td>
</tr>
<tr>
<td>5121 Motion picture and video industries</td>
<td>275</td>
<td>3.96</td>
<td>0.12</td>
</tr>
<tr>
<td>5122 Sound recording industries</td>
<td>30</td>
<td>0.43</td>
<td>0.01</td>
</tr>
<tr>
<td>5131 Radio and television broadcasting</td>
<td>390</td>
<td>5.61</td>
<td>0.16</td>
</tr>
<tr>
<td>5414 Specialized design services</td>
<td>525</td>
<td>7.55</td>
<td>0.22</td>
</tr>
<tr>
<td>5418 Advertising and related services</td>
<td>645</td>
<td>9.28</td>
<td>0.27</td>
</tr>
<tr>
<td>6116 Other schools and instruction</td>
<td>1,320</td>
<td>18.99</td>
<td>0.55</td>
</tr>
<tr>
<td>7111 Performing arts companies</td>
<td>120</td>
<td>1.73</td>
<td>0.05</td>
</tr>
<tr>
<td>7112 Spectator sports</td>
<td>70</td>
<td>1.01</td>
<td>0.03</td>
</tr>
<tr>
<td>7113 Promoters (presenters) of performing arts, sports and similar events</td>
<td>100</td>
<td>1.44</td>
<td>0.04</td>
</tr>
<tr>
<td>7114 Agents and managers for artists, athletes, entertainers and other public figures</td>
<td>15</td>
<td>0.22</td>
<td>0.01</td>
</tr>
<tr>
<td>7115 Independent artists, writers and performers</td>
<td>390</td>
<td>5.61</td>
<td>0.16</td>
</tr>
<tr>
<td>7121 Heritage institutions</td>
<td>160</td>
<td>2.3</td>
<td>0.07</td>
</tr>
<tr>
<td>8112 Electronic and precision equipment repair and maintenance</td>
<td>185</td>
<td>2.66</td>
<td>0.08</td>
</tr>
<tr>
<td>8132 Grant-making and giving services</td>
<td>135</td>
<td>1.94</td>
<td>0.06</td>
</tr>
<tr>
<td>Creative, Cultural &amp; New Media Industries</td>
<td>6,950</td>
<td>100</td>
<td>2.91</td>
</tr>
<tr>
<td>All Industries</td>
<td>238,465</td>
<td>-</td>
<td>100</td>
</tr>
</tbody>
</table>

4.3.4 Local dynamics

As noted above, within the economic development field, there is a growing consensus that the cultural character of a region plays an important role in attracting and retaining talent. Although the region’s cultural assets have not been leveraged to promote a cultural character for the region, an amenity perspective that focuses on the region’s cultural assets as a means of attracting and retaining human capital has guided support in this sector.\textsuperscript{LXXIII} Several initiatives, including the Arts Enabling Organization (now known as the Creative Enterprise Enabling Organization, CEEO) and the Creative Talent Attraction Project, are focused on increasing cultural development and capacity to address this challenge in the region. In addition, the City of Kitchener’s identification of a digital media cluster, the establishment of Communitech’s Hub (an incubator for digital media start-ups) and the development of the University of Waterloo’s Stratford Campus, are evidence of the perceived economic development value of the digital media sector.\textsuperscript{LXXIV} Appendix E provides a more comprehensive list of important sectoral actors.

The prominence of the technology sector in Waterloo region also shapes interest in the creative and cultural industries. The broader technology sector can provide many of the inputs, such as specialized technology, needed for the production of digital and new media. This connection is well recognized within the region. Communitech, initially established to support technology companies in Waterloo region, offers specialized services for digital media companies at The Hub. Underpinning recent
initiatives spearheaded by the Prosperity Council is the belief that cultural development will make Waterloo region a more desirable place to live, in turn attracting the human capital necessary to meet the needs of the businesses represented by its founding partners: Greater Kitchener-Waterloo Chamber of Commerce, Cambridge Chamber of Commerce, Canada’s Technology Triangle and Communitech. However, there remain issues and tensions related to differences between the traditional arts community and broader initiatives focused on the creative economy.
A growing interest in regional development is generating a need for new, innovative approaches that reflect changes in the structure and dynamics of local and regional economies. This requires a deeper understanding of the factors and conditions that shape current and future strategies for regional economic development. While our analysis focused on these dynamics within the local food, clean technologies, and creative and cultural sectors of the Waterloo region, our findings are more broadly applicable to regional economic development in Ontario.

Four central themes emerged from our analysis related to both sectoral and regional economic development. These are:

1. The critical role that local networks play in emerging, knowledge-intensive industries.

2. The important role that regional identity plays in shaping regional approaches and outcomes.

3. The value that coordination and consultation have in creating regional vision and leadership; and

4. The barriers and challenges that must be overcome in taking regional action

5 Towards Regional Action
Each of these themes is explored in depth, with an emphasis on its importance to the local food, clean technologies, and creative and cultural sectors. The analysis provides insight into sector-specific network dynamics and strategic implications. For each theme, we identify and discuss the challenges and opportunities associated with taking regional action.
5.1 
The role of local networks

In the global economy, knowledge, innovation, and the commercialization of ideas are increasingly viewed as critical factors in achieving regional competitiveness. The role that knowledge plays in product development, value creation, and innovation is now well-recognized by scholars and policymakers. Moreover, knowledge circulation and exchange tends to occur through interactions between various actors, within and across sectors, through networks. For economic development practitioners, there is now—more than ever—a growing interest in understanding and creating the conditions to facilitate the sharing and exchange of knowledge between actors in regional networks. Understanding how these regional networks form, their purpose, and how best to support their development is critical for academics, policymakers, and practitioners interested in economic development.

Past research has illustrated that knowledge transfer is facilitated by the interactions between different organizational actors. Networks often take explicit shape around formal business relationships such as participation in supply chains or industry and trade associations. However, informal networks, or the social relationships that take shape through business, community, and government interactions, also influence network structures. Bridging social capital refers to relationships that form between communities and groups and supports broad-based network inclusion. Bonding social capital refers to the strengthening of existing relationships within a given community or group and is influenced by pre-existing trust between individuals. Linking social capital refers to relationships that form within hierarchical organizations and/or networks, as is often the case in supply chains. Despite the importance of trust as a foundation for bonding capital, trust is understood to develop as a by-product of social capital of all kinds. As networks reflect the aggregation of individual relationships, social capital is integral to understanding why and how networks are formed within a group or community.

5.1.1 Value creation, location decisions, and new business and project development

Networks are shaped by the strength of pre-existing relationships and the social capital and trust embedded within these relationships. However, social capital can also produce barriers to the formation of new networks. The presence or absence of relevant networks may also influence the location decision of firms, as this reflects the ability to access important local and sector-specific knowledge. Being embedded in an existing network provides the opportunity to capitalize on knowledge transfer within a cluster or sector and provides the opportunity to identify and create linkages to important firms and other organizations in the region. Further, the exchange of ideas and knowledge amongst individuals within a network can lead to problem solving, innovation and the formation of new business ventures.

Social capital plays a critical role in understanding how relationships form and develop between individuals. The idea of social capital describes the set of values and norms that dictate interactions. Like other forms of capital, social capital takes many forms. Prior research illustrates that the level and type of social capital in a community has implications, both positive and negative, for the development and growth of a community; different forms of social capital result in differences in how relationships are formed and sustained within a given group or community.
Local food

In local food systems, the value of a product reflects a combination of the product’s physical characteristics and the qualities associated with it that convey knowledge about the mode and location of production and/or processing. Due to the centrality of these associational qualities in value creation, local food systems have specific requirements for trust in supply chain interactions. Without this trust, the reliability of information embedded in a given product is questioned. Our interviewees identified that trust-based inter-firm and consumer-firm relationships represent an important source of value for firms involved in the local food system, and the local food system as a whole. As the owner-operator of a local farm and distribution business explained,

“Those [supply connections] are old relationships that have proven themselves by the service we provide. A lot of the stores we supply, we’ve supplied for the last 30 years and a relationship has developed between the store and us and they know what they’re getting, we know their habits…this is the value of the business. The value of the business is the relationships we have that buy twice a week from us.”

However, these trust requirements result in connections that are often based on longstanding, pre-existing personal relationships that consequently shape the structure of local food networks. Our findings underscore the importance of social capital in local food interactions; however, the reinforcement of pre-existing relationships develops bonding capital that can be exclusionary and represent a barrier to entry for newcomers to the region, including recent immigrants.

Clean technologies

Recent growth in the demand for cleantech in Ontario, specifically in the solar energy sector, has required an increase in the sector’s domestic manufacturing capacity. Large-scale manufacturers of solar energy products are critical in the development of a local solar energy cluster. Waterloo region is home to three major solar energy manufacturers: Canadian Solar Solutions, Photowatt Ontario, and ARISE Technologies. Our interviews revealed that recent developments involving these manufacturers illustrate the importance that networks can play in shaping location decisions and the development of new businesses.

In Waterloo region, Canadian Solar Solutions and Photowatt Ontario were established through investment decisions made by their parent companies operating in the international solar energy market. These investment decisions resulted in local job creation and added solar manufacturing capacity in Ontario. Local networks played a critical role in the development and location decisions of these two global manufacturers. In the case of Photowatt Ontario, direct business networks facilitated development through its relationship as a subsidiary of ATS Automation, a prominent factory automation firm. ATS had gained experience in the solar industry when it created Spheral Solar Power as a division to produce a distinct PV technology based on tiny silicon spheres. Although Spheral Solar did not achieve commercial success, it created valuable human and social capital for the region’s solar industry network and several current Canadian Solar Solutions executives formerly held senior positions at ATS Automation. Our interviews with industry experts revealed that networks and the transfer of knowledge between key individuals at ATS Automation and Canadian Solar Solution led to a variety of business opportunities. In the case of Canadian Solar Solutions,
knowledge and the depth of existing local networks were important in making the decision to locate head offices in the Waterloo region. Furthermore, Canadian Solar Solutions’ formal business networks, developed through their foreign operations, enabled them to convince other firms in their supply chain to establish a presence in the Ontario market, adding even more capacity to the solar energy sector.

Creative and cultural

Work in the creative and cultural industries is often organized on a project-by-project basis, which calls for the creation of project teams that are uniquely assembled to meet the needs of a particular project. Social networks are essential to the development of project teams. In order to seize new project opportunities or be considered for potential project teams, workers must belong to the social networks underpinning the industry. Access to opportunities in the creative and cultural industries is shaped by the quality or success of a firm or individual’s previous projects, the ability of firms and individuals to gain information about new projects, and perceptions about the desirability of a firm or individual as a project partner. Thus it is essential to continually cultivate and maintain a positive reputation and develop trust to gain access to new work opportunities: social networks are a platform for these efforts. Our interviews confirmed that, in the Waterloo region, active participation in social networks was paramount for accessing local project opportunities. As one of our respondents explained:

“It’s knowing other people’s work. So, it’s very much being involved in the community and seeing their work and being able to judge their work. Then choosing somebody to work with, that experience and then the outcome. So, is the outcome the quality that we expect? If it’s not, then we’ve got to find somebody else…I don’t think that it matters where they are, as long as you can communicate on the project and get it done.”

Owner, Design Studio.
5.1.2 Sectoral dynamics shape networks

Knowledge requirements vary by sector, and accordingly, are reflected in the structure of sectoral networks. New product knowledge and innovation, process development, and product collaboration are all requirements that shape the nature of knowledge solicited by actors within a network. These knowledge requirements also shape how networks form, including the prevalence of vertical and horizontal network linkages within the sector. Both vertical and horizontal linkages create opportunities for efficiencies and new areas for knowledge exchange. Vertical network linkages refer to the relationships formed along sectoral supply chains and serve the purpose of creating efficiencies and transferring knowledge about specific problems or processes. Horizontal network linkages refer to the relationships that span sectoral boundaries and are recognized for facilitating cross-sectoral knowledge flows leading to new knowledge creation and innovation.

Local food

Ontario’s commodity-based approach to agricultural production has not only shaped the structure and composition of the industry, but also the organizations and networks that support this sector. An emphasis on single crop production and vertical supply chains has resulted in the proliferation of industry associations supporting single commodities, such as the Dairy Farmers of Ontario, or associations supporting a specific component of the supply chain, such as the National Farmers Union or the Alliance of Ontario Food Processors.

While the overall food sector requires vertically-oriented, commodity-specific support structures, the unique network dynamics of local food systems require very different organizational support structures. These systems are place-based and are comprised of a diverse set of interrelated actors. Therefore, rather than vertically-oriented networks, these actors require place-based, horizontal networking groups that take a comprehensive approach and focus on regional issues. In the early 2000s, Waterloo Region Public Health conducted a series of comprehensive food system studies that identified the dearth of horizontal networking supports addressing regional food system issues. Based on this finding, they developed Foodlink Waterloo Region and, later, the Waterloo Region Food System Roundtable, to fill this void. These organizations and their role in the region will be discussed in subsequent sections.
Clean technologies

The structures of knowledge networks are shaped by broader industry trends. The growth in the cleantech sector prompted by the Green Energy Act has led to foreign and domestic firms establishing and expanding operations in order to take advantage of increased demand for renewable energy products. Ontario has established economic strength in the environmental sector; however, the sector has relied heavily on foreign technologies. Currently, reliance on technologies that have proven commercial viability in other markets, such as Germany and Japan, are important for the development of the local cleantech cluster. The major solar PV manufacturers in the region have leveraged foreign-developed technologies to access markets in Ontario. This sectoral trend highlights the importance of international networks for the transfer of knowledge.

