

**REGIONAL CENTRE OF EXPERTISE ON EDUCATION FOR SUSTAINABLE
DEVELOPMENT SASKATCHEWAN (RCE SASKATCHEWAN):
REPORT TO THE INTERNATIONAL RCE CONFERENCE, PENANG, MALAYSIA
(AUGUST 7-8, 2007)**

1(a) RCE SASKATCHEWAN ACTIVITIES SINCE 2007 DESIGNATION

RCE LEAD ACTIVITIES

Note: Achievements and contributions of each activity (both to the four UN ESD thrusts and RCE Saskatchewan ESD outcomes/goals) are listed in the final bulleted item for each activity. Documents related to these events/activities can be found on the RCE Saskatchewan website: www.saskrce.ca.

Celebrations for RCE Saskatchewan Designation (March 1-2, 2007)

- events in Regina, Craik, and Saskatoon marked the designation by the United Nations University (UNU) of the Saskatchewan RCE and showcased existing ESD activities in the region
- participants included senior representatives from the UNU and UNESCO and three other levels of government including federal officials, the Premier and the Lieutenant Governor of Saskatchewan, provincial ministers, mayors, city councilors, as well as representatives from 5 post-secondary institutions in Saskatchewan (the University of Regina (U of R), the University of Saskatchewan (U of S), the Saskatchewan Institute of Applied Science and Technology (SIAST), First Nations University of Canada (FNUC), and Luther College at the University of Regina).
- extensive media coverage and internal organizational publicity of all 3 events raised broad organizational and public awareness of SD, ESD, and the UN Decade. The event promoted (1) open knowledge sharing in the region, (2) regional networking, (3) identification of ESD projects, (4) establishment of formal organizational linkages promoting ESD, and (5) acknowledgment and celebration of success.

Presentations at two side meetings of the Commission on Sustainable Development (CSD 15), UN Headquarters, New York (May 4 and 7, 2007)

- with the support of Environment Canada a representative of RCE Saskatchewan was able to attend two side meetings of the 15th session of the CSD to showcase RCE Saskatchewan and the region's activities
- included discussion and showcasing of ESD elements of the Province of Saskatchewan's *Green Strategy*, the RCE Saskatchewan process to date, and its use of Free/Open Source networking software
- provided opportunity to raise awareness about ESD activity in Saskatchewan in an international forum. Presentations facilitated (1) open knowledge sharing, (2) formal linkages promoting ESD between organizations, and (3) advocacy for RCE Saskatchewan ESD goals/outcomes.

Acquisition of Services to Develop RCE Website and Related Resources (May 23, 2007)

- a PhD candidate in computer science was hired by Luther College at the University of Regina with support from the Government of Saskatchewan to further develop the RCE website and to increase the user-friendly and open nature of the RCE Saskatchewan web-based resources to facilitate RCE working groups and members.
- current projects include upgrading to a new version of the content management system (CMS, in this case *Drupal*), development of tutorials, and FAQs.
- the RCE web-based CMS supports ESD program development and awareness raising; it creates (1) open networks for knowledge sharing, (2) public awareness of SD in the region, (3) opportunities for collaborative ESD work, and (4) development of science and technology for ESD.

RCE Workshop “From a Local to Global Perspective with the RCE Saskatchewan Model”, University of Saskatchewan, Saskatoon, SK (May 24, 2007)

-the workshop involved discussing the RCE Saskatchewan model, the region’s activities to date, and next steps and directions for RCE Saskatchewan. This included identifying areas for ESD research, identifying how regional networking among RCE participants and North American and international networking between RCEs might facilitate participants' own ESD work, and identifying further opportunities for the UNU-IAS playing a supportive role.

-participants included educators and students from the U of S and U of R with presentations from Susan Kingsbury (Environment Canada) and Charles Hopkins (UNU).

-the workshop supported reorienting education towards SD and raising awareness about the importance of ESD. The workshop promoted (1) opportunities for collaborative work on ESD projects, (2) integration of SD into education curricula, and (3) identification of current and prospective ESD research projects.

