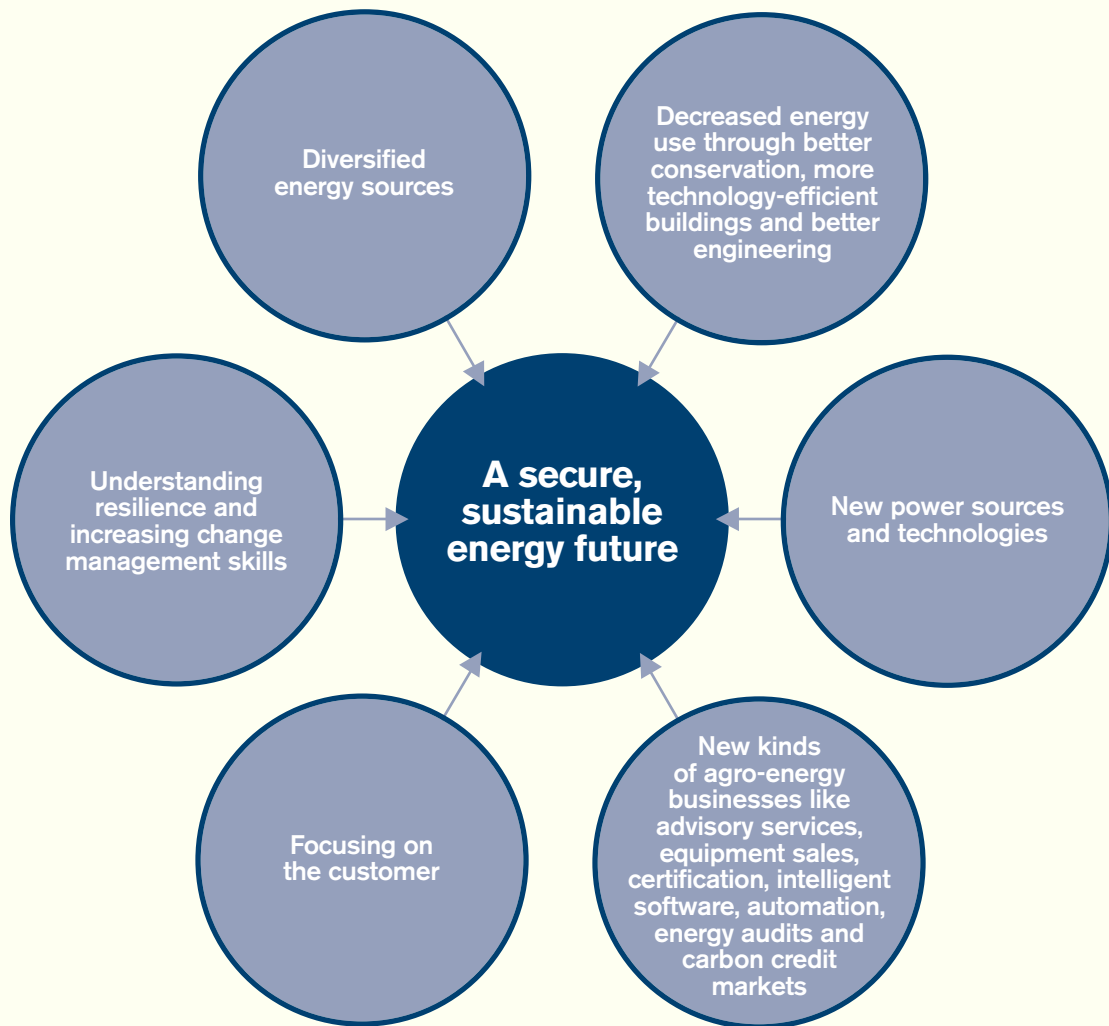


A man in a brown shirt is shown in profile, looking out over a vast rural landscape at sunset. The sky is a mix of deep blue and orange, with the sun low on the horizon. The landscape below is green and rolling, with a few buildings and a road visible in the distance.