While foreign technologies have been important during the initial growth phase of the cleantech sector, domestically developed energy technologies are likely to become important if Ontario is to become a leader in the cleantech sector. Research institutions, such as the Waterloo Institute for Sustainable Energy (WISE), will become critical assets in the development of Ontario based capacity. The Waterloo region is well poised to take advantage of current regional assets in the cleantech sector. Industry interviews indicated that R&D is an important component of current business models; however, in the short-term, gaining market share is a priority for most firms. Interviews also indicated that firms were unsure how to become connected with regional research assets. Creating spaces where linkages to research institutions can occur will be vital in facilitating innovation and product development in the region’s cleantech sector.

Creative and cultural

As noted above, our findings highlighted the importance of social networks for accessing work opportunities in the creative and cultural industries. Moreover, networks tend to be horizontal in that culture producers from across many sub-disciplines are likely to interact. Furthermore, certain types of social interaction are viewed as essential to the successful operation of creative and cultural industries. These social interactions are often place-based and include parties, gallery openings, ‘hanging out’ in industry ‘hot spots’ and connecting with influential players in the industry. Cultural producers rely on these social interactions—where personal and professional relationships overlap extensively—for career advancement and development, commercialization, and access to markets. Similar dynamics were apparent in the Waterloo region. As the owner of a production company explained:

“I’m pretty plugged in; I’m on Twitter every day. I know who’s who and I know a lot of people in town, so I know who the influencers are. I knew that [event X] was coming up. I kind of knew about it only at the last minute through Twitter, but I kind of noted last year when it was on and I missed it. I went, ‘oh, that probably would have been a good event to do’. I know enough people, so when we do a video like [event X] it’s because there’s going to be, maybe not money, but there has to be some kickback for us like recognition or it’s going to reach these communities.”

Owner, Production Company.
5.1.3 Opportunities for action
While regional networks are vital for sharing knowledge and stimulating innovation, such networks may not necessarily emerge naturally. Successful networks are developed through the efforts made by individuals and organizations driven by the need and desire to interact and share knowledge. However, networks are often shaped by personal relationships and as such are not always inclusive of all regional stakeholders. **A challenge for economic developers is to facilitate the development of sector-specific networks that will foster innovation and knowledge exchange at the regional scale.** Critical to the success of developing networks is a deep understanding of the knowledge dynamics of particular sectors. For example, the knowledge dynamics of the local food and creative sectors seem quite similar, in that they are trust-based, place-based and horizontal in nature. However, in the latter case, networks are developed through participation in particular social and professional events, which serve as a platform for knowledge exchange and learning, whereas in local food, trust and reputation are built up over longer periods of time and developed through supplier or customer relationships. In contrast, firms in the clean tech sector need to be connected to local knowledge infrastructure, as well as foreign expertise, either directly or through local partners with this access. In other words, different sectors require networks for different reasons and thus the focus of networks must also be appropriate to sector-specific knowledge, learning and innovation dynamics. **The opportunity for economic developers is to gain insight into sector-specific knowledge dynamics, allowing for the creation of appropriate supports that effectively build and further develop regional networks.**

5.2 Regional identity
The founding of Canada’s Technology Triangle, a regional investment attraction organization, suggests that the region not only approaches economic development with a regional consciousness, but also acts upon this consciousness through coordinated regional action. However, the development of this regional approach and specifically the identity that it portrays, represents a dynamic interface between the region’s past, its citizens’ values, and its on-going development. Although the region is promoted to outside audiences as a single entity, it is still comprised of seven local governments operating within a two-tier municipal structure. This governmental structure requires a balance between broader regional interests and local/municipal interests. These latter interests are grounded in the individual cultural and industrial identities of the different municipalities, who are ultimately accountable to local council and citizens. Given that each municipality has a distinct cultural and industrial identity, the development of a regional identity requires these local interests to be recognized and balanced against regional, shared interests.
Through an analysis of our interview data, it became clear that while a regional identity has been developed and largely accepted internally and externally, this regional identity remains a source of tension. One specific source of tension identified by our interviewees was that the tech-centric focus of economic development activities directs attention and investment to specific sectors, often overlooking other sectors that have high economic development potential. Moreover, we found that local legacies, both cultural and industrial, still heavily influence economic development activities within each local jurisdiction. Through visualization of our SNA data, it is clear that—in some cases—these conflicting influences have resulted in uncoordinated economic development activities that do not adequately leverage all of the assets available to the region resulting in missed opportunities.

### 5.2.1 The relationship between identity and sectoral development

Despite a diverse economy and longstanding traditions in agriculture and manufacturing activities, the region’s current identity is largely oriented towards its strengths in information and communications technologies (ICT). This high-tech emphasis influences both regional and local economic development activities in a number of ways, with varying implications for individual sectors in the region. For example, the tech-centric identity of the region has limited the attention given by both urban and regional economic development actors to issues confronting the local food sector. Meanwhile, the region’s tech-centric identity has been leveraged to develop capacity for clean technologies. In the case of the creative and cultural industries, the region’s focus on technology is shaping the sector’s economic development trajectory.

### Local food

Since the first Mennonites settled the region, food and agriculture have been prominent economic activities. Although much of the region’s agri-food success has been associated with large-scale food processing facilities associated with household names (e.g. Schneiders, Pillers, Dare, Weston’s), agricultural production has remained an essential industry to the region’s rural townships. Throughout the interviews, agricultural roots were acknowledged as integral to the region’s identity. This identity is exemplified by St. Jacob’s Farmer’s Market, which draws tourists from far and wide. However, external economic development-related marketing efforts have largely focused on advanced manufacturing and high-tech industries; the focus on food has been limited to supporting the establishment of food processing facilities. The region’s high-tech identity and the focus on large-scale food processing are a reflection of Canada’s Technology Triangle’s efforts, over the past two decades, aimed at branding the region to attract foreign direct investment. Our interviewees explained that the region’s tech focus not only affects how the region is externally marketed, it also shapes the perspectives and efforts of economic development actors within the region.

While the rural economic development actors we interviewed were very aware of the issues facing the local food system and recognized its importance and potential value to the region, urban and regional economic development actors consistently articulated a narrow view of the food system that was limited to food processing. Such a view excludes artisanal processing and small-scale production, both of which can and do make significant contributions to the local food system and the local economy. Our study found that this simplistic perspective was not limited to economic development actors: for example, a representative of a local chamber of commerce stated:
Food? I don’t see any restrictions on the food industry. I think the food industry is sometimes forgotten in terms of its prominence here...from my understanding Schneider’s has had about 1600 employees there for about the last 30 years. They don’t go up. They don’t go down. They pretty much maintain their consistency. So yeah, I don’t know, it’s a good industry. It’s still pretty stable.”

*Local Chamber of Commerce Representative*

Thus, not only does this narrow view of the food sector as food processing miss opportunities to leverage rural-urban supply dynamics in the region, the perception of stability related to the food processing sector also results in a general lack of attention to local food issues. The assumption of stability can lead to missed signals. In fact, in the case of the Schneider’s plant, the 2011 announcement of its closure demonstrated a radical departure from a pattern of stable employment. This lack of attention and support at the local and regional level was regularly identified in our interviews with firms in the local food system. As the owner of a local food distribution firm explained,

“To further illustrate the lack of regional focus on local food issues, we draw upon data from our social network analysis. Table 5.1 shows the number of economic developers who interact in each sector, the proportion of economic developer connections directed towards other economic developers, and the density of each sector’s network. While 18 economic development officers in the region indicated that they are involved in local food issues, there is less interaction amongst economic developers on these issues compared to either the cleantech or creative and cultural sectors. This lack of interaction suggests fragmented local approaches to the local food sector, rather than a cohesive regional approach. Another way of capturing this fragmentation is through measuring network density. Network density reflects the extent to which actors in a network are connected, whereby 1 represents a network where all actors are directly connected to one another in the network. The local food sector has a lower network density relative to the other sectors in our study. Figure 5.1 presents a visualization of this pattern. It illustrates the highly fragmented nature of the local food network, especially in comparison to the more technology-oriented cleantech and creative and cultural sectors.

**Table 5.1:** Sectoral network connections and density

<table>
<thead>
<tr>
<th>Sector</th>
<th># of EDOs Identified</th>
<th>Proportion of Inter-EDO Connections</th>
<th>Network Density (undirected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Food</td>
<td>18</td>
<td>61.3</td>
<td>0.099</td>
</tr>
<tr>
<td>Cleantech</td>
<td>18</td>
<td>68.7</td>
<td>0.139</td>
</tr>
<tr>
<td>Creative/</td>
<td>14</td>
<td>67.6</td>
<td>0.118</td>
</tr>
</tbody>
</table>

*Cultural*

Source: Social network analysis survey results

[Authors’ calculations]
Figure 5.1: Clustering and fragmentation in sector-based networks

Source: Social network analysis survey results
[Authors’ calculations]
Figure 5.1: Clustering and fragmentation in sector based networks

Source: Social network analysis survey results [Authors’ calculations]
Figure 5.1: Clustering and fragmentation in sector-based networks

Clean technologies

Source: Social network analysis survey results
[Authors’ calculations]
Clean technologies

A strong identity related to manufacturing and technology also provides the context for the development of the cleantech sector. Manufacturers, including automotive manufacturers, have been and continue to be, important employers in both Kitchener and Cambridge. For this reason, supply chains have been developed to support the larger manufacturing firms operating in the area. However, the recent economic downturn—acutely felt in the automotive industry—has prompted many firms to scale down or shutdown their operations. In spite of this downturn, a number of firms have made an explicit effort to connect and engage with the growing cleantech industry. When asked about challenges in the automotive sector and the transition to cleantech, a municipal economic development officer described the situation,

“Kitchener and Cambridge were really suffering because of the decline of the automotive sector and that was our prime supplier of jobs and wealth in this community…People that did tires, batteries, windshields, parts and castings—all kinds of people were out of work—because of the decline…We were looking for another economic sector to plug into and promote. We came to the determination that the renewable energy sector was one that we wanted to get into.”

Municipal Economic Development Officer

Economic development officers acknowledged the challenges in the automotive manufacturing sector and have made concerted efforts to create new opportunities in the cleantech sector, where many of the same skills and capabilities can be used. For example, the Solar Innovation Networking Group (SING) was created to facilitate learning and exchange in the local solar energy sector. Traditional manufacturing firms identified SING as an important organization for this purpose. When asked about the success of SING in assisting local manufacturing firms in this transition, a municipal economic development officer offered this example,

“[Firm X] had a metal fabrication plant. He [the firm owner] was making store fixtures and counter tops and display cases for pharmacies. About 5 years ago he had 40-45 employees and now he’s down to 15. So he came to [SING] and sure enough he hooked up with somebody and they went out and saw his shop and the capabilities of what he can do. And they now have a supply contract for making the roof racking for solar panels.”

Municipal Economic Development Officer

The region’s strong high-tech identity is also helping to draw attention to the cleantech sector. Our interviewees suggested that the clean and high-tech sector stand to benefit from the further integration of firms and assets in the region. As illustrated by the manager of a local cleantech consulting company, cleantech is beginning to be identified as part of this technology-focused identity of the City of Waterloo,
“Waterloo is most hungry for high-tech, which they are beginning to understand as inclusive of cleantech.”

Manager, Cleantech Consulting Firm

When asked about important connections to the sector, urban economic development officers identified a variety of cleantech firms, as well as solar firms, organizations, and institutions, but interact less amongst one another (Figure 5.2). Moreover, while our interviews highlighted the important role played by regional organizations such as WaterlooMIN and SING in sector development and assisting traditional manufacturing firms, the social network analysis revealed no connections between urban economic developers and these organizations. This suggests that while these organizations are considered important for the regional cleantech sector, urban economic developers rely more on relationships with specific sector actors rather than these regional organizations.

Our findings also show a lack of interaction between rural economic developers and cleantech actors. For example, while there are cleantech firms that operate in rural areas (e.g. NextEnergy, Waterloo Energy Products), these were not identified by rural economic developers. As Figure 5.3 demonstrates rural economic developers have no direct connection with cleantech actors. Rather, rural economic developers rely on urban and regional economic developers for access to sectoral information and knowledge.
Figure 5.2 Connections between economic developers and clean technology actors

Source: Social network analysis survey [Authors’ calculations]

Figure 5.3: Disconnected? Indirect connections between rural economic developers and cleantech actors

Source: Social network analysis survey results [Authors’ calculations]
Creative and cultural

Waterloo region’s strength in technology is well recognized in the community and offers an opportunity for specialized content creation in the creative and cultural industries. Scholars suggest that, in approaching creativity and culture-led economic development, regions should select particular sub-sectors that complement the existing industrial base upon which to develop a competitive advantage. In Waterloo region, our interviews demonstrated that local cultural producers understood that they could gain competitive advantage in the larger marketplace and that their content would have more value if they were better able to leverage innovations in the local technology sector.

“...We’ve learned the value of content development—what we’re worth in a way. What we can bring to the table—to the technology sector here. We know that with [technology company X], that we do bring value to the table, so it’s a matter of identifying those industries which we can really affect and benefit.”

