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**MEDIA
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March 2013

CONSTRUCTING ONTARIO

3

FACTS ABOUT THE
CONSTRUCTION
INDUSTRY



**HOW ONTARIO IS
BEING SHAPED
FOR THE FUTURE**

Exploring the advancements in **engineering,
design, and construction.**

CHALLENGES

The industries that are making the **growth of Ontario** possible show a **large increase in job opportunities.**



It's a bright future for skilled labourers

In the wake of the worst global economic downturn since the great depression, Canada's second largest goods producing industry is booming and this year will top \$300 billion and account for approximately 13 percent of our national GDP.

Soaring skyline

In Ontario, building permits reached record levels in 2012 and with rebounding corporate profits and strong commodity prices, economists are projecting steady growth for 2013 and beyond. Non residential construction will be particularly strong for the foreseeable future with programs like Ontario's long term energy plan paying enormous dividends as the province transitions to "clean" energy and undertakes to meet the ambitious commitment of coal free power by 2014.

More significant still is Ontario's long term infrastructure plan, Building Together, which includes unprecedented public investment

in such things as hospitals, public transit, schools, and highways. As a result, Ontario's design and construction industry now employs just shy of 500,000 people.

In municipal terms, Toronto has the highest number of high-rise buildings under construction on the continent (185). By contrast, Mexico City and New York City have a fraction the number of high-rise developments under construction (88 and 80 respectively) and there is little evidence that trend will change any time soon.

There is always a risk the bubble will burst, of course, but artificially low interest rates have restored pre-recession levels of private sector spending and diminished confidence abroad is attracting billions in foreign investment. Even the condominium market, notwithstanding slower sales in recent months, has 207 projects and 56,336 units currently under construction. Simply put, the construction business is booming!



John Mollenhauer
President and CEO,
Toronto Construction Association

Looking to the future

Looking ahead, construction employment will continue to rise sharply as a consequence of these record levels of construction and analysts fear the industry is facing a sizable skilled labour shortage. The Construction Sector Council estimates 320,000 new workers will be required between now and 2020 to meet the increased construction demand and compen-

sate for the much publicized aging workforce. The industry is predictably doing all it can to ensure supply keeps pace with demand but the accelerating loss of the baby boomer generation due to retirement is a considerable challenge and the combined effort of industry and government to attract and train skilled journeypersons isn't currently sufficient to offset the fact that a baby boomer turns 65 every 8 seconds.

For Ontarians, an imminent skilled labour shortage represents an opportunity. With a little training, the province of Ontario has the wherewithal to virtually eliminate unemployment. And opportunities abound for every skill set, particularly as we begin a new era of specialization and diversity.

The bottom line is that the future is very bright for architects, engineers, constructors and skilled trades so buckle up and enjoy the ride.

JOHN MOLLENHAUER
editorial@mediaplanet.com



WE RECOMMEND



Hazel Farley
The growth of green building in Southern Ontario

PAGE 4

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Publisher: Christian McDowell
christian.mcdowell@mediaplanet.com
Business Developer: Martin Kocandrlje
martin.kocandrlje@mediaplanet.com
Designer: Laura Shaw
laura.shaw@mediaplanet.com
Managing Director: Joshua Nagel
joshua.nagel@mediaplanet.com
Editorial Manager: Maggie Ritchie
maggie.ritchie@mediaplanet.com

Contributors: Glen Ackerley, Emilie Adams, Sal Bianco, Alex Carrick, Denis Dixon, Hazel Farley, Jackie Kelly, Abe Khademi, Karen Leibovici, John Mullenhauer, Joe Rosengarten
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NEWS

ONTARIO'S ECONOMIC OUTLOOK IS RELATIVELY ROSY

INTO THE SPOTLIGHT

Over the last decade, Ontario's economy has generally avoided the national spotlight. The bigger news items have featured job creation and population explosions in the resource-rich regions of the West and East. Alberta, Saskatchewan, and even Newfoundland and Labrador have been benefiting from increased raw material sales to the emerging world on the far side of the Pacific Rim and elsewhere overseas. The emphasis may be shifting back to the centre.

