

P. ZIHLMANN INVESTMENT • MANAGEMENT AG

Clean Energy: We need smart energy solutions that provide reliable and affordable electricity, contribute to a strong economy, and do not compromise our health or our climate. No single energy technology can accomplish all of this.

Lithium Batteries

As the insatiable demand for energy coupled with ever our increasing need for mobility continues at a furious pace, so too grows the demand for lithium compounds. Demand from the lithium battery market from all applications including mobile devices like cell phones and tablets, e-bikes, hybrid and electric vehicles and large scale energy storage is growing at an astounding rate. We are at the dawn of a new automotive era with “unprecedented technological and regulatory change” set to come in the next 5 years.”

Graphite

Graphite is an essential but often unrecognized material for modern life, with broad industrial applications due to its unique properties:

- Properties of both metals and non-metals (ideal for industrial applications)
- Highest natural strength and stiffness of any material
- Lightest weight of all reinforcement materials
- Very high melting point; low thermal expansion/shrinkage
- High electrical and thermal conductivity
- Low frictional resistance and hydrophobic behaviour (excellent lubricant)
- Non-toxic, chemically inert and high resistance to corrosion

ELON MUSK: LITHIUM ION BATTERIES SHOULD BE CALLED NICKEL-GRAFITE

Cobalt

We believe the story of the electric vehicle (EV) is akin to that of the mobile phone. Once inefficient, impractical and priced beyond the reach of the average consumer, the electric vehicle is on the cusp of reaching the next wave of adoption. Improving energy density of batteries together with declining battery costs and a growing desire to pursue environmentally-friendly technologies has led to an inflection point where the electric vehicle is now entering the mainstream at a more economically attractive price point. We believe now could be the beginning of a paradigm shift in automobile transportation. A shift that will be fueled in part by a relatively unknown metal in increasingly scarce supply – cobalt.

Nickel

High-purity nickel and cobalt sulphate are key raw material inputs for the rapidly growing lithium-ion battery industry

Zinc

About 60% of zinc is utilized for its corrosion resistance (galvanized steel, rebar, **autos**, structural steel).

Developing/emerging economies anticipated to increase zinc usage as middle class expands.

Initiatives propelling new uses of zinc include Zinc energy technology: Advances in **Zinc-Air battery technology** in renewable power storage applications and fuel cells

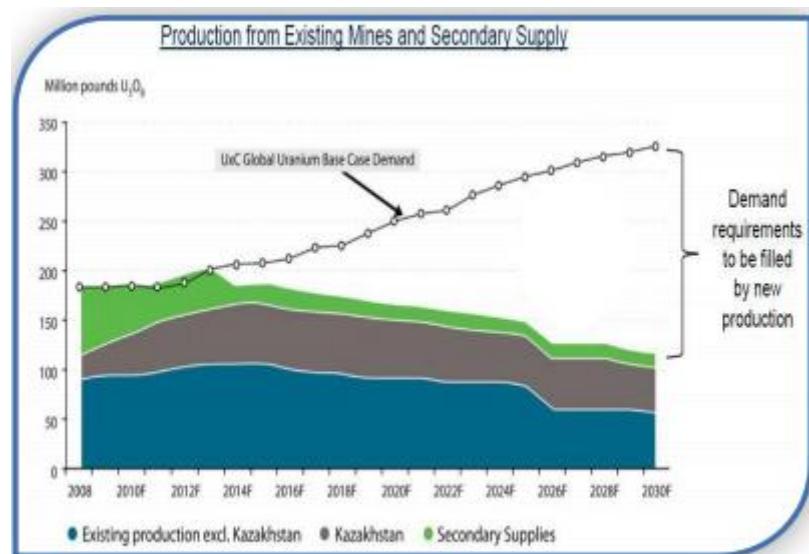
Zinc is difficult to substitute and typically forms a minor cost component in its applications.

Copper

As the world's leading economies continue to urbanise and industrialise, refined annual copper demand is expected to increase from 19 million tonnes to more than 25 million tonnes by 2020.

Clean Energy needs to be produced before it can be consumed!

Nuclear Fuel Demand Is Growing



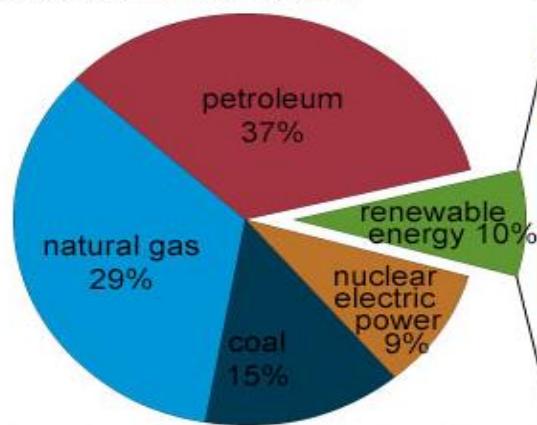
*Source: UxC Uranium Market Outlook

U.S. Nuclear: 20% of nation's electrical energy; 62% carbon-free electricity

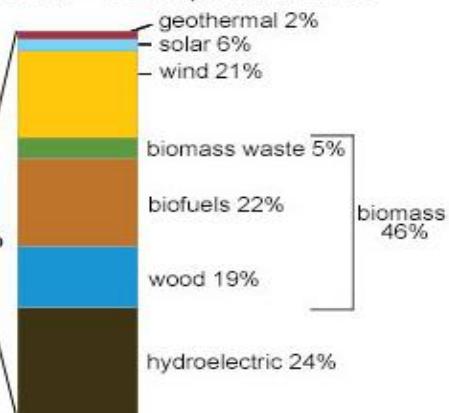
- Worldwide: 11% electrical energy; ~1/3 low carbon electricity production
- 448 operable reactors; 61 under construction
- International reporting projects continued increases in use: global U3O8 demand to increase 3.1% annually through 2025
- Russia's Rosatom and China's CNNC aggressively exporting nuclear power plants to non-OECD countries
- Chinese purchasing 66M lbs. of U3O8 per year, or 40% of total global U3O8 production
- Worldwide: > 1Billion pounds uncontracted for requirements 2017- 2027

U.S. energy consumption by energy source, 2016

Total = 97.4 quadrillion
British thermal units (Btu)



Total = 10.2 quadrillion Btu



Note: Sum of components may not equal 100% because of independent rounding.

Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1, April 2017, preliminary data



The world-wide trend towards **Clean Energy** will expand and offers unique investment opportunities!

How can you benefit?

We offer individually managed clean energy portfolios!



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