Meeting with the Province of Saskatchewan’s Minister of Environment and other representatives from Saskatchewan Environment, Regina, SK (May 31, 2007)

-updated Saskatchewan Environment on RCE Saskatchewan activities, received updates on current directions of Saskatchewan Environment, and discussed emerging ESD opportunities with RCE Saskatchewan recognition and the Provincial Green Strategy

(<http://www.saskatchewan.ca/green>)

-meeting raised awareness of importance of ESD; highlighted (1) opportunities for collaborative work on ESD projects and (2) created formal linkages promoting ESD between organizations.

RCE Submission to the Province of Saskatchewan’s Green Initiatives Fund (June 15, 2007)

-the submission included request for funding to support project-oriented RCE Saskatchewan activities particularly (1) student research support for 6 RCE ESD issue areas, (2) regional communication and networking including design of a regional ESD award and certificates, (3) funding for an International RCE Conference in Saskatchewan, and (4) participation in the UN University International RCE Meetings; RCE letters of support were provided for other local ESD applications of RCE members to the fund.

-if funding is received this will support (1) identification of regional sustainability issues and projects, (2) formal linkages between organizations promoting ESD (including promotion of a regional identity), and (3) acknowledgment and celebration of success.

Presentation to the City of Regina Executive Committee: “From a Local to Global Perspective on Sustainable Municipal Policy and Engagement” (July 18, 2007)

-discussed with Mayor and City Councilors opportunities that may exist in establishing a formal partnership between RCE Saskatchewan and the City of Regina

-forging a partnership would build on existing links between RCE Saskatchewan and the City of Regina (eg. the City's Green Ribbon Committee, Sustainable Communities Coordinator, Climate Change Coordinator, etc).

-supports delivering ESD training programs for all levels of society; promotes (1) public awareness of SD in the region, (2) ongoing opportunities for collaborative work on ESD projects, and (3) formal linkages promoting ESD between organizations.

Updating Canadian Commission of UNESCO with Accomplishments and Future Opportunities with RCE Saskatchewan, Ottawa and Gatineau (July 23, 2007)

-this presentation to the Canadian Commission of UNESCO involved an update of RCE Saskatchewan’s activities, with particular focus on the flagship project: *YouthBuild Saskatchewan* (described below)

-Environment Canada was also briefed on the *Youthbuild Saskatchewan* project

-promotes awareness raising efforts for ESD; allows (1) ongoing opportunities for collaborative work on ESD projects (through national RCE networking), and (2) formal linkages promoting ESD between organizations (RCE Saskatchewan, the Canadian Commission of UNESCO, and the Government of Canada).

LOCAL ESD INITIATIVES WITHIN REGION OF RCE MEMBERS

Note that the goals/outcomes of these ESD activities lead by RCE members are identified in relation to the 6 ESD issue areas identified by RCE Saskatchewan as well as its 2 cross-cutting themes (see RCE Saskatchewan original proposal to the UNU, October 15, 2006 for description of these on the RCE Saskatchewan website).

Toward a Sustainable Future Sustainability Symposium (event), Regina, April 19-20, 2007

Contact: Carla Ballman, Project Coordinator, Saskatchewan ESD Working Group (SESDWG) (esd@earthbeat.sk.ca)

-The SESDWG, a provincial (vs. regional) ESD organization in Saskatchewan, held an ESD symposium with a keynote address by Dr. William Rees, co-inventor of the ecological footprint with 150 people attending. Dr. Rees' address, entitled "Mything out on Sustainability (Barriers to Eco-Education)", is available as streaming video at www.saskesd.ca. The event included a panel discussion on sustainable livelihoods - from what these are to how ESD might foster their advancement, and a moderated discussion addressing the "the role of education in changing the world". A summary, outcome-based plan was developed in advance to frame the event and facilitate discussion of provincial ESD goals and actions.

