

# Community Waste Recycling Program in Khabarovsk, Russia



## Transferable Solution Project Summary Project Activities Project Benefits Lessons Learned Contact Information

**Project Title:** Community Solid Waste Sorting and Recycling Project in Khabarovsk, Russia

**Project Leader:** Community Service Enterprise #1, Khabarovsk, Russia

**Project Partner:** Association of Oregon Recyclers, Oregon USA

**Location of Project:** Khabarovsk, Russia

**Project Duration:** March 2001-March 2002

**EcoLinks Project Contribution:** Total EcoLinks Project Investment: \$ 132,000: EcoLinks Grant Support: \$48,000 Project Team Cost-share Contribution: \$84,000.

## Best Practice: Transferable Solutions

The project "Community Waste Recycling Program" is an EcoLinks Best Practice. Through this EcoLinks funded project, Khabarovsk's municipal waste service utility, Community Service Enterprise #1, teamed with the Association of Oregon Recyclers to develop and implement a neighborhood recycling program in Khabarovsk that would pay for itself through the sale of recyclable products. The Project Team conducted an assessment of the market for recyclable materials in Khabarovsk and signed agreements with two local enterprises to take recycled paper, textiles and PET bottles. 10 recycling depot stations were designed and constructed, maintenance staff was trained and collection and transport of recycled materials was organized. A wide-reaching outreach and education program was implemented both to teach local residents how to separate trash and use the recycle stations, and to gain business and government support of the project.

As a result of this project, a successful, sustainable recycling program was established in the Industrial Region neighborhood of Khabarovsk.

The recycling program design and implementation are highly transferable to other municipalities in NIS that have sufficiently developed markets (industry and business) for recyclables.

# Project Summary

The amount of municipal waste generated in the city of Khabarovsk (population 600,000) is increasing rapidly, due in part to an increase in disposable packaging of goods. In addition, the recycling programs which existed during Soviet times have been abandoned. Prior to project implementation, almost all residential garbage went directly to the city landfill. The Khabarovsk landfill is quickly reaching capacity, is unlined, and does not have a methane capture system.

Through this EcoLinks funded project, Khabarovsk's municipal waste service utility, Community Service Enterprise #1, teamed with the Association of Oregon Recyclers, USA to develop and implement a neighborhood recycling program in Khabarovsk that would, after initial set up, bring in revenue through the sale of recyclable products. The Project Team first completed an analysis of municipal waste content and an assessment of the local markets for recyclable goods.

Ten recycling depot stations were designed and constructed, and maintenance staff was trained. A wide-reaching outreach and education program was implemented both to teach local residents how to separate trash and use the recycle stations, and to gain business and government support of the project. The recycling program project design and implementation are highly transferable to other municipalities in NIS that have sufficiently developed markets (industry and business) for recyclables.

The project was implemented in the Industrial Region neighborhood of Khabarovsk city. The neighborhood consists of 50 large, multi-family apartment buildings with about 80,000 residents.

## Project Activities

The main goal of this project was to design and establish a pilot, market-based recycling program in Khabarovsk, which could later be replicated in other neighborhoods in Khabarovsk and beyond. Project Activities included the following:

### **1. Assessment of Waste Composition and Inventory of Existing Waste Depositories**

Action: Project Team members analyzed the make-up of municipal waste. Waste was sorted into different categories and weighed. Vegetative food was by far the largest component, followed by plastics (mostly PET bottles), packaging, newspapers and textiles.

An inventory of existing depots for waste collection, containers, their location and ease of access was conducted together with personnel from the Municipal Services Department. The inventory was conducted in order to adapt future recycling points to existing waste depot designs/conditions.

Product(s): 1) Waste composition was determined. 2) An inventory of existing depots for waste collection, containers, their location and ease of access was developed.

## **2. Assessment of Market for Recyclables**

Action: Project Team members met with staff from the Department of Natural Resources and Industrial Processes, local businessmen and utilities providing municipal services to identify the demand for recyclable items. 11 firms were identified which either currently use, had used, or planned to use recycled goods as potential consumers/buyers of recycled goods. The assessment showed that the most promising recycling market in Khabarovsk was for paper and textiles. While two users of PET bottles were identified, one takes only cleaned and prepared bottles, while the second was not willing to pay for recycled PET bottles.

In addition to assessing the existing, local market demand, the Project Team also considered the introduction of EM-technologies (Effective Microorganisms) in the future for composting organic waste into fertilizer (there is an EM Technology Center in Khabarovsk) and shipping PET bottles to foreign buyers, most likely to China.

A contract was signed with Khabarovsk Roofing Factory to purchase collected waste paper and textiles. An agreement was reached with a second Khabarovsk-based business to accept PET bottles.

