

# Net Zero Carbon – “Your Country Needs You!” aka “The Constancy of Purpose”

written by Steve Mackowski | February 23, 2023

That’s right. Your country needs you! Because it is every one of you (us) that needs to contribute to the goal of Net Zero Carbon if there is to be any chance of reaching the goal. Note here that it doesn’t really matter if you believe (or I believe) that the goal is attainable. What does matter is that if the goal is to be reached then the discussion below is how it can be achieved.

Since this is [Article 6 in my series](#) and I am expecting it to be the last, I wanted to do something catchy, hence Uncle Sam. But what I really want to highlight is almost the name of the next James Bond or Mission Impossible film – “The Constancy of Purpose”. The most important aspect of the whole approach. I’ll get back to that.

So, your mission, should you choose to accept, is to be part of the solutions that need to be achieved for the goal of Net Zero Carbon to be attained. This message will not self-destruct after 30 seconds, so you don’t have to hurry. You can re-read before you commit. And when I say to be part of, I mean actively engaged. It’s your part of “The Constancy of Purpose”.

1. Nuclear power. Any new additional power requirements of any size are to be provided by nuclear power. Any replacement power following a fossil-fuelled power station shutting down must be provided by nuclear power. Why? As previously demonstrated there will simply be not enough

[Critical Minerals](#) developed to supply our power needs from the renewables sector. There will also not be enough [STEM graduates](#) to fulfill the resources required. So, you have to be actively engaged in the development or expansion of the nuclear power solution.

2. Solar power. You have to accept that large scale remotely located solar power is a waste of the limited resources highlighted. There is not enough lithium to make enough solar panels. The need to co-develop long transmission systems and battery back-ups is an inefficient use of resources. Rooftop solar is fine as it fits into existing infrastructure, but a solar farm in the center of Australia with 1,000 kms of new high voltage power lines. Methinks not. And using the power to produce hydrogen! Well, let's get it straight. No government subsidies are allowed anywhere in this discussion. If it isn't self-sufficient economically, it isn't a solution. It's part of the problem.
3. Wind power. Another huge waste of limited resources for the same reasons as above. Magnets are better utilized elsewhere. End of story.
4. Electric cars. The symbol of inner city wokeism. I'll only browse here. Just imagine the upgrade to your district's electricity network needed to charge even 20% of electric cars. Just imagine who is going to pay for the upgrade of the apartment block's electrical system to accommodate a significant increase in demand. Many thousands of dollars per apartment! Is it an efficient use of resources to span our countries with additional electricity transmission infrastructure? Resources are short remember! So, stick to your guns (oops, cars). OK. I'll let you have a hybrid!
5. Human Resources. Once we have the issues above well planned and in train, we can then define the [STEM needs](#) to achieve the goal. All levels of our education systems need

to change. And you have to be part of that. Whether as a parent or grandparent, or maybe just a concerned voter influencing our governments, we have to fix this. You have to encourage your children, you have to lobby the governments. The volume of STEM graduates needs to dramatically expand and be focussed. “The Constancy of Purpose” again.

Now sure, everyone has their part to play, but tokenism is not healthy. As [reported](#) in The Australian Newspaper, Sunday, February 12, 2023, by Robyn Ironside, is having the “greenest” airline really that important? When the solution requires orders of magnitude more production of “sustainable”, but still carbon dioxide emitting fuel at increased costs?

These “solutions” are wokeisms in play. Change the definition of sustainability and it becomes OK. Well, that is not acceptable. Net Zero Carbon is a real goal and is not to be fudged. I get pretty enraged when I read that EU power stations are burning purposely grown “wood waste” instead of coal and claiming zero carbon emissions. This is fixing the books, not fixing the problem.

## **“The Constancy of Purpose”**

“The Constancy of Purpose”. Who does this apply to? Well, if the world is going to achieve the Net Zero goal, well then, the world needs to have “The Constancy of Purpose”. LOL sorry, couldn’t help it. The developed world and the developing world are streets apart here. Only the developed world is chasing the goal. The developed world wants the developing world to also chase the Net Zero goal. But how can they? In a resource-constrained world, do you really think that the developed world will allow those limited resources to be deployed in developing

countries?

