

# **Tungsten Market Review**

**November 2011**

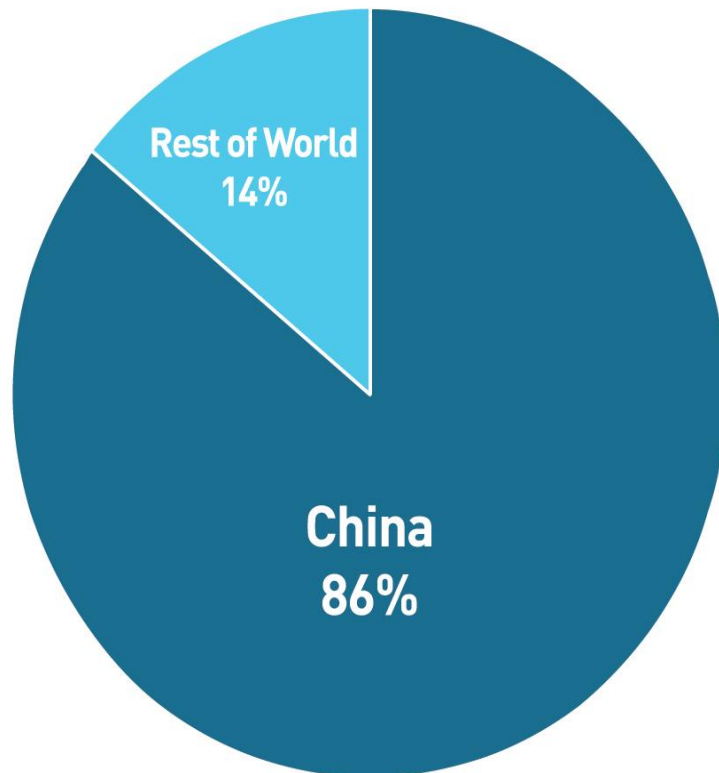
**(Includes proprietary information kindly provided by the CRU & Roskill)**

- **Metal with many outstanding properties –**
  - Second **strongest** material after diamond
  - **Highest melting point** of all metals  $3,400^{\circ}\text{C}$
- As a result **no real satisfactory substitute** for key applications
- **Most important use is as tungsten carbide (hardmetals)** in all cutting & drilling tools
- Also in **specialist steels, electronics, aerospace & military applications**
- **Environmentally “inert”**



## China Dominates World Primary Tungsten Production

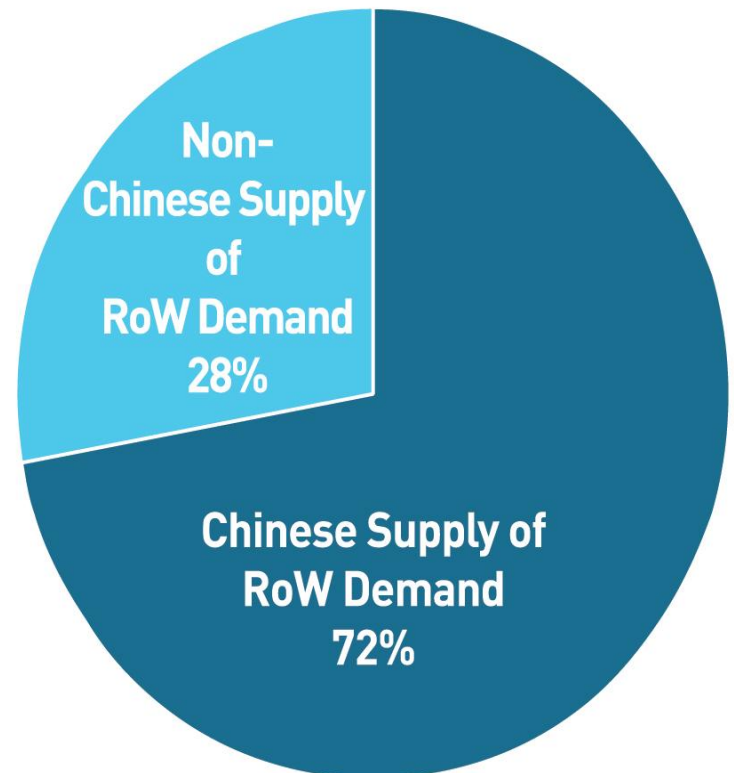
World mine Production in 2010



SOURCE: ITIA (2011)

