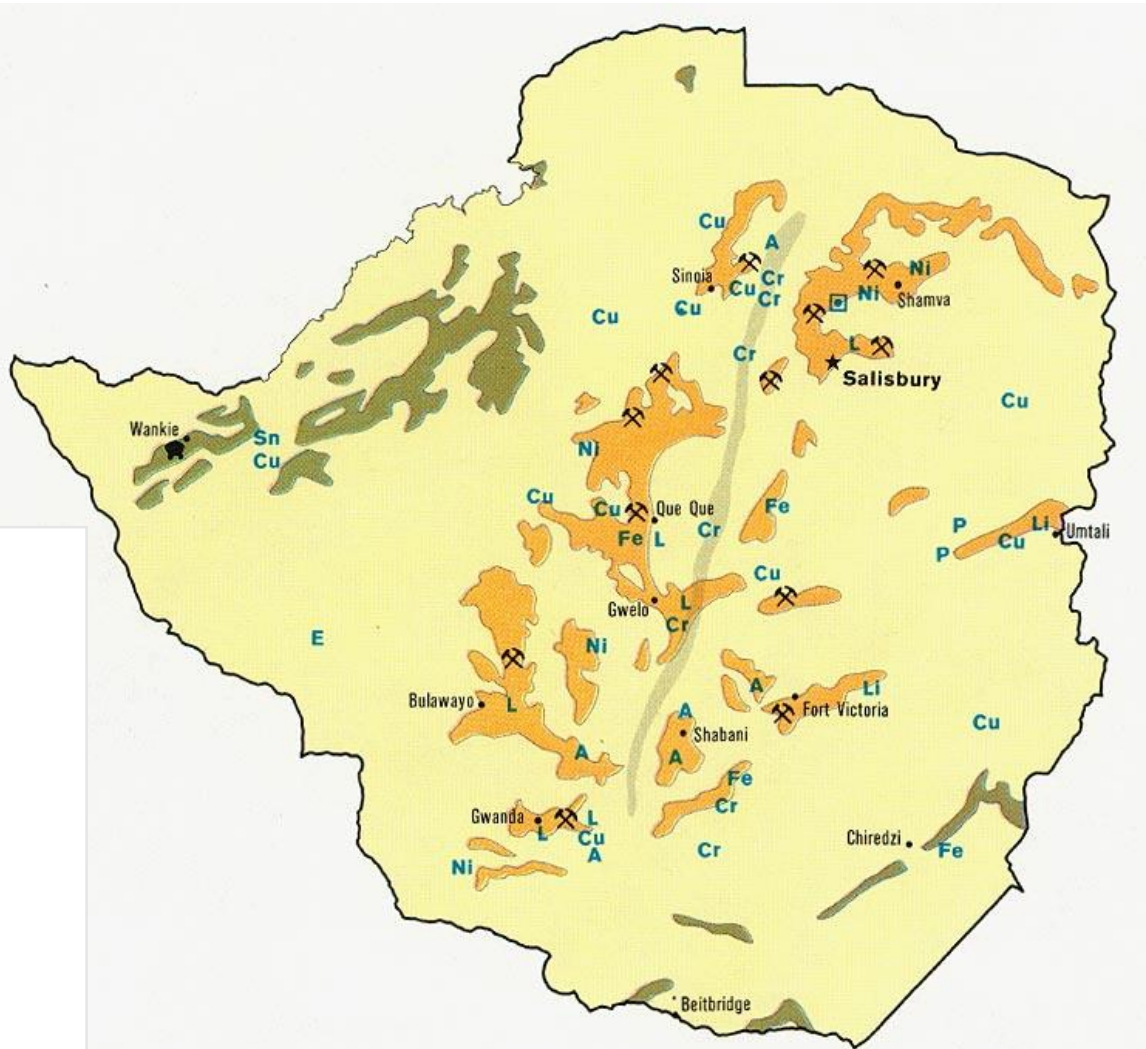


# From HERO to ZERO



Exploit



End Product  
= ZERO

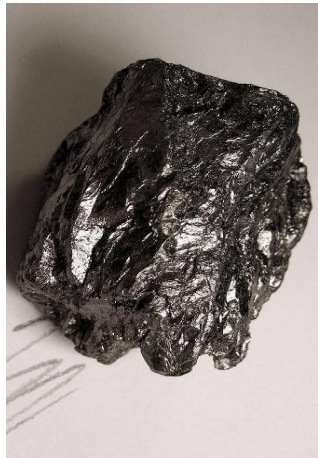


# Manufacture of Graphite Crucibles

**Nyahwai Tatenda Cyril**  