Product(s): 1) Assessment of the market for recyclable goods in Khabarovsk. 2) A contract for the sale of collected textile and waste paper was signed and an agreement was reached with a second business to accept collected PET bottles.

## **3. Design, Construction and Installation of Recycling Depots**

Action: The Association of Oregon Recyclers provided designs of US neighborhood recycling stations. Recycling depot design and placement was coordinated with the Khabarovsk City Municipal Services Department and recycling bins were designed to fit the loading and lifting mechanism of existing refuse collection trucks. The depots were built along side existing garbage containers to make them easily accessible for residents and businesses.

The Project Team began by constructing just two recycling stations. The two stations were closely monitored to determine the speed with which recycling bins filled up, the condition of the garbage area and the general attitude of the public and maintenance workers toward the recycling program. As a result of this gradual introduction and monitoring, it was possible to modify the stations and containers as needed (for example, the weight and height of the paper and textile bins were reduced to make them easier to unload). Eight additional stations were constructed and installed. At the same time, a promotional/educational campaign for local residents and a training program for neighborhood yard-keepers was conducted (see Activity 4 below).

The Khabarovsk municipality donated approximately \$10,000 to construct paved platforms and access paths for the recycling containers and to replace or repair damaged existing municipal waste collection bins. A local shopping center donated funds to construct and install an additional municipal waste and recycling depot.

Product(s): 1) Ten Recycling stations were designed, constructed, installed and monitored. A local shopping center donated funds to install an additional recycling depot.

#### **4. Educational Campaign and Outreach**

Action: Educational/promotional campaigns were conducted with different segments of the population throughout this project.

The first of these focused on working with and educating the local population in the neighborhood where the pilot project was implemented. The Association of Oregon Recyclers provided a handbook on developing recycling depots for apartment houses, model leaflets, sample decals and posters which have been successfully used in neighborhoods in the US into which recycling has been introduced. 75 volunteers were recruited and trained to work with the local community to demonstrate how to use the recycling depots and what items can be recycled. Advertising and educational materials were distributed in areas of general use and were also delivered to each apartment.

At the same time, yard-keepers in the neighborhood were trained in maintaining the stations and provided with necessary equipment and clothing. They were paid an additional \$15/month from grant funds during the initial stages/start up of the program. This nominal wage was later replaced by money they can receive from recyclable goods. A training for CSE #1 municipal waste collection personnel working in the project area was also held to teach them about the program and instruct them how to maintain the recycling area.

Together with the Regional Government Administration, the Project Team conducted a regional seminar on waste recycling and legislative and economic instruments to support recycling and waste minimization. The seminar was attended by staff from municipal and environmental protection agencies of the regional and city administration government, businessmen interested in using recycled goods and representatives from scientific and public organizations. Representatives from the business community presented recommendations on creating favorable conditions for the development of recycling and waste management business. Subsequently, the Department of Environmental Protection of the Khabarovsk Region produced a publication entitled "Directory for Businesses Using Recyclable Products and Waste Minimization". The Directory outlines legal and economic mechanisms on recycling and waste minimization.

Several of the recruited volunteers worked with a veteran house in Khabarovsk, teaching veterans how to make 90 everyday products from recycled goods. The veteran house later displayed their works in an exhibition of products made from recycled plastic and textile waste. At the request of members of the veteran house, an additional container for waste paper collection was set up to raise money for the "Ecological Works Club" of the veteran house.

Based on educational curricula provided by the AOR and existing curricula and experience from the city and regional government, an environmental curricular program for school children was developed called "Household Waste". This program was developed under the guidance of a Khabarovsk professor of pedagogical sciences. A seminar of 45 Khabarovsk teachers and school administrators was conducted to review the curricula. Practical information and experience gained from the neighborhood recycling program was also presented at this seminar. Representatives from AOR presented American experience in recycling education programs.

Ten months after the initiation of the neighborhood recycling program, local residents were given questionnaires to determine their attitude toward the recycling program. Results of the survey showed that 100% of the respondents considered separate waste collection as useful activity, 75% of them participated in separate waste collection, and 97% of residents thought it necessary to continue the program of separate collection of household wastes.

Product(s): 1) Increased public awareness on waste separation and recycling. 2) School curriculum developed. 3) Public opinion poll conducted. 4) Directory on legal and economic mechanisms on recycling and waste minimization in Khabarovsk Region published.

