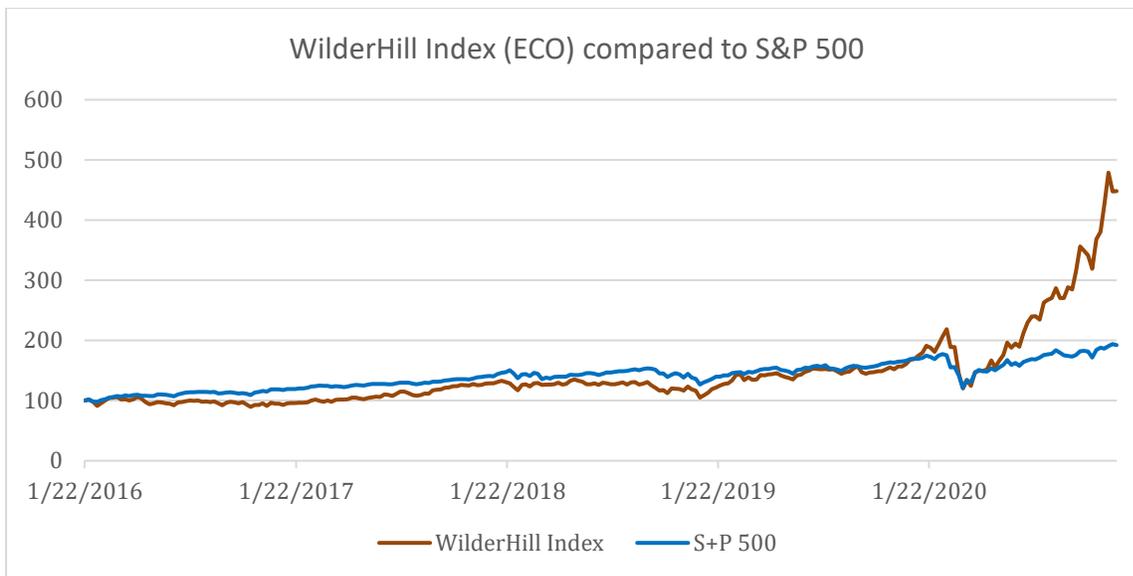


January 26th, 2021

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### Clean Tech Rally

Despite a global pandemic, several stock indices were up meaningfully in 2020 including the S&P 500 which returned 18.4% and the NASDAQ which was up 43% (having doubled over the past two years). Both of those index gains were more than lapped by clean energy stocks in the second half of 2020 which rallied on increased expectations for a more favorable regulatory environment from the Biden Administration. The WilderHill Clean Energy Index (ECO), a reasonable measure of clean energy stocks was up 207% in 2020. This is in stark contrast to the S&P 500 Energy Sector which was down -33.68% over that same period. ECO has 47 holdings and over six of them were up over 1000% this year. The index is currently trading at 70.64x NTM P/E. Nothing exemplifies this enthusiasm more than Tesla, whose valuation has exceeded Ford, Honda, BMW, GM, Daimler, Volkswagen, and Toyota combined despite having 1/36<sup>th</sup> the revenue. This public markets' enthusiasm is also found in venture capital, where over \$16.4 billion was invested this year, three times as much as in 2016 and more than any single year.



One of the four macro climate themes that we consider in our investment process is regulatory changes that will accelerate the transition to a low carbon economy. We believe over time these changes will increasingly tilt the scale toward low carbon solutions. While the United States has been woefully slow on this front, optimism has grown and now appears more than fully priced into asset valuations. Our portfolio has benefited from this re-rating and we are now starting to

pivot away from some clean tech investments. While we believe in clean tech's long-term growth prospects, we also think there will be more attractive entry points in the future. We sold our position in HASI and trimmed Ameresco and Clearway Energy. We continue to focus on the rest of the economy where we believe there are still many second order beneficiaries of this transition with more attractive market valuations.

## **Railroads and Sustainability**

It is this larger, older portion of the economy where we continue to see the greatest market inefficiency. **It is easy for market participants to see that a more climate centric administration may provide a tailwind for growth in clean tech. It is more complicated to understand the myriad of ways that our broader economy is going to transition to adapt to a low carbon economy. That transition is opaque and remains unpriced.**

As an example, let us look at railroads, an industry found in many ESG investor portfolios. At first glance, railroads' inclusion in sustainable investment portfolios seems quite reasonable; transporting goods by rail is up to three times more carbon efficient than by truck. The largest rail companies all have glossy ESG reports and high ratings from various credible independent organizations scoring companies on their sustainability. A specific example is CSX, though the overall lesson is the same among the railroad companies. In 2020 CSX received the highest climate ranking ("A") from Carbon Disclosure Project and are part of As You Sow's "Clean 200" index. The company's 65-page ESG report highlights that "as the most fuel-efficient mode of freight transportation on land, rail continues to enable significant emission reductions for customers, while driving economic prosperity."