At the present time, commodity prices are mainly flat and below their previous peaks, while industry in Ontario and Quebec has been benefitting from its close ties to the U.S. economy.



Alex Carrick
Chief Economist,
Reed Construction Data Canada

The population of Ontario at 13.5 million accounts for nearly 40 percent of the nation's total, which has recently risen above 35 million.

A growing province

Ontario is adding about 130,000 people per year, which is the equivalent of another city the size of Peterborough. A great deal of infrastructure construction is needed to support such a large advance in the province's demographic profile. No wonder there's an emphasis on transit projects in the region. Toronto has ongoing and upcoming subway and light-rail lines. An extension of the Spadina subway line to Vaughan will also serve students at York University. An Eglinton LRT system is in the works and Toronto's mayor, Rob Ford, wants to proceed with a subway extension along Sheppard Avenue to the Scarborough Town Centre. So far, he's been stymied in his ambitions. Highway work will also continue to

be important in the province. More "406" construction is planned in the Niagara Region and Highway 404 is being extended north of Bradford.

Major projects underway

The Toronto construction scene is benefitting from a solid base provided by the Pan Am and Parapan Am Games to be hosted in 2015. The construction of venues—from arenas, swimming, and biking complexes and living quarters for the athletes—is mostly underway.

Hamilton is building a new Ivor Wynne Stadium for the Tiger Cats in the CFL, but the new facility will also serve to host soccer matches when visitors from both North and South America come to town in 2015. Windsor is seeing an

improved auto sector, plus it can look forward to construction of a second bridge over the river separating it from Detroit, at a cost of a billion dollars plus.

Despite a generally optimistic outlook for Ontario, there are several worries. Toronto's condo market won't likely stay as buoyant; the auto sector is coming under pressure from aggressive global competitors; and the province's financial situation could certainly be better.

But relative to many other locales, we in Ontario have good reason to be content.

ALEX CARRICK

editorial@mediaplanet.com



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NEWS

The growth of green building in Southern Ontario

FACT

2

IN 2012, 346 LEED PROJECTS WERE CERTIFIED IN CANADA WITH 160 OF THOSE BEING IN ONTARIO

Established in 2002, the Canada Green Building Council (CaGBC) is a non-profit national organization dedicated to leading and accelerating the transformation to high-performing, healthy green buildings, homes, and communities throughout Canada.

Buildings have a dramatic impact on our environment. Not only do they consume vast amounts of our natural resources, they also contribute highly to climate change. By building green, we can greatly reduce these environmental impacts. Green buildings differ from conventional buildings by integrating environmental and social initiatives that result in a reduction of their environmental impact while improv-

ing building performance and providing healthier interiors for occupants.

Certification

Leadership in Energy and Environmental Design (LEED) is a third-party certification program and an internationally accepted benchmark for the design, construction and operation of high performance green buildings. As an internationally recognized mark of excellence, LEED provides building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance.

LEED promotes a holistic approach to sustainability by recognizing performance in five key areas of human and environmental health, which include sustainable site development, water efficiency, energy efficiency, materi-



"The benefits of green building are numerous and the potential for the industry's growth is substantial."

Hazel Farley
Executive Director,
Greater Toronto Chapter,
Canada Green Building
Council

als selection, indoor environmental quality. Through certification over the past decade, LEED Canada has transformed the way built environments are designed, constructed, and operated.

The green building industry continues to grow and increase its impact every year across Canada, and this has been especially evident in Southern Ontario. In 2012, 346 LEED projects were certified in Canada and over 160 of those were in Ontario. Green construction methods can be integrated into buildings at any stage, from design and construction, to renovation and deconstruction. The most significant benefits can be obtained if design and construction processes take an integrated approach from the earliest stages of a building project. It is imperative that Southern Ontario's building industry continues

to integrate green construction methods into building projects whenever possible so that the province can profit from its environmental, social and economical benefits.

