Oil & Gas

Additive Manufacturing Opportunities in 2018–23

3dpbm x SMARTECH MARKETS PUBLISHING

Digging for AM in Oil & Gas

The oil and gas industry is poised to become one of the most important generators of revenue – both near- and long-term -- for additive system manufacturers and service providers worldwide.

We believe that AM will be invaluable to oil and gas industry stakeholders as well as to the investment community, while it will offer a huge opportunity of growth to the additive manufacturing community itself.
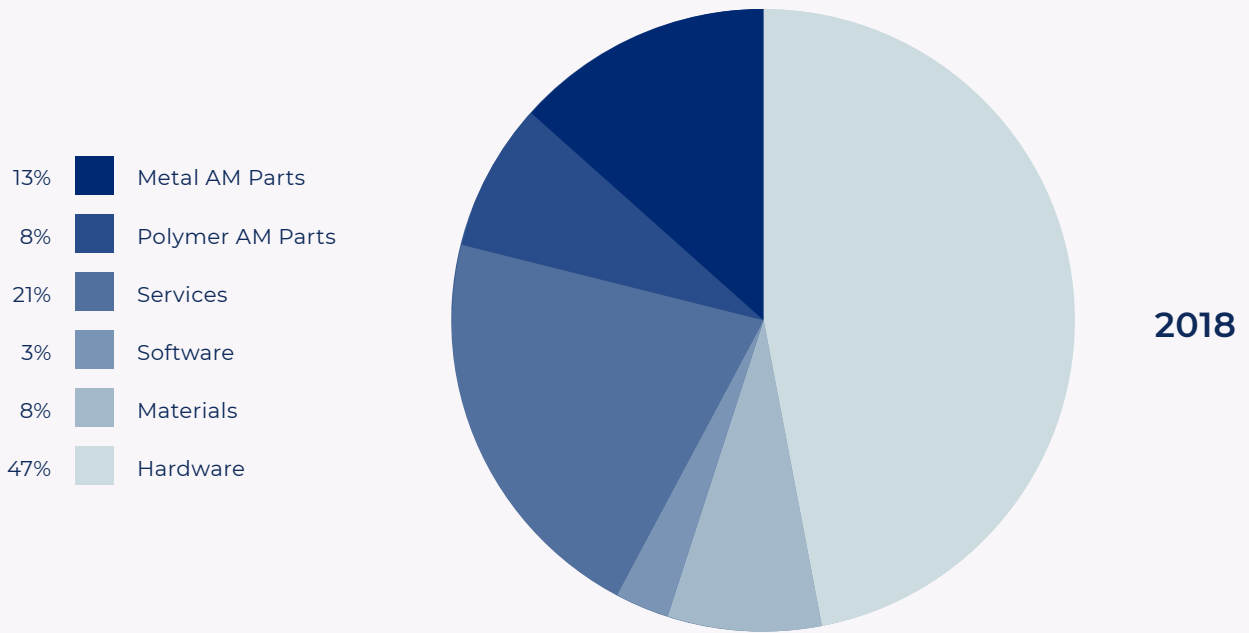
The overall market for AM adoption in the Oil & Gas sector is expected to grow at **40% CAGR** throughout the full 11-year forecast period between 2016 and 2027, which is taken into consideration in the full report. Growth rates are higher in the first part of the forecast and they slowdown in the second half of the forecast period, as the segment consolidates and yet continues to explore a very significant potential.
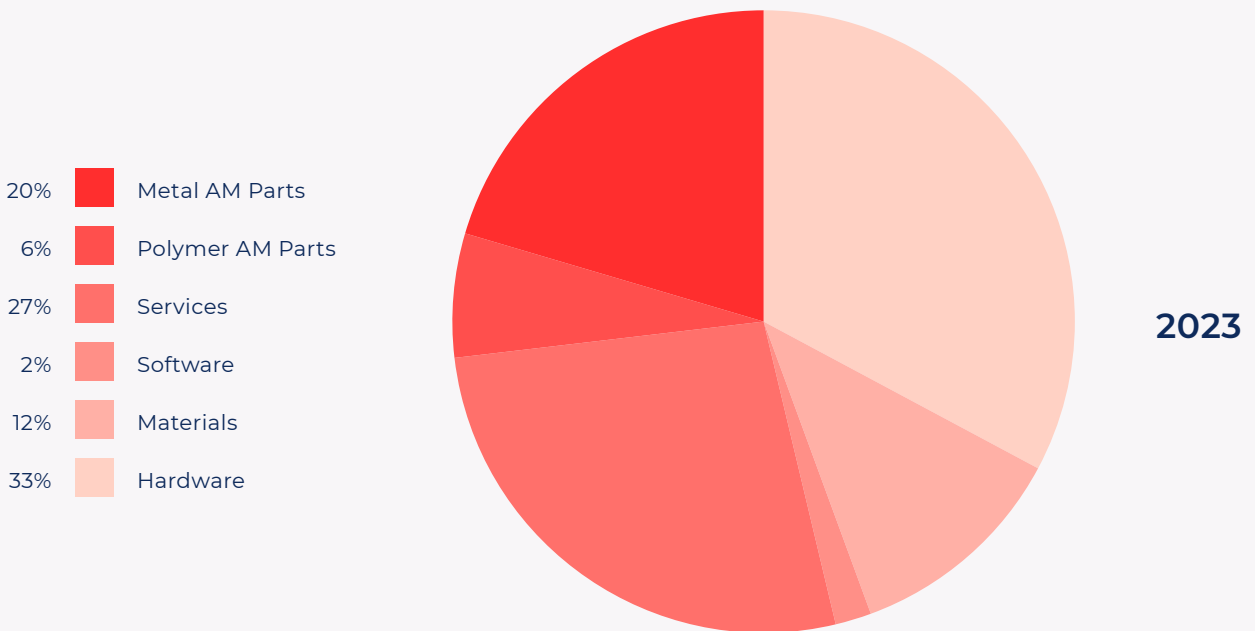
Overall, SmarTech Publishing expects 3D printing hardware and 3D printing services to represent the most significant revenue opportunities, with AM software (not including CAD) only representing a minor revenue opportunity at this time.

