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INFRASTRUCTURE INSIDER

LAVERY LAWYERS

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The latest developments in the Canadian infrastructure market

Author: Gérard Mounier

New developers admitted to SaskPower's 200 MW wind energy call for tenders

In response to industry demands, SaskPower has expanded the shortlist of respondents to its request for proposals for 200 MW of wind power generation.

The following companies have been added as eligible developers:

- Suncor Énergie
- Samsung C & T Corporation
- ENGIE Canada
- TransAlta Corporation
- Algonquin Power
- Invenergy
- Potentia Renouvelables

SaskPower plans to announce the winning bidder in the fall of 2018 with the goal of starting commercial operations in early 2021.

As mentioned in our last newsletter, the Infrastructure Insider, dated December 18, 2017, SaskPower plans to sign two 25-year electricity purchase agreements.

Colas acquires Miller McAsphalt Corporation

Miller McAsphalt Corporation, a private company based in Markham, Ontario, and Colas Canada, the Canadian subsidiary of Colas SA, itself a subsidiary of the French Bouygues group, announced on August 31, 2017, the conclusion of a business agreement to create one of Canada's leading construction and active transportation infrastructure companies.

According to information reported by InfraAmericas, Colas Canada will acquire 100% of the shares of the Ontario company for about $1.09 billion, about 12 times the operating profits of the Miller Group and McAsphalt. The transaction should be concluded in 2018, subject to regulatory approval.

The transaction includes the road construction and maintenance companies of the Miller Group as well as McAsphalt, a company that supplies asphalt products, related services and technologies. The other Miller McAsphalt companies – marine fuels, waste management, public transit and environment and real estate companies – are not included in this transaction and will continue to be managed independently.

Miller McAsphalt was founded in 1970 and today employs over 3,300 people in Canada. Miller Group companies have participated in projects such as the 407 Express Highway in Ontario, improvements to the Sea to Sky Highway in British Columbia and the Fredericton-Moncton Highway. The company is currently participating in the extension of Highway 427 in Ontario.

Colas' main activity is road construction and maintenance, and Colas Canada now employs 4,300 people in seven provinces and territories. Colas' national network of companies is vertically integrated and operates in a decentralized manner. The operating companies and its subsidiaries have distinct trade names and each company is responsible for business in its respective region across the country, including the control and operation of their own plants, quarries and testing and engineering facilities.



DONG Energy forms a partnership for the British Columbia offshore wind project

On September 13, 2017, DONG Energy announced it had signed a letter of intent with NaiKun Wind Energy Group to develop a wind project off the coast of British Columbia.

The project will be located in Hecate Strait, between Haida Gwaii and Prince Rupert. The letter of intent gives DONG Energy the exclusive rights to negotiate a joint development agreement for the project.

NaiKun Wind reported that it holds environmental assessment certificates from the provincial and federal governments for the first phase of the 300 to 400 MW project. The site's ultimate potential is assessed at 2 GW and could accommodate an increase in the size of the project at a later date.

The two companies hope to negotiate an electricity purchase agreement with BC Hydro for the first phase of the project, which will take about three years to build once the agreement is obtained.

SNC-Lavalin invests in the Carlyle Global Infrastructure Fund

SNC-Lavalin plans to invest $100 million as a sponsor in Carlyle Global Infrastructure Opportunities I, a fund dedicated to infrastructure investments that require project development capabilities.

The investment will come from SNC-Lavalin Capital, the Group's investment and asset management company, and will represent the company's first commitment to an infrastructure fund. SNC-Lavalin staff will have to collaborate with the fund by providing preliminary project assessments, technical advice and, more generally, expertise in diligent review and project development.

Carlyle Global Infrastructure Opportunities I is aiming for a capital endowment of $2.5 billion USD as well as co-investments that would make it possible to deploy a total of almost $10 million USD in capital.

Carlyle launched its fundraising process in 2016 and will target public-private partnerships as well as traditional assets in the transportation and water sectors in Europe, Australia, the United States and Canada.

This investment will allow SNC-Lavalin to develop a partnership with Carlyle Global Infrastructure, an international firm and major project development platform that requires consulting and engineering services.



InstarAGF acquires Skyservice

InstarAGF Asset Management Inc. announced on September 18, 2017, that it acquired a majority stake in Skyservice Investments Inc. through its InstarAGF Essential Infrastructure Fund.

Founded in 1986, Skyservice is Canada's largest business aviation services supplier, which operates facilities located in Toronto, Montréal, Calgary and Ottawa. Skyservice manages the largest and most diversified fleet of aircraft in Canada and remains ranked among the leading service providers by industry publications such as Professional Pilot Magazine and Aviation International News Magazine.

InstarAGF, which focuses on North American mid-sized infrastructure assets in the energy, public services, civil and social infrastructure sectors, manages a portfolio of companies that includes an interest in the Billy Bishop Airport passenger terminal in Toronto.



Northland Power refinances a portfolio of solar projects in Ontario

InfraAmericas reported that Northland Power concluded $240 million in refinancing for a portfolio of solar projects in Ontario totalling 50 MW. The portfolio, known as Ground-Mounted Solar Phase III, includes five 10 MW facilities:

- Abitibi
- Burks Falls West
- Empire
- Martin's Meadows
- Long Lake

Each of these projects hold a 20-year electricity purchase agreement with IESO and entered into operation in 2015.

The transaction was concluded at the end of August 2017 and was intended to reduce the cost of the debt by taking advantage of the downward trend in interest rate spreads on borrowing.



A hyperloop link contemplated between Montréal and Toronto

The Montréal-Toronto corridor is among the most serious candidates for construction of a hyperloop system which would reduce the travelling time between the two cities from hours to 39 minutes.

This project is the only Canadian candidate selected from among ten international proposals presented to the American firm Hyperloop One. Its commercial viability will now be studied.

The hyperloop is a technology promoted by businessman and Canadian-American inventor Elon Musk – the founder of companies such as Tesla, PayPal and SpaceX. Pods placed inside a long cylinder kept at low pressure would be propelled by electricity and magnetism at speeds comparable to a commercial aircraft.