## And is the Main Source of Tungsten to the Rest of World (RoW)

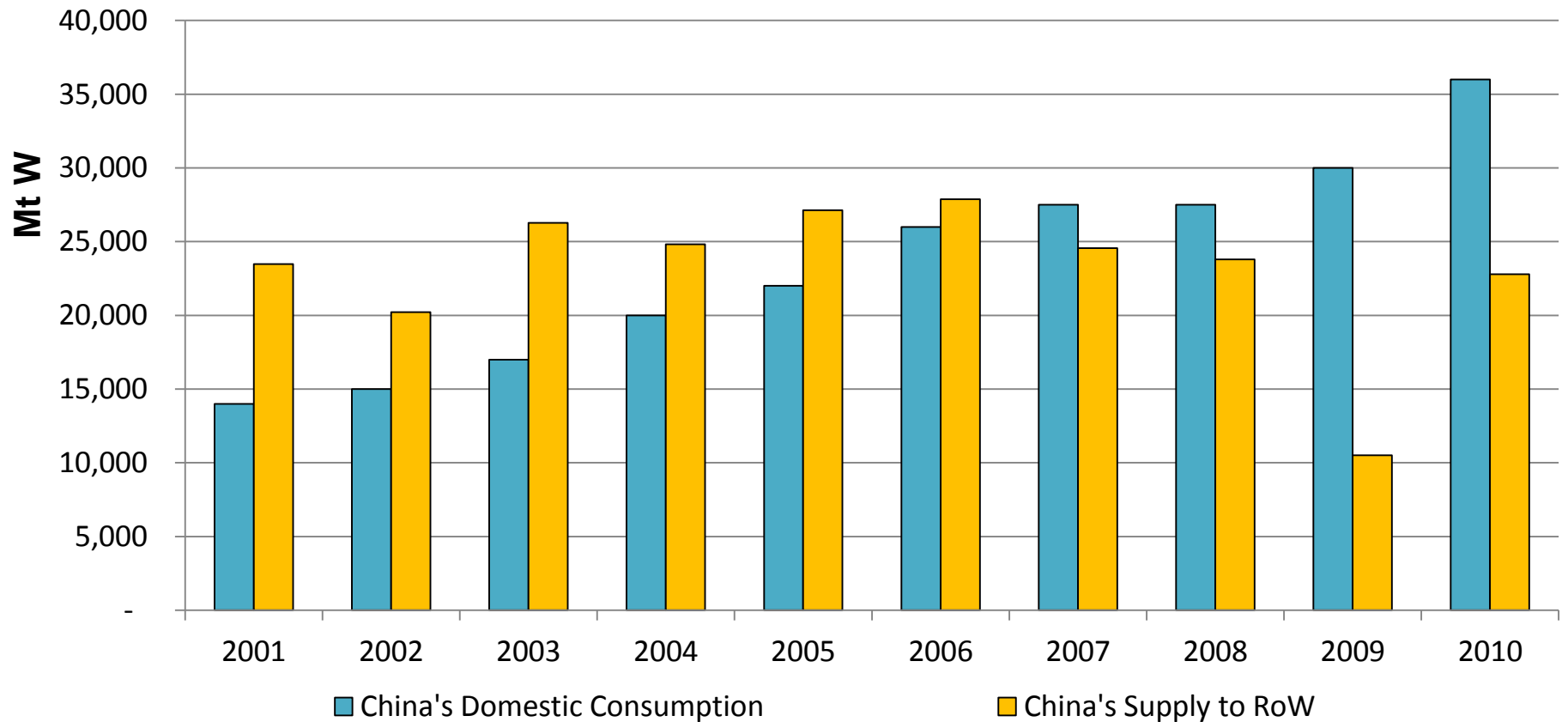
RoW Primary Tungsten demand in 2010



SOURCE: ITIA (2011)

