

**MAYNE  
MINERALS INC.**

*URANIUM • VANADIUM • RARE EARTHS • TIN • TUNGSTEN*

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# ABOUT MAYNE MINERALS INC.

Mayne Minerals Inc. is committed to developing its operations based on the highest possible research standards in order to acquire valuable assets that address the global need for sustainable products.

Our focus on historical mining data allows us to identify strategic opportunities that meet the needs of the world today.

Moreover, we are ideally positioned to target the increasing demand for minerals and resources that are necessary to support the growth of green-electric industries.



## From the President & CEO

After 67 years in the mining industry I'm excited to be able to advance the renewable energy sector to another level. There are many targets to be investigated prior to a drilling program.

I'm continuing my research for new acquisitions for the company to increase shareholder value. It is a joy and pleasure to work with professionals on all levels to make my dream a reality.

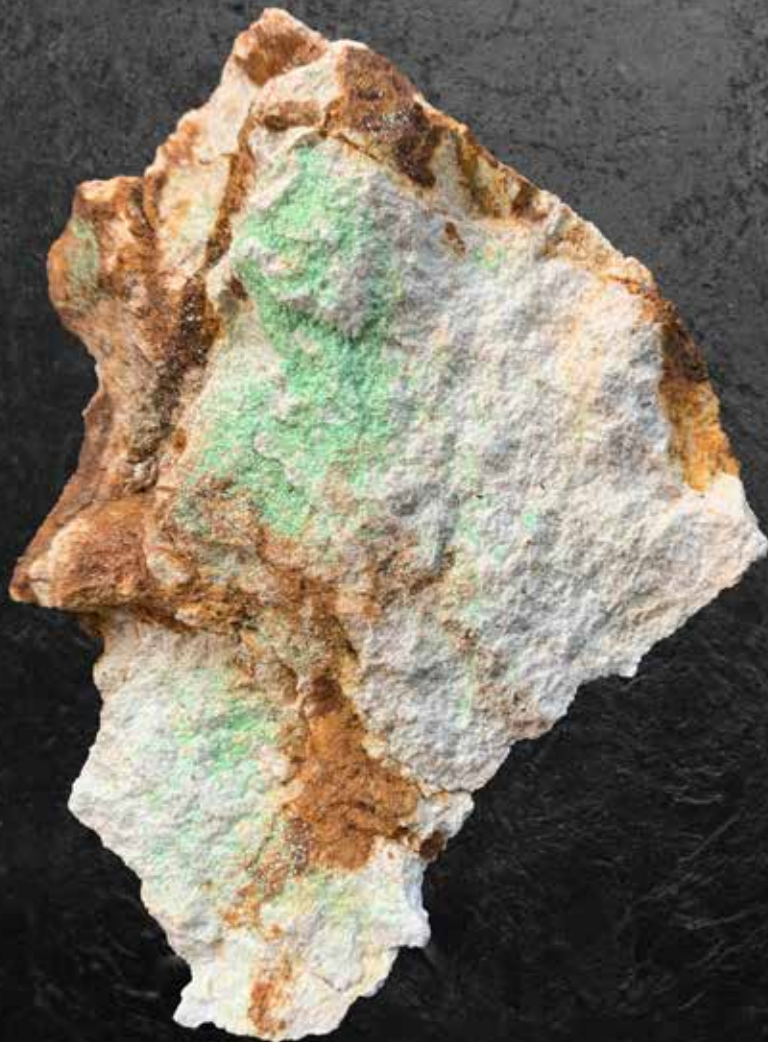
I look forward to blue skies ahead!

Robert Rosenblat

A handwritten signature in black ink that reads "Robert Rosenblat". The signature is written in a cursive, flowing style.

# PROSPECTOR FREEDOM MINES

## OVERVIEW



Mayne Minerals has made the strategic decision to acquire **The Prospector U.C.A and Freedom 1 & 2 mines** due to the presence of a significant uranium deposit at lower levels.

It is important to note that these mines have a history of production. The average grade of the **ore extracted was .2%**.

One of the key advantages of these mines is their **ideal location, as they are situated near main roads, secondary roads, and have access to power and water sources.**

The property itself features **two inclined shafts and a vertical shaft that reaches a depth of 900ft.**

In the past, mining operations focused on ores found within **50-150 feet of the surface.** The process of surface oxidation led to the formation of various **secondary uranium and molybdenum minerals.**

The primary ore minerals found in these mines include **uraninite, coffinite, jordisite, and umohaite.**

Notably, a **previous drill hole** extended all the way to the **1500 feet level** and was still within the **ore zone.**

