toronto zoo

STAFF REPORT

To: Board of Management

From: John Tracogna
Chief Executive Officer

Subject: **BIOGAS PROJECT**

Date: 2011-06-01

Summary:

This report updates the Board on the Biogas Project and outlines the terms of an operating agreement with the proponent ZooShare Biogas Co-operative Inc. (ZooShare). The Biogas Project represents an excellent opportunity to showcase biogas and waste management best practices to the public, consistent with the Zoo's education mandate. The proposal provides a guaranteed financial return to the Zoo and allows the Zoo's organic waste to be processed in the most environmentally friendly manner possible. This facility represents an innovative public-private partnership, which incorporates a unique community funding model. Zoo staff are recommending that an operating agreement be executed with ZooShare to formalize the relationship between ZooShare and the Board. The success of the Biogas Project is contingent upon ZooShare achieving other milestones, notably approval of the OPA FIT application and securing the necessary financing for the project.

Recommendation:

It is recommended that the CEO be authorized to enter into an operating agreement with ZooShare Biogas Co-operative Inc. to build a 500kW biogas facility on Zoo managed land.

Financial Impact:

The proposed operating agreement negotiated with ZooShare provides an annual financial contribution to the Zoo of 10% of net earnings or $50,000, whichever is greater.

Background:

On 2008-10-28, the Board of Management approved in principle the building of a biogas facility on site and directed Zoo staff to release a request for proposals for such a facility. Toronto City Council approved (2010-02-22) the “construction of a Biogas Facility at Toronto Zoo, pending the decision by the Board to award the project to a successful proponent, following completion of the Request for Proposal process” and to “report back to Executive Committee prior to making a commitment to a successful proponent, if any unfavourable impacts to future Capital and Operating budgets arise”.

The Board was updated on the responses to the Toronto Zoo Request for Proposals (RFP #07) - "Provision of a Large-Scale Biogas Facility at the Toronto Zoo", at the 2010-08-24 Board of

Management meeting. As outlined in the Board report, the Zoo did not receive any proposals that satisfied the minimum requirements of RFP #07. Industry concerns with RFP #07, based on surveyed responses from attendees at the mandatory site meeting, included: technical risks, timelines, feedstock supply, thermal heat distribution and the price for electricity. A common suggestion from all respondents was that the above noted concerns would be reduced if the project size were reduced.

On 2010-10-25 a consortium under the name "Zoo Biogas Co." provided a detailed proposal to construct a 500kW modular biogas facility on Zoo managed land. The consortium is comprised of four distinct companies with between 8 and 38 years of experience in design and development, building and grid connections, strategy and marketing, business modelling and project management of biogas facilities. Members of Zoo Biogas Co. have built five biogas facilities in Ontario.

At its meeting of 2010-11-25, the Board approved a staff report recommending that a Memorandum of Understanding (MOU) be entered into with Zoo Biogas Co. in accordance with the following terms:

- Zoo Biogas Co. is responsible for financing, engineering, building and operating the facility;
- Zoo Biogas Co. will form a special purpose company (SPC) to secure funds, permits and feedstock and the Toronto Zoo will have representation on the SPC Board;
- Toronto Zoo is responsible for providing ~3000 tonnes of organic waste to the facility;
- Toronto Zoo will have the option to receive thermal heat and exhaust C02 (enough to sufficiently supply 95% of the needs of a 2 acre greenhouse);
- Toronto Zoo will have exclusive rights to solid fertilizer that is a by-product of the process;
- Toronto Zoo will receive an annual donation/contribution.

The MOU, which was signed with Zoo Biogas Co. on 2010-12-23, provided the consortium with the level of commitment necessary to proceed with the facility design, formalizing the consortium structure, discussions with the Ontario Power Authority (OPA) and securing grants from funding sources.

On 2011-04-26, a not-for-profit non-share capital renewable energy co-op under the name ZooShare Biogas Co-operative Inc. (ZooShare) was formally incorporated in Ontario. ZooShare is governed by a Board and employs staff to carry out its activities, which will be to develop and commission the biogas facility and then to operate and maintain the facility. ZooShare will hold all contracts for the project, including the operating agreement with the Zoo.

Over the past five months, ZooShare has prepared a more detailed concept and has been working with Zoo staff to define the terms for an agreement. As requested by the Board at the November 2010 meeting, staff are now in a position to report back to the Board on the operating agreement terms for consideration.

Comments/Discussion:

The ZooShare concept for the biogas plant includes a primary digester, two storage tanks and a 500kW generator to be connected to the local distribution grid and sold to the OPA (under a 20 year Feed-in-Tariff or "FIT" contract). Manure from the Toronto Zoo and food waste (including fat, oil, and grease) from a major grocery retailer are mixed in a digester. The anaerobic digestion generates methane as well as liquid and solid digestate. The methane is burned in a generator to produce electrical power. What remains after the conclusion of the anaerobic digestion is called digestate. It comes in liquid and solid form (sediment) and is high in nutrients such as nitrates and phosphates. Digestate can be used and marketed as fertilizer. The burning of methane creates heat that drives the generator, but that can also be used for district heating or to produce hot water. The process also generates carbon dioxide (CO2) that could be used to heat a nearby building, such as a greenhouse operation.