-Supports RCE SK Cross-Cutting ESD Theme: *Educational Approaches for Regional ESD*

Wings Over Wascana (event), Regina, May 11-12, 2007

Contact: Lyle Benko, Vice-President and Vice-Chair (lyle.benko@sasktel.net)

-Hosted by Friends of Wascana (a local non-profit corporation), Ducks Unlimited Canada, Nature Regina, Saskatchewan Watershed Authority, and Saskatchewan Outdoor and Environmental Education Association

-This event raised student and public awareness and appreciation for wetlands and wildlife in Wascana park, one of the largest urban parks in North America, located in Regina, SK. Over 200 students from grades 4-6 participated.

-Supports RCE SK ESD Issue Area: *Reconnecting to Natural Prairie Ecosystems*

University of Saskatchewan School of Environment and Sustainability (graduate school and research hub), established June 14, 2007

Contact: Dr. Jim Basinger, Associate Dean Science in the College of Arts & Science, University of Saskatchewan and Executive Sponsor for the School (jim.basinger@usask.ca)

-The University of Saskatchewan established a new interdisciplinary school entitled *The School of Environment and Sustainability* to offer innovative opportunities for graduate education, research and partnerships.

-Its activities focus on four core themes: ecological integrity and resource use; energy use and climate change; earth system processes; and environmental ethics, justice and governance.

-The proposed School of Environment and Sustainability programs include an interdisciplinary Master of Environment (M.Env.), a course-based professional Master of Applied Environmental Processes (MAEP), an interdisciplinary thesis-based MA or MSc programs on particular themes

like hydrology, and an interdisciplinary PhD program. The programs are to launch in 2008. The full research proposal is available at:

<http://www.usask.ca/vpresearch/pdf/SENS%20FINAL%20PROPOSAL%20MAY%2007.pdf>

-Supports RCE SK Cross-Cutting ESD Theme: *Educational Approaches for Regional ESD* as well as specific RCE ESD issue areas including: *Climate Change*; *Reconnecting to Natural Prairie Ecosystems*; and *Sustainable Infrastructure including Water and Energy*

Green Roof Workshop (events), University of Regina, Regina, SK, (June 22 and September, 2007)

Contact: Dena McMartin, RCE Saskatchewan Sustainable Infrastructure Working Group Co-Coordinator (Dena.McMartin@uregina.ca)

-This event sponsored by Communities of Tomorrow and Saskatchewan Industry and Resources was attended by more than 35 people representing a wide variety of members throughout the RCE region. People from environmental organizations, construction and consulting industries, architects and engineers, greenhouse and nursery operators, educators, academics, and members of municipal, provincial and federal government agencies attended the 5-hour short course.

-The event offered training and developed methodologies and learning materials. It also provided an opportunity to discuss the impacts and requirements for education and research of vegetated roofing systems in the extreme Saskatchewan climate. A follow-up meeting to the Green Roof Workshop will be hosted by the Regina Regional Economic Development Authority (RREDA) in September 2007.

-Supports RCE SK ESD Issue Area: *Sustainable Infrastructure including Water and Energy*

1(b) RCE SASKATCHEWAN FUTURE PLANNED ACTIVITIES

RCE LEAD ACTIVITIES

Note: The following activities will be occurring with existing RCE resources. Should funding be received through the Province of *Saskatchewan's Green Initiatives Fund* (see above), it is anticipated that an International RCE Conference would be held in Saskatchewan in May, 2008. This event would include (1) opportunities for international networking of RCEs, (2) regional networking of RCE members around its 6 SD issue based working groups, (3) presentation of ESD research, and (4) a possible recognition/awards ceremony for local and regional ESD initiatives within the RCE's issue and theme areas.

“Universities Innovating for Sustainable Development: Commercialization or Free/Open Source Licensing?” (presentation), August 10-11, 2007

Contact: Roger Petry, RCE Saskatchewan Facilitation Group (roger.petry@uregina.ca)

-This is an upcoming Presentation at the World Innovation Forum in Kuala Lumpur, Malaysia whose conference theme is “Innovating Towards Sustainability”. Roger Petry will present research contrasting the merits and challenges of Free/Open Source licensing and commercialization of university SD research using SD research case studies at the University of Regina in the area of information technology.