The benefits of green building are numerous and the potential for the industry's growth is substantial. Building tenants can expect lower operating costs through their commitment to creating a healthier, cleaner environment, which in turn means more satisfied occupants and employees. Moreover, building owners and operators will gain financial benefits and gain a competitive advantage by obtaining the tools required to improve building performance.

HAZEL FARLEY

editorial@mediaplanet.com



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NEWS

CONSIDERING MORE THAN THE BOTTOM LINE

■ Question: Why is it important that the construction industry moves to a greener and more sustainable model?

■ Answer: There are simply not enough resources, money, or energy to build what's needed for the future if we maintain traditional methods of design and construction.

Ten years ago, the American Institute of Architects stated that seventy five percent of the space that needed to functionally support our residential and business requirements in 2030 does not exist today.

“To build smarter, with less, is critical,” said Rick Huijbregts, VP, Industry and Business Transformation at Cisco Canada. “We’ve got to be more intelligent about how

we design, build, and use our buildings to reduce the energy consumption and environmental footprints. Buildings in cities consume more than forty percent of our total energy, of which, half is wasted.”

New point of view

For decades, the priority of the construction industry has been value for money. The success of a completed project would be measured by its ability to stick to budget and be completed on time. For the industry to become truly sustainable, this, says Huijbregts, has to change.

“There is no shortage of suppliers and vendors that have incredible solutions for environmental, economic, and social sustainability. We need to move away from a low cost procurement model to a

high-value network collaboration model.”

For the construction industry to have successful green policies in place, Huijbregts believes

“To build smarter, with less, is critical.”

that a shift in educational focus required. “It’s a transition that the educational industry needs to go through. Certain educational institutions have a proactive approach, they show great interest in shaping their future curriculum in collaboration with the industry,” he said.

“We will need industry specific content for those learning to become designers, builders, and building operators, but the key is to get the main aspects of sustainabil-



Rick Huijbregts
VP, Industry and Business Transformation, Cisco Canada

ity, such as concepts of environment, energy and cost, into education earlier on.”

By instilling a mindset of economic and environmental sustainability into students, educational institutions have the opportunity to help create a Canadian construction industry that is fully in tune

with the true effects of its energy consumption and sustainability footprint.

Michael Grossman, Project Manager of Sustainable Building at Urbacon, has a similar viewpoint. He says “energy efficiency is obviously the cornerstone of what makes a Sustainable Building. But the true harbinger of a sustainable building is occupant comfort and functionality. If my building is difficult to manage, and my occupants are not spending their time in my building feeling better there than they do elsewhere, than I have forsaken the essence of a Sustainable Building”.

JOE ROSENGARTEN
editorial@mediaplanet.com

Developing a more sustainable Ontario.

The new George Brown College Green Building Centre connects the Canadian construction sector with applied research in green construction and sustainable building practices.

Bring us your innovative ideas. We work with industry to develop, test, and commercialize green building technology, including sustainable building products and processes. We can help you take your green building ideas from concept to commercialization.

Together we will make Ontario a more sustainable place to live, learn and work. A place that's built to last.



The George Brown College Green Building Centre:
Enabling the innovation economy.

georgebrown.ca/green



The Green Building Centre was funded with the support of the Economic Action Plan through the Federal Economic Development Agency for Southern Ontario.

NEWS

Projections for the engineering labour market

Engineers Canada released *Engineering Labour Market in Canada: Projections to 2020* in January 2013, which shows that Canada is facing a short supply of engineers with 5 to 10 years of specialized experience. A projected 95,000 professional engineers are expected to retire across the country by 2020.