**Metallurgical Engineering Department**  
**University of Zimbabwe**



# ‘Unlocking Economic Value from our Mineral Resources’



+



+



+



=



**Graphite**

**Quartz**

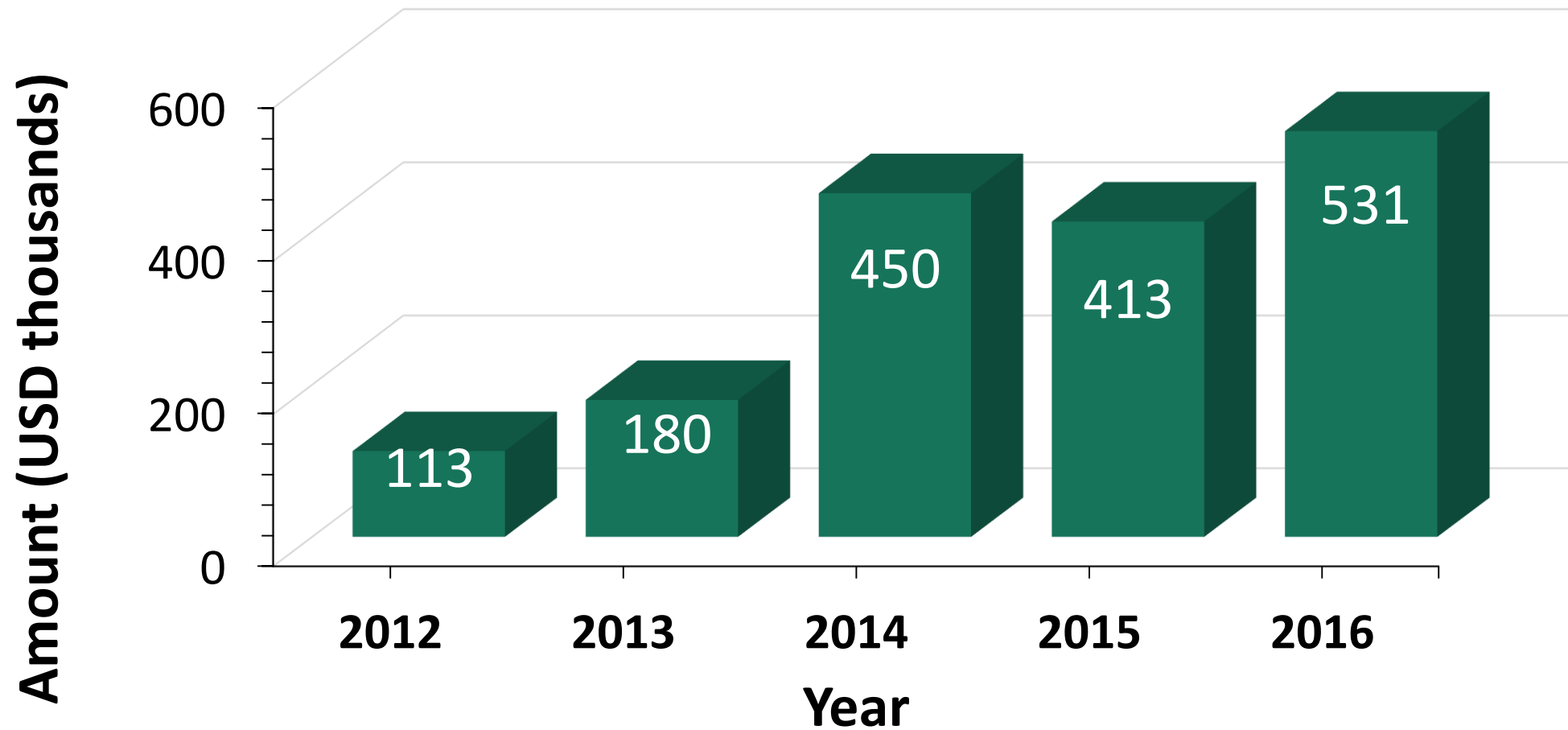
