



Energy in Mining

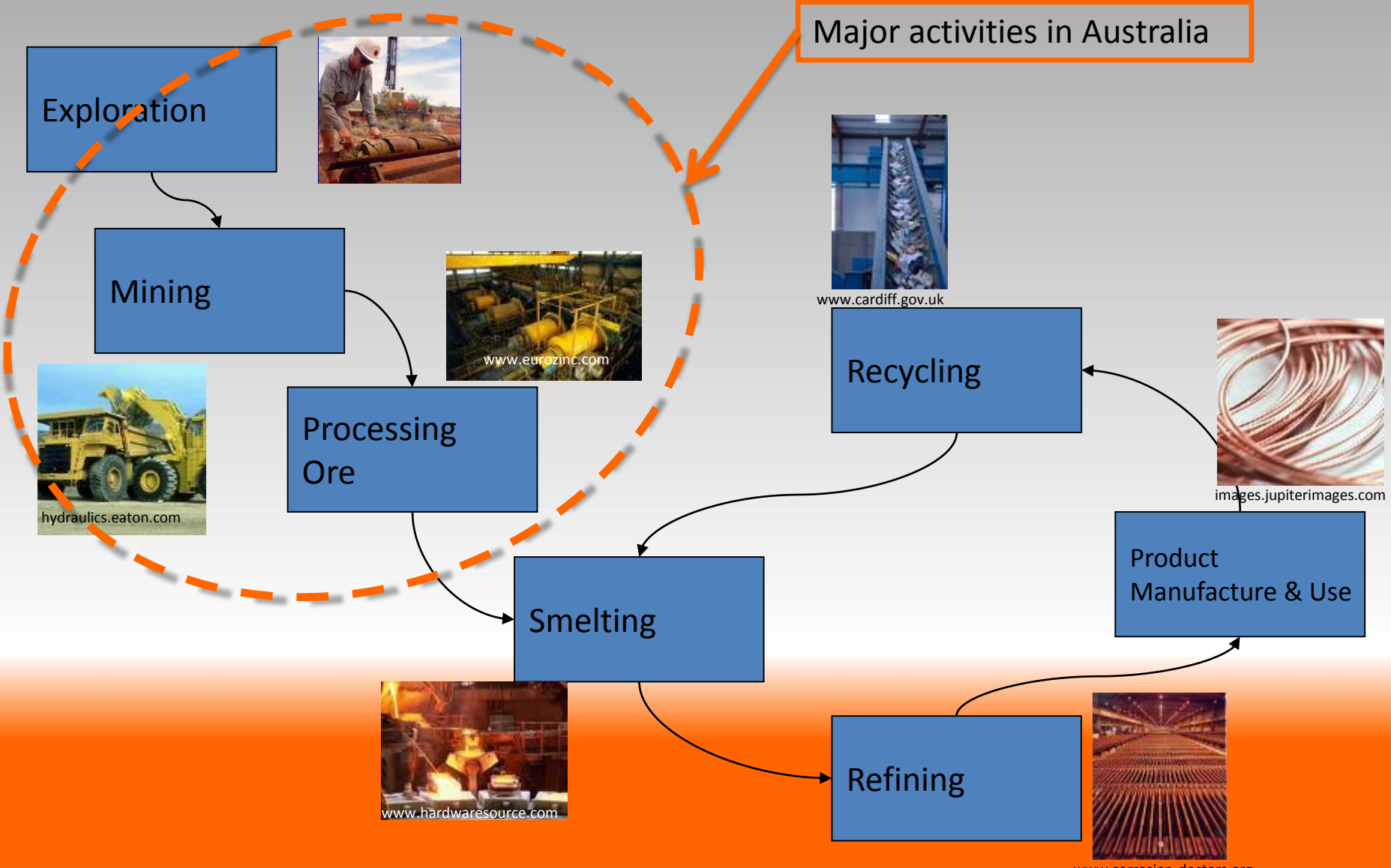
Sarah Boucaut

With thanks to Glen Corder, Principal Research Fellow, Sustainable Minerals Institute, University of Queensland

