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AI Update (Part 2)

Dear Investors

We have previously highlighted how infrastructure growth will drive demand for energy resources. We believe this trend remains in its early stages. In today's note, we turn our focus to how AI advancements are also increasing the need for fiber optic cables. As more data centres are built, connecting them efficiently is becoming a priority. This trend, while nascent, is expected to gain momentum alongside the energy infrastructure buildout.

AI Advancements and the Rise of Interconnected Data Centres

Given construction timelines and power availability constraints, the traditional approach of training AI models at a single data centre is becoming less feasible. To keep up with leaders like Google, Microsoft, and OpenAI, companies are linking ultra-large data centre campuses. This allows them to train the next generation of AI models collaboratively across sites.

Training AI models across campuses involves asynchronous workflows, akin to an orchestra where different GPUs handle specific parts of a model before integrating them. Effective coordination requires fault-tolerant communication protocols to maintain seamless workflows. These innovations are not just enabling AI model development at scale for Big Tech, but also improving the flexibility and efficiency of inference workloads in interconnected data centres.

Fiber Optics: The Backbone of AI-Driven Infrastructure

Connecting data centres together is primarily achieved by laying down thousands of fiber optic pairs. Since the bulk of costs lie in digging trenches for the optics, hyperscalers often overprovision fiber capacity to save space within data halls and simplify telecom deployment. This strategy reduces complexity and improves scalability.

Hyperscalers are now racing to secure fiber capacity to interconnect their data centres. Microsoft, for instance, struck a \$5 billion deal with Lumen Technologies to leverage its existing network and build new segments to its data centres, with an additional \$7 billion in the pipeline. Notably, 85-90% of the deal involves upfront capital expenditures dedicated to infrastructure development.

Dylan Patel of SemiAnalysis suggests "this could be just the start." In response, Lumen pre-ordered 10% of Corning's fiber-optic supply for the next two years. Lumen has since announced partnerships with Meta, AWS, Google Cloud, and Prometheus to connect their AI data centres. AWS's CEO remarked that "the next wave of innovation will be driven by generative AI, which requires a combination of secure, scalable cloud infrastructure and flexible networking."

These partnerships highlight the rapid evolution of interconnected data centres, enabling more scalable and fault-tolerant AI training models for customers across every industry. They also underscore the increasing importance of robust fiber optic infrastructure as a backbone for AI-driven growth.

Capital Expenditures and Market Growth Outlook

Our analysis indicates that these connections will drive significant demand for optical fiber. Historically, capital expenditures by the three dominant U.S. telecom companies grew at an average of 1% per annum throughout the 2010s, reaching approximately \$45 billion annually by 2024. However, recent deals such as Lumen's suggest an additional \$15-20 billion in telecom capex over the next 4-5 years. This level of investment would accelerate capex growth rates by nearly 9x. Importantly, much of this spending will focus on expanding fiber networks, enabling faster growth in this segment relative to overall telecom infrastructure. This turbocharged growth highlights the critical role fiber optics will play in the AI-driven infrastructure boom.



To triangulate these estimates, Lumen Technologies has announced plans to double the length of its fiber optic network from its current 450,000 miles. This expansion would represent roughly a 20% increase in the amount of fiber optic mileage compared to what's needed today.

We anticipate a substantial rise in fiber optic cable production over at least the next five years. While Corning is expected to capture the lion's share of this demand, we expect peripheral producers like Optical Cable Corporation to also benefit given the size of the change. On its latest earnings call, the company noted that "weakness across the industry has begun to subside" and that "the sun is starting to peak through in 2025." Given that much of Lumen's capex to connect datacentres together begins in 2025, we suspect this is a key reason that management believes that "looking ahead, we see indications of growing strength in our target markets and among our customer base as well as potential opportunities to expand our product offerings."

Kind Regards,

Fawkes Capital Management

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