Local festival director

The network diagram in Figure 5.4 illustrates the connections amongst economic development actors involved in fostering and promoting the creative and cultural industries, alongside other community actors engaged in these activities. Of particular note is the very strong connection between economic development practitioners and the technology sector in Waterloo region. For example, all of the private sector firms identified as important to the development of the creative and cultural industries were technology firms. Similarly, connections with Communitech (the local industry association representing technology firms) are prominent among economic developers focused on the creative and cultural industries. Overall, this suggests that the economic development view of the creative and cultural industries focuses on technology-oriented rather than arts-based activities.
Figure 5.4 Tech-focused: Connections between economic developers and creative and cultural industry actors

Source: Social network analysis survey results
[Authors’ calculations]
5.2.2 The past shapes the present

Our findings reveal that the region’s identity shapes and constrains the development of individual sectors; however, the current, explicit identity of CTT is not only influenced by present regional, cultural, and economic realities, but also reflects an ongoing evolution that is shaped by both the region’s history, and those of each individual municipality. For this reason, understanding the implications of identity for regional economic development requires understanding the historical trajectories of each municipality and how that has shaped sectoral development in the region.

For the local food system, despite a lack of attention from economic development actors, the region’s long-standing traditions in agriculture have been internalized by the agricultural sector into a commonly recognized identity. The region’s agricultural history has resulted in a core group of deep-rooted private sector actors that provide a foundation for local food system development in the region. In terms of the clean technology sector, the region’s embedded community environmental values have provided the context for the early adoption of renewable energy technologies. Meanwhile, developments in the region’s creative and cultural industries are shaped by, and reflect, cultural traditions unique to each lower-tier municipality.

Local food

The region’s agricultural history and the preservation of farmland assets facilitate the strengthening of the local food system. However, along with the prevalence of farmland, the region’s small-scale, diverse production led OMAFRA’s representative in the Waterloo region to call Waterloo the “king of small farms”. Our interviewees regularly associated the region’s diverse agricultural production, and the identity it brings, with the region’s Mennonite heritage. As a Regional planning representative stated:

“A big part of [the region’s diverse production] is because of the Mennonite communities. It’s a part of their culture, their religion to be self-sufficient and to produce a greater variety of products for sale and for their livelihood, so that’s one of the key factors that sets us apart from a lot of the other places in Ontario.”

Regional planner

Agricultural diversity and small-scale agriculture are central components of a local food system, as they provide consumers with a wide range of products and the ability to establish more direct relationships with the producers of their food. However, without adequate retail and distribution channels, this small-scale farming identity does not necessarily facilitate the development of a local food system. Our findings suggest that the Region’s local food system has benefited from a core group of established food businesses that have maintained and/or developed on-farm retail outlets, and that, in turn, provide avenues for other local producers to sell their products. When asked what assets in the Region facilitated the local food system’s development, a local distributor stated:
There’s a handful out there. Charles’ Quality Meats has been out there for 30 years, Martin’s Family Fruit Farm has been around forever. Herrle’s has been around forever selling farm gate and such. And Hilltop, out there on Bloomingdale Road… I think the fact that they’ve managed to stick it out and do their thing, now the pendulum’s come back, and everybody’s been reading ‘local, local, local’ and they’ve been around forever."

Owner, Local Distribution Firm

Our interviewees cited this group of well-established, on-farm retail stores as pivotal in maintaining both the visibility and availability of local food in the region, and providing a solid foundation for other producers in the region to piggy-back on the recent interest in local food.

Clean technologies

The development of the cleantech sector in the region reflects not only a transition within manufacturing, but also a history of early adoption of technologies and community environmental values. The region was home to Canada’s first solar neighbourhood demonstration project, Eastbridge, which became the first community scale project in Canada to showcase multiple households generating solar electricity. The project was led by ARISE Technologies, a leading local solar firm, and included local municipalities, a local developer and bank, along with federal funding. In addition to a history of early technology adoption, there is a long-standing culture of progressive environmental initiatives in the region. For example, the provincial blue box recycling program was initially developed here. A watershed approach to urban planning has been adopted. Even local crises have led to positive responses. For example, Agent Orange, a toxic chemical compound used by the US military in the Vietnam War, was manufactured in Elmira during
Towards Regional Action

Understanding networks in the local food, green energy and creative sectors in Waterloo region

I think people really have a desire to really clean up their environment, and that is a local piece. So when you’re talking about cleaning up the environment, that’s where you live, that’s where you work, that’s local. So those kinds of pieces are going to stay around here… somebody’s not going to develop a green technology and suddenly move to India, you know what I mean? They’re going to stay here."

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Representative, Regional organization

The history and cultural traditions of Waterloo region have also shaped the development of the creative and cultural industries. According to our interviewees, in terms of cultural production, certain artistic and craft traditions are associated with certain parts of the region. For example, quilting and pottery are associated with an agrarian lifestyle and the City of Waterloo’s agricultural history. While it is unclear whether these traditions are actually reflected in the current distribution of the creative and cultural industries, this does suggest that place identity becomes embedded in the product itself; this ‘place in product’ adds and reinforces value to both the product itself and the place in which it is produced.

"The fundamental difference between Kitchener and Waterloo is that Waterloo’s history is grounded in agriculture and Kitchener’s history is grounded in industry. Even the industry in Waterloo, going back a hundred years, was agriculture based—beer making and whiskey making, those are both by-products of agriculture, they’re grains that have been processed into something else. What that gives me is all the traditions that go along with agriculture, like quilt-making, pottery, rug-hooking, knitting, they kind of live here [in Waterloo] instead of there [Kitchener]. It’s fascinating."

Municipal cultural official

Creative and cultural

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Our interviewees recognized this mutually reinforcing processing, noting that pottery at the Waterloo Potters’ Workshop Sale at RIM Park in Waterloo and visual art at the Box 11 show and sale in the abandoned downtown Kitchener Rumple Felt Factory have added value because they reference and are embedded in each community’s history. As a municipal cultural department official explained:

"The fundamental difference between Kitchener and Waterloo is that Waterloo’s history is grounded in agriculture and Kitchener’s history is grounded in industry. Even the industry in Waterloo, going back a hundred years, was agriculture based—beer making and whiskey making, those are both by-products of agriculture, they’re grains that have been processed into something else. What that gives me is all the traditions that go along with agriculture, like quilt-making, pottery, rug-hooking, knitting, they kind of live here [in Waterloo] instead of there [Kitchener]. It’s fascinating."

Municipal cultural official

the 1960s. As a result of poor disposal practices by the manufacturer, the water supply was compromised, leading to the development of a number of programs and initiatives to promote environmental stewardship in the Township of Woolwich. For example, the annual Healthy Communities month was designed to create awareness and educate citizens on sustainable living practices in the Woolwich area. More broadly, there is a strong ethos of sustainability in the region, which lends support to developing the cleantech sector and encourages the adoption of renewable energy at both commercial and residential levels. Compared to other jurisdictions, there are a large number of organizations addressing sustainability and environmental issues (Appendix E). When asked about the region’s community environmental values, a representative of a regional research organization stated:

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Municipal cultural official
5.2.3 Opportunities for action

Our findings reveal that cultivating a regional identity is an on-going process that incorporates a multitude of factors, including local histories and economic strengths, and combines a multitude of unique, local identities. The challenge for economic developers is to integrate diverse, local identities into a consistent regional identity. Moreover, a regional identity can shape sectoral development trajectories within the region. For example, the development of the creative and cultural industries is viewed primarily in relation to technology-based development. However, a dominant regional identity can have unintended consequences for economic development, inadvertently favouring the development of some sectors over others. For example, our research identified that the Waterloo region’s strong tech-based identity results in some economic development opportunities, such as those in local food, being overlooked. The opportunity for economic developers is to develop an inclusive regional identity that recognizes the unique histories and strengths of different localities and leverages these assets to create regional advantage.

5.3 Vision and leadership

A central observation in the academic literature on the ‘new regionalism’ is that regions are the key economic drivers of the contemporary economy. In this view, regionally-oriented strategies, networks and organizations are best positioned to respond to local challenges and leverage local assets. This has focused attention on the role of local and regional institutions, such as cultural norms, values and organizational structures, in supporting local and regional development. Recent studies have illustrated that these institutions provide the basis for effective local business attraction and retention, as well as local and regional network formation. Therefore, institutions have a critical role to play in providing certainty and creating opportunities for more collective approaches to development.

However, these same local and regional institutions, if not properly leveraged and/or coordinated, can also hinder regional development efforts. Ensuring that regions capitalize on their norms, values, and organizations requires a guiding, strategic vision. In order for a regional vision to be effective, it must incorporate an in-depth, comprehensive understanding of both local and regional institutions, which is not possible without extensive consultation and a joined-up approach to regional governance that overcomes traditional top-down approaches and integrates the actions of both local and regional government. However, such processes require collaborative relationships between and within the public, private and community sectors. The conventional means to achieve this coordination is a regional agency capable of planning regional initiatives to foster and maintain these relationships.

Based on our findings, it became clear that while Waterloo region does possess a regional economic development agency with a significant role, CTT, its limited mandate prevents it from taking a broader
leadership role. Our findings also illustrate a series of fragmented approaches to economic development and missed opportunities for leveraging inter-municipal relationships, which suggest the need for a guiding regional vision and a form of leadership capable of developing it. Two options are available to generate this vision and leadership: the conventional approach is to create a strong regional agency to develop the vision and coordinate actions; a less conventional approach is to strengthen existing networks and build the region by enhancing networks and their key actors.

5.3.1 Regional aspirations through regional interaction

Our evidence suggests that a strong collaborative approach to economic development exists within the Waterloo region. Despite previous studies of the region emphasizing the challenges that intra-municipal competition in the region pose for creating substantive regional economic governance structures, this study finds evidence of a strong level of collaboration and interaction amongst economic developers. When asked how this level of regional collaboration occurs, a municipal economic development officer stated:

“A lot of it happens because the people are great and we make it happen. We’re not mandated, we’re not told, and we’re not directed to collaborate, it just kind of happens because we know that to be competitive we have to work together.”

Municipal Economic Developer

Through our network analysis we are able to map the depth of interactions between economic developers in the region. This provides the basis for a number of observations about the role that economic development actors and the interactions between them play in regional economic development.

First, it is clear that municipal economic developers in the region have established informal connections with their counterparts in other municipalities (Figure 5.5). These connections play an important role in knowledge circulation and exchange within the region. There are a large number of connections within the network, but there are some individuals (nodes) in the network who are more important (central) to the network than others; Figure 5.5 helps to illustrate this point. The size of the node reflects the number of connections that a particular individual has with other individuals in the network; this reflects the degree to which they are central to the network. Based on this understanding, we are able to determine that a number of individuals are more central in this regional economic development network. For example in Figure 5.5, KIT2, WAT1, KIT3, KIT4, and CAM1 are among the largest nodes in the network, suggesting that they possess the highest level of connectivity and centrality, while smaller nodes reflect less central actors. In other words, these economic development officials play an instrumental role in connecting the economic development community in the region.
Taking regional action?

Figure 5.5 Interactions between municipal economic development actors

Source: Social network analysis survey results
[Authors’ calculations]

Figure 5.6: Interactions between urban and rural economic development actors

Source: Social network analysis survey results
[Authors’ calculations]
A further examination of the network produces interesting findings with respect to the interactions between urban and rural municipalities. Our findings suggest that connections between rural economic developers and the regional network are quite variable. Figure 5.6 illustrates the network connections between rural and urban economic developers, while Table 5.2 explicitly quantifies the variation in the degree of centrality amongst rural economic developers. Our interview findings suggest that this varying degree of centrality reflects the capacity and interest of rural economic developers to participate and network with the regional economic development community, as well as their perception of the extent to which their rural township is integrated into the broader regional economy. On this latter point, economic developers in the rural townships recognize economic interdependencies in the region to varying extents. For example, certain townships simply acknowledge the labour flows that exist between rural and urban areas, while others recognize areas for value-added opportunities in terms of attracting firms to low-cost rural spaces and connecting to other urban assets. Our research indicates that these different approaches to addressing interdependencies appears related to the level of connectivity to the regional economic development network. The varied nature of these connections means that certain townships are better able to leverage opportunities presented by these urban-rural interdependencies, and suggests that some rural economic developers are missing important opportunities that could further support local development.

To date, regional approaches to economic development have centred on CTT. The emergence of CTT in 1987 marked a critical moment in the region’s economy development trajectory and provides an example of how collaborative structures can be leveraged for regional benefit. As previously discussed, CTT emerged out of a need to foster more effective inward investment attraction and develop the regional brand of Canada’s Technology Triangle. Although urban municipalities initiated the development of CTT, the organization has a regional mandate that encompasses both urban and rural municipalities. Since its inception, the organization has evolved to become a successful model of regional collaboration for the purpose of inward investment attraction.

The nature of CTT’s operations and accountability structure positions the organization as a central actor within the economic development fabric of the region. As noted above, the organization has a clear regional mandate for inward investment attraction, which is supported by private and public sector organizations. CTT’s regional approach, coupled with its accountability to municipalities, has facilitated the creation of a robust network of economic development interactions in the region. Figure 5.7 illustrates the strong linkages between CTT and the rest of the regional economic development network. The network map indicates that connections exist between CTT and all of the municipalities, urban and rural, and that CTT provides a clear opportunity to bring all jurisdictions in the region to the table.

