

## Resource Recovery Parks:

### ***A Twenty-First Century Solution to a Nineteenth-Century Problem***

#### Introduction

The **EPA** in the USA define Resource Recovery Parks (RRPs) as: a group of reuse, recycling, and composting processing, manufacturing, and retail businesses receiving and selling materials and products in one location. RRP's differ from Amenity Sites, as all materials for recovery and recycling are brought to and recycled on the same site; thus, cutting down on the costs of transportation and traffic volume. There are **RRPs** in: Rakaia New Zealand; Cabazon, Monterey, Berkley California, San Leandro; and Canberra Australia. Resource Recovery and the Zero Waste approach to waste management are also being developed and used in Nova Scotia Canada, Scotland and Britain.

**Resource Recovery Parks** are today's most progressive waste management system and are an essential mechanism for **Sustainable Resource Management**. **RRPs** have their origins in the highly successful Japanese car manufacturing system of Total Quality Management control (or TQM). In other words, this economic system operates on the principle that if a company is to maximize profit margins, there should be zero defects at the end of the manufacturing chain. When transferred to industry at large, if we are left with waste at the end of a manufacturing process, this is considered a defect. Waste is; therefore, a design problem.

RRPs do not rely on high-tech methods designed to eliminate waste, as more often than not, these systems generate yet more waste and create further environmental problems. Rather, they rely on the creation of wealth-from-waste industries and small businesses. In this way, RRP's provide a tangible example of best practice that changes public awareness from thinking of waste as rubbish to be buried or burned, to recognizing that waste is potential wealth. Waste is, in fact, the new gold-mine of the 21<sup>st</sup> century.

An RRP provides many varied opportunities for value-added eco-businesses, which are located on site. They work on the principle of diverting usable materials from the waste stream and making those materials into new, *value-added* products. Charities, scrap dealers and second-hand shops have always been an important part of a local economy.

RRPs simply expand on this good idea with a well coordinated strategy that not only benefits the greater community through new business opportunities and jobs, but also helps reduce or eliminate waste with its related management costs, both financial and environmental.

The green industry, in particular recycling, represents the fourth largest economic power in the world; and it is the most rapidly growing. Resource Recovery creates jobs. In the

U.S., the reuse and recycling industries support more than 56,000 establishments, employ over 1.1 million people, and generate annual revenues of 236 *billion* dollars. Sorting and processing recyclables sustains five to ten times more jobs than land-filling or incineration. Further, the Zero Waste Trust predicts 40,000 jobs will be created in New Zealand over ten years as they convert transfer stations into Resource Recovery Parks.

The price of recycled materials has tripled in three years. This is a gold mine on our back doors and we've ignored it. Waste is a new resource. We own it; we have bought it in the supermarket. We can get the value of it only when we put it back into local communities rather than shipping it to other countries for reprocessing. RRP's would "put the emphasis on a new Irish enterprise strategy focused on indigenous industry."

Whilst RP's sustain fully commercial enterprises, they also offer not-for-profit partnership with the community in order to maximise community Wealth from Waste projects. It has been found that labour intensive solutions lead to local regeneration. The RRP multiplier effect of creating new local opportunities reinforces this. In other words, one eco-business creates new opportunities for other businesses. RRP's have an inbuilt strategy for local development. This leads to greater self-sufficiency, self-reliance and greater competence within the community. It also increases local wealth. This enables population migration back to less populated areas. And it offers long-term sustainability. Therefore, *we are not only recovering resources, we are recovering people.*

RRPs operate successfully in conjunction with an MBT or Mechanical Biological Treatment Plant. In other words, at the end of the recycling, reuse and repair chain, anything that cannot be recycled back into nature or back into the market place is put through an MBT. This end user facility is a low-tech operating system. It removes all putrescibles or organics so that the biological breakdown processes do not occur. The highly reactive substances are also removed so that the final residuals are rendered truly inert. These materials are then "Clean-filled" in sites where there are no green house gas emissions and no leaching of toxins into the ground. So RRP's are an incinerator-free approach to resource management, and are widely supported by environmental groups around the world.

There is no longer any doubt that global warming is a reality. Almost two decades ago leading international scientists warned us all about the ill effects that uncontrolled environmental pollution would have on the world. Today we are seeing those effects. General practices of mining the world's resources often amidst great destruction to local environments then burying or burning those resources approximately six months later is confronting the international community with the three most imminent threats to world security. These are Global Warming, Pollution and Resource Depletion.

