

## XEBEC ADSORPTION INC. (XBC-TSXV)

Power & Energy Infrastructure | Diversified & Utilities

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### Time to Gas Up for Trip to the Next Renewable Opportunity

#### RECOMMENDATION

We are initiating coverage of Xebec Adsorption with a Strong Buy rating and \$3.20 price target. Our bullish view is predicated on the company's strong positioning in the burgeoning renewable natural gas (RNG) industry. As gas utilities look to make up ground vs. electric utility peers in moving to renewable sources and government incentives are increasingly supportive of renewable fuels we expect this industry is poised for sustained growth. With its superior proprietary technology, Xebec has made impressive strides with revenues and EBITDA recently hitting an inflection point.

#### ANALYSIS

**An emerging play on a potentially high growth industry.** With superior biogas upgrading and hydrogen purification equipment, we believe XBC can benefit from several meaningful growth opportunities; the most significant of which will be the emerging Renewable Natural Gas (RNG) sector. We highlight the keys to our bullish thesis on Xebec include: 1) A compelling proprietary technology with meaningful advantages vs. other RNG adsorption methods; 2) validation from large orders and success penetrating numerous markets globally; 3) strong positioning at what may be the forefront of an industry poised for exceptional growth; 4) momentum in the form of government mandated requirements for renewable gas standards; and 5) a recent inflection point in earnings and EBITDA with a growing backlog and brisk quote activity.

**RNG ready to hit the mainstream.** Driven by the need to keep pace with electrical utilities on decarbonization, gas utilities have increased lobbying efforts aimed at encouraging governments to subsidize the use of renewable fuels. This has resulted in governments announcing RNG or low carbon content targets of 10-20% by 2030 in some regions— compared to minimal current penetration. In Canada specifically, there is a 5% renewable gas target by 2025—representing a 250x potential increase in volumes with a potential increase to 10% being contemplated. Importantly, Xebec can capitalize on this opportunity both via equipment sales and eventual participation in what could be a large scale RNG infrastructure build-out in Canada. We also see China's growing demand for renewable hydrogen (fuel cell vehicles) as presenting a meaningful longer term opportunity for Xebec's hydrogen purification systems.

**Revenues and EBITDA have hit an inflection point; order backlog suggests continued strong growth.** XBC has seen impressive top line growth in recent years from \$9.6 mln in 2016 to \$48-49 mln for 2019. Further, 2020 guidance of \$80-\$90 mln implies a 3 year revenue CAGR of 71%. Considering the strong order and quote activity Xebec has reported, we have conviction the company can continue strong revenue growth into 2021. Meanwhile, we see EBITDA margins expanding from ~13% in 2019 to 14% in 2021 as the company benefits from operating leverage, supporting our \$16.9 mln EBITDA forecast.

#### VALUATION

Our \$3.20 price target is based on a ~2.5x 2021 EV/sales multiple. This is a discount to industrial and clean tech peers at 3.0x balancing Xebec's superior growth rate and lower market cap.

DECEMBER 31, 2019 | 6:23 AM EST  
INITIATING COVERAGE

**Strong Buy 1**  
**Target Price C\$3.20**

Suitability High Risk/ Growth

#### MARKET DATA

Current Price (Dec-27-19)	C\$2.16
Market Cap (mln)	C\$215
Current Net Debt (mln)	C\$(20)
Enterprise Value (mln)	C\$195
Shares Outstanding (mln)	99.6
30-Day Avg. Daily Value (mln)	C\$0.0
Dividend	C\$0.00
Dividend Yield	0.0%
52-Week Range	C\$0.68 - C\$2.44
Net Debt (%)	(10.3)%

#### KEY FINANCIAL METRICS

	1Q	2Q	3Q	4Q
EPS (C\$, Dec FY)				
2019E	0.01 A	0.02 A	0.02 A	0.02
2020E	0.02	0.03	0.03	0.02
2021E				

	2019E	2020E	2021E
EPS (C\$, Dec FY)			
	0.06	0.09	0.15
P/E			
	39.0x	22.8x	14.2x
P/E (Dec FY)			
	39.0x	22.8x	14.2x
EBITDA (mln) (C\$, Dec FY)			
	6	11	17
EV/EBITDA			
	32.2x	17.0x	11.5x
Revenue (mln) (C\$, Dec FY)			
	48	85	120
EV/Revenue			
	4.1x	2.3x	1.6x
Gross Profit Margin (Dec FY)			
	32.5%	33.0%	31.4%
FCF (mln) (C\$, Dec FY)			
	9	(4)	3
Net Debt/EBITDA (Dec FY)			
	(3.3)x	(0.4)x	(0.4)x

Source: Thomson One, Raymond James Ltd.  
Quarterly figures may not add to full year due to rounding.

Weighted average basic EPS shown

Please read domestic and foreign disclosure/risk information beginning on page 44 and Analyst Certification on page 45.

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## INVESTMENT THESIS

**An emerging play on a potentially high growth industry.** We believe Xebec is optimally positioned with a compelling technology in the early stages of what we expect will be a high growth industry. While the company offers a comprehensive suite of purification and filtration equipment and services, we believe the key opportunity in front of the company lies in the burgeoning Renewable Natural Gas (RNG) sector. As such, the keys to our bullish thesis on Xebec include: 1) a differentiated technology with meaningful advantages vs. other RNG adsorption methods; 2) validation from large orders and success penetrating numerous markets globally; 3) strong positioning at what we believe is the forefront of an industry poised for exceptional growth; 4) momentum in the form of government mandated requirements for renewable gas standards; and 5) a recent inflection point in earnings and EBITDA with a growing backlog and brisk quote activity.

**Other growth opportunities not to be forgotten.** Xebec maintains three operating segments: Cleantech Systems, Industrial Services & Support and Renewable Gas Infrastructure. Currently the majority of revenues (70% in 2018) come under the Cleantech segment, which designs and manufactures biogas upgrading and purification systems used for the production of RNG and purified Hydrogen (H<sub>2</sub>). In addition to the potential opportunity in RNG, we highlight ambitious targets for fuel cell vehicle deployment in China could also drive demand for Xebec's renewable hydrogen purification systems. Xebec's partner in China, Shenergy, has been nominated as one of the companies that will participate in the build out of hydrogen refueling stations in the country. Meanwhile, the Industrial Services & Support segment (30% of 2018 revenues) provides local service and replacement parts, as well as the sale of compressed air and natural gas equipment and parts. Detailed below, Xebec sees an opportunity to employ a roll up strategy in this segment which we anticipate will also drive significant growth. Finally, while the segment does not contribute to revenues today, Xebec also plans to play a role in the build-out of mid-market energy infrastructure assets in Canada—essentially selling RNG to gas utilities via its planned Renewable Gas Infrastructure line of business.

**Renewable natural gas moving from niche to mainstream driving massive potential development and large addressable market in Canada and elsewhere.** With the emergence of wind and solar power, electric utilities have made significant strides in decarbonization over the past decade—a trend gas utilities have not kept pace with. Accordingly, a key element of our constructive view on Xebec is the potential for RNG to play a central role in the next wave of renewable development. Although small scale, rudimentary biogas systems used to collect methane from landfills, sewage plants and farms, have been around for decades; we believe the industry is now building momentum. This is supported by government incentives for RNG as well as the broader trend towards decarbonization.

Also referred to as biomethane, RNG is refined to the point where it is a drop in substitute for natural gas (but carbon-negative) and injected into natural gas pipelines then used for electricity production, heating homes, or as fuel for vehicles. We believe a key underlying driver for RNG demand is the realization on the part of gas utilities that consumers will eventually look to switch, where possible, to more renewable electrical sources, unless a “greener” fuel source is found. These gas utilities have increased lobbying efforts aimed at encouraging governments to subsidize the use of renewable fuels. This has contributed to rising government mandated RNG content targets in some jurisdictions of as much as 10-20% by 2030—compared to minimal current penetration. Meanwhile, multi-nationals and gas utilities have been announcing RNG contracts with increasing frequency. In Canada specifically, there is a target of 5% renewable gas by 2025—representing a 250x potential increase in volumes vs. the current 0.02% of natural gas that currently comes from RNG. Notably, with the Liberal minority government in place, this requirement is expected to move to 10%—likely to be finalized in 2020.

Elsewhere, California is targeting a 20% reduction in carbon intensity of fuels sold; this is up from just 5% under the state's Low Carbon Fuel Standard (details follow). In Europe, certain nations can serve as a template for RNG deployment such as Denmark where a material proportion of generation needs from RNG (as much as 18% during the summer months) and Poland, which generates 8% of its electricity from RNG. In fact, in March 2019, a group of gas infrastructure transmission operators and biogas producers in Europe (called Gas for Climate), working with Navigant Research, released a study suggesting that renewable methane could represent 1,170 TWh of electricity by 2050 (or 95 bcm of natural gas equivalent which compares to 2 bcm currently); representing 26% of total generation. This was predicated on biomethane generation costs declining from €70-90/MWh currently to €47-57/MWh over this period. We detail the support for RNG globally in Exhibit 1 below.

### Exhibit 1: Building Momentum for RNG Globally

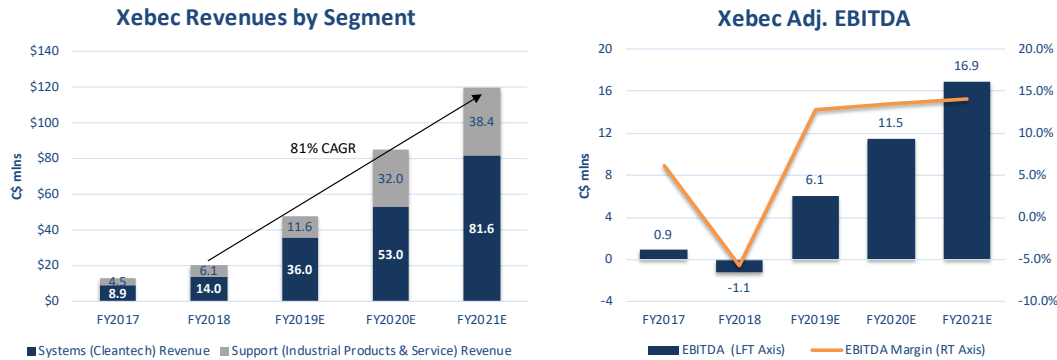
Country	RNG Expansion Plans/Target	
Canada		RNG Plan includes target of 10% by 2030 with Clean Fuel Standard, to be finalized
	Apr-18	British Columbia regulation from 5% RNG by 2022, Fortis RNG plan for 15% by 2030
	Mar-19	Quebec adopts regulation requiring 1% RNG by 2020, 5% by 2025
US		Federal Renewable Fuel Standard (RFS) and California and Oregon State Low Carbon Fuel Standards driving uptake of RNG in transportation (i.e. RINS and LCFS credit markets)
	Mar-19	SoCalGas announced commitment to 5% RNG in their gas network by 2022, 20% by 2030
	Jul-19	Oregon bill signed targeting 15% RNG into state's pipeline system by 2030, 30% by 2050
	May-19	UPS Plans to purchase more than 6,000 natural gas powered trucks from 2020-2022 and committed to purchasing 230 mln gallon equivalents over the next 7 years - largest RNG consumer for transportation
	Oct-19	Carolina, Virginia, and Utah, planned expansion to Arizona and California; goal is to serve 4% of Dominion Energy's customers by 2040 with RNG
China	Feb-19	China's National Energy Administration issues biomethane (RNG) guideline; guideline proposes 2 bcm* by 2020, 15 bcm by 2025 and 30 bcm by 2030 to increase natural gas supply, promote industry and protect environment
France	Nov-18	ENGIE announced €800M in next 5 years in support of 10% RNG in gas network by 2030, as enshrined in French Energy Transition Law for Green Growth
Italy	Mar-18	European Commission approved €4.7B public support scheme for advanced biomethane and biofuels in Italy
Denmark	Feb-19	Reached 11% in 2018 starting from near zero in 2014; projection of 100% RNG by 2035

\*bcm= billion cubic meters

Source: Xebec Adsorption Inc., Greenlane Biogas, Raymond James Ltd.

**Impressive top line growth and growing backlog drives EBITDA inflection point.** As highlighted in Exhibit 2 below, Xebec has already seen impressive top line growth in recent years from \$9.6 mln in 2016 to \$48-\$49 mln for 2019 and \$80-\$90 mln for 2020 according to company revenue guidance. This implies y/y revenue growth of 130%+ in 2019 and a further 78% in 2020 or a 3 year CAGR of 81%. While the company has not provided guidance for 2021, we estimate revenues of \$120 mln, up 41% from our 2020 estimate, and we believe likely conservative given recent revenue growth rates. Considering the strong order and quote activity Xebec has reported (described below), we have conviction that the company can meet these top line forecasts. Factoring this strong recent and forecast revenue growth, we see EBITDA margins expanding modestly from ~13% in 2019 to 14% in 2021 as the company benefits from operating leverage, supporting our \$16.9 mln EBITDA forecast. Of course, given Xebec's early stage and the larger size of some recent contract wins, relative to total revenues, there is potential for growth and margins to be lumpy. Nevertheless, we maintain conviction that the potential magnitude of the RNG opportunity warrants weathering some near-term volatility.

## Exhibit 2: Xebec Adsorption Inc. Financial Performance



Source: Xebec Adsorption Inc., Raymond James Ltd.

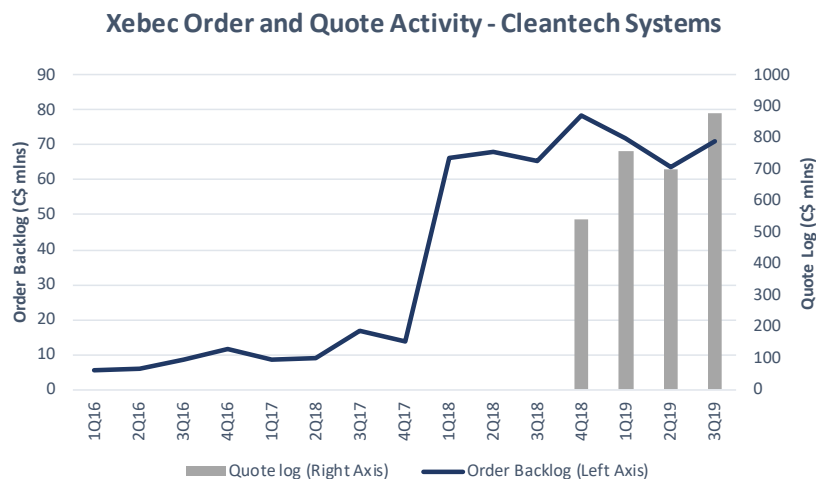
**Large utilities and corporations getting on board while Xebec's large Cleantech segment orders also provide validation.** As evidence of the increasing traction for RNG in Canada, we note FortisBC recently received BC Utility Commission approval to build a biogas plant that will capture methane at a Vancouver area landfill; providing fuel sufficient to power 2,500 homes. This represents FortisBC's third RNG facility in BC with a fourth proposed site also in the works. The investments come as part of a broader goal to supply 15% of natural gas from RNG while reducing greenhouse gas emissions by 30% by the year 2030. In the US, there have also been several high profile examples of large utilities such as Duke Energy (DUK-NYSE, Not Rated) and Dominion Energy (D-NYSE, Not Rated) partnering with livestock farmers to produce RNG from manure. This traction for RNG comes despite the fact that it is currently roughly ~3x as expensive as natural gas. Equally important, Xebec has landed some significant contract wins of late (see Exhibit 3) including a \$51 mln order with SAPIO Group in Italy, a Biogas upgrading system to be sold to Enbridge to produce RNG from a City of Toronto landfill (announced Jul-19) and an order from one of the largest waste-to-energy landfill operators in the US. Further, as of Nov-19, the company maintains a backlog of \$71 mln with a further \$26 mln of awarded tenders—something we believe can conservatively support revenues of roughly \$120 mln for 2021. While the SAPIO order represents 40% of the company's backlog, it will be completed gradually between 2019 and 2021, during which we anticipate further orders in Italy, where support for RNG is significant on the back of €4.8 bln support program for bio-methane and bio-fuels. Xebec has also recently begun disclosing its quote log in quarterly reports as the company believes it is an indicator of future order activity. This quote log currently sits at \$880 mln—the highest level reported by the company (see Exhibit 4).