**Fireclay**

**Feldspar**

**Nyahwai Crucible**

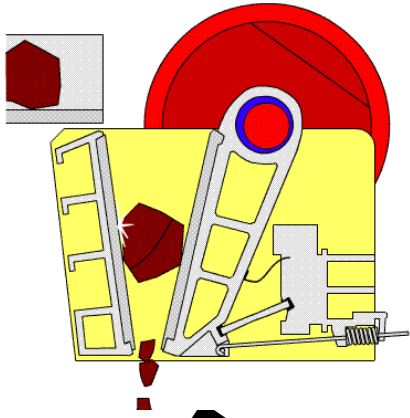


# How Much Money are We Externalizing?



*(Zimtrade, 2017)*

# How I did it?



Particle  
size  
reduction



Blending  
and  
mixing



molding



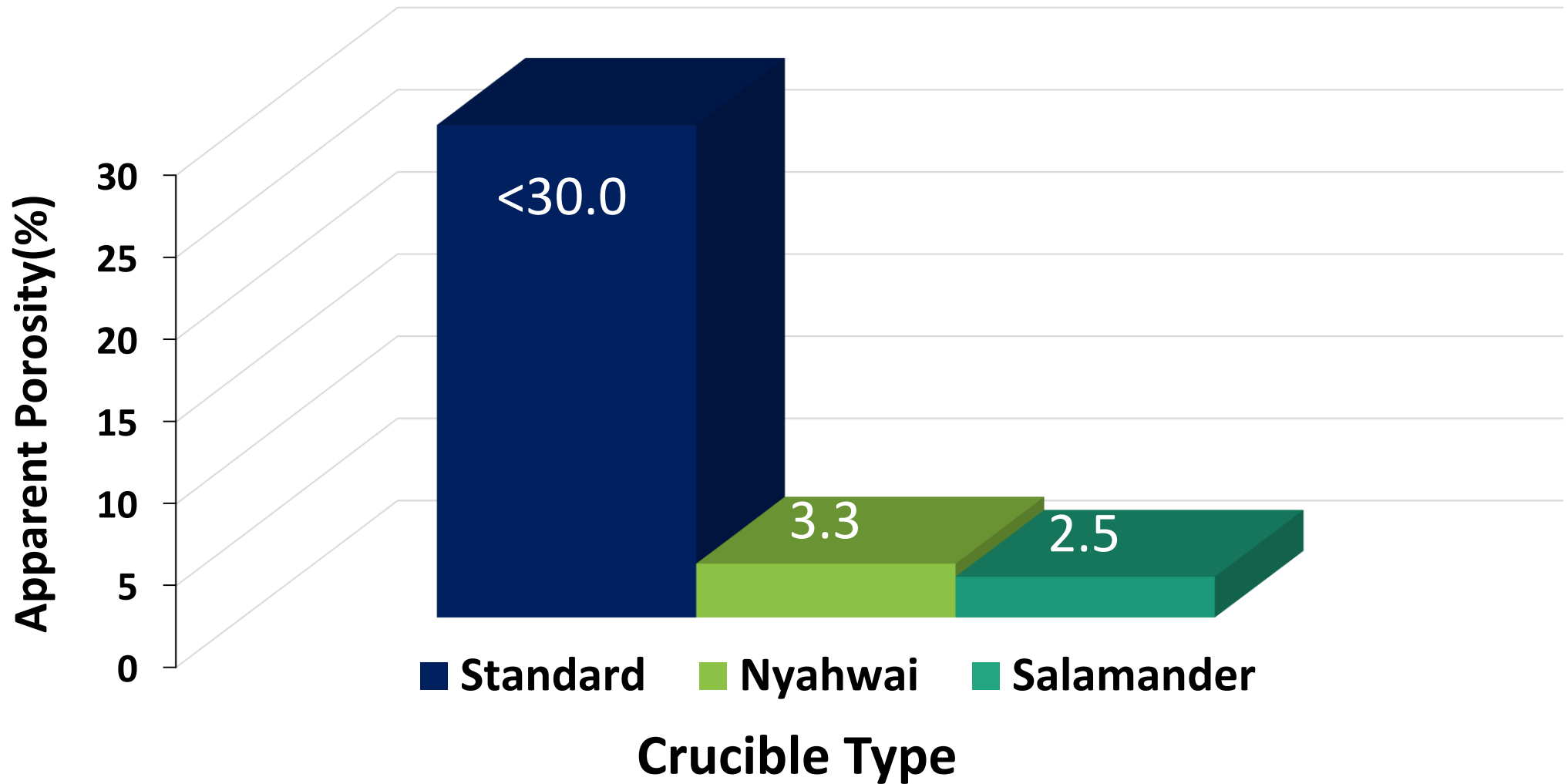
Nyahwai  
Crucible



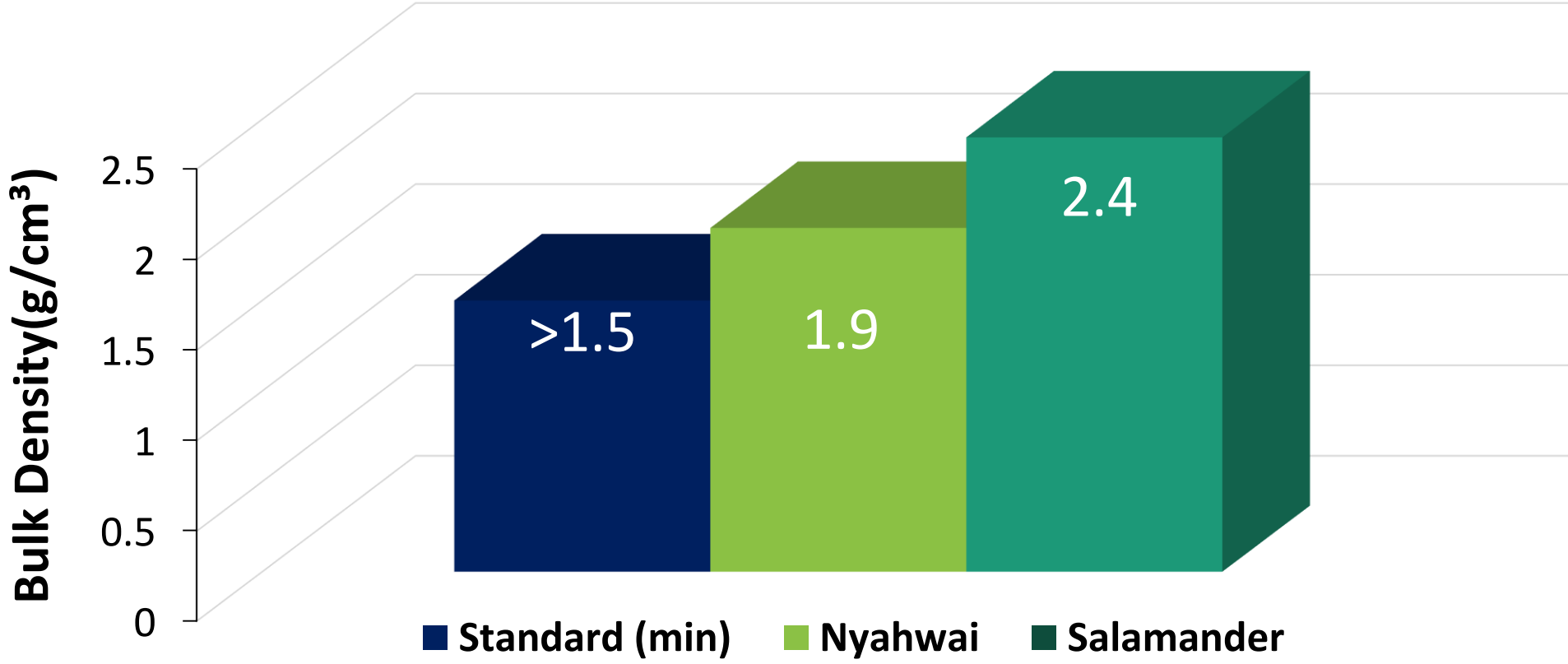
Curing



# Apparent Porosity

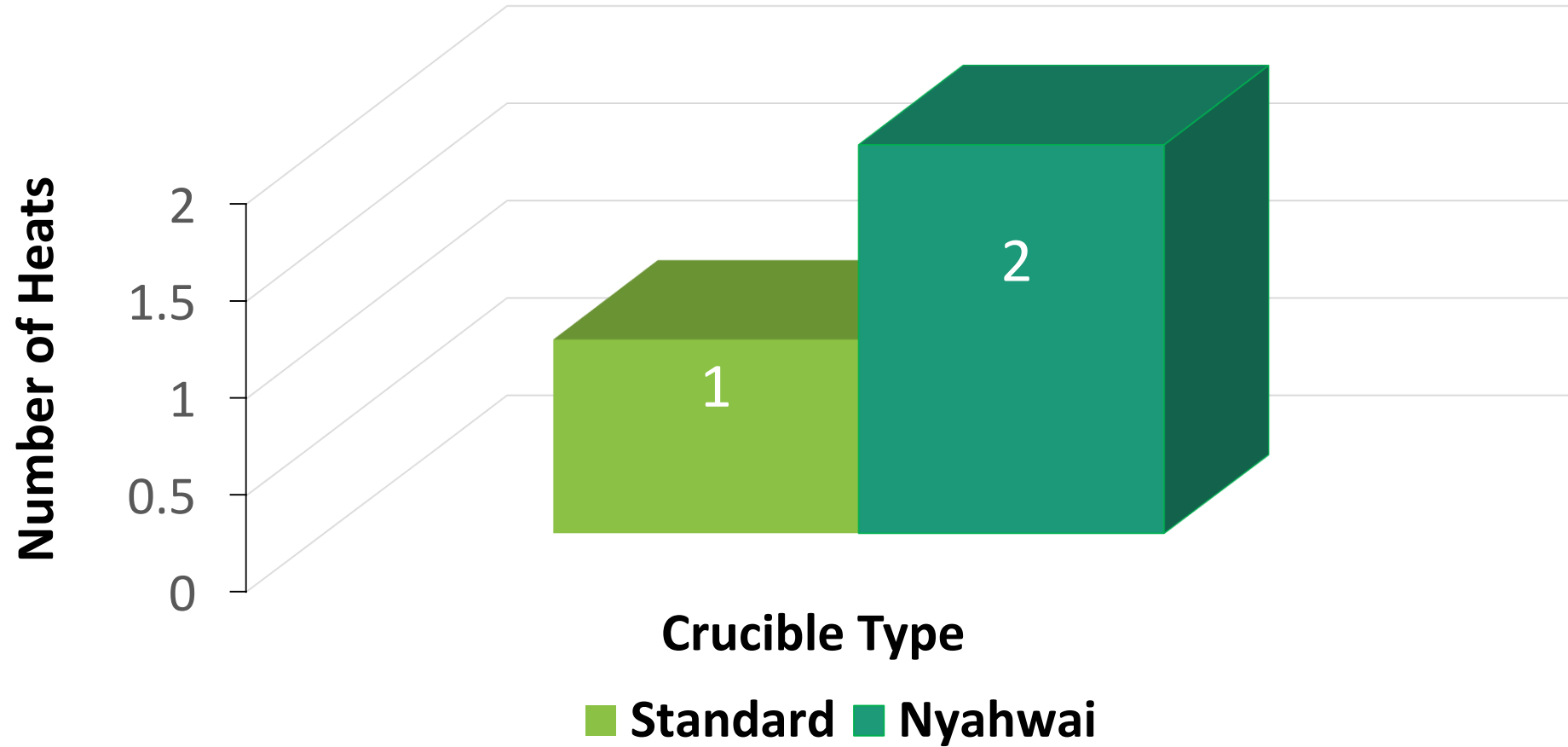