<table>
<thead>
<tr>
<th>Rural Economic Developer</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>RURAL1</td>
<td>7</td>
</tr>
<tr>
<td>RURAL2</td>
<td>18</td>
</tr>
<tr>
<td>RURAL3</td>
<td>9</td>
</tr>
<tr>
<td>RURAL4</td>
<td>17</td>
</tr>
<tr>
<td>RURAL5</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: Social network analysis survey results

[Authors’ calculations]
However, junior staff members in the urban economic development offices often did not have direct connections with CTT. While this regional economic development network creates an important asset for the purpose of inward investment attraction, it plays a broader role as well. Due to the presence of CTT, there is a platform for economic development officials from all of the urban and rural jurisdictions to interact, learn and exchange knowledge. Our research shows that, comparatively, the regional economic development network benefits from an increase in density and connections facilitated through the existence of a regional economic development organization. Table 5.3 illustrates the difference with respect to network density and average node degree between a network comprised of only municipal economic developers and the network once CTT is included. When asked about how the collaborative nature in the region supports the organization’s operations, an official said:

“Because it works. And I think it’s as simple as that, it has a long history and long roots here in terms of being collaborative, and it works, and so people just keep doing it and new people come to the region and they get orientated and indoctrinated in that and it works and we see the results of it day after day. Nothing sells like success. Waterloo region is successful and because it’s successful it feeds off itself and just continues to work.”

Economic development official

While regarded as successful for investment attraction, the organization’s narrow mandate currently limits the ability of CTT to act as a more holistic regional economic development organization. While investment attraction is an important component of economic development, and provides an avenue for the inflow of new knowledge, technologies and ideas, the ability to create comprehensive regional economic strategies is limited as a result of this formal mandate. Our interviews revealed that there is some interest in creating a facilitative role for the organization in order to support broader regional economic development activities. However, despite the potential opportunities this role creates for addressing other regional economic development needs, this role requires clarification and raises questions as to the appropriateness of this specific organization for addressing these non-FDI-based regional needs and leading innovative approaches to development.

Table 5.3: The role of CTT: Changes in density and degree between economic developer networks

<table>
<thead>
<tr>
<th>Network</th>
<th>Density</th>
<th>Average Node Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Economic Developer Network (excludes CTT)</td>
<td>0.46</td>
<td>6.32</td>
</tr>
<tr>
<td>Regional Economic Developer Network (includes CTT)</td>
<td>0.50</td>
<td>7.72</td>
</tr>
</tbody>
</table>

Source: Social network analysis survey results
[Authors’ calculations]
Towards Regional Action

Figure 5.7: Relationships between municipal and regional economic developers

Source: Social network analysis survey results [Authors’ calculations]
5.3.2
Shared priorities, fragmented approaches

While there is a high degree of regional collaboration with respect to some aspects of economic development such as investment attraction, a regional approach is less evident in the local food, cleantech, and creative and cultural sectors. In these sectors, economic development approaches are more fragmented. We found that economic developers have identified these sectors as priorities, to varying degrees; however, while there are shared sectoral priorities between municipalities, there is an uncoordinated approach taken in acting on these priorities. Indeed, the pursuit of local initiatives in isolation (or independent of a broader-based strategy) is hindering the cultivation of a regional identity and brand for some sectors. These uncoordinated municipal actions also miss important opportunities that could be leveraged through a more joined-up regional approach. The development of discrete, municipal-level sectoral plans does not create an environment in which regional assets can be easily leveraged for the mutual benefit of municipal and regional competitiveness.

Local food

In the local food system, the lack of regional coordination has led to fragmented local economic development efforts. These discrete approaches to economic development reinforce local networks without fostering the regional interactions required for an effective local food system. Without an appropriate forum to discuss and coordinate their efforts, local economic developers are only able to effectively support pre-existing, local networks. An example of these local development activities are local trade or harvest shows that promote the products of local producers, processors, and other food businesses.

“Most of our representatives are from Community X and it’s an event that was created by Community X for Community X, so the vendors as well. We have allowed vendors from outside the community if they carried a Community X product, or if they had some sort of business dealings with Community X. For example, one of the vendors has a chicken processing plant, a lot of chickens come from Community X, he sells and processes chickens from Community X…and [that community-specific inclusion is] intentional.”

Organizer, Community Event

Despite supporting interaction between actors from throughout the local food sector, these actions develop bonding capital within local networks that can exclude non-local actors and therefore limit regional interaction. The exclusivity of tight, local relationships can prevent the development of bridging social capital that would facilitate a regional understanding of local food system issues. Furthermore, given the central role that place-based qualities hold in product differentiation, the exclusion of other regional, non-local actors can also result in local identities being prioritized to the detriment of efforts supporting regional identity development, such as Foodlink’s regional promotion efforts through their ’Buy Fresh! Buy Local!’ map, which provides the public with a map of the local food assets that exist in the region.
Clean technologies

Green economic development has become a priority for all the municipalities in Waterloo region. While energy policy remains the purview of provincial policy, there are programs and initiatives that municipalities can employ to facilitate the development of the cleantech sector, such as procurement of renewable energy technologies for municipal properties through the FIT program, and educating citizens on energy conservation and efficiency products. In Waterloo region, municipalities have employed a variety of programs and initiatives although these municipal policies vary across the municipalities, reflecting different municipal approaches to cleantech support (Table 5.4). While these individual municipal policies and actions provide a means of supporting the growth and development of the green economy, there remains an opportunity to create regional approaches that can better leverage the existing capacities within each locality. Our interviews suggest that Kitchener is regarded as taking significant steps forward in promoting cleantech and sustainable development within the Region. However, as Table 5.4 illustrates there are a number of programs and policies that overlap within the urban municipalities that present opportunities for collaboration. Our research did identify some instances of collaboration; for example, Kitchener and Cambridge are collaborating on a Business Retention and Expansion strategy for the environmental sector by sharing final results.

While the urban municipalities have a variety of programs and policies related to cleantech and sustainable development, there is a dearth of similar programs in the rural townships. Through our research we identified that, while cleantech is considered a priority for rural townships, a lack of resources prevents the creation of similar programs and policies. Creating a regional approach to cleantech development could address differences within the region in terms of resources and capacities to the benefit of the region overall.

Table 5.4 Municipal green economic development actions

<table>
<thead>
<tr>
<th></th>
<th>Procurement of cleantech</th>
<th>Community funds</th>
<th>Sector BR&amp;E</th>
<th>Regional Carbon Initiative</th>
<th>Sector identified as a strategic priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Kitchener</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>City of Waterloo</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>City of Cambridge</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Indicates membership in the Regional Carbon Initiative through Sustainable Waterloo Region.

Source: Primary Interview Data
Creative and cultural

In the creative and cultural sector, individual municipal approaches to cultural development serve to duplicate some efforts and provide a complex terrain for other organizations to navigate. Each lower-tier municipality is responsible for its own Official Plan and Master Plan, and there are numerous plans within the region that address cultural development and the development of the creative and cultural industries. For example, the Cities of Cambridge, Kitchener and Waterloo each have a plan for culture, and each city addresses the development of the creative and cultural industries in their economic development strategies. Not only do these plans only address development within lower-tier municipal boundaries, they are often proprietary pieces of work—coming and going with individual civil servants and political actors. This lack of coordination results in private sector uncertainty and missed opportunities for leveraging potential inter-municipal cultural relationships. As one of our interviewees explained:

“Where the Cities fall short is that they end up being parochial. The first Culture Plan didn’t even mention that Kitchener was part of a larger city-region. The other thing is that they tend to be inconsistent and it comes and goes. It sometimes depends on individual civil servants. Everybody was all excited about [the] Culture Plan, but now it’s on the shelf. Then when new people came along they wanted to have their own thing, with their own stamp and they never fully understood the plan. All that work is kind of wasted.”

Former Executive Director of a Regional Arts Organization

5.3.3 Existing capacity for vision and leadership

Waterloo region has been recognized for its robust and active civil society. Organizations representing a variety of causes have developed capacity based on this vibrant ethos of volunteerism in the community. While these organizations possess limited resources, their mandates are often focused on regional issues. Whether it is promoting local food, sustainability initiatives, or a creative agenda, the mandates and reach of these organizations are not confined to specific municipalities. Rather, they usually adopt a regional approach to their programs and initiatives. Our findings underscore the importance and potential of these organizations to foster the development of the local food, cleantech, and creative and cultural sectors, as they bring together communities of interest and develop critical associational capacity. In each of the three sectors, civil society organizations were often associated with prominent private and public sector actors and have a vital understanding of the challenges these sectors are currently facing in the region and can more readily identify leadership assets or act as regional leaders themselves.

Local food

As identified in the previous section, Foodlink Waterloo Region and the Waterloo Region Food System Roundtable represent two horizontal networking organizations with separate mandates. Foodlink Waterloo Region promotes food system assets from across the region and fosters intra-regional supply connections, while the Waterloo Region Food System Roundtable has the mandate of “connecting our community to the work of building a healthy food system” thereby providing a forum for networking, advocating policy changes, and disseminating information about the many dimensions of the local food system—from farm viability and local food infrastructure to food justice,
urban agriculture, and food access. As a Public Health planner involved in the creation of the Roundtable stated:

“...We formed [the Waterloo Region Food System Roundtable as]... a group of volunteers [that] covers all aspects of the food system: researchers..., people from the food retail industry, representatives from food banks, coming together to look at the big picture of the food system and identify what needs to happen for a healthy food system.”

Public Health planner, Region of Waterloo Public Health

The creation of these organizations has provided the capacity to develop a regional vision, and in doing so, has identified key leadership assets at the community and industry levels.

However, our findings suggest that despite possessing distinct regional mandates, tensions have developed as a result of perceived competition for funding and overlap in mandates. As the director of one community organization stated:

“I would have it that I think there is some duplication. So, it becomes a little bit confusing about who is doing what when there’s more than one organization doing the same kind of thing...which ultimately leads to some confusion in the minds of consumers, and not even just consumers but other folks who are wanting to get information or wanting to know where to go.”

Director of a Community Organization

These frictions prevent collaborative capacity-building efforts, while the confusion over mandates also diminishes the ability of each organization to flourish independently. Overall, the valuable community vision and leadership assets that these organizations have developed are underutilized by the region and the economic development community.
Clean technologies

There is a growing consensus in the economic development literature that cleantech development must bridge community assets and other related actors, such as hydro companies, in an overall sectoral vision. As shown earlier, there is a dense network of economic development actors involved in cleantech. Indeed, when asked about the characteristics of the cleantech network, a regional economic developer said:

“You have Photowatt, Canadian Solar, and ARISE technologies all located within the region and then you have foreign companies coming in that are forced to participate and deal with local companies, local manufacturing companies. So I think that’s created a little more of a cohesive cluster there.”

— Regional Economic Developer

Our interviews suggested that while the Waterloo region’s cleantech sector is considered integrated, bringing seven municipalities, three hydro companies, and a number of external actors together to create a cohesive strategy remains incredibly challenging. Yet, while the challenge of stakeholder engagement is present, the connectivity of the cleantech sector, as demonstrated earlier in our social network analysis, offers important capacity to create regional level sectoral strategies and visions. The development of the cleantech sector by attracting outside investment and building on current assets is dependent on a regional vision that integrates actors currently not active in the regional cleantech network. When asked about how community approaches and values impact location decisions, a senior executive of a solar manufacturer stated:

“We visited a lot of municipalities in the region. Community X was one of them. Since day one, we realized the union between community, chambers, city and hydro. We realized how they were working together…It was more because of the package, and what we can do together.”

— Senior Executive of a Solar Manufacturer
Creative and cultural

In the creative and cultural sector, developing capacity for regional collaboration is confounded by a number of factors. For example, many of the organizations participating in the sector are non-profit organizations. For these organizations, funding is usually obtained through grants from government agencies, sponsorship programs and earned revenue (e.g., ticket sales, consulting). Limited funding options, as well as uncertainty regarding levels of funding, creates competition amongst these organizations leading to a culture of scarcity. As a result, our interviewees often identified others in the sector as competitors. As the director of a cultural organization in the region notes:

“There are all these organizations… They are now having to justify what they are doing, which is very important as accountability and transparency are very important. But it does not make a very collaborative situation between the organizations. There is this little pot of money and everyone is scrambling to come up with the best ideas. If it was collaborative, that would be fabulous, but it is almost competitive… therefore there is no real strong strategy about how we work together.”

Director, Cultural Organization

In other words, limited funding and other scarce resources perpetuate a culture that is not conducive to collaboration; in particular, this prevents the pooling of resources for greater efficiency and impact.
5.3.4 Missed opportunities to capitalize on local and regional capacity

Our findings underscore that economic development officials in Waterloo region participate in networking activities that assist in developing an understanding of sectoral dynamics. This enables informed decision-making and allows for the creation of effective and appropriate economic development strategies. However, our findings show that important sector-based, regionally oriented organizations within the region are not well connected to this economic development network. In other words, there are missed opportunities to access critical knowledge and information, develop leadership assets and learn from these regional organizations. Creating comprehensive and responsive sectoral strategies require creating inclusive networks that are able to leverage sources of knowledge from a variety of stakeholder groups.