# PROSPECTOR FREEDOM MINES

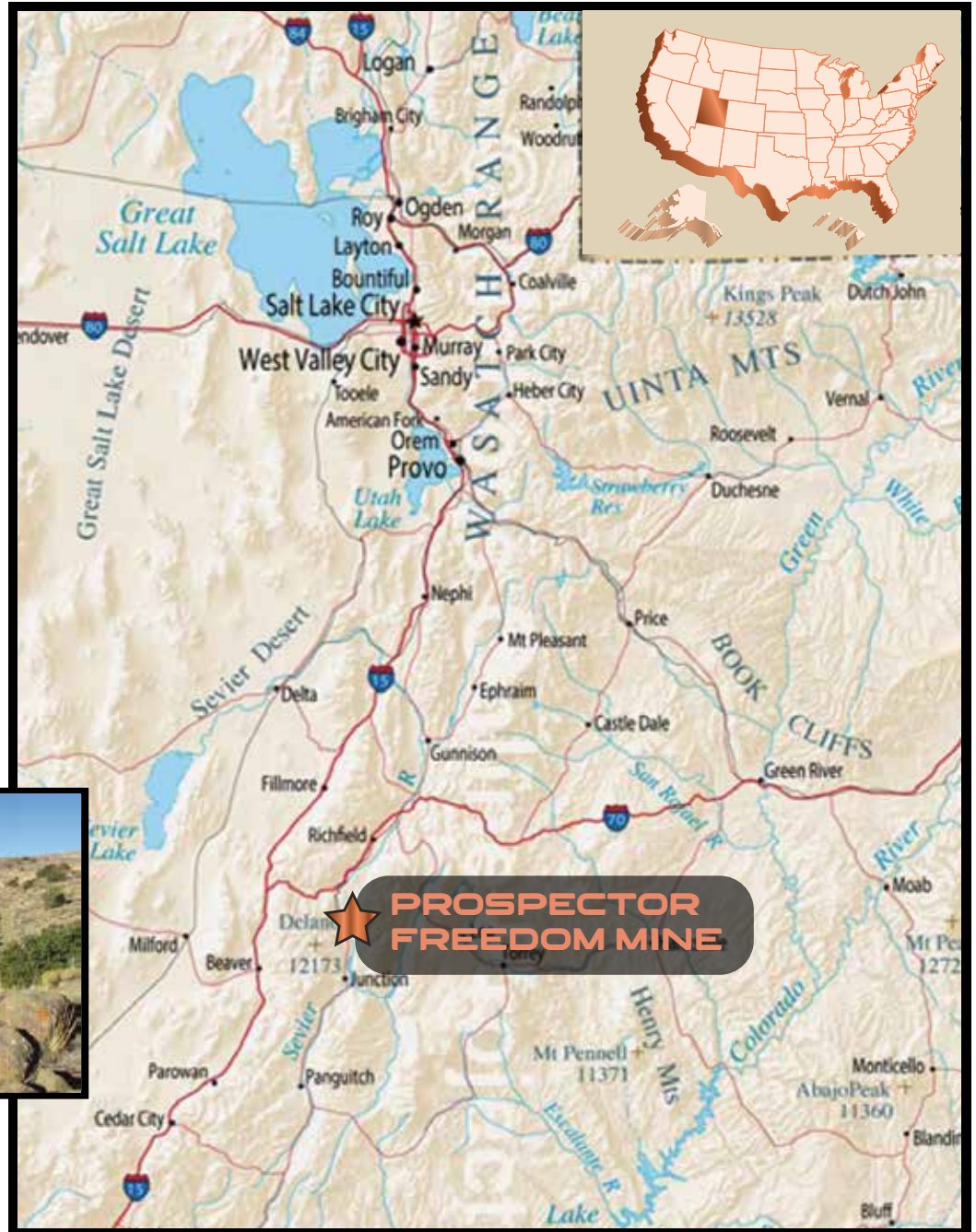
## MARYSVALE MINING DISTRICT, UTAH

### LOCATION

The Prospector and Freedom Mines Project is located approximately 3.25 miles (5.25 km) North East from the village of Marysville.

The Property is accessed by several gravel and paved roads (County maintained), approximately 5 Km (3 miles) east of US Highway 89.

The Prospector and Freedom Mines Project is located in a moderate to high relief known as the Antelope Range extending NW-SE between the mountain ridges.



View of the Prospector South adits and trenches.



Waste piles of the main Prospector Mine (looking SW)

# PROSPECTOR FREEDOM MINES

## ACCESS ROADS

Gravel roads network in the Central Mining Area, Marysville area, Utah



# PROSPECTOR FREEDOM MINES

## CLOSER VIEW

View to the SW, showing the large flat valley of the Sevier River and in the back-ground, the eastern slope of the Tushar Mountains (above 12,000 ft above sea level).



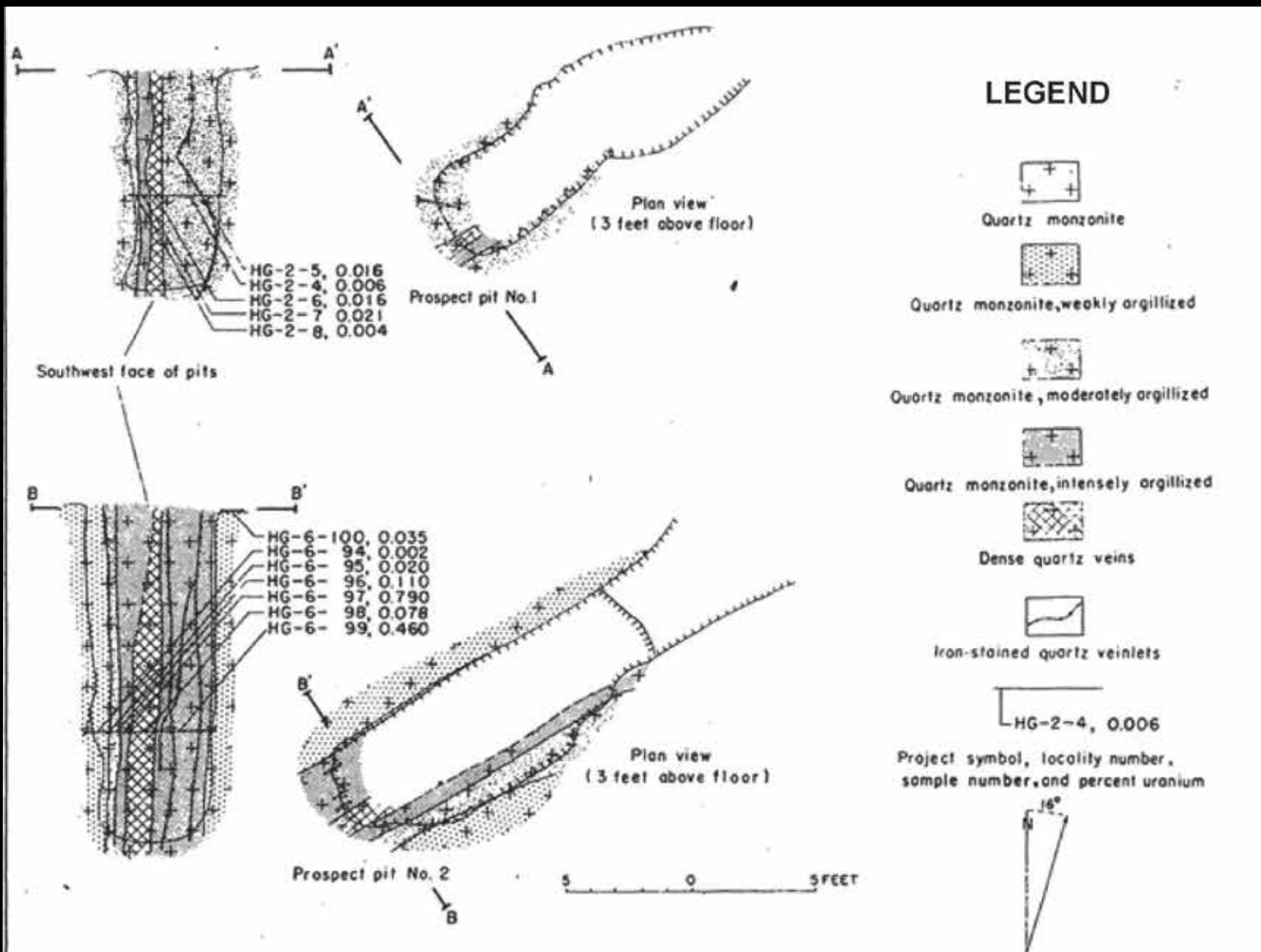
View of the Prospector Freedom Mines Project area.