# Bulk Density

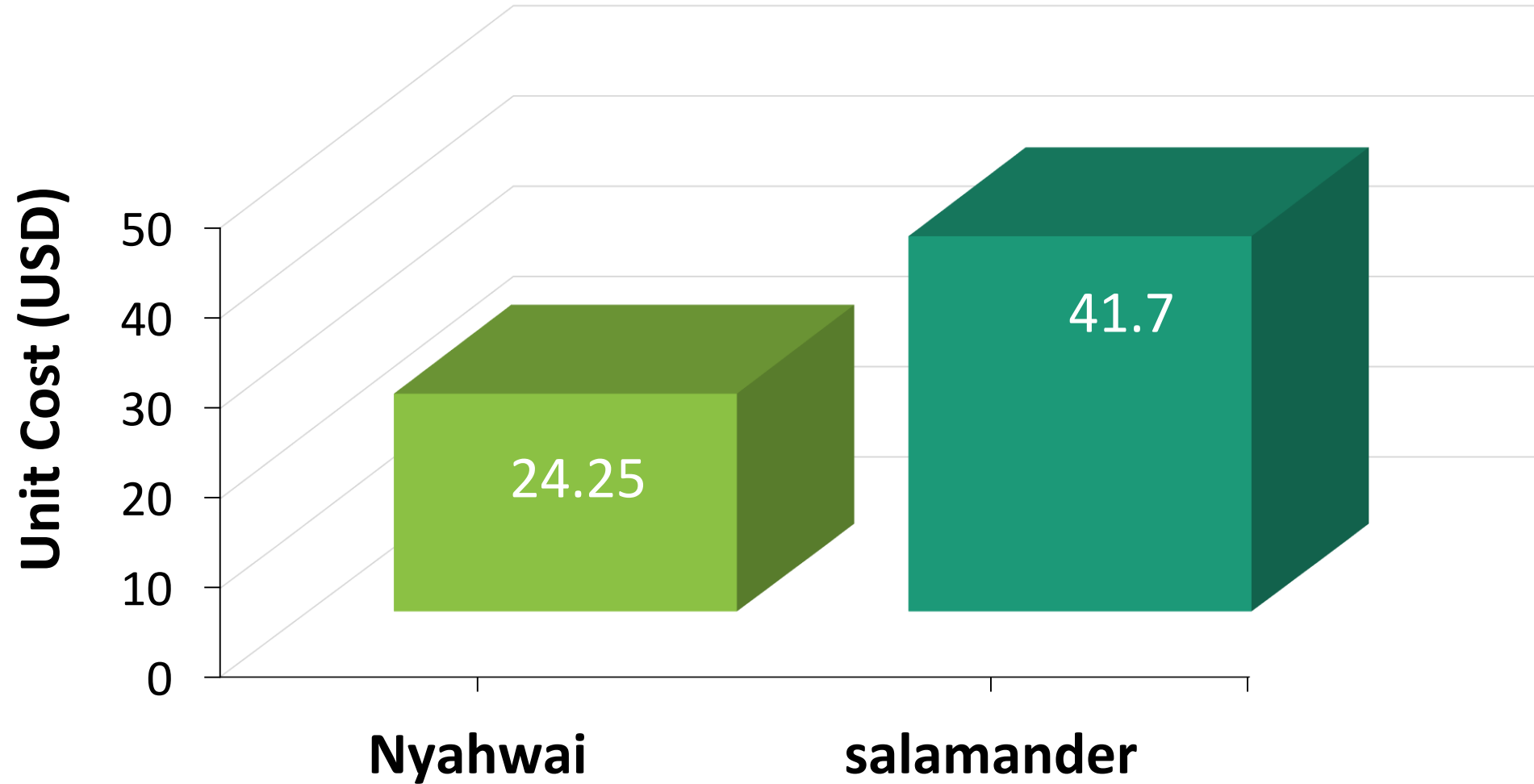


Crucible Type

# Crucible Life Span

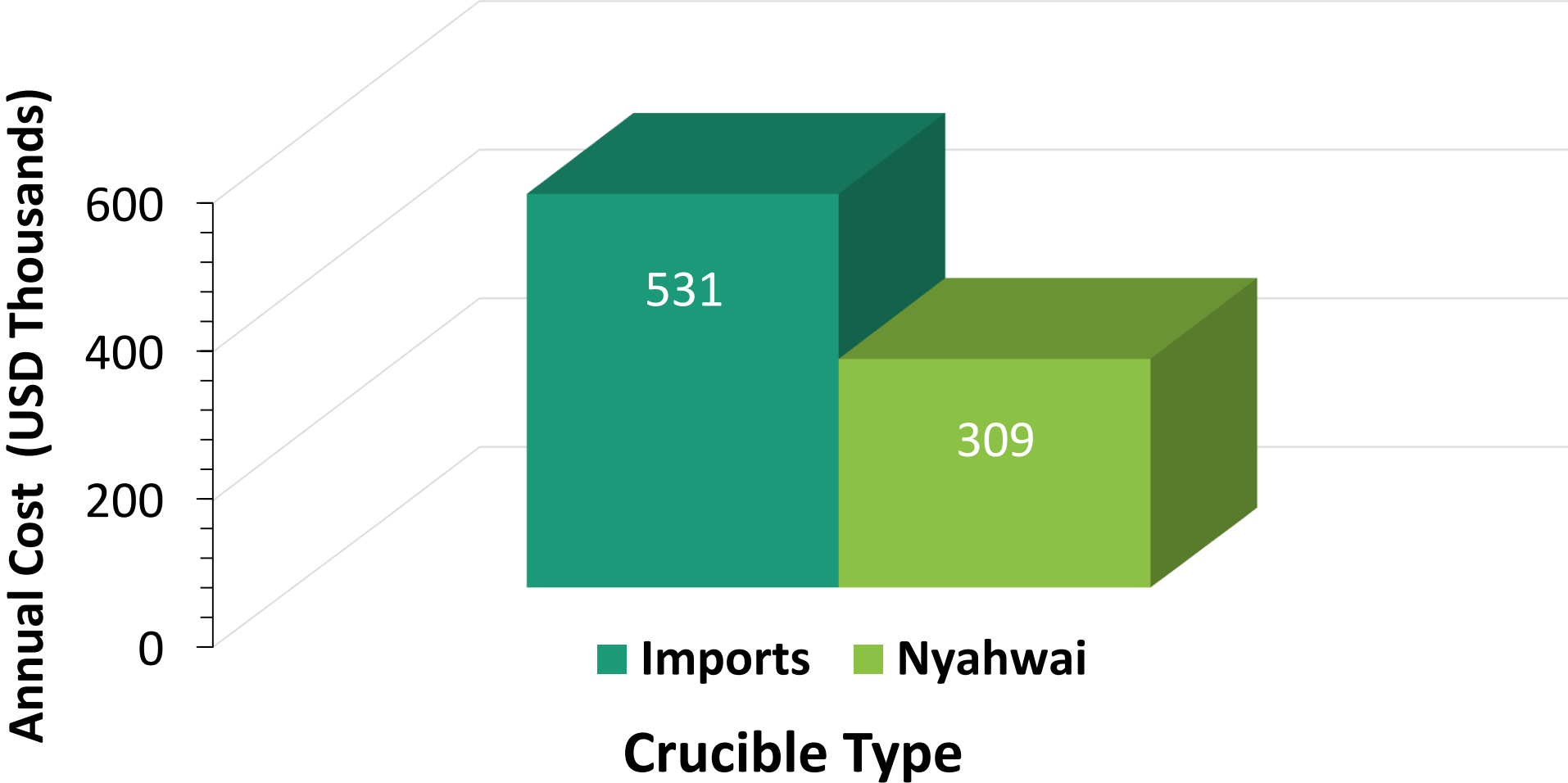


# Market Value



**A2 Bulge Shaped Crucible**

# Cost