Often, as is the case here, the economic impacts are more complicated than they might appear. A paper written by Robert Brulle studied what he termed the "Climate Change Counter Movement" to understand the role of conservative think tanks in slowing climate action. What he found at the center of climate denial groups were the railroads. A Brown University study uncovered that the four major railroad companies, Norfolk Southern, BNSF, Union Pacific and CSX are all members of the American Coalition for Clean Coal Electricity that advocates the social benefits of carbon pollution. Why would an industry touting its inherent carbon efficiency lobby to prevent climate policy? One would assume they would benefit from policies such as a price on carbon.

In this case, Deep Throat's timeless advice to "follow the money" holds. Seventy percent of American coal is shipped by rail. One out of every three tons hauled by the four largest railroad companies is coal. Fourteen percent of all railroad revenue was generated from coal. Rob Jackson, a geoscience professor at Stanford, calculates that, if you were to take shipped coal into account, railroads facilitated sixteen and half percent of the total U.S. carbon pollution.<sup>1</sup> For an industry like railroads that has seen flat to declining revenue for the past five years, preventing or slowing a decline in volume from your largest customer base is important. You might throw your hands up in frustration over the hypocrisy. But we highlight this example, not to demonstrate that corporations are not always forthright (they are not). **The intended moral is that investors should**

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<sup>1</sup> <https://www.theatlantic.com/science/archive/2019/12/freight-railroads-funded-climate-denial-decades/603559/>

**look at the economic interests of a company, not their sustainability statements or ESG scores, to more fully understand how they are positioned for a transition to a low carbon economy.**

How companies spend their lobbying dollars can be a clue, as was the case here. But overall, it is not easy, and it is how we spend considerable time and effort in our analysis.

Financial analysts do not have a history of this type of analysis. Quant investors do not yet have the necessary data to incorporate it into their algorithms. However, some are attempting to create repeatable systematic frameworks to understand these economic risks. Harvard Business School recently launched a new initiative called Impact Weighted Accounts Initiative (IWA), to quantify and account for companies' environmental costs. They found for example that American Airlines environmental costs are \$4.8 billion far exceeding their profitability in good years.<sup>2</sup> This accounting and others are new, untested, and unfamiliar to the market. Because the massive economic shifts required to mitigate and adapt to climate change represent a new paradigm, one cannot back test the new accounting to determine its effectiveness in stock selection. As investors this works to our advantage, as these methods have not yet been adopted by mainstream investment models. **We believe those that incorporate an analysis of the economic impacts of these shifts into a traditional investment process, even imperfectly, will benefit from greater returns while driving capital to corporations preparing for a low carbon economy.**

### **Intel and Climate Change**

While we have invested in pure play clean tech companies, current valuations are high given our assessment of fundamental prospects. We mentioned Tesla earlier as an example of the market's enthusiasm for electric vehicles. However, there are companies that are secondary beneficiaries of this type of transition, with meaningfully lower valuations. One of those, Intel, is a recent add to our portfolio.

Intel's business has dominated the CPU market for the past two decades but has stumbled recently. Their chips can be found in almost every PC and server used by Amazon, Microsoft, and Alphabet. Recently that dominance has been threatened. The last two process nodes (14 nanometer and 10 nanometer) were delayed 12-18 months. In an industry where days matter, these were significant delays allowing their competitors (AMD and NVIDIA) to gain market share. Their competitors outsource manufacturing to Taiwan Semiconductor (TSM) which delivered the new generation of chips on time. INTC on the other hand has built its dominance by primarily manufacturing its own chips in 11 fabs based here and around the world. These manufacturing assets once viewed as a competitive advantage are increasingly seen as an albatross. Another recent challenge is those same customers, Amazon, Microsoft, and Alphabet are customizing their own chips with other designers and manufacturers.

Valuations, in our opinion, reflect these concerns. INTC shares are priced at 11x P/E LTM and 6.5x EV/EBITDA compared to its competitors like AMD at 125x P/E and 75x EV/EBITDA. The value of AMD outstanding equity or market cap is about half that of INTC's (neither company has significant debt). However, INTC's chips supply 90-95% of the market, their revenue is 8x's larger than AMD's and has significantly higher margins. Even if AMD were to grow without any significant competitive response from INTC, it will take many years for them to take market share

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<sup>2</sup> <https://hbr.org/2020/09/how-to-measure-a-companys-real-impact>

because semiconductor capital expenditure cycles are long. INTC is not waiting. They just replaced their CEO Bob Swan with Pat Gelsinger, the head of VM Ware and one-time Chief Technology Officer at Intel, to address the problem head on. They are also expected to manufacture more of their chips with TSM.

