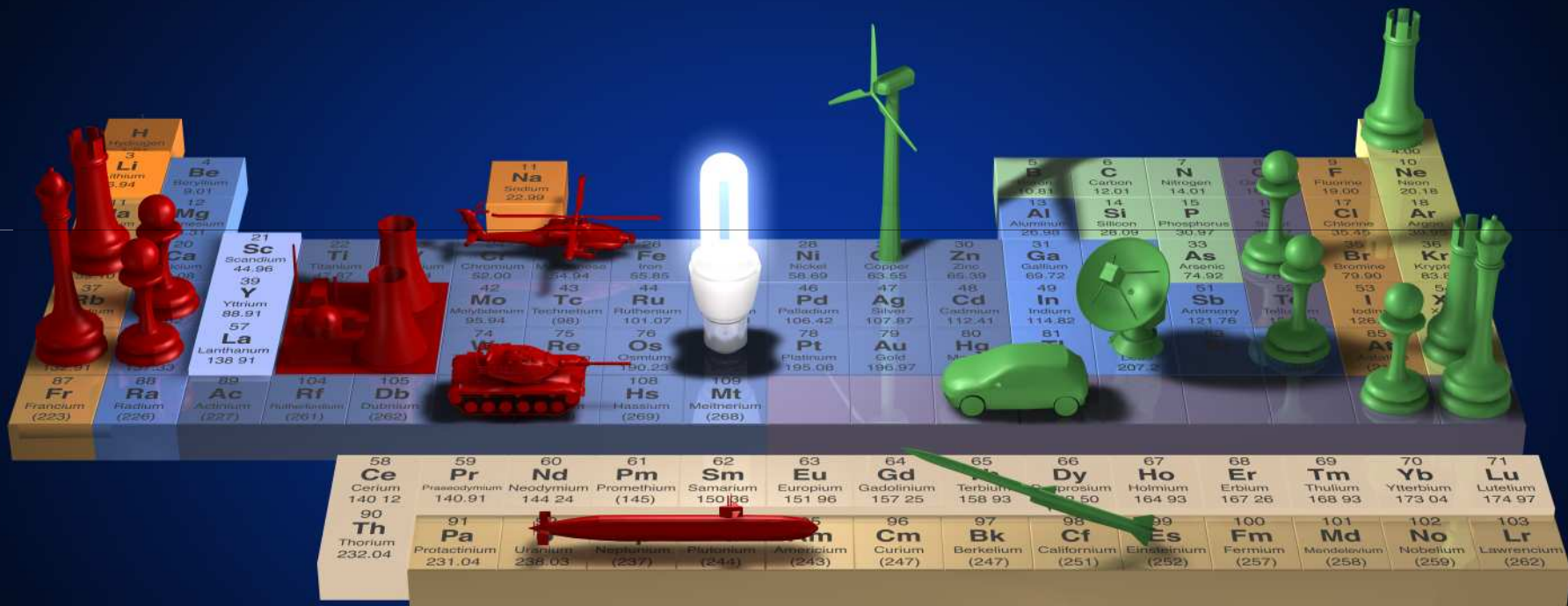


T R E M

TECHNOLOGY & RARE EARTH METALS
FOR NATIONAL SECURITY AND CLEAN ENERGY



TREM

Periodic Table of the Elements

Chemistry Reference Sheet

California Standards Test

																		18 8A																	
1 1A																13 3A		14 4A		15 5A		16 6A		17 7A		18 8A									
1 H Hydrogen 1.01																5 B Boron 10.81		6 C Carbon 12.01		7 N Nitrogen 14.01		8 O Oxygen 16.00		9 F Fluorine 19.00		10 Ne Neon 20.18									
3 Li Lithium 6.94		4 Be Beryllium 9.01																11 Na Sodium 22.99		12 Mg Magnesium 24.31		13 Al Aluminum 26.98		14 Si Silicon 28.09		15 P Phosphorus 30.97		16 S Sulfur 32.07		17 Cl Chlorine 35.45		18 Ar Argon 39.95			
11 Na Sodium 22.99		12 Mg Magnesium 24.31		3 Sc Scandium 44.96		4 Ti Titanium 47.87		5 V Vanadium 50.94		6 Cr Chromium 52.00		7 Mn Manganese 54.94		8 Fe Iron 55.85		9 Co Cobalt 58.93		10 Ni Nickel 58.69		11 Cu Copper 63.55		12 Zn Zinc 65.39		13 Ga Gallium 69.72		14 Ge Germanium 72.61		15 As Arsenic 74.92		16 Se Selenium 78.96		17 Br Bromine 79.90		18 Kr Krypton 83.80	
37 Rb Rubidium 85.47		38 Sr Strontium 87.62		39 Y Yttrium 88.91		40 Zr Zirconium 91.22		41 Nb Niobium 92.91		42 Mo Molybdenum 95.94		43 Tc Technetium (98)		44 Ru Ruthenium 101.07		45 Rh Rhodium 102.91		46 Pd Palladium 106.42		47 Ag Silver 107.87		48 Cd Cadmium 112.41		49 In Indium 114.82		50 Sn Tin 118.71		51 Sb Antimony 121.76		52 Te Tellurium 127.60		53 I Iodine 126.90		54 Xe Xenon 131.29	
55 Cs Cesium 132.91		56 Ba Barium 137.33		57 La Lanthanum 138.91		72 Hf Hafnium 178.49		73 Ta Tantalum 180.95		74 W Tungsten 183.84		75 Re Rhenium 186.21		76 Os Osmium 190.23		77 Ir Iridium 192.22		78 Pt Platinum 195.08		79 Au Gold 196.97		80 Hg Mercury 200.59		81 Tl Thallium 204.38		82 Pb Lead 207.2		83 Bi Bismuth 208.98		84 Po Polonium (209)		85 At Astatine (210)		86 Rn Radon (222)	
87 Fr Francium (223)		88 Ra Radium (226)		89 Ac Actinium (227)		104 Rf Rutherfordium (261)		105 Db Dubnium (262)		106 Sg Seaborgium (266)		107 Bh Bohrium (264)		108 Hs Hassium (269)		109 Mt Meitnerium (268)																			