## Exhibit 3: Recent Major Contracts and Acquisitions

Year	Major Events	Date	Additional Information
2017	- Multiple Hydrogen and RNG purification orders received worth CA\$2.6 mln	Mar-06-2017	- Projects involve both French and Taiwanese H <sub>2</sub> purification systems, and Canadian and French RNG biogas upgrading systems
	- Xebec receives CA\$2.4 mln in gas purification system orders	Mar-29-2017	- Orders originate from China, Denmark, and the U.S.
	- \$9.8+ mln orders placed received from France, Italy and China	Nov-10-2017	- Xebec won 12 contracts in France through its French partner for biogas upgrading systems; Xebec will provide core technology - Received one order for a flange-to-flange agri-food waste biogas upgrading plant in Modena Italy - Xebec China received order for complete biogas upgrading plant for a Jiangsu waste water treatment plant; RNG will be injected into local grid
2018			
	- Signed an exclusive partnership with SAPIO group	Feb-15-2018	- Letter of intent signed with Italy's largest distributor of technical gases to help develop Italy's RNG biogas upgrading infrastructure - Minimum purchase order of C\$51 mln agreed upon by SAPIO to be delivered over three years
	- Xebec Shanghai receives \$3.4 mln in hydrogen purification orders	May-29-2018	- Xebec China has received four orders for its fast cycle PSA gas purification systems
	- Supplier agreement contract signed with DV Systems Inc.	Jul-17-2018	- Xebec will supply 40 to 60 air dryers to DV Systems within the next year
	- Xebec receives multiple hydrogen purification system orders totalling \$3.1 mln	Aug-01-2018	- Unit orders for transport, stationary fuel cells, and refinery off-gases were won from customers in Japan, Taiwan, Italy and Canada
	- Xebec receives U.S. order for a landfill gas upgrading Nitrogen Rejection Unit (NRU)	Aug-13-2018	- Multi-million dollar landfill single stage PSA unit ordered from U.S. based customer
	- Xebec is chosen for RNG facility for the City of Toronto	Aug-30-2018	- Selected by Enbridge to be supplier of biogas upgrading system for City of Toronto's first RNG facility where RNG will be used for city trucks
	- \$5.9 mln French order for biogas upgrading plant	Nov-29-2018	- Multiple biogas upgrading Pressure Swing Adsorption units to be delivered in 2019 - Xebec will provide core technology while its French partner will provide the balance of the plant for the biogas upgrading system
	- Xebec acquires Ontario based air and gas service company Compressed Air Intl. (CAI)	Dec-10-2018	- CAI is a full service provider and distributor of industrial compressed air and gas products - All outstanding shares of CAI bought for CA\$ 2.2 mln - CAI will provide Canada-wide service and support for Xebec's Cleantech segment
2019			
	- Xebec's first Italian RNG project becomes operational	Jan-28-2019	- Biogas upgrading plant for Atzwanger AG-SpA in Modena, Italy is now operational - Project is producing pure biomethane for injection into local natural gas grid from source-separated municipal organic waste
	- Xebec receives \$6+ mln Italian landfill biogas upgrading contract	Mar-12-2019	- Project will produce ~ 5 mln m <sup>3</sup> of carbon neutral RNG
	- Xebec announces over \$11.7 mln in new orders	Sept-11-2019	- Orders span from RNG generation to hydrogen purification projects - Awarded a contract for Oakville Ontario based BerQ RNG for installing a flange-to-flange food waste biogas upgrading plant - Combined orders will increase backlog to \$72.2 mln from \$63.5 mln
	- Signed letter of intent with Maas Energy Works (MEW) for five RNG systems	Dec-05-2019	- Four biostream container systems will be supplied by Xebec to MEW in order to produce RNG from dairy farms throughout California - An additional larger biogas unit will be supplied for a site located in the western U.S. region - Project delivery dates are throughout 2020
	- Xebec Acquires California-Based Air and Gas Service Company, CDA Systems LLC	Dec-10-2019	- All cash purchase of CDA Systems' outstanding securities - CDA Systems is a distributor and service provider of air compressors, air dryers, and filtration systems in the San Francisco, Bay Area

Source: Xebec Adsorption Inc., Raymond James Ltd.

#### Exhibit 4: Xebec Adsorption Sales Pipeline



Source: Xebec Adsorption Inc., Raymond James Ltd.

#### Head start in global RNG market and proprietary tech makes Xebec an attractive play on the emergence of RNG while hydrogen purification in China also represents a big opportunity.

As discussed throughout this report, there are numerous players; from smaller technology focused companies, to large diversified utilities, that are currently involved in the emerging RNG market in some fashion. As momentum builds, we expect a significant opportunity exists for Xebec to capture meaningful market share both via sales of its Cleantech Systems and potentially as a participant in what could ultimately be a substantial required build-out of RNG infrastructure in Canada. Xebec's proprietary technology uses a variation of a process known as Pressure Swing Adsorption (PSA)—a means by which certain gas molecules can be separated from a mixture of gases. As we understand it, a key element of Xebec's PSA technology is a rotary valve that facilitates faster cycling time and reduces the footprint of the system. Xebec has invested \$65 mln in this technology for which it received over 100 patents. While these patents were sold to Air Products and Chemicals Ltd. (APD-NYSE, Not Rated) and currently licensed from them, Xebec maintains access to the technology with no royalty in perpetuity. Importantly, while 2 of the patents sold to APD are used in XBC's biogas upgrading systems, much of the company's value proposition and performance of the units stems from know-how and process optimizations made over years. Typically, PSA recovery rates deliver recoveries in the 94% to 96% range. In March 2017, Xebec broke this range and was able to achieve recovery rates of 98.5% by optimizing the process design with the adsorption/desorption cycle. Xebec has been achieving these recovery rates in their European upgrading systems for some time; as such, it is a well proven process and is one of the main reasons responsible for their significant order book increase. Further, Air Products is not in the equipment business and therefore does not compete with Xebec and has not licensed the IP to any other player. The benefits of Xebec's equipment/adsorption process relative to other adsorption methods include: high resulting product purity; a lower lifecycle cost; flexible process; lower energy usage; a drying effect to the gas, which avoids the need to complete this step separately; and low maintenance costs (see Exhibit 5). As several other companies are targeting the RNG space, we expect Xebec's success will center on increasing adoption of its technology. We believe the value proposition for this technology is borne out by Xebec's successful penetration of numerous markets internationally. Markets including France—where the company is a market leader with 20 systems installed—Canada, China, Italy, the US, Japan and Taiwan. Moreover,



the company's key competitive advantages are the low lifecycle costs of its adsorption equipment and ability to service these systems via its Services segment. Discussed in more detail above, the increasing traction Xebec is seeing is evident from its growing backlog. We also highlight another potentially sizable opportunity for Xebec's hydrogen purification systems in China where ambitious government targets for fuel cell vehicles and infrastructure will necessitate large volumes of renewable hydrogen.

#### Exhibit 5: Xebec Pressure Swing Adsorption vs. Other Adsorption Methods

Comparison	Xebec PSA	Other PSAs	Water Scrubber	Amine Scrubber	Membrane
Removes CO <sub>2</sub>	•	•	•	•	•
Removes N <sub>2</sub> & O <sub>2</sub>	•	•			
Delivers high methane recovery	•			•	•
Compact	•				•
Keeps operating & maintenance costs low	•	•			
No water, chemicals or solvents are added	•	•			•
Economical in wide range of flows	•	•			
Easy to operate	•				•
Delivers reliable & consistent life performance	•	•		•	
Environmentally friendly	•	•			•
Produces high purity biomethane	•	•		•	
Quick start-up	•	•			•

Source: Xebec Adsorption Inc.

**Industrial service division growing by M&A, positioned to provide operations and maintenance to cleantech systems sold and get access to lucrative aftermarket.** Representing another significant growth opportunity for Xebec, the company is employing a consolidation strategy in its Industrial Services segment. From our conversations with management, we understand these companies are typically run by individuals who are nearing retirement and are thus motivated to sell. These businesses typically come at transaction multiples between 4-6x adj. EV/EBITDA (or 0.5x revenues) suggesting meaningful accretion relative to the company's 2020 and 2021 multiples of 17.0x and 11.5x respectively. Purchase prices are structured with 70% cash and with the remainder coming in the form of 30% earn out with management incentivized to stay with the company and maximize revenues during the earn out period. Notably, Xebec expects to grow services revenues from \$11 - \$12 mln in 2019 to \$30-35 mln in 2020; with roughly half of this y/y growth coming organically, while the remainder comes from M&A. As an example of this strategy, Xebec recently signed a letter of intent with Maas Energy Works, to supply four small-scale, containerized RNG upgrading systems at Dairy Farms in California; an additional larger, non-bio-stream unit will be delivered for a site in the western region of the U.S. This was shortly followed by the acquisition of an air and gas services company in the state, CDA Systems which will provide service and support for this new customer. This represented a move into the California dairy RNG market as well as illustrating the complementary nature of the two segments. Importantly, we speculate this acquisition may signal more Cleantech segment sales in California, supported by the rising Clean Fuel Standard. While financial details of each transaction were not released, we believe this represents an intriguing strategic move into what should be a high growth market for RNG. Looking ahead, while the CDA Systems' acquisition may satisfy the M&A related portion of 2020 revenue guidance for the segment, we would not be surprised to see further acquisitions in the medium-term likely in other regions with renewable fuel mandates such as Washington and Oregon. Importantly, this service footprint, in addition to representing a competitive advantage for the Cleantech systems business, also gets Xebec access to the lucrative service



aftermarket. Moreover, Xebec has had good success growing revenues organically in the acquisition it has made thus far (CAI) with 20+% organic growth post acquisition.

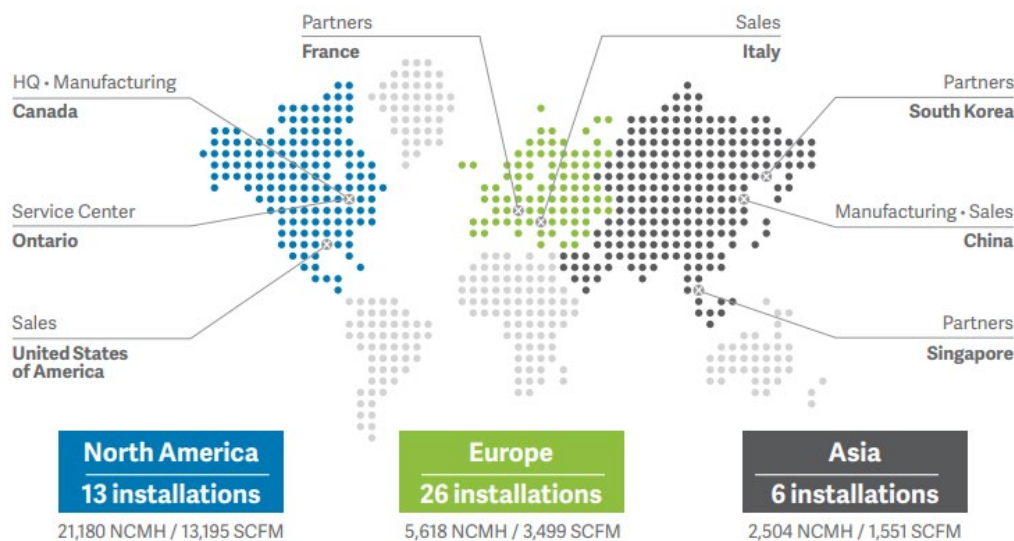
**RNG Infrastructure build out could be a game changing opportunity.** While it is not currently reflected in our estimates, we believe the potential for Xebec to play a role in what could be a substantial RNG infrastructure build out in Canada represents an opportunity that could revolutionize the company. Interestingly, not only is the gas distribution network larger in terms of energy delivered than the electrical grid (1.2x larger in the US and 2x larger in Canada), but it is also much earlier in its transition to renewable content—roughly 10 years behind the electrical utilities. We expect a potential catalyst for increased activity on this front in Canada would be a decision from the federal government on the Canadian Clean Fuel Standard (CFS)—a federal low carbon fuel requirement that will mandate the reduction of carbon content by using 10% RNG. With an expected confirmation in 2020, Xebec estimates that a 10% renewable gas requirement would necessitate 600-800 RNG facilities in Canada and a required investment of \$15-\$18 bln in RNG infrastructure. Of this, 15% (or \$3 bln) would be equipment that Xebec could supply directly while the company would also play a role in developing the infrastructure operating it and likely maintain an ownership stake.

## COMPANY OVERVIEW

Headquartered in Montreal, Quebec, Xebec Adsorption Inc. (XBC-TSXV) specializes in compressed air and gas and has developed an array of products and technology solutions for renewable gas generation, purification, dehydration, separation, and filtration applications. Today, the company’s key products are upgrading systems for biogas to RNG and hydrogen purification for fuel cell applications. Established in 1967, Xebec has more than 50 years of experience in adsorption technology and has sold over 9,000 units to 1500 clients internationally.

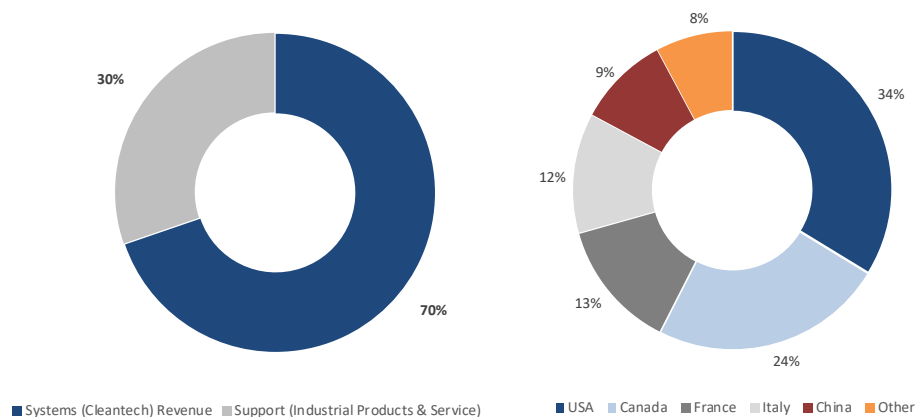
The company maintains manufacturing facilities in Blainville Quebec and Shanghai China, and also has a sales office in Milan Italy, the U.S. and China (see Exhibit 6.1). Further, Xebec has partner firms in France and Singapore. As of 2019, Xebec operates in three main business segments (see Exhibit 6.2): i) Cleantech Systems, ii) Industrial Service & Support; iii) Renewable Gas Infrastructure. The majority of the company’s revenue comes from its Cleantech Systems segment (~70%) with the remainder coming from its Industrial Service & Support segment. Xebec’s Renewable Gas Infrastructure segment is newly established and has yet to contribute to revenues. Xebec has a broad range of customers and revenues and is well diversified globally with approximately two thirds being derived from North America—approximately 34% and ~24% being generated from the U.S. and Canada respectively.

**Exhibit 6.1: Xebec Adsorption Inc. Global Footprint**



Source: Xebec Adsorption Inc.

**Exhibit 6.2: Xebec Adsorption Inc. Revenues by Segment & Geography—(FYE 2018)**



Source: Xebec Adsorption Inc., Raymond James Ltd.

By way of background, Xebec was founded in 1967 and initially operated as a manufacturer of compressed air dryers. The more relevant part of the company’s history began in 1998 when Xebec was acquired by a UK-based filtration company, Domnick Hunter. Then, in 2004, current CEO Kurt Sorschak was appointed general manager of the Canadian division of Domnick Hunter’s air dryer manufacturing facility (the largest adsorption dryer manufacturer in North America at the time). In 2005, Domnick Hunter was acquired by US Multinational firm, Parker-Hannafin and Kurt Sorschak was appointed general manager of their Xebec division. With Parker Hannafin looking to move its compressed air business to the US in 2007, Mr. Sorschak was able to buy the Canadian division of Xebec with two other partners through a management buyout. While Xebec had focused on gas dehydration up to this point, in 2009 the company purchased publicly traded Questair (via RTO), a company focused on adsorption technology for RNG and hydrogen purification. It was in 2009 that management shifted focus to the growth opportunities available in the RNG upgrading space. However, this opportunity was slow to materialize and the legacy gas segment business remained the core of the business. However with the rise in demand for renewable energy sources and increased legislative and regulatory support, Xebec shifted focus to what is now termed its Cleantech Systems segment in 2016 with the significant momentum the business is seeing today coming from this line of business. The legacy gas dehydration business continues to perform well and provides a foundation for the high-growth Cleantech systems segment.