# Knowledge Insider

Tips, tools and strategies | **Energy edition**

# Solutions for your business











# Knowledge Insider tools

What you'll find	Web address
<b>Biofuel specifics</b>	
Alternative Fuels in Canada, Office of Energy Efficiency	<a href="http://oee.nrcan.gc.ca/publications/infosource/pub/transportation/fuels-in-canada.cfm?attr=16">http://oee.nrcan.gc.ca/publications/infosource/pub/transportation/fuels-in-canada.cfm?attr=16</a>
Natural Resources Canada discusses next generation biofuels	<a href="http://oee.nrcan.gc.ca/transportation/next-gen-biofuels.cfm?attr=8">http://oee.nrcan.gc.ca/transportation/next-gen-biofuels.cfm?attr=8</a>
Canadian Renewable Fuels Association	<a href="http://www.greenfuels.org/">http://www.greenfuels.org/</a>
Understanding Commercial Opportunities in the Biogas Sector in Canada, commissioned by Alberta Agriculture, Food and Rural Development	<a href="http://www.climatechangecentral.com/files/attachments/OpportunitiesInTheCanadianBiogasSector.pdf">http://www.climatechangecentral.com/files/attachments/OpportunitiesInTheCanadianBiogasSector.pdf</a>
A biogas commercial website that reviews solutions for agribusiness and agri-food	<a href="http://www.bioterre.com">http://www.bioterre.com</a>
Growing the Margins Conference and First Annual Canadian Farm and Food Biogas Conference and Exhibition, held in March 2009	<a href="http://www.gtmconference.ca/site/index.php/canadian-farm-and-food-biogas">http://www.gtmconference.ca/site/index.php/canadian-farm-and-food-biogas</a>
<b>Alternative energy specifics</b>	
Wind energy resources, Canadian Wind Energy Association (CANWEA)	<a href="http://www.canwea.ca/index_e.php">http://www.canwea.ca/index_e.php</a>
Solar energy resources at the Canadian Solar Industries Association	<a href="http://www.cansia.ca/Default.aspx?pagel=139835">http://www.cansia.ca/Default.aspx?pagel=139835</a>
Geothermal resources from the Canadian Geothermal Energy Association	<a href="http://www.cangea.ca/">http://www.cangea.ca/</a>
Government of Canada hydrogen economy portal, moving towards a hydrogen and fuel cell future	<a href="http://www.hydrogeneconomy.gc.ca/home_e.html">http://www.hydrogeneconomy.gc.ca/home_e.html</a>
<b>Programs or subsidies</b>	
Integration of Renewable Energy on the Farm website is a one-stop shop for on-farm renewable energy information and includes a summary of financial programs and other resources	<a href="http://www.farm-energy.ca/IReF/index.php?page=funding-programs-incentives">http://www.farm-energy.ca/IReF/index.php?page=funding-programs-incentives</a>
The Pembina Institute offers Sustainable Energy Solutions including resources for programs and provincial policies	<a href="http://re.pembina.org/canada/policies">http://re.pembina.org/canada/policies</a>
If you're experimenting with new technology or new methods, you may be eligible for significant tax credits through Scientific Research and Experimental Development. If you prefer working with a consultant, check out Incentive Access Group.	<a href="http://www.cra-arc.gc.ca/txcrdt/sred-rsde/menu-eng.html">http://www.cra-arc.gc.ca/txcrdt/sred-rsde/menu-eng.html</a> <a href="http://www.incentiveaccess.com/pages/aboutsred.html">http://www.incentiveaccess.com/pages/aboutsred.html</a>
Check out incentives to get gas guzzlers off the road including the National Vehicle Scrappage Program	<a href="http://www.ecoaction.gc.ca/news-nouvelles/20080604-eng.cfm">http://www.ecoaction.gc.ca/news-nouvelles/20080604-eng.cfm</a>