## **5. Development of Recommendations**

Action: Based on close monitoring of the recycling program at all stages and on working closely with target groups from the local population, city municipality and local businesses, the Project Team developed recommendations for improving municipal waste management in Khabarovsk. The recommendations focus on improving compliance with existing regulations on waste collection and disposal and on the development of a single administrative body, which would be responsible for consolidating and overseeing policies and regulations on municipal waste. Finally, the recommendations outline the experience gained from the neighborhood pilot recycling program and how the experience gained from the project can be transferred to other neighborhoods. The recommendations have been submitted to the Khabarovsk City and Regional governments for their review. Based on these recommendations, the Khabarovsk Region Department of Environmental Protection is currently developing a comprehensive system for solid waste management in the Khabarovsk Region.

Product(s): 1) Recommendations for improving waste management developed and submitted to Khabarovsk Region and City governments.

## **Project Benefits**

This project draws on experience gained in the US in developing and introducing neighborhood recycling programs. This project built capacity within city and regional municipal bodies and service enterprises to design and implement sustainable neighborhood recycling programs. Environmental benefits resulting from the project include conservation of natural resources through the use of recycled materials, reduction in greenhouse gas emissions (from methane gas generated at the landfill), conservation of landfill space and conservation of energy. The economic benefits of the project include the successful establishment of a sustainable neighborhood recycling program through the sale of collected recyclable goods, as well as several other economic benefits associated with reduced natural resource use.

### **Capacity Building Benefits**

The main achievement of this project is the increased capacity of city and regional bodies and municipal services enterprise to design and implement sustainable neighborhood recycling programs. The regional administration is currently preparing proposals to duplicate results of the project in other territories of the region, and 200,000 rubles (\$6,500) from the Khabarovsk regional and city budgets has been obligated for this purpose.

Through outreach and educational programs implemented in this project, the community's awareness and understanding of recycling was increased.

### **Environmental Benefits**

During the first 8 months of operation of the recycling depots, 16,300 kg of paper, 4,516 kg of textiles and 165 m<sup>3</sup> of PET plastic bottles were collected and recycled. The neighborhood recycling program established through this project has the following environmental benefits:

- The program conserves natural resources through the use of recycled materials in production processes.
- The program reduces methane gas emissions generated at the city landfill. When paper and other organic materials decompose under anaerobic conditions in landfills, methane gas is generated. The Khabarovsk city landfill does not have a methane capture system; therefore, methane gas generated at the city landfill poses an immediate safety threat as well as contributes to the greenhouse effect.
- The program conserves landfill space. Increasing generation of solid waste is causing the city landfill to fill up much more quickly than was planned. Recycling materials will extend the life of the city landfill. If the recycling program is expanding throughout Khabarovsk, municipal waste landfilled could be reduced by 20%.
- The program conserves energy. In general, it takes less energy to produce products from recycled goods than from virgin materials. The Project Team estimates that the neighborhood recycling program implemented through this project conserved 65,200 kWh of electric energy (by using paper and textiles recycled through this project rather than virgin paper products at the Khabarovsk Roofing Factory).
- The program reduces air and water pollution. In general, making paper and other products from recycled materials is less polluting to the air and water than making products from virgin materials.

### **Economic Benefits**

The most important economic benefits resulting from this project was the successful establishment of a sustainable neighborhood recycling program through the sale of collected recyclable goods. The Project Team identified buyers/consumers of recycled goods and established agreements with two businesses in Khabarovsk to take the collected paper, textiles and PET bottles. In addition, foreign markets for recyclable goods and technological processes were identified as future options.

Additional economic benefits include:

- 65,200 kWh of energy was conserved by making roofing paper from the materials recovered in this project as opposed to making the paper from virgin wood.
- The income of yard-keepers was supplemented through the project. They were initially paid \$15/month to maintain the recycling stations from project grant funds; subsequently they earn extra income through returning collected recyclable goods.
- Recycling materials helped reduce the cost of garbage hauling and disposal costs.
- Recycling programs can postpone expensive construction of a new landfill. Through this project, the municipal waste going to landfill was reduced in the Industrial Region neighborhood. If the recycling program is extended to Khabarovsk city-wide, it could add years to the life of the city landfill.

# Lessons Learned

Lessons learned from this project include the following:

- Critical to this project's success was the involvement of all target groups from the outset of the project. This included city administration and municipal services staff, local population, representatives from business and industry. In the case of such projects carried out in NIS, it is important to keep in mind that city waste management responsibilities are split between various government organs and utilities. In order to ensure project success, any recycling project must begin by identifying all the affected groups and seeking their involvement.
- The importance of outreach, educational campaigns and promotion of the program should be stressed. Outreach should begin before actual implementation of the recycling program. About 30-40% of the costs associated with establishing a neighborhood-recycling program should go towards educational and promotional programs.

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