Engineering market in Ontario

Engineering labour market conditions vary from region to region. In Ontario, resource projects in the north, and utility, infrastructure and construction projects in most regions, will lead to new engineering jobs, particularly for mining and civil engineers.

Improvements in the manufacturing sector will mean more

demand for industrial engineers. There is also potential for job growth in the aerospace sector.

“This report helps engineers, students, employers, and governments plan for the future requirements of the Canadian engineering labour market,” said Kim Allen, FEC, P.Eng., chief executive officer of Engineers Canada. “In order for Ontario to keep engineers in the province and meet the coming labour market demands, the province must find ways to strike a balance between retiring workers and training new graduates and international engineers interested in working in Canada.”

Engineering market in the rest of Canada

Throughout the rest of Canada, there is currently more need for engineers in the west than in the east, with demand highest in British Columbia and Alberta, focused on strong mining, oil and gas and manufacturing

sectors, and expansion in resource, utility and infrastructure projects. Requirements to replace retiring engineers with more than ten years of experience and specialized skills is



RETIREMENT RATES

This shift in the industry is going to create lucrative career opportunities.

greater than the number of new jobs created by economic growth.

Despite the skills shortage, new graduates from engineering pro-

grams and recent immigrants to Canada may have difficulties finding jobs, because their skills and experience do not yet match specialized employer needs.

training programs to enhance work experience for new and international engineering graduates, recruiting more engineers in the west through post secondary programs and immigration, and added flexibility and transfer of specialized engineering services across regions and specialities.

About the labour market study report

The report is the third update in Engineers Canada’s analysis of engineering human resources issues in Canada. It explores demographic trends and job growth projections, including an overview of disciplines and geographical markets, such as occupations by province, and a new economic background.

The report is produced in partnership with Randstad Engineering.

EMILIE ADAMS,
ENGINEERS CANADA
editorial@mediaplanet.com

FROM GRADUATE TO PROFESSIONAL

In Ontario, the P.Eng. designation represents high standards of engineering knowledge, experience, and professionalism.

It tells employers that you’re committed to engineering excellence; have the right skills, education, and attitude; and are a responsible professional with the proven problem-solving abilities to help their business build business. To become a professional engineer (P.Eng.) in Ontario, you must be licensed by Professional Engineers Ontario (PEO).

From past to future

For more than 90 years, PEO has

governed its licence and certificate holders and regulated professional engineering practice to serve and protect the public of the province. Under the Professional Engineers Act, PEO establishes the educational, experience and other requirements for licensing, and disciplines licence and certificate holders who fail to maintain the expected standards of practice. PEO also raises public awareness of its role and of engineering as a licensed profession. Only a PEO licence holder can take responsibility for professional engineering work in Ontario; only a PEO Certificate of Authorization holder can offer or provide engineering services to the public.

Recent PEO initiatives have made it easier for applicants from outside Canada to apply for and become licenced. The Professional Engineers Act no longer requires that an applicant be a Canadian citizen or landed immigrant to become licensed. PEO research had shown that a misunderstanding of the residency requirement was the primary reason for newcomers waiting to apply for a licence. With the elimination of the residency requirement, many qualified applicants can now arrive in Canada having met most of the licensing requirements and be ready immediately to enter the engineering workforce.

Immigration

In addition, engineering graduates, newcomers to Canada, and unlicensed people working in industry may be eligible to have their Ontario licence application fee waived under



Denis Dixon,
P.Eng., FEC
President,
Professional
Engineers Ontario

“Since 1922, the Professional Engineers Act has set the bar for practice in a profession in which public safety—in its broadest sense—is paramount.”

the association’s Financial Credit Program. Eliminating this potential financial hurdle ensures that everyone with appropriate qualifications has an equal opportunity to apply for a P.Eng. licence.

Since 1922, the Professional Engineers Act has set the bar for practice in a profession in which public safety—in its broadest sense—is paramount. PEO protects and serves the public by ensuring all PEO licence holders are qualified—and by licensing all who qualify—as well as by holding licence holders professionally accountable for the outcomes of their work.