The Montréal-Toronto line was proposed by the Canadian branch of the American engineering giant AECOM and would include a stop in Ottawa. Travel between Toronto and Ottawa would take 27 minutes, and 12 minutes between Ottawa and Montréal.

In the second stage, the line would be extended west to Detroit, and east to Buffalo, Chicago, New York and Boston.

BBGI completes its investment in four Canadian PPPs

BBGI has completed its investment in four operational PPPs of SNC-Lavalin, according to an announcement by the company on September 29, 2017.

The transaction took place simultaneously with the transfer of project stakes by SNC-Lavalin to the company's new capitalization fund (SNC-Lavalin Infrastructure Partners LP), which aims to hold North American operating assets originally developed by SNC.

BBGI must invest $254 million in the fund, which represents an 80% stake in the partnership. SNC retains the remaining 20% stake.

The transaction's assets and BBGI's new interests include:

- The William R. Bennett Bridge, a 2 km corridor that has a concession that will receive availability payments from the province of British Columbia until 2035;
- The Canada Line, a 19.5 km automated rail rapid transit service that will receive availability payments from Translink until 2040;
- The Southeast Stoney Trail, a 25 km highway project that will receive availability payments from the province of Alberta until 2043;
- The Restigouche Hospital Centre, a 140-bed hospital that will receive availability payments from the province of New Brunswick until 2044.

The transfer of a fifth asset, the McGill University Health Centre, should be completed shortly.

The total value of BBGI transactions for stakes in the five assets is about $189 million.

SNC's new fund will have a right of first refusal for the purchase of investments in any project for which SNC-Lavalin obtained contracts before the partnership was formed.

CHUM construction moves to Pomerleau

Radio-Canada reports that the Quebec company Pomerleau is preparing to replace the Spanish company Obrascon Huarte Lain (OHL) to carry out the final phase of the Centre hospitalier de l'Université de Montréal (CHUM).

Pomerleau is currently negotiating an agreement that would allow it to carry out demolition work at the Hôpital Saint-Luc, whose patients have just been transferred to the new building, as well as to build a new building on this site that will house a portion of the ambulatory centre, clinical administration offices and an amphitheatre.

The government has authorized a $3,075 billion budget for phases 2 and 3, which include the construction of the new hospital and clinical administrative centre. The latter alone represents a $500 million expenditure.

The withdrawal of OHL could be explained by several factors. The Group has had financial difficulties for several years and the press reports rumours of a possible takeover by a Chinese group. In addition, the company's reputation has been marred by several ethical and regulatory allegations and breaches in Spain and Mexico.

In Quebec, due to the 11 month-delay in the delivery of the CHUM's main building, the consortium has been deprived of at least $110 million in revenue.

Pomerleau is returning to this project though the back door, given that the company was part of the Accès Santé Montréal consortium that bid to build the CHUM in 2011, but was disqualified because its proposal exceeded the government's planned budget for the project. That left only Collectif Santé Montréal, a consortium of which OHL is a member.

Three bidders vying to build wind farm in the Îles-de-la-Madeleine

Three companies are attempting to win the contract for the construction of the Northern Dune Wind Farm, in the Îles-de-la-Madeleine:

- TUGLIQ Energy
- Kruger Energy
- The Quebec division of the French company Valeco

Bear in mind that the call for tenders was launched two years ago by Hydro-Québec and that the selected company will be unveiled in the first quarter of 2018. The wind farm should be operational by the end of 2019.

This small 6 MW wind farm should allow islanders to reduce their dependence on the thermal power plant by 10% and, as a result, reduce their greenhouse gas (GHG) emissions by 12,000 tonnes.

Like twenty or so other communities in Quebec, the Madelinots have an independent network and are not connected to Hydro-Québec's main grid.

The call for tenders for the Northern Dune Wind Farm was the last in progress for wind power in the province. However, Hydro-Québec could soon move forward with other independent grid projects in order to reduce the use of fossil fuels for other communities (such as Nunavik) that are not connected to the main grid.

Brookfield completes acquisition of TerraForm Power

On October 16, 2017, Brookfield Asset Management announced the conclusion of its acquisition of a 51% stake in TerraForm Power. The transaction is valued at $656 million USD and the operation will add 2,600 MW of solar and wind power to Brookfield's existing portfolio.

This acquisition represents the entry point for Brookfield Renewable in the solar energy and decentralized production sectors. TerraForm Power will remain on NASDAQ and become Brookfield's main vehicle for acquisition of solar and wind assets that operate in North America and in Western Europe.

Bear in mind that TerraForm Power started to look for a new majority shareholder after its parent company SunEdison went bankrupt in April 2016. It appears that Brookfield was chosen due to its willingness to acquire a majority stake in the company and as a result became the company's «sponsor». TerraForm indeed appears to consider that a «no sponsor» model has not been proven and does not favour the business' development or shareholder returns.



Boralex invests in onshore wind projects in the United Kingdom

Boralex has concluded a joint venture agreement with the British wind power company Infinergy to develop a 352 MW onshore wind power portfolio.

The portfolio consists of Scottish Infinergy wind projects at various stages of development, including the 72 MW Limekin wind farms and the 32 MW Ardtaraig project. Boralex and Infinergy will invest a total of £6.6 million until 2019 to finance the development of assets and prepare them for the construction phase.

The projects will be operated as wind farms without subsidy, since they do not comply with the criteria to qualify for the various current programs. However, Infinergy hopes that by the time the projects are under construction (early 2020s), the British government will have changed its position on onshore wind turbines and will have decided to offer some form of market support.

Infinergy's long-term goal as a developer is to implement projects, with the expectation that Boralex — which aims to strengthen its exposure to wind energy — will take over the entire portfolio after construction.

Brookfield closes financing for an Ontario energy storage project

Brookfield Renewable Partners has developed an 8.8 MW energy storage project in Stratford, Ontario, based on lithium-ion batteries supplied by Powin Energy, which is currently the largest battery project in Canada.

The project was funded by $5.5 million in non-recourse debt financing, considered to be the first such project financing for a large-capacity battery facility in Canada.

