

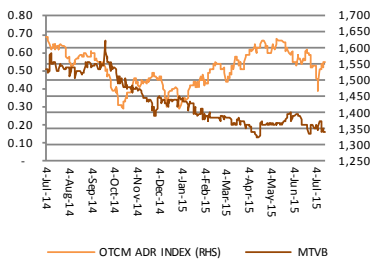
# Mantra Venture Group Ltd.

(OTCQB:MVTG)

August 10, 2015

RB MILESTONE GROUP   
EQUITY RESEARCH AND MARKET INTELLIGENCE

**Price (\$): (August 7, 2015)** 0.11  
**Beta:** -3.99  
**Price/Book Ratio:** N/A  
**Debt/Equity Ratio:** N/A  
**Listing:** OTCQB



\*Company is compared to the S&P/ASX 200 index. Source: Bloomberg.

## Recent News

**July 30, 2015:** Mantra announced the Incorporation of Mantra Energy USA

**June 30, 2015:** Mantra announced that members of its management team will be attending and presenting a poster at the 2015 International Conference on Carbon Dioxide Utilization (ICCDU).

**May 25, 2015:** Mantra announced the release of a video demonstrating its novel Mixed-Reactant Fuel Cell (MRFC). The video depicts the operation of a scooter, christened the Mantra Spark, powered entirely by the MRFC.

**April 7, 2015:** Mantra Energy Alternatives Ltd., a subsidiary of Mantra Venture Group Ltd., has announced that it will release a video demonstration of its novel fuel cell technology, the MRFC, upon the filing of the relevant provisional patent applications.

**Feb 3, 2015:** Mantra announced an update on the deployment of their first fuel cell demonstration prototype and Electro-Reduction of Carbon Dioxide (ERC) pilot plant.

**Shares in Issue:** 71,377,692

**Market Cap:** \$7,922,924

**52 Week (Low - High):** \$0.09 - \$0.68

## MRFC is on the Edge of Revolutionizing Fuel Cells

Mantra Venture Group Ltd. (OTCQB:MVTG) ("Mantra" or the "Company") is a clean technology company that identifies unique emerging technologies and moves them to commercialization. Through its subsidiary, Mantra Energy Alternatives, the Company is developing two disruptive electrochemical technologies – the first reduces greenhouse gas emissions in a profitable manner and the second is a fuel cell that is cheaper, lighter, and more compact than conventional fuel cell technologies. When these technologies are equipped together they can utilize carbon dioxide as an energy storage medium. Mantra has continued to obtain federal funding for its innovative technologies allowing it to advance pilot testing, which is a crucial step towards eventual commercialization.

The Company released a video in May 2015 of a scooter (see Figure 1) that runs on its Mixed-Reactant Fuel Cell (MRFC) technology. The scooter, named Mantra Spark, used formate salts as its fuel source. The MRFC produces power by mixing this fuel and an oxidant, thereby eliminating the need for a costly and failure-prone membrane. The Company strategically used this fuel source because it is produced from CO<sub>2</sub> using the Company's other technology, Electro-Reduction of CO<sub>2</sub> (ERC). In this way the Company can convert harmful CO<sub>2</sub> emissions into fuel, which can be used in the MRFC for energy storage, distributed power production, and transportation.

## Investment Arguments

- **MRFC scooter demonstration brings Mantra on the brink of commercialization:** Mantra recently released a video of a scooter powered entirely by its MRFC technology. This proof of concept demonstration will instill enhanced confidence in the commercial potential of Mantra's technology and brings the company just steps away from large-scale commercialization. Mantra's MRFC technology eliminates the requirement of an ion-selective membrane, the most expensive component of a conventional fuel cell. The elimination of the membrane from the fuel cell not only reduces its cost and improves its durability and lifetime, but also makes for a simpler and more compact system. The fuel cell industry is expanding rapidly and Mantra's unique technology has immense potential in the stationary power and transportation sectors.
- **ERC technology is both effective and cheaper:** Mantra's patented Electro-Reduction of CO<sub>2</sub> (ERC) technology allows an industrial greenhouse gas emitter to convert harmful emissions into profitable products. The current alternative process of capturing and sequestering CO<sub>2</sub> underground represents a massive unrecoverable cost to emitters. In contrast, the market for the chemical products of ERC, which include formic acid/formate salts, carbon monoxide, methane, formaldehyde and hydrocarbons, have a large existing market, making it financially attractive to reduce CO<sub>2</sub> emissions.
- **Integration of ERC and MRFC an irresistible proposition:** The two technologies can be integrated to provide a unique, CO<sub>2</sub>-neutral energy storage cycle. Formate can be produced from CO<sub>2</sub> emissions through the ERC process; this same formate can be used as a fuel for the MRFC (see Figure 2) to produce electricity. Large-scale energy storage, which this solution serves, is considered the key to the successful distribution of renewable energy technologies.