Ontario P.Engs are part of a community of more than 80,000 PEO licence and certificate holders committed to enhancing the quality of life, safety and well-being in the province.

DENIS DIXON
editorial@mediaplanet.com

NEWS

ALL-ENCOMPASSING TECHNOLOGY

TECHNOLOGY

Building Information Modeling (BIM) is a process in which a digital prototype of a building is produced to exactly replicate the physical characteristics and behaviours of that construction. It's a system that can help the construction industry save time and money by increasing efficiency and productivity.

"The idea is that you have an integrated team working on a shared platform for the design, analysis, and construction of a building," explained Professor Daniel Forgues, Department of Construction Engineering, École de technologie supérieure, Montreal. "BIM can streamline everything from planning to opera-

tion. It can save up to twenty per cent on the cost of projects because of the better management of information."

Collaboration

Instead of using hundreds of physical drawings and construction plans, BIM uses 3D projections and stores each piece of relevant design information in a database, ensuring efficient sharing of information between the different agencies involved in the construction process.

"The group that most appreciate BIM is general contractors because for them badly constructed drawings are a real nightmare. It can provide huge savings for clients, because instead of dealing with a problem when you are building,



COMPUTERS VS PAPER
The ability to alter plans on the go has many advantages over traditional drawings.

you can spot it earlier and modify designs on a computer."

BIM's ability to pool information gives contractors better opportunity to source materials that will help minimize energy consumption. Paul Seager, professional engineer, explained, "One aspect that can be exploited is the ability to develop other linked databases of information concerning sustainable materials, such as, types, energy content, logistics for transportation, etc. Such "smart" data can assist designers and contractors regarding selection of low carbon footprint materials and methods of construction."

Long term management

After construction, BIM provides

building managers with access to important information about the characteristics of their building, making general maintenance more efficient, organized and easier to predict.

Seager said, "operational related information, such as testing reports, commissioning results, manufacturers operating and maintenance literature and service call records can all be added to the database associated to each piece, or class, of equipment. This information is the foundation for developing a preventative based maintenance system, as well as managing event based maintenance."

JOE ROSENGARTEN

editorial@mediaplanet.com

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GET TO KNOW OUR TEAM OF COMPETENT AND PASSIONATE BUILDERS WHO SHARE A COMMON GOAL: YOUR SUCCESS

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INSPIRATION

First priority: safety in the workplace

■ Question: Why is it so important for construction leaders to implement workplace safety initiatives?

■ Answer: A construction site can be littered with hazards. Without health and safety training, and equipment, construction workers are at risk each time that they step onto a site.

Stronger implementation of government health and safety standards has seen the actions of organizations within building operations come under close scrutiny.

“Organizations are very concerned with being compliant to government regulations,” said Chris Conway, President, Chief



Jay Peterson
Industry
Representative,
Ontario Sheet
Metal Workers

Staff Officer, Building Owners and Managers Association, (BOMA) Toronto. “There are inspectors going around to check that policies are in place and the government is routinely issuing fines to companies that aren’t compliant.”

The decision of government to publicize punitive measures gives organizations more impetus to meet regulatory requirements. Conway said, “Getting a fine draws a lot of negative attention. It can

overshadow everything else that’s going on. It’s in everyone’s interests to be doing things in the right way.”

It’s the law

Modern health and safety policies state that safety clothing and equipment must be available to all persons on site. Bob Wood, President of G&K Services Canada Inc., believes that by providing its workforce with protective apparel, a building operator can encourage safety and maintain consistency among work staff.

“Uniforms and safety apparel are more than just clothing. The right garments help protect businesses and their employees by minimizing risk,” said Wood. “Uniforms

also help build group morale, they provide each worker with a sense of belonging to a greater whole and project a professional and consistent image to the public.”