The future is on loan to us from our grand-children. Now is the time to take good care of their inheritance. Mass producing cheap goods for our throw-away societies is unsustainable. Ireland, like most of its European neighbours is now faced with the realisation that we can no longer ignore the problem of waste. With its rapidly growing economy, Ireland has also developed a rapidly growing need for a Waste Management Plan that is truly *sustainable*. The central government in Ireland, along with the EU, are working to set out a general plan, some guidelines and regulations. But what we need at this crucial time in the future development of our country is real vision from Ireland's

counties and cities. Galway could take the lead in this, by spear-heading this individualised and specific Waste Management Strategy. This would set an example, not only to the rest of Ireland, but to the whole of Europe.

## **The Benefits of a Resource Recovery Park**

There are well defined benefits from resource recovery parks (RRPs). There are well documented examples from working RRP's in Canberra Australia, Rakaia New Zealand and in four locations in California USA.

### **They report that the main benefits are:**

- Decreasing the costs of waste management
- Decreasing the distances that waste is transported
- Increasing recycling rates
- Creating jobs
- Creating new opportunities for small and medium size businesses
- Attracting small and medium size industry
- Contributing to the local economy Increasing public participation in and awareness of recycling
- Contributing to public education on waste management and recycling
- Stimulating local innovation in value added processes

## **The Right Thing to Do**

- RRP's form part of Zero Waste Approach to Waste Management
- Requires a paradigm shift from thinking of waste as rubbish to be buried or burned to thinking of waste as valuable resources
- New gold-mine of the 21st century
- Price of recycled materials has tripled in 3 years
- Instead of thinking of it as recycling, think in terms of diversion and recovery of valuable resources
- Green industry now constitutes the fourth largest economic power in the world and is the fastest growing
- Many companies are changing direction and demonstrating Producer Responsibility such as Xerox and Dell in Ireland, Hewlett Packard and Fetzer are among 35 companies in the US that report over 90% diversion rate
- Wye Cycle reports 83-85% diversion rates
- "Right thing to do" and sound investment
- Challenge to business
- Becomes embarrassing to burn or bury waste

## **A Brief Overview of the Economics of a Resource Recovery Park**

The economics of RRP's are based on commodity markets, i.e. the transactions between materials sellers and the manufactures that use either virgin raw materials or recycled materials. In general, when we compare most materials, virgin materials (primary materials) are considered more valuable than recycled {or secondary materials}. This is because they are often purer, more consistent and easier to modify for specific purposes.

However, despite the challenges of using recycled resources manufacturers do make a profit, by being selective in what they produce and keeping production costs down. This usually means they only succeed when they are able to buy recycled materials at low prices. These prices, however, are usually not sufficient to cover the full cost of their recovery; which includes transport and sorting.

It appears then that recycled materials cannot compete with virgin materials in the open market. However, it must be taken into consideration that subsidies and tax breaks for virgin materials keep their prices artificially low and therefore set an unrealistic price cap on recycled materials. There is disagreement on whether removing these subsidies and tax breaks would actually raise product prices because prices are set in a very competitive international market. Governments use subsidies and tax breaks to manufacturers in order to allow them to remain competitive in the world market. So would it be possible to also subsidise recycled materials to keep them competitive and in this way level the playing field?

A study of recycling in Australia calculated that the total \$ value of the benefits of using recycled materials, including reducing the costs of waste disposal and pollution control substantially exceeds its net costs to recover. Bringing down the costs involved in eco-industry can be done if these "waste management" savings by governments/tax payers is passed on to the manufacturers in the form of subsidised recovery and delivery of recycled materials. Resource Recovery Parks offer the opportunity to do this.

Some of the savings on waste management by the government could be spent transporting waste materials to the RRP where they are sorted and made available to the eco-industries and businesses also located on site. When these products are sold in the retail shops located on the RRP site, further savings on transport are made. And when the public can drop off items to be recycled and purchase other items like compost, building materials, second-hand white goods and crafts, the recycling loop is then closed. Secondary materials have value-added by being made into new products.

The costs of mining, logging and initial production of virgin materials is taken out of the cost equation, and new goods made from reclaimed materials are produced much more cheaply and give rise to new indigenous businesses and a new eco-industrial revolution.