The summit is the Jungfrau Hill topping at 2195 m (7,200 ft) above sea level.

# PROSPECTOR FREEDOM MINES

## SAMPLING AND ASSAYS,

Sections A-A' and B-B' across the underground working and pits, sampling and assays, Prospector No 1, Piute County, Utah.





# URANIUM

## FACTS AND USES

U

238.02

U

Uranium  
92

Uranium is the provider of the main heat source within the core of our planet. This is the result of a slow radioactive decay, which is part of uranium's natural life cycle.

Uranium is more common than gold, silver, and mercury, it just occurs in lower concentrations, typically about .1% to .2% .

In addition to its use as a source of near-limitless energy, uranium is also used to propel maritime vessels and to create healing medical isotopes.

Uranium's high energy density makes nuclear power more efficient than other energy sources. This includes renewables like wind and solar, which require much more land to generate the same amount of electricity as a single nuclear reactor.

Nuclear reactors harness uranium's properties to generate energy without any greenhouse gas emissions.

The resurgence of nuclear power, in addition to reactors that are already under construction, will likely lead to higher demand for uranium—especially as the world embraces clean energy.





### 1789

#### DISCOVERY

Martin Klaproth, a German chemist, who isolated an oxide of uranium while analyzing pitchblende samples now known as Uraninite.



### 1800s

#### USES

It was mainly used to tint glass and ceramics in shades ranging from yellow-green to orange and red.



### 1896 - 98

#### RADIOACTIVE PROPERTIES

Marie Curie and husband Pierre, first noticed uranium's radioactive properties using tonnes of uranium to obtain fractions of a gram of a new radioactive element they discovered in 1898 – radium.

### 1938

#### NUCLEAR FISSION

German chemist Otto Hahn and radiochemist Fritz Strassman split uranium by bombarding its nucleus with low-velocity sub-atomic particles, in the world's first neutron-induced nuclear fission.

### 1945

#### ATOM BOMBS

Y-12 plant in Oak Ridge, Tennessee, began producing the bomb-grade U-235 used in Little Boy, the world's first nuclear bomb

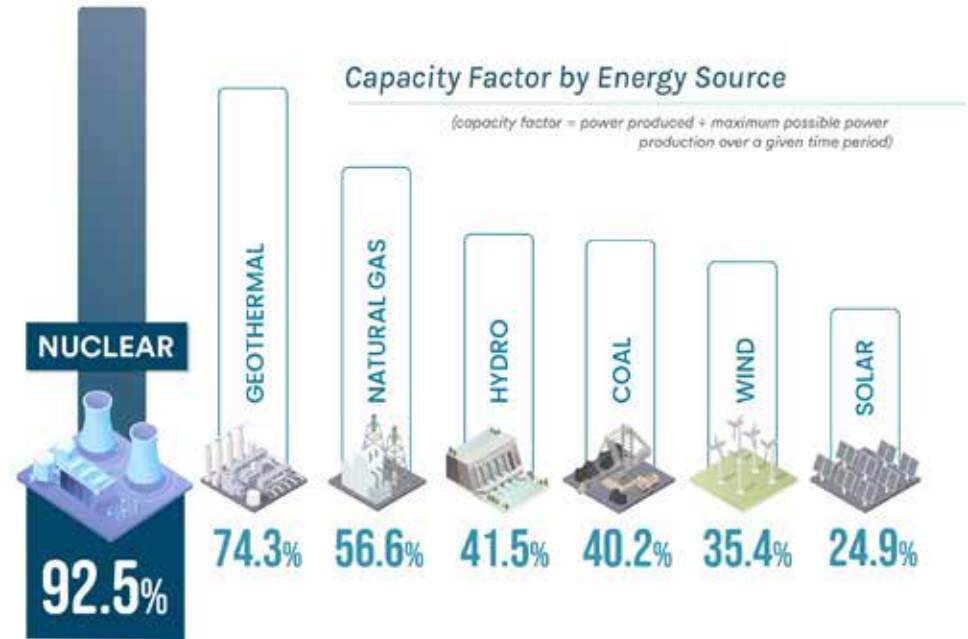
### 1951

#### NUCLEAR FUEL

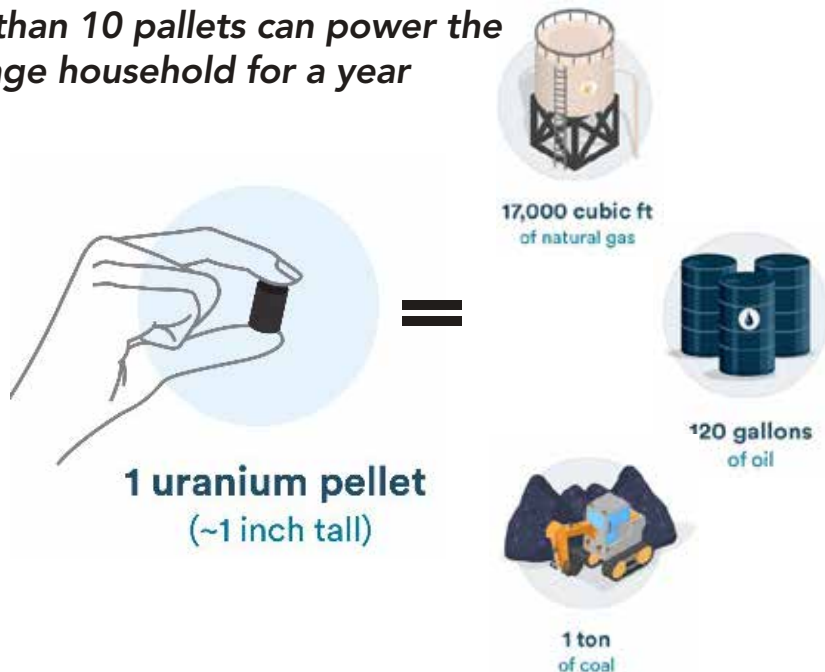
Nuclear power was first used when an experimental nuclear reactor at lit four ordinary light bulbs. Six years later the U.S. opened its first full-scale power plant with a 60- megawatt generating capacity.

