New Underwater Discovery Could Change Energy Forever

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Today… an exciting announcement about *Exponential Investor…*

As you'll know as a regular reader, our beat here is helping you understand and anticipate the biggest tech trends in the world, completely free of charge every day. I think we do a great job of it. But I'm always looking for ways to improve what we do and further our mission to make you a smarter, better informed and more profitable investor.

Which is why I've been working behind the scenes to add even more market insight and opportunity to what we do here. It's led to an unusual development I think you'll want to be a part of.

It's not a new newsletter… stock picking service… a training course… conference… or anything like that. In fact, it's new to our business.

Put simply, I'd like to introduce you to *Exponential Investor PREMIUM* – an all-new upgrade to your subion that gives you an even higher level of market insight. It's your daily "insiders alert" on the most important market-moving trends… delivered to you directly each morning in videos of three minutes or less.

In these video alerts, you get one simple, important idea to focus on each day… something that helps you turn the knowledge and insight of *Exponential Investor* into action.

Think of it as your daily dose of "financial intelligence", delivered directly to you from a genuine financial insider – someone with the experience, the contacts and the expertise to help you understand what's really going on in the markets.

Note: this isn't a case of simply getting a news bulletin each morning. There are plenty of places you can get that. We're not reporting the news… we're ANTICIPATING it.

And here's the best part: this "upgrade" on your current membership costs virtually nothing. We're talking pennies per day to get a high level financial expert in your corner each day. It's crazy good value.

All you need to do to get started – and get your "upgraded" *Exponential Investor PREMIUM* version tomorrow morning – is follow this link right now.

Best,

Nick O'Connor
Publisher, *Exponential Investor*

PS Here's a great example of just how valuable *Exponential Investor PREMIUM* is going to be for you. It's a video alert from Monday morning, right after the markets opened following the weekend's massive cyber-attack. Do you know what that means for your money and the markets? Do you know how to turn that attack into opportunity? That's what *Exponential Investor PREMIUM* will help you do. In less than three minutes. For pennies on the pound. Here's a short sample issue for you to take a look at.

Sunshine from below the sea

Andrew Lockley

Commodities are at the heart of the global economy. Behind the physical products you buy are materials and ingredients: steel, grain, aggregates, etc. Even services depend on the commodities which underpin transport, energy, construction and computing.

Today, we're going to be looking at a different energy commodities story – tellurium. This element is vital for many solar power projects. It's topical right now, because of a huge new underwater discovery.

Cheaper energy is the backstory

We talk a lot about solar energy at *Exponential Investor*, but rarely mention commodities. Nevertheless, they're important. We use rare-earth neodymium magnets in wind turbines. We also use lithium in batteries (other battery chemistries are available).

As we're fond of saying: the big story in renewables is solar. There's effectively no limit to the energy available; we just have to learn how to collect and store it efficiently. Right now, there are two main methods. Firstly, there are photovoltaics – the black panels you see on roofs. Secondly, there's the steampunk- concentrated solar power, which uses mirrors to create high temperatures – just like a power station.

The solar revolution is currently expected to be based mainly on photovoltaic technology – and the most common approach is silicon-based panels. These are made in a manner akin to computer chips. As production has increased, costs have decreased. This is a virtuous circle, that's common to many emerging technologies. These price falls are very predictable, according to "Swanson's law" – which is the solar equivalent of computing's "Moore's law". However, no technology can be squeezed forever. Cost falls for silicon technology may hit a slowdown, in the near future.

We've looked at the future for solar, and it need not be based on the current generation of panel technology. Instead, thin-film reel-to-reel technology could give further dramatic price falls. Solar films are being already being applied to windows – and they could be used on many more surfaces. If we had a cheap way of making thin-film solar work well, then it could help drive down solar costs substantially.

One of the issues with thin-film solar is that the tellurium that's typically used in its production is both expensive and in short supply. By contrast, the manufacturing process itself is fairly simple. What's more, thin-film technology lends itself to next-generation "reel-to-reel" production, like newspaper printing. Reel-to-reel could lead to astonishing price falls – but only if we can sort the materials supply out. One approach is to use novel chemistries – such as perovskite solar cells (Oxford Photovoltaics is an interesting firm using this approach).

However, an obvious alternative is to dramatically expand the supply of tellurium. One way to achieve this is to look at deep-sea mining. Deposits of tellurium on land are pretty scarce. What's more, tellurium is found on land in very low concentrations. This means that both mining and processing the material is very expensive. All those costs are ultimately passed on to the buyers of solar cells – and then to electricity consumers.

That's why subsea tellurium is such big news

British scientists have discovered a vast deposit of tellurium on Tropic Seamount – an underwater mountain in the Atlantic Ocean. Not only is this deposit large (just under 10% of global supply), it's also highly concentrated – 50,000 times higher than currently-mined deposits on land. As a result, refining costs will be much lower than for comparable terrestrial deposits. By contrast, extraction costs are likely to be high – as subsea mining is a technology in its infancy. Nevertheless, this one tellurium discovery could kick-start the whole sea-mining industry.

Tellurium could be a very important chemical element, if we want to optimise our solar energy revolution. However, marine mining is likely to be a much bigger story. There are many other minerals waiting to be recovered from our vast oceans. Two vital elements that can be readily obtained from the seafloor are phosphorous and manganese – and they're a big economic story. We've covered phosphorus before – and it's crucial you understand it.

Soon in *Exponential Investor*, we'll be looking at a company with big plans for deep-sea mining. I'm sure you'll find this interesting. But for now, it's worth reflecting on the effect on energy that an abundance of tellurium might have. If we can cover everything we place outdoors with lightweight Te-based solar cells, then we can routinely make our buildings and vehicles into power stations. This would give us self-charging cars, and power-generating park benches.

However, it's worth considering the challenges of obtaining subsea materials in any volume. To mix a geographical metaphor, the deep sea is the Wild West. Underwater mining is a potentially very damaging technology – especially if it's applied to underwater biodiversity "hot spots". Unfortunately, some of the most promising areas for mineral prospecting are the hydrothermal vents, where life is first believed to have evolved. Digging them up could be like crushing the pyramids for gravel.

The ocean floor is poorly understood, and we don't fully understand what damage ocean mining may do. The usual prospecting

and licensing requirements are underdeveloped – as is the technology for extraction and environmental monitoring. Lack of appropriate regulation is therefore a challenge for legitimate operators – just as surely as it is an opportunity for unscrupulous ones. This poses a challenge for the sector. Deep-sea mining will be a huge new area for the minerals industry – but it is also a significant challenge for society to manage.

If you'd like to trade this sector, check out the small-cap Nautilus Minerals. It is seeking a variety of commodity metals: copper, gold, zinc and silver. Alternatively, you can play the manufacturers – with First Solar a leader in thin-film solar cells.

Do also check out our current "white diesel" information.

Feedback, as always, to: andrew@southbankresearch.com.

Best,

Andrew Lockley
Exponential Investor