Maybe they should if the overall balance to Net Zero indicates that is the most resource-effective answer. Methinks not going to happen. Our political classes are too focused on their own political survival (and ideological orientation) to let valuable resources out of their grasp. That got me thinking about how to determine resource utilization effectiveness on a global scale. Another time, another series. But it will come to that distribution question. Why? Because there will come a time when the developing countries will see that they are being starved of resources by the developed world to attempt to meet their own Net Zero goals. And sorry developing world, you can't have any! Not a pleasant thought.

So, what chance Net Zero? [An article](#) from The Australian newspaper, also on Sunday, February 12, 2023, by well-acknowledged editor, Greg Sheridan, seems to present the argument that is most often proffered.

## Net Zero Carbon?

Again. Very negative. My views on Net Zero Carbon? The Critical Minerals developments needed can be addressed. Will take a major shift in Government approvals timing though. The choice of power technology to be nuclear focussed is again achievable but will take some guts from some governments. The Human Resources issue is again achievable, but it would mean the end of the woke revolution in our education system. Achievable yes, in practice – No!

Net Zero Carbon by 2050 on a global scale? No chance! The emissions from the developing world will continue to grow. They will not have access to the resources needed. Well, how about on a local scale, by Country say? In the US or Australia, or the

EU? “The Constancy of Purpose” test gives me no confidence. Twenty-five years of focussed efforts to achieve a goal that not even a majority of the population understands, acknowledges, or prioritizes? Methinks not.

We will just have to advance at a pace that results from ignoring the requirements that could move toward the answers. No wonder the Cheshire Cat has such a wide grin!

However, if you still want to do your bit in the Net Zero challenge, remember. “The Constancy of Purpose” may be coming to a theatre near you. So, thanks to movie-world for the license and to Forrest for the end quote: “Well, that’s all I have to say about that.”

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# **Some potential winners from the White House commitment to ‘Securing a Made in America Supply Chain for Critical Minerals’ Announcement**

written by InvestorNews | February 23, 2023

Could this be the moment the USA finally takes some actions towards supporting critical minerals supply chains? The big news in the world of securing domestic supplies of critical minerals for the USA last week were two key announcements by the White

House:

- [FACT SHEET: Securing a Made in America Supply Chain for Critical Minerals](#) – Biden-Harris Administration, Companies Announce Major Investments to Expand Domestic Critical Minerals Supply Chain, Breaking Dependence on China and Boosting Sustainable Practices.
- [DOE Releases First-Ever Comprehensive Strategy to Secure America's Clean Energy Supply Chain](#) – DOE Report Includes Over 60 Actions to Enhance Supply Chain Resiliency, Spur Domestic Manufacturing Capacity, and Create Millions of Good Paying Jobs for American Workers.

Additionally, the first article linked above refers to earlier reports (E.g: [America's Supply Chains](#)) and [states](#): “the reports recommended expanding domestic mining, production, processing, and recycling of critical minerals and materials – all with a laser focus on boosting strong labor, environmental and environmental justice, community engagement, and Tribal consultation standards.”

The takeaway here is that investors looking to benefit from the new White House initiatives need to look for U.S. domestic critical mineral projects, processing projects, and recycling projects. A U.S. processing project would include [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR) rare earths processing at their White Mesa mill in Utah, USA. Today I will focus on the U.S. critical minerals projects.

**China has dominated the critical minerals supply chain, leaving the U.S. vulnerable this decade**

After many years of talk and very limited action, it appears the USA may finally be waking up to the need to urgently support and facilitate domestic U.S. critical minerals supply chains. Those of us involved in the manufacturing industry know that for years

China has been buying up and controlling the critical minerals' supply chains. The consequences are that China now completely dominates the supply chains for lithium-ion batteries, electric vehicles, wind energy, and solar energy. These are multi-trillion-dollar industries, but if you cannot access the raw materials then you cannot produce a product. We saw that in 2021, with semiconductor shortages slowing the U.S. auto industry, and we are seeing it again now with lithium-ion battery shortages leading to a limited supply of domestically produced EVs, despite enormous consumer demand. Tesla has an estimated [1.3 million pre-orders](#) for its Cybertruck but has [delayed production until 2023](#) due to not having enough lithium-ion batteries.