## WHY INVEST

- With the world's demand for reliable, low-carbon electricity set to increase by 27% from 2021 levels through 2030, and by another 41% from 2031-2040., **nuclear power** is expected to become an **integral part of the energy mix**. This will create an **high demand for uranium**, a key component in nuclear power generation. <sup>1</sup>
- Highest capacity factor** of any traditional or alternative energy source, **nuclear energy can provide a steady and reliable supply of power with minimal wastage**.



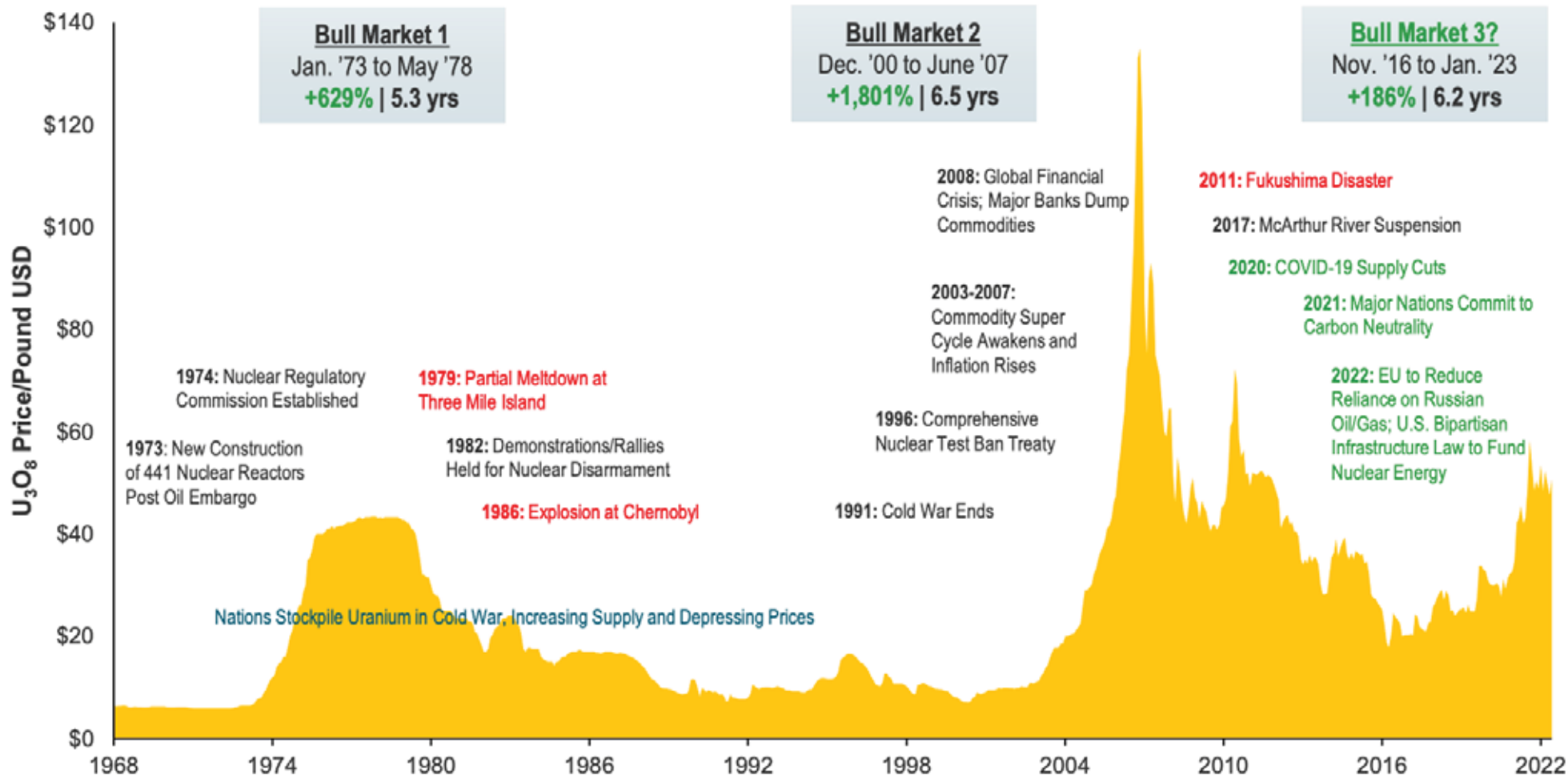
*Less than 10 pallets can power the average household for a year*



- Nuclear power plant restarts, life extensions and new builds** are all creating incremental **demand for uranium**
- Nuclear energy** produces the **LEAST CO2 equivalent** emissions versus other energy forms, helping solidify its place in **global decarbonization goals**.
- Uranium's** high energy **density** **reduces the impact** of extraction and transport, facilitating the ability to **contain waste**
- Current **uranium price** remains **below incentive levels** to restart tier 2 production and greenfield development

# URANIUM

## THE BIG COME BACK





More than 80% of vanadium is currently used as an alloy in steel and titanium.

Vanadium rarely exists as a free element in nature but can be found in about 65 different

Good corrosion resistance to alkalis, sulphuric acid, hydrochloric acid, and salt waters

World resources exceed 63 Million tons

Can be found in

- Auto components (axles,crankshafts, gears)
- Aerospace (Jet engines)
- High-speed drilling

Vanadium-steel alloys are also used to manufacture tools, armour plates, and automobile components such as axles, piston rods and crankshafts.

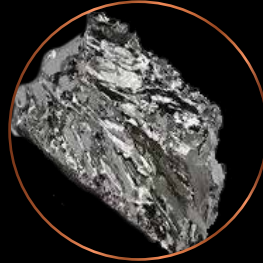


## 1801 DISCOVERY

Discovered twice. The first time was in 1801 by Andrés Manuel del Río. The second time was in 1831 by the Swedish chemist Nil Gabriel Selfström at Stockholm.

## 1911 MEDICAL

In 1911, German chemist Martin Henze discovered vanadium in the hemovanadin proteins found in blood cells (or coelomic cells) of Ascidiacea (sea squirts)



## 1831 “V” ISOLATION

Berzelius reported the production of the metal, but Henry Enfield Roscoe showed that Berzelius had produced the nitride, vanadium nitride (VN)

## 1927 NEW CATALYSTS

Pure vanadium was produced by reducing vanadium pentoxide with calcium.



## 1867 IMPROVEMENTS

Roscoe eventually produced the metal in 1867 by reduction of vanadium(II) chloride,  $VCl_2$ , with hydrogen.

