Wasted Income

Industrial waste: from disposal to prevention

In partnership with
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Russia generates 4 to 5 billion tons of waste annually, most of which is industrial waste. The intensity of its generation is much higher than in Europe: the manufacturing industry delivers five times more waste per $1 of added value. Greater amounts spur up companies’ direct and hidden costs (on disposal and due to the loss of material and other resources). Lowering these costs requires making resource use more efficient and adjusting the waste management scheme, including recycling.

Company managers and owners may underestimate the real costs associated with industrial waste. You will learn from this booklet:

- Why actual costs may be 10 times higher than expected;
- How to assess the real costs associated with waste;
- What is more profitable: recycling or prevention;
- How implementation of resource-efficient technologies saves millions of rubles even in low-waste productions.

The IFC resource efficiency specialists estimated the real costs in waste management for small and medium-sized companies from machine building, construction materials, and food industries.

The analysis revealed:

1. Companies may underestimate costs associated with waste, while the latter can amount to millions of rubles a year even for small businesses.
2. With all costs factored in, waste prevention may bring several times more profit to the company than the revenue from recycling. This is true even in the cases when waste is highly demanded on the market of secondary raw materials (scrap metal).
3. Accounting for the full costs of waste encourages companies for more pro-active use of technologies that reduce costs and cushion an environmental impact.

The benefits of waste prevention can be accounted as an additional cash flow in the analysis of benefits and costs for equipment modernization projects.

<table>
<thead>
<tr>
<th></th>
<th>Waste intensity</th>
<th>In Russia, the manufacturing industry generates 5.5 times more waste than the European average</th>
<th>Waste intensity in the extractive industry is 1.5 times higher than the European average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(kg/$)</td>
<td>Russia</td>
<td>Russia</td>
</tr>
<tr>
<td>EU-27</td>
<td>0.2</td>
<td>1.1</td>
<td>16</td>
</tr>
<tr>
<td>Germany</td>
<td>0.1</td>
<td>5.5 times</td>
<td>10.4</td>
</tr>
</tbody>
</table>

In Russia, the manufacturing industry generates 5.5 times more waste than the European average.
**HIDDEN PART OF THE ICEBERG**

**WHAT IS THE REAL COST OF WASTE FOR THE COMPANY?**

Direct costs of waste disposal and environmental fees are visible to any manager or owner. Yet there is also a hidden component.

This includes labor, material, power, and other resources spent on something that will eventually be wasted.

Some losses of basic materials are often accounted under defective products, but the costs of their recycling are not. As a result, the expected value of waste is only the tip of the iceberg, and the full costs of waste management turn out to be much higher than expected.

A full assessment of the costs requires considering all aspects of waste.

A detailed cost analysis allows identifying when it is more beneficial to prevent waste generation, transfer for recycling, or dispose of.

These findings may suggest a system of waste management with potential cost savings on recycling. This would greatly contribute to the company’s competitiveness.

**SAMPLE ESTIMATION OF THE REAL LOSSES FROM WASTE OVER ONE YEAR**

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost (in million RUB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct costs waste disposal</td>
<td>5</td>
</tr>
<tr>
<td>Reported costs of basic materials</td>
<td>15</td>
</tr>
<tr>
<td>Extra costs of basic materials</td>
<td>30</td>
</tr>
<tr>
<td>Other costs of resources</td>
<td>20</td>
</tr>
<tr>
<td>Tip of the iceberg Perceived costs</td>
<td>20</td>
</tr>
<tr>
<td>Bottom of the iceberg Hidden costs</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
</tr>
</tbody>
</table>

**LEARN FROM REAL-LIFE CASES OF OTHER COMPANIES**

- How to identify the real cost of waste and assess its impact on competitiveness.
- How to compare the cost-effectiveness of various waste management strategies: recycling, disposal, and prevention.
- How the cost of waste is accounted for in production and managerial decision-making.
PAPER STANDS FOR MONEY

For medium-sized businesses, it is more profitable to prevent generation of waste than recycle it.

The case of printing and publishing works

Company brief:

Products: newspapers, leaflets, and brochures.
Regional market operator (Rostov oblast, Northern Caucasus).
70 workers in two shifts.
Modern production technology and equipment.

Turnover in excess of 2,730 tons of printed products annually.
Basic materials: paper and paint.
Other costs: power, gas, payroll, and depreciation.

The real costs are nearly ninefold higher than perceived. Prevention of waste is 149 times more efficient than the sales of scrap paper.

