



Metal

Additive Manufacturing Opportunities in 2018–23



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Pedal to the Metal

Even though metal AM has been booming, total revenues reported in 2015 have been revised down from our previous study. This may seem counter-intuitive but is actually due to greater than anticipated activity from major powder suppliers and their sales activity with major end users. This activity, characterized by much larger average order quantities and significant volume discounts, resulted in lower than previously expected average pricing in a number of critical alloys.

Mid-term outlook for metal powder revenues is now estimated at **\$1.4B by 2023**, growing from \$300M in 2018. Longer term outlooks remain largely unchanged thanks to stronger than

previously expected overall utilization and acceptance of metal AM systems, with total revenues expected to climb to **\$2.1B in 2025** compared to previous estimations of \$2.36. The metal AM powder market is forecasted to reach \$3.1B by 2027.

The highest grossing metal AM technology sub-segment will be laser powder bed fusion, which has generated more than 70 percent of market revenues in 2016. This is expected to increase to almost 75 percent of revenue in 2017. Powder-based directed energy deposition systems have seen major growth in revenue since 2014 thanks to the continued integration into subtractive digital manufacturing

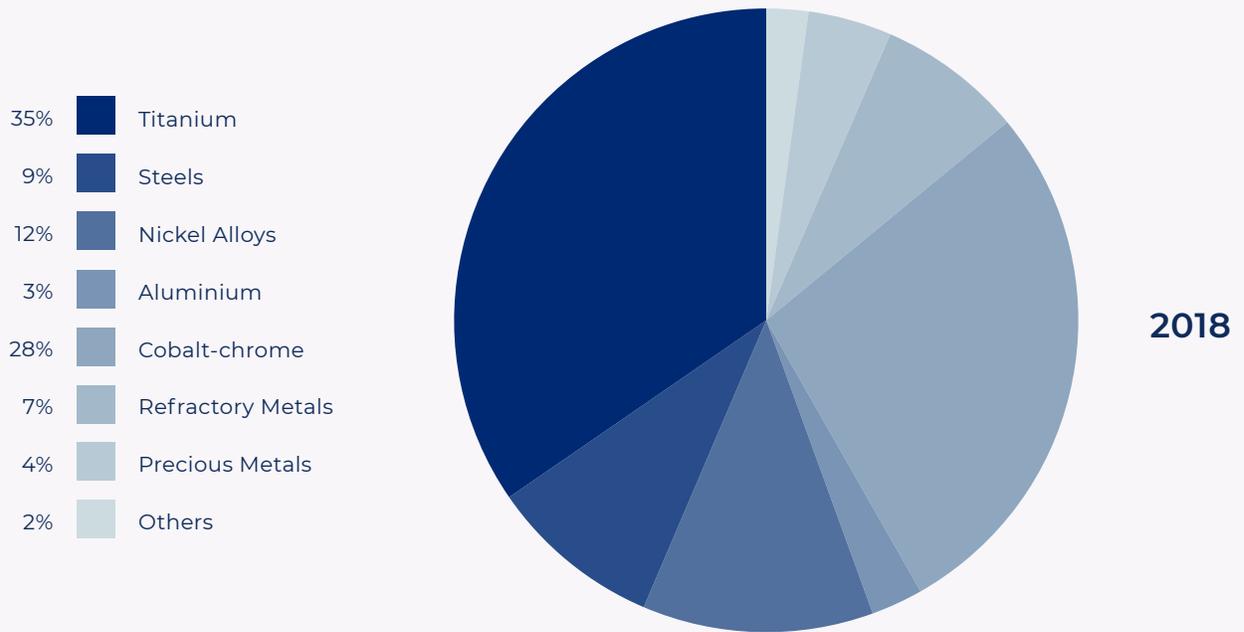
technologies as well as investment in large standalone additive systems by the aerospace industry. Next up will be the impact from upcoming, high-speed metal inder jetting systems. Their actual impact in terms of adoption and powder consumption will need to be carefully monitored.

Our take is that 2017 was a transition year. In other words, we believe that the market didn't grow in 2017 as much as it had been growing historically. To contextualize, **GE** had been wrapping up acquisitions, which had an interesting effect on the market overall. Having a big company like GE on board got more people interested in the technology, but it also created a lot of uncertainty in terms of customer orders because many potential customers were hesitant to buy machines; they wanted to see how the industry was going to play out before committing.