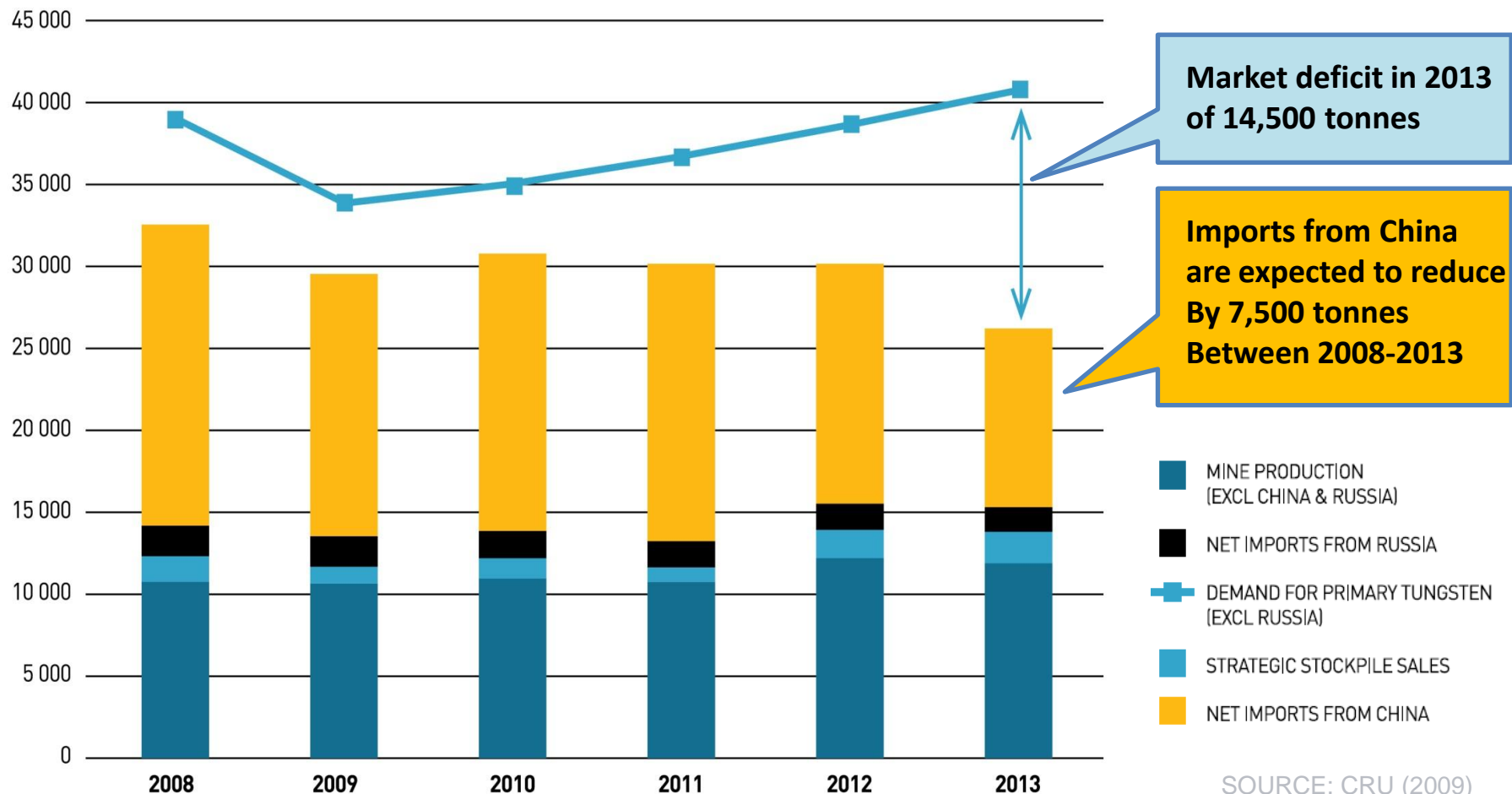
**However China's requirement for tungsten in its indigenous industry is increasing, resulting in reductions of supply to RoW**

## China's Domestic Consumption V's China's Supply to RoW



**..leading to forecasted supply shortages of primary tungsten outside of China**

**Forecast Tungsten Demand V's Supply excluding China and Russia (Tonnes of Tungsten)**



## **Costs of tungsten production in China are also increasing due to:**

- Increased taxes
- Lower grades/cut off
- Higher HSE costs
- Deeper mining
- Significant increases in labour costs

