

ETRA'S role in TyGRe



Market Analysis

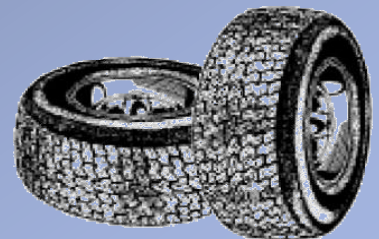
Current status of the market

Exploitation Plan

....and the Future

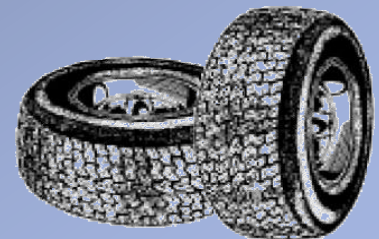


- ETRA is pleased to be among the partners participating in the TyGRe Project under Framework 7
- ETRA's roles and responsibilities are :
 - WP 8 : Market analysis and exploitation
 - WP 9 : Dissemination



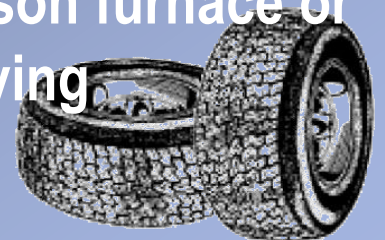
Current Status of SiC production

- ✓ SiC production has increased geometrically during the past decade, from \pm 650,000 tonnes per year worldwide, to a projected 1,432,100 anticipated by the end of 2012
- ✓ And that is not the entire story –
 - ❖ Global SiC capacity at the end of 2012 will be +2,171,000 tonnes
 - ❖ Thus, by the end of 2012, plants will be producing at only 65.9% of capacity
 - ❖ + 65% of the total will be produced in China



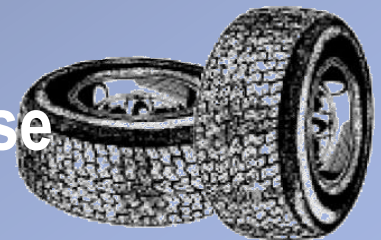
SiC production

- ✓ SiC is described in terms of its characteristics, purity, properties and grain size (or other format) –
- ✓ The means of production – from initial processing to post-treatment can impact upon the output characteristics and properties
- ✓ The predominant means of production is in an Acheson furnace – however, newer methods are also being used which are more environmentally sustainable and provide unique characteristics
- ✓ Today, more than 95% of SiC is produced with an Acheson furnace or an adaptation of the system, but new systems are evolving

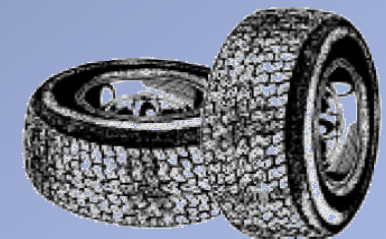
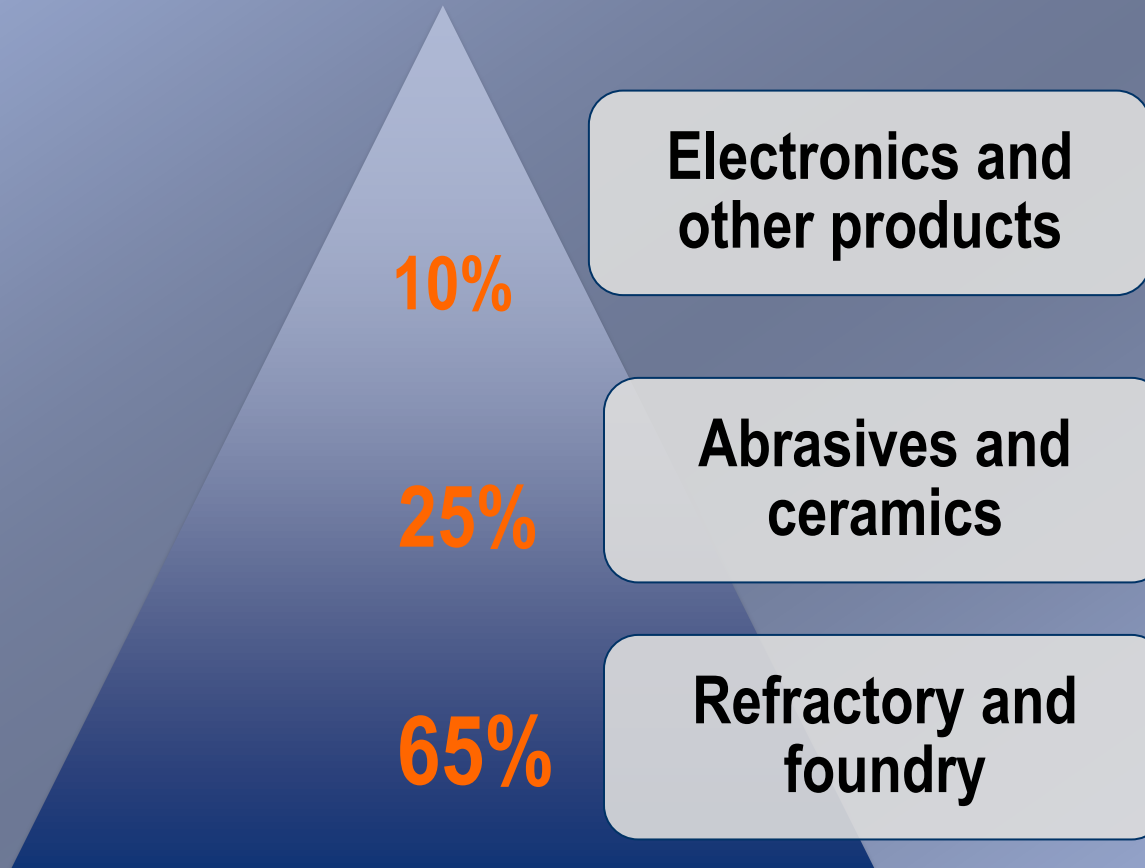