Local food

The lack of formal, broad-based regional leadership in economic development activities leaves no formal space for the discussion of the potential contributions of the regional food system to economic development. This discussion is important to enable economic developers to gain an understanding of the inter-municipal challenges facing local food actors. Despite the lack of a formal forum for visioning exercises, Waterloo region Public Health undertook a number of comprehensive food system studies and consultations and, based on the priorities that these studies identified, established two not-for-profit, horizontal networking organizations, Foodlink Waterloo Region and the Waterloo Region Food System Roundtable, to facilitate this shared understanding. However, despite the regional government’s involvement in their creation, and the broad-based recognition that their efforts have garnered in the region’s local food system, these organizations are not adequately recognized within, or integrated into, the region’s economic development network. Figure 5.8 makes this clear: only two economic developers in the region identified Foodlink Waterloo Region as an important sector contact, while none of the region’s economic developers cited the Waterloo Region Food System Roundtable, nor any of its members, as contacts of note, despite this organization having farmers, food manufacturers, food distributors, food retailers and restaurateurs, and economic development professionals among its members. There is clear potential to raise the profile of these organizations and take advantage of their local knowledge to improve, focus and direct economic development efforts in this area.

This lack of connections represents a missed opportunity for leveraging community food system visions, community and sectoral leadership assets, and the organizations’ robust knowledge of the challenges and opportunities confronting the region’s local food system.
Figure 5.8: Limited connection between economic developers and community leaders in the local food system

Source: Social network analysis survey results [Authors’ calculations]
Clean technologies

Our interviewees identified the importance of community environmental organizations in promoting sustainable and cleantech development in Waterloo region with a specific focus on renewable energy technologies and energy conservation and efficiency. Programs and services offered by these organizations provide access to information about renewable energy products and critical advice on energy savings approaches. There is also a local economic development benefit to these organizations. For example, Community Renewable Energy Waterloo (CREW) provides information and consultation on a number of renewable energy related issues and concerns; it also facilitates market linkages to existing local installers and retailers of renewable energy and energy efficiency products in the area. REEP takes a similar approach by offering residential energy audits and providing connections to locally vetted firms for energy efficiency and retrofit products and services. By providing product knowledge and customer connections to local firms, these organizations play a critical role in developing avenues for green economic development. These organizations also bring together individuals that have an interest in sustainable development and the related approaches and technologies. These individuals often include active citizens advocating for change, as well as owners and employees of cleantech firms from across the region. When asked about the role that community organizations play in cleantech sectoral development, a municipal economic developer stated:

“First is promotion to talk about the industry and what it means to Ontarians and Canadians. Second, advocacy. Trying to fix some of the problems in order to enhance the industry. Third, just bringing people together. Building the cluster.”

Municipal Economic Development Officer

Creating and maintaining connections to community organizations offers another insight into sector development. Understanding the community dynamics of cleantech development, for example, can lead to municipalities creating programs and initiatives designed to aid in the capacity of these organizations. The Local Environmental Action Fund (LEAF), further addressed in the following section, is an example of municipal action designed to add capacity to community organizations. While some of our interviewees identified these community organizations as important to cleantech development, none of these organizations were identified in the social network analysis. Figure 5.9 makes this gap very clear. Our findings suggest that while community organizations are regarded as important for cleantech development, these organizations are not integrated into the current cleantech network.
Figure 5.9: No connections between economic developers and community leaders in the cleantech sector

Source: Social network analysis survey results [Authors’ calculations]
Our interviewees regularly cited the Creative Enterprise Enabling Organization (CEEO) as an organization with potential to lead development in the creative and cultural sector. The CEEO, a non-profit organization supported by the Prosperity Council of Waterloo, has recently described itself as “a business strategy driven out of the Prosperity Council to deliver against the economic imperative of attracting and retaining the best talent for the Waterloo region by delivering a sustainable creative economy.” This approach to the development of the creative and cultural industries aligns with the economic development goals articulated in Cambridge, Kitchener and Waterloo’s economic development strategies. However, Figure 5.10 clearly demonstrates that, despite shared priorities between the economic development offices and CEEO, and the recognized potential CEEO has for sectoral leadership, there is little connection between this organization and the economic development community. Other arts-based organizations were also not identified, underscoring the biases of economic development in this sphere.
5.3.5 Opportunities for action

Overall, our interviews identified key civil society organizations possessing regional mandates and extensive knowledge in all three sectors. However, these same organizations were not identified as important in our social network analysis. In other words, there is a gap between community leadership and economic development networks. Our interview data and social network analysis results suggest that a void in regional leadership has resulted in a number of industry-, community-, and government-led sector-specific initiatives that lack co-ordinated vision and/or a joined-up strategy. This void has also left a reliance on informal relationships, which lack the vision required to ensure that key assets in civil society and the private sector are identified and leveraged.

While the existence of informal relationships, organizations, and governance does reflect valuable collaborative capacity in the Waterloo region, the lack of a regional vision and leadership to systematically leverage these assets limits their potential. The challenge for economic developers is to structure relationships within and across the private sector, civil society, and government in a manner that overcomes inter-municipal and inter-organizational tensions.

There is an opportunity in Waterloo region to leverage the region’s robust civil society, engaged private sector, and collaborative economic development community to create innovative models for regional development. Regions must be able to cultivate their assets in a collaborative process that allows for the development of sound, holistic visions and creates a foundation for regional foresight. There is an opportunity to mobilize the cooperative, regional ethos that exists within the Waterloo region to create spaces for collaboration and engagement across sectors. Evidence of collaboration and innovation exists in the Waterloo region and is showcased through CTT’s wealth of regional interactions and the proliferation of networking organizations in the region. It is precisely this approach to collaboration that can be leveraged throughout the region’s economic development sphere to create a more robust vision and strategy for economic development at the regional level. Such a collaborative approach can also increase regional capacity by leveraging the capacity of local and regional governments, as well as industry and civil society organizations. The opportunity for economic developers is to identify key leadership assets in civil society and the private sector and develop a forum that integrates their local and sectoral knowledge into a regional economic development vision and on-going leadership.
5.4
Barriers to regional action

Our analyses of interview and SNA data have revealed the need for a forum to development and maintain a regional economic development vision through the creation of a regional development organization or by developing regional development networks. Although this regional approach presents opportunities to better leverage assets across the region, our interviewees also identified a number of barriers confronting action at a regional scale. Through an analysis of the challenges identified in our interviews with regional industry actors and civil society, our study identified two key areas where coordinated regional action can best respond to sector-specific needs.

First, across all three sectors, our interviewees consistently identified the current policy environment within the region as a challenge. Although much of this policy is created federally and provincially, our findings suggest that local and regional policies can mitigate many of the challenges associated with these policies set by senior levels of government. Our interviewees from civil society also identified the provision of regional and local funding as an area that can hinder civic initiatives by creating inter-organizational tension.

Second, our interviewees consistently identified access to appropriate space within the region as a serious challenge. Accessible space does not only entail the provision of physical space for private sector initiatives, but also the appropriateness of available physical space, and the availability of interactive, networking space for industry and community initiatives.

5.4.1 Policy and funding

As identified above, the multi-level policy environment presents a number of barriers and uncertainties to industry actors in the region. Although regional advocacy presents an opportunity to inform federal and provincial policies, these efforts are usually slow to produce change. However, regional leadership with a comprehensive understanding of these challenges can mitigate external policy barriers and uncertainties through regional and/or local policy initiatives, as well as through the targeted provision of regional and municipal funding.

Specific policy barriers and uncertainties identified by our interviewees within the local food, clean technologies, and creative and cultural sectors are presented below to illustrate opportunities for regional response. In the region’s local food system, a lack of federal attention to the cross-scalar impacts of food safety regulations was consistently identified as a barrier to the development of a local food processing infrastructure. In the clean technology sector, uncertainty as to the future of the Ontario FIT program has hindered sector development by creating uncertain market conditions for the installation of renewable energy technologies.Yet despite the difficulties in influencing provincial policy, regional and local economic development actors were still able to support the sector through the provision of regional and municipal funding, such as the City of Kitchener’s LEAF fund, which has increased the capacity of sector-specific community organizations. However, as illustrated in the region’s creative cultural sector, the provision of regional and municipal funds must be coordinated and clear, or else capacity is lost to inter-firm and inter-organizational competition.
Local food

Interviewees across the local food system identified a significant barrier to food system development being the onerous financial and bureaucratic burdens placed on small-scale food processing firms by federal and provincial food safety regulations. Although interviewees unanimously identified the value of Canada’s rigorous food safety regulations, there was an equally universal acceptance that these regulations were established to ensure safety in large-scale processing facilities without consideration of their impact on medium-, small-, and micro-scale facilities. A local producer who maintained a small processing kitchen identified an example of this burden:

“my inventory of pickles and jams in a given year is probably about $2000 worth of inventory… under Ontario legislation I’m classified as a private water system because… I’m on a private well… that means technically I am required to do all the water testing that the region does on their water, for example, every month. So the cost of doing that, when I worked it out, would be around $6000 a year—so, like, way more than my inventory…”

Local Producer

This represents a considerable burden to establishing new processing facilities, which not only limits the potential for individual value-added opportunities, but also prevents the development of a local processing infrastructure. This lack of infrastructure has been notable in the meat processing industry, as the owner-operator of a local processing and distribution firm identified:

“It’s quite a costly business to be in…. as a result, people are not creating small meat companies because it’s just too costly to get into this line of work.”

Owner, Local Processing/Distribution Firm

This regional infrastructure is essential to the development of a local food system, as it provides value-added opportunities for producers and retailers throughout the region.
Clean technologies

Creating policies that incentivize renewable energy technologies requires a long-term commitment that creates a sense of market certainty. Investments in renewable energy are extremely costly and require a stable incentive environment to ensure reasonable returns on investment. The Feed-In-Tariff (FIT) program accomplishes this through set prices over 20 year contracts. However, during the recent provincial election, a debate emerged resulting in uncertainty regarding the future of the FIT program. This effectively stalled progress as investors were unsure whether there would be future guarantees on the premium prices for renewable energy. The FIT program survived beyond the election; however, the feeling of uncertainty left an imprint on the industry. As an economic developer observed:

“Well it has dried up a bit with all the election stuff, anyone thinking of doing anything, it is on hold now full stop. Because, what happens is companies can’t handle uncertainty and therefore can’t plan.”

Municipal Business Development Officer

Certainly, regions and municipalities cannot solely influence the outcome of politics or policies in senior levels of government. While they are able to inform decision makers and present their views on issues and challenge, there is little room to influence final decisions. However, regions and municipalities have a critical role to play during times of political uncertainty. Understanding the regional effects of a policy environment can allow for appropriate responses to industry needs.

Municipal funds and commitments are playing an important role in facilitating cleantech growth by adding capacity to community organizations. The City of Kitchener’s Local Environmental Action Fund (LEAF) is an example of how municipalities are able to stimulate cleantech growth and community engagement. The LEAF is designed to fund local community environmental and sustainability initiatives. Through a grant funding structure, community organizations are able to further their mandates in the community. For example, LEAF funded the Solar Cities Project. Led primarily by CREW, the vision of the Solar Cities Project is to create a regional solar co-operative. The first phase involves a partnership with Greening Sacred Spaces, a local community organization with a mandate to promote sustainability in faith communities; solar projects will be developed in faith community buildings across the City of Kitchener. The LEAF provides funds for an inverter and the first kW of the project. This innovative use of the fund is also providing market linkages to local installers who will compete for the project through a bidding process. Due to the nature of LEAF, the project is limited to the City of Kitchener. However, there is demand for similar funds in other municipalities to facilitate the development of similar projects, as was voiced by the president of a local community organization:

“I think [LEAF] is great in terms of what is has enabled in this community. Maybe that would be a great step forward if we found that Waterloo and Cambridge had comparable funds and we found the cities working together to share their ideas about what is important and what works.”

President, Community organization
Creative and cultural

Our interviews revealed that existing funding rules made regional approaches to supporting creative and cultural activity exceedingly difficult. Many of our interviewees expressed that lower-tier and upper-tier municipal funding programs for non-profit organizations in the creative and cultural industries were not easily understood by those in the sector. It was unclear which organizations were 'local', which were 'regional' and what kinds of creative and cultural activities were prioritized at which level of municipal government. For example, the Waterloo region Arts Fund offers grants to all performing, visual and literary arts, as well as film, video, and new media (Waterloo region Arts Fund, 2011). Funding programs such as the City of Waterloo's and City of Kitchener's Community Grants programs are available to non-profit organizations within the creative and cultural sector who offer arts and culture programming to the community (City of Kitchener, 2010; City of Waterloo, 2011). Both funding programs stipulate that if services offered by the applicants extend beyond municipal boundaries, then the other municipality or municipalities must be approached for funding. Therefore, should an applicant intend to service residents of more than one lower-tier municipality, they are required to approach the other lower-tier municipalities for funding as well, leading to uncertainty and confusion. Although not explicitly stipulated in funding programs, there was a perception amongst interviewees that certain levels of municipal government fund certain activities. As discussed earlier, scarcity and competition amongst non-profit organizations in the creative and cultural industries prevents collaboration; uncertainty regarding municipal funding does not improve this situation. As one of our key informants explained:

"I think the division between the upper and lower is very peculiar. The region supports heritage and will give some money to the performing arts, but there is some understanding that the visual arts are strictly lower-tier. Why? We should sort all that out...It's the politicians' job to look at that and sort it out. People are going to start pointing fingers. It's going to cause rifts."