Benefit Analysis



*(Zimtrade, 2017)*

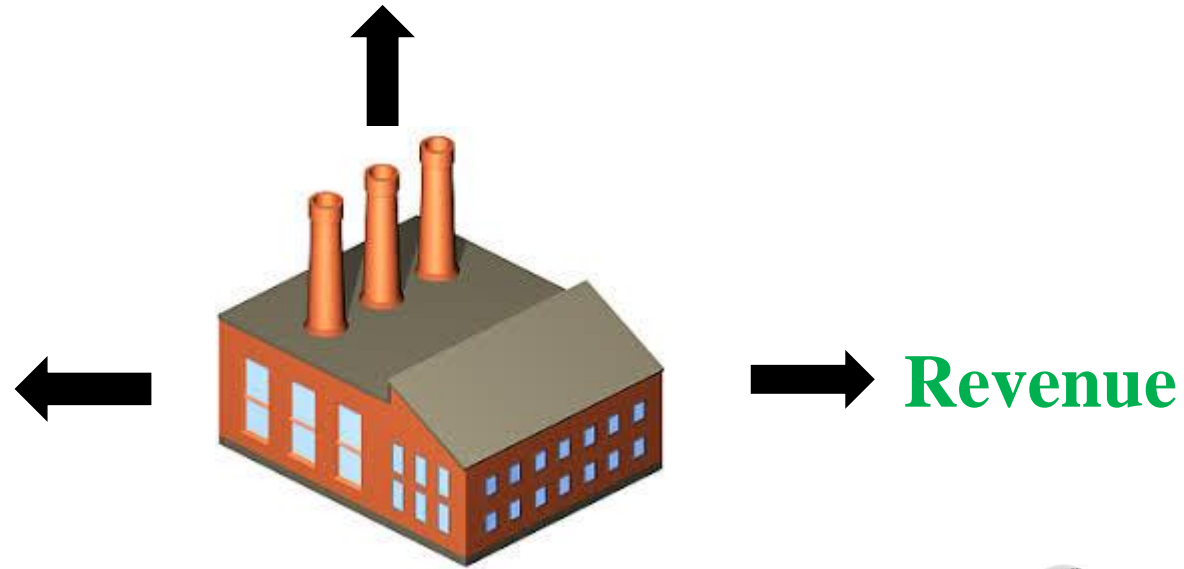
# Cost of Setting up a Plant

Equipment	Quantity	Price
Jaw crusher	1	9 570
Hammer mill	1	3 520
Pulverizer	1	10 000
Factory		60 000
Pan mixer	1	21 560
Dry presser	1	27 300
Furnace	1	50 000
Ancillary		20 000
<b>Total</b>		<b>201 950</b>

Courtesy of *Luoyang Zhongde Heavy Industries Co., Ltd* and *Henan Fote Heavy Machinery Co., Ltd*