Energy statistics and general information	
Canada's Energy Future, reference case and scenarios to 2030 from the National Energy Board	<a href="http://www.neb-one.gc.ca/clf-nsi/rnrgynfmrn/nrgyrprt/nrgyfr/2007/nrgyfr2007-eng.html">http://www.neb-one.gc.ca/clf-nsi/rnrgynfmrn/nrgyrprt/nrgyfr/2007/nrgyfr2007-eng.html</a>
The World Energy Council presents annual survey of energy resources around the world	<a href="http://www.worldenergy.org/publications/115.asp">http://www.worldenergy.org/publications/115.asp</a>
Energy Information Administration offers a comprehensive list of official energy statistics from the U.S. government	<a href="http://www.eia.doe.gov/">http://www.eia.doe.gov/</a>
Check out these links or use a search engine like Google or Copernic to learn more about peak oil	<a href="http://www.peakoil.net/Publications/20040201ExxonMobil.pdf">http://www.peakoil.net/Publications/20040201ExxonMobil.pdf</a> <a href="http://www.energybulletin.net/primer">http://www.energybulletin.net/primer</a> <a href="http://www.peakaware.com/">http://www.peakaware.com/</a>
Planning for energy project	
Canadian Renewable Energy Network offers information on renewable energy sources, technologies and applications	<a href="http://www.canren.gc.ca/using/index.asp#about">http://www.canren.gc.ca/using/index.asp#about</a>
The Canadian Centre for Energy Information covers a range of topics from oil and natural gas, to solar, wind and alternative energy	<a href="http://www.centreforenergy.com/Silos/ET-CanEn01.asp">http://www.centreforenergy.com/Silos/ET-CanEn01.asp</a>
The Integration of Renewable Energy on Farms website helps you assess and plan renewable energy options for your farm	<a href="http://www.farm-energy.ca/iref">http://www.farm-energy.ca/iref</a>
Will your alternate energy project pay for itself? Find out with free Retscreen software that offers technical detail and benchmarks most alternate energies and technologies around the world	<a href="http://www.retscreen.net/ang/home.php">http://www.retscreen.net/ang/home.php</a>
Information, tools and resources will help you assess the renewable energy opportunity in your business	<a href="http://farmenergyonline.com/">http://farmenergyonline.com/</a>
Publications and buyers guides for renewable and electrical energy resources from Natural Resources Canada	<a href="http://www.energymanagementcanada.com/index.php/Digital-Editions.html">http://www.energymanagementcanada.com/index.php/Digital-Editions.html</a>
For urban agribusiness, LEED information, check out the free Energy Management online magazine	<a href="http://strategis.ic.gc.ca/epic/site/dsib-logi.nsf/en/h_pj00115e.html">http://strategis.ic.gc.ca/epic/site/dsib-logi.nsf/en/h_pj00115e.html</a>
The Small Farm Energy Primer includes information about solar collectors, panels, passive solar, wind and biogas	<a href="http://www.cfra.org/node/680">http://www.cfra.org/node/680</a>

Planning a green company or community	
Check out the Bio Village in Strathmore, Alberta. Energy TV features the village and other Canadian developments	<a href="http://crfuels.com/index.php/bio_village">http://crfuels.com/index.php/bio_village</a> <a href="http://energytv.com/videos/view/310/">http://energytv.com/videos/view/310/</a>