CEEC - A not-for-profit company, supported by industry donations

www.ceecthefuture.org

Mining Life Cycle



Mining



Open Cut Mine

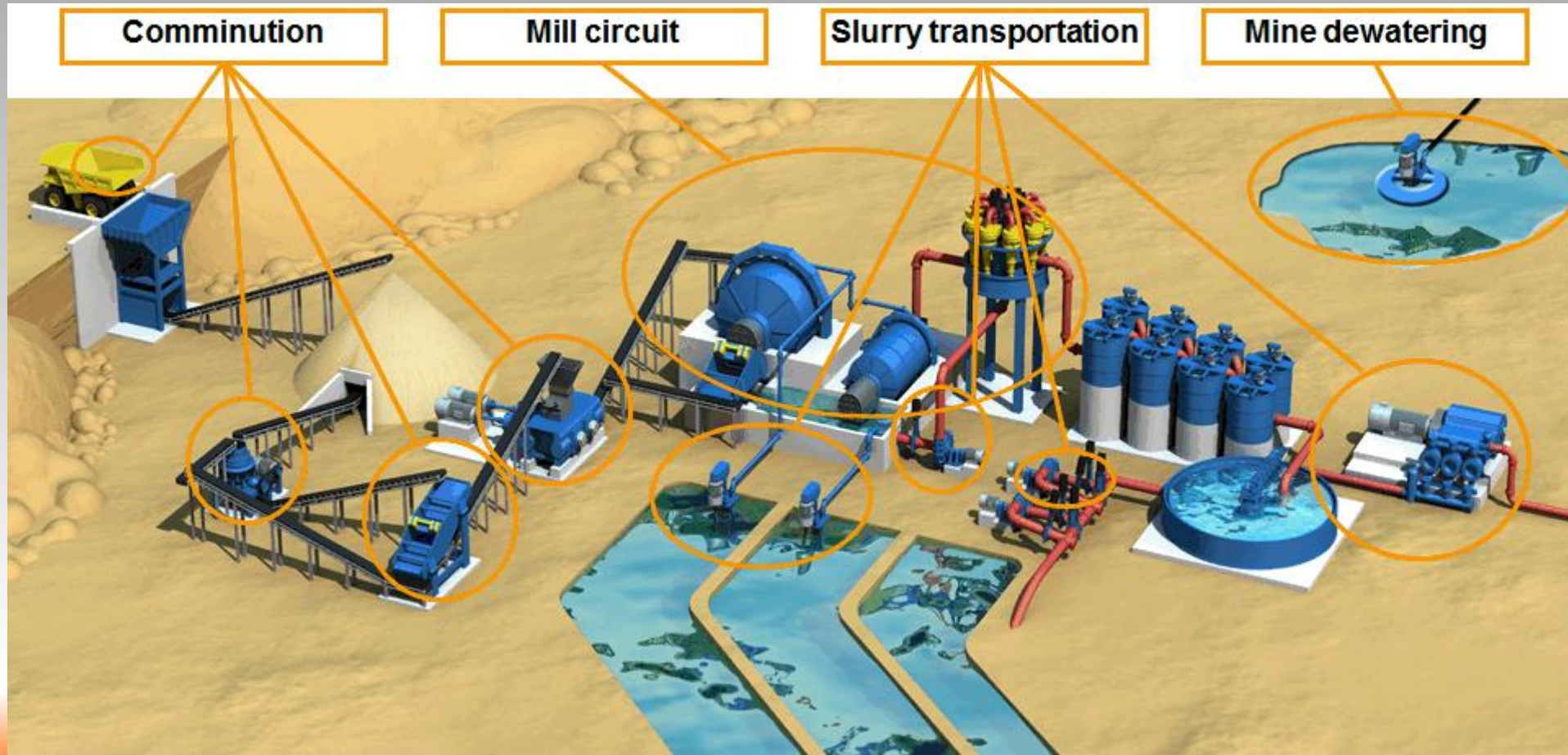
From <http://www.mining-technology.com/projects/cadiavalley/cadiavalley3.html>