**Green energy from solar, wind, and nuclear will increasingly power electric vehicles**



**Companies that may benefit from U.S. support of the critical minerals industry**

Looking through the White House announcement gives us several clues:

1. "These minerals—such as **rare earth elements, lithium, and cobalt**.....As the world transitions to a clean energy economy, global demand for these critical minerals is set to skyrocket by 400-600 percent over the next several decades, and, for minerals such as **lithium** and **graphite** used in electric vehicle (EV) batteries, demand will increase by even more—as much as 4,000 percent.....will also discuss **\$3 billion** in [BIL funding](#) to invest in refining battery materials such as **lithium, cobalt, nickel, and graphite**"
2. "President Biden will announce that the Department of

Defense's Industrial Base Analysis and Sustainment program has awarded MP Materials Corp. (NYSE: MP) **\$35 million** to separate and process heavy rare earth elements at its facility in Mountain Pass, California."

3. "Berkshire Hathaway Energy Renewables (BHE Renewables) will announce that this spring, they will break ground on a new demonstration facility in Imperial County, California, to test the commercial viability of their sustainable lithium extraction process from geothermal brine.....In addition to BHE Renewables, Controlled Thermal Resources (CTR) and EnergySource Minerals have established operations in Imperial County to extract lithium from geothermal brine."
4. "Redwood Materials will discuss a pilot, in partnership with Ford and Volvo, for collection and recycling of end-of-life lithium-ion batteries at its Nevada based facilities to extract lithium, cobalt, nickel, and graphite."
5. "Tesla intends to source high-grade nickel for EV batteries from Talon Metals' Tamarack nickel project."
6. "DOE, DOD, and the Department of State signed a memorandum of agreement (MOA) to better coordinate stockpiling activities to support the U.S. transition to clean energy and national security needs."

The winners of the U.S. critical minerals policy should be those with projects in the USA which are focused on critical minerals (rare earths, lithium, cobalt, nickel, graphite), critical minerals processing and critical minerals recycling. Needless to say, they will need to pass environmental and permitting rules and support local communities and American jobs.

Of the companies mentioned above, MP Materials and Talon Metals are the only two that are listed. BHE Renewables, Controlled Thermal Resources (CTR), EnergySource Minerals, and Redwood



Materials are all private companies.

### **MP Materials Corp.**

MP Materials Corp. (NYSE: MP) owns and operates the Mountain Pass open pit rare earths mine facility, located in Mountain Pass, California, USA. Mountain Pass plans to have an output containing 5,000 metric tons of neodymium and praseodymium (NdPr), starting in ~2022. MP Materials also plan to have their own Heavy Rare Earth separation facility at their Mountain Pass Mine. As discussed above MP Materials have now been [awarded a DoD contract](#) (refer to the US\$35 million in point 2 above). MP Materials Chairman and CEO, James Litinsky, [stated](#): “The ability to mine, process, and refine rare earths at Mountain Pass is foundational to a national effort to secure the U.S. rare earth supply chain.....We thank the Department of Defense for its confidence and support.”

MP Material’s stage III plan is to develop a rare earth metal, alloy and [permanent magnet manufacturing facility in Fort Worth, Texas](#). MP Materials has [an agreement to supply General Motors](#) (GM) with magnets to be used in EV motors for the Hummer EV, Cadillac Lyriq, Chevrolet Silverado EV, and more than a dozen models using GM’s Ultium platform.

### **Talon Metals Corp.**

Talon Metals Corp. (TSX: TL0) has a JV with Rio Tinto (ASX: RIO) at their Tamarack nickel-copper-cobalt Project in Minnesota, USA. Talon owns 50% but can earn-in to a 60% share of the Project. Talon recently announced a 5-year [nickel supply agreement](#) with Tesla (NASDAQ: TSLA).

