

U.S. COEXCELL, INC.



## N55 DRUM

*More Sustainable  
Than Steel*

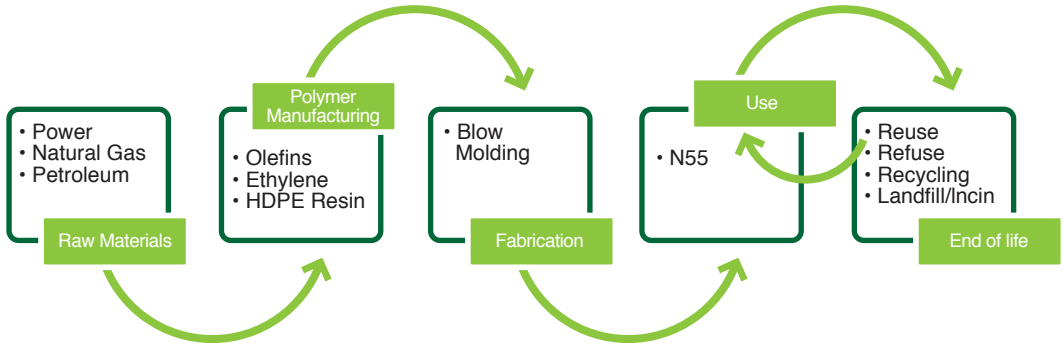
This is the Executive Summary of the results of a comprehensive study conducted by the Global Environment & Technology Foundation between February 2010 and March 2010.



**EXECUTIVE SUMMARY: COMPARATIVE ENVIRONMENTAL STUDY**

**Initial Environmental Trends and Synthesis “Snap Shot”**

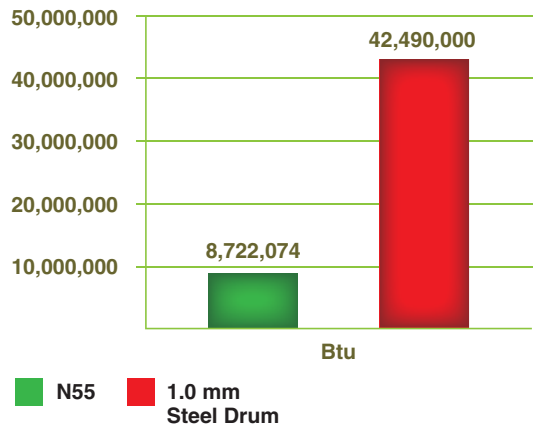
The following offers a “snap shot” comparison of the initial life cycle environmental impact of the 55-gallon N55 drum, to that of a traditional 1.0 mm, open head 55-gallon steel drum.



**Energy Use**

The following is a comparison of the energy used to produce 1,000 drums:

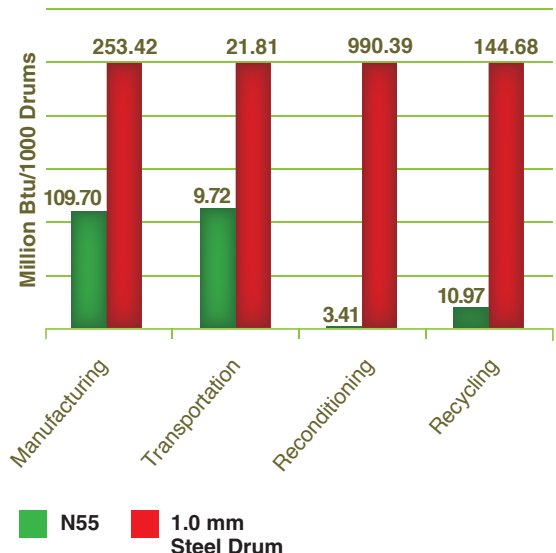
The energy used in the manufacturing process for 1,000 N55 drums is approximately 80 percent less than required to make 1,000 steel drums.



The following is a comparison of lifecycle energy used for 1,000 drums:

N55 lifecycle energy use is approximately 10 percent of the lifecycle energy use for 1,000 steel drums.

According to Dr. Mike Biddle, President of MBA Polymers, recycling plastics uses only roughly 10 percent of the energy that it takes to make a pound of plastic from virgin materials.



## INTRODUCTION

This Executive Summary Report is extracted from the results of a comprehensive study conducted by the Global Environment & Technology Foundation (GETF). For more than 20 years, GETF – a 501 (c)(3) not-for-profit organization – has been building the infrastructure for sustainable development; helping companies, governments and NGOs improve their environmental performance.