## **FORECAST FOR CHINESE MARKET:**

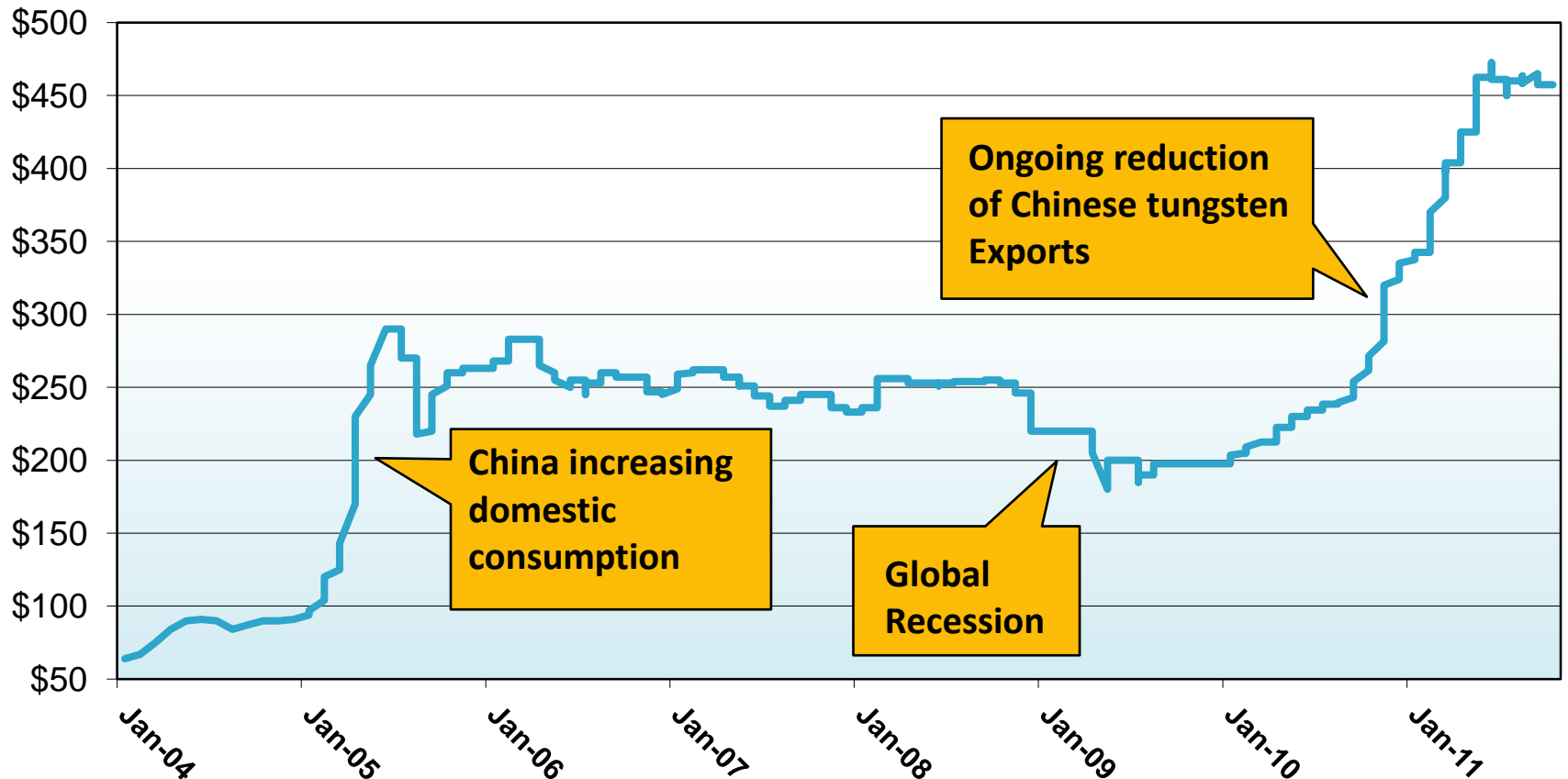
- High capital costs & rising taxes – difficult to open new mines
- Export quota will be reduced, export costs will be increased

### ***China Minmetals Non-Ferrous Metals Company (Largest Chinese Producer)***

***“The actual value of limited strategic resources has not been reflected as it should be.... China will continue to supply, but China is no longer in a position to and should not supply tungsten at a low price by sacrificing its resources, and violating its environment. ”***