Jay Peterson, Industry Representative for Ontario Sheet Metal Workers, thinks that the best way of educating construction workers on health and safety issues is through demonstrative training. “Meaningful training, where workers get involved, where they can demonstrate that they have the adequate knowledge, that is what is required. If they can’t demonstrate it, they haven’t had the correct training.”

Shared responsibility

In such a fast moving and tran-

sient industry, implementing all of the rapidly evolving government standards and legislature is a challenge. Peterson believes that a collaborative model, with all areas of the industry coming together, is what’s required. He said, “health and safety policies look great but it comes down to action and collaboration.

The smart people make health and safety a number one issue, because if you have a healthy workplace you have a happy workplace, and therefore, a more productive workplace.”

JOE ROSENGARTEN

editorial@mediaplanet.com



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QUESTION & ANSWER WITH NICK STARK



Nick Stark
Principal, VP Knowledge
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■ What role do engineers play in helping to develop more sustainable projects?

Arguably the most important role energy efficiency has the greatest impact on sustainability. With some building types the exterior envelope is the major contributor to energy use, so the approach to heating and cooling is critical. But with many

building types, such as hospitals, the interior processes dominate, with ventilation and lighting being the prime consumers. The engineer modelling the energy use needs to work with the integrated design team to find optimum solutions, taking into account how the facility will be used.

One aspect of sustainability often overlooked is the long term utility of what is being constructed. With the huge upfront investment of resources in a new facility, is it robust, and has it been designed to be flexible and adaptable over its life?

JACKIE KELLY

editorial@mediaplanet.com

BOMA

Toronto

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INSIGHT

INVESTING IN INFRASTRUCTURE GENERATES SEVERAL LONG TERM BENEFITS

ECONOMY

The release of the Canadian Infrastructure Report Card last September should have been a wakeup call to all governments. Now, with the federal government poised to unveil its plan for future infrastructure investments, we will see if the call was heard.

The report, which FCM produced in partnership with the Canadian Construction Association (CCA), the Canadian Public Works Association (CPWA), and the Canadian Society for Civil Engineering (CSCE), found that much of our country's infrastructure is at risk and with it the standard of living, quality of life, and safety of all Canadians.

Ontario's backbone

While future reports will look at the state of other aspects of our physical foundations, this first edition measured the condition of our roads, drinking water, wastewater, and storm water systems. And its findings are sobering.

- One third of the infrastructure assessed needs significant repair or upgrades.

- Canada's municipal roads are crumbling beneath our feet and falling behind the needs of our growing economy and population.

- About 15 percent of our municipal drinking water infrastructure requires immediate repair or upgrades.

- Large portions of our wastewa-

ter infrastructure have been made inadequate or obsolete by new federal wastewater treatment standards. Over the next 20 to 30 years, one out of every four wastewater systems across Canada will need to be substantially upgraded, at a cost of more than \$20 billion.

Without immediate improvement and ongoing maintenance, the cost of fixing the assets studied will explode over the next decade. Without adequate maintenance, \$170 billion dollars would be needed to replace them—that's about \$13,700 for every taxpaying household across the country.

Municipalities are responsible for about 60 percent of the country's infrastructure but they collect

just 8 cents of every tax dollar paid in Canada. They simply don't have the fiscal tools to maintain the country's infrastructure alone and Canadians can't afford the price tag that comes with inaction.

This is why the Federation of Canadian Municipalities along with numerous other groups and organizations has urged the Government of Canada to put in place a new long-term infrastructure plan to replace the programs set to expire in 2014.

Built to last

The new plan must deliver secure, stable and sufficient funding so municipalities can continue providing Canadians with safe roads,

clean drinking water and environmentally sound waste water facilities.

Since it was first elected in 2006, the current government has been leading change in how the federal government funds infrastructure in this country.

Today, as we wait for the government's plan, we hope it has taken note of the pressing needs in our communities and that it will continue taking bold, innovative steps toward building a stronger economy and safe communities.