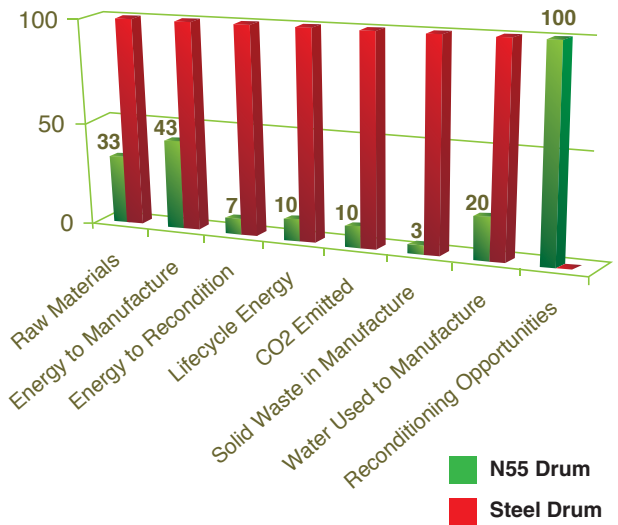
## BACKGROUND

U.S. COEXCELL is a leading manufacturer of innovative plastic drum technologies and for many years has led the development of state of the art, high-purity production systems for the electronic chemical industry. The company is extending these “clean” technologies beyond their traditional applications into the food and beverage industry by using innovative packaging development and commercialization to create packaging that meets the demands of sustainability.

### Superior Environmental Performance

The N55 drum is clearly advantaged when compared to a 55 gallon steel drums. Early environmental investigations compared the two packages by looking at energy and water used, and by investigating CO2 and wastes that are emitted during the life cycles of each. On each and every score, the N55 was substantially superior. The chart depicts the comparison of each package in the various dimensions of the analysis:

Percentage Per 1,000 Drums



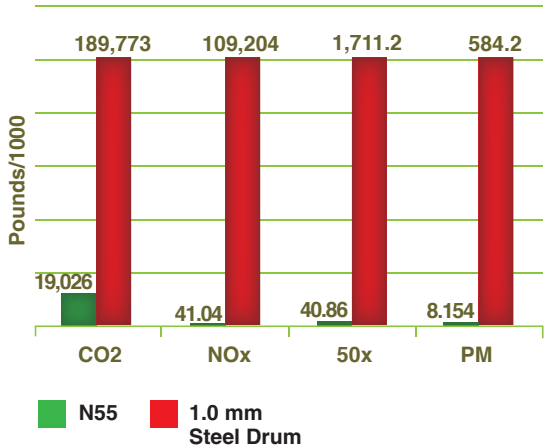
### The following are the key conclusions from the comparison:

- N55 advantaged through reductions in raw materials used, energy and water used, CO2 emitted and solid waste produced.
- N55 advantaged through energy required for reconditioning and transportation.
- N55 advantaged because it can be reconditioned twice as many times as a comparable steel drum.
- Recycling plastic uses less energy.
- N55 does not require painting avoiding volatile organic compounds
- N55 meets most criteria of Sustainable Packaging Coalition

### Air Emissions

The following is a comparison of the lifecycle air emissions of representative pollutants per 1,000 drums:

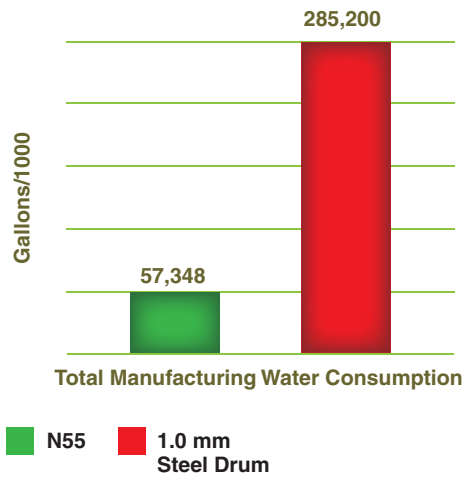
Air emissions are substantially smaller for the N55 lifecycle as compared to steel drums for the primary criteria pollutants identified by the U.S. Environmental Protection Agency.



### Water Use

The following is a comparison of manufacturing water use:

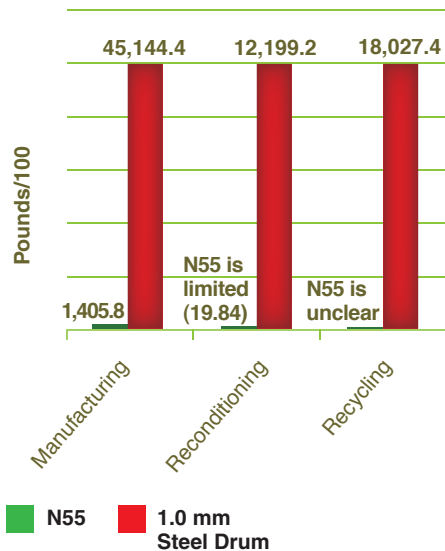
U.S. COEXCELL reported that the water requirements to manufacture the N55 are relatively low. Water is used in a closed loop system for cooling. The only water required to supplement the process is for make-up water that is used to replace the water that evaporated.



