

Case Study

Texas Instruments and RecycleBank Make an Environmental Difference -- One RFID Tag at a Time

Company Description

RecycleBank is a rewards company that motivates people to recycle. By utilizing innovative, breakthrough technology, they have created an environmentally conscious solution for communities to deal with the rising cost of waste collection. RecycleBank equips households with the tools to streamline recycling efforts while providing municipalities with the technology to measure the amount of material each home recycles. The weight of the recyclables is then converted into RecycleBank Reward Points that can be used at hundreds of local and national participating reward partners. RecycleBank is easy to implement, market-driven and proven to work, saving municipalities' money, giving citizens' rewards for their environmental stewardship, and bolstering local economies. RecycleBank is a privately held company with offices in New York and Philadelphia. The company can be found online at www.recyclebank.com



Operations

- RecycleBank was founded in 2004 with the belief that environmental solutions can create economic opportunities. The co-founder and CEO, Ron Gonen, conceived of the idea while attending the Entrepreneurial Greenhouse Program at Columbia Business School.
- The company received its seed funding from the Eugene Lang Entrepreneurial Initiative, and in 2005, deployed its first program in Philadelphia.
- In May 2007, RecycleBank secured \$13.1 million in Series A funding from RRE Ventures and Sigma Partners.
- RecycleBank received \$2 million in funding from The Coca-Cola Company in October 2007.

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- RecycleBank received \$30 million in Series B funding in April 2008 from Kleiner Perkins Caulfield and Byers, The Westly Group, RRE Ventures and Sigma Partners.
- As of May 2008, RecycleBank households have diverted more than 36,000 tons or 72,000,000 pounds of recyclables from landfills (that includes plastic, paper, cardboard, glass, aluminum and tin); saved more than 318,000 trees and 21 million gallons of oil through recycling.
- RecycleBank is currently deployed in more than 100,000 homes, in more than 40 communities, and in nine states with plans for national expansion this year.
- RecycleBank Points redeemed (for 2007) amount to 1,046,387 RecycleBank Points (that's more than \$1 million back into local economies).



The Problem

RecycleBank is an innovator even by today's leading industrial and technological standards. If their receipt of the 2007 Social Venture Network Innovation Award doesn't demonstrate their innovation, then take a look at the positive impact they are making on our environmental landscape through their waste recycling program. RecycleBank's reward program gives consumers the incentive to recycle. The more a household recycles, the more RecycleBank Reward Points are earned. The points can be redeemed for products and discounts in the consumer's community. With RecycleBank's forward thinking and progressive recycling plan, it comes as no surprise that they also leverage technology to help expedite their waste management applications and initiatives.

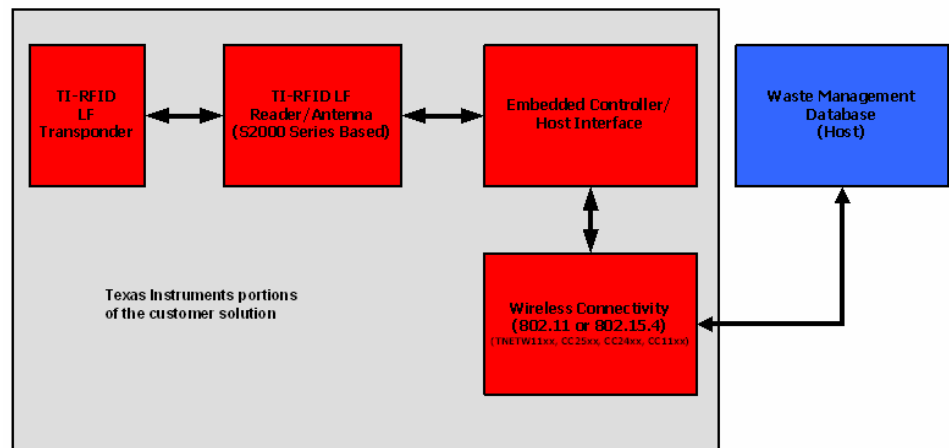
In 2007, RecycleBank turned to Texas Instruments seeking reliable technology to enable a key piece of their program. RecycleBank's challenge was to implement a technology solution that authenticated the name and address of the household, weighed the waste credit, and applied

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the correct number of reward points, automatically. The company sought to achieve this level of automation so as not to burden the waste hauler's driver or crew with this task. Additionally, with Recycle Bank's commitment to the recycling process, they needed an RFID solution that would function as a facilitator to their process. The technology had to contribute to the greater cause and make recycling easy for consumers, hands-free for waste haulers and fiscally responsible for communities. Finally, because RecycleBank works in direct cooperation with city services, waste haulers, material recovery facilities and reward partners, the company was seeking a credible, experienced technology provider. It was also important to create the right solution, the first time. That meant looking beyond the actual waste-pick up process mechanisms and securing a quality RFID product. The solution had to accurately collect the participating household information and instill consumer confidence. Reliability and consistency were paramount to the program's success. A breach of confidence in the process i.e. not recording the curbside recycling activity, would reflect poorly on RecycleBank. TI, with its 18 years RFID experience (10 years in waste management technology) and more than 600 million deployed tags, promised stability, accuracy, and experience.