KAREN LEIBOVICI,

PRESIDENT,

FEDERATION OF

CANADIAN MUNICIPALITIES

editorial@mediaplanet.com



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PANEL OF EXPERTS



Question 1:

What is the best strategy for funding long term infrastructure projects?

Question 2:

Will the growth of Toronto be able continue at its current pace, or is there a plateau in sight?



Glenn Ackerley
Partner,
WeirFoulds LLP

The key to the development of successful infrastructure projects is stable, predictable, and long-term funding on the part of all levels of government. While alternative approaches to financing public projects through the private sector allows projects to proceed using non-governmental funding, the costs are still ultimately borne by the public. A long range plan and a firm commitment by the public to invest in infrastructure is therefore critical. This allows the construction industry to plan and grow to meet the demand in a strategic way.

The volume of construction in Toronto, particularly in the high-rise condominium sector, has been remarkable. Defying some predictions, the demand for new units appears to remain steady. This pressure will continue to fuel construction activity, including work in supporting infrastructure projects, such as transit. The completion of those transit projects, under construction and planned, will in turn spur future development along new subway lines. Office projects also continue to be proposed. The level of activity does not seem to be slowing down.



Abe Khademi
Senior Associate
& Sustainability
Manager,
The Municipal
Infrastructure
Group

Current funding deficits are the result of short term planning, near term priorities and denial of the true cost of supporting our communities. Stable, dedicated and long term funding sources from senior levels of government, such as the gas tax, would be necessary to support a more holistic planning approach. Planning for a more distant time horizon, with greater care, prioritized fiscal responsibility and consideration for life cycle costs would yield the strategies needed to sustain our communities in perpetuity and with greater resilience to an ever changing future.

Toronto has the advantage of being next door to an abundant source of freshwater, which doubles as a boundless repository for treated waste. So with appropriate infrastructure planning and ignoring fluctuating global, national and local economics, the potential for a radically changing climate or variable governance models, there is no reason why Toronto should not continue to grow sustainably for the foreseeable future.



Sal Bianco
Partner, National
Engineering,
Construction
Leader, Audit and
Assurance Group,
PwC

Funding strategies depend on the type of project as well as the expected risks, costs and returns. For example, the P3 model (a public-private sector partnership) is often used for larger projects like roads, airports, transit, energy and power and enables government to receive assistance from private corporations to bring these developments to life. In other cases, particularly where there is a likelihood of low return on investment, hybrid P3 models are used or projects are fully funded by the public sector.

Urban growth depends on the economy, and the key for a thriving city is to have the systems in place to support the highs and lows and weather the changing patterns of growth while adapting to societal changes. In Toronto's case, despite predictions of a plateau, the city is booming. And, with many projects in place to revitalize the city—from office towers to condos to sporting venues to transit expansion—the future looks bright.

“Take the  by the horns.”

We know wrangling a P3 project, design-build undertaking or RFP process is no simple task. With recognized expertise in planning and structuring infrastructure and construction projects, WeirFoulds is leading the way to get the job done – and all before you start seeing red.



Ontario's Energy Advantages Offer a Better Environment and Economic Prosperity



By DON MACKINNON
President
Power Workers' Union

Canada's economic success is clearly linked to rapid fossil fuel development, which makes better management of greenhouse gas emissions (GHG) imperative. Ontario has two natural energy advantages that can help deliver significant environmental and economic benefits for all Canadians—a successful nuclear reactor technology and vast biomass resources. Nurturing these advantages to meet their potential requires provincial and federal leadership working collaboratively to make the necessary investments.

Environment Canada data estimates that by 2020, GHG emissions from the oil sands will exceed those from all transportation and electricity generation in Canada and the total emissions of every province except Alberta and Ontario. Both major oil sands extraction techniques, mining and "in situ" will contribute; however, in situ production is more GHG intensive and will overtake mining by 2017.