-Supports RCE SK Cross-Cutting ESD Theme: *Educational Approaches for Regional ESD*

Fostering a Culture of Sustainability (event), Fall, 2007

Contact: Glenn Sutter, Royal Saskatchewan Museum (gsutter@cyr.gov.sk.ca)

-Culture is emerging as more than a fourth "pillar" of sustainability, to be given equal treatment

alongside society, environment, and economy. Instead, cultural transformation may be what living sustainability, and education to this end, is all about.

-A visit from Douglas Worts of the Art Gallery of Ontario is being planned in order to hear his ideas in this area and generate discussion about the challenges and research opportunities associated with fostering a “culture of sustainability.” Multiple events in the region are anticipated.

-Supports RCE Supports RCE SK ESD Issue Area: *Supporting and Bridging Cultures for Sustainable Living and Community Building*

Education for Transformations in Production: Process Approaches to Sustainable Development (research initiative and upcoming conference)

Contacts: Robert Regnier Executive Director of the International Process Network and Co-director of the University of Saskatchewan Process Philosophy Research Unit

(robert.regnier@usask.ca)

Roger Petry, Luther College at the University of Regina (philosophy) and RCE Saskatchewan Co-coordinator (roger.petry@uregina.ca)

-The move to sustainable development envisions significant changes in existing production systems to meet the needs of all within the carrying capacity of ecosystems. Anthropologists, economists, political scientists, philosophers, and historians are aware of radical transformations in production by earlier societies based on kinship, tributary systems used by monarchies, and the current market based systems of industrial societies. These transformations have included various kinds of organizations involved in education such as the Royal Society in England which facilitated transition to an industrial society through the rise of science.

-RCE Saskatchewan and the Executive Director of the International Process Network/Co-director of the University of Saskatchewan Process Philosophy Research Unit have begun discussions to construct a proposal for an interdisciplinary conference which would both examine these historic transitions in production and propose processes of formal, informal, and non-formal education to identify useful strategies for RCE SK and other RCEs globally in seeking a shift to sustainable production systems.

-The conference would invite and welcome humanities and social sciences scholars and researchers who can recommend process approaches to addressing challenges of sustainable development.

-Supports RCE SK Cross-Cutting ESD Theme: *Educational Approaches for Regional ESD*

LOCAL ESD INITIATIVES WITHIN REGION OF RCE MEMBERS

Youth Forum on Sustainability (event), Saskatoon, Fall, 2007

Contact: Carla Ballman, Project Coordinator, Saskatchewan ESD Working Group (SESDWG)

(esd@earthbeat.sk.ca)

-The Royal Saskatchewan Museum (RSM) Youth Forum on Sustainability is an education program for older teenagers which aims to encourage young people to learn about, through, and from actions that make a tangible difference in their communities.

-Based on a model developed by Learning for a Sustainable Future, the Forum brings high school students, teachers and local experts together:

- To foster learning about sustainability issues,
- To build partnerships between schools and communities, and
- To help participants become empowered through student-led Action Projects.

-The RSM Youth Forum on Sustainability has been running for four years with the four forums in 2006 in both rural and urban areas attracting 300 students. The SEDSWG has been facilitating the development of additional Youth Action Forums on Sustainability in the province.

-Supports RCE SK Cross-Cutting ESD Theme: *Educational Approaches for Regional ESD*

Action Framework Development Project (provincial ESD framework), Fall, 2007

Contact: Carla Ballman, Project Coordinator, Saskatchewan ESD Working Group (SESDWG) (esd@earthbeat.sk.ca)

-The SEDSWG is developing an action framework that will allow members to identify how their efforts reflect provincial ESD objectives. As the framework comes together and is periodically renewed, there will be opportunities to share knowledge, develop cross-sector collaborations, and recognize excellent projects that involve formal, non-formal, and informal education.

-Due to be launched in the fall of 2007, the action framework will ultimately support an increase in sustainability action projects and help to foster a culture of sustainability in Saskatchewan.