### **Other critical mineral companies with USA projects**

**Lithium** – Lithium Americas Corp. (NYSE: LAC | TSX: LAC),

Standard Lithium Ltd. (TSXV: SLI | NYSE.A: SLI), Piedmont Lithium Inc. (NASDAQ: PLL | ASX: PLL) (have a [supply deal with Tesla](#)), Cypress Development Corp. (TSXV: CYP | OTCQX: CYDVF), Ioneer Ltd (ASX: INR), Albemarle Corporation (NYSE: ALB).

**Cobalt** – Jervois Global Limited (ASX: JRV | TSXV: JRV), Electra Battery Materials Corporation (TSXV: ELBM | OTCQX: ELBMF) (previously First Cobalt), Global Energy Metals Corporation (TSXV: GEMC | OTCQB: GBLEF).

**Graphite** – Westwater Resources, Inc. (NYSE American: WWR), Syrah Resources Limited (ASX: SYR) (spherical graphite plant planned for USA).

**Nickel** – Global Energy Metals Corporation (TSXV: GEMC | OTCQB: GBLEF).

**Rare Earths** – Lynas Rare Earths Limited (ASX: LYC) (rare earths processing plant planned for USA).

**Li-ion batteries** – Magnis Energy Technologies Limited (ASX: MNS) – New York battery factory.

**Li-ion battery recycling** – Li-Cycle Holdings Corp. (NYSE: LICY) – [Partnership](#) with GM and LGES's Ultium JV for a battery recycling facility in Ohio.

## **Closing remarks**

In addition to the above-mentioned companies with U.S. projects it should be noted that allied countries such as Canada and Australia will also be needed to help supply critical materials. Several of these companies can be found [here](#) in our InvestorIntel member's page.

The USA's domestic production of green energy and the associated need for critical materials supplies has long been a major weak

point for the USA to compete with China. It does look like the USA is finally taking some **actions** to catch up, albeit still about a decade behind China.

Investors can look to play this catch-up trend, and as we saw with Tesla, if you invest early the sky is the limit.

*Disclosure: The author is long Tesla (NASDAQ: TSLA), MP Materials (NYSE: MP), Lithium Americas (TSX: LAC), Piedmont Lithium (ASX: PLL), Jervois Global (TSXV: JRV), Electra Battery Materials (TSXV: ELBM), Syrah Resources (ASX: SYR), Lynas Rare Earths (ASX: LYC), and Magnis Energy Technologies (ASX: MNS).*

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# Tesla set to lead this decade's renewable energy and electric vehicle boom

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Renewable energy and electric vehicles (EVs) are set to be massive macro trends this decade. A raft of Government support, combined with massive cost reductions, will propel both sectors higher. In most locations globally solar is now [the cheapest](#) form of electricity production (followed by wind), and from about [2023](#) electric vehicles will be cheaper to buy than conventional cars. Hundreds of millions of people globally will make the move to solar and wind power, combined with EVs simply because it will be the cheapest way to create energy and to commute.

EV, solar, and wind stocks are already surging in anticipation

of this at least decade long boom as shown in the chart below. Just take a look at these sizzling returns so far in 2020. This is just the beginning of what lies ahead.

- Tesla (NASDAQ: TSLA) – Up 258%
- BYD Co. (HK: 1211) – Up 89%
- SolarEdge Technologies Inc. (NASDAQ: SEDG) – Up 86%
- Enphase Energy Inc. (NASDAQ: ENPH) – Up 133%
- Vestas Wind Systems (GR: VWS) – Up 32%

### **2020 YTD returns for some leading EV, solar, and wind stocks**



[Source](#): Yahoo Finance

### **Government support for renewable energy and EVs announced in July 2020**

- July 21, 2020 – The EU announced the biggest green stimulus in history with a [500 billion Euros](#) (US\$572 billion) climate change plan as part of a 1.8 trillion Euros stimulus plan over 7 years.
- July 14, 2020 – In the USA, Joe Biden unveiled a [US\\$2 trillion green infrastructure and jobs plan](#) over 4 years, if elected. The plan aims for the U.S. to have a carbon pollution-free power sector by 2035. The plan includes US investments in new infrastructure, public transit, clean electricity, the electric vehicle industry (EV and battery production), buildings and housing, and agriculture. Also to boost fuel economy standards which encourages car makers to switch to EVs.
- July 7, 2020 – The UK announced a [GBP 3 billion ‘green’ plan](#) to focus on energy efficiency and re-skilling for ‘green jobs’, which includes a housing retrofit scheme. The UK Gov. already [supports EVs](#).