## COMPANY STRATEGY

### Cleantech Systems – Renewable Natural Gas and Renewable Hydrogen

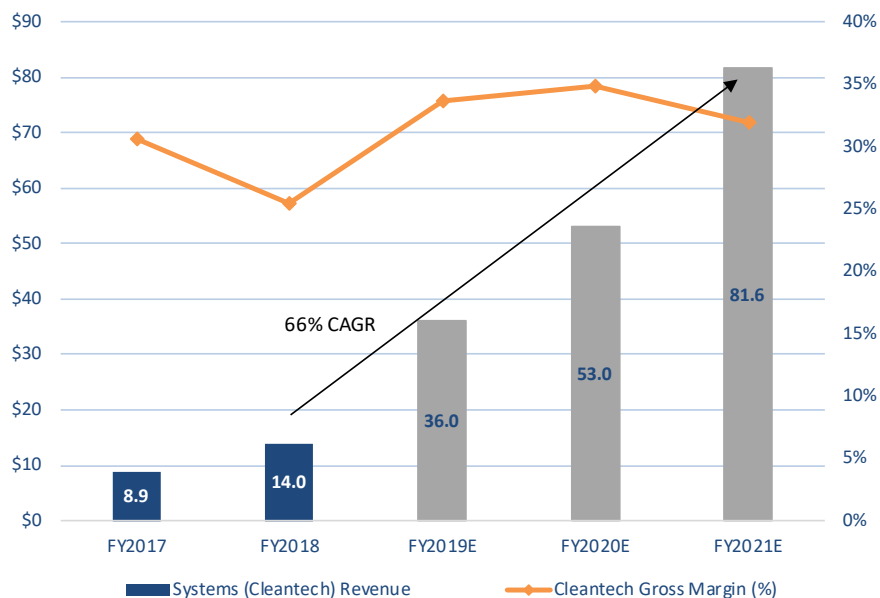
Xebec's Cleantech Systems segment features two primary product lines; biogas upgrading systems (trademarked BGX) and hydrogen purification systems (H2X). Among these, we believe the most significant near term opportunity is the sale of equipment used to upgrade biogas to Renewable Natural Gas (RNG). Using its proprietary Pressure Swing Adsorption (PSA) technology, the company's systems replace the bulky network of piping and valves used in conventional PSA systems with two compact integrated valves. As detailed in Appendix I in this report, adsorption is the process by which industrial gases are purified and are used in a variety of industrial gas applications. As it relates to RNG specifically, Xebec's technology provides lower lifecycle costs and improved methane recovery, which drives improved profitability to project owners. Xebec management believes these systems are the most compact, economical, and reliable PSA systems available today with easy, flexible installation and strong operating performance. We believe the success Xebec has had internationally is evidence of this value proposition with hundreds of RNG systems sold to date in core markets including the U.S., Canada, France, and Italy. With this superior proven technology, Xebec is extremely well positioned, in our view, to benefit from rising demand from gas utilities and government incentives for RNG globally (see Exhibit 7).

Notably, although rapid development of wind and solar has significantly increased renewable generation among electric utilities, gas utilities have not kept pace and are therefore exposed to the risk that customers seeking renewable power sources will substitute these gas end uses for electricity—particularly in home heating, water heaters, and gas stoves. We believe this, as well as increasing government support for RNG, will drive significant growth in demand for Xebec's Cleantech systems. Xebec management believes the addressable opportunity in North America is \$6.3 bln, representing 1,400+ systems, while the broader opportunity in the company's core markets globally is approaching \$11 bln. As testament to Xebec's equipment, we note Fortis has already procured biogas upgrading facilities from the company as part of its RNG rollout strategy in British Columbia.

While perhaps not on the magnitude of the opportunity in RNG, Xebec also sees an opportunity over the coming decade in Hydrogen (H<sub>2</sub>) purification for fuel cell applications (the company expects H<sub>2</sub> to ramp up over the next half decade potentially surpass RNG). Essentially, Xebec's equipment is able to upgrade gas sources containing H<sub>2</sub> (reformate, petrochemical gas streams, refinery off-gassing, etc.) and upgrade it to sufficient purity to use in Fuel Cell Vehicles (FCVs). We understand Xebec is working with several fuel cell manufacturers in Europe, North America, and China to supply the equipment used in refueling and H<sub>2</sub> production equipment. Further, the company has partnerships that will facilitate the sale of integrated systems—from H<sub>2</sub> generation to refueling. The H<sub>2</sub> purification opportunity is centered primarily in China (which represented 9% of 2018 revenues), where refinery and petro-chemical end use (the company's equipment is used for off-gas purification) and the fuel cell opportunities are each more advanced. In fact, the company's partner in China, Shenergy, has been nominated to build H<sub>2</sub> infrastructure in one of China's largest cities, Shanghai. This is part of broader Chinese government plans to deploy 1 mln Fuel Cell Electric Vehicles (FCEV) by 2030 while building over 1,000 refueling stations. As part of its legacy business, Xebec maintains manufacturing operations in China, but notably does not manufacture the core technology of its systems there. As an indicator of the magnitude of this opportunity, forecasts from industry groups (the Hydrogen Council) suggest the market for H<sub>2</sub> in Asia and California could reach 100 mln tonnes per year by 2050. Further, the Fuel Cell & Hydrogen Energy Association has estimated total US H<sub>2</sub> demand of 13 mln tonnes by 2025 driven by an estimated 125k material handling vehicles and 200k light-medium-and heavy duty FCEV's. While data from the International Energy Association indicates H<sub>2</sub> produced from

renewable sources is currently much higher cost than when it is produced from fossil fuels, costs are expected to decline over time. As highlighted in Exhibit 7 below, we anticipate continued robust growth in XBC's Cleantech Systems segment with y/y revenue growth of 47% and 54% in 2020 and 2021 respectively.

**Exhibit 7: Xebec Adsorption Inc. Cleantech Revenues & Gross Margin**

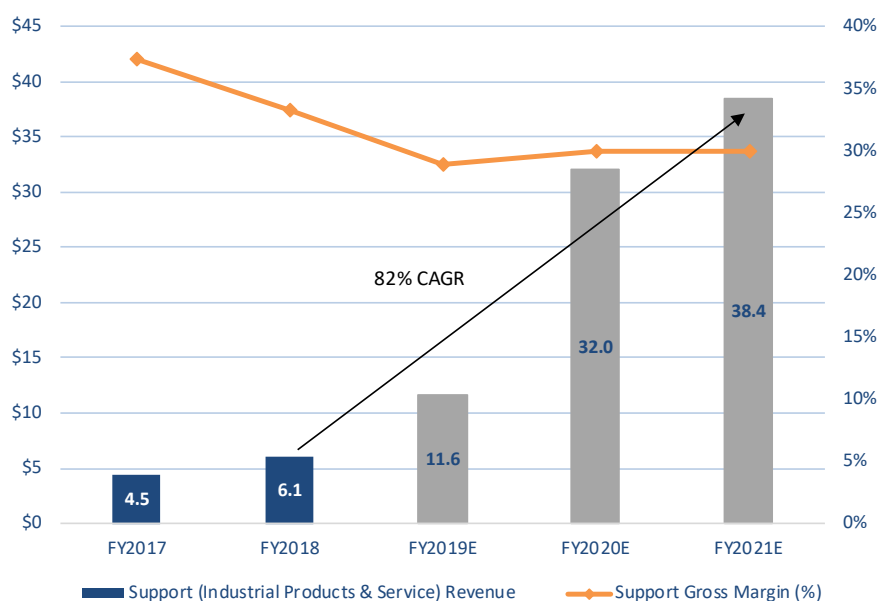


Source: Xebec Adsorption Inc., Raymond James Ltd.

## Industrial Service and Support

Under Xebec's industrial service and support segment, the company develops, builds and sells a range of products including compressed air dryers for industrial end uses, compressed air and gas filtration products and alternative brand replacement parts. As shown in Exhibit 8 and mentioned earlier in this report, management has provided guidance for total segment revenue to more than double in 2020. Service replacement parts, maintenance and operational support that Xebec provides for an existing customer base of 9,000 installations globally, represent the majority of revenues in this segment—something that is typically a high margin business with recurring revenues.

M&A represents a key part of the company's strategy in this segment, with the company acquiring small to mid-sized compressed air and gas service businesses in Canada and the U.S. We note that the companies Xebec has historically acquired are typically servicing air compressor systems, which are similar to gas compressor systems. As the only meaningful difference is air vs. gas compression, some training and certifying is needed, but this is not an overly onerous process. Xebec estimates the company's current market share is at 15% (Canadian industry size: \$60-\$70 mln) and has communicated a target of 30% by 2021. Meanwhile, in the US the market is much larger—estimated at US\$700-\$800 mln. We see the benefits of this strategy as three-fold including: 1) via M&A, the company can add what are typically high margin businesses with strong recurring revenue at reasonable multiples; 2) it provides Xebec the ability to provide local service and support for RNG upgrading systems and is expected to represent a competitive advantage over time; and 3) it gives Xebec access to the lucrative after market where the company can service any kind of RNG facility (filters, oil, etc.). We highlight our expectation of significant growth in this sector in coming years with estimated revenue growth of 175% and 20% in 2020 and 2021, respectively.

**Exhibit 8: Xebec Adsorption Inc. Service & Support Revenues & Gross Margin**

Source: Xebec Adsorption Inc., Raymond James Ltd.

## Renewable Natural Gas Infrastructure Segment

Representing a new line of business for Xebec, the company plans to partner with gas utilities, waste companies, municipalities or other project developers, to capitalize on the large potential need for RNG Infrastructure expected in Canada. Two Canadian utilities, Energir in Quebec and Fortis in BC, are currently offering attractive 20 year gas offtake agreements for prices up to C\$30/GJ. Under this segment, Xebec would play a role in developing, permitting, and operating RNG upgrading plants. Further, in conjunction with partners, Xebec would sign offtake agreements and enter into feedstock agreements with suppliers (landfills, farmers, etc.). These facilities will be located at sites determined by the company where feedstock and gas interconnectivity are available. As mentioned earlier in this report, we expect a catalyst for increased activity on this front would be a decision from the federal government on the Canadian Clean Fuel Standard (CFS). As it currently stands, players in the RNG space are relatively small and generally lack the balance sheet and development expertise necessary to move forward on these projects. Thus, the challenge for Xebec will be finding partners and scaling the business. Importantly, we note that unlike a renewable power development, these facilities need to secure feedstock and to redistribute digestate (the organic fertilizer waste products from the RNG upgrading process) while the operations of these facilities will be more substantial and require more expertise. Clearly, the successful scaling of this opportunity will necessitate large partners with substantial financing capacity; however, Xebec believes it can participate by selling equipment, signing agreements to operate the assets and potentially keeping a partial ownership stake. Management has indicated expected IRRs of 12-15% for these projects.

We understand Xebec is currently in discussions with utilities such as Fortis to provide RNG under a Gas Purchase Agreement (GPA) searching for an appropriate partner and model to move forward with. The company expects to have a project announced and a partnership in place by early 2020. Thus, while this segment does not yet contribute to revenues, we believe it could represent significant long

term blue sky potential. In fact, in the long run, Xebec sees an opportunity for its technology to facilitate the use of RNG as a means of storing power from renewable sources such as wind and solar power. Notably, RNG theoretically has an order of magnitude greater potential capacity for storage than lithium ion batteries while also providing a much longer discharge time. While this would require a substantial reduction in cost for the technology, we believe it represents a large potential future opportunity.

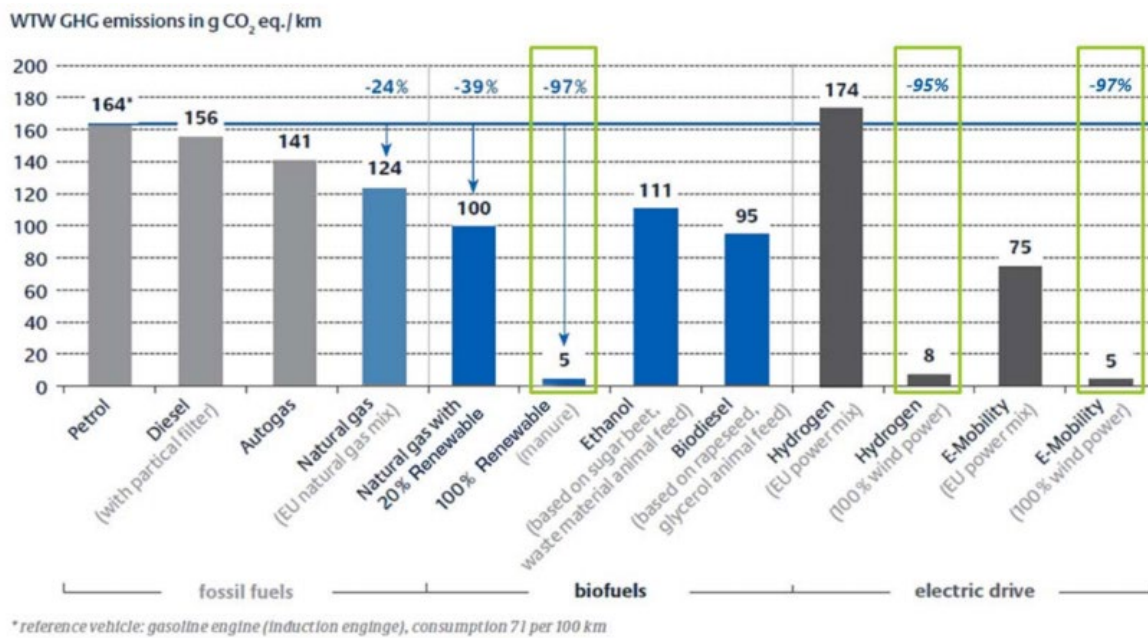


## INDUSTRY BACKGROUND

### Climate Change Driving Government Policy

As we have often noted in our coverage of the renewable power producers, the global political will behind reducing carbon emissions remains significant, in our view, and will continue to drive investment in renewable energy sources and infrastructure. While electric generation has become significantly less carbon intensive over the past decade, lower carbon fuels such as Renewable Natural Gas (RNG) and Renewable Hydrogen (RH2) represent alternatives for gas utilities that are currently at a much earlier stage of de-carbonization. RNG is produced from raw biogas emitted by agricultural and organic industrial waste, both of which are large emitters of methane, which is 28x more potent than CO<sub>2</sub> with respect to trapping heat within the earth’s atmosphere. Thus, as this RNG comes from a source that would otherwise decay and emit methane, it effectively captures more greenhouse gases than it emits making it a carbon negative fuel. In fact, the US Department of Energy has found that RNG sourced from landfills and dairy manure can reduce greenhouse gas emission by 125% and 400% respectively. As shown in Exhibit 9, the carbon intensity level for engines running on RNG and RH2 from renewable sources are 97% and 95% lower respectively when compared to engines using fossil fuels. The current zeitgeist and opportunities of RNG and RH2 are leading to major industrial and government policy change. As the only Canadian manufacturer of gas adsorption systems, Xebec is well positioned to grow with the industry.

**Exhibit 9: Low Carbon Fuels—RNG & RH2 GHG Emissions Carbon Intensity**



Source: Xebec Adsorption Inc. Quarterly report

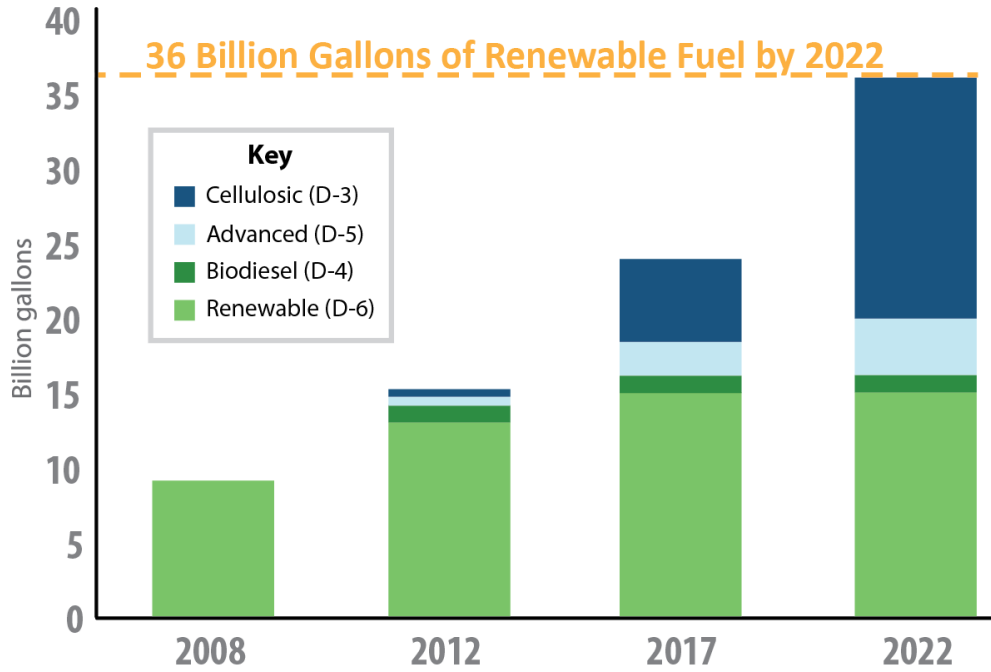
## Changing Government Standards

Broad based government support for the reduced usage of Green House Gas (GHG) emitting fuels has led to several policy and regulatory changes globally such as the Paris Climate Accord, the Renewable Fuel Standard (RFS) in the U.S. and the Canadian Clean Fuel Standard (CFS)—currently in the implementation phase and will most likely be put into law mid-2020. We believe each of these policies will drive investment in the RNG sector going forward and briefly describe each below.

