## CAN WE WESTERNIZE THE BATTERY SUPPLY CHAIN? A Conversation With Wood Mackenzie

Chris Gannatti And just so people understand some of what is shown in figure 1, the value chof what we were talking now there relates to the orange, which is the raw m

resent—we call them sub-s re are valuable activities as the expertise to f find compani that

or

ırrin

pa

n

tire

zh

at

a ont more on the raw m ac-manufacturers. These are the cates

Adam Woods:

short, it's going to be massive. That's the five-word answer. But the longer ar segment it out into what we think of as energy storage and batteries. Energ wth there is massive. Over 10 years, it's something like a 30% compound prowth year-on-year.

> ier, that storage system only accounts for 10% to 20% of battery d with EVs. And that EV growth is expected to grow not as quickly but s % per year all the way out. We don't see any real lags in that grow rific to lithium-ion batteries that we're talking about. So, in shor by EVs.

bn .on

Woods: Yes, I think with the recycling, you hit the nail on the head with the mid-2030s, citement around it right now, though. The obvious potential, especially for

> ight now is that the price of cobalt/cost of cobalt versus the cost of re balt surge in price before, but we're going to need to see a more sust e the build-out of the recycling plants. There's simply not enough ercially viable.

> > ries, and we're going to need a higher price for cobalt in orde . There are a couple of other things in play, like policies in ا build-out of recycling plants. But where it stands right at has to take o in the late 2020s to, like you said, mid-20

am mentioned cobalt, there was something I was this space is all sorts of di erent chemistries, so o attention in chemistry class back in the day. Bed g about these di erent molecules, these di ere ecause I just can't match that level of unders

> k of a unit of weight, and you think of a par It's estimated that a normal car is going uranium, think e=mc2, with the c as th ake the equivalent of a car 1.77 milli

> > each

pes of fuel, and one of them has just so ese are not completely equiva/ nt. B n an important idea becau ome es? The idea of powe nit

ic

ba

w

W

ust

to

e th

me

s co

ue

bd

0

ne

IC th

у

g e

n

e matching i

curse. And Chris, I'm no chemist either, but luckily, like you sa within our renewables group whom I have gotten to talk to about these chemistries. I' we have today. And, like I mentioned, we're limited to the lithium-ion batteries, a te But there are di erent chemistries and componentry that can make di erent types of li for the sake of the discussion, we'll keep it on EVs, as for now, that's where most of the de have your NCMs, nickel, cobalt, manganese, and then you have your LFPs, those are the two most popular ones. LFPs were where things started, th nickel cobalt. That's why you hear so much about it today. It's because tha iu ra

WisdomTree.com

Chris Gannatti: Every country is going about it in their own way. Some countries are trying some solar, some a mix, all of the above. You see the small-scale or more compa tot disappeared, even if the Russian-sourced natural gas is harder to come by the world seems to want to address all of the above.

> mised a discussion on China, I reference figure 3 as we are talking about e value chain. There are articles that indicate if you buy an electric ay have traveled 50,000 miles before the vehicle itself even travels 1 in components coming from Argentina or Chile and Australia, and t back to California, and then they need to get to all these di eren

> > is in the chip space, namely, can they actually Westernize th ral battery in the U.S. doesn't need to go to China at all. A or not that's even possible? It's a big change relative to whe

lin

ai

W

od

Figure 3: Country Exposure of the WisdomTree Battery Value Chain & Innovation Index

WisdomTree.com - 000.70

Adam Woods:

It is. Yes, we definitely have a view. Every team is looking at this, especiall, he answer is today, it can't be. I don't know if there's a metric that really show % of the componentry is Chinese based. It is massive. Even if the materials a y aren't, they're globally sourced, it still goes through China.

without? Our view is yes, but it's not easy. It's going to require so muc wo out there is 10 years from today; if all facets of the value chain wer trade partners, we're looking at 10 years until we see those project nle. It's a long road, but it's definitely possible.

> es side, to pivot just a little bit, it's even more commercially vial t, if fully taken advantage of the IRA credits, is cost competit tion. Just simply because we already have component mar value chain that aren't even in their infancy yet. They're t even have any active ones domestically. It's going to e the IRA to make it competitive because right now the t right now.

Chris Gannatti:

uncements, whether it's in Georgia, Tennessee be GM and LG coming together, making batt vafactories. Is the correct way to think of i erent places around the world, and tho ist end up with nickel chemicals, for inst c)21 ()10 (o)1/0ef the T)g01 Tm@he a e B

ct

po

se

ta

na

pet

Car

ana

e g

na<sup>.</sup> r li

(

Adam Woods:

Yes, that's interesting. I think that the short answer is yes, it could lower cost is that it's produced domestically. Some self-su iciency in lithium would be cost savings as far as you don't have to import it, you can refine it domesti costs across the value chain, not just on the mining side for the raw lith hink yes.

> ere is that it's a proposed project, so there's still some geologic map think that if it was permitted and the lithium itself was of high qua ch is a couple of ifs, but if it all came together, yes, it definitely co lithium certainly.

Chris Gannatti:

that sometimes is in the top 10 amongst the exposures of which stands for Contemporary Amperex Technology; it ventures within the battery space. A recent article wa dium instead of lithium. Similar to dierent cathodes ight have lithium-ion and phosphorus. There are di

> t you would imagine. I'm curious on the potent and the metals, but what if you change th ase, and you use something that might be e

Adam Woods:

for that change. But I think that if you can sive. But the question that comes to my Why hasn't it already been done? Wha yould o er? And although I'm ot su imilarly, there's a trend to mo

e. ot re

y;

С

ng

ou

ade

at ۱

ıр

ap

nd



## Glossary