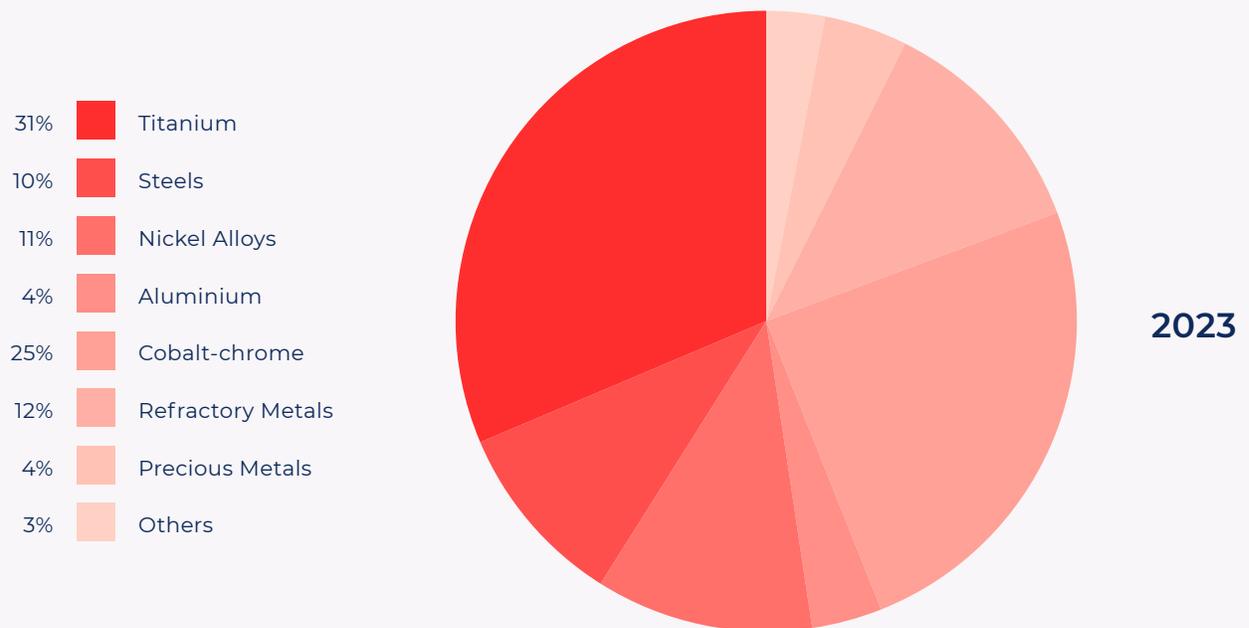
More generally, competitive landscapes are shifting at record pace in the market, with the notable acquisitions from GE along with market entries by major machine tool manufacturers and metal powder suppliers happening throughout 2018 (the latest being **Carpenter's** acquisition of **LPW**). General Electric's own internal consumption of additive manufacturing machines, expected to be around 1,000 total systems over the next decade, represents as much as 4 percent of the total market sales for metal AM units in a given year during the forecast period.

Major metal powder suppliers are beginning to make investments in order to gain key foothold in the future market for powders used in additive manufacturing. These suppliers are ramping up their influence in the market as more end users begin serial manufacturing applications in AM, and

Metal AM Market Share by Segment



Source: Smartech Publishing



Source: Smartech Publishing

“The past two years went down in history as the time in which a global revolution centered on metal additive manufacturing picked up speed”

as a result hold the potential to weaken the business models of metal AM machine OEMs relying on redistribution of metal powders to customers as an additional revenue stream.

As we accurately forecasted in 2016, the past two years went down in history as the time in which a global revolution centered on metal additive manufacturing picked up speed, with even the historic leaders in polymer 3D printing now looking towards metals as a strategic growth area. **Stratasys** and **HP** entered or will enter the market in 2018/2019 to compete with the newly formed **GE Additive**, the rapidly growing Renishaw, historic leader **EOS**, and a slew of other innovative newcomers with backgrounds ranging from laser manufacturing solutions (**Trumpf**) to pureplay additive startups (**Desktop Metal, XJet**) and more. It is clearly one of the most exciting times to be involved in

the powder-based metal AM market.

Now, the big thing in the industry is how the metal AM market is being more broadly accepted by metal powder manufacturing organizations and associations. Metal powder manufacturing associations that oversee those non-additive processes are all now treating AM as another powder-based manufacturing process for metals, which is very positive. The next evolution in the market is additive becoming a part of the metal powder toolbox for industries like automotive and aerospace and what is really helping that is all this interest and activity around bound metal printing.

A key player in metal AM is GE Additive, a fairly recent division of GE that has quickly become a giant in the industry (following a number of high profile acquisitions). Desktop Metal, which has