-Supports RCE SK Cross-Cutting ESD Theme: *Educational Approaches for Regional ESD*

Learning Indigenous Science from Place (research project)

Contacts: Herman Michell, Principal Investigator (Hmichell@firstnationsuniversity.ca), Yvonne Visina, Co-Investigator (Yvonne.vizina@usask.ca)

-This research project, led by First Nations University of Canada, in collaboration with the Indigenous Knowledge in the School Science Curriculum Committee, is designed to investigate how educators and education systems might take up place-based Indigenous science and apply it within the established school curriculum.

-Results will include information on First Nations and Métis perspectives of learning Indigenous science from place; how learning from place can help create a foundation for a science curriculum that is contextualized to place and to the people of the place; how the perspectives can inform teachers of processes and content needed in science curriculum; and supports needed for educators to engage in Indigenous science.

-Teacher focus groups and community focus groups will provide a range of experiential information. A database of exemplary practices used in classroom teaching is being compiled. The exploration, and inclusion, of Indigenous science perspectives within science education supports the concepts of sustainable development and sustainable lifestyles.

-Supports RCE SK ESD Issue Area: *Supporting and Bridging Cultures for Sustainable Living and Community Building*

2. RCE SASKATCHEWAN FLAGSHIP PROJECTS

Flagship Project A: *YouthBuild Saskatchewan* (youth education for green building)

Project Overview

-YouthBuild Saskatchewan is a flagship project given that it encompasses all three prongs of sustainability (economic, social, and environmental) and in so doing educates youth, provides an innovative way to building green houses, and fills a gap in the labour market.

-YouthBuild Saskatchewan and its partners are committed to train and educate youth to help reduce both the energy and green house gases produced in the construction and operation of residential and commercial buildings as well as increase the number of affordable green housing units built. It uses a proven strategy by starting a community based non-profit housing development corporation capable of handling the entire process of building affordable homes.

-These community housing development corporations often become affiliated with YouthBuild, an international NGO, in order to combine the training of youth and the building of affordable housing. This strategy has been successfully used in the United States over the past 30 years by local YouthBuild programs (see <http://www.youthbuild.org/>). YouthBuild USA and Home Depot

Foundation implemented a Green Building Initiative in 2005 to document affordable green home building technologies in the United States, deliver 3-day workshops on affordable green building, and provide on-site technical assistance.

-YouthBuild Saskatchewan intends to build on this proven model of training youth and building affordable green buildings. YouthBuild Green Building Initiative supports these goals:

1. Increasing the number of youth who are ready for work.
2. Increasing the number of affordable housing units built each year.
3. Decreasing the building and energy cost of affordable housing.
4. Increasing the number of community based housing development corporations.
5. Creating a Saskatchewan Centre of Expertise on affordable green home building.

-An important component of the Green Building Initiative is to research how the program is developing so that it can be done in other parts of the world and to evaluate different building components and techniques. The evaluation process will include starting a data collection process, data repository, and knowledge base about affordable green building practices.

Whenever possible, we will implement data collection devices to monitor temperature gradients across walls, collect resource consumption data, and monitor the quality of air and water in the home. This data collection process will be important to reaching our goal of building better quality affordable housing at less cost than currently possible. The data and knowledge base will be available to education institutions to support learning activities about affordable green building practices.

Problem Project Addresses

-Saskatchewan needs more skilled entry-level workers. According to the report “Without a Paddle” published by the Canadian Policy Network, there are approximately 10,000 youth in Saskatchewan between the ages of 20 and 24 who do not have their Grade 12 diplomas, are not in school, and are not working. YouthBuild estimates there are up to 30,000 Saskatchewan youth between the ages of 16 and 30 in this category. This pool of youth includes many potential future Saskatchewan workers.

-Saskatchewan also needs more affordable housing. The number of affordable housing units needed in urban, rural, First Nations, and Metis communities continues to grow. Current estimates are that 40,000 families in Saskatchewan do not have affordable, decent housing. Another 10,000 families are estimated to live in marginal housing. A major constraint on the number of affordable homes built is available, trained workers. In addition, the cost of affordable housing continues to increase. One reason for this is the general rise in the market price of housing, the cost of labour to build new homes, and the cost of energy to maintain a home is increasing.