Whilst the Government initiatives will help, the private sector is also rapidly moving towards supporting renewable energy. Global investment in new renewables capacity [rose 5%](#) in H1 2020, despite the chaos of COVID-19. Offshore wind was the star performer with \$35 billion of new financing in H1 2020, [up 319% YoY](#). This bodes well for the leading wind turbine manufacturers.

Regarding electric vehicles, sales have been picking up rapidly and outperforming regular vehicles in terms of gaining market share, especially in Europe and China. For example, for Europe in June 2020, conventional car market sales [fell 24% YoY](#), whereas electric car sales [rose 95%](#). Electric car sales in Europe are surging and in June made up [8.2%](#) market share. Germany has led the way where conventional car sales fell 32% but electric car sales [rose a staggering 274%](#), growing to reach 8.6% market share in June 2020.

**EV sales forecast to really take off after 2022 as affordability kicks in**



### [Source](#)

BloombergNEF [2020 forecast](#) for annual electric vehicle sales are:

- 10% share by 2025 (~9 million pa)
- 28% share by 2030 (~24 million pa)
- 58% share by 2040 (~54 million pa)

Investors would be wise to review some of the leading companies for each of the three boom areas:

**Solar** – Tesla, SolarEdge Technologies Inc., Enphase Energy Inc., First Solar, Inc. (NASDAQ: FSLR).

**Wind** – Vestas Wind Systems, Siemens, GE Wind/General Electric (GE), Siemens AG (GR:SIE | OTC: SIEGY), Xinjiang Goldwind Science & Technology Co. (HK:2208).

**Electric Vehicles** – Tesla, BMW, Volkswagen, BYD Co.

Investors could also look at some niche players that lead in their area. Here are some examples.

- [dynaCERT Inc.](#) (TSX: DYA | OTCQX: DYFSF) – Emissions reductions, and greater fuel efficiency.
- [Exro Technologies Inc.](#) (CSE: XRO | OTCQB: EXROF) – Making electric engines more efficient (like gears in a car).

You can read more at InvestorIntel's Cleantech coverage [here](#).

Finally the other area to benefit will be the suppliers of critical materials, especially the EV metal miners, the rare earth miners, and the lightweight materials companies. Some names we follow include [Nano One Materials Corp.](#) (TSXV: NNO), [Neo Performance Materials Inc.](#) (TSX: NEO), [Appia Energy Corp.](#) (CSE: API | OTCQB: APAAF), [Avalon Advanced Materials Inc.](#) (TSX: AVL | OTCQB: AVLNF), [Scandium International Mining Corp.](#) (TSX: SCY), [Imperial Mining Group Ltd.](#) (TSXV: IPG), and [ZEN Graphene Solutions Ltd.](#) (TSXV: ZEN). You can review InvestorIntel's coverage on this sector [here](#).

## **Closing remarks**

The renewable energy and EV booms have already begun but are still in the very early stages of what will be at least a decade long boom. The opportunity for investors is enormous as we have already started to see with Tesla as well as several other EV, solar and wind stocks so far in 2020.

Picking the winners of any disruption is never easy, but a good start is to go with the existing winners, and to diversify

across a few sectors and stocks. The 2020s decade will see several disruptions combining as we see with solar, wind, EVs, and energy storage. Later this decade we will likely see a boom in Transport as a Service (TaaS), autonomous vehicles, and even affordable point-to-point space travel.

### **Further reading**

- [A look at some combined disruptions for the 2020s – Searching for the next Amazon or Tesla](#)