**Canadian Clean Fuel Standard (CFS).** With the draft released in Jun-19, the CFS maintains an objective of requiring an 11% reduction in the carbon intensity of fuel products used in transportation, buildings, and industry by 2030. This is expected to result in a 30 mln ton annual reduction in GHG emissions, which is estimated to be the equivalent to taking 7 mln cars off the road. This makes the CFS policy the largest contributor to Canada's climate change mitigation efforts representing 15% of the country's GHG reduction target. These regulations, which possibly begin to take effect in 2022, will set separate requirements for liquid, gaseous and solid fossil fuels. Importantly, although these final objectives are set by the government, the manner in which they are achieved is not prescribed; meaning, increasing blends of cleaner fuels, efficiency improvements, or supporting companies focused on electrical mobility (via credit purchase) can each be utilized. Under the CFS, clean energy credits will be generated to entities switching fuels from a higher carbon intensity fuel, to a lower carbon intensity fuel (i.e., Hydrogen, Natural Gas). Leading us to believe the proposed regulations will represent a tailwind for RNG production.

**Renewable Fuel Standard (RFS) Program.** Established by the 2005 Energy Policy Act (EPA), the RFS has a mandate that requires the reduced use of petroleum-based transportation fuel, heating oil and jet fuel. Currently, the policy requires that these petroleum based fuels be replaced with renewable fuels that fall into four renewable fuel categories: 1) Biomass-based diesel; 2) Cellulosic biofuel; 3) Advanced biofuel; 4) Renewable fuel. Under this policy, RNG is one of the approved pathways to generate a Registered Identification number (RIN); a form of renewable energy credit. Exhibit 10 shows the volume of renewable fuel—that is being targeted by US congress—to replace petroleum based fuels under the current policy targets. The target volume is 36 bln gallons by 2022, which compares to the 4.0 bln gallon renewable fuel requirement in 2006. As a fuel type for use or a feedstock, RNG can fall under the cellulosic (D-3 credit) or advanced technology (D-5 credit) meaning that it has a 20+ bln gallon 2022 target. However, RNG can also be used in the production process for many different types of fuels that fall under the biodiesel D-4 and renewable D-6 credit. According to a report put out by the Congressional Research Service however, it is unlikely that the U.S. will meet these targets. In fact, the total renewable fuel and total advanced fuel targets have not been met since 2013 and currently sit at 71% and 38% respectively of the 2019 mandate. The EPA cites that a number of issues such as infrastructure, technology and limited federal support were the main challenges leading to the shortcomings. Despite this, as it relates to RNG specifically, we note there are a large number of facilities being built in North America today while RNG production, measured in Greenhouse Gas Equivalent (GGE), has grown significantly according to data from the industry group, Natural Gas Vehicles for America (detailed below). Thus, we believe these policies, while perhaps overly ambitious, are still driving significant growth in RNG.

Exhibit 10: Congressional Volume target for Renewable Fuel



Source: United States Environmental Protection Agency

## Growing RNG Footprint in North America

As detailed in Exhibit 11.1, data from the Coalition of Renewable Natural Gas indicates there are 110 fully operational RNG facilities in North America (99 in the U.S. and 11 in Canada) with another 40 under construction and 58 in development. In North America, over 95% of the current RNG output reported through the RFS program comes from landfill projects, which are lower cost due to the large quantities of processable gas emitted and more mature technology. In comparison, RNG production from waste water treatment plants and agricultural bi-products are in the early stages of development. However, we see production from these feedstock sources rising over time as large energy companies have been partnering with livestock farmers for RNG projects. In fact, due to the sheer amount of methane produced from waste water and agricultural sources, these types of projects actually provide a greater GHG emission reduction per unit of output. We believe that this will give an incentive to utilize the waste water and agriculture bi-product processes. According to data from the Renewable Natural Gas Coalition, currently there are a total ~31 landfill projects that are under construction or late stage development, while there are a combined ~69 waste water and agricultural bi-product projects in those same stages.

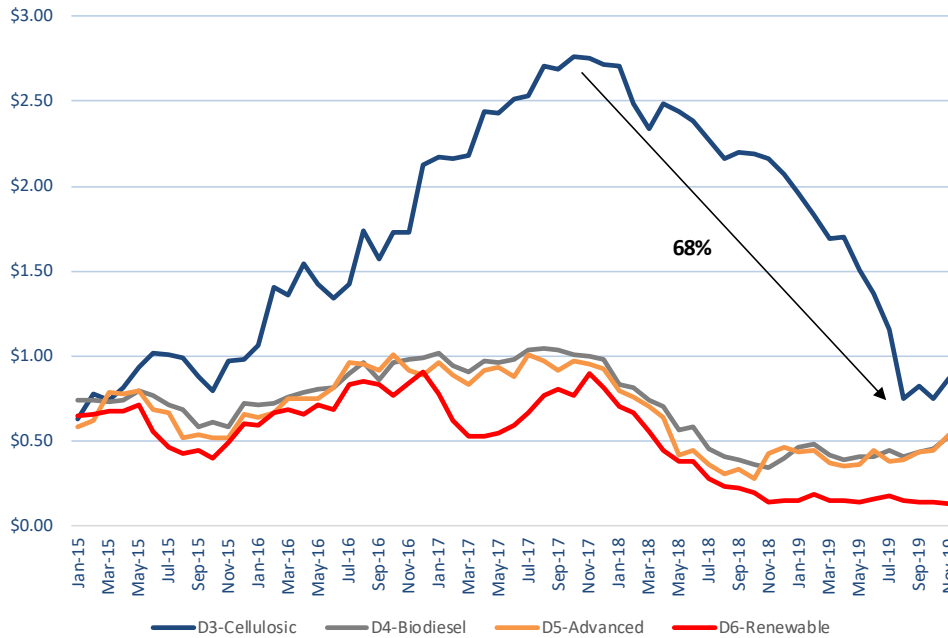
**Exhibit 11.1: North American RNG Production Facilities**



Source: Renewable Natural Gas Coalition

**RNG is interchangeable with conventional natural gas.** After processing the raw gas emitted from biomass, RNG can be used to replace or be blended with conventional natural gas. As such, it can be injected into existing natural gas pipelines allowing for the usage of existing infrastructure. This interchangeability results in diverse end-uses such as electricity generation, industrial heating, hydrogen production and liquid/gas refueling. As shown in exhibit 11.2, Registered Identification Number (RIN) data gathered by the U.S. Environmental Protection Agency (EPA) shows RIN pricing has declined as of late. The decrease has mainly been attributed to the significant increase in EPA small refinery exemptions—exemptions that free small refineries in economic hardship from their RFS obligations. As contract pricing for RNG between producers and gas offtakers are established by factoring in RFS RINs, RNG economics have taken a corresponding hit. However, working in favor of RNG adoption is that 1) RNG can also be distributed through existing infrastructure (no additional investment to distribute is needed) and 2) the fact that municipalities are slowly becoming more restrictive on the disposal of organic materials in landfills. Considering that infrastructure is one of the largest cost factors, this is a material benefit to RNG relative to other renewable fuels. For example, vehicles that use conventional natural gas require no further investment to retrofit these vehicles for RNG. Additionally, the disposal of organic waste will include tipping fees—a charge levied on a given quantity of waste. Considering the infrastructure and waste management savings, the RNG economics for gas utilities workout favorably. As shown in Exhibit 12 below, this has led to substantial growth in RNG usage over the past few years, which, according to the Natural Gas Vehicles for America, has also lead to the displacement of over seven million tons of Carbon Dioxide Equivalent (CO<sub>2</sub>e). Total RNG production has more than doubled since 2014 (CAGR of 54%) with substantial further production capacity available. However, we note that this was during a time of heavy government incentives in the U.S., and that programs like the RFS and CFS have promoted RNG production. Sustaining this type of growth will prove more difficult going forward without similar support from such programs.

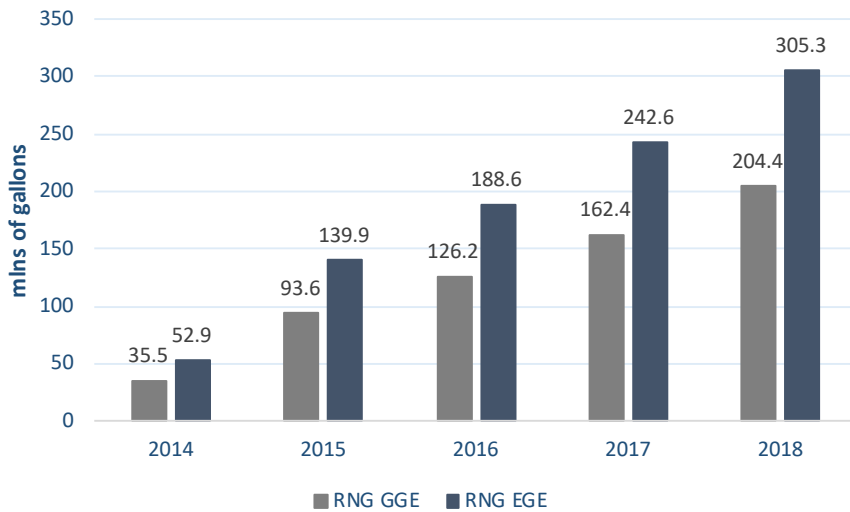
**Exhibit 11.2: Historical Registered Identification Number (RIN) Pricing**



Note: Weekly average pricing shown

Source: U.S. Environmental Protection Agency

**Exhibit 12: RNG Gasoline Gallon Equivalent & Ethanol Gallon Equivalent Annual Production**



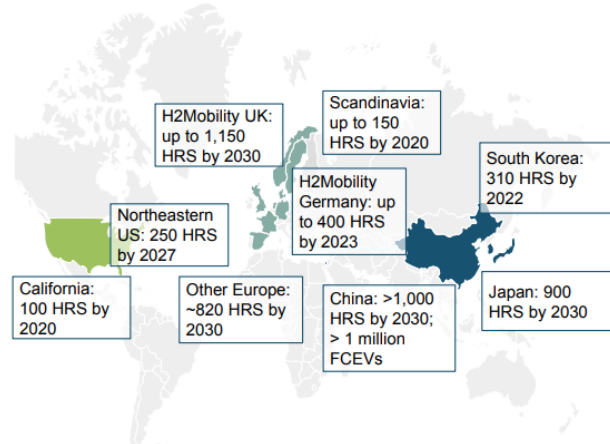
Source: Natural Gas Vehicles for America, Raymond James Ltd.

## Increased Hydrogen Demand for Fuel Cell and Industrial Applications

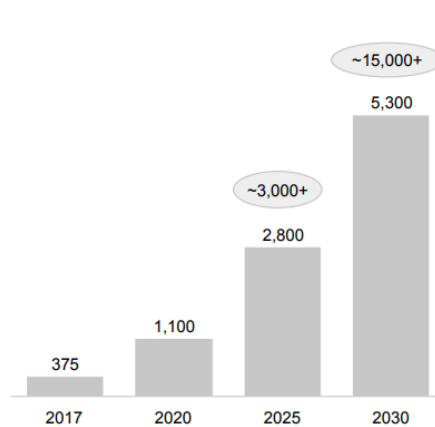
Primarily used in industrial applications, Hydrogen (H<sub>2</sub>) is typically produced through water electrolysis or Steam Methane Reforming (SMR) each of which necessitate the use of fossil fuels. In fact, the International Energy Agency estimates, more than 60% of H<sub>2</sub> used in refineries today comes from fossil fuels. With more stringent regulations and policies being implemented however renewable H<sub>2</sub> created from RNG is increasingly being favored over H<sub>2</sub> produced by SMR (“gray H<sub>2</sub>”) which currently represents 95% of H<sub>2</sub> produced globally. Meanwhile the decarbonization of the transportation sector, energy sector, the potential for H<sub>2</sub> to be used as a feedstock in chemical industries, and in the steel making industry, are each supportive of increased H<sub>2</sub> consumption. In fact, according to the Hydrogen Council’s 2017 report, they estimate that in the transportation sector alone, Fuel Cell Electric Vehicles (FCEV) could represent 3% of new vehicle sales globally by 2030 and ramp up to 35% by 2050; with China becoming the global leader in H<sub>2</sub> Refueling Stations (HRS) and FCEV use (see Exhibit 13). It is expected that by 2030, China will have 1000+ HRS and over 1 mln FCEV. As it relates to Xebec, we believe that this bodes well for their unit sales, and the resulting servicing and maintenance required—further bolstering their recurring revenue. In fact, management believes that the potential system and equipment sales, based on announced projects in their target areas, exceeds \$6 bln.

### Exhibit 13: Global Hydrogen Re-fueling Station Footprint

Latest announced investments in hydrogen refueling stations (selected countries)



Current global announcements<sup>1</sup>



<sup>1</sup> Announcements for shaded countries/regions: California, Northeastern US, Germany, Denmark, France, Netherlands, Norway, Spain, Sweden, UK; Dubai; China, Japan, South Korea

<sup>2</sup> Equivalent number of large stations (1,000 kg daily capacity)

SOURCE: Air Liquide; Honda; Hydrogen Mobility Europe; H2Mobility; E4tech; NREL; web search

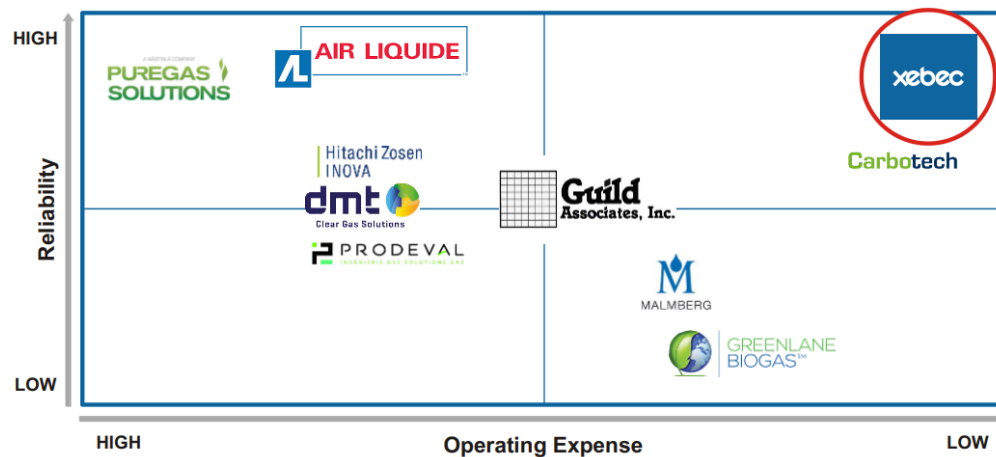
Source: Hydrogen Council: Scaling Up Hydrogen (2017)



## Competitive Landscape

Among renewable technologies, the RNG industry is still considered niche relative to the more developed wind and solar sectors. Further, as it currently stands, there are very few competitors that are involved in adsorption specifically. As shown in Exhibit 14 below, there are a handful of companies that operate in the RNG space and even fewer with comparable products. Of these, we understand the company with the most comparable product is Carbotech, which uses a more conventional Pressure Swing Adsorption (PSA) technology. As explained in Appendix I and elsewhere in this report, Xebec’s PSA systems are able to achieve 99%+ methane recovery rates at low operating costs. Most other conventional PSA systems offered are not able to achieve these recovery rates at these lower costs due to the slow-cycle pressure swing technology they utilize. Conventional PSA technology uses 5 or 6 vessels, which in turn requires a large number of switching valves and solenoids to control them. As a result, more complex controls and software are required in order to keep these systems operating; resulting in higher servicing and maintenance costs as well as costly replacement parts. Xebec’s more advanced fast cycle technology allows systems to operate at lower pressures and therefore significantly reduces the number of vessels and controls required. Further, the lower pressures do not require the gases to be compressed to the high levels found in conventional systems, meaning less energy input is required—30% less in input energy costs relative to main competitive technologies like membrane RNG upgrading plants. Carbotech’s slow-cycle system has comparable methane recovery rates and runs with a similar energy input, but comes with higher operating expenses (due to increased complexity), higher up front capital expenditure, and greater life cycle costs. We believe this gives Xebec a competitive advantage. We note this advantage is further extended by Xebec’s ability to service this equipment for customers.