According to information published by InfraAmericas, the cost to build the project will be less than $14 million and financing was closed on September 26, 2017, based on a three-year term at an interest rate of 8.75% per year.

The project is under construction and should be operational by the beginning of 2018.

Powin Energy has about 130 MW of storage projects in development. The company sees growth opportunities for storage in North America as battery technology costs drop, particularly in Ontario, New York and California.

Although the Stratford is a first in Canada, storage site project financing has already been closed in the United States. In March 2017, Macquarie Capital closed non-recourse financing with CIT for a $200 million USD portfolio for battery projects in California.

Axium Infrastructure acquires a 76 MW solar portfolio

Axium Infrastructures announced on October 25, 2017, that it had agreed to acquire a 76 MW solar portfolio in Ontario from TransCanada Corporation. The transaction is assessed at $540 million and includes eight projects (Liskeard 1, 3 and 4, Williams Rapids, Mississippi Mills, Burritts Rapids, Brockville 1 and 2).

All of the projects have been operational since 2014 and have 20-year electricity purchase agreements with the Independent Electricity System Operator of Ontario (IESO).

Axium will acquire the portfolio through its variable capital fund Axium Infrastructure North America. The portfolio will be housed in the subsidiary of Axium Infinity Solar L.P.

TransCanada acquired this portfolio from Canadian Solar between June 2013 and December 2014 for about $450 million.

Quebec will soon impose a minimum threshold for biofuels

Quebec's Minister of Natural Resources and Energy, Pierre Montreal, announced on October 27, 2017, in his address to the Metropolitan Montreal Chamber of Commerce, that Quebec will soon impose a minimum threshold for biofuels sold in the province. The minimum threshold is still being considered, but it should be «above 2%», the Minister said.

This means that all fuels sold in Quebec should contain at least 2% biofuel. This measure will favour projects such as the biorefinery in La Tuque, in Mauricie, as well as biofuels distributed by Énergir (biomethane from domestic waste).

The La Tuque project, which costs around one billion dollars, involves the construction of a biorefinery that would begin operations in 2023, able to produce renewable fuel from forest residues for road vehicles (trucks, cars, etc.).

Similarly, the minimum threshold announced will indirectly favour the organic crude project at Port-Cartier, on the Côte-Nord, which should be commissioned in 2018, and which also needs a domestic market to be profitable in the long term.

The question that remains is the level that will ultimately be set for this minimum threshold, which must be high enough to allow the industry to really take off.

Innergex acquires Alterra Energy for $1.1 billion

On October 30, 2017, Innergex Renewable Energy Inc. (TSX: INE) and Alterra Power Corp. (TSX: AXY) announced that they concluded an agreement under which Innergex will acquire all of Alterra's issued and outstanding common shares for $1.1 billion, including the assumption of Alterra's debts.

The transaction depends on Alterra shareholders' approval and other usual closing conditions.

This transaction is part of Innergex's growth strategy, which aims to achieve net installed power of over 2,000 MW by 2020. In the immediate future, the addition of Alterra's portfolio adds to Innergex's assets of hydroelectric and wind power projects in operation in Canada, a large number of wind power projects in operation, under construction and potential projects in the United States, as well as geothermal assets in operation in Iceland. Innergex's net global energy production capacity will rise to 1,606 MW, an increase of over 40% after the transaction, which includes assets under construction.

The transaction was financed through an unsecured five-year conditional loan of $150 million offered by the CDPQ, as well as by the increase in the Innergex business credit facility that grew from $425 to $700 million.

Deutsche Bank revises its project financing strategy

According to an InfrAmericas article dated November 1, 2017, Deutsche Bank again wishes to deploy capital on traditional lending activities and the financing of durable goods. The Bank has in particular identified the transport, infrastructure and energy financing sectors as target areas for deployment of its capital.

However — and this is an interesting fact — Deutsche Bank is seeking opportunities beyond traditional senior debt. The Bank sees a niche in the capital market that lies between term loans provided by conventional commercial lenders and high-yield financing provided by investment funds.

The types of financing that the Bank is now targeting would include second-tier loans, holding company financing, mezzanine financing or financing in less-developed sectors, such as biomass.

Deutsche Bank would therefore stand out from conventional commercial banks and insurance companies to invest in a relatively undeveloped, but in demand, financing niche, in the area of project financing.

Fluor Enterprises and Lane Construction selected to design high-speed train between Dallas and Houston, Texas

The Fluor Enterprises and Lane Construction Corp. companies have been selected to build the high-speed rail line that will transport travellers between Dallas-Fort Worth and Houston, Texas.

The decision comes after more than three years of development by Texas Central, the private promoter behind this project that exceeds $12 billion USD. The project is supported by private investors and the company is committed to not solicit federal or state government subsidies, but could take advantage of government funding programs for transport projects.

The 386-kilometre-long high-speed train line would take passengers between the two cities in less than 90 minutes (compared to four hours by car), with trains departing every 30 minutes during peak periods.



The next major step in the project's development process is the identification of the train's preferred route while taking environmental factors into account, which must be carried out by the Federal Railroad Administration.

Construction should begin at the end of 2018 or in early 2019 and last four or five years. Texas Central plans to use the N700-I high-speed train, the same as the one used by the Central Japan Railway Central on its Shinkansen line between Tokyo and Osaka.

It is a project exposed to the risk of passenger volume, so ticket prices will have to be competitive compared to other means of transportation.

A 2015 impact study commissioned by the company estimated that the project would result in an economic spinoff of $36 billion over 25 years. It is estimated that 10,000 jobs would be created per year over the four years of construction and, according to the study, the company would have to hire nearly 1,000 permanent employees.

Ontario to launch bidding process for the Toronto-Windsor line this year

The Ontario Ministry of Transport plans to launch a call for tenders for the planning and environmental assessment of a high-speed rail network connecting Toronto and Windsor.

David Collenette, special adviser to the province for the high-speed train, said at the 25th Annual Conference of the Canadian Public-Private Partnerships Council (CPPPC) on November 7, 2017, that the administrative process should allow the project to be completed by 2025.