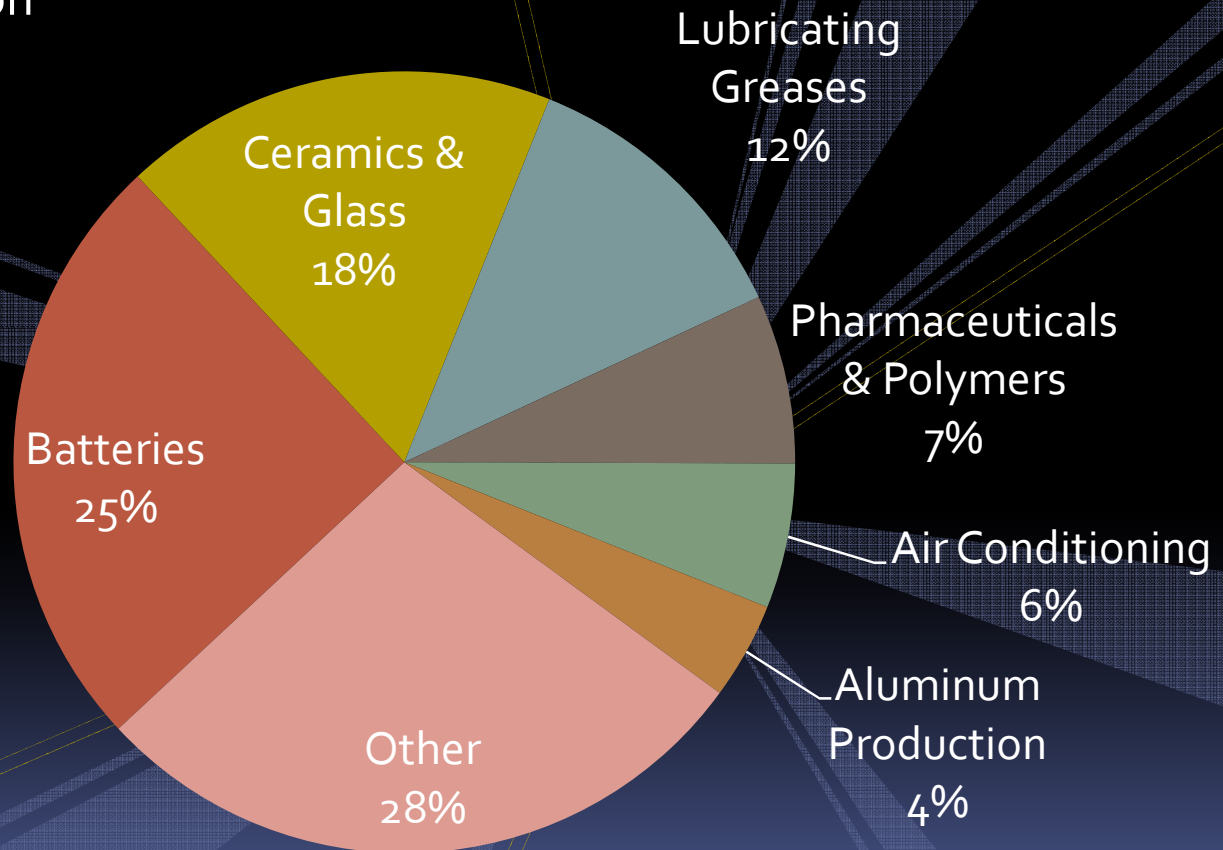
What is Lithium

- The first metal on the periodic table
- Lightweight
- Plentiful
- “Charged” with misinformation
- Our Electric Future



Lithium Applications

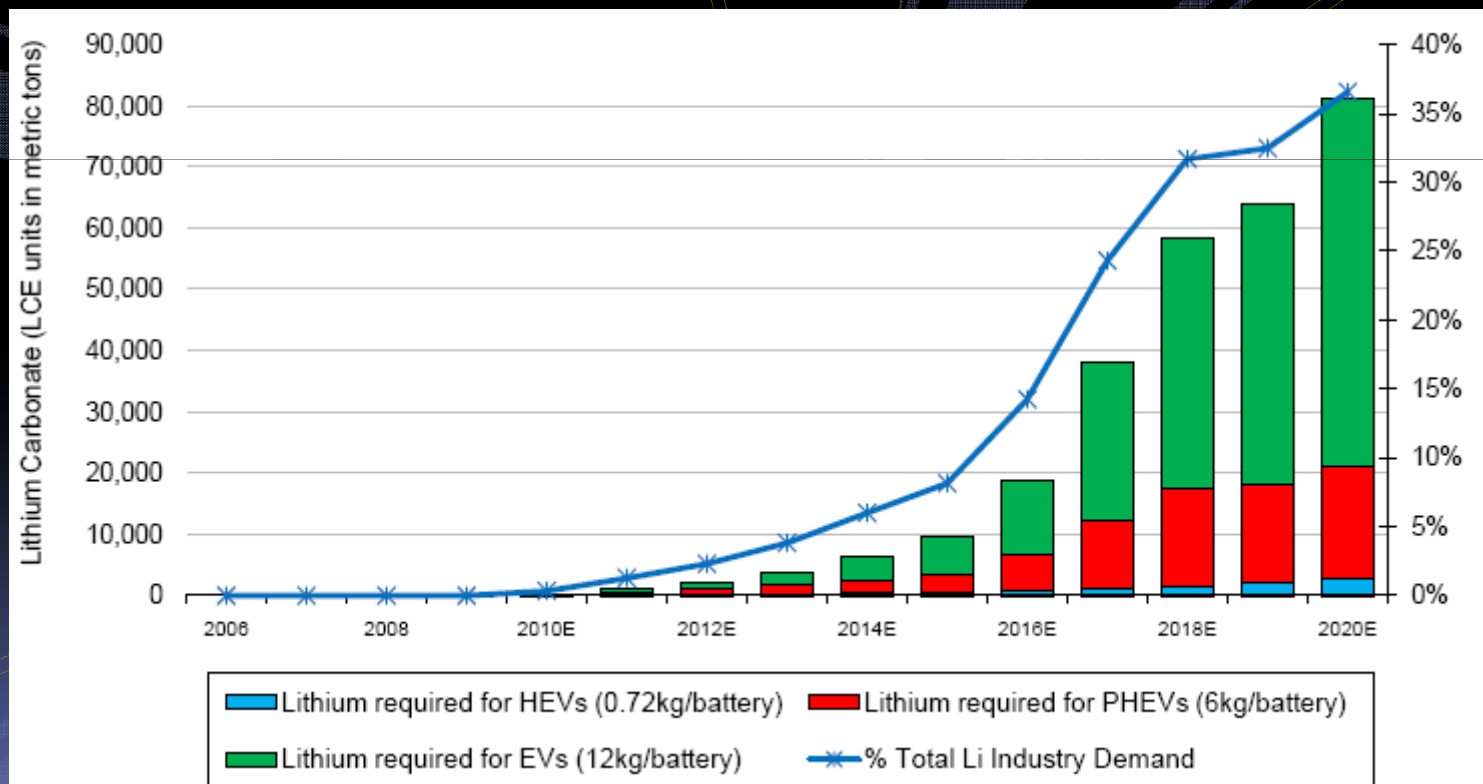
Currently lithium batteries of all kinds make up only 25% of consumption