## Key Developments

### Mantra releases demonstration video for MRFC

In May 2015, Mantra released a video demonstrating its Mixed-Reactant Fuel Cell (MRFC) technology. The video depicted a scooter, named Mantra Spark, which was powered solely by the MRFC. The MRFC is a novel, unconventional and disruptive fuel cell technology. This is a keystone event for the Company – the first time a vehicle has ever been powered by a MRFC system.

Conventional fuel cells produce clean electricity from hydrogen fuel using an expensive, failure-prone ion-selective membrane. Despite their potential as a clean power source, conventional fuel cells have seen limited adoption due to several drawbacks, including cost and practicality. Mantra's MRFC design addresses each of these shortcomings. Firstly, the MRFC uses a mixture of fuel and oxidant, thereby eliminating the need for the membrane and consequently reducing the cost, size and weight of the system. Secondly, the MRFC uses easily stored and transported liquid fuels, instead of hydrogen, which is an explosive, difficult-to-transport gas.

The Company successfully scaled this technology up from the bench scale and demonstrated the scooter application in less than twelve months. The scooter utilized formate as the fuel, which is a non-toxic, non-flammable, naturally occurring energy-dense compound. Formate fuel can be produced from waste CO<sub>2</sub> emissions using Mantra's other technology, ERC.

In addition to formate, the MRFC can use a broad range of other liquid fuels as required by the application; therefore, it is well-suited to several markets including stationary power, backup power, industrial equipment, automotives and energy storage.

### ERC and/or MRFC: an irresistible value proposition

The ERC technology has wide applications for all industrial establishments. For instance, a steel plant or a utility company could use it to process their harmful and, in some jurisdictions, taxable CO<sub>2</sub> emissions into profitable products, such as formate salts/formic acid. We have highlighted in our initiation note on the Company how its ERC technology is superior to alternatives such as carbon capture and storage (CCS). Standalone, ERC is an excellent solution to meet the carbon reduction commitments of industrial establishments.

Furthermore, its second offering, the MRFC technology, targets an industry that is growing at a steadfast pace – the fuel cell industry. As the demand for energy continues to increase, several countries are now looking at measures to meet demand in a cost effective and environment friendly way. Fuel cell is one such technology that has gained significant traction in recent years. The energy efficiency of a fuel cell is 40-60% with much lower carbon emissions than conventional engines. In addition, the life of a fuel cell is about 10 years and it can operate in extreme climatic conditions. The developed countries in Europe, Japan, South Korea and the US have been frontrunners in the adoption of fuel cells with cost continuously coming down. The day is not far when fuel cells will be cheaper than conventional sources as adoption increases – for instance in Italy, fuel cells are a cheaper alternative. The fuel cell costs in the US have also gone down by 50% since 2006.

- Korea has aggressive plans for developing fuel cells and is targeting fuel cells to meet 10% of its requirements by 2030. The government is investing considerably in the technology

- Germany is pushing the demand for fuel cells through its automotive section, led by Daimler and Nissan. BMW is also cooperating with Toyota to develop the technology
- Japan, the largest market for fuel cells, has plans to install home fuel cell system in 10% of all households by 2030. The Fukushima disaster has prompted higher demand for fuel cells in the country.

All the major automakers have vast plans to move into the production of electric vehicles, be it Toyota, Honda, Hyundai or Daimler. Toyota is moving at a fast pace to counter Tesla, the US electric vehicles behemoth.

Mantra's technology removes the need for membrane, which is costly and technically challenging. This has brought down the cost for its fuel cells considerably. We believe its process may be the way forward for the industry, given its superiority. While the company is at a nascent stage it has already tied up with large corporations such as Alstom and Lafarge (world's largest cement maker). GE has a large stake in Alstom and is looking to develop this technology through it.