Materials sales also represent a smaller opportunity than services at this time as the intrinsic value of finished 3D printed parts indicates that the technology will continue to be used – for the immediate future – for relatively small batches or small size high value parts. SmarTech Publishing expects that the oil & gas sector will resort primarily to outsourcing for AM part production rather than internal production – at least for the duration of the period analyzed in this report.

Oil & Gas AM Market Share by Segment

13%	Metal AM Parts
8%	Polymer AM Parts
21%	Services
3%	Software
8%	Materials
47%	Hardware

2018

Source: Smartech Publishing

20%	Metal AM Parts
6%	Polymer AM Parts
27%	Services
2%	Software
12%	Materials
33%	Hardware

2023

Source: Smartech Publishing

AM Opportunities in Oil & Gas 2018

Learning to fly (and sail)

The oil and gas industry was not a first adopter of AM. Publicly disclosed application cases have been and are still very rare if compared this vertical segment's global revenues and importance. The oil and gas industry, however, has the potential to largely bypass prototyping and small batch/ small size part production to jump directly into full AM production. In order to do this, oil and gas can take lessons learned from the aerospace industry, especially with respect to powder bed (laser and electron beam) fusion applications. Global companies such as **GE** and **Siemens**, that are both AM hardware/services providers and major oil and gas stakeholders are leading the way.