Former Executive Director
of a Regional Arts Organization

The nature of funding programs for the creative and cultural sector limits the potential for regional approaches. Overall, the structure of funding programs with jurisdictional stipulations makes it difficult for organizations to create programs and initiatives that have a wider regional focus.
5.4.2 Accessing space

In addition to policy and funding, regional actors can respond to sector-specific challenges through the provision of accessible, appropriate spaces. Our interviews from all sectors identified that value creation in knowledge-intensive sectors requires appropriate physical space, as well as networking space for the exchange of industry knowledge. However, physical space is not all the same, and its provision must be appropriate to sector-specific needs. Meanwhile, despite the multiple networks accessed by firms for information, regional issues require networking space that is specific to the region.

Development in all three sectors in the region has been uniquely shaped by issues relating to access to space. First, land use policy has ensured the preservation of farmland, necessary for the local food system. However, the zoning regulations that ensure this preservation of productive space also undermine opportunities for on-farm, value-added space. Second, in terms of clean technology, until 2009, the region’s solar sector found little opportunity for intra-regional knowledge exchange until economic development actors in the region recognized this need and developed SING as a regional networking space. Third, the region’s creative and cultural industries face a lack of available physical space, such as studio space, which represents a barrier to creating the infrastructure needed for successful cultural production. Each of these issues is discussed in greater detail below.
Local food

The Waterloo region is unique in Ontario for its abundance of rural land in such close proximity to its urban centres. This proximity presents a number of benefits to the region as a whole, and specifically to strengthening the local food system. However, the close proximity of urban areas, coupled with urbanization, places increasing pressures on urban-adjacent areas. Without concerted, on-going efforts to develop land use policies that preserve the region’s rural lands, this proximate rural land would be at risk of succumbing to ad hoc rural development and urban encroachment. However, preserving agricultural land and agricultural production are not the same things. Producers in the region still struggle to maintain economic viability, due to the highly consolidated retail and processing sectors in Canada.

This lack of viability means that farmland preservation is not sufficient for protecting agricultural production, and specifically small-scale production, in the region. Indeed, the same land use policies that prevent farmland loss also limit the extent of on-farm, value-added opportunities, and thus local food system development in the region. For example, the core group of on-farm retail businesses that have provided a stable retail outlet for small-scale agricultural production in the region, such as Herrle’s Country Market and the packing facility on Martin’s Fruit Farms, would no longer be permitted under current size restrictions for on-farm, farm-related businesses in the region’s municipal official plans. Although this tension is fundamental to the preservation of rural and agricultural land, it is heightened by a lack of clarity surrounding what value urban and rural residents place on the existence of rural land. Without a better understanding of the value of rural land, this tension around the protection of appropriate space cannot be resolved.

Clean technologies

Creating vertical and horizontal linkages in a sector is vital in supporting innovation and business opportunities. As noted earlier, the solar sector in the Waterloo region has experienced growth as a result of the 2009 Green Energy Act. As a result, foreign and domestic firms expanded and established a presence in the regional market, leading to an increase in the number of local firms. Yet, initially there were few efforts to create regional synergies and, in fact, industry interviews indicated that the only time firms interacted was at international and national trade shows. At the same time, economic developers in the region were unsure of who the actors were in the growing solar sector. The emergence of SING represented an innovative way to address these sectoral needs. As one economic development official explained:

“We’ve started a solar industry-networking group…we never even knew they were in the community. You throw out an invite and all these solar people who are either in it or want to get in it show up and you put them in a room and just let them talk.”

Economic development official

SING provided a venue where by economic developers could engage with this potential emerging regional cluster and also allowed local firms to create linkages and networks to develop partnerships. As another economic development officer explained:

“That way you build the cluster and you allow the professionals and business people and researchers from UW to all get together share ideas and collaborate.”

Economic development official
Overall, the case of SING provides a good example of municipal economic developers acting to support a sector through a regional approach.

Creative and cultural

Space represents a critical success factor for the creative and cultural industries and is vital infrastructure for cultural production. Because work in this sector is often organized around projects, space is required to facilitate project development. As one of our interviewees explains:

“It is really quite important this business of having a space; it’s part of our infrastructure. When people think about artistic infrastructure, they think about concert halls, galleries, and all this sort of stuff. They don’t think of the layer below that—in order to make the stuff that goes in there, you have to have a place to make it.”

Visual Artist

Having physical space in which informal network interactions can take place is vital to how the sector operates. Within Waterloo region, space has been a topical issue amongst actors in the creative and cultural sector for quite some time. Recently, a number of different initiatives have been undertaken to address the development of specialized space to support activities in the creative and cultural sector. Table 5.5 provides an overview of some of these initiatives. In many of these instances, these initiatives have been led by civil society organizations, often with a broader regional mandate. However, our interviewees noted that—despite these initiatives—there remains a lack of affordable spaces for networking and interaction that allows for innovation and knowledge exchange.
Table 5.5 Recent initiatives to provide space for the creative and cultural sector

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Globe Studios</td>
<td>A non-profit organization which provides an accessible, affordable space and resources for visual artists in the Kitchener, Waterloo and Cambridge region.</td>
</tr>
<tr>
<td>Treehaus Collaborative Workspace</td>
<td>Non-profit organization offering low-rent collaborative workspace for creative entrepreneurs.</td>
</tr>
<tr>
<td>The Communitech Hub</td>
<td>An digital media start up incubator administered by the non-profit technology organization Communitech</td>
</tr>
<tr>
<td>Centres for Community Innovation and Design Project</td>
<td>Feasibility study undertaken by the Civics Research Cooperative to identify a possible network of shared-spaces in the Waterloo region for social and environmental businesses, organizations, and entrepreneurs.</td>
</tr>
</tbody>
</table>

5.4.3 Opportunities for action

Our findings reveal that individual sectors within a region face a multitude of sector-specific barriers and uncertainties that can hinder development and limit the region’s ability to foster broad-based development. Our findings illustrate that the interaction between regional and external policies can have unintended consequences for specific sectors. While funding can establish capacity to overcome some of these barriers, without coordination, this capacity can be lost to inter-organizational tensions. In addition, our findings show that requirements for appropriate space are also sector-specific and that responses to these needs have the potential to impinge on other space requirements. The challenge for economic developers is to understand the collective factors and trends influencing each sector and find ways to address them through regional action.

Our findings suggest that addressing the barriers and uncertainties confronting individual sectors requires the identification of existing sector-specific leaders in the private sector and civil society. Identifying these assets, and capitalizing on their in-depth sectoral knowledge, provides insight for the development of sound future strategies, plans, and policies.

The opportunity for economic developers is to identify sector-specific leaders in civil society and the private sector and leverage their in-depth knowledge to ensure that regional policy and funding initiatives effectively target sector-specific obstacles.
The objective of this research was to understand different models of collaboration and governance that support regional approaches to economic development. Overall, our research identifies two overarching models of regional governance and collaboration: 1) a conventional model, based on a leading regional agency and 2) a network model, based on strengthening existing regional and sector-based networks. The effectiveness of each model is mixed, due to organizational mandates and sector dynamics. Furthermore, we identify opportunities for collaboration that require joined up approaches between different levels of government, as well as other important regional and community organizations. Our research also identifies that the barriers to regional action often relate to 1) a lack of clear, recognized leadership, either from an agency or from within the community; 2) the lack of connections between existing community leadership and the economic development community; and 3) a lack of understanding related to sector-specific development challenges. Finally, our research highlights the value of using new tools and techniques such as social network analysis, alongside other methods.

Our research identified four central themes related to taking a regional approach to economic development. First, networks are important assets in the field of economic development for creating informed
policies, programs and initiatives designed to support specific sector development. Second, given the increasing importance of regions as economic drivers; economic development approaches must understand how regional identity shapes and constrains the development of particular sectors. In other words, regional development is often path dependent. This means that some sectors receive extensive support, while others only receive support in areas where there are clear connections to dominant sectors and identities, while others still are overlooked altogether. Third, an effort needs to be made to identify and engage regional civic and private sector leaders and organizations to leverage their regional leadership capacity and to integrate their local and sector-specific knowledge into regional economic development visions and strategies. This civic leadership, what has been termed ‘civic capital’, can be a critical ingredient to taking a regional approach. Finally, it is through accessing and mobilizing the in-depth knowledge and networks of this civic leadership that regional policy and funding initiatives can effectively target and overcome sector-specific obstacles and barriers to regional action. Each of these four central themes is summarized below:

1. The importance of local networks:
   Networks allow for the exchange of ideas and knowledge amongst individuals leading to problem solving, innovation and the formation of new business ventures. However, the drivers of network structure and formation vary by sector. Networks are shaped by sector-specific social, learning and innovation dynamics, and by the types of information and knowledge required for innovation and business development. They are also shaped by the strength of pre-existing relationships and the social capital and trust embedded within them.
2. **Regional identity:**
A dominant regional identity—such as one reflecting advanced manufacturing and technology—can facilitate, shape and sometimes hinder sector development. This is evident in all three sectors under study in the Waterloo region. Moreover, economic development is path dependent: the past shapes the present.

3. **Vision and leadership:**
Our findings point to the necessity of strong regional leadership, capable of integrating and coordinating diverse interests. While the Waterloo region has a regional economic development agency (CTT), its mandate (focused on investment attraction) limits its ability to take on a broader leadership role. Other economic development efforts are often uneven and fragmented; rural communities—in particular—are often less connected to their urban and regional counterparts. However, important sector-based, regionally oriented civic and industry organizations do exist, but they are not always well connected to the region's economic development network. As a result, valuable community vision and leadership assets are underutilized by the region and the economic development community. This leads to missed opportunities to access critical knowledge and information, develop leadership assets and learn from these regional organizations.

4. **Barriers to regional action.**
Regional action is most influential when informed by a comprehensive understanding of sector-specific issues, challenges and tensions. In our study, the most commonly identified challenges include a lack of access to land, physical space and spaces for networking, as well as difficulties in navigating a complex funding landscape. Although common to all three sectors, the details are different in each case. Understanding sector-specific challenges and dynamics allows for a platform for regional action.

To foster regional approaches to economic development, it is necessary to understand the social, innovation and knowledge dynamics of sectors and the networks that underpin them. In doing so, it is critical to engage a comprehensive and inclusive stakeholder group, which includes the private sector, civil society, institutions, government and other related organizational actors. Our research underscores the benefit of using several techniques to achieve this understanding. A holistic understanding of regional and sector-based networks can be achieved through: a) conducting stakeholder interviews to identify regional and sector-based organizations that have the potential to be regional leaders or champions; and b) using emerging social network analysis (SNA) tools to document the formal and informal relationships between economic developers in a region and better understand interactions between regional and sector-specific actors. Our research demonstrates the value of using new tools such as social network analysis to identify gaps in regional leadership and missed opportunities for regional collaboration.

Based on our findings, we identified a series of challenges and opportunities related to each of the four overarching themes. Given these challenges and opportunities, we identify actions that economic developers can take to support both broad and sector-based regional approaches to economic development. In general, regional approaches can be supported through the development of a regional agency or through strengthening and existing networks in the region. There are three areas for regional action: broad-based regional leadership and vision, regional identity, and sector-specific regional networks. Actions related to these three areas are outlined below:

1. **Taking regional action through regional vision and leadership**

   • Ensure that economic developers from across the region are well-connected to one another.
Conclusions and recommendations

• Identify, engage and mobilize key leadership assets, including the public, private and civic sectors across the region.

• Tools such as social network analysis can help to identify whether the economic development community is well-connected to each other across the region, as well as to other regional leaders.

• For individuals and organizations that are well-connected, strengthen and support identified regional leaders in addressing key regional challenges and issues.

• For individuals and organizations that are less connected, ensure that they become better integrated into regional networks.

2. Taking regional action through developing a regional identity

• Understand how prevailing regional identities shape and constrain the development of the region.

• Develop a consistent regional identity.

• Engage a broad network of regional actors.

• Integrates diverse, local identities. This entails recognizing the unique histories and strengths of different localities and being inclusive of all jurisdictions.

• Regularly review the perceived image of the region among actors to ensure consistency and in order to refine future actions.

3. Taking regional action through sector-specific regional networks

• Identify sector-specific civic and private sector leaders and organizations. Leverage their in-depth knowledge to ensure that policy and funding initiatives are designed to effectively overcome sector-specific obstacles rather than creating them.

• Gain insight into sector-specific dynamics to support and develop regional networks.

• Support sector-specific networks to foster innovation and knowledge exchange at the regional scale.

• Tools such as social network analysis can help to identify civic leadership and the connections (or lack thereof) between these individuals and organizations and the economic development community.

Overall, these actions can be more broadly applied to communities seeking to address economic development through regional approaches. By taking regional action, economic developers can support innovation, creativity and sustainability in urban and rural communities and work towards enhancing the long term prosperity of communities across Ontario.
Acknowledgements

The authors thank the Economic Developers Council of Ontario for funding this project. In particular, Cindy Hick, Lauren Millier and the EDCO board have provided valuable feedback. The authors would also like to thank the Ontario Association of Community Futures Development Corporations (OACFDC), Waterloo Region Food System Roundtable, Waterloo Region Green Solutions (WRGS), and the Woolwich Health Communities Committee for providing letters of support and acting as partner organizations for this funded project. We would also like to thank Kelly Legault, Nancy Arredondo, and Machteld Faas Xander for their design expertise in preparing this final report.
About the research team

**Tara Vinodrai**, PhD is Assistant Professor in the School of Environment, Enterprise and Development (SEED) and the Department of Geography and Environmental Management. She is also an Assistant Director of the Economic Development Program (EDP) at the University of Waterloo. Her research addresses issues related to the creative economy, local and regional economic development, innovation and technological change, and local labour market dynamics. She is working on several projects related to highly skilled workers, mobility, and quality of place; the role of universities in economic development; and the role of local and national institutions in supporting design-led industrial upgrading in response to local economic restructuring and change. Previously, she has worked in the Microeconomic Analysis Division at Statistics Canada. She is a member of the Innovation Systems Research Network (ISRN), as well as a research affiliate of the Program on Globalization and Regional Innovation System (PROGRIS), the Cultural Economy Lab, and the Martin Prosperity Institute, all housed at the University of Toronto.