## 1908 - 1927 FORD MODEL T

The first large-scale industrial use of vanadium was in the steel alloy chassis of the Ford Model T, inspired by French race cars

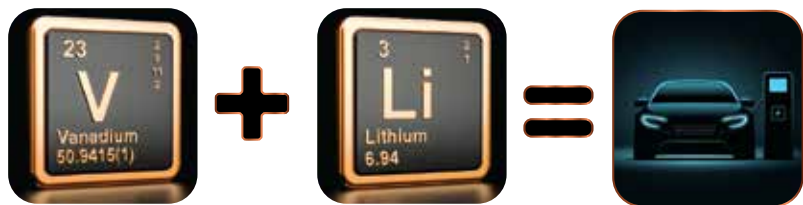


### 'V' IS FOR VERSATILE

Vanadium plays a pivotal role in the advancement of **electric vehicles, construction, aviation and medical equipment**. Significant **supply demand** in these regions are attracting interest in the **Vanadium mining industry**.

### VANADIUM FLOW BATTERY (VFB)

Vanadium acts as a **SUPERCHARGER** to batteries and improves the performance of what it is added to.

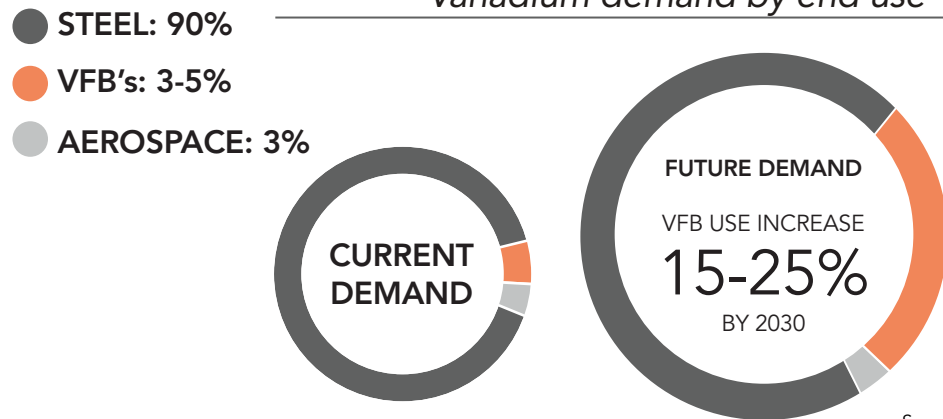


### VFB ADVANTAGES

- Lifespan of tens of thousands of cycles.
- Does not self-discharge.
- Can release huge amounts of electricity instantly.
- Only battery technology today capable of powering everything from a single home.

Source: Nextsourcematerials  
Bushveld Minerals  
Lifescience

Vanadium demand by end use



Source: Crugroup

### CONSTRUCTION STEEL

Vanadium is primarily used in **high-strength steel, titanium, aluminum and other alloys**, along with certain applications in the chemical industry. The use of stronger rebar to reduce catastrophic destruction in earthquake is creating a **high demand for vanadium**.

### AVIATION AIRFRAMES

**Vanadium** foil is used in cladding titanium to steel to make **airframes**. In this sector, **vanadium is irreplaceable** as there is no acceptable substitute for Vanadium in aerospace titanium alloys.

### MEDICAL EQUIPMENT

Vanadium is used to treat various ailments, from diabetes and heart disease to high cholesterol, and has been used in components of implantable cardioverter defibrillators. It is also used in cellular growth, redox and signaling processes, as well as enzyme function.

# RARE EARTHS

## FACTS AND USES

Rare-earth elements (REE) are necessary components of more than 200 products across a wide range of applications, especially high-tech consumer products.

Rare-earth magnets are stronger per unit weight and volume than any other magnet type.

The glass industry is the largest consumer of REE raw materials, using them for glass polishing and as additives that provide color and special optical properties



The chemical properties of the rare earth elements make them difficult to separate from surrounding materials and from one another. These qualities also make them difficult to purify

Other substances can be substituted for rare earth elements in their most important uses; however, these substitutes are usually less effective and costly.

Deposits of these metals are found in many places around the globe, with some elements in about the same abundance in the earth's crust as copper or tin.

REEs do not exist individually, like gold or copper often do, but instead occur in minerals as either minor or major constituents.



# RARE EARTHS

## THE HISTORY



**1788**

### DISCOVERY

yttrium was the first RRE found when an unusual black rock was unearthed by a miner in Ytterby, Sweden. Johan Gadolin who then gave the element its name.

**1913**

### ELEMENTS

British physicist Henry Moseley determined there were 15 elements in the lanthanide series (atomic numbers 57 through 71) using X-ray spectroscopy.



**1839**

### FINDING ELEMENTS

Chemist Carl Gustaf Mosander began to systematically analyze the mixed rare earths, discovering and naming lanthanum, erbium, and terbium. Gustav Kirchhoff and Robert Bunsen developed spectroscopy as a technique for identifying elements by examining light spectra

**2000**

### ATOMIC AGE

Otto Hahn, Lise Meitner, and Fritz Strassmann discovered nuclear fission of uranium. In order to build an atomic bomb the rare earths needed to be separated and removed in the process of purifying uranium.



**1880**

### IMPROVEMENTS

Carl Auer von Welsbach found and named neodymium and praseodymium. Welsbach became the first person to develop a commercial use for the rare earth elements.