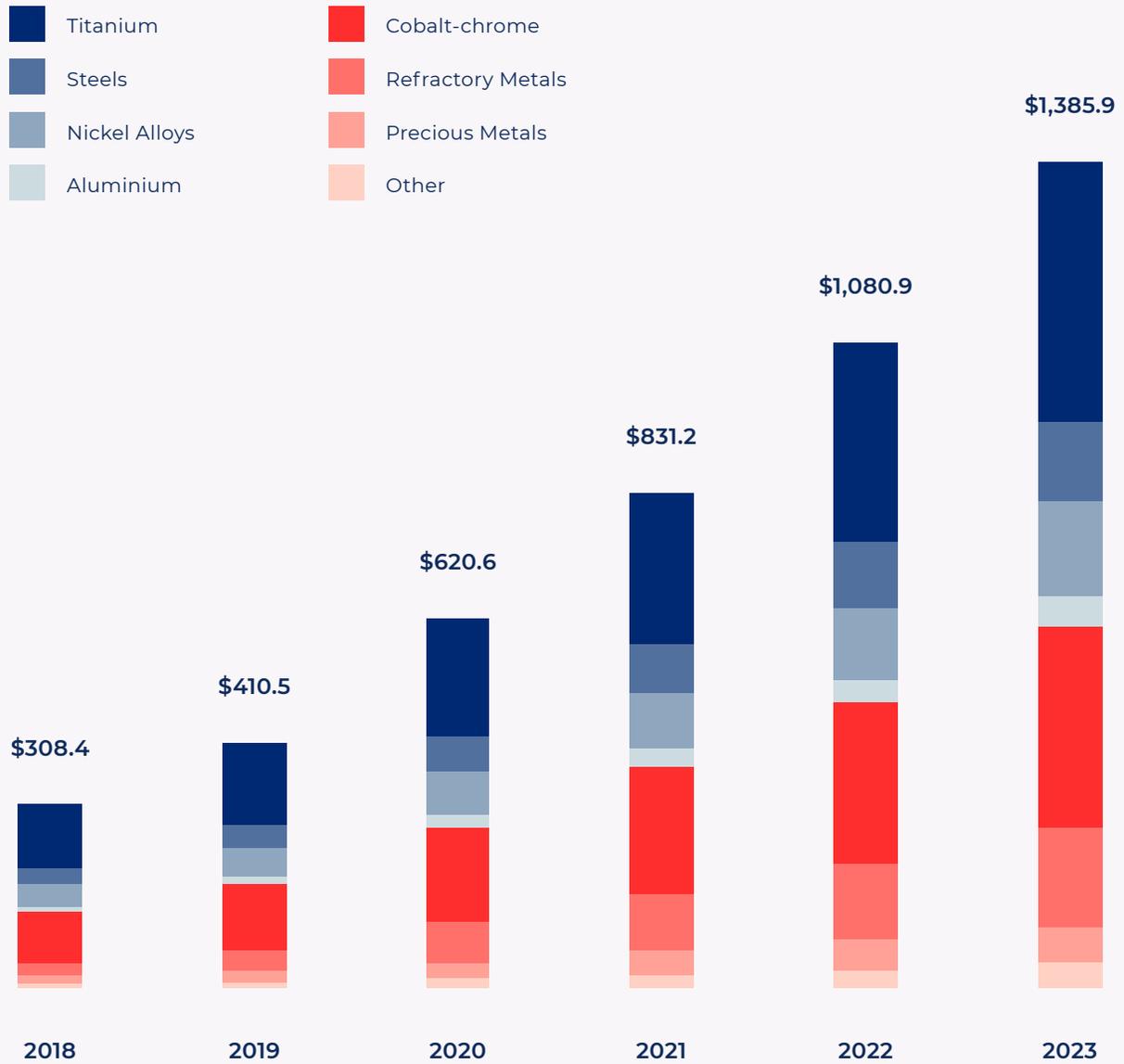
already introduced its bound metal Studio System and is preparing to launch its Production System, is another company making waves. Additionally, Germany-based EOS is still a leader in metal AM. EOS is still definitely a force in the market and will be for years to come. There will definitely be an advantage from a competitive standpoint for companies that have a solution in multiple metal AM technologies. Whether its powder-bed fusion, bound metal printing or directed energy deposition processes, all three are carving out their own niche. In the future, it won't be a niche, it'll be a lot bigger than that and there will definitely be some sort of competitive edge if you can attack all three of those as one machine provider or solution provider.

We still identify the medical and aerospace sectors as the two most important growth drivers for the

metal AM industry, though we also highlight the growing importance of the automotive segment, which is increasingly exploring and adopting metal AM processes for producing replacement and spare parts. We also look more closely at the oil and gas/energy sectors as separate growth drivers for metal AM.

Though adoption in these energy sectors has remained relatively slow, energy companies (nuclear, wind and power generation) will become big users of metal AM in the future, and largely thanks to innovations within the aerospace field. The types of applications in those segments are pretty close to what has been investigated in aerospace as far as engine components. This makes it easier for the energy industries to get going with additive because there's this body of work they can tap into from the aerospace segment.

Total Metal AM Powder Market 2018–23 (\$US M)



Source: Smartertech Publishing

Full Report

[See Report](#)

Metal powder additive manufacturing continued its disruptive journey in 2017, largely overcoming some major challenges and seeing faster than anticipated movement into true serial production applications which spurred another year of healthy growth despite temporary slowdowns experienced at the end of 2016.

Now the metal powder additive manufacturing market appears to be entering its next major phase of growth, with the established area of metal powder bed fusion technologies undergoing major changes to address costs and volumes limitations, and an emerging market coalescing around new bound metal printing technologies.

The next two years are likely to go down in history as the time in which a global manufacturing revolution picked up speed, with even the historic leaders in polymer 3D printing now looking towards the metals segment as a strategic growth area. Stratasys and HP will enter the market in 2018 to compete with the newly formed GE Additive, the rapidly growing Renishaw, historic leader EOS, and a slew of other innovative newcomers with backgrounds ranging from laser manufacturing solutions (Trumpf) to pureplay additive startups (Desktop Metal) and more. It is clearly one of the most exciting times to be involved in the powder-based metal additive manufacturing market -an industry on the rise.

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