-The residential and commercial building industries use a significant amount of energy to manufacture and build new buildings. This activity also produces significant amounts of green house gases. Operating residential and commercial building also requires large amounts of energy and produces large amounts of green house gases.

Partnerships formed in carrying out project

-Using the Craik Eco-Centre in Craik, Saskatchewan as the base for our Centre of Expertise for Affordable Green Building, YouthBuild, working with its partners, will begin experimenting with different building techniques and building materials. The Centre Of Expertise will participate as a network member of the Regional Centre of Expertise on Education for Sustainable Development Saskatchewan (RCE Saskatchewan, see www.saskrce.ca). The project supports multiple RCE Saskatchewan ESD issue areas including: (1) *sustainable infrastructure including water and energy*, (2) *climate change*, and (3) *Supporting and Bridging Cultures for Sustainable Living and Community Building* as well as the cross-cutting theme area of *Sustaining Rural Communities*.

-Important education partners in the YouthBuild Green Building Initiative will be the University of Saskatchewan, University of Regina, the Saskatchewan Institute of Science and Technology, the Saskatchewan Indian Institute of Technology, the Dumont Technical Institute, and local high schools across Saskatchewan.

Current stage in development

-YouthBuild is working with the University of Saskatchewan to implement a pilot plant in Craik to produce eco-materials from flax or hemp straw. These include eco-bricks, eco-shingles, green boards, and structural building components. This project will include building a YouthBuild community centre in Craik using affordable green technologies. A goal of the project is to have as many community members as possible contribute to the project. This demonstration project will provide the base for additional community based buildings projects in Saskatchewan.

-The 3-year goal of the Centre of Expertise will be to reduce the cost of building an affordable home by ten (10) percent and the cost of operating the home by 50 percent. The Centre of Expertise will help local communities start new home building enterprises or non-profit housing development corporations to manage their own affordable home building.

-The 2007 goal is to have Affordable Green Building Programs operating in Saskatoon, Regina, and Craik. During 2007/08, we will work to expand the program to Prince Albert, two small cities or rural communities, two First Nations communities, and two Metis communities. Swift Current and Humboldt are high priorities due to their worker and affordable housing needs. Humboldt is facing the challenge of finding affordable housing for up to 100 immigrant workers and their families.

-The first affordable green home building project is scheduled to start in August 2007 in Craik. Projects in Saskatoon and Regina are targeted to begin in the Spring of 2008.

-Within three to five years, the YouthBuild Green Building Initiative, working with business partners, community-based organizations, and government will be managing the development of 100 new affordable green homes per year across the Province and increasing the number youth working on building affordable housing by 200 per year.

References for more information on the project:

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Flagship Project B: *Engineering Education for Sustainability Project* (education in alternative energy technology)

Project Overview

-The goal of the Engineering Education for Sustainability Project is to continue to build on education and research related to sustainable wind energy in the RCE Saskatchewan region through the collaboration of Shamrock Energy Systems/Cleanfield Energy Corporation, the University of Regina, RCE Saskatchewan, and the Centre for Study in Energy and Environment.

-The Project involves contributing to the development of two Regional Laboratory Centres (RLCs), one in a rural and one in an urban setting, to be established in Craik, Saskatchewan, and at the University of Regina in Regina, SK. The chosen sites are geographically positioned within the existing RCE Saskatchewan corridor and the locations provide for easy research accessibility, public visibility, educational training, resource servicing, and an affirmation of the town of Craik's commitment to sustainable practice.

-The RLCs allow for the:

- Demonstration of new technology or adapted technology in rural and urban settings;
- Demonstration of the commercial feasibility of the technologies;
- Training in the use of the technologies and provision of technical support in concert with business, SIAST, and Universities;
- Development of standard business practice and funding arrangements to accelerate the process of communities adopting the demonstrated technologies to their use;
- Identification of research gaps that could be filled by research at both Universities in the province.