Source: USGS

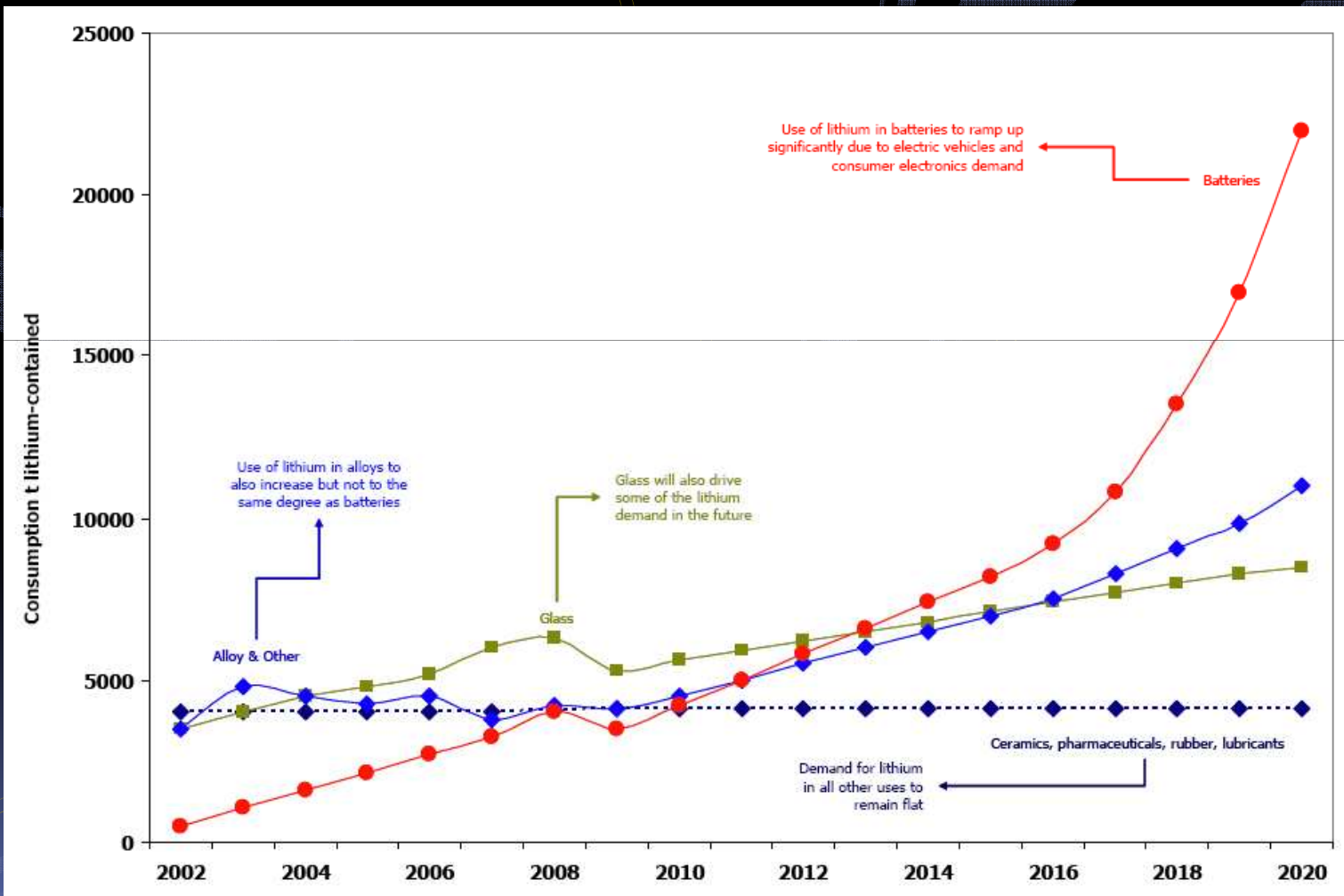
Lithium Growth for EVs

35% of lithium demand will be driven by EV Batteries



Source: Credit Suisse

Lithium Usage Projections

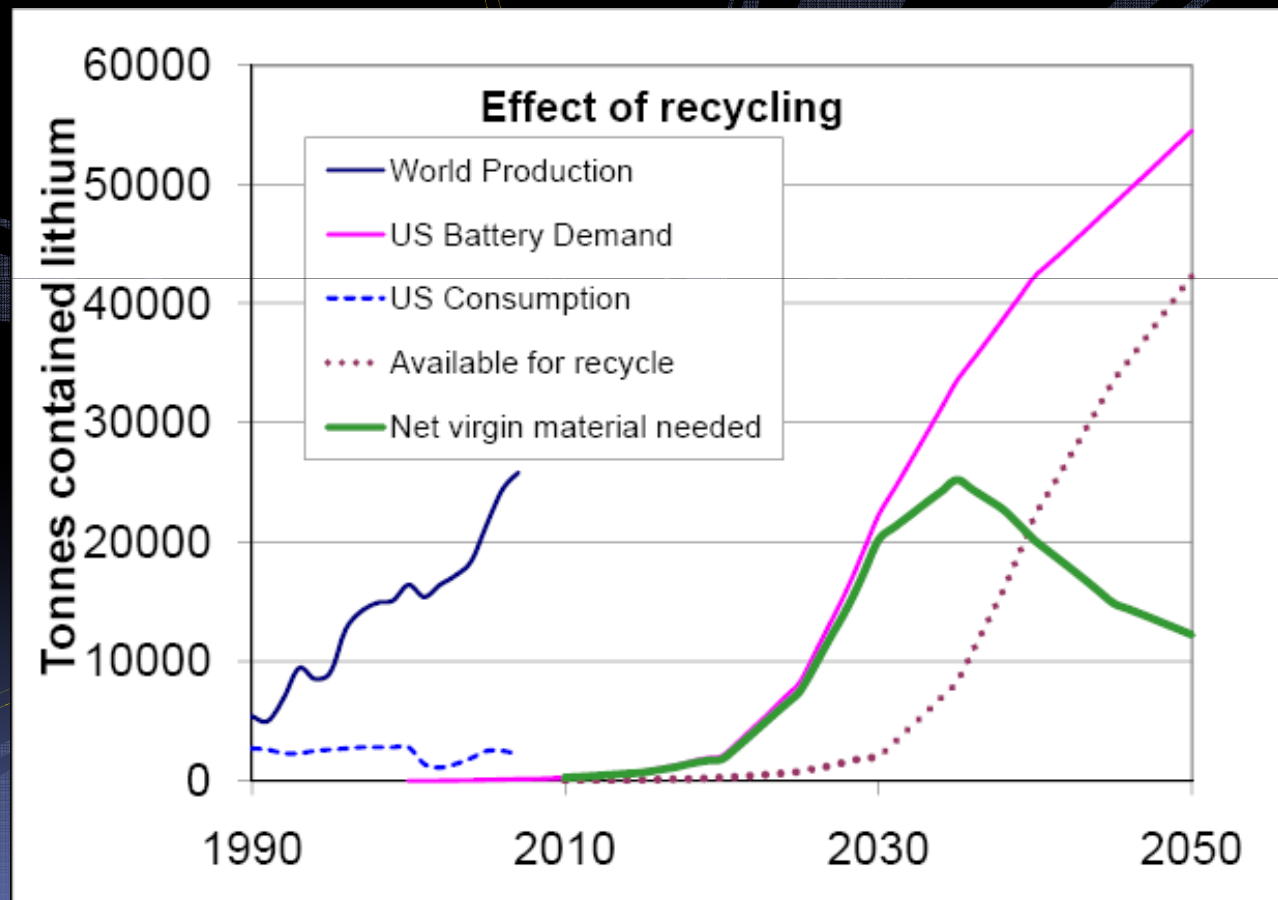


Source: TRU Group/Dundee Securities

Lithium Usage in Batteries

2050 Demand of 54000 tonnes

Recycling will reduce lithium consumption



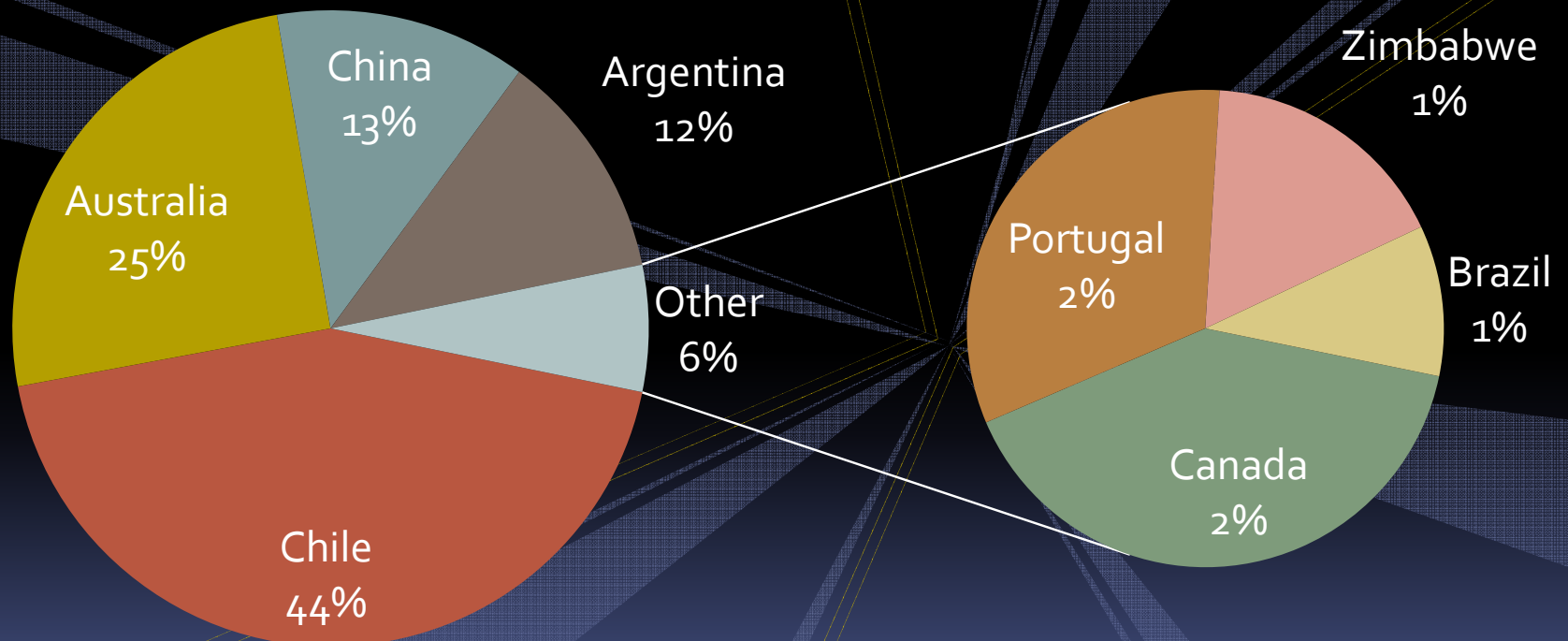
Source: Argonne National Lab – L. Gaines