**Exhibit 14: Competitor Equipment Reliability vs Operating Costs**

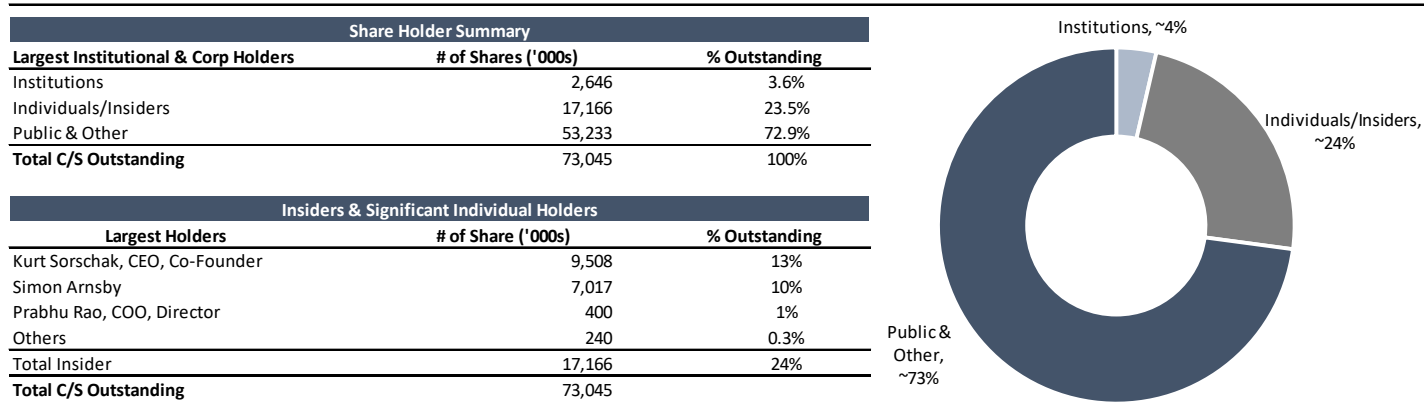


Source: Xebec Adsorption Inc.

## Share Ownership

Shares of Xebec trade on the TSX Venture under the symbol XBC. As shown in Exhibit 15, the company currently has ~73.0 mln common shares outstanding of which ~4% are held by institutions, ~24% are held by insiders, and ~73% are held publicly. We also highlight the significant insider ownership of XBC stock—led by CEO Kurt Sorschak, who owns 13% of Xebec’s outstanding stock. Xebec has one class of common shares with each holding one voting right as well as warrants and stock options. We note Xebec recently completed an equity offering whereby ~9.5 mln common shares were sold at \$2.10/share raising a total of \$20.0 mln. The company’s expected share count after this public offering will be 81.7 mln ignoring the over-allotment option of 15%. With option exercise prices ranging from \$0.16 to \$0.70 per share and an average exercise price of \$0.32/share, currently all options are exercisable and dilutive. Assuming dilution, the company has a fully diluted share count of ~99.6 mln.

**Exhibit 15: Xebec Adsorption Inc. Share Ownership as at Dec-02-2019**



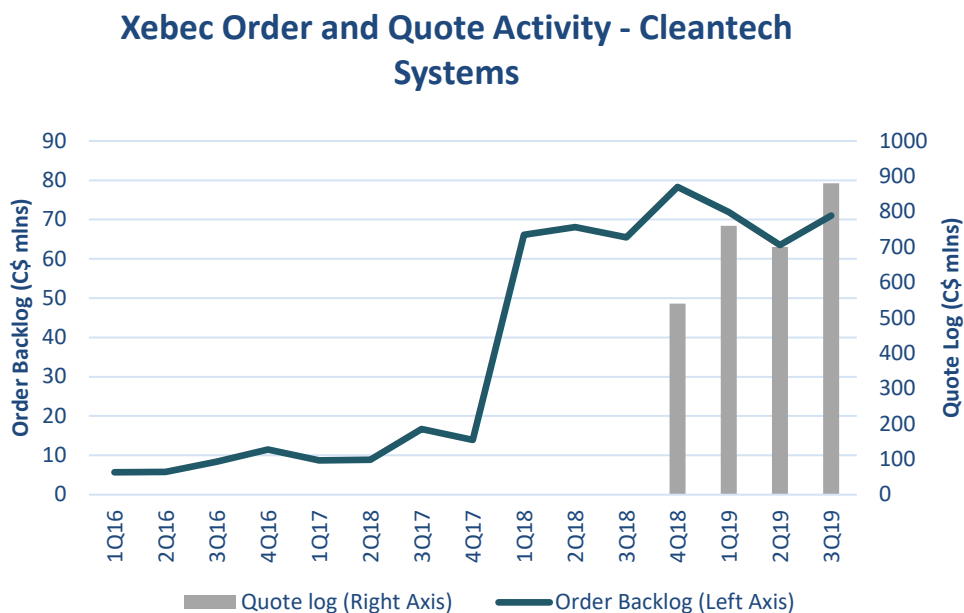
Source: Xebec Adsorption Inc., Capital IQ

## FINANCIAL FORECASTS

**Impressive 2019 results mark a breakout year for Xebec.** In recent years, Xebec has seen a step change in revenues driven by emerging demand for its clean tech systems. In fact, Xebec has indicated revenue guidance for its Cleantech Systems segment of \$34 to \$36 mln for 2019, representing top line growth of 130-150%. Meanwhile, the service segment is also on pace to nearly double revenues in 2019, by our estimates, to \$11.6 mln (the guidance range is \$11 mln to \$12 mln) from 2018's \$6.1 mln. This dramatic jump in consolidated revenues was driven by a marked increase in order activity and has spurred an inflection point in EBITDA, which was slightly negative for 2018, before improving to an estimated \$6.1 mln in 2019. With the company now profitable and cash flow positive while simultaneously growing revenues at an impressive pace, we believe investors are well served to add to positions at current levels.

**SAPIO contract is a big piece of order backlog but we expect it will be backfilled.** Of a total \$51 mln, \$8 mln of orders have been put through under Xebec's order with SAPIO, which currently represents 40% of the company's backlog. With Xebec currently working on 3 of 15 plants, progress under this order has been modestly slower than anticipated. However, the company anticipates moving forward on five plants next year and another seven in 2021. Importantly, Xebec expects more orders out of Italy in light of a large \$4.8 bln government subsidy program for RNG. In order to capitalize on this opportunity, Xebec has a sales office in Milan with a 10 person staff. We expect this strong reference project and significant RNG tailwinds will facilitate future orders in Italy that will contribute to continued growth of the order backlog.

Exhibit 16: Xebec Order and Quote Activity



Source: Xebec Adsorption Inc., Raymond James Ltd.

**Looking for continued robust growth in 2020 and 2021.** Driven primarily by continued strong growth in the Cleantech Systems segment, we forecast Xebec posting robust revenue growth over our forecast horizon. Underpinning this outlook, the Cleantech segment maintains an order backlog of \$71 mln with a further \$26 mln in tenders expected to be added in the coming weeks. In addition, Xebec has indicated its quote log is an indicator of future order activity—a metric that has continued to trend higher and now sits at its highest recorded level of \$880 mln (up from \$700 mln in 2Q19). While the company's order backlog has fluctuated between ~\$65-\$80 mln in recent quarters, it remains at levels well above those seen prior to 2018 largely due to the \$51 mln SAPIO contract awarded in early 2018. Looking forward, we estimate Cleantech Segment revenues of \$53 mln in 2020 (+47% y/y) while the Industrial Service segment contributes revenues of \$32 mln (+175% y/y)—each of these estimates are within management's guidance range of \$50-\$55 mln for Cleantech Systems and \$30-\$35 mln for Industrial Services with roughly half the y/y growth coming from acquisitions and the remainder coming from organic growth. On a consolidated basis, our \$85 mln estimate represents 78% growth y/y and falls within the \$80-90 mln guidance range. Notably, Xebec management has indicated they do not expect revenues from the Renewable Gas Infrastructure segment in 2020. For 2021, we forecast revenues growing by a further 41% as the Cleantech and Industrial services segments post continued robust y/y revenue growth of 54% and 20% respectively. Turning to margins, we assume gross margins comparable to those delivered in 2019 in the low 30% range throughout our forecast period (see Exhibit 17). However, reflecting operating leverage in the business, we anticipate EBITDA margins expanding modestly from 13% in 2019 and 2020 to 14% in 2021.

**Recent equity raise covers near term capital needs.** After accounting for a recent \$23 mln equity raise, we now estimate Xebec's cash balance at \$27 mln. We anticipate that after assuming a roughly \$5-6 mln price tag for the CDA acquisition, this provides Xebec with sufficient capital over our forecast horizon. Moreover, Xebec maintains \$23 mln in credit facilities with Economic Development Canada (EDC) to supporting working capital needs and a \$2.0 mln working capital line as well as an unused \$9 mln facility used to supporting the working cap needs for certain export contracts. Total debt of 10.5 mln as of 3Q19 is composed of: total long-term debt of \$5.9 mln (consisting of \$1.3 mln in convertible debt, \$1.9 mln on the working capital line, \$2.1 mln in lease liabilities and \$0.6 mln in earn outs for the CAI acquisition), government royalty obligation of \$0.5 mln, and from shares issued by subsidiary obligations of \$4.1 mln. As illustrated by the company's two bought deals over the past 12 months (totaling just over \$30 mln in proceeds) and strong share price performance, Xebec is abundantly able to raise equity capital for growth needs.

## Exhibit 17: Xebec Adsorption Inc. Earnings Summary; Historical and Forecast

Xebec Adsorption Inc.					
	2018-2021				
Financial Stats (\$mlns)	2018A	2019E	2020E	2021E	CAGR*
Cleantech Systems	14.0	36.0	53.0	81.6	80%
Service	6.1	11.6	32.0	38.4	85%
Infrastructure	-	-	-	-	na
Total Revenue	20.1	47.6	85.0	120.0	81%
<i>YoY Growth</i>	<i>36%</i>	<i>137%</i>	<i>78%</i>	<i>41%</i>	
Gross Profit	5.8	15.8	28.8	38.7	88%
Gross Profit (%)	29%	33%	34%	32%	
Adj. EBITDA	(1.1)	6.1	11.5	16.9	67%
<i>EBITDA Margin</i>	<i>NA</i>	<i>13%</i>	<i>13%</i>	<i>14%</i>	
FCF	(1.3)	5.7	11.1	16.5	71%
Net Income	(2.9)	3.8	7.9	12.6	83%
FCF/Share	(0.03)	0.06	0.11	0.17	
EPS <sup>1</sup>	(0.07)	0.04	0.08	0.13	
Balance Sheet (\$mlns)					
Cash & Equivalents	2.4	26.6	10.8	12.5	
Net Debt	1.8	(20.2)	(4.4)	(6.0)	
Net Debt/EBITDA	n/a	n/a	n/a	n/a	
Total Debt/EBITDA	-3.7x	1.1x	0.6x	0.4x	
WAD Shares Outstanding (mlns)					
WAD Shares Outstanding (mlns)	42.7	99.6	99.6	99.6	

1) EPS calculated using WAD share count

\* As adj. EBITDA and FCF were negative in 2018A, we have shown a 2 year CAGR

Source: Xebec Adsorption Inc., Raymond James Ltd.

## VALUATION AND RECOMMENDATION

We are initiating coverage of Xebec with a Strong Buy rating and \$3.20/share price target. As outlined in this report, we believe Xebec is poised as a leading player in an emerging industry with substantial growth opportunities. We see potential for RNG to deliver industry growth comparable to the early days of wind and solar power. However, unlike the more commoditized renewable power modalities, Xebec enjoys a meaningful competitive advantage in the form of proprietary technology and processes that sets it apart from peers. Accordingly, we believe this business warrants a growth multiple commensurate with the size of addressable market and competitive positioning.

While there are few legitimate comps for Xebec, we believe there are businesses with similar traits. Particularly, those focused on emerging clean-tech including fuel cells, alternative fuels, and other environmentally focused companies—we note these stocks trade at an average 2020 and 2021 EV/Sales of 3.6x and 2.8x respectively (see Exhibit 18.1 below). Meanwhile, a more mature group of companies focused on industrial gases, filtration, and air pressure equipment trade at similar multiples of 3.2x for 2020 and 3.0x for 2021. We note that based on our estimates, Xebec currently trades at 2.3x 2020 EV/EBITDA and 1.6x 2021 EV/EBITDA. As the company delivers on ambitious growth plans and sees continued expansion in its order backlog, we expect the market will gain confidence in its growth outlook resulting in re-rating of its trading multiple. We point to the industrial peers, which sport an average consensus sales CAGR of ~8% are growing at a much slower pace than our estimate 3 year CAGR of 81% (2018A-2021E) for Xebec. Therefore we believe a 2021 target multiple of 2.5x is warranted, which supports a \$3.20/share price target. In support of our choice of using an EV/Sales target multiple we highlight XBC's steep growth trajectory and recent turn to EBITDA positive as well as the fact that several peers are yet to post EBITDA positive results, making comparison to these companies challenging.

From another perspective, we note on an EV/EBITDA basis XBC trades at 11.5x 2021 EBITDA, as compared to Cleantech and Industrial peers at 12.5x and 11.8x respectively. We note, however, that we expect Xebec's near-term goal will be to maximize growth, as opposed to focusing on gross margins or EBITDA margins. Thus, while we would argue that EV/Sales is the more appropriate valuation methodology, we note our \$3.20 target represents a 17.6x 2021 EV/EBITDA multiple.

**Exhibit 18.1: Xebec Comparable Valuation Summary Table (EV/Sales)**

Company	Ticker	Recent		Potential Return	Shares	Market Cap	Net Debt Current	Total EV	Net Debt	Sales				EV/Sales			Sales CAGR
		Price	Target							2018A	2019E	2020E	2021E	Annual	2019E	2020E	
Symbol	27/12/2019	Price*	(%)	o/s	(\$ mlns)	\$mlns	\$mlns	(%)									
<b>Industrial Gas Servicing Peers</b>																	
Donaldson Company, Inc.	NYSE:DCI	\$ 58.15	\$ 52.80	-9%	127	7,360	577	7,918	7%	2,734	2,844	2,838	2,946	2.8x	2.8x	2.7x	2.5%
Parker-Hannifin Corporation	NYSE:PH	\$ 207.54	\$ 211.00	2%	128	26,662	5,330	32,009	17%	14,302	14,325	14,413	15,238	2.2x	2.2x	2.1x	2.1%
Pressure Technologies plc	AIM:PRES	\$ 1.19	\$ -	nm	19	22	11	33	34%	32	24	32	34	1.4x	1.1x	1.0x	1.8%
Air Products and Chemicals, Inc.	NYSE:APD	\$ 236.97	\$ 245.96	4%	220	52,249	888	53,275	2%	8,930	9,059	9,535	10,223	5.9x	5.6x	5.2x	4.6%
Linde plc	NYSE:LIN	\$ 213.46	\$ 219.75	3%	536	114,319	12,036	128,332	9%	14,900	28,450	29,473	30,649	4.5x	4.4x	4.2x	27.2%
<b>Averages</b>													3.4x	3.2x	3.0x	7.6%	
<b>Clean Tech Peers</b>																	
FuelCell Energy, Inc.	NASDAQ:FCEL	\$ 1.45	\$ 0.75	-48%	194	281	122	402	30%	89	61	61	90	6.6x	6.6x	4.5x	0.1%
Plug Power Inc.	NASDAQ:PLUG	\$ 3.11	\$ 4.16	34%	278	864	410	1,312	31%	175	221	276	363	5.9x	4.8x	3.6x	27.6%
L'Air Liquide S.A.	ENXTPA:AI	\$ 126.00	\$ 124.43	-1%	471	59,357	15,039	74,834	20%	21,011	22,191	23,111	24,039	3.4x	3.2x	3.1x	4.6%
SPX FLOW, Inc.	NYSE:FLOW	\$ 49.31	\$ 48.33	-2%	43	2,099	560	2,662	21%	2,090	1,507	1,463	1,515	1.8x	1.8x	1.8x	-10.2%
Westport Fuel Systems Inc.	TSX:WPRT	\$ 3.21	\$ -	nm	136	437	25	482	5%	270	301	355	439	1.6x	1.4x	1.1x	17.6%
<b>Averages</b>													3.8x	3.6x	2.8x	7.9%	
<b>Average</b>													3.6x	3.4x	2.9x	7.8%	
Xebec Adsorption Inc.	TSXV:XBC	\$ 2.14	\$ 3.20	50%	100	213	(20)	193	-10%	20	48	85	120	4.1x	2.3x	1.6x	81.4%

\*Note: Target, rating, and estimates for Xebec Adsorption are by Raymond James; all others represent consenses mean from Capital IQ.

Source: Capital IQ, Raymond James Ltd.