Underground Mine

From <http://www.newcrest.com.au/our-business/technology/mining-technology/>

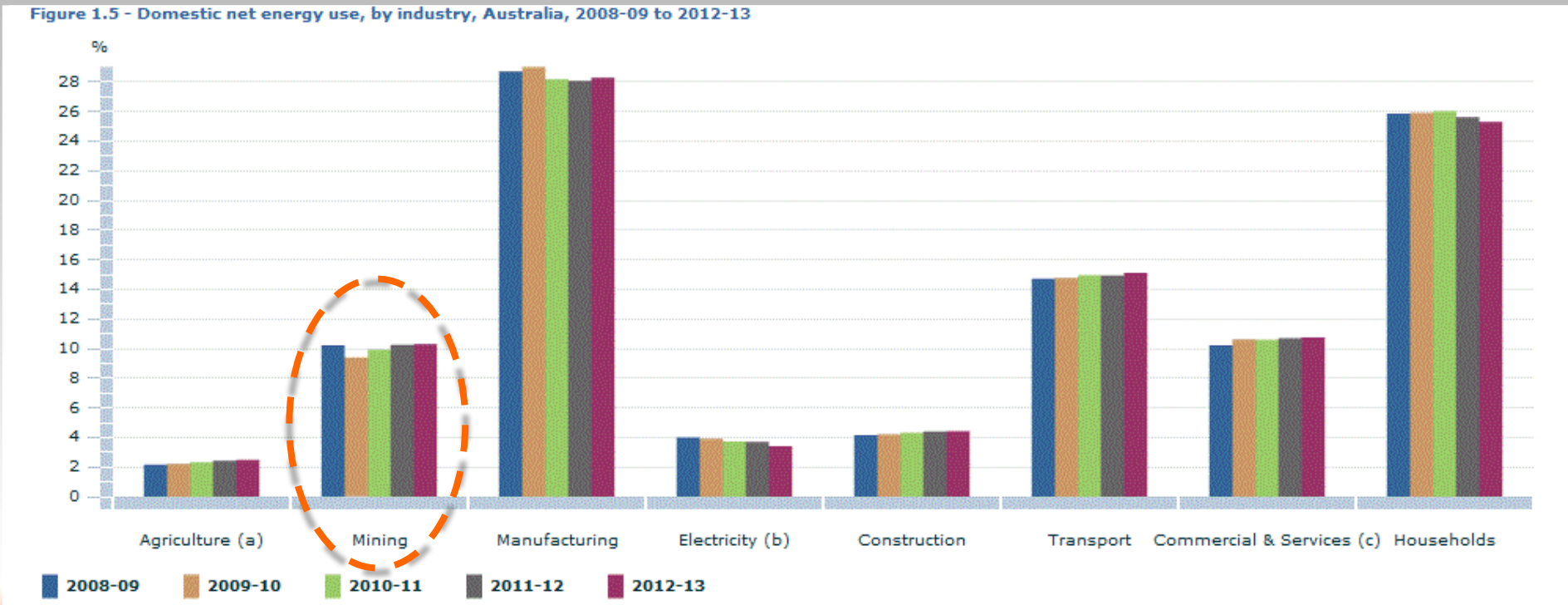
Minerals Processing





Net Energy Usage

Australia's domestic energy consumption 4,139 PJ in 2012-13, an increase of 57 PJ from 2011-12.