The project's mode of implementation has not yet been specified, although Mr. David Collenette recommended that the province consider a PPP model. The project's cost would vary from $21 billion to $56 billion, depending on the route selected for the line.

The proposed new high-speed rail line would allow travelling up to 250 km/h between Toronto and Windsor on a combination of existing lines and exclusive new rail corridors.

Macquarie sells its stake in Autoroute 25

Macquarie Infrastructure Partners (MIP) has begun the process of selling its 100% stake in Autoroute 25 (A25) between Montréal and Laval.

Autoroute A25 is a 7.2 km toll highway that connects Henri-Bourassa Boulevard in Montréal with Autoroute 440 in Laval. It also includes a 1.2 km six-lane bridge that crosses the Rivière des Prairies.

Bear in mind that MIP won the bid for the Autoroute A25 extension project in June 2007, along with Kiewit and Parsons.

Built in PPP mode, the highway was opened to traffic in May 2011 and the operations contract has a 35-year term, i.e. until 2042.

Expected launch of a call for tenders for the rehabilitation of the Louis-Hippolyte-LaFontaine

Quebec's Ministère des Transports is expected to launch the pre-qualification process for the rehabilitation of the Louis-Hippolyte-Lafontaine Tunnel in the spring of 2018.

The project will be carried out in PPP mode (or alternative mode, according to the new wording used by the Ministry) using a design-build-finance (DBF) mode. The project's cost is not yet known, but is expected to be in the range of $500 million to $1 billion.

The project involves the restoration of several of the tunnel's elements, including the replacement of the concrete topping and the installation of a protective coating that will protect the structure from salt spray and tires. Construction of the project will not begin until the new Champlain Bridge project is completed, due to traffic problems.

Transports Québec is currently selecting engineering services for the project. Arup Canada, Groupement CIMA+/EGIS, Consultants SM and Norda Stelo have submitted bids. The selected company should be announced in early 2018.

BNP Paribas abandons consulting contracts for LNG projects

BNP Paribas has withdrawn from its consulting contracts for exporting LNG projects in the context of the Bank's overall abandonment of fossil fuel-related activities.

Therefore, the Bank is no longer a financial advisor for Magnolia LNG and it will terminate its consulting mandate with Texas LNG before the end of the year.

On October 11, 2017, the French Bank announced that it would stop financing LNG terminals that liquefy and export shale gas, as well as pipelines that transport petroleum and gas from shale and tar sands. However, BNPP will continue to finance gas-fired power plants and renewable energy projects.

Reorganization at SNC-Lavalin following the acquisition of WS Atkins PLC

Following the acquisition of WS Atkins PLC in July 2017, SNC-Lavalin reorganized its activities to maximize the synergies related to this transaction.

The main organizational changes are the following:

- All oil and gas activities will be grouped under the same sector, led by Christian Brown. The skills of SNC-Lavalin and Atkins will accordingly be consolidated under a single banner;

- Nick Roberts, current CEO of Atkins in the United Kingdom and Europe, will lead the new Engineering, Design and Project Management sector. He will supervise all infrastructure engineering and design services worldwide, with the exception of activities in Canada, which will remain integrated with the Infrastructure sector;

- SNC-Lavalin's former Energy sector and a portion of Atkins Energy activities will serve as the foundation of two new sectors within the new integrated business, named Nuclear Energy and Clean Energy, respectively. The nuclear energy activities of Atkins and SNC-Lavalin will be grouped under a single Nuclear Energy sector, led by Sandy Taylor;

- Marie-Claude Dumas will lead the Clean Energy sector. This will integrate the following activities: hydroelectricity, transport and distribution of electricity, renewable energy and energy storage.

The other sectors remain unchanged:

- Ian L. Edwards will remain at the helm of the Infrastructure sector;

- The Mines and Metallurgy sector will continue to be led by José J. Suárez;

- SNC-Lavalin Capital will still be under the leadership of Chantal Sorel.

Infrastructure spending remains a priority for Ontario

Ontario's 2017 Fall Economic Outlook and Fiscal Review predicts improved economic growth for the province over the next three years. It highlights several key sectors for investments, in particular infrastructure.

Therefore, the Ontario Government has undertaken to publish a long-term infrastructure spending plan, setting out its vision for provincial infrastructure over the next ten years.

The Economic Outlook highlighted the following initiatives:

- The construction of a new courthouse with 21 courtrooms in the Halton region. This project should be carried out in accordance with a design, building, financing and maintenance model (DBFM) and construction should begin at the end of 2019;

- This year, up to 400 million dollars from the Trillium Trust Act will support investments in public transportation projects, such as the GO Regional Express Rail project and the Hurontario Light Rail Transit;

- The implementation of the GO Regional Express Rail project in the Greater Toronto and Hamilton areas;

- The development of regional rapid transit facility projects achieved through alternative financing and procurement (AFP), including the Eglinton Crosstown LRT, the Mississauga Bus Rapid Transit, the York Viva Bus Rapid Transit and the Waterloo Rapid Transit Initiative;

- Plans to construct a high-speed rail connection in the Toronto-Windsor corridor are moving forward;

- An additional 180 million dollars for programs aimed at expanding broadband telecommunication services;

- Nine billion dollars to support the construction of significant new hospital projects throughout the province.

The Government of Quebec's economic update provides for increased targeted spending and continued spending on infrastructure

The Quebec Government's economic update highlights a significant improvement of the provincial economy since the March 2017 budget, as it reaffirms the government's commitment to infrastructure investment.

Capital investments will be maintained at 91.1 billion dollars under the 2018-2028 Québec Infrastructures Plan (PQI), with planned investments of 9.6 billion dollars in 2017-2018. Priority will be given to public safety, to the replacement of outdated infrastructure and to economic development, taking into account the Quebec taxpayers' ability to pay and the government's debt reduction objectives.

The 2018-2019 capital investments of 13.7 billion dollars projected in the PQI and by government enterprises, will generate benefits representing 2.2% of the real GDP, which will create or maintain 79,000 jobs, including 44,000 direct jobs.





