Ballarat, Australia

Smarter Cities Challenge executive summary

Introduction

The City of Ballarat, Australia, was one of 16 cities selected to receive a Smarter Cities Challenge® grant from IBM in 2014 as part of the company's citizenship efforts to build a Smarter Planet®. During three weeks in October of 2014, a team of five IBM experts worked to deliver recommendations on a key challenge identified by Mayor John Philips and the City Council leadership team:

Support innovations that will help manage local waste resources effectively while reducing reliance on the landfill and strengthening the regional economy.

Highlights:

- Phase in waste-to-energy implementation to build value and divert waste from the landfill
- Use modern sorting techniques to recover maximum value from waste streams
- Optimise transport and logistics to reduce costs
- Engage the community to support change
- Use technology to generate insights about resource recovery and waste

The challenge

Ballarat is a growing city with a comparably growing residential waste problem. The local landfill at Smythesdale has only 20 years of capacity remaining. New regulatory requirements and increasing costs make it difficult for the City to keep up with demand. Citizens expect new waste management services, including green waste and hard waste pickup, which require additional funding. At the same time, there is significant pressure to keep municipal rates at current levels.

The Ballarat City Council supports strategic development and the addition of industry as part of the Ballarat West Employment Zone (BWEZ). Zoning suitable sites for waste infrastructure within BWEZ creates an opportunity to implement waste management solutions that could generate energy and other outputs to support new industry in this area.

The Council's belief is that a waste-to-energy facility could power the BWEZ precinct's main tenants. Modern waste-to-energy plants help maximise the recovery of energy from waste while minimising the volume of waste going to landfill. These technologies offer an attractive way for Ballarat to divert waste from the landfill and, together with a new sorting and resource recovery facility, helpthe City transition to using waste as a resource. For any waste-to-energy proposal to be an attractive investment opportunity, it requires a continuous, large-scale supply of waste input ("feedstock"), a positive economic environment, a stable regulatory environment and a downstream market for energy and processing outputs.

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Findings and recommendations

Ballarat is well positioned to invest in an optimised waste management system that will help reduce costs and improve both services and liveability throughout the municipality and to invest in the infrastructure and innovation required for future growth.

Today, waste management processes are burdened by a growing population and a landfill with only 20 years of remaining capacity. Ballarat has many options to better utilise its waste resources, extend the lifespan of the landfill and improve local economic conditions.

To help the Council chart a course for future waste management, the IBM Smarter Cities Challenge team has developed a holistic decision-assessment framework that incorporates the broader Ballarat strategy, waste management goals and local government performance criteria. When applying this framework, it is recommended that the Ballarat City Council explore the introduction of a green waste service, then implement a pilot waste-to-energy project using some of the resulting green waste feedstock to demonstrate the value of waste-to-energy in a community project, such as providing biogas for Council waste collection trucks or a bus service, or in a cogeneration project at the local pool using solar and gas.

Incorporating post-collection sorting and compaction at a facility in town or at BWEZ will provide operational efficiencies in truck route optimisation, divert and lower the volume of waste reaching the landfill and help provide homogeneous waste feedstocks to support future waste-to-energy projects. This can support jobs through a social enterprise and position Ballarat to attract investors for a future waste-to-energy facility. Becoming a regional hub for sorting also can improve economies of scale and further reduce waste sent to the landfill.

Prior to embarking on a large-scale waste-to-energy project for municipal solid waste, Ballarat should work with regional councils and the state government to understand the entire regional waste-to-energy value chain, including available feedstocks and markets for processing outputs. It will be important to seek state support in order to make the project attractive to investors through regulatory certainty, sufficient availability of reliable feedstocks and an economic environment that makes waste-to-energy competitive with current landfill facilities.

A waste information system will help capture key data points and generate insights through interconnected sensors and technology on bins, trucks and other infrastructure. These sensors can provide additional information to build a case for investment in waste-to-energy initiatives. Learning more about waste practices and trends will improve community engagement, broaden local understanding of waste management and demonstrate the personal financial impact of individual waste management decisions. Smart apps can be employed not only to reach the community but also to optimise truck routes.

Finally, it will be important to engage the community in this transformation effort. A comprehensive communications program will be needed to build the awareness, understanding and urgency to encourage support and participation. In addition, forming a community-based Clean Ballarat Advisory Group can encourage the community and local experts to contribute to the waste management roadmap for Ballarat.

Conclusion

Building a high-quality, segregated waste stream — through sorting and a green waste service enabled by operational efficiencies in waste collection — will improve Ballarat's waste services, increase citizen satisfaction and build feedstocks for future waste-to-energy initiatives. Initiating waste-to-energy processing for green waste can support City infrastructure, help build awareness and approval for broader scale initiatives and enable the Council to reach its goal of 65% diversion of waste from the current landfill site. Furthermore, waste-to-energy projects provide a unique opportunity for Ballarat. In the right socioeconomic and political environment, waste-to-energy has the potential to offer a holistic solution for mitigating waste, increasing employment, significantly improving environmental performance and showcasing the City's global leadership.

For more information

To learn more, send an email to ccca@us.ibm.com or visit smartercitieschallenge.org