The Solution

Texas Instruments, in collaboration with RecycleBank's partners, provided RecycleBank with an RFID solution that attaches a low frequency RFID tag (part number: RI-TRP-R9QL-30) to the actual recycling container and includes an integrated RFID reader that is installed on the



recycling truck's weighing mechanism. As designed and implemented for RecycleBank, the TI RFID tag stores a serial number (which relates to the name and address of the container owner), the tag is read, and data is sent to the recycling truck's internal computer. The data collected is then uploaded back to RecycleBank's data collection and processing systems. It is important to note that the personal data (name, address etc.) is not programmed into the tag. Only a serial number is captured which then goes into RecycleBank's secure database. The TI patented, low frequency technology has a unique benefit for waste management and recycling applications because it is an all-weather, all-climate, reliable solution capable of functioning in snow, rain or harsh and dirty environments around the world. In waste management and recycling environments the tags must endure a significant amount of physical ruggedness while retaining its full technical features over the life of the container. TI's RFID products have proven to exceed estimated life expectancy (industry standard is five-years for an LF tag), consistencies and reliabilities required for this harsh environment.

These benefits were key considerations during Recycle Bank's selection process which lead them to select and develop with TI. With their growing success, RecycleBank has active recycle

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programs in nine states to include: Pennsylvania, New Jersey, Massachusetts, Delaware, Vermont, Connecticut, Virginia, Nebraska and New York with additional states to join in the effort by years-end. RecycleBank manages all aspects associated with rewarding the households, including the recruitment of reward partners, fulfillment of rewards and servicing customers. In addition, the robust local reward partner program drives business to a variety of community retailers. RecycleBank often hires locally based people to manage the RecycleBank program. The company provides a turn-key rewards program for cities and haulers which includes retrofitting existing trucks with the technology to record how many pounds of recyclables each home produces.

More specifically, they work to undo much of the harmful environmental impact that so many of us leave behind by way of taking out our trash each week. RecycleBank has received many awards to include:

- National Recycling Coalition – 2007
- 2007 Social Venture Network Innovation Award
- Outstanding Recycling Innovation Award 2007 Philadelphia Sustainability Award

Several states have reported statistics which serve as a testimony for the environmental impact that RecycleBank's programs are making in communities. Below are a few of those facts and figures which demonstrate the positive results:

- In one week's time, the township of Cherry Hill, New Jersey recycling rates increased its recycling by 135 percent. Before RecycleBank, the average home recycled 12 pounds of recyclables. Homes now average more than 26 pounds of recyclables each week.
- By using the RecycleBank program, the city of Wilmington, Delaware went from a recycling rate of zero percent to 37 percent in just six months.
- Elk Township in New Jersey averaged 16 tons of recyclables weekly before RecycleBank. Using RecycleBank, the township now averages 42 tons of recyclables weekly – a 136 percent increase.

About RecycleBank:

RecycleBank is a rewards program that motivates people to recycle. It does this by quickly and easily measuring the amount of material each home recycles and then converting that activity into RecycleBank Reward Points that can be used at hundreds of local and national rewards partners. RecycleBank is simple to implement, market-driven and proven to work, saving municipalities' money and rewarding citizens for their environmental stewardship. Kleiner, Perkins, Caulfield and Byers, RRE Ventures, The Westly Group and Sigma Partners are institutional shareholders and Ron Gonen, the co-founder and CEO is the largest individual shareholder. RecycleBank is headquartered in New York City and also maintains an office in Philadelphia. Visit www.recyclebank.com for more information.

About Texas Instruments RFID Systems

Texas Instruments is the world's largest integrated manufacturer of radio frequency identification (RFID) transponders and reader systems. Capitalizing on its competencies in high-volume

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semiconductor manufacturing and microelectronics packaging, TI is a visionary leader and at the forefront of establishing new markets and international standards for RFID applications. For more information, contact RFID Systems at 1-800-962-7343 (North America) or +1 214-567-7343 (International), find this and other RFID case studies at www.ti.com/rfidnews , or visit our Web site at www.ti-rfid.com.

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