

Volta Redonda, Brazil

Cooking oil waste is used in community development with the Eco-oil Programme

Through a practical solution and via successful partnerships, the Eco-oil Programme is a replicable example of cooking oil waste management with impact. Volta Redonda has demonstrated how it is possible to transform a serious problem into an economically, socially and environmentally successful outcome: used cooking oil is collected and processed into biodiesel, demonstrating the ease and profitability in managing cooking oil waste while benefiting local schools.

106

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Abstract

Municipalities such as Volta Redonda have demonstrated that creativity is fundamental in transforming problems into practical solutions, in a simple and non-expensive way. The 'magical formula' to reduce negative impacts caused by the improper disposal of cooking oil, and to reduce the pollutants that are released into the environment from the large number of diesel run vehicles in the city, can be found in the Eco-oil Programme. The Eco-oil Programme oversees the collection of used cooking oil in the city and the processing of this oil to produce biodiesel. The Eco-oil Programme has clearly demonstrated how joint actions between local government, communities, schools and the private sector can result in a promising partnership for the betterment of the social and environmental well-being of a city. The city's schools have had a major role in both the collection of the used oil and in raising awareness.

The Importance of Cooking Oil Waste Management

In Brazil, fried food is increasingly gaining in popularity and now makes up a large part of the Brazilian diet. This increase in cooking oil use corresponds to an increase in waste oil (termed oleaginous waste). The population at large is mainly unaware that the use of sinks, toilets and garbage cans for the disposal of oil presents a very negative impact on our environment.

Improperly disposed cooking oil waste often ends up in the sewage system, where it severely harms the flora and fauna found in the rivers and seas that are linked to this system. Every litre of oil disposed in the rainwater drainage system pollutes one million litres of water, equivalent to the amount of water consumed by a person over a span of 14 years. Since oil is less dense than water, it forms a thin layer over the water that does not allow for the penetration of oxygen and light, which in turn endangers the basic food chain. The accumulation of oils and fats in pipes can cause clogs, sewage refluxes and even breakages in the sewage system. Toxic products are then used to remove these materials from the system, and these toxins create a harmful chain reaction in elevated costs in water and sewage system maintenance in the city. In addition, the inappropriate disposal of cooking oil can attract pests and produces disagreeable odours. Fortunately, used vegetable oil is a raw material for a diversity of industries, ranging from the production of soaps and detergents, to animal feed and biodiesel.



Population:

approx. 260,000 (2007)

Land area:

182 km²

Municipal budget:

approx. R\$ 690 million (2007)
(US\$ 351.5 million)



An ICLEI Initiative

ICLEI supports and strengthens local governments which promote the generation and supply of renewable energy and energy efficiency in the urban environment.

Case Study

Burning biodiesel derived from old cooking oil has been shown to yield a four-fold reduction in the emission of soot compared to the burning of diesel derived from soy oil, and lower emissions of sulfur oxides (responsible for acid rain and respiratory diseases); particulate matter (responsible for respiratory diseases); hydrocarbons; arenes (a carcinogen); and carbon dioxide (a key green house gas) are all reduced. In addition the local economy benefits through sustainable development, job creation, and through the improvement of public health through improved air quality.

Context of the Municipality

The city of Volta Redonda in the state of Rio de Janeiro is located in the valley of the South Paraíba River, between the sea and the Mantiqueira mountain ranges. With a population of almost 260,000 inhabitants, the city is the main industrial and commercial centre of the South Fluminense region, hosting the largest steel company in Latin America. Although the city has a mainly industrial profile, the transportation sector is responsible for 47% of the city's CO₂ emissions, which come from the 120,000 vehicles that pass through the city daily. After the transportation sector, the industrial sector is the second largest emitter at 36%, and waste is in third place, being responsible for 12% of the emissions.

Concerned with the volume of emissions and the environmental impacts that urban life has wrought in the river catchment area that surrounds the city, the municipal government launched the project "The Environment of Volta" in 2005. This project has been responsible for the advances in environmental policy in Volta Redonda, and relies upon the participation of all sectors of society to find initiatives and policies that improve the environment and quality of life in Volta Redonda. Some project initiatives include the monitoring of air, soil and water quality; construction of bicycle paths; recuperation of degraded areas; and the transformation of the landfill site into a permanent preservation area, among others. Volta Redonda, an ICLEI member, has also participated in the Cities for Climate Protection CCPTM Campaign that integrates climate change mitigation into governmental decision-making processes.

Case Description

Eco-oil: A new organization for collecting and selling used vegetable oil:

The April 2007 announcement of the installation of a biodiesel power plant by the Cesbra Chemical S.A. Group, with a production capacity of 120,000 tonnes per year in Volta Redonda was welcomed by local decision-makers, and was viewed as an opportunity to generate further awareness in the community regarding the many interconnected problems and solutions related to the issue of improper cooking oil disposal. It offered an opportunity to transform a waste problem into a source of energy and employment. The Municipal Government therefore encouraged the founding of Eco-oil – the Association of Collectors of Effluents and Solid Waste, through the Banco de Cidania, the Municipal Fund for Development, Employment Generation, Income and Shelter.