Despite this difficult competitive background, we expect a growing tailwind for the industry. For the past 15 years, the main driver of growth for the semiconductor industry was the transition to mobile devices. Today, five major trends are coming together to drive the next generation of growth; cloud computing, IoT devices, 5G, AI and autonomous (AV) and electric vehicles (EV).<sup>3</sup> All of these secular trends are prospective growth tailwinds for INTC. As an example, if we just look at the economic benefits of transition in transportation, Internal Combustion Engine (ICE) vehicles have between \$50-\$100 of semiconductors in them, EV's have about \$500 and autonomous vehicles are expected to have upwards of \$1800. Intel is well positioned for the transition from ICE to EV to AV. It owns Mobileye, a leading Advance Driver Assistance System, and Intel's chips are used in Waymo's cars, Google's leading autonomous vehicle company. Even before this transition to EVs and AVs accelerates, greater chip demand in more sophisticated vehicles are causing a bottleneck in automobile manufacturing. The Financial Times recently reported that Honda, GM, Volkswagen, Fiat Chrysler, Nissan and others are experiencing a shortage of chips that according to IHS will delay or prevent half a million vehicles from being manufactured.<sup>4</sup>

The (now former) CEO of INTC Bob Swan, understands that INTC will be a beneficiary of this transition to a low carbon economy. In November of 2020 he wrote a letter to President Elect Joe Biden asking him to increase spending in digital infrastructure. Mr. Swan explained "smart infrastructure spending will help address pressing economic and climate change needs. This will include technology designed to make cities and energy systems smarter and more efficient. Widespread deployment of advanced 5G telecommunications networks will fuel efficiencies for businesses in all industries and enable more U.S. innovation."<sup>5</sup> Intel also partnered with Johnson Controls to create a new coalition called the Digital Climate Alliance. It will lobby lawmakers to make sure digital solutions are part of climate policy.<sup>6</sup> Unlike the railroad companies, INTC believes that climate solutions are good for their business.

Not only is there a business opportunity for the semiconductor industry, how they approach it will materially affect the carbon footprint. The combined energy footprint of the world's data centers, networks, and devices is around 6% of global electricity use.<sup>7</sup> With a goal of carbon neutral computing, INTC is constantly working to improve the energy efficiency requirements for CPUs. They also have aggressive goals to reduce the Greenhouse Gas footprint of their operations, currently purchasing 100% of their US electricity from renewable resources.

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<sup>3</sup> <https://spectrum.ieee.org/view-from-the-valley/semiconductors/design/semiconductor-ceos-on-life-after-moores-law-climate-change>

<sup>4</sup> <https://www.ft.com/content/13094950-fb45-4686-9ef9-8199c674b90d?emailId=600fe1926e8c960004d510fe&segmentId=3934ec55-f741-7a04-feb0-1ddf01985dc2>

<sup>5</sup> <https://newsroom.intel.com/news/bob-swan-open-letter-president-elect-biden/#gs.qiv4b4>

<sup>6</sup> <https://www.digitalclimate.io/>

<sup>7</sup> <https://semiengineering.com/semiconductors-and-the-climate-curve/>

Finally, from a climate change risk perspective we think that INTC's U.S. centric manufacturing capabilities are an asset. The McKinsey Global Research Institute published a report showing that global supply chains on average would be disrupted for over a month once every 3.7 years, costing companies on average 42% of their annual EBITDA every ten years.<sup>8</sup> Climate, according to multiple reports is expected to exacerbate these disruptions through increased storm damage, flood risk, heat stress and geopolitical unrest.

By applying a holistic analysis to understand climate change's risks and opportunities including supply chain risk, capital deployment decisions and materiality to name a few, we believe we can better assess the economic impacts for our investments. In the case of INTC we are compelled by both the opportunities created by a low carbon future as well as the risks averted and importantly its fundamental valuation.

### **Closing Thoughts**

This coming quarter will mark the end of Redwood Grove's fourth year. As our investors know, we incorporate the economics of climate change into a fundamental, value investment process. We launched in February 2017, shortly after Donald Trump was elected president. At the time, the idea that climate change ought to be included in investment analysis was not conventional thinking. That contrarian view has served us and our investors well, helping us beat our benchmark by 500 bps annually.

Since our launch, ESG investing has increasingly become de rigueur, and investment managers who shunned the idea just a few years ago are scrambling to launch products to meet that demand. We expect this trend to continue. It is up to asset owners to ensure that the products they are investing in are meeting their expectations. All too often asset managers will meet demand with well branded, but ineffective products. It is much easier to brand a company "sustainable" than it is to understand what a company is doing to address climate change and how it might impact their earnings.

We know that our investment thesis is a bit more complicated and less conventional than many others. So, we appreciate our investors willingness to read this far into the letter and to ask the tough questions to better understand why we believe our approach is different and impactful. We hope our process continues to benefit our investors and the planet.

As always, thank you for your continued trust in us. If you have questions, concerns or comments please do not hesitate to reach out.

With gratitude,

The image shows two handwritten signatures in black ink. The first signature is 'Red' and the second is 'Greg'. They are positioned side-by-side.

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<sup>8</sup> <https://www.mckinsey.com/business-functions/operations/our-insights/risk-resilience-and-rebalancing-in-global-value-chains>