### Solid Waste

The following is a comparison of the lifecycle solid waste use:

Steel production lifecycle solid wastes are significantly greater than the N55 total of 78.1 pounds per 1,000 pounds of resin – approximately 92.1 percent. This amount does not include the additional waste from disposal of used plastic bags which many food grade products require for transport in steel drums.



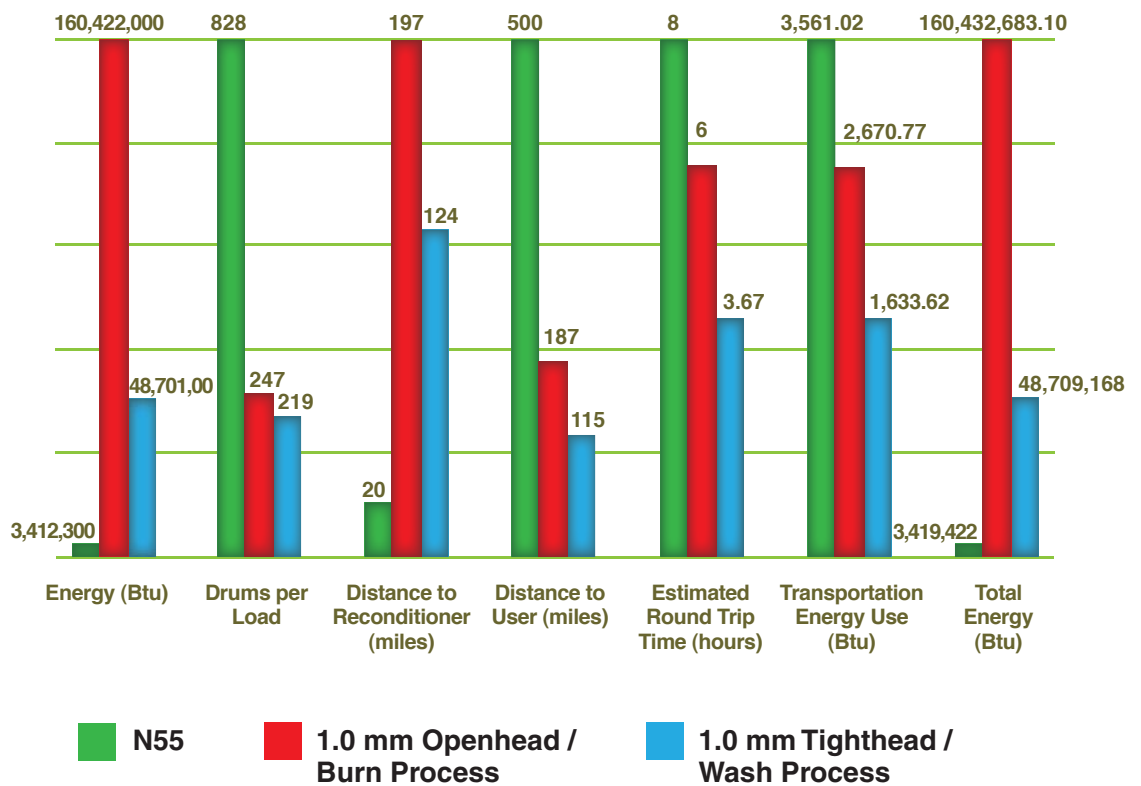
## Reconditioning

The reconditioning process provides a significant advantage for the N55 drum. According to the International Confederation of Container Reconditioners, plastic drums such as the N55 are reconditioned on average twice as many times as a steel drum, which likely translates into more energy required for manufacturing, transportation and reconditioning of steel drums.

## Water Use

The following graph compares the key energy impacts of the reconditioning lifecycle:

The reconditioning lifecycle energy use for the N55 is 98 percent lower than the burnishing reconditioning process for open head steel drums, and 93 percent lower than comparable wash processes for tight head steel drums. It is important to note that the energy estimated for N55 reconditioning is based upon the most stringent reconditioning process used by the European firm Contraload, which sanitizes the drums to a level which enables direct contact with food and beverage without the use of a plastic liner.



**The following are the key conclusions from the comparison:**

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**Primary References:**

- ACC, "Plastics and EPDs, a Global Perspective, 2009.
- International Confederation of Container Reconditioners, "Life Cycle Inventory of Single-Trip and Multi-Trip Steel Drum Systems in the U.S., Europe, and Japan," 1999.

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U.S.COEXCELL, Inc.  
400 W. Dussel Drive  
Maumee, Ohio 43537  
USA

www.uscox1.com  
Main Phone: +1.419.897.9110  
FAX: +1.419.897.9112  
Email: info@uscox1.com



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**For Direct Sales Assistance Call or Email:**

Mark E. Wotell  
Vice President Sales and Marketing  
+ 1.567.377.6363  
mwotell@uscox1.com