SiC production

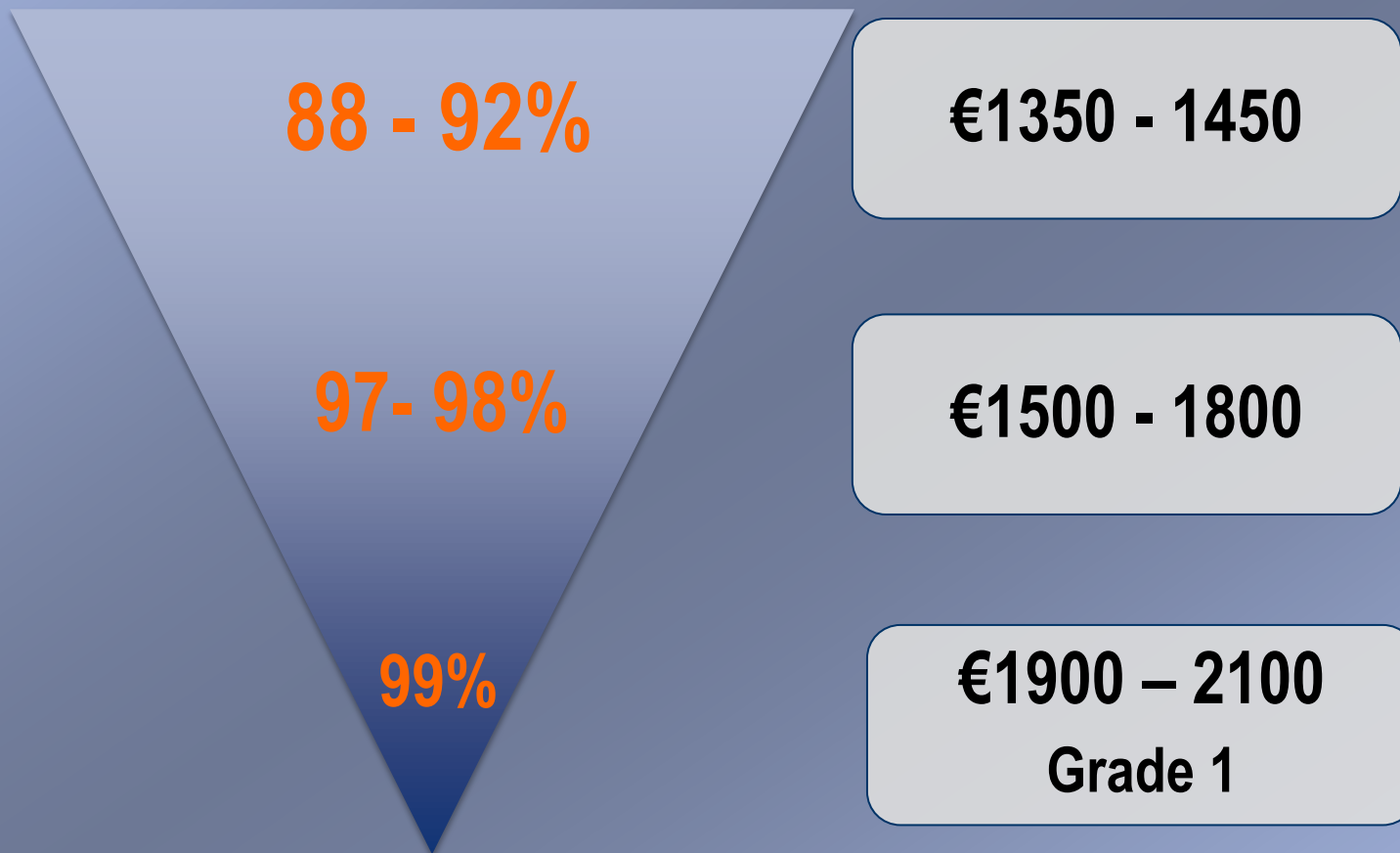
- SiC powders can be produced in at least three principal ways :
 - ❖ pyrolysis of silane compounds,
 - ❖ direct carbonisation of Si metal, and, of course,
 - ❖ carbothermal reduction of SiO_2
- Each process can impact upon the final characteristics and or properties of the output materials
- The end properties will determine the potential use