Failure to mitigate these rising emissions will come with a substantial economic cost for all Canadians. A September 2011 National Roundtable on the Environment and Economy (NRTEE) report concluded that unless GHG emissions are reduced, the economic impacts of climate change on Canada could be billions of dollars per year.

Leveraging Canada's successful CANDU reactor technology can help mitigate GHG emissions. This can be accomplished by continuing support for current mining operations and ongoing reactor refurbishments; constructing two new reactors at the Darlington Generating Station in Ontario; building new reactors in western Canada to help with in situ oil sands production; and revitalizing international reactor sales initiatives.

Globally, nuclear generation avoids two to three billion tonnes of carbon dioxide emissions per year, while in

Canada CANDU reactors have avoided 2.4 billion tonnes of GHG emissions since 1972. On an annual basis Canada's CANDU fleet avoids about 90 million tonnes of GHG emissions, the equivalent of about 18 million cars, or about 12 percent of Canada's total emissions. As well, these nuclear reactors have helped Canada avoid 48.9 million tonnes of sulphur dioxide emissions since 1972.

Canada's \$6 billion plus a year nuclear industry supports 160 supply chain companies and 60,000 high value jobs. According to a 2012 study done by the Canadian Manufacturers and Exporters for the Canadian Nuclear Association, new investments in Canada's nuclear industry could drive an estimated 40 percent growth in the industry's Canadian workforce over the next five years. Building a new two-reactor power plant at Darlington will directly employ more than 10,000 people, and will support employment for over 10,000 others in Canada, for approximately a five-year period.

Ontario's forest and farms can provide extensive supplies of carbon neutral biomass fuel in the form of wood wastes, agricultural residues and purpose grown crops on marginal lands.

Further GHG reductions and more jobs and economic benefits can be realized by converting Ontario's coal stations to utilize this domestically sourced, renewable fuel along with natural gas for peak supply needs.

Besides reducing GHG emissions, these valuable, provincially owned generation assets and their associated transmission lines are recycled and Ontario's energy security is improved as natural gas imports from the U.S. are reduced. Investments in biomass fuel supply chain infrastructure are estimated to create about 1,500 jobs and contribute about \$600 million annually to Ontario's GDP. These investments will also support Canada's emerging bio-economy sector.

Ensuring Canadians have clean, affordable, reliable and secure electricity for the future while creating tens of thousands of jobs and economic wealth requires federal and provincial support for investments in CANDU technology and Ontario's biomass resources. Specifically, Ontario must get on with selecting Enhanced CANDU 6 technology for its new

reactors and converting its coal stations. Federal government support is needed to secure project financing and encourage CANDU reactor sales in other provinces and countries.

The NRTEE aptly defined our collective challenge as "not just coping with climate change, but prospering through it". Ontario's energy advantages can help deliver both.



ONTARIO'S ENERGY ADVANTAGES CAN HELP CANADA TACKLE CLIMATE CHANGE

Last summer's U.S. drought, Hurricane Sandy and Australia's current heat wave have the spotlight back on climate change.

Canada's National Roundtable on the Environment and the Economy aptly defined our collective challenge as "not just coping with climate change, but prospering through it".

Canada's economic success is clearly linked to rapid fossil fuel development, which makes better management of greenhouse gas emissions imperative.

Ontario has natural energy advantages—CANDU nuclear reactors and vast renewable, farm and forest-sourced carbon neutral biomass resources—that can help.

We need political leaders working together to make smart investments that ensure clean, affordable, reliable and secure electricity for the future while creating tens of thousands of jobs and economic wealth.

- Refurbish Ontario's nuclear fleet
- Build new CANDU reactors in Ontario and to help develop the oil sands
- Convert Ontario's existing coal stations to use domestically sourced, biomass along with natural gas

For more information go to www.abetterenergyplan.ca

**FROM THE PEOPLE WHO HELP
KEEP THE LIGHTS ON**