-The *Engineering for Sustainability Project* will involve the testing of Vertical Axis Wind Technology (VAWT) within the RLCs for its compatibility, effectiveness and reliability in Saskatchewan. The University of Regina's Faculty of Engineering, the Faculty of Education, the Centre for Studies in Energy and Environment, and the Canadian Plains Research Centre, will collaborate on:

- Monitoring of atmospheric conditions (wind speed, direction, humidity, pressure etc.) in correlation with the produced energy;
- Determining the optimum combination of wind, for various locations in the prairies;
- Determining battery storage capacity;
- Determining methods of installation of VAWT on commercial and residential buildings for high energy producing effect and minimum structural vibration;
- Assessing public understanding and acceptance of alternative energy wind turbine technology;
- Training and educational practices; and
- Curriculum development in trade sector areas.

Problem Project Addresses

-The Saskatchewan prairie region has been identified as one of the most vulnerable ecosystems to climate change. Due to its already naturally dry climate, this area is vulnerable to small changes and extreme weather conditions associated with climate change. For instance, prolonged droughts or sudden floods are likely to have a devastating effect. Heavy cultivation and fragmentation of land by human activities throughout large parts of Saskatchewan increase the impact of extreme conditions due to erosion prone cultivated fields and heavy water use for irrigation.

-While this prairie region is highly vulnerable to climate change it is, at the same time, a significant contributor for a number of reasons. The largest increase in contributions of greenhouse gas emissions has occurred from recent industrial development in Saskatchewan. At the same time, transportation in Saskatchewan makes use of substantial fossil fuels. The great

distances between cities and towns in Saskatchewan and the lack of frequent passenger trains between communities makes personal transportation a further source of CO₂ emission. As a landlocked province lacking waterways for shipping, transportation costs and fossil fuel use have historically been high. Highly mechanized, intensive agriculture also contributes to substantial greenhouse gas emissions.

-The results of the Engineering Education for Sustainability Project will contribute to research associated with current alternative energy technology in the RCE Saskatchewan region and the VAWT's utility in co-generation and altering consumer practices as well as its technological compatibility in Saskatchewan for reducing greenhouse gas emissions.

Partnerships formed in carrying out project

-With the establishment of RCE Saskatchewan, the University of Regina is well-positioned to provide the technical and supporting research required in alternative energy to take a leading role in re-orienting its curricula and educational and research practice to address sustainable development. The Project supports two of the RCE Saskatchewan ESD issue areas: *Climate Change* and *Sustainable Infrastructure Including Water and Energy* as well as the cross-cutting theme area of *Sustaining Rural Communities*.

-In conjunction with RCE Saskatchewan and following informal discussions with officials from the University of Regina (including its faculties and research centres listed above), the Town of Craik, and Shamrock Energy Systems/Cleanfield Energy Corporation, an agreed understanding of the importance and significance of establishing urban and rural research laboratory centres in Saskatchewan to advance research on alternative energy sources for reducing greenhouse gas emissions has been reached.

Current stage in development

-Currently, Shamrock Energy Systems/Cleanfield Energy Corporation, the City of Hamilton and McMaster University have tested and continue to install and study the utility of the VAWT technology. The recent research on the VAWT conducted at McMaster University has proven very successful with respect to the design and mechanical engineering prospectus.

-Shamrock Energy Systems/Cleanfield Energy Corporation and the University of Regina have recently signed a non-disclosure research agreement which links Shamrock Energy Systems/Cleanfield Energy Corporation, McMaster University, and the University of Regina. This agreement allows the University of Regina to continue to expand on the research to date using its systems engineering practice expertise.

-The Engineering Education for Sustainability Project will involve the installation of two Vertical Axis Wind Technology systems (VAWTs) on or near the University of Regina Campus and two VAWTs in Craik, Saskatchewan by October 30, 2007.

References for more information on the project

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See additional project document entitled: "Engineering Education for Sustainability"