Lithium Production



Lithium Production

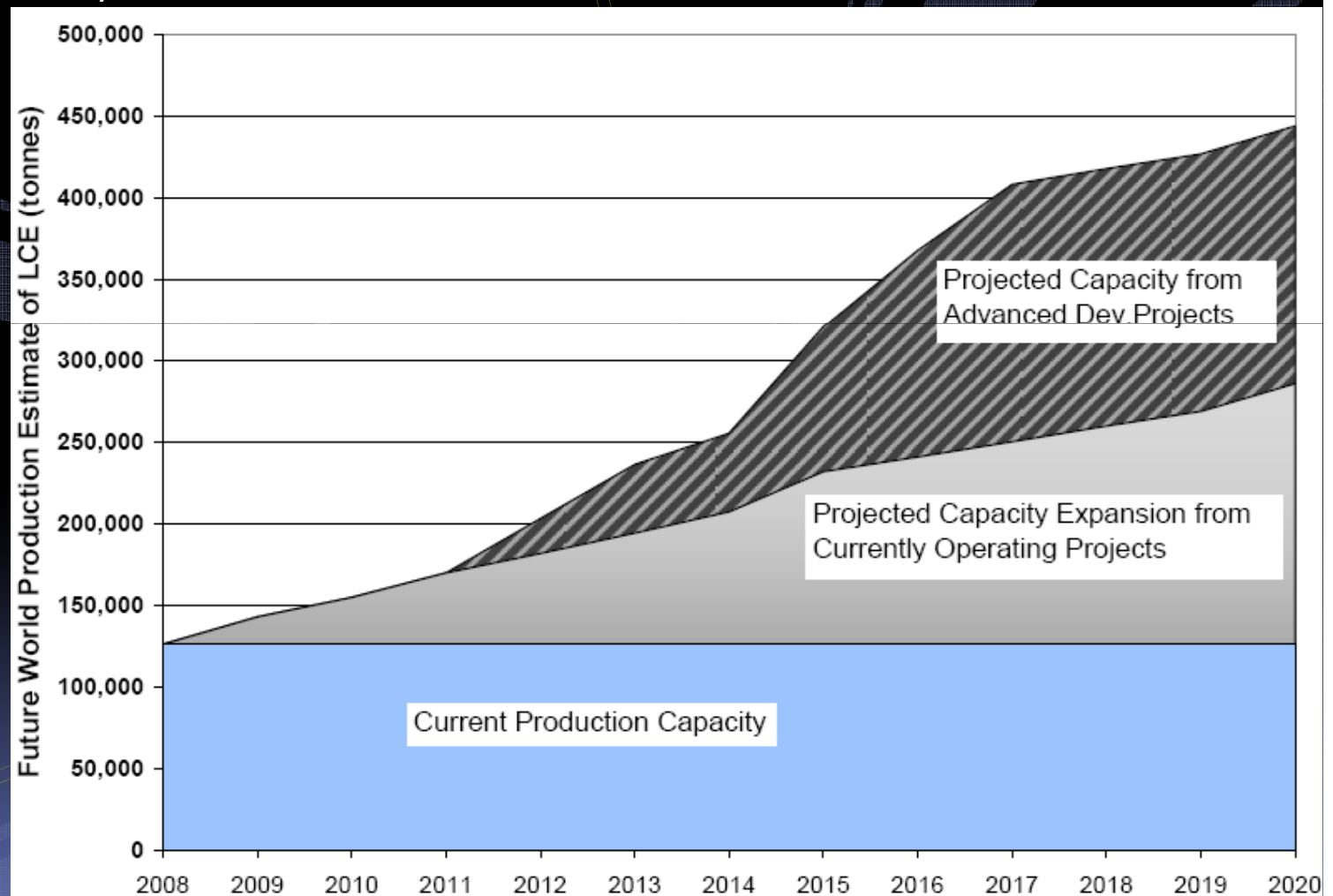
27,000 tonnes Li in 2008



Source: USGS

Production Projection

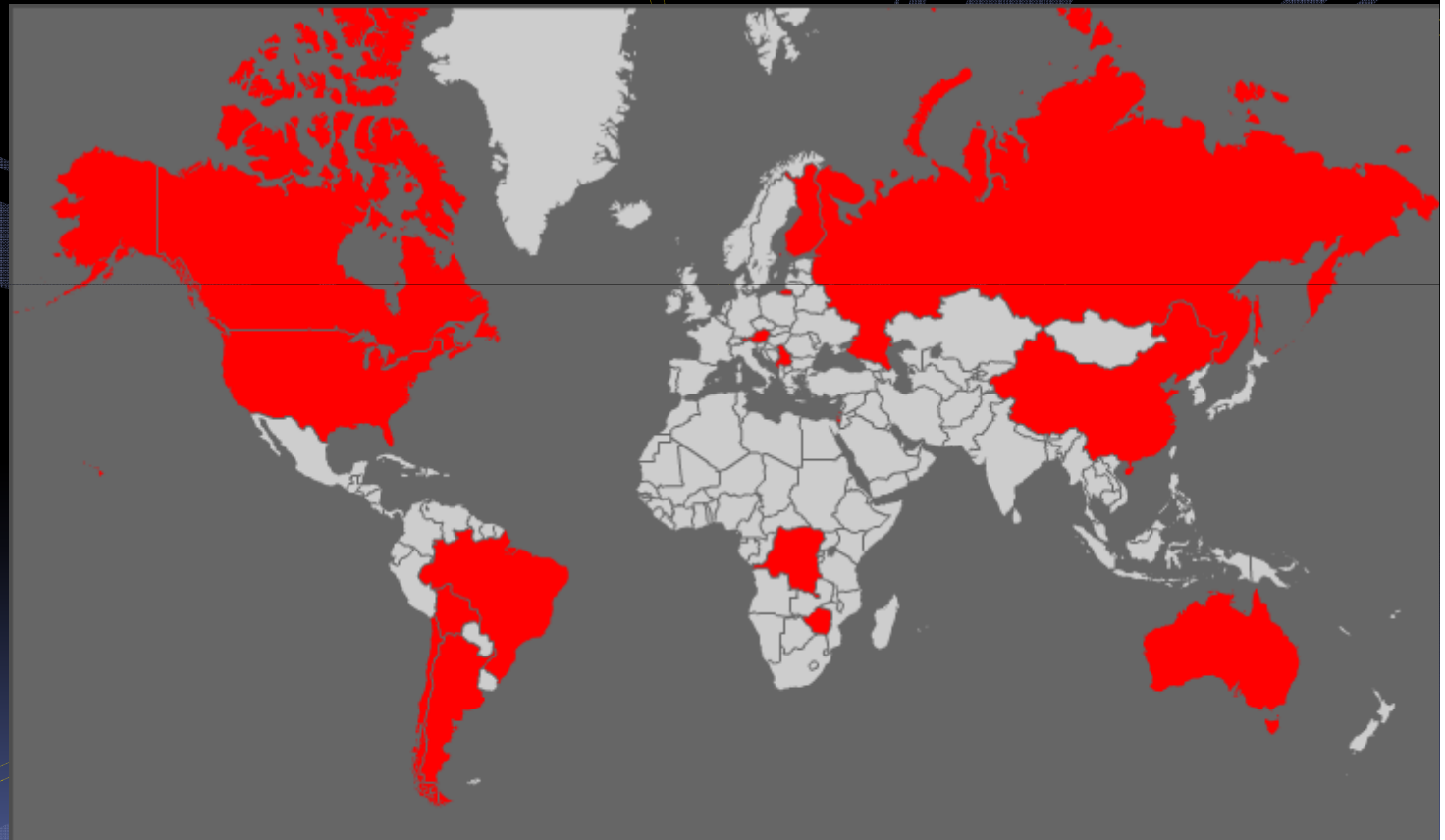