The economic update provides additional sums for a total of 300 million dollars to deploy high performance digital infrastructures. An expected call for projects will soon be issued as part of the *Québec branché* program, to improve Internet services in rural and remote areas.

The Quebec Government seeks to ensure that, within five years, 100 % of citizens have access to broadband networks and that more than 90 % of them have access to high-speed broadband networks.

Boralex closes financing for the Moose Lake wind project

On November 24, 2017, Boralex Inc. (TSX: BLX) announced the closing of a 53.3 million dollar financing for the Moose Lake wind farm project, located in British Columbia, Canada.

The 15 MW Moose Lake wind farm project is located on federal land, in the Peace region, northwest of Tumbler Ridge, British Columbia. The project has a 40-year electricity purchase agreement with the British Columbia Hydro and Power Authority (BC Hydro).

The funding, delivered through the KfW IPEX-Bank GmbH, includes a $2M letter of credit facility and a long-term tranche of $51.3M at an interest rate of approximately 4.9%. The long-term refinancing will be fully amortized over a period of 25 years, beginning on the commercial operation date of the project which is planned for the second half of 2018.

Boralex is developing the Moose Lake wind farm in collaboration with Aeolis Wind Power Corporation. At the closing date, Boralex and Aeolis held 70 % and 30 %, respectively, of the project.



Manulife first to offer green bonds in Singapore

On November 14, 2017, Manulife Financial Corporation announced the offering in Singapore of 500 million Singapore dollars, subordinated notes bearing interest at 3.00%, due on November 21, 2029.

The notes are Manulife's first green bond issuance, intended to be used to finance or re-finance eligible assets consistent with Manulife's recently released Green Bond Framework. The Framework is aligned with the International Capital Market Association's Green Bond Principles 2017, and directs the use of proceeds towards renewable energy, green buildings, sustainably managed forests, energy efficiency, clean transport, sustainable water management as well as pollution prevention.

The notes are the first green bond issuance by a life insurance company and by a Canadian issuer, certified as Climate Bonds by the Climate Bonds Initiative.

DBS Bank Ltd., The Hongkong and Shanghai Banking Corporation Limited, Singapore Branch and Standard Chartered Bank were joint lead managers for the offering.

CC&L concludes two private placements totalling 359 million dollars for solar projects in Ontario

On December 7th, 2017, Toronto investors Connor, Clark & Lunn Infrastructure (CC&L) closed two private placements related to the Windsor and Southgate, Ontario Solar Projects, each with a rated capacity of 50 MW.

The total of both financings, of 188 million dollars and 171 million Àdollars, respectively, will be used to refinance Windsor's and Southgate's bank debt. Both private investments have an 18.5-year term.

Both projects began operations in 2016 and sell their production to IESO, under 20-year electricity purchase agreements.

These projects were originally developed in partnership with Samsung Renewable Energy and the Desjardins Group Pension Plan.

Ontario selects energy storage projects to provide grid-balancing service

On November 28, 2017, the Ontario Independent Electricity System Operator (IESO) announced that two new energy storage facilities had been selected through a competitive process to support the reliability, flexibility and efficiency of the province's electricity grid.

The companies selected — Hecate Energy Ontario Stockage VII, LP and Saturn Power Inc. — will provide a combined 55 MW grid regulation service, a grid-balancing function that corrects short-term changes in electricity consumption that could affect the reliability of the power system. This regulation service helps compensate for real-time supply and demand imbalances.

Under the 2017 request for proposals, the IESO received 42 submissions representing approximately 350 MW of regulation capacity from a variety of existing and new build facilities, including energy storage and waterpower facilities.

Alberta obtains the lowest wind energy price in Canada

The Government of Alberta successfully implemented the first phase of its Renewable Electricity Program by obtaining the lowest-ever price for wind energy generation in Canada.

The Alberta Electric System Operator (AESO) will therefore secure power from four new wind energy projects, which have a capacity of about 600 MW at an average price of $37 per megawatt-hour. The three companies behind these four projects have each signed a 20-year Indexed Renewable Energy Credit (IREC) agreement with the AESO, providing predictable revenues for the operators, while protecting Albertans against increases in the price of electricity. Under the IREC, when the market price is lower than the contracted price, the producer will be paid the difference and when the market price is higher, producers will be required to pay back the difference to the government.

The competitive nature of this procurement process was critical to achieve a low-cost result. In total, 29 projects representing over 4,000 MW of renewable energy were eligible to participate in this initial process, and the great



interest shown by renewable energy producers means that Alberta is well positioned to succeed in its goal of procuring 5,000 MW of renewable energy in the province by 2030.

This additional 600 MW in wind power is the first step towards the achievement of the Alberta Climate Leadership Plan objective to meet 30 % of Alberta's electricity demand with non-greenhouse gas emitting renewable energy by 2030.

Canada Infrastructure Bank appoints interim chief investment officer

The Canada Infrastructure Bank called on Bruno Guilmette, a former senior vice-president of PSP Investments, to act as interim chief investment officer.

Until November 16, 2017, Mr. Guilmette was one of the 10 members appointed to the Bank's board of directors. He will be responsible for the management of the Bank's operational aspects currently being developed while the board of directors seeks a permanent chief executive officer. Guilmette should resume his position on the board of directors once a chief executive officer is hired, which could take five or six months.

For 10 years, Mr. Guilmette was senior vice-president of infrastructure with PSP Investments. Previously, he was senior director with the Caisse de dépôt et placement du Québec. In addition to his role with the CIB, Guilmette is also president of the advisory committee at Plan A Capital, in Montreal.

Fiera Infrastructure purchases portfolio of residential solar assets in the United Kingdom

On December 21, 2017, SNC-Lavalin (TSX: SNC) announced that Goldwind Australia had selected it as contractor for the Stockyard Hill Wind Farm in Victoria, Australia, and that preliminary work had begun.

SNC-Lavalin, in joint venture with WBHO Infrastructure Pty Ltd. (WBHO), will undertake the design and construction of all electrical infrastructures for the project, in addition to civil engineering infrastructure work for the entire worksite: access roads, parking areas, foundations, public road upgrades, and internal access roads.