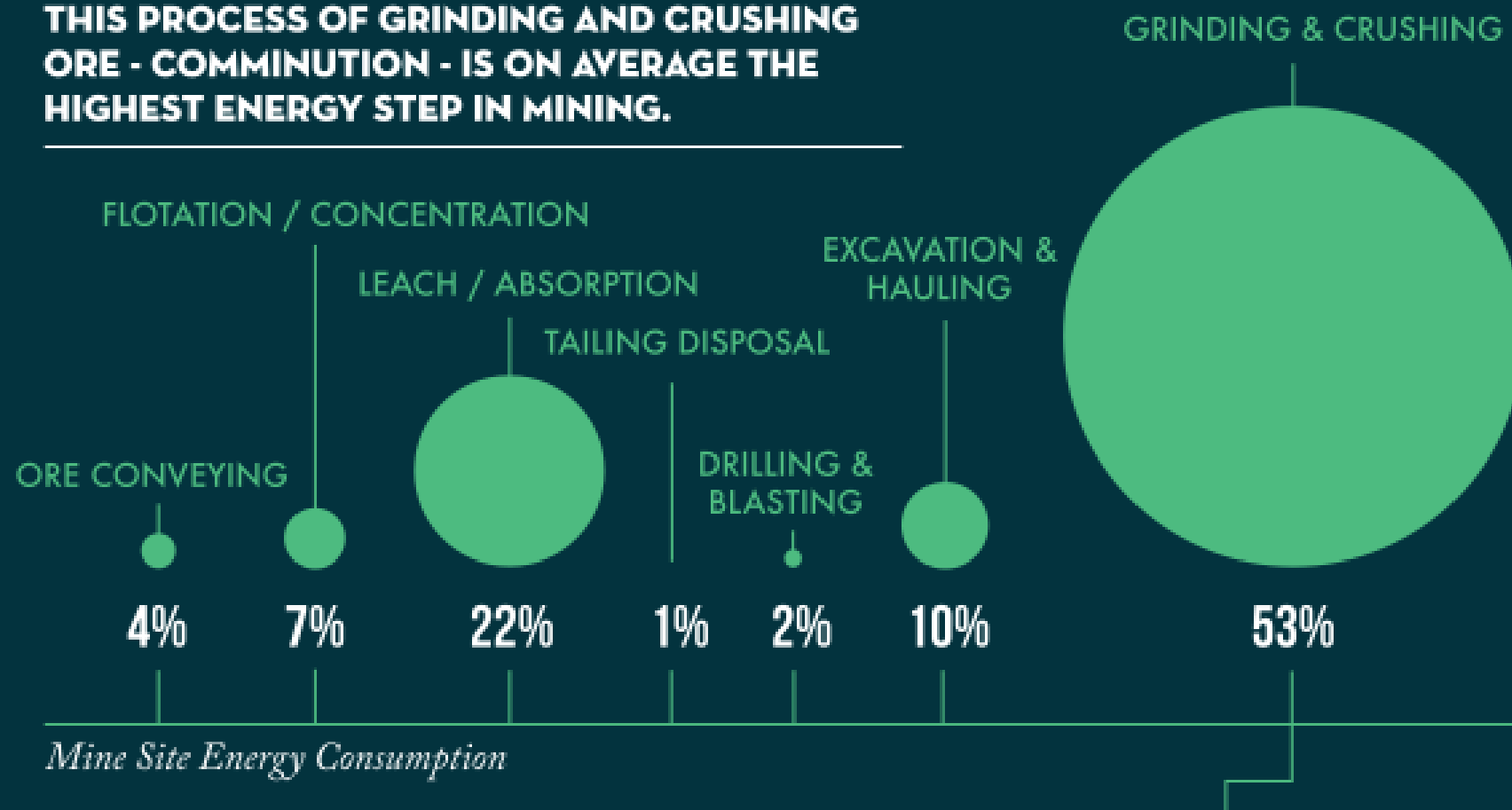


From <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4604.0>

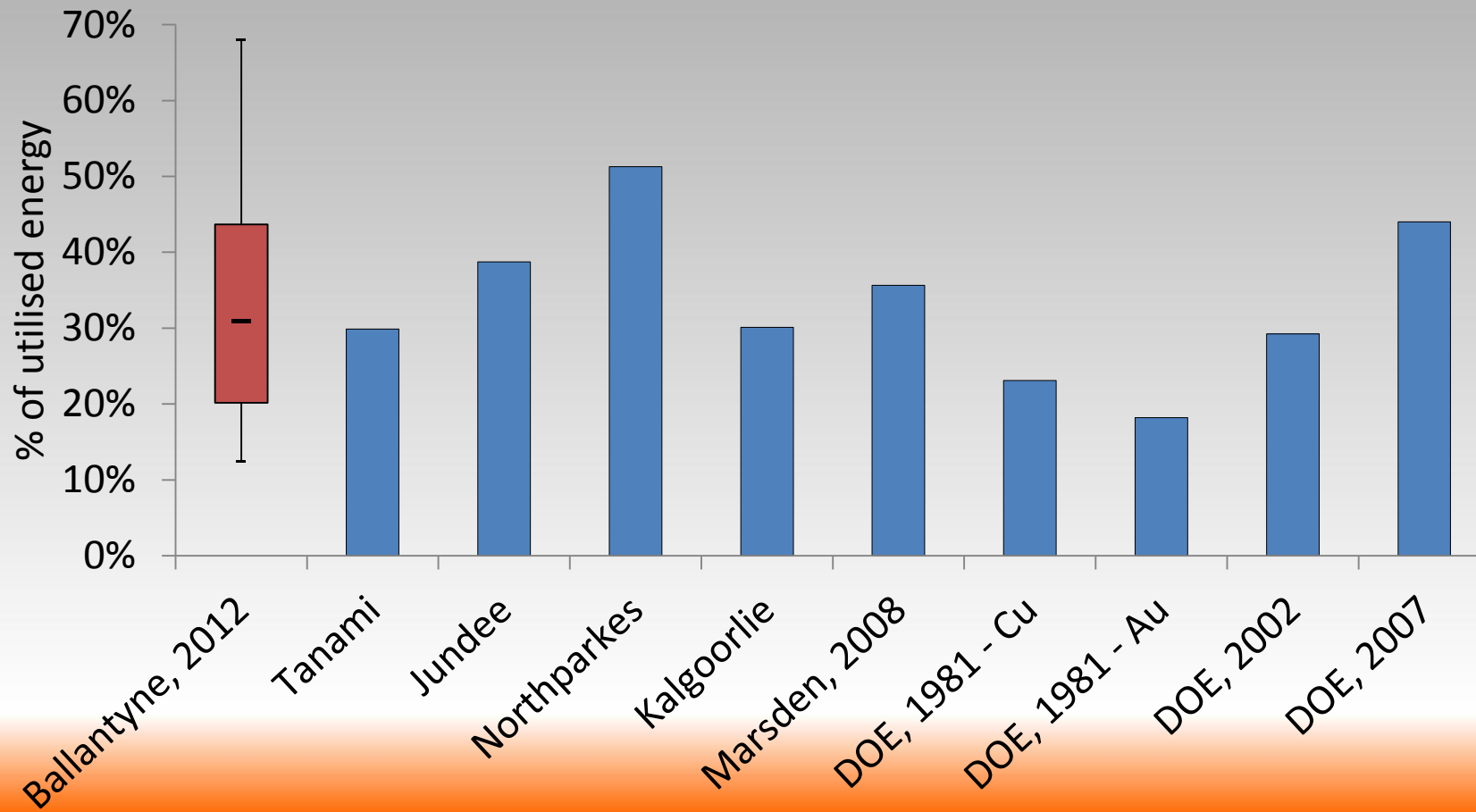


Energy Usage

THIS PROCESS OF GRINDING AND CRUSHING ORE - COMMINUTION - IS ON AVERAGE THE HIGHEST ENERGY STEP IN MINING.