450,000 tonnes/year in 2020



Source: Dundee Securities

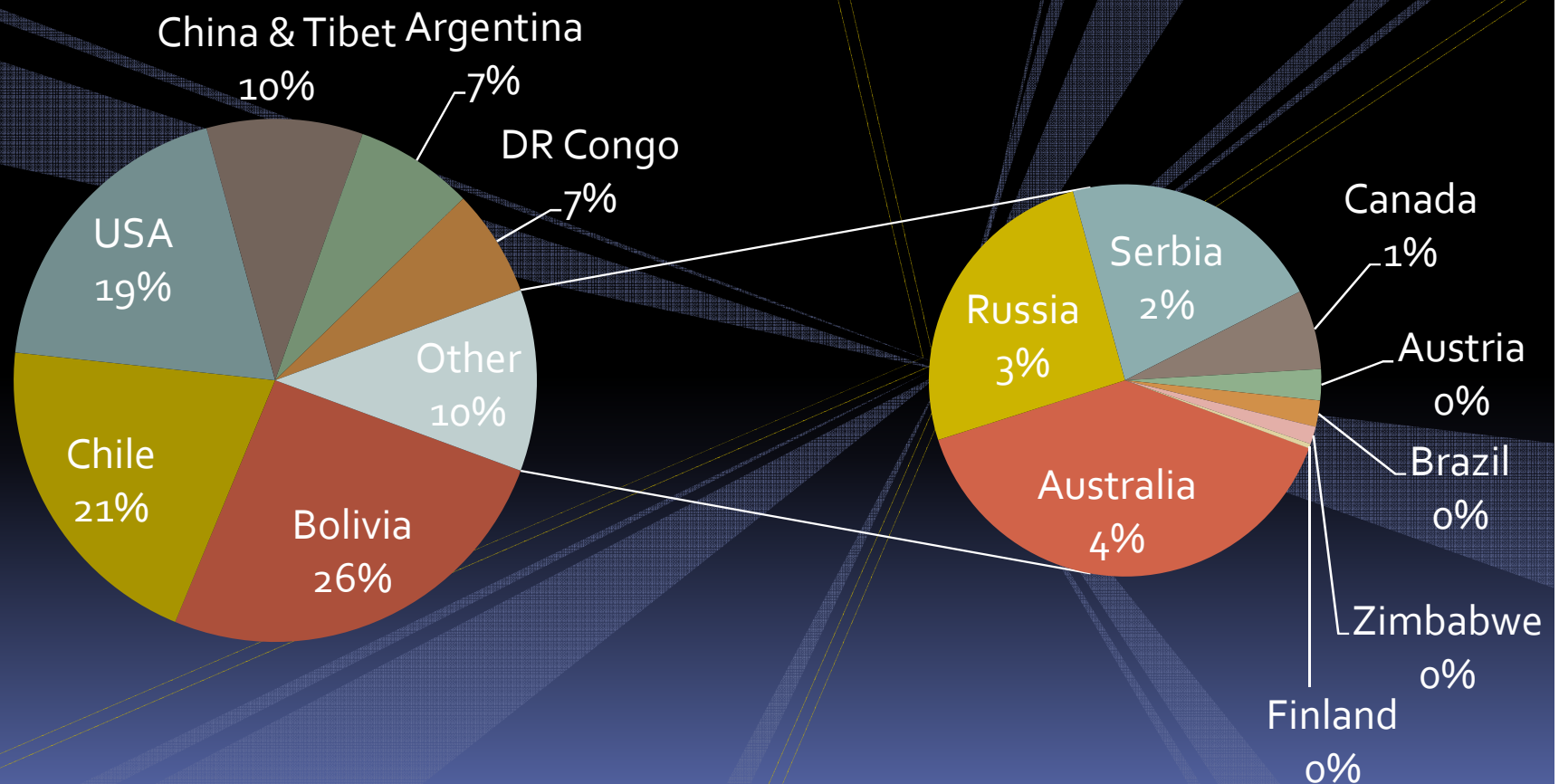
Lithium Reserves

Lithium



Lithium Reserves

Nearly 35 million tonnes Li – enough for 100 years without recycling.