The Stockyard Hill Wind Farm (SHWF) is expected to be among the world's ten largest projects and the largest wind farm in the Southern Hemisphere generating approximately 530 MW of clean energy. It will include 149 Goldwind 3.57 MW wind turbines erected on 100m high steel towers. Located approximately 35 km west of Ballarat in Victoria's central highlands, the Stockyard Hill Wind Farm SHWF will provide electricity to more than 340,000 homes annually.

CDPQ announces REM contract awards

The winning consortium for the engineering, procurement, and infrastructure construction contract is the NouvLR, comprised of SNC-Lavalin, Dragados, Aecon, Pomerleau and EBC.

The supply contract for rolling stock, operation and maintenance services and systems has been attributed to Groupe des Partenaires pour la Mobilité des Montréalais, composed of Alstom Transport Canada and SNC-Lavalin O&M. The operation and maintenance contract is for a 30-year term and the rolling stock fleet contract involves 200 cars.

The project is financed by the CDPQ Infra (2.95 billion dollars), the Government of Québec (1.28 billion dollars), the Government of Canada (1.28 billion dollars), Hydro Québec (295 million dollars) and by the Autorité Régionale de Transport Métropolitain ("ARTM", 512 million dollars).

According to statements by CDPQ Infra's management, as reported by InfraAmericas, 100% of the CDPQ's investment would be made up of shares. Later, once the project is at a more advanced stage of the construction or operational phase, debt refinancing or new financing partners could be considered.

Also according to InfraAmericas, the economic model continues to be based on two sources of revenue: passenger traffic and property value capture. The CDPQ hopes to obtain a 9% return on investment for that project.

Property value capture has two components: first, drawing revenue from property development along the route of the project, and second, sharing with municipalities the tax revenue increases generated by the development around the stations. This last component was converted, however, into the ARTM's upfront investment of 512 million dollars in the project.

Bear in mind that, in January 2015, the CDPQ announced its intention to take on a public infrastructure mandate. The project launch was then announced in May 2016 and ultimately took two years to materialize, which compares favourably to the usual 4- to 5-year delay for such infrastructure projects. It is also the first time in Canada that a public pension fund has taken charge of the design and implementation of a project.



SNC-Lavalin awarded Stockyard Hill Wind Farm contract

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Hyperloop: Hypercool? Or Hyperflop?

Author : Gérard Mounier

The genesis

The Hyperloop is a futuristic transportation project launched by the well-known South African billionaire, Elon Musk, co-founder of Paypal, CEO of the SpaceX and Tesla companies, and former chairman of the board of directors of the SolarCity company. He is also the founder of The Boring Company, a tunnel construction company, and co-president of OpenAI, an artificial intelligence research association.

In July 2012, Elon Musk first announced his Hyperloop project, which he presented as a fifth mode of transport, different from boats, planes, cars, and trains.

The billionaire's idea is to develop a mode of transport more reliable than planes, unaffected by the quirks of weather, and ultra-fast. The principle is to propel a capsule of passengers in a low-pressure tube — kept in the air with a magnetic suspension system powered by electricity — at a speed of about 1,200 km/h, i.e. slightly lower than the speed of sound.

A system like this installed between Los Angeles and San Francisco would make it possible to connect the two cities in less than 30 minutes, faster than a plane that travels the same distance in 35 minutes at a speed of 885 km/h. Eventually, this mode of transport could connect multiple countries,

The genesis

even the world, by connecting the biggest cities like a kind of subway, but on a global scale.

Elon Musk estimates that the cost for a ticket could be less than an airplane ticket or for any other means of transport, and that the system could also eliminate schedule constraints and wait times for travellers, since the capsules could depart at any time.

The system could be self-sufficient in terms of energy, by installing solar panels on the tubes, and even generate an energy surplus if the Hyperloop consumes less electricity than it accumulates.

He estimates that the cost of the Hyperloop connecting San Francisco to Los Angeles would be 6 billion dollars, which represents a tenth of the price of the high-speed train line (California High-Speed Rail) currently in development in California.

For the time being, Elon Musk has stated that he wants to stay focused on Tesla and SpaceX, but he has promised that he will take care of the Hyperloop himself if no investors commit to a prototype in the coming years. He strongly encourages crowdsourcing, the open source and collaborative aspect, and in fact has not filed any patent for the Hyperloop.

Key stakeholders and ongoing projects

Several companies are working on the technology design: Hyperloop One (formerly Hyperloop Technology Inc.), Hyperloop Transportation Technologies, launched by the German Dirk Ahlborn, and the Canadian company Transpod. There is also the Arrivo company, created by former Hyperloop One employees, but whose project differs slightly from Hyperloop, technically.

- Hyperloop One recently received financial support from the Virgin Group, and the company was, in fact, renamed Virgin Hyperloop One. Richard Branson, the founder and owner of Virgin, was just appointed non-executive president of the company. Since its creation in 2014, Virgin Hyperloop One has raised 295 million dollars from various investors, including GE ventures and the SNCF (inventor of the French TGV). The company has a 500 m test track in the Nevada desert, where speed tests are performed on prototypes.

- **Hyperloop Transportation Technologies** (HTT) is an American company launched by Dirk Ahlborn, a German entrepreneur. The company operates primarily as an Internet platform that allows a community of contributors to work on the project while being paid with stock options. In January 2017, HTT announced the launch of a feasibility study for connecting the Czech city Brno and the capital of Slovakia, Bratislava. This connec-

Key stakeholders and ongoing projects

tion could eventually be extended to Prague and Budapest, in Hungary. In order to develop, the company is also going to install a centre for research and development in the Toulouse Francazal aerodrome in France.

- TransPod is a Canadian startup, based in Toronto. In 2016, it designed a transport vehicle as a prototype for testing and presented a full-scale vehicle concept during the InnoTrans railway fair in Berlin in September 2016. TransPod announced its plans to produce a commercial vehicle by 2020 and to work with Transport Canada for approval of its first Hyperloop lines between 2020 and 2025. The Montréal-Toronto Corridor is one of the lines envisioned by the company.