Benefit per ton of products, RUB:
Prevention: 10,880
Recycling: 73
The only significant source of waste is the return of finished products. The volume of rejects is approximately 45 tons per year (0.8% of the output).

Company brief:
- Products: bakery products.
- Regional market operator (Rostov oblast, Northern Caucasus).
- 130 workers in three shifts.
- Modern production technology.
- Turnover in excess of 5,200 tons annually, more than 120 million RUB.
- Low-waste production.
- Basic resources: flour (33.6 million RUB per annum).
- Other costs: power, gas (4.7 million RUB per annum), payroll, and depreciation.

Waste prevention is beneficial even for a low-waste production. The case of a bakery plant

GAINS OUT OF FOOD WASTE

The recycling of waste brings no gain, while prevention of rejects would allow for a revenue of 65 RUB per ton of products.

Benefit per ton of products, RUB:
- Prevention: 0
- Recycling: 65
PREVENTION BEATS RECYCLING

Prevention is more beneficial than recycling, even if secondary materials are of high value

The case of a boiler manufacturer

Company brief:

Products: household appliances (gas boilers).
Regional market operator (Rostov oblast, Northern Caucasus).
350 workers.
Modern production technology.

Turnover of about 6,000 tons of heating appliances.
Large losses of thermal energy in the technological process.
Basic resources: steel (4000 tons per year, 108 million RUB) and paint.
Other costs: power (17 million RUB), payroll, and depreciation.

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**Benefit per ton of products, RUB:**

Prevention: 1,533
Recycling: 216

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Estimated annual gains and losses

- **Income from scrap metal sold:** 1.5 million RUB
- **Costs of collection of production waste and haulage:** 0.2 million RUB
- **Metal cuts:** 7.3 million RUB
- **Paint residues (up to 10% of paint is lost):** 1.1 million RUB
- **Associated costs of other resources:** 2.1 million RUB

**Accounted costs:** 6.0 million RUB
**Unaccounted costs:** 3.2 million RUB
**Perceived costs:** 9.2 million RUB
**Real costs:** 6.0 million RUB

- **Total volume of steel used:** 4,000 tons
- **Accounted losses of steel:** 270 tons (6.8% of total)
- **Losses of power and other resources:** 5,600 RUB/ton
- **Cost of scrap metal:** 27,000 RUB/ton

**Prevention of waste is seven times more efficient than its recycling.**
Waste prevention brings extra profit even at a low-waste production

The case of a brick factory

Company brief:

Regional market operator (Rostov oblast, Northern Caucasus).
200 workers.
Modern production technology.
Turnover in excess of 1 million tons of brick products.

Simple technological process.
Basic resources: clay (1 million tons of clay with a total cost of 40 million RUB).
Other costs: gas (6.6 million m³ per annum at 28 million RUB), payroll, and depreciation.

Major losses are associated with scrap brick in production or packaging (1.5% of the output).

Estimated annual losses

- Collection and haulage costs: 0.1 million RUB
- Assessed cost of clay: 0.6 million RUB
- Associated costs of other resources: 0.5 million RUB
- Other losses: 0.7 million RUB
- Total perceived costs: 1.2 million RUB
- Real costs:
  - Collection and haulage: -0.1 million RUB
  - Assessed cost of clay: -0.7 million RUB
  - Associated costs of other resources: -0.5 million RUB
  - Other losses: -0.7 million RUB
  - Total real costs: -1.2 million RUB

Total costs are almost double those anticipated

Gain, million RUB:

- Prevention: 1.2 million RUB
- Current situation preserved: 0 million RUB
The IFC Resource Efficiency Program has been implemented in Russia, Ukraine, and Europe and Central Asia countries since 2008.

The Program seeks to expand access to targeted financing of resource-efficient modernization for real-economy companies and utilities with an objective of improving economic and environmental performance indicators.

Priority sectors and areas:
- Machine building and foundry engineering,
- Chemical industry,
- Agriculture,
- Municipal and housing economy,
- Common resource-efficient industrial technologies.

The Program facilitates companies in assessment of possible savings on energy and other resources, and also reduction of waste. This allows businesses to identify and unlock potential resource savings, cut costs, and advance competitiveness.
With the support of the Austrian Ministry of Finance, the Free State of Saxony (Germany), the Finnish Ministry of Employment and Economy and the Agency for International Business Cooperation within the Dutch Ministry of Economic Affairs.