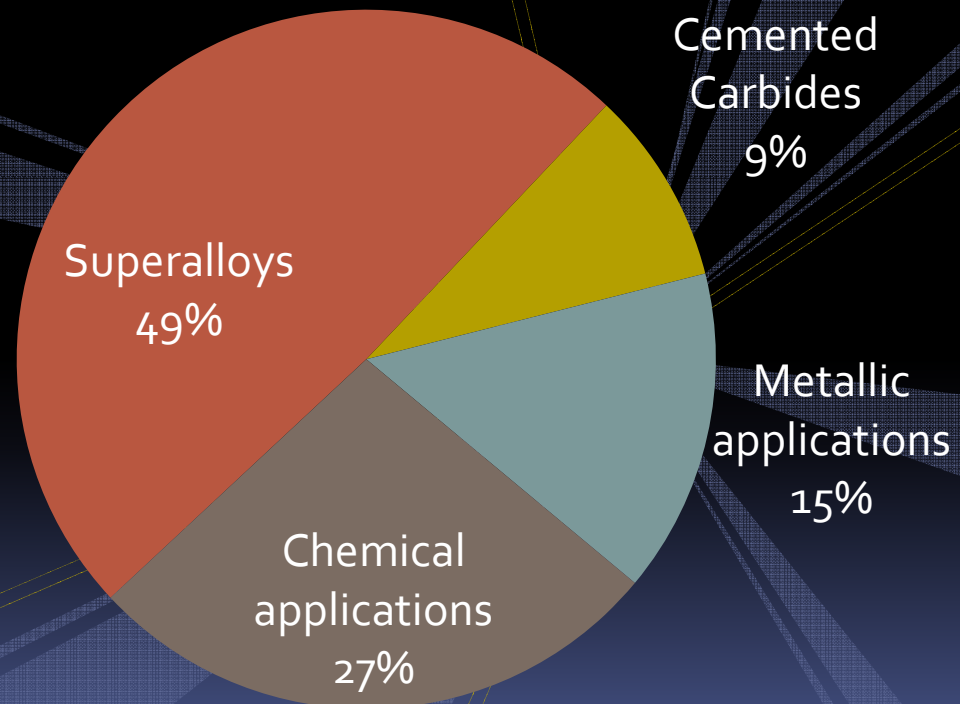
Source: R. Keith Evans

Bolivia

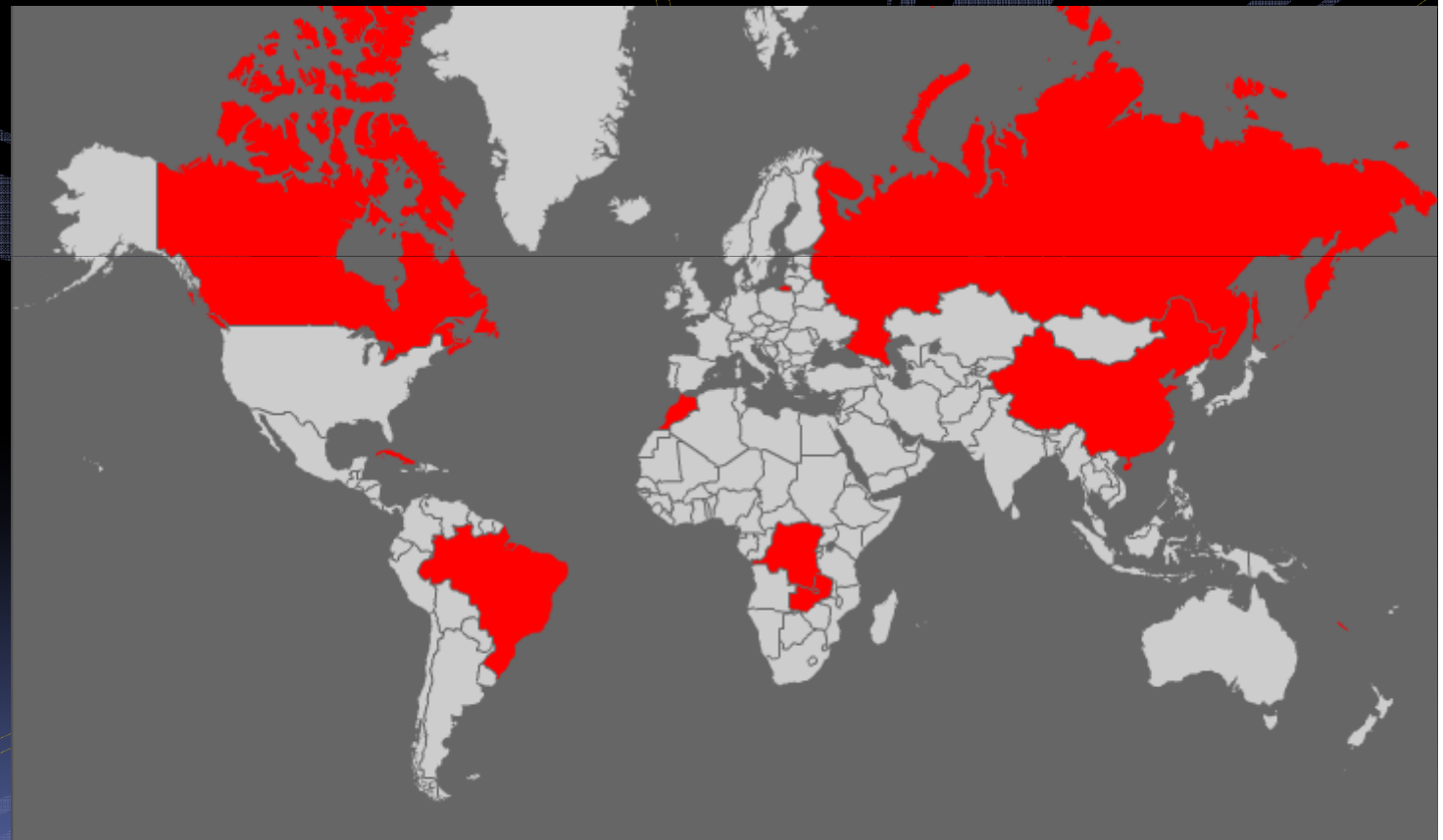


Cobalt Applications

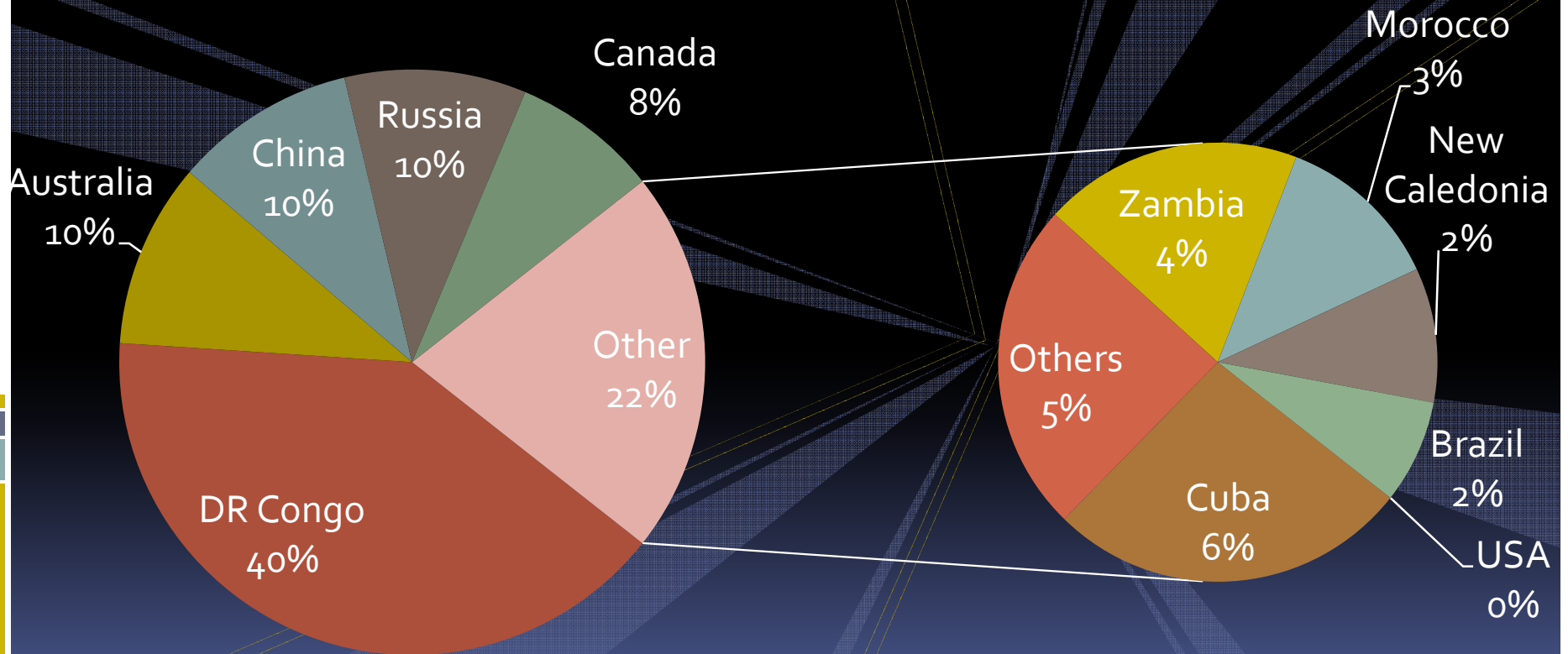
Total Market Share



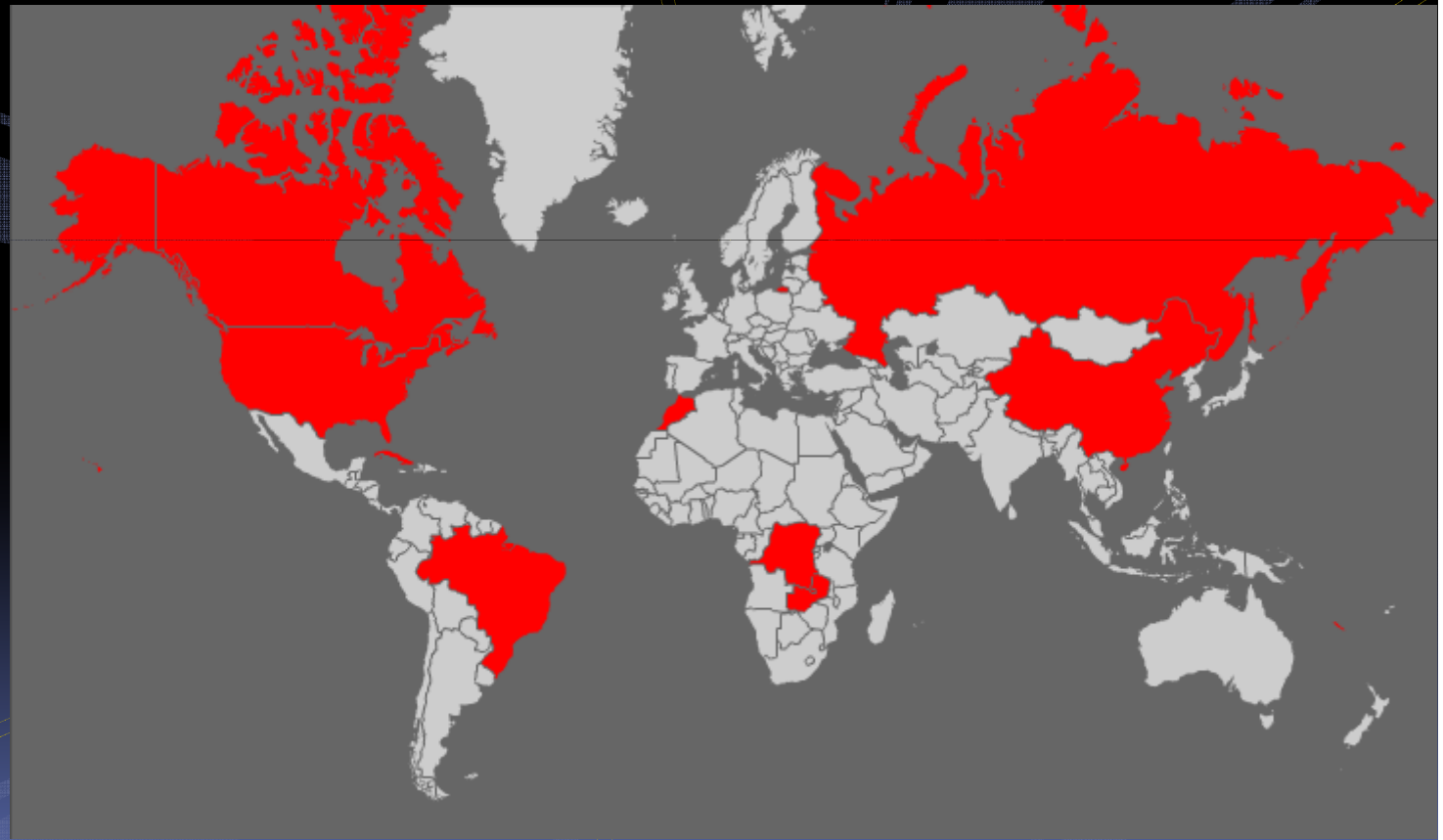
Cobalt Production



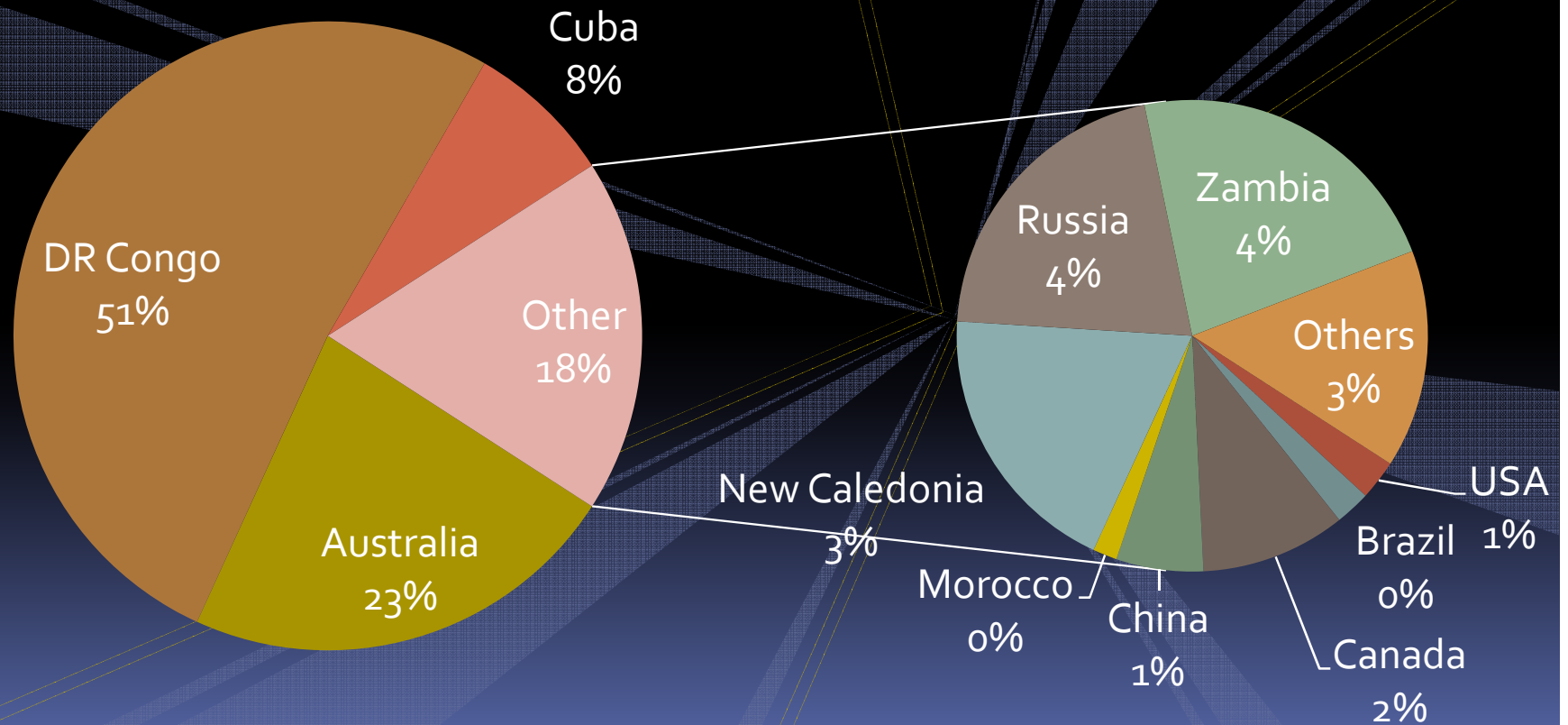
Cobalt Production



Cobalt Reserves