**Riaz Nathu** is a student in the Master’s of Applied Environmental Studies (MAES) in Local Economic Development (LED) at the University of Waterloo. His research focuses on how the development of the green energy sector can translate into economic development opportunities for communities across Ontario. He is also interested in innovative ways to promote green energy sources in East African communities through micro-finance tools and resources. Prior to joining the LED program, he was a Commerce Officer in the Energy Industries Directorate at Industry Canada. There he worked on several files relating to energy innovation and economic development, including understanding the opportunities in the global and domestic cleantech market for Canadian firms. Previously, his interests in international economic development led him to working in Bolivia and traveling extensively in South America. Riaz holds an Honours Bachelor of International Business with a concentration in International Trade and Marketing from Carleton University.
About the research team (cont’d)

Emily Robson is a student in the Master’s of Applied Environmental Studies (MAES) in Local Economic Development (LED) at the University of Waterloo where her research includes work on the role of social networks in the culture producing industries. Emily’s undergraduate degree in Art History and French from Queen’s University encouraged an understanding of the traditions and products that build culture and place. Her work in various historical museums and art galleries nationally and internationally further developed this perspective. After completing a Post-Graduate Certificate in Public Relations, Emily began working in tourism and economic development in Prince Edward County. Building on this experience, Emily was General Manager of the non-profit organization, Municipal Cultural Planning Inc. In this role, Emily worked with municipalities across Ontario to leverage culture as a driver of economic development. She is also part of a consulting team at Machteld Faas Xander working on the Waterloo Region Creative Talent Strategy.

Scott Ross is Director of Business Risk Management and Farm Policy at the Canadian Federation of Agriculture He is also a student in the Master’s of Applied Environmental Studies (MAES) in Local Economic Development (LED) at the University of Waterloo. His work focuses on rural development and agricultural policy, with specific attention on local food systems and their implications for economic development. Over the course of this program, he has also provided consultations for a number of initiatives in Waterloo region’s local food system. Scott’s undergraduate degree in Psychology from Queen’s University began his interest developed an understanding of the importance of individuals and their interactions, which has informed his work since. Since his undergraduate experience, Scott has spent time working as a researcher in the private sector, as well as travelling and working abroad. Through these international experiences he developed an interest in the importance of agricultural systems and their potential for development.
Paul Parker, PhD is Associate Dean, Graduate Studies of the Faculty of Environment and the Director of the Economic Development Program (EDP). His research focuses on issues related to sustainability, community and economic development in the green economy, including energy efficiency, green entrepreneurship, renewable energy policy and smart grid systems. He was the director of the Local Economic Development program for nine years. He is currently a member of an international partnership funded by SSHRC ($1.75 million) to study the social economy in southern Ontario. He is a member of the International Energy Agency’s SHC Task 37 examining innovation in solar energy and conservation, as well as being the Associate Director of the Waterloo Institute for Sustainable Energy (WISE).

Steffanie Scott, PhD is Associate Professor in the Department of Geography and Environmental Management and Director of the Local Economic Development program at the University of Waterloo. Her research interests include a focus on local food systems and sustainability in southern Ontario, Vietnam and China; and governance at various levels of social organization. Her recent research on local food systems has led to her involvement in several local and community-based initiatives addressing local production and distribution systems, sustainability, food access and food insecurity. She was Co-Chair of the Waterloo Region Food System Roundtable from 2007 until 2011 and is Vice-President of the Canadian Association for Food Studies.
### Background questions
1. Main line of business? (suppliers, distribution strategies, products, main markets)
2. Number of employees, revenue, annual sales, etc…
3. If your company is a subsidiary or branch of another firm, what role does it play within the overall corporate structure?
4. What events stimulated the founding of this company? Who were the individuals and/or organizations inside and outside the company who played a key role in its development?

### Collaboration and participation in leading organizations and their activities
1. Are there any unique local assets or capabilities that have contributed significantly to the development of the key local industries? If yes, explain. (Prompt the government programs, education programs, specific events, associations, service providers)
2. Do you consider your company to be part of a network of related firms in your region/locality, i.e. a cluster? What evidence is there of this?
3. Are there any other companies in this region and/or province that your company is associated with? Do you have a strategic partnership with any particular company?
4. How have these factors contributed to this company’s decision to locate in Waterloo region? (Prompt: What are the advantages of being located in Waterloo region? What are the top three factors?)
5. Are there any key business, community, or government leaders who played an important role in the development of your local industry or cluster? If yes, explain.
6. Association membership: Does your company (or key individuals in it) belong to any formal or informal associations at the local and regional level? If yes, which are the most valuable and why? If no, why not? Are there any significant networking events that you attend regularly?
7. What do you see as emerging trends within the industry? Are there recent developments (e.g. policies, development of new products) that are changing the way business is done?
8. What are the most important challenges or obstacles facing the local industry? What about your firm specifically?
9. What factors, external supports or policies would be most helpful in growing your local industry?

### Labour market linkages
1. How would you describe your HR resources? Generally speaking, where do they come from (prompt: inside/outside the region)? What level of qualifications do they have? How does being located in this region support your HR strategy?
2. Tell us about employees who have left your company within the last three years; how many have been employed by other firms within your region/locality? (Prompt: competitors, partners, other firms within your industry sector). If your key employees were to quit, how easily could you replace them from within this local region?

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### Appendix A: Interview guide-Private sector
Market structures (customers, suppliers, supply chains, regulation)

A. Customers
Where are your key customers located—locally (within 100 km or within the study region), in the rest of the country, North America or the world? How important is it for you to be located close to them? Would your company consider relocating to be closer to these key customers? (Prompt: customer relations, communication strategies with customers.)

B. Suppliers
Creative Sector: What are key services and products employed in order to complete your core business function? Are there emerging trends that are changing the way you access these products and services? (Prompt: specialized designed services, local vs. non-local sourcing strategies)

Green Energy and Local Food: What are your current supply-chain strategies (i.e. vertically integrated or externally sourced)? Are there any trends emerging in the supply-chain within the industry (e.g. Green Economy: FIT Program influencing the amount of domestically sourced content leading to the emergence of manufacturing facilities locally) (if relevant to the sector: Where are your suppliers located? How were they chosen? How long are contracts established for? Look for local vs. non-local sourcing strategies)

What are the main challenges in the current supply-chain network?

C. Competitors
Who are your key competitors? How does your company keep track of the activities of your current and potential competitors? How does your company monitor competitive products, services or process innovations? (Prompt: local vs. non-local sourcing strategies)

D. Others
What are the major sources of finance for your company? (angel investors, family friends, internally generated funds, funds from parent or affiliated firms, banks, venture capital, equity investment (IPOs), government loans or subsidies, other). What percent of these sources are local to the Waterloo region (Prompt: specific location)?
### Access to knowledge networks and infrastructure

1. What is the relative importance of the following local sources of new information for your product, service and process development? [1=not important, 5=very important]

<table>
<thead>
<tr>
<th>In-house resources</th>
<th>Competitors’ products</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D</td>
<td>Suppliers</td>
</tr>
<tr>
<td>Staff</td>
<td>Customers</td>
</tr>
<tr>
<td>Managers</td>
<td>Consultants (academic or professional)</td>
</tr>
<tr>
<td>Marketing dept</td>
<td>Venture capitalists or other financial services</td>
</tr>
<tr>
<td>University/Colleges researchers</td>
<td></td>
</tr>
<tr>
<td>Fed or Prov. Agencies programs</td>
<td>Formal industry or other associations</td>
</tr>
<tr>
<td>Research institutes</td>
<td>Informal associations</td>
</tr>
<tr>
<td>Not-for profit organizations</td>
<td>Other (please specify): _____________________________</td>
</tr>
</tbody>
</table>

2. What is the relative importance of the following non-local sources of new information for your product, service and process development [1=not important, 5=very important]

<table>
<thead>
<tr>
<th>University/Colleges researchers</th>
<th>Competitors’ products</th>
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</thead>
<tbody>
<tr>
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<td>Informal associations</td>
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<td></td>
<td>Other (please specify): _____________________________</td>
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*Follow-up on high-ranking sources indicated

For each of the 3 highest-ranked categories above: Which actors specifically are a source of innovative ideas? Why is this actor most significant? Describe this relationship. How does proximity (physical distance) factor into this relationship?
Appendix B: Interview guide—Government and other organizations

Background
1. Name of organization
2. Address and contact information
3. Mandate
4. History of the organization (has it been established under a program with a specific set time period?)
5. Source of funding (Prompt: sources of revenue)
6. Who does this organization represent?
7. What kinds of services/activities/program do you offer?
8. Human Resources
   a. Leadership model (Prompt: individual/ board/ other)
   b. Staff (Describe, prompt: number of workers)
9. Geographic area/boundaries of the organization (Prompt: regional; brief description; acquire map if possible; digital is ideal)
10. How do you engage with the community? (Prompt: open meetings/consultations/town halls)

Regional governance and collaboration
1. How does your organization contribute to the development of the sector? (Prompt: specific expertise, policies, programs, etc. and the level of support provided to these)
2. Who are the key businesses, community, government agencies, and activities that play an important role in the sector locally?
3. How would you describe the relationships among these players?
4. In your view, have any associations or events played an important role in the development or support of this sector? If yes, which are the most valuable and why? If no, why not?
5. Is your organization (or any individual within it) involved in any of these associations or events? Why/why not? (Prompt: development of present relationships with companies in sector/actors in network, establishing relationships among suppliers, customers, collaborators, research institutes)
6. Does collaboration with other organizations/businesses/groups play a role in how you deliver value to your stakeholders? If so, how? (Prompt: with whom? within the sector? Outside the sector?)
7. Can you think of a good example of a time when you collaborated with another organization/business/group to deliver a service/activity/event/program/initiative? If yes, ask questions a-h.
   a. Who did you collaborate with? (Prompt: inclusiveness)
   b. Where are these parties located? (Prompt: regional?)
   c. Does location impact the process of collaboration? (Prompt: Where are the collaborators? Does distance hinder collaboration?)
   d. How did you organize yourselves in order to facilitate the collaboration? How did you interact? (Prompt: advisory group/ task force/ third-party coordinator/ project-based)
   e. What was the purpose of the collaboration? (Prompt: benefits of collaboration, intended outcomes, impact on the region or industry, who is impacting in the region (urban/rural?)
   f. What were the outcomes of this collaboration? (Prompt: actual achievements and outcomes)
Appendix B: 
Interview guide—Government and other organizations (cont’d)

g. Were there any particular challenges? If so, what were they and how did you address them?
h. What have you learned from this instance of collaboration?

Market structures
1. Are there any unique local assets or capabilities that have contributed significantly to the development of the ********* sector locally? If yes, explain. (Prompt: government programs, existing programs, specific events, associations, service providers)

2. What are the factors inhibiting the growth of the firms/industries with which you work? What external supports or policies would be most helpful in overcoming these factors?

Access to knowledge networks
1. How frequently do you or others in your organization interact with companies or organizations (local or non/local), to disseminate research findings or new sources of knowledge?
   a. How many of these relationships are locally-based? (Tease out where in the region these companies and organizations are located).

2. Do you interact with public research institutes (such as government agencies, universities, colleges) or private companies (such as consultancies) to access new information or knowledge? Which are the most important?
   a. How would you characterise these interactions? (Prompts: formal collaborative research projects, university faculty working in/consulting with the establishment, participation in research consortia, licensing or patenting of public research inventions, development/adoption of new technology, development of specialized training program with college or university)

b. What are the primary benefits of these interactions? (Prompts: lower overhead costs on research, access to technical expertise, access to equipment and material, source of new product ideas, problem solving, hiring/retention of employees, connection to larger research community, market credibility, improvement of in-house R&D procedures)
Appendix C:
Social Network Analysis (SNA) survey instrument

NETWORK ANALYSIS QUESTIONNAIRE—Exploring your network…
This survey contains questions related to where and with whom you share and receive industry-related knowledge. The survey should only take 5-10 minutes of your time.

This study is entitled Creativity, Innovation and Sustainability: Understanding Urban-Rural Linkages in Regional Economic Development Initiatives. The research is funded by the Economic Developers Council of Ontario (EDCO) and is being overseen by Dr. Tara Vinodrai of the Department of Geography at the University of Waterloo.

Participation in this study is voluntary and there are no known or anticipated risks. You may decline to answer any of the questions and you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. Please ensure that all data will be kept in the strictest confidence and only the researchers associated with this project will have access to the information.

If you have any questions regarding this study, or would like additional information about your participation, please contact Dr. Tara Vinodrai at (519) 888-4567 ext. 33278 or by email at tara.vinodrai@uwaterloo.ca. This study has been reviewed by, and received ethics clearance through, the Office of Research Ethics.

If you have any comments or concerns resulting from your participation in this study, you may contact Dr. Susan Sykes of this office at (519) 888-4567 ext. 36005.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study

Yes [ ] No [ ]

N.B. Please note that you will be required to save this document with your name and reply to the original email with the saved version of this form as an attachment.