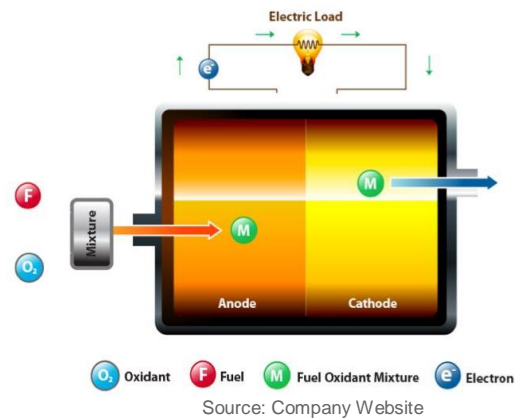
Lastly, the combination of ERC and MRFC is a win-win as the by-product from the ERC process can act as feedstock source for MRFC. Mantra has successfully demonstrated to the public that its MRFC can power a scooter using these by-products and should therefore put the Company in a good position to take a step closer towards getting the technology to commercialization.

Figure 1: Mantra Spark Scooter



Source: Company Website

Figure 2: MRFC Process



Source: Company Website

## Process improvement continues

Mantra's continuous research and development has led to component improvements and more optimized system integration. The Company's ERC technology has solidified patents in four countries with two pending and the MRFC has been granted patents in the US and EU with a pending patent in Canada. Manta has continued to look for more patent opportunities to grow its portfolio and protect its first mover advantage.

Figure 3: ERC & MRFC IP by Geography

		Intellectual Property Status						
		US	UK	EU	Canada	Australia	China	India
ERC PATENT	Pending			Pending	✓	✓	✓	✓
MRFC PATENT	✓	✓			Pending			

Source: Company Website

# Financial Performance

Exhibit 1: Latest Income Statement (Consolidated)

INCOME STATEMENT (in US\$ 000)	FY 2014	FY 2013	Y-o-Y (%)	FYQ3 2015	FYQ3 2014	Y-o-Y (%)
<b>INCOME</b>						
Revenue	275	3	NM	39	17	129%
Cost of goods sold		3	-NM			
Gross profit	275	1	NM	39	17	129%
<b>OPERATING EXPENSES</b>						
Business development	40	19	113%	6	0	
Consulting and advisory	342	121	183%	136	25	444%
Depreciation and amortization	26	31	-17%	7	5	40%
Foreign exchange loss (gain)	-89	-14	NM	-3	-20	-85%
General and administrative	133	48	174%	26	11	136%
License fees	40	30				
Management fees	184	313	-41%	77	46	67%
Professional fees	168	160	5%	36	33	9%
Public listing costs	24	15	59%	4	6	-33%
Rent	58	23	156%	18	16	12%
Research and development	396	429	-8%	55	92	-40%
Shareholder communications and awareness	7	40	-82%			
Travel and promotion	199	120	66%	22	1	NM
Wages and benefits	38	40	-6%	9	4	125%
Total operating expenses	1,568	1,375	14%	398	219	82%
Loss before other expense	1,294	1,374	-6%	-359	-202	78%
Other expense	12	0	NM			
Accretion of discounts on convertible debentures	-27	-3	NM	-28		
Loss on change in fair value of derivatives				-35		
Interest expense	-44	-43	2%	-9	-13	-31%
Total other expense	-59	-46	29%	-72	-13	NM
<b>Net loss for the period</b>	<b>1,353</b>	<b>1,420</b>	<b>-5%</b>	<b>-431</b>	<b>-215</b>	<b>100%</b>
Less: net loss attributable to the non-controlling interest	62	86	-28%	19	17	12%
Net loss attributable to Mantra Venture Group Ltd.	1,291	1,334	-3%	-412	-198	108%
Net loss per share attributable to Mantra Venture Group Ltd. common shareholders, basic and diluted	-0.02	-0.03	-33%	-0.01		
Weighted average number of shares outstanding (in mn)	59.1	51.05	16%	71.3	57.4	24%

Source: Company Financial Reports

Income from new projects helped Mantra generate revenue amounting to \$39,116 in the quarter ended February 28, 2015. This was 129% higher, compared to the corresponding quarter a year ago. While revenues increased, higher operating expenses kept the company in the red for yet another quarter. It incurred net losses worth \$430,715 during the quarter.

Total operating expenses shot up by a sharp 81.7% to \$397,637 mainly on account of a spike in consulting and advisory services, management fees and travel and promotion expenses. The whopping four-fold rise in the consulting and advisory services to \$135,735 was on account of the company launching the detailed engineering phase of its Lafarge pilot project. Adding staff for the execution of Phase 2 of the alternative products project pushed up the management fees cost by 67.5% (\$76,957). Mantra focused on attending various trade shows in Europe, which resulted in an increase in travel and promotion bills to \$22,278 from \$1,178 in the year ago quarter.

## Sources

- Company filings, website, presentations, financial reports

### Disclaimer

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We strongly urge all investors to conduct their own research before making any investment decision.