**Economic statistics on RRP:**

Diversion rates of between 83-87% are possible. Estimated costs of transfer and disposal of waste are on average \$75 per ton from country to country. If Galway is dealing with **10,000** tons per year, savings could be as much as €3, 000,000 per year.

Example:

**Cost/benefit analysis of the Urban Ore RRP in California**

Types of materials	Capital \$/year	Running costs	Annual Costs	Trans/disposal Savings/year	Sales \$/year	Benefit \$/year
Reuse	34,817	432,311	467,128	106,425	413,700	52,997
Recycle	58,475	169,928	228,403	323,925	108,410	203,932
Compost	79,113	158,928	238,041	509,000	74,040	344,999
Total	172,405	761,167	933,572	940,050	596,150	602,628

**Note:** average benefits of \$48 per ton on a total of **12,534** tons of waste in one year. This gave an amortization of 20 years on land and facilities and 6 years on equipment and fixtures.

- Cost and profit analysis from existing Resource Recovery Businesses and RRP are actually proving that they are viable as an approach to waste management and as a business venture. A cost/benefit analysis of a Resource Recovery Park in Del Norte County, California, shows that in 1998/99 a conservative 70% of the materials discarded were diverted. This amounted to 12,534 tonnes of recyclable materials. Materials repaired and sold, or sold directly for reuse generated 40% of the total \$600,000 revenue. Savings of \$940,000 p.a. on waste disposal and transport off-set the total yearly running costs.
- There are many good examples of private enterprise applying resource recovery strategies. Such manufacturers have implemented these strategies not because of an altruistic desire to be “green,” but because it is sound, long-term economic investment in the face of diminishing world resources and the rising costs of virgin materials. For example, Hewlett Packard has a 92% diversion rate, whilst Fetzer has a 93% rate. These are among the 35 companies in the US that report over 90% diversion rates. Xerox and Dell are also prime examples of good practice in Ireland and demonstrate high standards of extended Producer Responsibility.
- Us Recycling Economic Information published in 2001 shows that in the US the reuse and recycling industries support more than 56,000 establishments, employ over 1.1 million people, and generate annual revenues of 236 billion dollars. The ratio of jobs created in recycling is six to every one created by conventional Waste Management operations.

- Sorting and processing recyclables sustains five to ten times more jobs than land-filling or incineration.
- In New Zealand, more than one third of local governments have adopted goals of Zero Waste by 2015 and in 2001, efforts were under way to get the goal adopted nationally. The Zero Waste Trust predicts 40,000 jobs created over ten years as they convert transfer stations into Resource Recovery Parks.

## Figures from Nova Scotia

- There are more than 3000 jobs in the waste-resource management sector in Nova Scotia.
- The ENVIRO-DEPOT network provides more than 500 jobs for Nova Scotians in transportation, processing, and marketing beverage containers and other materials.
- Each year, composting facilities across Nova Scotia process over 100,000 tonnes of organic material into compost: a valuable soil enhancer.
- Each year, Material Recovery Facilities (MRF's) across Nova Scotia process over 40,000 tonnes of recyclable materials.
- Each year, over 900,000 tires are reused or recycled through the used tire management program.
- Each year, over 240 million beverage containers are collected in Nova Scotia for recycling.
- Each year, approximately 350,000 tonnes of waste are diverted from landfill.
- Delegates from over 20 nations (including Barbados, Bosnia, China, Iceland, India, Ireland, Japan, New Zealand, Russia, and Trinidad/Tobago) have visited Nova Scotia to learn about our world-renowned Waste-Resource Management Facilities.

## The Main Steps in Setting up a Resource Recovery Park

Here is a brief outline of the main steps to illustrate the process. These steps have been well documented by others. Communities that have set up RRP's are proud of their achievements and have a willingness to share their information and experience within the international network.