**1970 - NOW**

### INDUSTRY

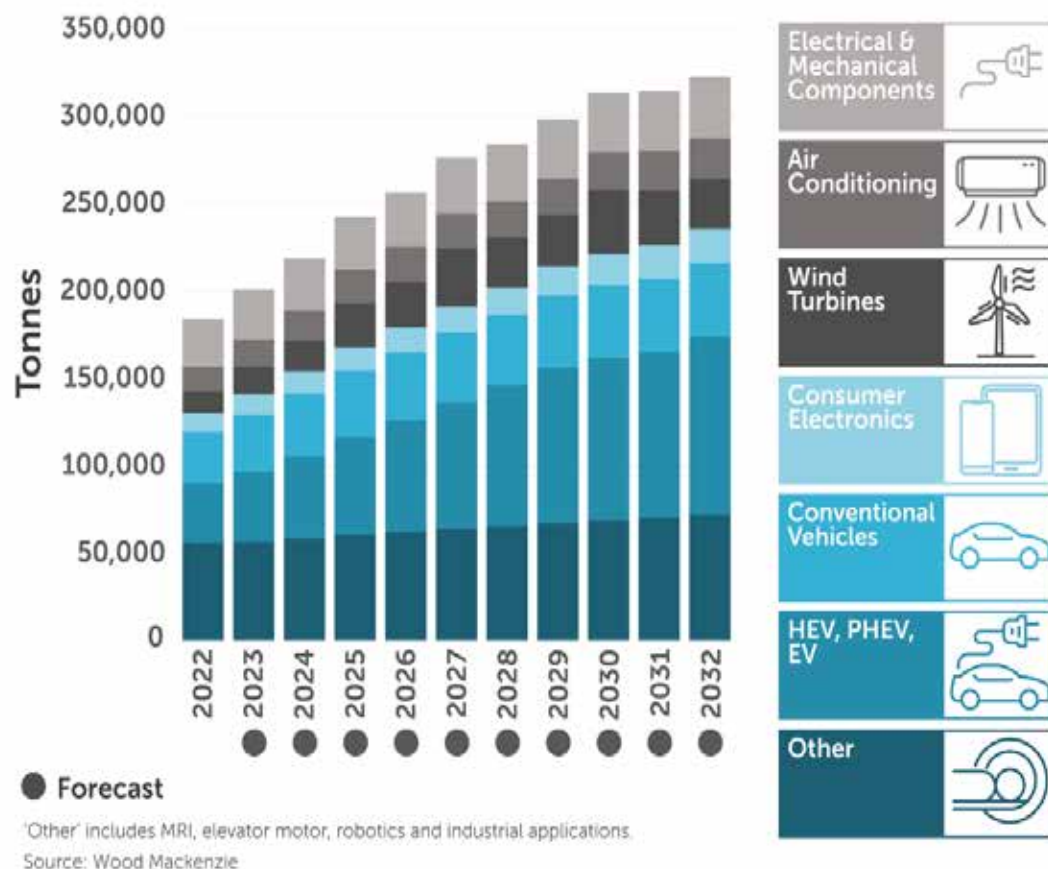
China began to develop its manufacturing and global trade capabilities as a way to secure political stability. Until now they remain leaders in the production and distribution of Rare Earths.

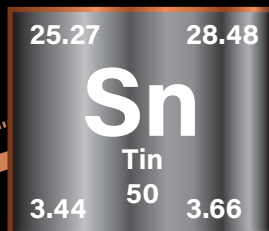
# RARE EARTHS IN MAYNE

## WHY INVEST

- As governments turn pledges to decarbonise economies into reality, there's **fierce competition for rare earths and strategic metals**. Among other things, they're needed for making the world's most **powerful magnets**, used in electric vehicle batteries and wind turbines.
- Magnets** from rare-earth metals are used in motors for **industrial robots as well as hybrid and electric vehicles**. The highly growing EV market requires about 50% more rare-earth metals than gasoline-powered models.<sup>1</sup>
- The **growth in NdFeB magnets** since 2005 is attributed to increased use in the **automotive industry**, in particular electric drivetrains and electric power steering used in **battery, plug-in hybrid and hybrid EVs**. Passenger EVs have grown from 450,000 in 2015 to almost 10 MIL units in 2022 with forecast worldwide expansion of EVs predicted to grow to 34 million in 2030.<sup>2</sup>

## Forecast NdFeB Magnet Consumption by Segment





Tin is never found as the free element. The most important Tin ore is cassiterite (Tin oxide, SnO<sub>2</sub>),

Malleable and somewhat ductile

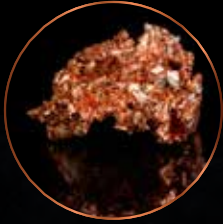
Most Tin is used as a protective coating or as an alloy with other metals such as Lead or Zinc.

Mixed with Copper it gives the alloy Bronze.

Can be found in

- Bells, metal cans
- Solder for pipes or circuits
- Glassmaking

When Tin is cooled below 13.2°C, it changes slowly from white to grey.



## 3500 B.C.

### COPPER TO THE BRONZE AGE

Metalworkers in what is now Turkey learned to add tin to mildly soft copper to form a much stronger bronze. From this bronze, harder tools and better weaponry were made.



## 1000 B.C.

### DISCOVERY OF TIN MINES

Extensive tin deposits were found in England, traders brought the precious metal to countries in the Mediterranean. Britain comes into prominence as a tin-producing country.



## 310 B.C.

### TIN TRADE POWER

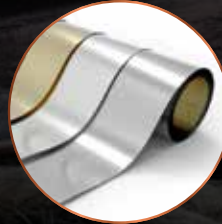
Roman invasion of Britain in 43 A.D. was to control the tin trade. After the conquest of Britain, the Romans were in control of most of the world's supply of the metal.



## 1859

### TIN CANS

Pierre Durand's method of preserving food in tinfoil cans was being perfected. Tin coating on thinly rolled sheet steel provided resistance to corrosion.



## 1952

### FLOAT GLASS METHOD

Glassmaking industry was transformed by the introduction of the float glass method on a bed of molten metal.



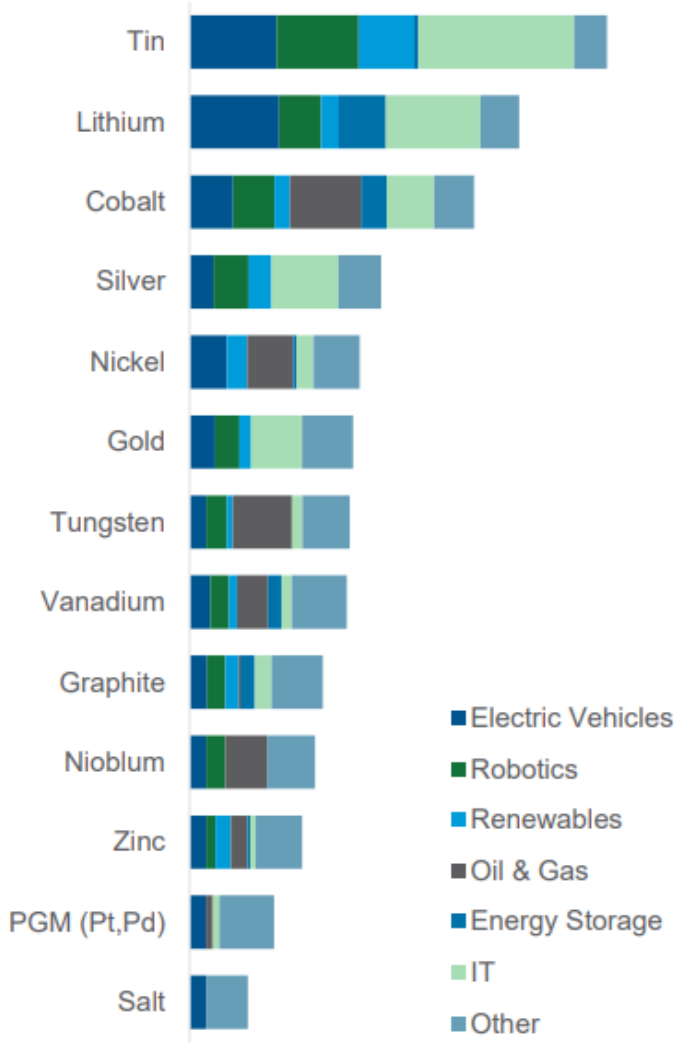
## 2013

### TIN PRODUCTION

More than 22 countries produce tin, but the six largest producers in 2012 were China (33%), Indonesia (32%), Peru (13%), Bolivia (7%), Brazil (4%), and DR Congo (2%).

