

## WMF 2023: Key messages Opening session

1. Our Criticality Assessment is the only one that takes into account the pipeline of new mining projects to quantify structural deficit 10-year ahead. The "red ones » are: Copper, Nickel, Neodymium, Praseodymium and Tin as in 2022. And Zinc is a "new red" in 2023. But Cobalt and Tungsten are no longer Red.
2. 5 key Challenges are ahead of us globally: regionalization of supply chains (Europe, US, Japan, Canada and Australia do not face the same issues), metals intensity of the energy transition (Wind requires 530 kg per Twh vs 9 kg per Twhh for coal, oil or gas), urban middle class population growth (urban population will be 60% of world population in 2030 vs 33% in 1960 and middle class will be 65% in 2030 vs 15% in 1960), low carbon power availability and costs (power costs have increased by 10% over the past 5 years) and mining costs/grades (existing ore grades will decline by 15% in the 5 years to come and new green technologies are not yet cost effective).
3. Solutions exist if implemented promptly: Alternative funding opportunities beyond Debt and Equity to finance the estimated 3,3 trillion dollars investment needed over the 10 years to come (BASF/Eramet, Ivanhoe Electric/Maaden), New regional incentives to speed up investment in the full electrification supply chain (IRA), Efficient regulation for faster permitting (Best in Class: Australia and Canada), Long Term Off Take Agreements (Mountain Pass/Sumitomo), Projects to Locate further downstream units in Raw Materials extracting countries, Raw Material Substitution (No Anode Solid State, Sodium or Sulfur Cathodes) and of course "High Quality Recycling."