Cobalt Reserves





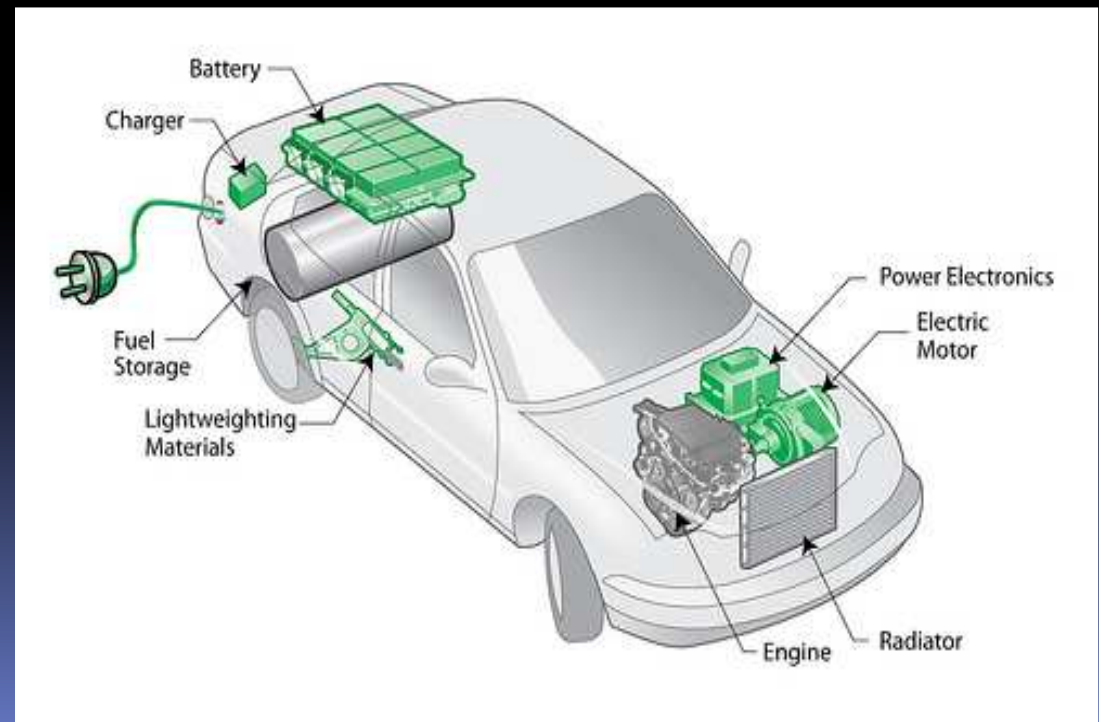
Democratic Republic of the Congo

Death Toll in Congo Since 1998

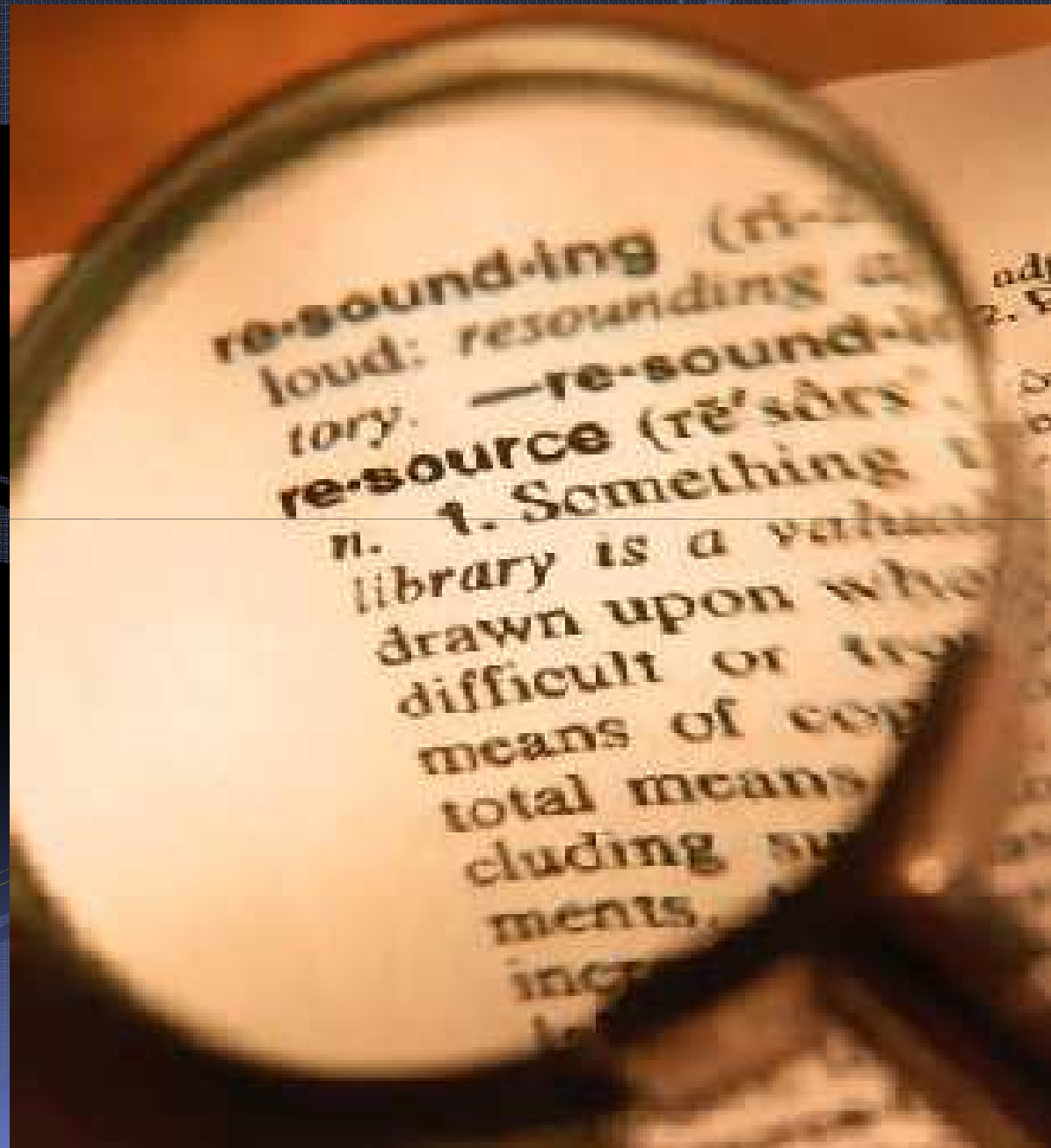
4,804,247

The TREM Car

- Battery
 - NiMH: Cobalt, Lanthanum, Cerium
 - Li-Ion: Lithium, Cobalt
- Electric Motors/Generator
 - Neodymium, Praseodymium, Dysprosium, Terbium
- Lubricants
 - Lithium
- Glass and mirror polish
 - Cerium
- LCD Screen
 - Yttrium, Europium and Cerium
- Catalytic Converter
 - Cerium/Zirconium, Lanthanum
- Diesel Fuel Additive
 - Cerium, Lanthanum



We need





We need

TRREM

Technology & Rare Earth Metals



TREM

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