A community interested in creating a RRP should begin the process by forming a small core group of people who want to take the idea forward. The first step is to share a common vision. There are many steps to accomplishing this. This vision will be unique to a particular community and will depend on local needs, skills, conditions and resources. The following will need to be identified:

- the predominate types of waste produced
- the quantities of each waste material
- existing recycling/reusing business
- new business interests
- existing infrastructures
- level of public awareness
- council policies
- local markets and consumer patterns

The vision is best created by a Working Group consisting of a wide cross section of representatives from stakeholders to ensure a broad perspective and a wide scope of ideas and input. Potential stakeholders to involve are:

- The Council and Local Authorities (ideally the lead group)
- Local Business
- Government agencies (FAS, Rehab and Leader)
- Environmental NGOs
- Charities
- Educational institutes
- The public
- Outside businesses
- Haulage companies
- Existing recycling enterprises
- Industry
- Research institutions

The vision must develop some strategic imperatives which are structural principles and requirements to be used in creating a resource infrastructure for handling the entire discard material supply. This is necessary to create a complex, dynamic and stable ecosystem within the community where a Resource Recovery Park can be established and grow naturally. The RRP becomes home to the various "materials recovery

enterprises” which are the services, businesses and small industries that are public or private, for profit and not-for-profit. The local environment or “ecosystem” must be right in order to foster, attract, encourage and maintain these eco-businesses.

### **Examples of strategic imperatives:**

1. Create a clear and accurate language or user terminology
2. Create reliability in the flow of recycled materials to the RRP
3. Minimize cross-contamination by unlike materials
4. Encourage maximum “value added” processing of recovered materials
5. Design financial incentives for recycling and disincentives (charges) for mixed waste
6. Encourage separation at source when and where appropriate
7. Develop and define the twelve main categories of materials for eco-businesses
8. Recognize and use the three main clusters of eco-business
9. Allocate sufficient land for the RRP (80 – 100 acres)
10. Design the RRP so that it can grow in phases naturally
11. Develop the RRP as part of a regional network with other sites suited to other operations
12. Conduct a regional gap analysis of services and businesses
13. promote cooperation as well as competition amongst businesses
14. Design flexible infrastructures, policies and guidelines to foster new growth
15. Foster entrepreneurial creativity and diversity, innovation in this new industry is essential.

Use existing RRP designs for site layout, infrastructure, management structure and system flow as a template on which to design your unique RRP. There are also services available for this.

Create a project plan/business plan

Look for sources of co-funding for this project, (EU and other)

Look for co-financing of this project (private or from financial investor)

Set up a promotional programme for: the public, for attracting local businesses and for attracting outside businesses.

Involve the local/regional public through participatory (SEA) appraisal meetings.

Appoint a qualified Business Manager

**Note:** some of these tasks are linked and will need to be completed in proper order while others can be done at any time. The steps for actually setting up the Resource Recovery Park will be part of the Project Plan.

## Reference Material

National Waste Database Report for 1998/2001, the EPA Ireland

Zero Waste Economics – Think Globally, Pay Locally, Dr. Jeffery Morris

Envisioning Resource Recovery Parks: Twelve Strategic Imperatives, Nov. 2001, Dr. Daniel L. Knapp

Zero Waste: Nova Scotia Moving From the Vision to the Reality, Paul Connett and Bill Sheehan

Zero Waste Systems: Rural Transfer/ Resource Recovery Park Design/Cost, Richard Anthony, Dan Knapp and Gary Liss, California USA

Towards a Zero Waste Society, Green Party Ireland

### Web Sites:

Cabazon RRP – [www.cabazonresourcerecoverypark.com/synergy.html](http://www.cabazonresourcerecoverypark.com/synergy.html)

Rakaia NZ RRP – [www.rakaia.co.nz/rrr.htm](http://www.rakaia.co.nz/rrr.htm)

Urban Ore RRP – [www.urbanore.ca](http://www.urbanore.ca)

Resource Recovery UK – [www.albaresource.co.uk](http://www.albaresource.co.uk)

RRP Strategy Paper – [www.indigodev.com/Eiprecov.html](http://www.indigodev.com/Eiprecov.html)

Jobs in resource recovery USA – [www.resource-recycling.com/jobs.html](http://www.resource-recycling.com/jobs.html)

Zero Waste site USA – [www.grrn.org](http://www.grrn.org)

EPA Ireland waste database – [www.epa.ie/waste/NWD2001/](http://www.epa.ie/waste/NWD2001/)

Zero Waste Alliance Ireland – [www.zerowastealliance.ie](http://www.zerowastealliance.ie)

Resource Recovery Parks Presentation to Galway City Council, September 2004

RRP Information California – [www.ciwmb.ca.gov/LGCentral/resource.htm](http://www.ciwmb.ca.gov/LGCentral/resource.htm)

Target Zero Canada - [www.targetzerocanada.org](http://www.targetzerocanada.org)