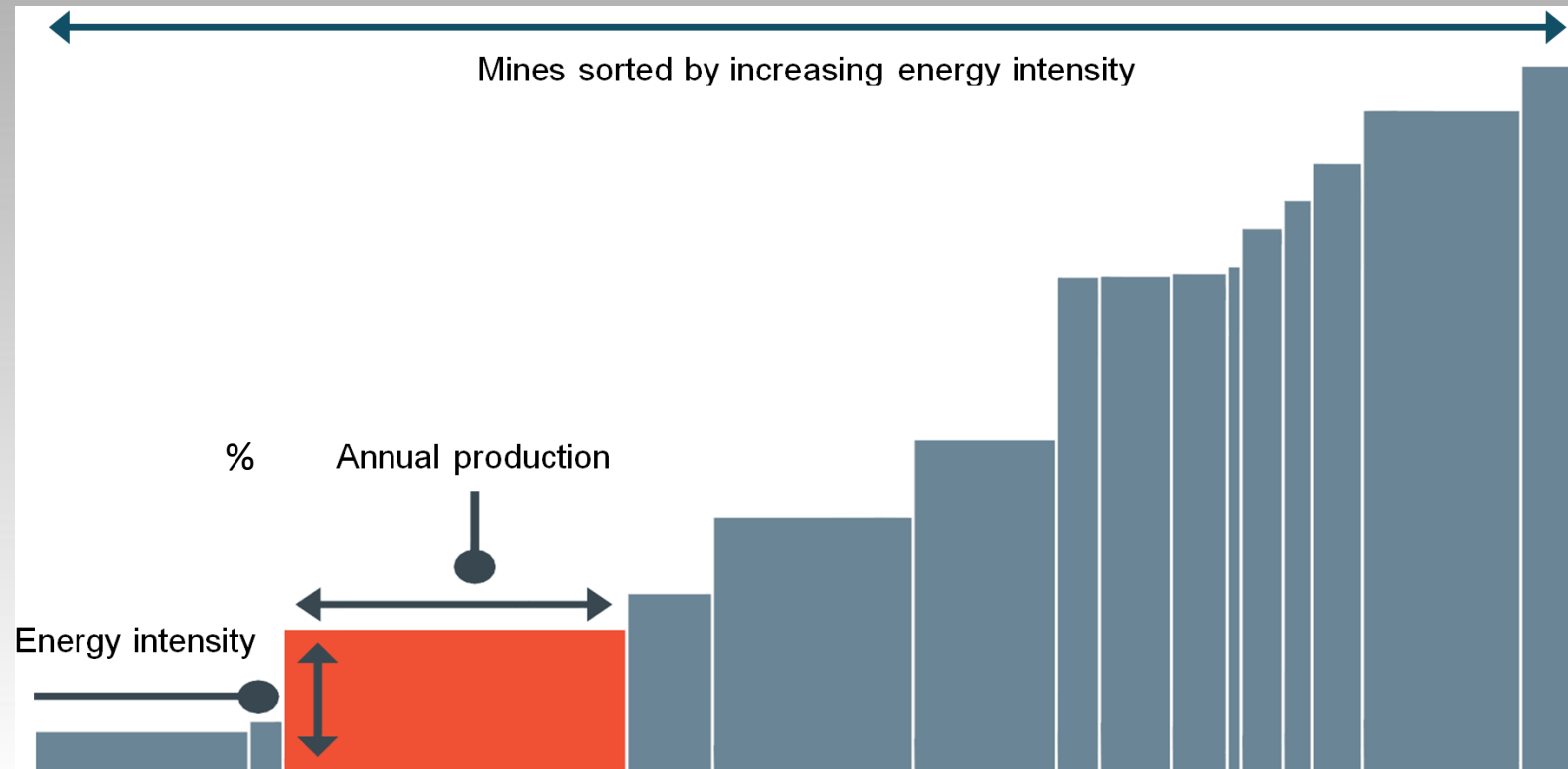


Crushing and grinding energy for copper and gold

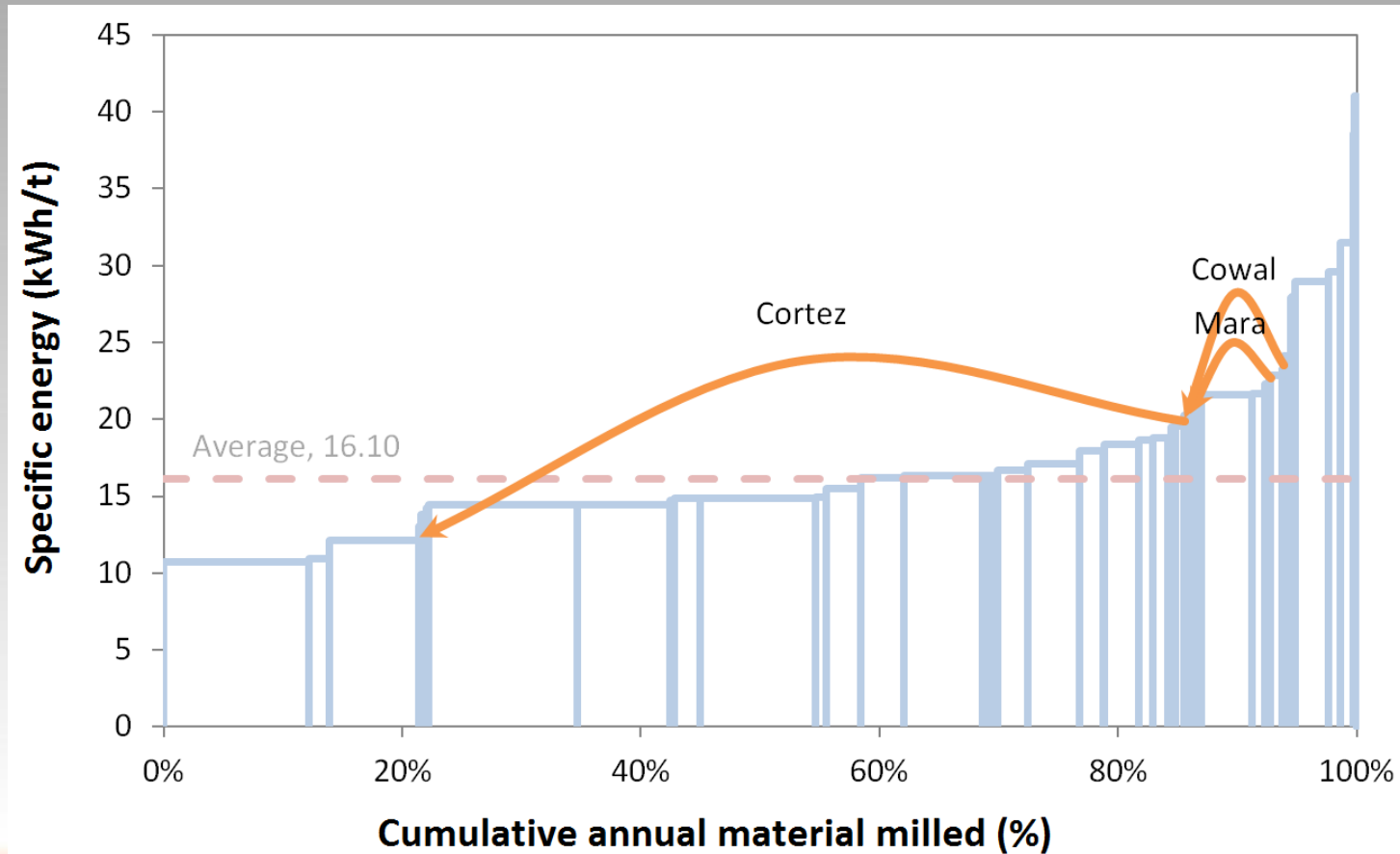


From Ballantyne, G. R., Powell, M. S. and Tiang, M. (2012). Proportion of energy attributable to comminution. In: Peter Hills (Conference Chair), Proceedings: 11th AusIMM Mill Operators' Conference 2012. 11th AusIMM Mill Operators' Conference 2012, Hobart, Tasmania, (25-30). 29-31 October 2012.