The ZooShare project concept also includes an education display area, which can be used to showcase biogas technology to the public. Education programs can be developed in collaboration with the Zoo, to increase awareness and understanding of this and other renewable energy sources.

The key terms of the proposed operating agreement are outlined in Attachment 1 and are described as follows:

- ZooShare will fully fund, design, develop, construct and operate the biogas plant;
- ZooShare will contract with the Ontario Power Authority to sell the electricity generated under the Feed-in-Tariff program;
- ZooShare will provide annual financial contributions to the Zoo equal to the greater of 10% of net earnings or $50,000;
- ZooShare will provide the Zoo with the needed amount of solid and liquid fertilizer each year at no cost to the Zoo;
- ZooShare will provide one seat on its board to the Toronto Zoo CEO or designate. There are five seats total;
- ZooShare will supply thermal energy and CO2 at no cost to the Zoo, if the Zoo provides a recipient facility in close proximity and the connection infrastructure;
- ZooShare will construct and operate a ($50,000) biogas education display at the site to educate the public about the benefits of biogas and community power;
- Toronto Zoo will lease approximately four acres of land (refer to the site diagram in Attachment 2) to ZooShare for a period of 20 years, with the option to renew on mutually agreeable terms for two additional five year periods;
- Toronto Zoo will supply its manure to the biogas facility;
- Toronto Zoo will assist ZooShare in disseminating information about the project through the Zoo website, Zoo publications, and other forms of member communications;
- Toronto Zoo will collaborate with ZooShare on education curriculum development and delivery of green education programs;
- Toronto Zoo will retain naming and sponsorship rights of the facility;
- Toronto Zoo will provide security services for the biogas facility.

The ZooShare Biogas Project proposal is an excellent opportunity for the Toronto Zoo and represents an innovative public-private partnership that also incorporates a unique community funding model. A biogas facility fits with the Zoo's vision and is consistent with the Toronto Zoo Five-Year Strategic Plan, the Zoo Green Plan (2007) and the recent Zoo Wildlife Conservation and Sustainable Living Plan (2011). As well, this facility would be the flagship site to showcase biogas and waste management best practices to the public, consistent with the Zoo's education mandate. The proposal allows the Zoo's organic waste to be processed in an anaerobic system, the most environmentally friendly manner possible. Lastly, there is a guaranteed financial return to the Zoo with no investment of operating or capital funds.

ZooShare will invest approximately $5.4 million to construct the biogas plant. Funding sources may include grants, sweat equity from the companies involved, community bonds purchased by the public, and a loan from the City of Toronto Sustainable Energy Fund.

The risks to the Zoo are minimal. ZooShare is responsible for raising the required funds and the Biogas Project will only proceed if financing is secured. Another critical factor is the approval of the FIT contract by the Ontario Power Authority, which sets out the rate to be paid to ZooShare for supplying energy to the grid over a 20 year period. The application was filed with the OPA in February 2011 and approval is anticipated in July 2011. Going forward with the biogas facility is contingent upon approval of this application. Following this initial OPA approval, ZooShare must complete a series of milestones within a certain time frame. ZooShare's biogas plant needs to obtain a Renewable Energy Approval (REA), Connection Impact Assessment (CIA), as well as provide a financing plan. These approvals will require the co-op to undertake public consultation in the community. Once these milestones have been reached, the OPA issues a Notice-to-Proceed, upon which construction can begin. During the construction phase and then when the plant is operational, ZooShare will commit to certain performance guarantees.

The Board should be aware that the facility is modular in design. There is the capability of expanding this facility in the future if demand warrants. This would be negotiated in a separate agreement with the Board and is not part of the proposed agreement. ZooShare has a long term strategy of expanding biogas technology to other sites in Ontario and potentially to other markets across North America. The biogas facility at the Toronto Zoo would be the first of its kind at a zoo in Canada.

The Board's solicitor is in the process of preparing a draft operating agreement. As there are no unfavourable impacts on future Zoo operating or capital budgets, it should be noted that there is no obligation for the Board to report back to the City's Executive Committee.

Subject to approval of the recommendations in this report by the Board of Management, the next steps are as follows:

- June 2011: Execute contract with Toronto Zoo
  Execute contract with major grocery retailer
  Founders round of financing

- July 2011: FIT-Contract approval
- August 2011: Start of general financing
- Fall 2011: Renewable Energy Application completed
- Winter 2011/12: Detailed engineering and procurement of equipment
- April 2012: Start of construction
- July 2012: Start-up and commissioning
- September 2012: Begin regular operations

John Tracogna
Chief Executive Officer

List of Attachments:

1. Proposed Terms
2. Site Diagram

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