There is a major investment opportunity for tin mining and recycling as the metal is a vital ingredient in solar energy, electric vehicles and other future technologies.

### Metals Most Impacted by New Technologies



Source: Rio Tinto commissioned MIT survey



#### Advanced Robotics

- The global market for robotics is expected to grow at a CAGR of c.26%, reaching c.USD210bn by 2025
- It is predicted that this market will hit the USD100bn mark in 2020

Source: Statista



#### Electric Vehicles

- The main focus for tin is in the positive anode electrode of lithium ion batteries
- The electric vehicles market is projected to reach 27.0 million units by 2030 from an estimated 3.3 million units in 2019, at a CAGR of 21.1%

Source: Markets & Markets



#### Renewables

- The share of renewables in meeting global energy demand is expected to grow by 20% to reach 12.4% in 2023
- Renewables will have the fastest growth in the electricity sector, providing c.30% of power demand in 2023, up from 24% in 2017

Source: International Energy Agency

# TUNGSTEN

## FACTS AND USES

183.74

W

Tungsten

74

Tungsten is primarily extracted from two types of minerals, wolframite, and scheelite.

Tungsten is only found on Earth combined with other chemical compounds.

The first use of tungsten was more than 350 years ago. Chinese porcelain makers used a tungsten pigment that was a unique peach color.

Tungsten recycling accounts for about 30% of the global supply.

Tungsten is the **ONLY** metal in the third transition series of the periodic table found in biomolecules.

Tungsten has the highest melting point of all metallic elements



# TUNGSTEN

## THE HISTORY



### 1783

#### DISCOVERY

Tungsten was discovered in samples of the mineral wolframite by Juan José and Fausto Elhuyar, Spanish chemists and brothers.

### 1960-90

#### NEW CATALYSTS

Tungsten Compounds were found to treat exhausts gases in the oil industry



### 1912

#### IN THE WAR

Tungsten played a more significant role in background political dealings. Its resistance to high temperatures, hardness and density, and its strengthening of alloys made it an important raw material for the arms industry.

### 2000

#### LAMP WIRE

A length which corresponds to about 50 times the earth-moon distance. Lighting consumes 4% and 5% of the total Tungsten production.



### 1964

#### IMPROVEMENTS

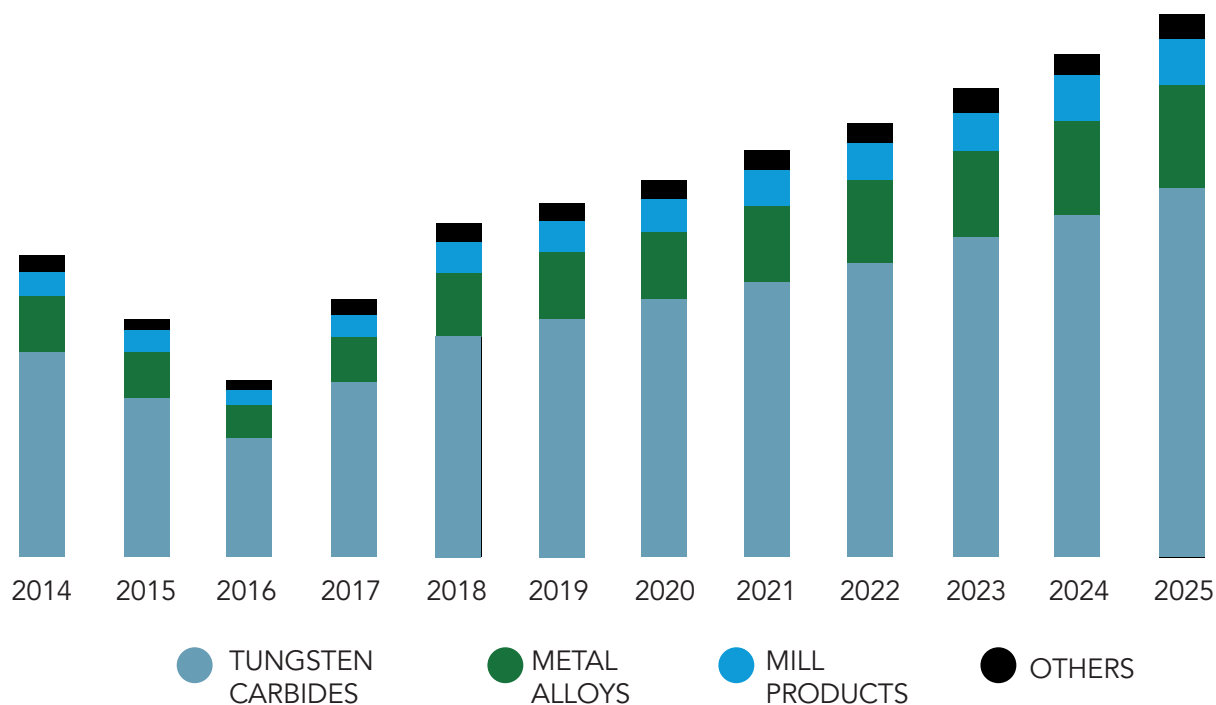
In efficiency and production of incandescent lamps reduce the cost of providing a given quantity of light by a factor of 30, compared with the cost at introduction of Edison's lighting system.

### 2010- NOW

#### TUNGSTEN CARBIDE

Tungsten carbide applications include: metal cutting, machining of wood, plastics, composites, and soft ceramics, chipless forming (hot and cold), mining, construction, rock drilling, structural parts, wear parts and military components.

### U.S TUNGSTEN MARKET SIZE, BY APPLICATION (USD MILLION)



Source: [www.gminsights.com](http://www.gminsights.com)

Tungsten is currently one of the most **valuable commodities** in the market, because of its many desirable properties. With one of the **highest melting points, unbeatable durability and extreme hardness**, it provides a stellar resource for the **manufacturing industry**.