Energy Curve methodology

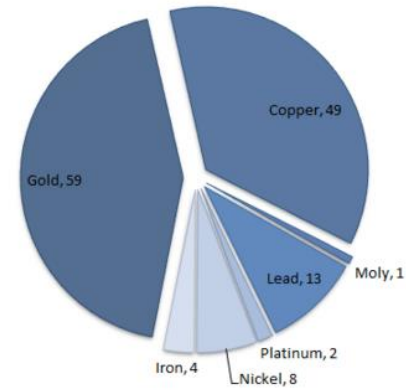


Case study: Barrick Gold

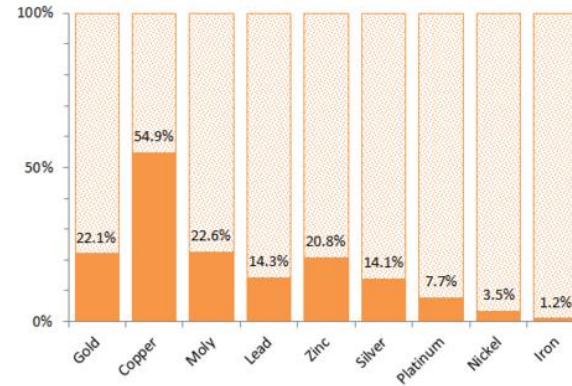


CEEC energy curve profile

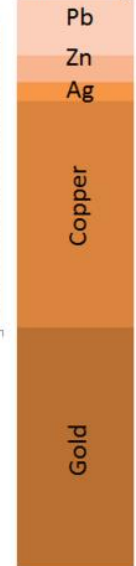
Number of mines by commodity



Proportion of global production in database

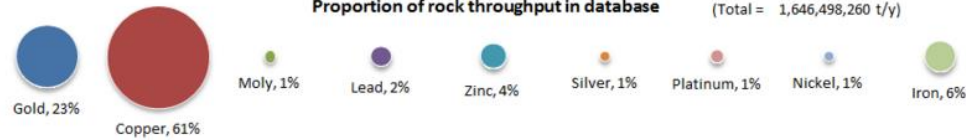


0.35%
global
electricity



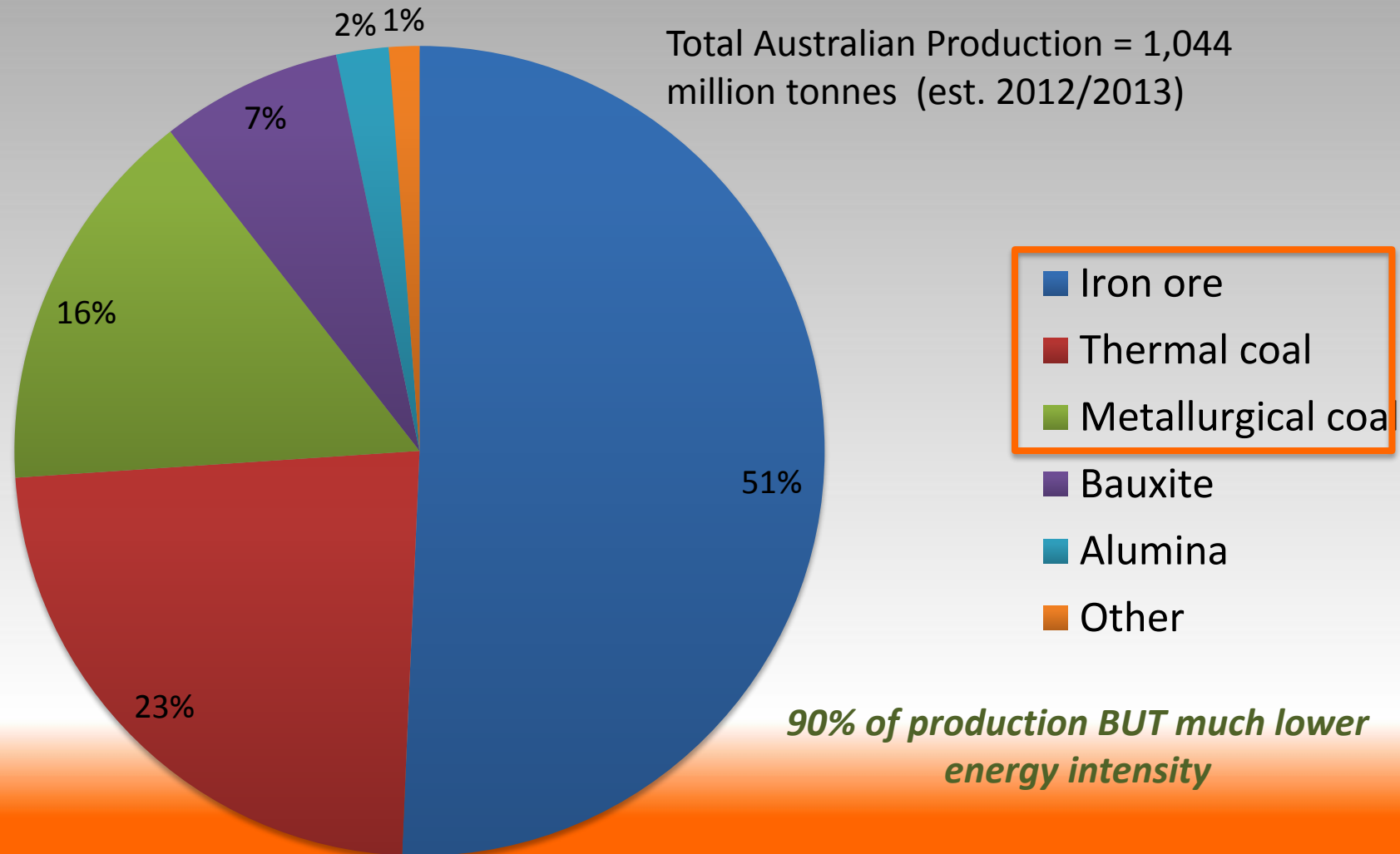
Proportion of rock throughput in database

(Total = 1,646,498,260 t/y)



As at 13/10/2015

Iron Ore & Coal Production



From http://www.minerals.org.au/focus/minerals_economy

Energy Initiatives in Mining



ICMM
International Council
on Mining & Metals

InBrief

The role of minerals and metals in a low carbon economy

Mining's contribution to sustainable development
June 2012

Rio Tinto forms new team to step up energy and climate initiatives

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A key focus will be to ensure energy and climate decisions. The strategy team will support the Group's energy and climate face and strengthen the Group's energy and climate



ENDURING VALUE

THE AUSTRALIAN MINERALS INDUSTRY FRAMEWORK FOR SUSTAINABLE DEVELOPMENT

BHP Billiton And University College London Launch Natural Resources Initiative

10 June 2011

BHP Billiton and University College London today announced an agreement to establish an Institute for Sustainable Resources in London, UK and an International Energy Policy Institute in Adelaide, Australia.

From

From http://www.riotinto.com/ourcommitment/features-2932_3284.aspx

From http://www.riotinto.com/ourcommitment/features-2932_3284.aspx

From http://www.minerals.org.au/focus/sustainable_development/enduring_value

<http://www.bhpbilliton.com/home/investors/news/Pages/Articles/BHP-Billiton-And-University-College-London-Launch-Natural-Resources-Initiative.aspx>

[Articles/BHP-Billiton-And-University-College-London-Launch-Natural-Resources-Initiative.aspx](http://www.bhpbilliton.com/home/investors/news/Pages/Articles/BHP-Billiton-And-University-College-London-Launch-Natural-Resources-Initiative.aspx)

[Launch-Natural-Resources-Initiative.aspx](http://www.bhpbilliton.com/home/investors/news/Pages/Articles/BHP-Billiton-And-University-College-London-Launch-Natural-Resources-Initiative.aspx)