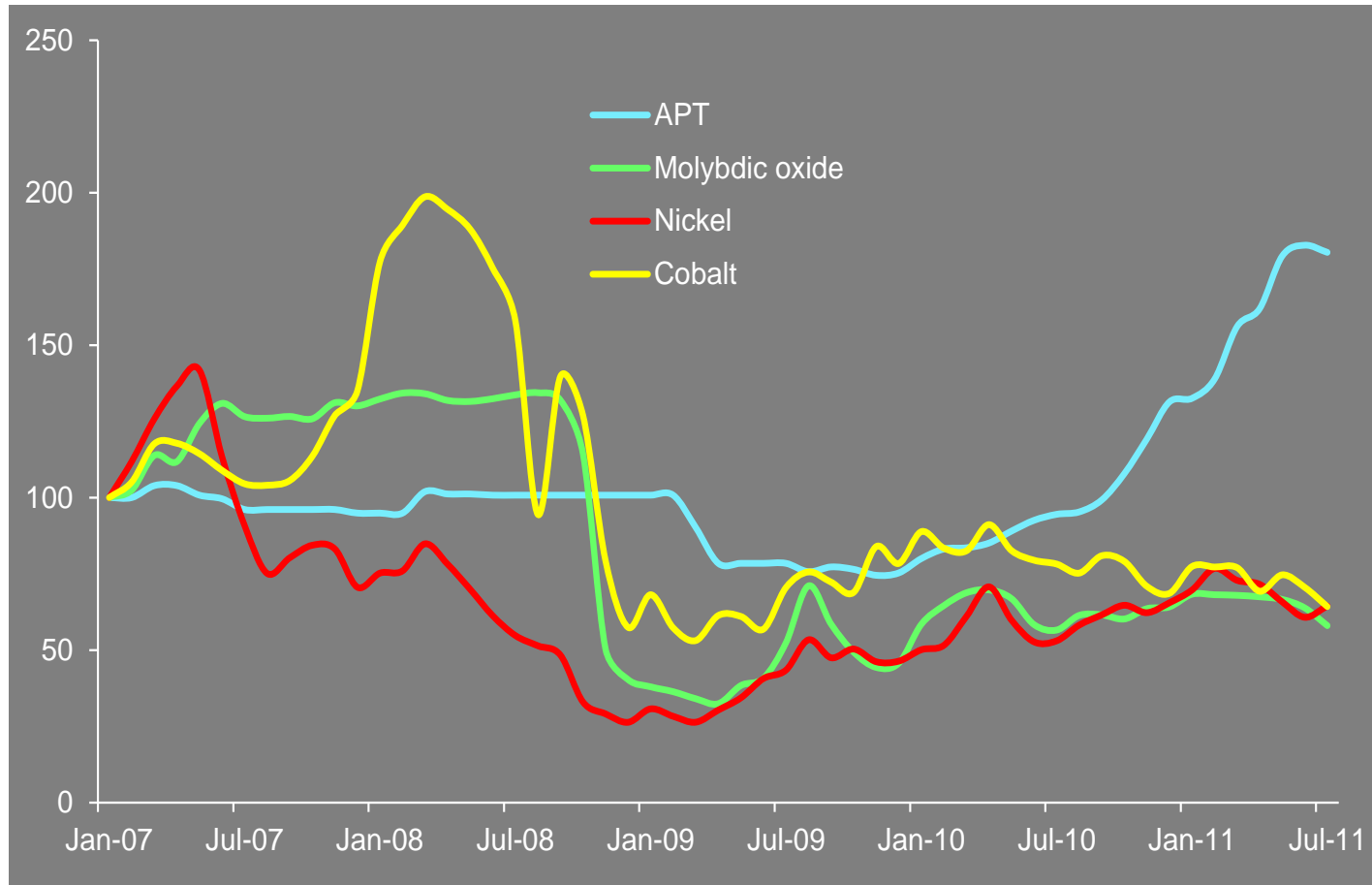
**These factors are having a significant effect on tungsten prices...**

### Tungsten Price (US\$/mtu for European APT) from 2004 - 2011



**...and are causing a divergence between tungsten and other metal prices**

**Tungsten (APT) prices compared to cobalt, molybdenum and nickel 2007 to 2011**



## TUNGSTEN MARKET SUMMARY

- **Increasing global demand for tungsten (driven by China)**
- **Limited growth forecast in worldwide primary supply**
- **China tightening control of its domestic tungsten industry**
- **China reducing tungsten exports to Rest of World**
- **China's costs of production rising significantly**
- **RoW supply shortages forecasted from 2012**
- **Companies holding large tungsten resources located within the Western World hold a strategic position**