SiC Distribution

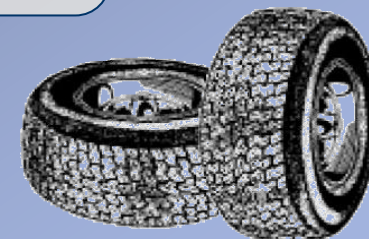


Pricing distribution*



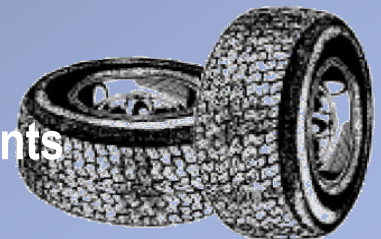
*September 2011, Industrial Mineral Prices

November 2011



SiC pricing

- ✓ Not surprisingly, SiC pricing is based upon the properties, characteristics, purity and size or format of the material
- ✓ Properties and characteristics of the materials are described in a product specification
- ✓ Size is described in a number of industry protocols referred to as : FEPA, JIS, ANSI, Micron and others
- ✓ Purity is defined as a percentage or percentage range and application e.g., :
 - ❖ 88 – 92 % Metallurgical, Abrasives
 - ❖ 97 – 98 % Ceramics, Refractory
 - ❖ 99 % Electronic devices and other high value added components



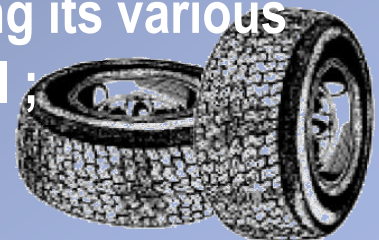
A simple rationale :

A tremendous amount of work has gone into this project (not just currently but for more than 2 decades) ;

In order for the results of this work to be appropriately commercialised, and profitable over the long-term, it should lead to commercialisation of more than one niche product with limited market potential ;

More than 500 sophisticated products and applications currently utilise SiC - in a range of qualities, purities and sizes ;

It should thus, be feasible to identify 3-5 potential applications that could benefit from the materials produced from the tygre research during its various phases along the way towards attaining its identified product goal ;

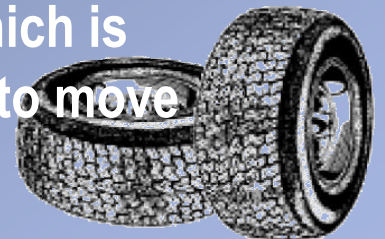


Therefore, the ETRA Team is looking at a range of options currently available on the market in order to identify 3 - 5 potential products/applications. We are attempting to create a 'scale-up' model which could result in identifying several products which could be generated from the TyGRe materials.

As background, we are looking at producers of current materials/products/applications, and their raw materials : $\pm 88\% - 92\%$; $\pm 92 - 97\%$; $\pm 98 - 99\%$

As a microcosm, we are looking at Italian companies, to compare them with the broader base.

Further, we have looked at the economics of the SiC industry - which is providing extremely interesting information - AND a good reason to move ahead with a broader range of materials/products



**Thank you for
Your attention**