Using local goat and sheep milk, Ontario's Fifth Town Artisan Cheese Company is an environmentally and socially responsible producer of handmade cheeses. Their carbon neutral production and retail facility is aiming for LEED platinum.	<a href="http://www.treehugger.com/files/2007/10/green_cheese_fr.php">http://www.treehugger.com/files/2007/10/green_cheese_fr.php</a>
Some towns turn to sustainable energy through a transition plan and others, like Greenburg, Kansas, start from scratch.	<a href="http://www.inhabitat.com/2007/07/23/leonardo-di-caprio-to-build-eco-town-in-kansas/">http://www.inhabitat.com/2007/07/23/leonardo-di-caprio-to-build-eco-town-in-kansas/</a>
A network dedicated to significantly rebuilding resilience and drastically reducing carbon emissions	<a href="http://transitiontowns.org/TransitionNetwork/12Steps">http://transitiontowns.org/TransitionNetwork/12Steps</a>
An organization dedicated to energy reduction through exploration into the head, heart and hands	<a href="http://transitionculture.org/">http://transitionculture.org/</a>
Shanghai Greenport, metropolitan agriculture in China	<a href="http://www.greenportshanghai.com">www.greenportshanghai.com</a>
Conservation	
The Ontario Ministry of Agriculture, Food and Rural Affairs looks at on-farm energy generation and conservation	<a href="http://www.omafr.gov.on.ca/english/engineer/energy.html">http://www.omafr.gov.on.ca/english/engineer/energy.html</a>
This excellent energy audit from Quebec's Agriculture and AgriFood reference centre has guides for poultry, cash crops, pork and dairy (French only)	<a href="http://www.craaq.qc.ca/UserFiles/file/Visuel_Web_CRAAQ_IACA319_audits.pdf">http://www.craaq.qc.ca/UserFiles/file/Visuel_Web_CRAAQ_IACA319_audits.pdf</a>
Michigan State University offers information about improving tractor performance	<a href="http://www.msue.msu.edu/objects/content_revision/download.cfm/revision_id.490364/workspace_id.65638/Tractor%20Efficiency%20Fact%20Sheet.pdf/">http://www.msue.msu.edu/objects/content_revision/download.cfm/revision_id.490364/workspace_id.65638/Tractor%20Efficiency%20Fact%20Sheet.pdf/</a>
Information from FarmEnergy.org (Canada) and the National Sustainable Agriculture Information Service (U.S.)	<a href="http://attra.ncat.org/">http://attra.ncat.org/</a> <a href="http://www.farmenergy.org/aboutce/index.php">http://www.farmenergy.org/aboutce/index.php</a>
Reading list	
<i>The Hydrogen Economy</i> by Jeremy Rifkin, converting from oil dependence to a hydrogen-based system	<a href="http://www.amazon.com/Hydrogen-Economy-Jeremy-Rifkin/dp/1585422541">http://www.amazon.com/Hydrogen-Economy-Jeremy-Rifkin/dp/1585422541</a>
<i>Hot, Flat and Crowded</i> by Thomas Friedman, globalization, climate change and competition for energy	<a href="http://www.thomasfriedman.com/bookshelf/hot-flat-and-crowded">http://www.thomasfriedman.com/bookshelf/hot-flat-and-crowded</a>
<i>A Thousand Barrels a Second</i> by Peter Tertzakian, meeting the challenges of the oil break point in an energy-dependent world	<a href="http://www.1000barrels.com/aboutthebook.html">http://www.1000barrels.com/aboutthebook.html</a>
<i>Who Moved My Cheese</i> by Spencer Johnson, managing through times of transition	<a href="http://www.whomovedmycheese.com/gaining_change_skills/view.php?id=who_moved_my_cheese">http://www.whomovedmycheese.com/gaining_change_skills/view.php?id=who_moved_my_cheese</a>