Awareness Raising: Eco-oil is responsible for working with schools in Volta Redonda to provide guidance to students, staff and faculty about the importance of collecting used cooking oil. Eco-oil's attention is divided into two fronts: one is dedicated to raising awareness of the issues that result from the improper disposal of cooking oil; and the second is aimed at creating a space to debate the benefits of renewable energy, such as biodiesel, that will be derived from cooking oil in Volta Redonda.

Waste Oil Collection: Eco-oil is also responsible for the collection of used cooking oil, using the schools as the collection points. Schools are the only

Photo by Eco-oil



Collecting Oil

Volta Redonda participates in the Local Renewables Model Community Network (LR), a project funded by the German Federal Ministry for Economic Cooperation and Development, that promotes the use of renewable energy and energy efficiency.

institutions that are able to act as collection units, and they are free to decide if they are interested in participating and have full authority in deciding how to spend the funds raised through the initiative. Eco-oil registers the educational institutions that wish to participate, and makes a monthly collection at each site. Mineral oils that are derived from the automobile and pharmaceutical sectors are not reused. Anyone who would like to help can store used oil in plastic containers and donate it to a participating school. Businesses that donate oil to the participating schools receive an environmental seal from the city administration. All of the collected oil is purchased by the local steel company and serves as a raw material in the production of biodiesel. The company pays R\$0,60/litre of oil and two thirds of this amount will fund Eco-oil's activities and the rest will be given to the participating schools. The city administration plans to collect approximately 80,000 litres a month, which represents approximately 20% of the vegetable oil consumption in the city.

All photos by Eco-oil



Oil collection vehicle

Results

Within 45 days of implementing the Eco-oil Programme, 70% of schools (municipal, state and private) had been registered, and so far Eco-oil has worked with 128 of 130 city schools and 110 commercial establishments, and now collects about 22,000 litres a month. It is believed that the high percentage of participation is due to the financial benefits received, and for companies, the environmental seal. The high participation rate of schools indicates a great potential for knowledge dissemination. This project is completely self financed.

A diverse number of organizations from the private sector have partnered in the project - such as a regional supermarket chain and Banco Real, which has invested in the containers that serve as collecting units in their bank branches for their schools of preference.

The programme's staff has found a use for the solid material in the collected oil, and in consequence Eco-oil has partnered with a business that processes the solid components of used cooking oil, for use in animal feed, an initiative that is of interest to local farmers. In addition, there remains the possibility to transform the organization into a co-op with the support from the City Administration, which has already had positive experiences with co-ops in other areas.

Although the programme has not yet reached its expectations to collect 80,000 litres of waste oil a month, it has still managed to divert 22,000 litres a month from unsustainable disposal and lowers emissions of CO₂ through supplying biodiesel.



The Environmental Seal



Oil Storage

Lessons Learned

There are great advantages in establishing partnerships between the public and private sectors in developing local initiatives for environmental protection.

The rise in social responsibility policies in medium and large businesses has created a favourable environment for cooperation with the public sector. In Volta Redonda's case, the partnership between the administration and the local steel company was crucial for the creation and implementation of the Eco-oil Programme.

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References / Sources

- More information about the LR Network:
www.iclei.org/local-renewables
- City of Volta Redonda:
www.voltaredonda.rj.gov.br
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The simplicity and objectiveness of the project was another fundamental reason for the project's success and it's accelerated implementation. The project was designed in a practical and direct manner, focusing on the lack of knowledge in the waste oil management, and yet finding a simple and useful end-use for this oil. As a result, a project with low-costs and great potential to self-finance was created.

The mobilization of local human capital was crucial in project success, and was responsible for the awareness raising campaign. The public and private educational institutions were willing to awaken their school body to civic responsibility by contributing to the protection of the environment. Such involvement of the community and schools in the programme made it possible to see in practical terms how apparently simple actions can make a tremendous difference in bettering the population's living conditions while at the same time contributing to increasing the sustainability of the Municipality of Volta Redonda.

Replication

The simplicity and effectiveness of the project has transformed Eco-oil into a model for replication by other local governments. It has been so effective that representatives from a diverse number of municipalities and states such as Ceará, São Paulo, Minas Gerais and Paraná that encounter similar difficulties, have contacted Eco-oil's staff to receive guidance on the development and implementation of similar projects.

The potential for replication is especially possible in the neighboring cities of Resende, Porto Real, Pinheiral and Barra Mansa that already collect used cooking oil. It is currently under consideration if the steel company in Volta Redonda can use contributions from these neighbouring municipalities. This new collection would also be organized by Eco-oil, at least in the beginning until another local institution is founded. These initiatives will create more employment opportunities and build regional institutional capacity.

Budget and Financing

The Banco da Cidadania invested about R\$9,000 for the operation of the Project. In addition to this fund, Eco-oil received a series of in-kind donations from the City of Volta Redonda estimated at about R\$23,000 for the use of a public building for its headquarters, furniture, construction materials needed for the renovation, and vehicles. In order for activities to continue, the project depends on a system of self-financing from the sale of the oil collected from the schools to the steel company, and no outside funding is required.



ICLEI – Local Governments for Sustainability is an international association of local governments implementing sustainable development. ICLEI's mission is to build and serve a worldwide movement of local governments to achieve tangible improvements in global sustainability with special focus on environmental conditions through cumulative local actions.



This case study is part of a series focusing on the activities of ICLEI members across the globe.

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