Finally, despite the futuristic and ambitious aspect of the project, Hyperloop raises a certain enthusiasm and dozens of pilot projects are currently being studied around the world. Some of the best known include, for example, the Quay Valley city of the future project in California, the underground line project between Washington and New York, the project connecting Bratislava to Vienna and Budapest, several projects in France between Lyon and Saint-Étienne, to Toulouse, between Corsica and Sardinia, to Limoges, as well as projects in Ukraine, Russia, China, and finally, the Dubai line project in Abu Dhabi (United Arab Emirates).

Advantages, Disadvantages, and Technical Challenges

The Hyperloop would be a mode of transport able to compete with planes due to its high speed, without the main problems in the vicinity of airports: noise and pollution. On the other hand, contrary to other existing modes of transport, its main inconvenience is that it would require the construction of a new dedicated infrastructure network - currently nonexistent - in areas with variable geography, or sometimes in areas that are already urbanized.

Moreover, the completion of a Hyperloop involves a number of technical challenges: tube linearity, pylon resistance to various forces, passenger safety, energy consumption, speed control, etc.

A number of specialists interviewed about the feasibility of the project bring up the challenge of safely moving from the transportation of merchandise to the transportation of human beings. However, these concerns are the same as those that were raised when the automobile, the train, and the plane, were in development, and yet they have all become modes of mass transport today.

Advantages, Disadvantages, and Technical Challenges

In addition, regulatory issues are still an unexplored area. In the United States, there is still a question of which administration would be best to supervise this new mode of transport, which is neither a train nor a plane.

Finally, beyond the technical aspects, the crucial question of cost remains unresolved. Beyond the developers' optimistic statements, no one has a clear idea yet of the real cost of a Hyperloop line and, consequently, of the business model that could result from it. This, however, is a central issue, which generally determines the success or failure of new technology.

Conclusion: is the future at hand?

The futuristic aspect of the Hyperloop is reminiscent of the Aerotrain project, an electric monorail on an air cushion, for which several uses were developed in Europe and the United States in the 60s and 70s, which was also presented, at the time, as a revolutionary new mode of transport.

Technically operational and very avant-garde, the Aerotrain was abandoned in favour of the High-Speed Train (TGV), essentially because the TGV did not require the construction of a new costly dedicated infrastructure network, and could use a part of the existing railway network. Pragmatism and economic reality therefore prevailed, at the time, over technological innovation.

It is likely that the Hyperloop technology will be successfully developed, in the more or less near future, in the form of a prototype or a pilot project. The Hyperloop project has the advantage of theoretically offering an advantage in terms of speed that outperforms all other existing methods of transportation. The question is whether it will be possible to build a viable and competitive business model from this technology, which would permit large-scale deployment, and accordingly make Mr. Elon Musk's dream accessible to ordinary citizens.

Renewable energy: an update on market trends

Authors : Gerard Mounier et Marie-Aude Thérien

For several years now, renewable energy can no longer be considered as developing technology, but rather as a mature industry, competitive with fossil fuels, subject to economic cycles and consolidation movements, which is gradually moving away from the backing of public authorities.

What are the main trends that will influence this industry in the months and years to come? In these complex times where policies, treaties, breakthrough technologies, and economic and social upheavals are competing for attention, it seemed important to us to try to take stock of the different factors that will affect this sector and their consequences on the projects that will ensue.

Policies that support the energy transition

The energy transition has become a priority objective for several countries around the world. Encouraged by the Paris Agreement of COP 21, several nations are working to put policies into place that aim to completely replace fossil fuels with renewable energy sources, while gradually phasing out nuclear energy. In 2016, Denmark was a forerunner of this movement, adopting a policy of reducing energy consumption, abandoning its oil and gas exploration activities, and developing renewable energy, with the ultimate goal of eliminating all fossil fuels by 2050. Other European countries have followed suit, like France and Great Britain, who are aiming to abandon gasoline and diesel by 2040. Norway, meanwhile, aims to stop the sale of new cars that use gasoline by 2025.

The interesting point is that this movement is no longer limited to OECD countries and that several developing countries are also taking the energy transition path. Brazil, for example, between 2005 and 2013, injected more than 23 billion in 108 wind and biomass projects, representing around 10 GW of installed capacity.

The energy transition is also favoured by the steady decline of the cost of renewable energy, such as solar and wind power. The year 2016 can be considered a turning point, when the price of electricity production by solar and wind projects became competitive with fossil fuels. The experts estimate that by 2020, the majority of renewable energy sources will be cheaper than fossil fuels.

This reduction in the cost of renewable energy should continue in the future, especially for solar, thermal, and photovoltaic energy. In fact, the energy transition will soon no longer be based on political and ecological will, but will simply result from rational economic choice.

Chinese Investments in Renewable Energy

China's investment in renewable energy is growing from year to year. Because of China's incontrovertible power due to the size of its population and the growth of its GDP (today second in the world), its energy choices influence the entire market and help guide international industry trends. Recently, China put into place a policy to fight air pollution — which reaches intolerable levels in large cities — that materialized through massive investments in renewable energy. This plan, established over a period of 5 years, put several projects into operation, including the installation of more than 30,500 MW of wind energy in 2015. To date, China has installed more than 145,100 MW of wind energy. The magnitude of Chinese investments in renewable energy has had the collateral effect of contributing to lower production costs. For example, between 2010 and 2015, China helped reduce the cost of solar energy by 60%. This has notably had positive consequences on less favoured regions such as India and Africa, by enabling them to increase their respective electricity production with the help of new, more decentralized energy sources, and to promote better energy access for their population.

Therefore, it is ultimately the high level of pollution in Chinese cities that has had a positive influence on the production of "clean" electricity not only at a local level, but also internationally. The International Agency for Renewable Energy (IRENA) confirms that the cost of producing onshore wind turbines has dropped 23% since 2010, and that the cost of solar energy has dropped 73% since the same year.

Investors' growing appetites for "green" products

Investment management experts estimate that investors' appetites for environmentally friendly investment vehicles and green bonds will only increase in the years to come. This is the result of a report on sustainable finance submitted to the European Commission at the end of January 2018. Generally, citizens are demanding more and more options for their savings and personal investments, so that they reflect their ethical, social, and environmental tendencies.

