Our View: Carbon Capture Is Vaporware

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December 2023

Legacy (established) firms and businesses are notorious for erecting barriers to prevent entry by innovative competitors. IBM may have been the most successful legacy firm in this regard for forty or fifty years. As Tim Wu writes, "Over the 1960s, there were long-standing complaints that IBM was maintaining its mainframe monopoly and scaring people away from supercomputers using anticompetitive, predatory, and unethical practices."[1]

Years later, the software giant Microsoft became famous for its "vaporware" barrier to new entrants. A paragraph from a 2002 Justice Department memorandum is apt here:

> With the entrenched Microsoft monopoly, independent developers confront an applications barrier—Microsoft has such a significant lock on the computer platform and on applications used, that many developers are dissuaded from producing new products. Should the Microsoft monopoly be broken down, developers would look to create compatible, consumer friendly products. In fact, that is what Netscape and Sun attempted to do with Navigator and Java—create software, known as "middleware" because they insert themselves between the operating system and applications running on top of the middleware. Because Netscape/Java were compatible across systems, they threatened Microsoft's control over the consumer. Microsoft's reaction was to crush Netscape and undermine Java.[2]

The following definitions of vaporware were collected by three academic researchers in 2001:

> vaporware n. 1: a product that the vendor keeps promising is about to arrive "real soon now," but it goes so long past its shipment date that no one believes it will ever really ship (Jargon: An Informal Dictionary of Computer Terms by R. Williams and S. Cummings 1993) 2: slang for announced software that may never materialize (Computer Dictionary by D. Spencer 1992) 3: a term used sarcastically for promised software that misses its announced release date, usually by a considerable length of time (Microsoft Press Computer Dictionary 1991)[3]

In their paper, the authors applied game theory to explain why dominant firms might announce new products early to discourage competitors:

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[1] Tim Wu, "Tech Dominance and the Policeman at the Elbow," in Kevin Werbach (ed.), *After the Digital Tornado: Networks, Algorithms, Humanity* (Cambridge, England: Cambridge University Press, 2020) [https://tinyurl.com/2aepv7pu].

[2] "Competitive Processes, Anticompetitive Practices And Consumer Harm in the Software Industry," US Department of Justice Antitrust Division, January 25, 2002 [https://tinyurl.com/25pj4zn7].

[3] Barry L. Bayus, Sanjay Jain, and Ambar G. Rao, "Truth or Consequences: an Analysis of Vaporware and New Product Announcements," *Journal of Marketing Research* 38 (February 2001) [https://tinyurl.com/3apwe4pf], p. 3.

> Analyzing a stylized game-theoretic model of the product announcement and introduction timing decisions of two competing firms, we find that preannouncing a product can be a way for a dominant firm to signal its product development costs. A dominant firm with low development costs thus deters entry; it can then enter at a later time than it originally preannounced, earning monopoly profits that exceed any penalty costs.[4]

It is becoming clear that legacy energy firms, which include almost all oil companies, are following the well-trodden path broken by IBM, Microsoft, and other dominant computer firms in the introduction of carbon capture technologies. Their endeavors in this area seem designed to delay the abandonment of fossil fuels and perpetuate their dominance.

Occidental Petroleum has led these efforts, followed by ExxonMobil. Both companies have made extensive, expensive, and detailed presentations on the advantages of carbon capture at the ongoing COP28 conference in Abu Dhabi.

However, Reuters' columnist Clyde Russell refutes their claims, noting a recent IEA study stating that carbon capture could help reduce global warming but is far from a game changer:

> While the global oil and gas industry is well placed to scale up technologies to help achieve the goal of net-zero emissions by 2050, the IEA warns of pitfalls.
>
> One of those is what the agency, which represents developed nations, called "excessive expectations and reliance on CCUS [carbon capture, utilization, and storage]."
>
> It called CCUS an "essential technology for achieving net-zero emissions in certain sectors and circumstances, but it is not a way to retain the status quo."
>
> The key word in the above quote is "certain," meaning that CCUS is a viable technology to reduce emissions in some cases, but it is far from the silver bullet it is often made out to be, **largely by major oil and gas producers and their supporters** [emphasis added].[5]

Carbon capture is extremely expensive, and progress is minimal for this reason, as Russell explains:

> The slow pace of advancing CCUS is largely because of a lack of incentives for investors to take on what are usually large and complex projects, involving multiple partners.

Russell also notes that those promoting carbon capture, who include conservative political backers and oil and gas companies, "don't push hard for the financial and policy settings that would enable a faster roll out," even though they keep advocating the technology as a solution.

In his article, Russell labeled the current CCUS plans as "pipe dreams." Looking at economic history, the term "vaporware" seems an apt synonym.

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[4] Op cit., p. 11.

[5] Clyde Russell, "Carbon capture and storage hopes are pipe dreams for now," Reuters, November 23, 2023 [https://tinyurl.com/24v8ey7w].