Possible oil and gas applications that could benefit from use of AM in aerospace include drill components, sensors and housings, combustion systems and turbomachinery, valve fittings and pump components, heat exchangers, catalytic reactors and complex manifolds.
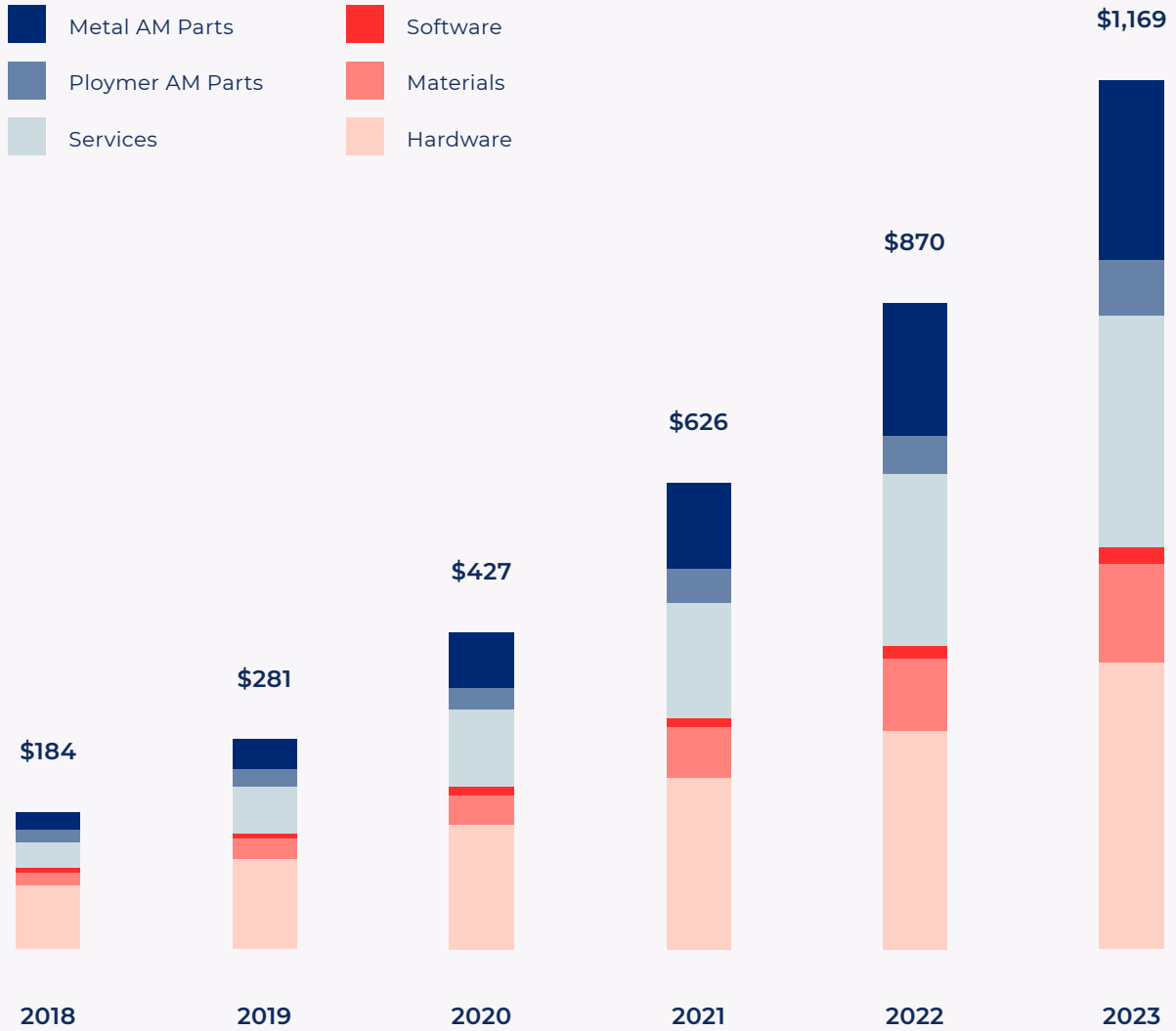
In addition, the recent rapid growth of powder fed (large format DED and cold blown powder) technologies, especially in the maritime segment, is also enabling oil and gas companies to envision clear benefits in adopting AM for both upstream and midstream applications such as on-site part manufacturing and large shipping components. This area of application is focusing on both metals and composites with major roles played by **SABIC**, **Mitsubishi Chemical** and **Lehvoss** (polymer and composite materials), **Stratasys**, **Thermwood** and **Cincinnati Inc** (polymer and composite hardware), **Titomic** and **DMG Mori** (metal hardware), **Siemens** and **Autodesk** (AM services and software).

According to a study conducted by Siemens Oil & Gas, the value of additive manufacturing in facts and figures can lead to:

· 30% reduction of greenhouse gas emissions
· 63% less resources in production process
· 75% reduction of development time
· ∞ flexibility for design of parts
· 60% faster repairs
· 50% reduction of lead time
· 60% hydrogen in the fuel mix

Total AM in Oil & Gas Market 2018-2023 ($US M)

Legend:
- Metal AM Parts
- Ploymer AM Parts
- Services
- Software
- Materials
- Hardware

Year	Value
2018	$184
2019	$281
2020	$427
2021	$626
2022	$870
2023	$1,169

AM Opportunities in Oil & Gas 2018

Full Report

See Report

In 2016 SmarTech released the first ever in-depth analysis of additive manufacturing for the Oil and Gas industry. Our conclusion was the that this sector would become a major adopter of additive adopter of additive manufacturing technologies. Our 2017 report on this topic shows that our projections were correct.   GE is now actively printing a variety of metal components for use in its oil and gas operations, while Halliburton is actively exploring the use cases for field production of active parts.

This report is illustrated with the latest examples of where additive manufacturing is making a difference in the oil and gas industry. The reader of this report will also gain a better understanding of how additive manufacturing continues to penetrate the oil and gas Industry. It also provides guidance on how AM firms can help message their products for the oil and gas industry and how to get the industry behind additive manufacturing, as well as a detailed exploration of potential application areas that can jump-start internal research and development activities within the Industry.

The oil and gas industry is poised to become one of the most important generators of revenue – both near- and long-term — for additive system manufacturers and service providers worldwide. We believe that it will be invaluable reading to oil and gas industry executives as well as to the investment community and the additive manufacturing community itself.

SmarTech Publishing

A leading provider of industry analysis and market forecasts for the additive manufacturing industry. SmarTech Publishing's coverage provides insight to complement internal product planning and technology roadmapping, and provide low-cost knowledge enhancement for companies working in the AM industry.

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