# Benefits to the Country

Forward and  
Backward Linkages



Employment



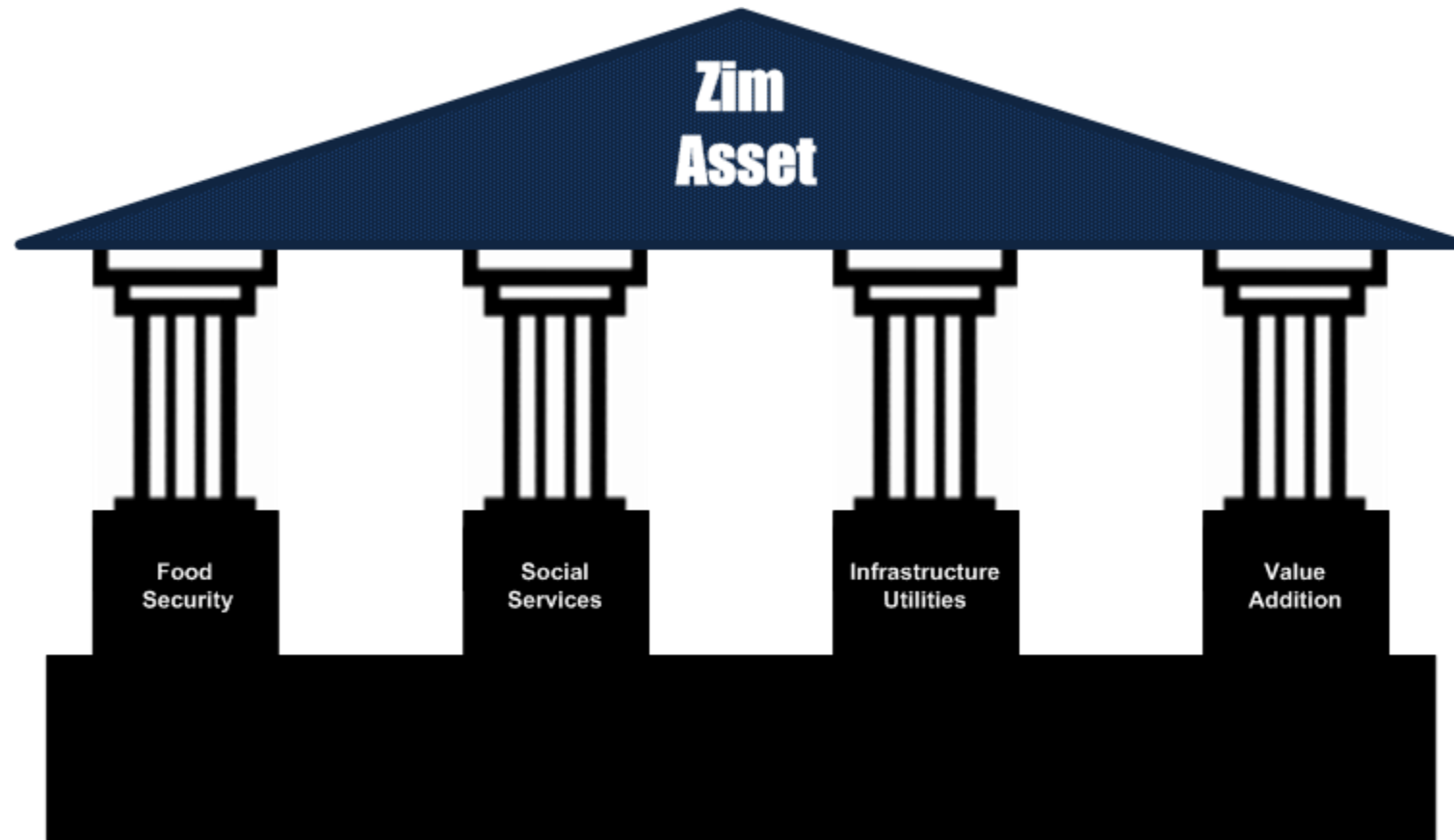
Revenue



Domestic and  
Foreign Trade



# Project Significance





# SUSTAINABLE DEVELOPMENT GOALS

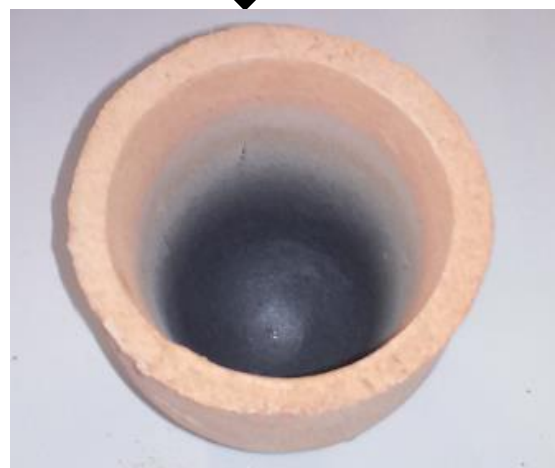
17 GOALS TO TRANSFORM OUR WORLD

<b>1</b> NO POVERTY 	<b>2</b> ZERO HUNGER 	<b>3</b> GOOD HEALTH AND WELL-BEING 	<b>4</b> QUALITY EDUCATION 	<b>5</b> GENDER EQUALITY 	<b>6</b> CLEAN WATER AND SANITATION 
<b>7</b> AFFORDABLE AND CLEAN ENERGY 	<b>8</b> DECENT WORK AND ECONOMIC GROWTH 	<b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE 	<b>10</b> REDUCED INEQUALITIES 	<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	<b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION 
<b>13</b> CLIMATE ACTION 	<b>14</b> LIFE BELOW WATER 	<b>15</b> LIFE ON LAND 	<b>16</b> PEACE, JUSTICE AND STRONG INSTITUTIONS 	<b>17</b> PARTNERSHIPS FOR THE GOALS 	 <b>SUSTAINABLE DEVELOPMENT GOALS</b>

# The next step.....



**Silicon Carbide**



**Corundum**



**Kyanite**



**THANK  
YOU!**