## Exhibit 18.2: Xebec Comparable Valuation Summary Table (EV/EBITDA)

Company	Ticker Symbol	Recent Price 12/30/2019	Target Price*	Potential Return (%)	Shares o/s	Market Cap (\$ mlns)	Net Debt Current \$mlns	Total EV \$mlns	Net Debt (%)	EBITDA				EV/EBITDA Annual			EBITDA CAGR 2018A-2021E
										2018A	2019E	2020E	2021E	2019E	2020E	2021E	
<b>Industrial gas Servicing Peers</b>																	
Donaldson Company, Inc.	NYSE:DCI	\$ 58.04	\$ 52.80	-9%	127	7,346	577	7,939	7%	454	483	488	525	16.4x	16.3x	15.1x	5.0%
Parker-Hannifin Corporation	NYSE:PH	\$ 207.00	\$ 211.00	2%	128	26,592	5,330	31,929	17%	2,431	2,586	2,542	2,854	12.3x	12.6x	11.2x	5.5%
Pressure Technologies plc	AIM:PRES	\$ 1.17	\$ -	nm	19	22	11	33	34%	2	4	5	5	9.6x	6.8x	6.2x	44.6%
Air Products and Chemicals, Inc.	NYSE:APD	\$ 235.49	\$ 245.96	4%	220	51,922	888	53,145	2%	2,942	3,417	3,913	4,283	15.6x	13.6x	12.4x	13.3%
Linde plc	NYSE:LIN	\$ 212.26	\$ 219.75	4%	536	113,679	12,036	128,070	9%	4,401	8,204	8,718	9,284	15.6x	14.7x	13.8x	28.3%
<b>Averages</b>													13.9x	12.8x	11.7x	19.3%	
<b>Clean Tech Peers</b>																	
FuelCell Energy, Inc.	NASDAQ:FCEL	\$ 1.41	\$ 0.75	-47%	194	272	122	429	28%	(35)	(28)	(9)	2	nm	nm	nm	nm
Plug Power Inc.	NASDAQ:PLUG	\$ 3.11	\$ 4.16	34%	278	864	410	1,292	32%	(58)	(2)	17	69	nm	nm	18.8x	nm
L'Air Liquide S.A.	ENXTPA:AI	\$ 126.50	\$ 124.43	-2%	471	59,592	15,039	75,234	20%	4,961	5,797	6,129	6,452	13.0x	12.3x	11.7x	9.2%
SPX FLOW, Inc.	NYSE:FLOW	\$ 49.29	\$ 48.33	-2%	43	2,098	560	2,668	21%	251	185	193	233	14.4x	13.9x	11.4x	-2.4%
Westport Fuel Systems Inc.	TSX:WPRT	\$ 3.15	\$ -	nm	136	429	25	463	6%	(26)	31	46	62	15.2x	10.0x	7.5x	nm
<b>Averages</b>													14.2x	12.0x	12.4x	3.4%	
<b>Average</b>													14.0x	12.4x	12.1x	11.4%	
Xebec Adsorption Inc.	TSXV:XBC	\$ 2.16	\$ 3.20	48%	100	215	(20)	195	-10%	(0)	6	11	17	32.2x	17.0x	11.5x	67.2%

\*Note: Target, rating, and estimates for Xebec Adsorption are by Raymond James; all others represent consenses mean from Capital IQ.

Source: Capital IQ, Raymond James Ltd.

## Exhibit 19: Xebec Target Price Sensitivity Table

		Xebec 2021 Sales (\$ mlns)								
		100	105	110	115	120	125	130	135	140
Assumed EV/Sales Multiple	1.0x	1.21	1.26	1.31	1.36	1.41	1.46	1.51	1.56	1.61
	1.3x	1.46	1.52	1.58	1.65	1.71	1.77	1.83	1.90	1.96
	1.5x	1.71	1.78	1.86	1.93	2.01	2.08	2.16	2.24	2.31
	1.8x	1.96	2.05	2.13	2.22	2.31	2.40	2.49	2.57	2.66
	2.0x	2.21	2.31	2.41	2.51	2.61	2.71	2.81	2.91	3.01
	2.3x	2.53	2.65	2.76	2.88	3.00	3.11	3.23	3.35	3.46
	2.5x	2.71	2.84	2.96	3.09	<b>3.21</b>	3.34	3.46	3.59	3.72
	2.8x	2.96	3.10	3.24	3.38	3.51	3.65	3.79	3.93	4.07
	3.0x	3.21	3.36	3.51	3.67	3.82	3.97	4.12	4.27	4.42
	3.3x	3.46	3.63	3.79	3.95	4.12	4.28	4.44	4.61	4.77
3.8x	3.97	4.15	4.34	4.53	4.72	4.91	5.10	5.28	5.47	
4.0x	4.22	4.42	4.62	4.82	5.02	5.22	5.42	5.62	5.82	

Source: Raymond James Ltd.



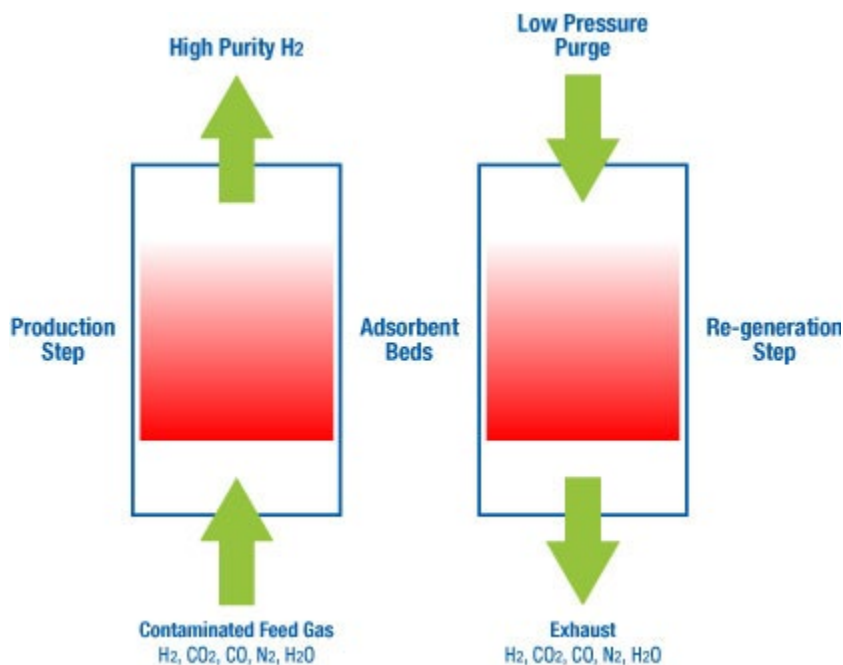
## APPENDIX I: BACKGROUND ON XEBEC'S ADSORPTION TECHNOLOGY

Almost all gases on the periodic table of elements, can be dried to remove impurities using adsorption technology. Adsorption is the process by which a solid holds molecules of a gas or liquid as a thin film. This process is used in many industrial gas treatment processes including biogas separation and purification, hydrogen recovery, air separation, and oxygen enrichment for medical applications as well as drying applications for air, natural gas, propane, syngas and many more. Impurities are removed from these gases so that they can be used in many different applications. In order to provide these services and products to its customer, Xebec uses its proprietary technology and processes to implement Pressure Swing Adsorption systems (PSA).

### Pressure Swing Adsorption (PSA) System

PSA is accomplished by reducing the pressure in the regeneration process and is a widely used technology for purifying gases. By swinging the pressure from High-to-low, a large amount of moisture is adsorbed at high pressures and then released at low pressure—thoroughly drying the gas and releasing the contaminants ( $H_2$ ,  $CO_2$ ,  $CO$ ,  $N_2$ ,  $H_2O$ ) as exhaust. In a conventional PSA system, the drying process requires at least two large adsorbent filled vessels (containers); one vessel to remove moisture at high pressure and the other releasing moisture at low pressure (see Exhibit 20). Consisting of 4 to 16 large vessels, conventional PSA systems are a complex network of piping and valves that switch gas flows to these vessels in order to remove contaminants from the feed gases used to produce RNG.

#### Exhibit 20: Conventional PSA Schematic



Source: Xebec Adsorption Inc.

## Xebec's Licensed PSA Technology vs Conventional PSA

The use of conventional PSA systems is widespread throughout the industry. Xebec believes there are a number of disadvantages with these systems. Aside from a more complex apparatus, the main disadvantage is the slow operating cycle speeds required to prevent the adsorbent beads from floating or becoming fluids within the vessel; this is the result of slow cycle speeds. As a result, conventional systems use larger vessels to compensate for the slow cycle speed and therefore require a larger footprint and are higher in cost. Furthermore, the additional vessels would require more valves and solenoids to operate those valves; a conventional system can end up having 30+ solenoids, which in turn requires more complex controls and software. Xebec believes that its products solve most of the disadvantages with conventional systems products (see Exhibit 21 below). Its rotary valve technology replaces the complex and bulky network of piping and valves used in conventional PSA systems with two compact, integrated valves. These valves speed up the flow of gas into the PSA system without the need of larger vessels—operating cycle speeds can reach up to 50 cycles/min. Additionally, in order to avoid the fluidization limitation of beaded adsorbents, Xebec also has a license for structured adsorbent material. The licensed structured adsorbent material and rotary valve technologies are used in some of Xebec's advanced Hydrogen and biogas purification. However, in order to achieve 99%+methane recovery rates, the true advantage lies in the trade secret and process that works in tandem with the rotary valves and adsorbent material.

Xebec's products offer the following benefits:

- **Compact size**—increased cycle speeds and rotary mechanical design significantly reduce the size of Xebec's PSA systems
- **Modular, scalable design**—integrated, scalable designs allow for small portable applications—which can be skid mounted—to large industrial scale applications
- **Low-cost structure**—smaller size of units result in lower capital cost structure and reduced installation time and cost
- **Operational benefits**—rotary valve design allows for more efficient gas flow, reduced maintenance and unit down time
- **Superior purification capabilities**—high gas recovery rates from triple equalization process
- **Flexibility**—PSA systems can be modified to purify a range of different gases with minimal associated costs

**Exhibit 21: Xebec Adsorption Inc. Fast Cycle PSA System**

Comparison	Xebec PSA	Other PSAs	Water Scrubber	Amine Scrubber	Membrane
Removes CO <sub>2</sub>	•	•	•	•	•
Removes N <sub>2</sub> & O <sub>2</sub>	•	•			
Delivers high methane recovery	•			•	•
Compact	•				•
Keeps operating & maintenance costs low	•	•			
No water, chemicals or solvents are added	•	•			•
Economical in wide range of flows	•	•			
Easy to operate	•				•
Delivers reliable & consistent life performance	•	•		•	
Environmentally friendly	•	•			•
Produces high purity biomethane	•	•		•	
Quick start-up	•	•			•



Source: Xebec Adsorption Inc.

## APPENDIX II: DETAILED SEGMENT DESCRIPTIONS

### Cleantech Systems Segment Description

The Cleantech Systems segment is primarily focused on designing and building systems that produce Renewable Natural Gas (RNG) and purify Hydrogen (H<sub>2</sub>). Using proprietary technology, Xebec installs biogas-to-RNG upgrading systems, H<sub>2</sub> purification systems, natural gas dehydration units for refueling stations, and systems for generating Renewable Hydrogen (RH<sub>2</sub>)—which includes H<sub>2</sub> filtration and separation products. Xebec provides standard, scalable and modular systems that are both cost effective and efficient relative to conventional systems (see Exhibit 22). This Segment is responsible for the majority of their recurring revenue and has driven most of the recent backlog and revenue growth.







While anaerobic digestion is the most prevalent and most commonly used process currently, there are three methods to produce RNG: i) Anaerobic Digestion, ii) Pyro-Gasification and iii) Electrolysis Methanation.

**i) Anaerobic Digestion**—is the production of methane by breaking down organic matter [biomass] (food waste, animal or human waste, dead vegetation etc.) in the absence of air by using micro-organisms. Xebec provides the systems that facilitate this natural process and converts the biogas (methane) produced naturally into RNG.

**ii) Pyro-gasification**—is similar to the anaerobic digestion process, however here the production of methane will mainly come from forestry waste via a thermo-chemical process.

**iii) Power-to-gas**—this technology process will use renewable electricity to produce methane by electrolyzing water. This will result in the methanation of H<sub>2</sub>—process of converting hydrogen and carbon oxides into methane—which will then be converted into RNG for energy generation.

#### Exhibit 22 :Product Platform—Cleantech Systems

>62 Biogas Plants	>200 Industrial PSAs	>1200 NGX Dryers
		
		
<p>Agri &amp; Farm-based Digesters &amp; Landfills, Waste Water Treatment</p>	<p>Hydrogen, Helium &amp; Syngas Purification</p>	<p>CNG Stations &amp; Refinery Gas Drying</p>

Source: Xebec Adsorption Inc.



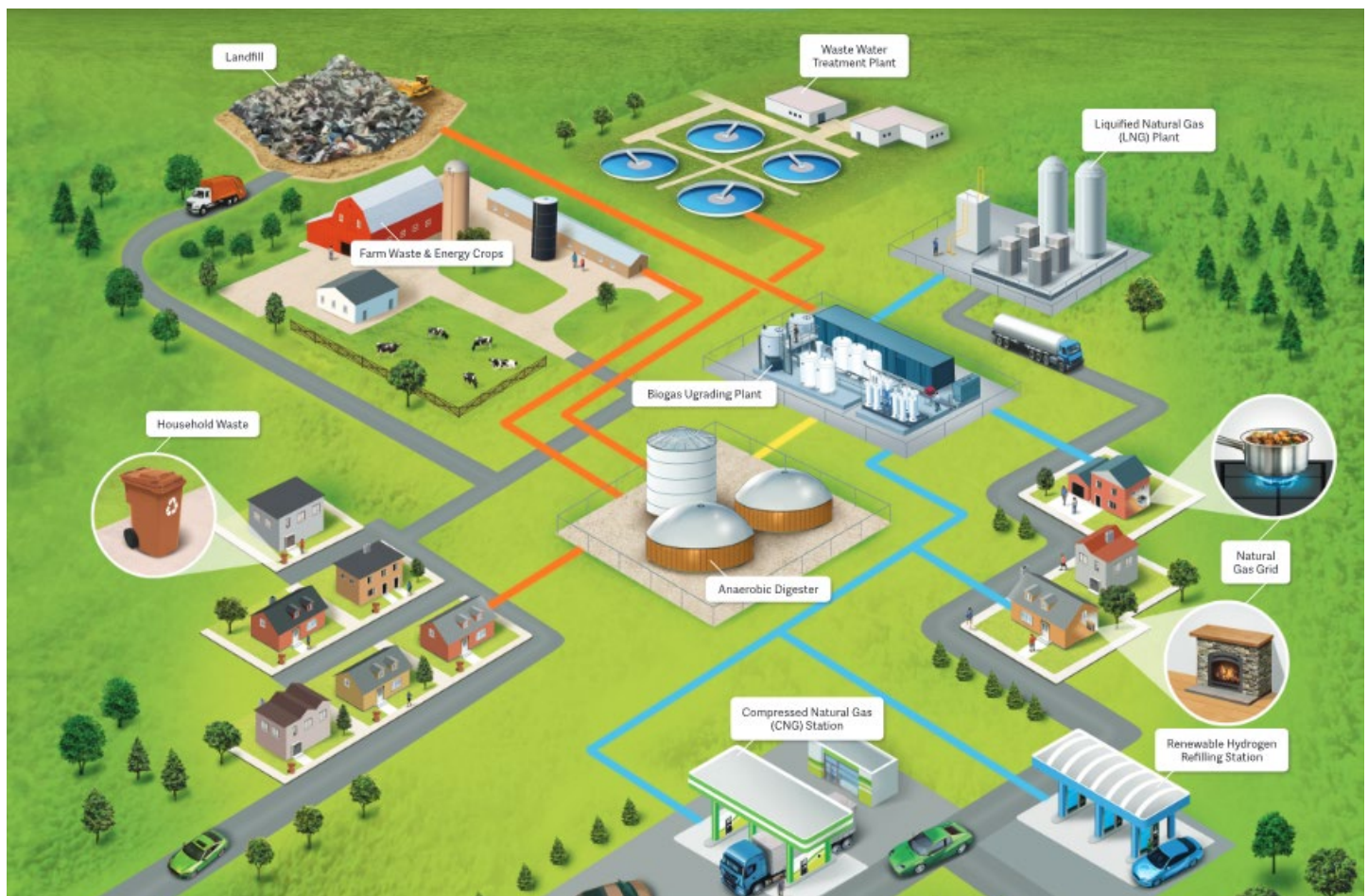
## Cleantech Systems Business Products

Xebec designs, develops, builds and sells a range of systems in this segment under several brands: BGX solutions, for biogas purification (PSA) systems; H2X Solutions, for hydrogen purification systems; NGX Solutions, for Natural Gas Vehicle (NGV) refueling stations and natural gas upgrading; and SGX Solutions, for helium purification systems.