Developments in **infrastructure, 5G telecommunications and railroad construction** projects are expected to **boost demand** for tungsten<sup>1</sup>

Tungsten has a variety of uses correlated to the global economy. Tungsten carbide, alloy and chemicals are used in the construction, electronics, mining and automotive industries, and can also be found in oil operations, as well as mineral exploration and mining.



# ELECTRIC VEHICLES

## WHAT THEY ARE MADE OF

### EV MOTORS

**Dy** Dysprosium

**Nd** Neodymium

### LCD SCREENS & WINDSCREENS

**Ce** Cerium

**Eu** Europium

**Yb** Ytterbium

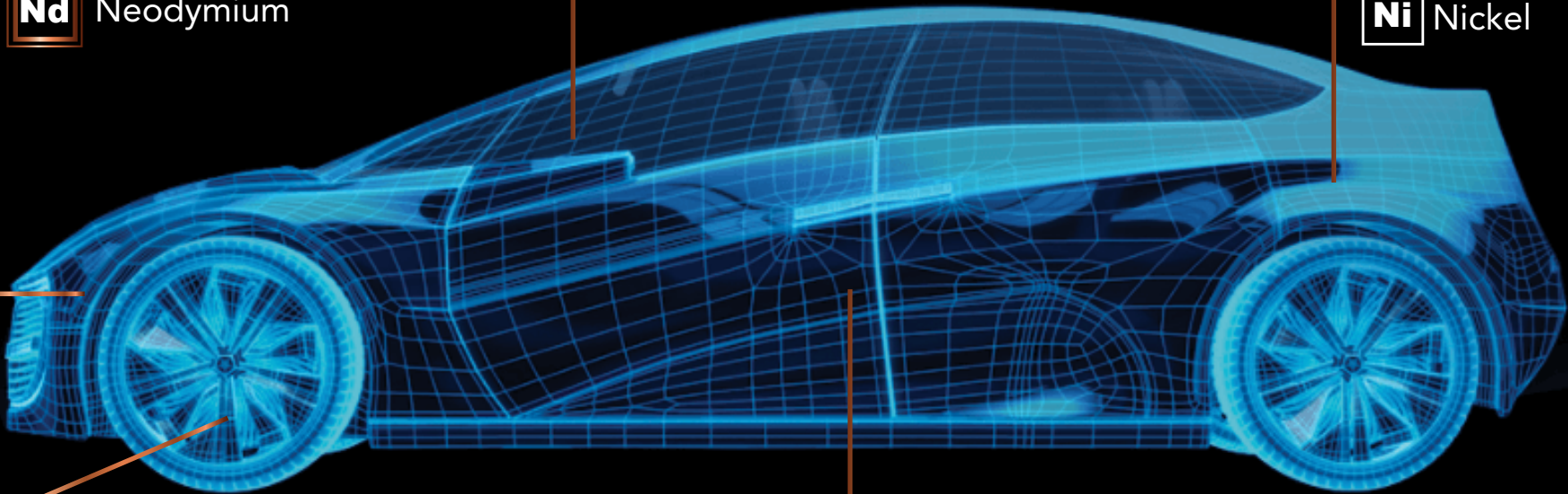
### VFB & EV BATTERIES

**V** Vanadium

**Li** Lithium

**Co** Cobalt

**Ni** Nickel



### BREAKS, BEARINGS AND CONNECTORS

**Cu** Copper

**W** Tungsten

**Sn** Tin

### CAR BODY AND FRAME

**Mo** Molybdenum

**Fe** Iron

**Al** Aluminum

**Mn** Manganese

**Mg** Magnesium

# MINERALS

## FOUND IN EVERYDAY TECHNOLOGY



Silica (silicon dioxide or quartz) sand, with ceramic materials and then add potassium.



Layers of indium-tin-oxide are used to create transparent circuits in the display. Tin is also the ingredient in circuit board solder, and cassiterite is a primary source of tin.



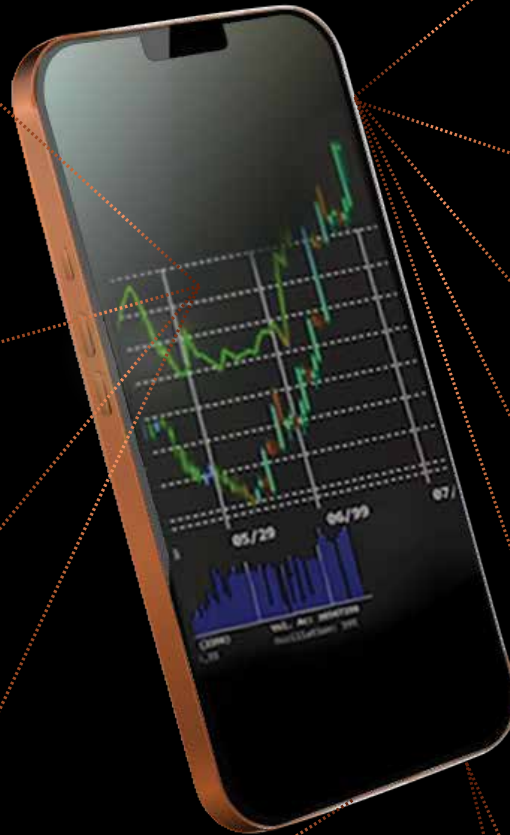
Gallium provides light emitting diode (LED) backlighting. Bauxite is the primary source of this commodity.



Sphalerite is the source of indium (used in the screen's conductive coating) and germanium (used in displays and LEDs).



Cerium is a source of rare-earth elements used to produce magnets in speakers, microphones, and vibration motors.



The content of copper in a mobile device far exceeds the amount of any other metal.



Tetrahedrite is a primary source of silver. Silver-based inks on composite boards create electrical pathways through a device.



Arsenopyrite is a source of arsenic, which is used in radio frequency and power amplifiers.



Tantalum is added to capacitors to regulate voltage and improve the audio quality of a device.



Wolframite is a source of tungsten, which acts as a heat sink and provides the mass for mobile phone vibration.



Spodumene and subsurface brines are the sources of lithium used in cathodes of lithium-ion batteries.



Graphite is used for the anodes of lithium-ion batteries because of its electrical and thermal conductivity.



**MAYNE**  
**MINERALS INC.**

Clean energy's greatest challenge is  
*MAYNE'S GREATEST OPPORTUNITY.*

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