Please continue to the next page…
Appendix C: 
Social Network Analysis (SNA) survey instrument (cont’d)

Personal Information:
Name:_____________________________________ Organization:________________________________

Please indicate whether you interact with the following practitioners on a general basis or for more sector specific purposes. Interaction can be understood as the sharing of knowledge or information that is relevant and useful to your work.

Please indicate if this interaction directly relates to a specific sector, multiple sectors, is general in nature, or does not exist. Please check as many as apply.

<table>
<thead>
<tr>
<th></th>
<th>Creative Industries (including Digital Media)</th>
<th>Local Food</th>
<th>Clean Tech</th>
<th>General</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDO 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDO 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDO 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDO 4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>....</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Please continue to the next page...*
**Sector-Specific Contacts:** Beyond the above practitioners, who do you interact with for sector-specific purposes? Interaction, in this case, can be understood as the sharing of knowledge or information that is relevant and useful to your work with respect to a sector.

Please identify up to five (5) contacts for each sector by providing a name and affiliated organization.

<table>
<thead>
<tr>
<th>Creative Industries (including Digital Media)</th>
<th>#</th>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
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<td>3</td>
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<td></td>
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<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Local Food</th>
<th>#</th>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clean Tech</th>
<th>#</th>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please click save and provide your name as the file name and send back to the researcher.

Your interest and participation in this study is greatly appreciated. Thank You!
## Appendix D: Summary of key demographic and socio-economic indicators for the Waterloo regional Municipality

<table>
<thead>
<tr>
<th>Population</th>
<th>Waterloo</th>
<th>%</th>
<th>Ontario</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>377,762</td>
<td></td>
<td>10,085,000</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>404,955</td>
<td></td>
<td>10,754,000</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>438,515</td>
<td></td>
<td>11,410,046</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>478,121</td>
<td></td>
<td>12,160,282</td>
<td></td>
</tr>
</tbody>
</table>

### Immigration

<table>
<thead>
<tr>
<th></th>
<th>Waterloo</th>
<th>%</th>
<th>Ontario</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Immigrants</td>
<td>363,795</td>
<td>76.1</td>
<td>8,512,020</td>
<td>70.0</td>
</tr>
<tr>
<td>Immigrants</td>
<td>105,375</td>
<td>22.0</td>
<td>3,398,725</td>
<td>27.9</td>
</tr>
<tr>
<td>Before 1991</td>
<td>63,395</td>
<td>60.2</td>
<td>1,884,440</td>
<td>55.4</td>
</tr>
<tr>
<td>1991-2001</td>
<td>24,955</td>
<td>23.7</td>
<td>933,545</td>
<td>27.5</td>
</tr>
<tr>
<td>2001-2006</td>
<td>17,020</td>
<td>16.2</td>
<td>580,740</td>
<td>17.1</td>
</tr>
<tr>
<td>Non-permanent Residents</td>
<td>4,085</td>
<td>0.9</td>
<td>118,150</td>
<td>1.0</td>
</tr>
</tbody>
</table>

### Education Attainment (Population 15 or older)

<table>
<thead>
<tr>
<th>Population 15 or older</th>
<th>Waterloo</th>
<th>%</th>
<th>Ontario</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No certificate; diploma or degree</td>
<td>92,580</td>
<td>24.3</td>
<td>2,183,625</td>
<td>22.2</td>
</tr>
<tr>
<td>High school certificate or equivalent</td>
<td>106,675</td>
<td>28.0</td>
<td>2,628,575</td>
<td>26.8</td>
</tr>
<tr>
<td>Apprenticeship or trades certificate or diploma</td>
<td>30,920</td>
<td>8.1</td>
<td>785,115</td>
<td>8.0</td>
</tr>
<tr>
<td>College; CEGEP or other non-university certificate or diploma</td>
<td>70,465</td>
<td>18.5</td>
<td>1,804,775</td>
<td>18.4</td>
</tr>
<tr>
<td>University certificate or diploma below the bachelor level</td>
<td>11,080</td>
<td>2.9</td>
<td>405,270</td>
<td>4.1</td>
</tr>
<tr>
<td>University certificate; diploma or degree</td>
<td>69,275</td>
<td>18.2</td>
<td>2,012,060</td>
<td>20.5</td>
</tr>
</tbody>
</table>
### Labour Force Characteristics

<table>
<thead>
<tr>
<th>Labour Force Characteristics</th>
<th>Waterloo</th>
<th>%</th>
<th>Ontario</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the labour force</td>
<td>272,530</td>
<td>100.0</td>
<td>6,587,580</td>
<td>100.0</td>
</tr>
<tr>
<td>Employed</td>
<td>257,655</td>
<td>94.5</td>
<td>6,164,245</td>
<td>93.6</td>
</tr>
<tr>
<td>Unemployed</td>
<td>14,875</td>
<td>5.5</td>
<td>423,335</td>
<td>6.4</td>
</tr>
<tr>
<td>Not in the labour force</td>
<td>108,455</td>
<td></td>
<td>3,231,840</td>
<td></td>
</tr>
</tbody>
</table>

| Participation rate (%)       | 71.5     |      | 67.1          |      |
| Employment rate (%)          | 67.6     |      | 62.8          |      |
| Unemployment rate (%)        | 5.5      |      | 6.4           |      |

### Occupational Composition ( Experienced Labour Force )

<table>
<thead>
<tr>
<th>Occupational Composition</th>
<th>Waterloo</th>
<th>%</th>
<th>Ontario</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total experienced labour force 15 years and over</td>
<td>269,265</td>
<td>100.0</td>
<td>6,473,735</td>
<td>100.0</td>
</tr>
<tr>
<td>A Management occupations</td>
<td>25,235</td>
<td>9.4</td>
<td>666,485</td>
<td>10.3</td>
</tr>
<tr>
<td>B Business; finance and administration occupations</td>
<td>47,765</td>
<td>17.7</td>
<td>1,204,490</td>
<td>18.6</td>
</tr>
<tr>
<td>C Natural and applied sciences and related occupations</td>
<td>19,745</td>
<td>7.3</td>
<td>451,930</td>
<td>7.0</td>
</tr>
<tr>
<td>D Health occupations</td>
<td>12,240</td>
<td>4.5</td>
<td>340,690</td>
<td>5.3</td>
</tr>
<tr>
<td>E Occupations in social science; education; government service and religion</td>
<td>21,350</td>
<td>7.9</td>
<td>546,385</td>
<td>8.4</td>
</tr>
<tr>
<td>F Occupations in art; culture; recreation and sport</td>
<td>6,115</td>
<td>2.3</td>
<td>200,980</td>
<td>3.1</td>
</tr>
<tr>
<td>G Sales and service occupations</td>
<td>58,875</td>
<td>21.9</td>
<td>1,522,820</td>
<td>23.5</td>
</tr>
<tr>
<td>H Trades; transport and equipment operators and related occupations</td>
<td>41,990</td>
<td>15.6</td>
<td>911,250</td>
<td>14.1</td>
</tr>
<tr>
<td>I Occupations unique to primary industry</td>
<td>5,060</td>
<td>1.9</td>
<td>165,085</td>
<td>2.6</td>
</tr>
<tr>
<td>J Occupations unique to processing; manufacturing and utilities</td>
<td>30,885</td>
<td>11.5</td>
<td>463,610</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Source: Statistics Canada, Census of Population, 2006

*Numbers may not add due to rounding.*
# Appendix E:
Key actors in the local food, clean technologies, and creative and cultural sectors

<table>
<thead>
<tr>
<th>1. Higher Education</th>
<th>Local Food</th>
<th>Clean Technologies</th>
<th>Creative/Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conestoga College</td>
<td>University of Waterloo — Waterloo Institute for Sustainable Energy (WISE)</td>
<td>University of Waterloo</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Anchor Firms</th>
<th>Local Food</th>
<th>Clean Technologies</th>
<th>Creative/Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Jacob’s Market</td>
<td>Canadian Solar Solutions</td>
<td>The Tannery</td>
<td></td>
</tr>
<tr>
<td>Martin’s Fruit Farms</td>
<td>Photowatt Ontario</td>
<td>Christie Digital</td>
<td></td>
</tr>
<tr>
<td>Herrle’s Country Market</td>
<td>ARISE Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oakridge Acres Country Meat Store</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elmira Produce Auction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piller’s Fine Food</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Sector-Specific Government</th>
<th>Local Food</th>
<th>Clean Technologies</th>
<th>Creative/Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region of Waterloo Planning Department</td>
<td>WaterlooMIN</td>
<td>WaterlooMIN</td>
<td></td>
</tr>
<tr>
<td>Region of Waterloo Public Health</td>
<td>Solar Industry Networking Group (SING)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waterloo regional Tourism Market Corporation</td>
<td>Utility Companies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Cambridge Farmers’ Market</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Kitchener Farmers’ Market</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Civil Society</th>
<th>Local Food</th>
<th>Clean Technologies</th>
<th>Creative/Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foodlink Waterloo Region</td>
<td>Community Renewable Energy Waterloo (CREW)</td>
<td>Creative Enterprise Enabling Organization (CEEO)</td>
<td></td>
</tr>
<tr>
<td>Waterloo Region Food System Roundtable</td>
<td>Residential Energy Efficiency Project (REET)</td>
<td>Waterloo region Arts Council</td>
<td></td>
</tr>
<tr>
<td>Canadian Organic Growers: Perth-Waterloo-Wellington</td>
<td>Greening Sacred Spaces</td>
<td>Communitect and the Communitect Hub</td>
<td></td>
</tr>
<tr>
<td>Old Order Mennonite Community</td>
<td>Sustainable Waterloo region</td>
<td>Alliance for a Grand Community</td>
<td></td>
</tr>
<tr>
<td>Alliance of Ontario Food Processors</td>
<td>Local Initiative for Future Energy (L.I.F.E.) Co-op</td>
<td>ArtsTogether</td>
<td></td>
</tr>
<tr>
<td>Waterloo Federation of Agriculture</td>
<td>Woolwich Healthy Communities</td>
<td>Contemporary Art Forum of Kitchener and Area (CAFKA)</td>
<td></td>
</tr>
<tr>
<td>National Farmers Union: Waterloo &amp; Wellington</td>
<td></td>
<td>MT Space</td>
<td></td>
</tr>
<tr>
<td>Christian Farmers’ Federation of Ontario</td>
<td></td>
<td>Neruda Productions</td>
<td></td>
</tr>
<tr>
<td>Commodity-specific organizations (e.g. Dairy Farmers of Ontario, Chicken Farmers of Ontario, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Works cited


II Ibid.


VII Wolfe, D. 2010; However, it should be noted that not all firms fared well in the most recent global economic downturn and the fallout from the subsequent halting economic recovery remains to be seen and fully understood. See Bathelt, H., Munro, A. and Spigel, B. Forthcoming. Challenges of transformation: Innovation, re-bundling and traditional manufacturing in Canada’s Technology Triangle. *Regional Studies*.


IX Limitations include the introduction of bias due to non-response; unidentified interactions due to the structure of the survey questions; potential misunderstanding or misinterpretation by respondents; and respondent bias towards social desirability (i.e., respondents identify who they think they should interact with rather than those with whom they actually interact).

X Gephi Visualization and Manipulation is an interactive visualization and exploration software program for analyzing networks and complex systems. The program includes a number of tools and methods to analyze and visualize network data. Visualization tools used in Gephi employ a number of algorithms to create network maps emphasizing specific network attributes. See www.gephi.org for more information.


XIII Ibid.


XX Despite the usage of the term ‘firm’, which denotes enterprises of a certain scale, local food system products are often developed by individuals or collective entities, often with informal structures. This introduces an additional challenge in delineating a local food system.


XXII Maye and Ilbery, 2006.

XXIII Ibid.

XXIV Ibid.


XXVI Maye & Ilbery, 2006.
Works cited (con’t)

---


**xxviii** Ibid.

**xxix** Maye and Ilbery, 2006.


**xxx** Donald, 2009.


**xxxiv** Ibid.


**xxxvi** Donald, 2009.


**xlvii** The FIT program is comprised of projects that exceed 10kW while the microFIT program is designed for projects less than 10kW and is more focused on the residential sector.

**xlviii** Domestic content requirements form part of the FIT program approval process, which stipulates that a certain proportion of the overall project value must be sourced using Ontario-based goods and labour.

**xlix** Wind power projects over 10kW require 50% of the overall project value be sourced from Ontario, whereas solar power projects exceeding 10kW require 60%. For more details, see fit.powerauthority.on.ca.


Understanding networks in the local food, green energy and creative sectors in Waterloo region


Howkins, 2002.

Markusen et al., 2008., Wassall, and DeNatale, 2008.


Ibid, p. 376.

Ibid, p. 1682.


Ibid, p. 2619.


Network density describes how complete a network is; thus, it is a reflection of integration within a network. Density is measured from 0 to 1. Zero indicates that there are no connections between the nodes within a network. Whereas, 1 indicates that all possible connections between nodes in a network are present.
The Regional Carbon Initiative is an effort led by Sustainable Waterloo region designed to mitigate GHGs produced by an organization. For municipalities, this includes LEED buildings, using energy efficiency transportation, and the promotion of conservation practices. For more information, please visit www.sustainablewaterlooregion.ca/regional-carbon-initiative/.


Creative Enterprise Initiative, 2011.