### BGX Solutions, Biogas Upgrading Plants

The natural anaerobic digestion process takes biogas from waste materials from landfills, waste water treatment plants, agricultural and industrial organic waste (to name a few) and generates a renewable source of natural gas—Renewable Natural Gas (RNG)— also known as biomethane (see Exhibit 23). RNG is a purified form of renewable biogas that meets pipeline natural gas quality requirements. RNG can be sold and injected into existing natural gas pipelines or compressed, then sold as Compressed Natural Gas (CNG) to refuel NGVs. Xebec’s biogas units are compact, easily installed, maintained and capable of meeting the stringent pipeline and CNG refueling station specifications. These units efficiently remove CO<sub>2</sub>, H<sub>2</sub>O vapor, and most trace gases found in biogas streams. Xebec’s BGX Solutions represented ~39% of the company’s 2018 revenues.

### Exhibit 23: Biogas to Biomethane (RNG), How the Process Works



Source: Xebec Adsorption Inc.

### H2X Solutions, Hydrogen Purification Systems

Under this brand, Xebec utilizes its PSA technology to purify hydrogen from steam reforming and off-gas streams at a number of sites across North America, Europe and Asia. The then 99.9+% “pure” and “ultra-pure” hydrogen is sold to and used by refineries, chemical plants, metal production plants and edible oil operations in these regions. H2X solution represented ~11% of Xebec’s 2018 revenue.

### NGX Solutions, Natural Gas Upgrading & CNG Drying for NGV Refueling

NGX Solutions provides products for both Natural gas upgrading (for natural gas distribution via pipeline) and CNG drying for CNG refueling stations. Due to the stringent CO<sub>2</sub> content specifications within the natural gas distributed via pipelines, CO<sub>2</sub> must be removed from sub quality gas. Considering that a large portion of the natural gas produced globally is of sub-par quality in respect to CO<sub>2</sub> levels, Xebec provides several PSA systems in order to filter natural gas to industry standards (See Exhibit 24.1).

#### Exhibit 24.1: Natural Gas Upgrading Systems



Source: Xebec Adsorption Inc. Company Website

When it comes to CNG for refueling stations, CNG is stored at high pressures in order to use in NGV applications and runs the risk of developing moisture. This leads to water droplets, and ultimately ice, which can corrode and damage compressors and storage tanks. NGX Solutions brand offers a full product line of CNG dryers for CNG refueling stations. They offer several SKUs for different customer requirements; they offer single tower, re-generable single tower and re-generable twin tower gas dryers (see Exhibit 24.2). Altogether, NGX Solutions represented 19% of the company’s revenues for 2018.

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**Exhibit 24.2: NGX Solutions NGV Refueling Station CNG Dryer Line-up**


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**Single Tower****Single Re-generable Tower****Twin Re-generable Tower****CNG Filters**


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Source: Xebec Adsorption Inc. Company Website

**SGX Solutions, Helium Purification**

Helium is a scarce, non-renewable gas that has been declining in reserves, but increasing in demand in recent years. The primary reason for this is its use in the production of fibre-optic equipment and semiconductors. Through SGX Solutions, Xebec provides the HE-3200 which requires a quarter of the space required by conventional systems.

## Industrial Services & Support Segment Description

With more than 9,000 installed units globally and 200+ gas installations in its Services & Support segment, Xebec provides service, maintenance and operational support for all of its customers. This segment is currently one of the main sources of recurring revenue. Under its ADX Solutions brand, Xebec designs, develops, builds and sells a range of products for industrial compressed air driers. In addition to providing alternative brand replacement parts (see Exhibit 25), Xebec's FSX Solutions brand has a full range of compressed air and gas filtration products. This segments products include: compressed air and gas dryers, filters, spare parts, replacement filter elements, dew point probes and calibration services.

### Services & Support Business Products

#### ADX Solutions, Compressed Air Dryers

Since 1967, air purification has been part of the core of Xebec's business. Xebec's filtration solutions include compressed air and gas filters, high-pressure filters, stainless steel process filters, landfill and biogas filters, and replacement filter elements and accessories. ADX Solutions represented ~5% of the company's total revenue in 2018.

#### FSX Solutions, Gas Filtration and Separation Equipment

Most compressed air and gas applications require filters in order to remove different types of particles that can harm sensitive equipment. Xebec's filtration solutions include compressed air and gas filters, high-pressure filters, stainless steel process filters, landfill and biogas filters, and replacement filter elements and accessories.

#### Exhibit 25: Industrial Products—ADX Dryers, Compressors (LHS) vs FSX Air & Gas Filters (RHS)



Source: Xebec Adsorption Inc.



## APPENDIX II: MANAGEMENT TEAM BIOS

**Kurt Sorschak, CEO & President, Chairman**—Mr. Sorschak is currently the CEO, president and a co-founder at Xebec. He began his time at the company as a general manager at Domnick Hunter Group PLC and then as a general manager of the Xebec division of Parker-Hannifin Corp. Through a management buyout, he and two other partners bought out the Xebec division from Parker-Hannifin. Kurt has an Associate's Degree from the American University in Paris, France, as well as a law degree from Ludwig-Maximilians University in Munich, Germany.

**Louis Dufour, CFO**—Mr. Dufour is currently the CFO of Xebec and has been in this role for approximately three years. With over 25 years of experience, Mr. Dufour holds his C.A. designation and has held several senior accounting and information technology positions over his career. Mr. Dufour earned his Bachelor's in accounting from Ecole des Hautes Etudes Commerciales in Montreal, Quebec.

**Dr. Prabhu Rao, COO, Board Director**—Dr. Rao is currently the COO of Xebec and has been in this role for over four years. Additionally, he brings over 15 years of alternative energy industry experience. His technical expertise ranges from alternative fuels and emissions controls, to hydrogen generation/fuel cells and environmental air quality. Dr. Rao brings ample experience in the fuel cell industry as he has held several senior roles—including CCO—at Nuvera Fuel Cells over approximately 15 years. Dr. Rao received his Master's in Mechanical Engineering, Master's in Environmental Engineering and his Doctorate's degree in Mechanical Engineering from Drexel University in Philadelphia, Pennsylvania.

**Dr. Peter Cheng, General Manager (Xebec China)**—Dr. Cheng brings over 20 years of business development, strategy and management experience to the company and has held several executive positions with energy and oil & gas firms in both North America and China. Additionally, Dr. Cheng is a professional engineer in Ontario, a Sr. Engineer in China and is a member of the American Society of Mechanical Engineers. Prior to his time at Xebec, Dr. Cheng held roles at A.T. Kearney, Hong Kong & China Investment Ltd., Ontario Power Generation and ABB China Ltd. Dr. Cheng received his Ph.D in mechanical engineering at the Shanghai Jiao Tong University. Additionally, he also received his MBA from the Rotman School of Management at the University of Toronto.

**Dr. Francesco Massari, General Manager (Xebec Europe)**—through several senior positions, including CTO of French renewable energy company McPhy, Dr. Massari brings 25+ years of high-tech and clean-tech industry experience. During his time at McPhy, Dr. Massari was responsible for electrolyser development and deployment as it relates to power-to-gas energy storage.

## APPENDIX III: BOARD OF DIRECTORS

**Kurt Sorschak, CEO & President, Chairman**—See detailed description in Appendix II: Management Bios

**Dr. Prabhu Rao, COO, Board Director**— See detailed description in Appendix II: Management Bios

**William Beckett, Lead Director**—Mr. Beckett brings years of executive management and operations experience to the board. He has held several roles with industry leaders and gained management expertise—such as lean manufacturing—from Pratt & Whitney and Canadian General Electric. He is a professional, mechanical engineer and a member of the Order of Engineers of Quebec.

**Joseph H. Petrowski, Board Director**—As a former CEO of holding company Cumberland Farms Gulf Oil Group—and other senior management positions in the energy sector—Mr. Petrowski brings over 25 years of experience in the oil and energy sectors. Additionally, he holds several other board and advisory positions and is a member of the Federal Reserve Bank of Boston’s Advisory Council. He holds a Bachelor’s of Science in Economics and Government from Harvard University.

**Guy Saint-Jacques, Board Director**—Mr. Saint Jacques has held several leadership positions in industry and government around the globe. He has held several public positions such as Ambassador Extraordinary and Plenipotentiary for Canada to the People’s Republic of China and Deputy High Commissioner at the High Commission of Canada in London, U.K. He currently serves on as Honorary Chair for the China Policy Center and for the Canada-China Small Medium Enterprises. He has a BSc in Geology from the University of Montreal and a Master’s in Regional Planning and Development from Laval University.

## APPENDIX IV: RISKS

**Environmental and regulatory policies**—Xebec benefits from certain environmental policies, such as incentives, tax credits and subsidies, implemented by governing bodies globally. The implementation and timeline of these mandates is not guaranteed and can adversely affect Xebec's competitiveness relative to other larger resource companies in energy sectors.

**Technological change**—Xebec's market is characterized by rapidly changing technologies, industry standards and processes. Xebec invests significant resources into its products, which are complex in nature and are designed to be compatible with current and evolving industry standards. Any delays in developing new product enhancements or failure by any products, technologies or services to gain market acceptance, could adversely affect Xebec's business and results of operations.

**Dependency on a limited number of customers for revenue**—a large portion of Xebec's revenue is dependent on a small number of customers. For the year ended December 31, 2018, five principal customers accounted for approximately 45% of Xebec's total revenue. The loss of purchase orders or anticipated purchase orders from these five principal customers, could have a material adverse effect on the company's business.

**Difficulty recruiting experienced, qualified personnel in order to expand business**—the technological nature of Xebec's business requires the company to continuously train and recruit experienced personnel. Competition for qualified personnel in their industry is intense and in short supply causing experienced research & development, engineering, manufacturing, operating, sales & marketing and management personnel to be difficult to recruit and retain.

**Protection of technology and development**—Xebec is dependent on its ability to attain and maintain the rights to its intellectual property. Xebec's inability to attain patents for its technology or reach its targeted development or integration timelines, could reduce the feasibility of their products reducing the company's competitive edge.

**Inability to raise required capital**—the execution of Xebec's business and commercialization plan may be jeopardized if the company is unable to raise the required capital. Xebec mitigates this risk through the issuance of debt and equity, but may use a variety of measures including funding from government agencies, the sale of non-core assets or strategic investors.

**Renewable Natural Gas and Hydrogen market development risk**—markets for RNG and RH2 may never develop or develop slower than the company expects affecting their revenues and earnings.

**Dependency on third party suppliers**—Xebec may be unable to obtain comparable materials or components from alternative suppliers, and that could adversely affect its ability to produce commercially viable products. Additionally, Xebec regularly outsources aspects of its product manufacturing to contract manufacturers. An increase in the manufacturer's service price or delays in their deliveries, could adversely affect Xebec's financial condition and operational results.

**Foreign exchange risk**—the majority of Xebec's revenues are earned in Canadian dollars, U.S. dollars and the Chinese Yuan. The majority of the operating expenses are incurred in the Canadian dollar and Chinese Yuan. Xebec has not entered into any currency derivative contracts in order to hedge against any currency fluctuations.

## APPENDIX V: DETAILED FINANCIAL STATEMENTS

## Appendix V.1: Xebec Adsorption Inc. Income Statement (2016 – 2021E), FYE Dec. 31

Income Statement	2016	2017	2018	2019E	2020E	2021E
<i>Currency: mlns CAD</i>						
Revenue	9.6	14.7	20.2	47.6	85.0	120.0
Cost of Goods Sold	7.4	9.0	14.5	32.2	57.0	82.4
<b>Gross Profit</b>	<b>2.2</b>	<b>5.8</b>	<b>5.7</b>	<b>15.5</b>	<b>28.0</b>	<b>37.6</b>
Research & Development	0.1	(0.0)	0.1	0.1	0.3	0.4
Selling & Administrative Exp.	4.4	5.2	7.2	10.1	18.3	23.0
Foreign Exchange Gain & Loss	0.2	0.1	(0.2)	0.2	0	0
Gain on Conversion of Shares Issued by Subsidiary	(0.4)	(0.0)	0.1	(0.3)	0	0
Stock Based Compensation	-	-	-	0.4	0.7	0.9
Other	-	(0.1)	-	(5.4)	(9.8)	(10.0)
<b>Operating Income</b>	<b>(2.2)</b>	<b>0.6</b>	<b>(1.6)</b>	<b>5.2</b>	<b>9.4</b>	<b>14.2</b>
Finance Income	(0.0)	(0.1)	(0.0)	(0.0)	0	0
Finance Exp.	0.5	0.6	1.3	1.4	1.6	1.6
Other	-	-	-	-	-	-
<b>Other Charge (Income)</b>	<b>0.54</b>	<b>0.49</b>	<b>1.32</b>	<b>1.4</b>	<b>1.6</b>	<b>1.6</b>
<b>EBT</b>	<b>(2.7)</b>	<b>0.1</b>	<b>(2.9)</b>	<b>3.8</b>	<b>7.9</b>	<b>12.6</b>
Income Tax	(0.1)	-	-	-	-	-
<b>Net Income to Common Shareholders</b>	<b>(2.7)</b>	<b>0.1</b>	<b>(2.9)</b>	<b>3.8</b>	<b>7.9</b>	<b>12.6</b>

Source: Xebec Adsorption Inc., Raymond James Ltd.

## Appendix V.2: Xebec Adsorption Inc. Cash Flow Statement (2016 – 2021E), FYE Dec. 31

Cash Flow Statement	2016	2017	2018	2019E	2020E	2021E
<i>Currency: mlns CAD</i>						
<b>Net Income</b>	<b>(2.7)</b>	<b>0.1</b>	<b>(2.9)</b>	<b>3.8</b>	<b>7.9</b>	<b>12.6</b>
Depreciation & Amor.	0.1	0.1	0.1	0.5	0.9	1.3
Amortization of intangible assets	0.1	0.1	0.1	0.2	0.4	0.5
Inventory Writedown Reversal	(0.0)	(0.2)	(0.1)	(0.1)	-	-
Accretion finance Exp.& Govn't Royalty Revaluation Gain	0.0	(0.1)	0.0	0.0	-	-
Accretion of Obligation from Shares Issued by Subsidiary	0.4	0.3	0.5	(0.1)	-	-
Accretion of Conv. Debentures	0.0	0.1	0.2	0.1	-	-
Stock based Compensation Exp.	0.1	0.4	0.4	0.4	0.7	0.9
Deferred Rent	0.0	(0.0)	0.0	-	-	-
Accretion of Debt Liabilities	-	-	-	0.2	-	-
Other	(0.1)	(1.0)	-	0.0	-	-
<b>CFO before Working Capital</b>	<b>(2.1)</b>	<b>(0.2)</b>	<b>(1.8)</b>	<b>5.1</b>	<b>9.9</b>	<b>15.3</b>
Change in Working Capital	(0.7)	(1.6)	(1.2)	(7.9)	(19.7)	(23.7)
<b>Cash from Ops.</b>	<b>(2.7)</b>	<b>(1.9)</b>	<b>(3.0)</b>	<b>(2.8)</b>	<b>(9.8)</b>	<b>(8.4)</b>
Acquisition of PPE	(0.1)	(0.0)	(0.1)	(0.2)	-	-
Acquisition of intangibles	(0.0)	(0.3)	(0.1)	(1.2)	-	-
Business acquisitions, net of cash acquired	-	-	-	(7.5)	(6.0)	-
Other	-	-	0.0	-	-	-
<b>Cash from Investing</b>	<b>(0.1)</b>	<b>(0.3)</b>	<b>(0.3)</b>	<b>(8.9)</b>	<b>(6.0)</b>	<b>-</b>
Increase (decrease) of bank loan	0.4	(0.8)	-	-	-	-
Increase (decrease) of credit facility	-	1.4	(1.4)	-	-	-
Proceeds from issuance of shares	-	0.1	6.0	34.2	-	10.0
Long-term debt	-	-	1.9	0.0	-	-
Repayment of long-term debt	-	(0.0)	(0.0)	(0.0)	-	-
Repayment of gov.n.t royalty program	-	(0.1)	(0.1)	(0.1)	-	-
Other	1.0	1.9	(0.2)	-	-	-
<b>Cash from Financing</b>	<b>1.4</b>	<b>2.5</b>	<b>6.2</b>	<b>34.2</b>	<b>-</b>	<b>10.0</b>
Foreign Exchange	(0.2)	(0.1)	(0.4)	0.2	-	-
<b>Net Change in Cash</b>	<b>(1.5)</b>	<b>0.4</b>	<b>3.0</b>	<b>22.5</b>	<b>(15.8)</b>	<b>1.6</b>
<b>Cash at BOP</b>	<b>2.7</b>	<b>1.1</b>	<b>1.3</b>	<b>3.9</b>	<b>26.6</b>	<b>10.8</b>
<b>Cash at EOP</b>	<b>1.1</b>	<b>1.3</b>	<b>3.9</b>	<b>26.6</b>	<b>10.8</b>	<b>12.5</b>

Source: Xebec Adsorption Inc., Raymond James Ltd.