Futurists speculate on what will happen in the future and generally have good track records. For more immediate term developments, look through company websites and speeches, presentations or publications.	
Dr. Patrick Dixon offers British perspectives and future trends for science, consumers and energy	<a href="http://www.globalchange.com">http://www.globalchange.com</a>
Dr. James Canton at the Institute for Global Futures discusses harnessing the power of innovation	<a href="http://www.globalfuturist.com/">http://www.globalfuturist.com/</a>
Futurist Jim Carroll focuses on agriculture. Check out his 10 words for business owners to keep their businesses relevant and adapting	<a href="http://www.jimcarroll.com/weblog/archives/000716.html">http://www.jimcarroll.com/weblog/archives/000716.html</a>
Lester Brown, a former producer, agriculture economist and president of the Earth Policy Institute, The Washington Post calls him one of the world's most influential thinkers	<a href="http://www.earth-policy.org/">http://www.earth-policy.org/</a>

## Footnotes

- <sup>1</sup> Hoffman, Jane and Michael. Green – Your Place in the New Energy Revolution. Palgrave, MacMillan 2008; presentation from PLASCO, Ontario, FITT Conference June 1 2008.
- <sup>2</sup> Tertzakian, Peter. One Thousand Barrels a Second. McGraw Hill 2007, p. 107.
- <sup>3</sup> Sovereign wealth funds come from budget surpluses in countries with little foreign debt, largely from oil proceeds. They are invested into equities, money and futures markets. They are separate from a country's foreign reserve and the liquidity it must hold to manage its currency and monetary policies. The biggest ones, in order, are United Arab Emirates with almost US\$1 trillion. Norway, Singapore, China, Kuwait and Russia each hold several hundred billion.
- <sup>4</sup> Economist James K. Galbraith says speculative demand for oil futures in summer 2008 was five times the actual stockpile and orders couldn't be met. Mother Jones, Sept 2008.
- <sup>5</sup> Report by the Science Applications International Corporation for the U.S. Department of Energy 2005 (Hirsch Report).
- <sup>6</sup> Climate Change 2007: The Physical Science Basis. Inter-government Panel on Climate Change: United Nations Environment Program (UNEP) and WMO, Paris.
- <sup>7</sup> Seth Borenstein, Associated Press Science Writer, Sept. 26, 2008.
- <sup>8</sup> One producer recalls the advent of electricity in his 1950s home and says he had less money then, than during the Great Depression! As soon as there were plugs in walls, he bought a fridge and stove. In those days, appliances easily cost double a month's income. Although expensive, it increased the quality of life. Lionel Kambeitz, CEO HTC Purenergy, family story.
- <sup>9</sup> Dahl, Eric J. Naval innovation: from coal to oil. Joint Force Quarterly, Winter 2000.
- <sup>10</sup> [http://attra.ncat.org/attra-pub/PDF/biodiesel\\_on\\_farm.pdf](http://attra.ncat.org/attra-pub/PDF/biodiesel_on_farm.pdf)
- <sup>11</sup> Known for its medicinal properties, a jatropha plant is a small tree or shrub that will grow in gravel, sand and saline soils. Jatropha oil is seen as an excellent input to biodiesel.
- <sup>12</sup> "Who will reap the wind?" – The Montreal Gazette, Sept. 08 2007.
- <sup>13</sup> Photovoltaic cells are usually made of specially treated silicon, which transfers solar energy from the sun to electrical energy.
- <sup>14</sup> Peter Tertzakian, Chief Energy Economist at ARC Financial Corporation client seminar, Sept. 17, 2008, Calgary and T. Boone Pickens ([www.pickensplan.com](http://www.pickensplan.com)) are proponents of natural gas.
- <sup>15</sup> Jeremy Rifkin, The Hydrogen Economy. 2003; Thomas Friedman, Hot, Flat and Crowded. 2008; and Lionel Kambeitz, CEO HTC Purenergy envision a hydrogen future.

<sup>16</sup> Ed McCallum, Senior Principal, McCallum Sweeney Consulting, Inc.

<sup>17</sup> One of Canada's 50 Best Managed companies, Yanke operates a fleet of 400 trucks.

<sup>18</sup> The Shanghai Greenport is in Phase 1 of construction and will be showcased to the world at the 2010 World Expo. [www.greenportshanghai.com/film.php](http://www.greenportshanghai.com/film.php)

<sup>19</sup> [www.transitiontowns.org/Totnes](http://www.transitiontowns.org/Totnes)

## Sources

Figure 1 – World Energy Council: 2007 Survey of Energy Resources

Table 1 – Natural Resources Canada Reference Case, Centre for Energy, U.S. Department of Energy; "The Future of Energy". Mother Jones. May/June 2008.

Figure 2 – oil barrel data: U.S. Department of Energy (DOE); farm-level data: Centre de référence en agriculture et agroalimentaire du Québec (CRAAQ).

Figure 3 – [www.lifeaftertheoilcrash.net](http://www.lifeaftertheoilcrash.net)

Figure 4 – [www.opec.org](http://www.opec.org)

Figure 5 – World Energy Council: 2007 Survey of Energy Resources; Energy Information Administration

Figure 6 – Adapted from OPEC, Petro Canada, Energy Information Administration (U.S.), and CNNMoney.com

Figure 7 – [www.globalfirepower.com/list\\_oil\\_prod.asp](http://www.globalfirepower.com/list_oil_prod.asp)

Figure 8 – [www.ucsusa.org/global\\_warming/science\\_and\\_impacts/science/each-countrys-share-of-co2.html](http://www.ucsusa.org/global_warming/science_and_impacts/science/each-countrys-share-of-co2.html); World Energy Council: 2007 Survey of Energy Resources

Figure 9 – Adapted from Natural Resources Canada; The Economist. "The Power and the Glory – a special report on energy", June 21, 2008 and Tertzakian p.166

Figure 11 – Adapted from [www.inflationdata.com](http://www.inflationdata.com); [www.farmdoc.uiuc.edu/manage/pricehistory/PriceHistory.asp](http://www.farmdoc.uiuc.edu/manage/pricehistory/PriceHistory.asp); [www.Globeinvestor.com](http://www.Globeinvestor.com); Energy Information Administration; [www.wtrg.com/prices.htm](http://www.wtrg.com/prices.htm)

Figure 12 – Energy Information Administration and [www.tradescorner.ca](http://www.tradescorner.ca)



Farm Credit Canada is proud to present Knowledge Insider, a semi-annual publication offering thought-provoking information to producers and other agriculture entrepreneurs. Trends described in this document are supported with facts and figures and examined in the context of what's on the horizon for Canadian agriculture.

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