This interest for "green" investments is reflected in different ways in the ecosphere of the financial world. Take, for example, the CSN Foundation workers fund, which created joint ventures dedicated to renewable energy projects, or internationally, the creation of investment funds that aim to support the production of clean energy in developing countries. For example, Nordic Development Fund and Norfund, two Nordic equity funds, will support the production of renewable energy in sub-Saharan Africa in the coming years.
This trend towards green investments seems to encourage developing countries to implement green finance solutions. This is the case in India, whose first green bank will open in 2018. This initiative will materialize through the transformation of the Indian Renewable Energy Development Agency (IREDA), owned by the Indian government, into a commercial bank with direct access to public funds in the form of deposits, and consequently, able to reduce the interest rates on its loans.

Financial markets are also following the trend, as indicated by the growing interest in green bonds by pension funds and insurance companies in the compositions of their portfolios. In 2017, it is estimated that all green bonds issued internationally amounted to more than 155 billion, according to the Climate Bonds Initiative (CBI), an international organization dedicated to promoting this type of financial product. Fund managers who invest mainly in bonds (64% in 2015, according to the OECD) are drawn to the "green" rating of these new appealing instruments.

Projects eligible for this rating must promote sustainable activities and fulfill the criteria of categories established by "Green Bond Principles" or the approach of Bloomberg New Energy Finance. Moreover, large institutional investors (Aviva, BlackRock, State Street), responsible investment specialists (Natixis, Mirova, ACTIAM), companies (Barclays, Apple, GDF, EDF) and governments and municipalities (Central Bank of Peru, Ile de France Region) are already requesting it. This trend has spread to Canada, where more than 3.8 billion dollars in green bonds were issued in 2017, which is a record.

Energy storage process

In 2017, according to a Bloomberg New Energy study, California lost more than 300,000 MWH of renewable electricity because it did not have an efficient storage system. Despite the positive environmental benefits, renewable energy like solar and wind still present a challenge in terms of production irregularities. Specialists estimate that energy storage would largely address this problem. Progress in terms of storage will certainly be a critical element that will positively impact the transition to 100% green energy.

Numerous solutions are currently in development: lithium-ion or sodium-sulphur batteries, pump-storage stations, flywheels, hydrogen production, and others. The emergence of large-scale commercially operational storage solutions, in addition to lower costs for renewable energy and other technological developments, such as smart grids, will undeniably shape the energy “bouquet” of the decades to come.

Towards the development of decentralized production?

Technological development of renewable energy, energy storage solutions, and other “smart” technologies will also contribute to changes in the way that energy production is organized and controlled. Where, in the past, energy production was centralized in large installations located near production sources (dams, fossil fuels) or near cities and consumption centres, there is now a trend towards the development of autonomous networks, even private residential production. Take, for example, Ontario, where residential solar power generation can already be purchased at a cost of $.39 per KWH through the FIT program (Ontario Feed-In-Tariff).

These innovations first emerged to counter power shortages and to ensure greater energy security. Then other factors influenced this phenomenon: the desire to abandon systems that used polluting energy sources (diesel), the high cost of connecting to networks, the reduction of environmental impact, a better control of demand, to name only a few.

Towards the development of decentralized production?

In Quebec, it is mainly remote communities that set up autonomous networks, such as the North Shore, Gaspésie-Îles-de-la-Madeleine, Nunavik and Haute-Maurice, and even mining projects (Raglan mine). The networks are still regulated by Hydro-Québec, but are independently operated. For individuals and small businesses (hotels, outfitters, farms, etc.), private electricity generation (or "autogeneration") is still in its early stages in Quebec, but could quickly grow in the coming years. Hydro-Québec is already proposing an autogeneration program that is a first step towards what could be a complete reconfiguration of the way electricity is generated in our society.



The electrification of transportation

Another trend that should have an effect on the field of renewable energy is the electrification of transportation and its consequences on the generation of electricity. Bloomberg New Energy Finance analysts predict that this transportation electrification will be a cornerstone of the global energy transition, and that this change could prove to be particularly disruptive depending on how quickly it is implemented. Certain countries, states, and cities have a transportation electrification plan (like Paris, California, Germany, and Montréal to name a few). The first impact will clearly be on oil production, to the detriment of producing countries, but to the advantage of the importing coun-

The electrification of transportation

tries' trade balance. For instance, only a few European countries have moved in this direction with a proactive timetable, but if a country like China decides to take this route, the impact on the market would certainly be considerable. Moreover, although the Canadian oil industry would undoubtedly suffer from this situation, Canada could, on the other hand, benefit from this trend through the development of new renewable energy projects that become necessary to meet the demand. Additionally, this could allow Canada to revive the development of other types of resources, for example metals and minerals used to manufacture electric vehicles and batteries, like Lithium or graphite.

That said, as nothing is ever certain in terms of technological evolution, other sources of energy such as biofuels or hydrogen should not be neglected, or eliminated too quickly, as they seem to still have many potential opportunities in store. In this regard, the service station industry is beginning to consider the development of multi-energy distribution stations, which would serve all types of vehicles, regardless of their mode of propulsion.

Conclusion

All of the different factors discussed above should accelerate the progress of energy transition in the coming years, and should greatly benefit the renewable energy industry. In Canada, it is interesting to note that it is the western provinces, traditionally focused on the oil and gas industry, that currently offer the most development opportunities for new renewable energy projects. According to the "predictors" of disruptive technology, transportation electrification should materialize in the next fifteen years, and solar energy, along with storage solutions, should become the most competitive production method. Decentralized production of energy should also expand, eventually breaking the constraints of connecting with the grid.

Only time will tell whether these predictions are realistic. However, in this constantly evolving context, Canada and Quebec have substantial assets to get through this energy "revolution." Whether in terms of geography or resources, various implemented federal and provincial policies, the presence of renowned industrialists and investors, applied research and more, Canada appears well positioned to respond to this transition and continue to see renewable energy projects develop in its territory and in the future years to come.

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Lawyers