## Appendix V.3: Xebec Adsorption Inc. Balance Sheet (2016 – 2021E), FYE Dec. 31

Balance Sheet ☒	2016	2017	2018	2019E	2020E	2021E
<i>Currency: mlns CAD</i>						
<b>ASSETS</b>						
Cash & Restricted Cash	1.1	1.3	3.9	26.6	10.8	12.5
Trade & Other Receivables	2.4	4.1	6.9	19.1	34.0	48.0
Inventory	1.3	2.0	3.3	4.5	9.2	18.9
Investment Tax credits Receivable	0.05	0.02	0.02	0.02	0.02	0.02
Other Current Assets	0.2	0.3	0.3	0.2	0.2	0.2
Other	-	-	-	0.01	0.01	0.01
<b>Total Current Assets</b>	<b>5.1</b>	<b>7.7</b>	<b>14.4</b>	<b>50.4</b>	<b>54.3</b>	<b>79.7</b>
Property, Plant & Equipment	0.3	0.2	0.3	8.2	13.2	11.9
Intangible Assets	0.2	0.4	0.4	1.4	1.1	0.5
Goodwill	-	-	-	1.3	1.3	1.3
<b>Total Assets</b>	<b>5.6</b>	<b>8.3</b>	<b>15.1</b>	<b>61.3</b>	<b>69.9</b>	<b>93.4</b>
<b>LIABILITIES</b>						
Credit Facility	-	1.4	-	-	-	-
Trade, Other Payables & Accrued Liabilities	3.6	3.6	2.7	8.8	8.8	8.8
Contract Liabilities	-	0.7	4.4	3.3	3.3	3.3
Curr. Long-term Debt	0.0	0.0	1.8	1.8	1.8	1.8
Unearned Revenue, Current	0.8	0.1	0.1	0.1	0.1	0.1
Curr. Govn't Royalty Program Obligation	0.2	0.0	0.0	0.1	0.1	0.1
Curr. Provisions	-	-	0.2	0.2	0.2	0.2
Curr. Obligation from Shares Issued by Subsidiary	-	-	-	-	-	-
Income Tax Payable	1.7	-	-	-	-	-
Other	-	-	-	-	-	-
<b>Total Current Liabilities</b>	<b>6.3</b>	<b>5.9</b>	<b>9.1</b>	<b>14.3</b>	<b>14.3</b>	<b>14.3</b>
Long-Term Debt	0.8	2.2	1.9	4.1	4.1	4.1
Govn't royalty program obligation	-	0.5	0.4	0.4	0.4	0.4
Obligation from shares issued by subsidiary	3.6	3.9	4.0	3.9	3.9	3.9
Deferred rent	0.1	0.1	0.1	-	-	-
Provisions	0.01	0.01	0.04	0.07	0.07	0.07
Deferred tax liabilities	-	0.1	0.1	0.1	0.1	0.1
Other	0.0	-	-	-	-	-
<b>Total Liabilities</b>	<b>10.8</b>	<b>12.7</b>	<b>15.7</b>	<b>22.8</b>	<b>22.8</b>	<b>22.8</b>
Share capital	19.3	19.7	26.5	61.3	61.3	71.3
Contributed surplus	3.0	3.3	3.7	4.4	5.1	5.9
Equity Component of conv. Debentures	0.2	0.3	0.2	0.2	0.2	0.2
Accumulated other comprehensive loss	(0.9)	(1.0)	(1.1)	(1.2)	(1.2)	(1.2)
Deficit	(26.8)	(26.7)	(29.9)	(26.1)	(18.2)	(5.6)
<b>Total Equity</b>	<b>(5.2)</b>	<b>(4.4)</b>	<b>(0.6)</b>	<b>38.6</b>	<b>47.1</b>	<b>70.6</b>
<b>Total Liabilities And Equity</b>	<b>5.6</b>	<b>8.3</b>	<b>15.1</b>	<b>61.3</b>	<b>69.9</b>	<b>93.4</b>

Source: Xebec Adsorption Inc., Raymond James Ltd.

**COMPANY DESCRIPTION**

Headquartered in Montreal, Xebec designs, manufactures and sells a range of purification, gas upgrading, and filtration products internationally. The company's key products include biogas upgrading systems and hydrogen purification which the company also services through its Industrial Service and Support segment.

**Company Citations**

Company Name	Ticker	Exchange	Closing Price	RJ Rating	RJ Entity
Fortis, Inc.	FTS.T	TSX	C\$54.21	MP3	Raymond James Ltd.

Prices are as of the most recent close on the indicated exchange. See Disclosure section for rating definitions. Stocks that do not trade on a U.S. national exchange may not be registered for sale in all U.S. states. NC=not covered.

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**Raymond James Ltd. (Canada) Definitions: Strong Buy (SB1)** The stock is expected to appreciate and produce a total return of at least 15% and outperform the S&P/TSX Composite Index over the next six months. **Outperform (MO2)** The stock is expected to appreciate and outperform the S&P/TSX Composite Index over the next 12 months. **Market Perform (MP3)** The stock is expected to perform generally in line with the S&P/TSX composite Index over the next 12 months and is potentially a source of funds for more highly rated securities. **Underperform (MU4)** The stock is expected to underperform the S&P/TSX Composite Index or its sector over the next six to 12 months and should be sold. **Suspended (S)** The rating and price target have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and price target are no longer in effect for this security and should not be relied upon.

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	Coverage Universe Rating Distribution*		Investment Banking Relationships	
	RJA	RJL	RJA	RJL
<b>Strong Buy and Outperform (Buy)</b>	55%	60%	21%	22%
<b>Market Perform (Hold)</b>	42%	37%	12%	18%
<b>Underperform (Sell)</b>	4%	3%	3%	0%

\* Columns may not add to 100% due to rounding.

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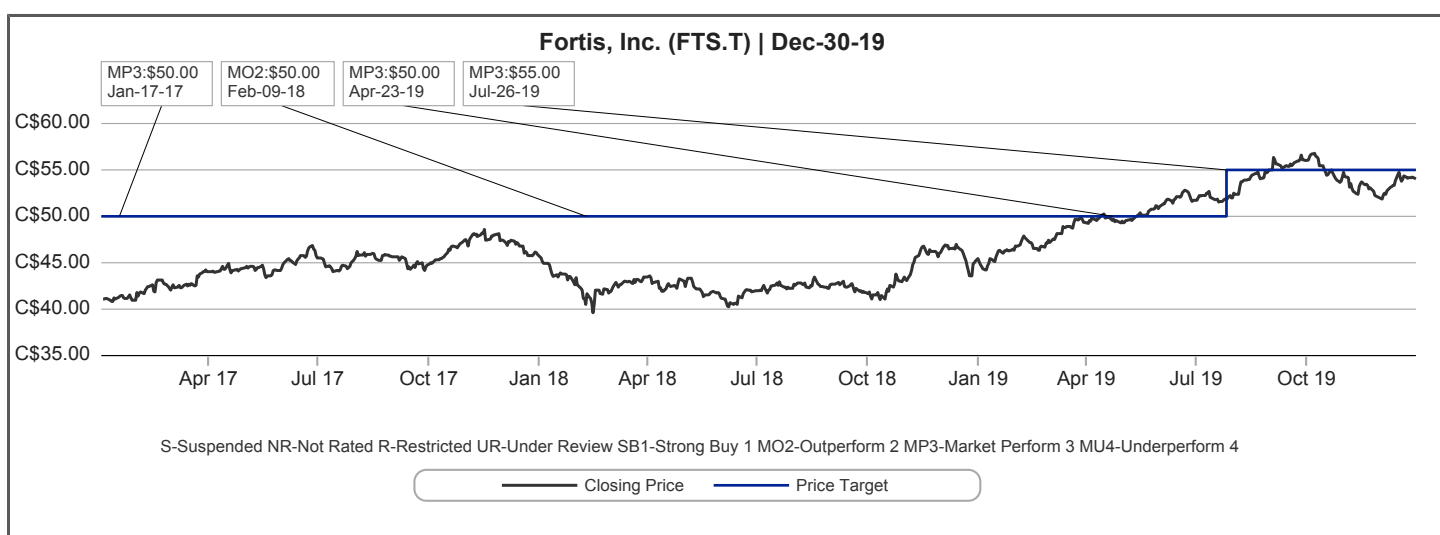
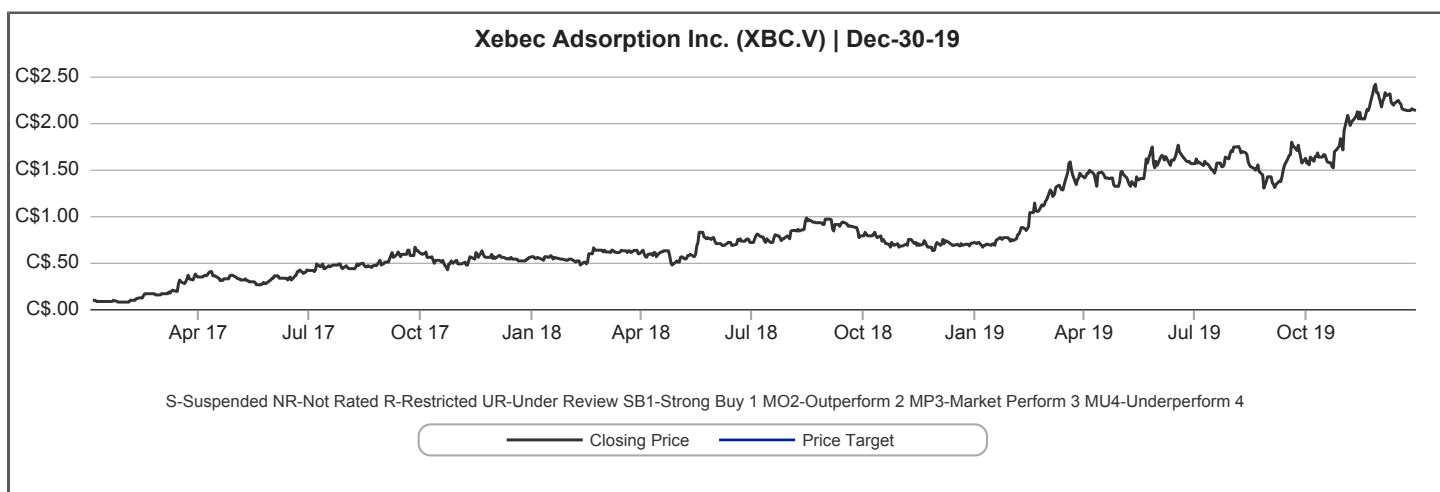
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Company Name	Disclosure
Xebec Adsorption Inc.	Raymond James Ltd. has managed or co-managed a public offering of securities within the last 12 months with respect to the issuer.
Xebec Adsorption Inc.	Raymond James Ltd. has provided investment banking services within the last 12 months with respect to the issuer.

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**Target Prices:** The information below indicates our target price and rating changes for the subject companies over past three years.



**Valuation Methodology**

**Fortis, Inc.**

Our valuation methodology for Fortis Inc. is based on P/E multiple relative to appropriate industry competitors.

**Xebec Adsorption Inc.**

We value Xebec by relative multiple in comparison to peer groups in the Clean Tech and Industrial Gas industries.

**Risk Factors**

**General Risk Factors:** Following are some general risk factors that pertain to the businesses of the subject companies and the projected target prices and recommendations included on Raymond James research: (1) Industry fundamentals with respect to customer demand or product/service pricing could change and adversely impact expected revenues and earnings; (2) issues relating to major competitors or market shares or new product expectations could change investor attitude toward the sector or this stock; (3) Unforeseen developments with respect to the management, financial condition or accounting policies or practices could alter the prospective valuation.

**Company-Specific Risks**

**Fortis, Inc.**

Counterparty Risk – Fortis and its subsidiaries are exposed to counterparty/credit risk through service providers, long term power purchase contracts, trade partners, derivatives and short term investments.

Financing and interest rate risk – From time to time Fortis will require cash for new projects which would come from either operational cash flows or external sources such as raising additional equity or debt on public markets. The inability to source sufficient cash by these methods to expand

and maintain Fortis's business represents a risk of this strategy. In addition, increased interest rates or difficulties in refinancing existing debt could arise, materially impacting the business. Fortis also has certain financial restrictions and debt covenants as part of its existing loan/security agreements which, if not met by the company, could result in issues in refinancing debt or sourcing sufficient liquidity to withstand downturns in the business. Similarly, the company's dividend could also be reduced or eliminated should the company's business enter a downturn of some kind.

**Liquidity Risk** – As liabilities come due, Fortis must ensure sufficient liquidity is available to meet the obligations. Failure to meet the obligations when due would have a negative impact on the solvency of the company.

**Foreign Currency Risk** – As the company maintains US operations, where utility services are provided and electricity is sold, Fortis can be exposed to the risk that the company's cash flows in Canadian dollar terms will be affected by fluctuations in USD/CAD exchange rates.

**Health and safety risk** – Should any of the employees working either operating or building Fortis' facilities be injured this could result in fines, orders to remedy unsafe conditions, increased compliance costs or issues with licenses/permits required to operate these facilities. In addition, failure to ensure the safety of these facilities could result in the company being in contravention of environmental, health, and safety laws, or face civil liability.

**Commodity Price Risk** – The company's electric and natural gas systems are exposed to natural gas price risk, with varying levels of revenue impact to shifting commodity prices.

**Mechanical and Operational Risk** – As part of the normal course of business, Fortis's facilities are subject to operational risk due to premature weak or failure of major equipment due to defects, materials, or workmanship. In some cases Fortis also relies on third parties for operations and maintenance and therefore relies on these companies to fulfill their obligations.

**Regulatory Risk** – The company's profitability can be affected by differing regulatory bodies. Including but not limited to the Hydroelectric facilities, where water levels are under the control of the government which can affect the top-line. The Distribution Group's facilities are also susceptible to regulatory risk, as rates are set by state agencies.

**Acquisition Risk** – As part of the company's strategy, Fortis may make acquisitions that align with their business. These processes are susceptible to delays in implementation or closing, unexpected costs or liabilities as well as failure to realize synergies.

**Environmental Risk** – The power generation and utilities business are exposed to a number of normal environmental risks, with many of these risks mitigated through insurance policies of varying levels. The industry is highly regulated and operations are subject to various environmental laws and regulations.

**Development and Construction Risk** – As the company builds new power generation facilities, the projects are subject to cost overruns or material delays, including but not limited to permitting delays, technical issues, construction delays, land owner disputes and or equipment underperformance.

#### **Xebec Adsorption Inc.**

**Environmental and regulatory policies**—Xebec benefits from certain environmental policies, such as incentives, tax credits and subsidies, implemented by governing bodies globally. The implementation and timeline of these mandates is not guaranteed and can adversely affect Xebec's competitiveness relative to other larger resource companies in energy sectors.

**Technological change**—Xebec's market is characterized by rapidly changing technologies, industry standards and processes. Xebec invests significant resources into its products, which are complex in nature and are designed to be compatible with current and evolving industry standards. Any delays in developing new product enhancements or failure by any products, technologies or services to gain market acceptance, could adversely affect Xebec's business and results of operations.

**Dependency on a limited number of customers for revenue**—a large portion of Xebec's revenue is dependent on a small number of customers. For the year ended December 31, 2018, five principal customers accounted for approximately 45% of Xebec's total revenue. The loss of purchase orders or anticipated purchase orders from these five principal customers, could have a material adverse effect on the company's business.

**Difficulty recruiting experienced, qualified personnel in order to expand business**—the technological nature of Xebec's business requires the company to continuously train and recruit experienced personnel. Competition for qualified personnel in their industry is intense and in short supply causing experienced research & development, engineering, manufacturing, operating, sales & marketing and management personnel to be difficult to recruit and retain.

**Protection of technology and development**—Xebec is dependent on its ability to attain and maintain the rights to its intellectual property. Xebec's inability to attain patents for its technology or reach its targeted development or integration timelines, could reduce the feasibility of their products reducing the company's competitive edge.

**Inability to raise required capital**—the execution of Xebec's business and commercialization plan may be jeopardized if the company is unable to raise the required capital. Xebec mitigates this risk through the issuance of debt and equity, but may use a variety of measures including funding from government agencies, the sale of non-core assets or strategic investors.

**Renewable Natural Gas and Hydrogen market development risk**—markets for RNG and RH2 may never develop or develop slower than the company expects affecting their revenues and earnings.

**Dependency on third party suppliers**—Xebec may be unable to obtain comparable materials or components from alternative suppliers, and that could adversely affect its ability to produce commercially viable products. Additionally, Xebec regularly outsources aspects of its product manufacturing to contract manufacturers. An increase in the manufacturer's service price or delays in their deliveries, could adversely affect Xebec's financial condition and operational results.

**Foreign exchange risk**—the majority of Xebec's revenues are earned in Canadian dollars, U.S. dollars and the Chinese Yuan. The majority of the operating expenses are incurred in the Canadian dollar and Chinese Yuan. Xebec has not entered into any currency derivative contracts in order to hedge against any currency fluctuations.

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