

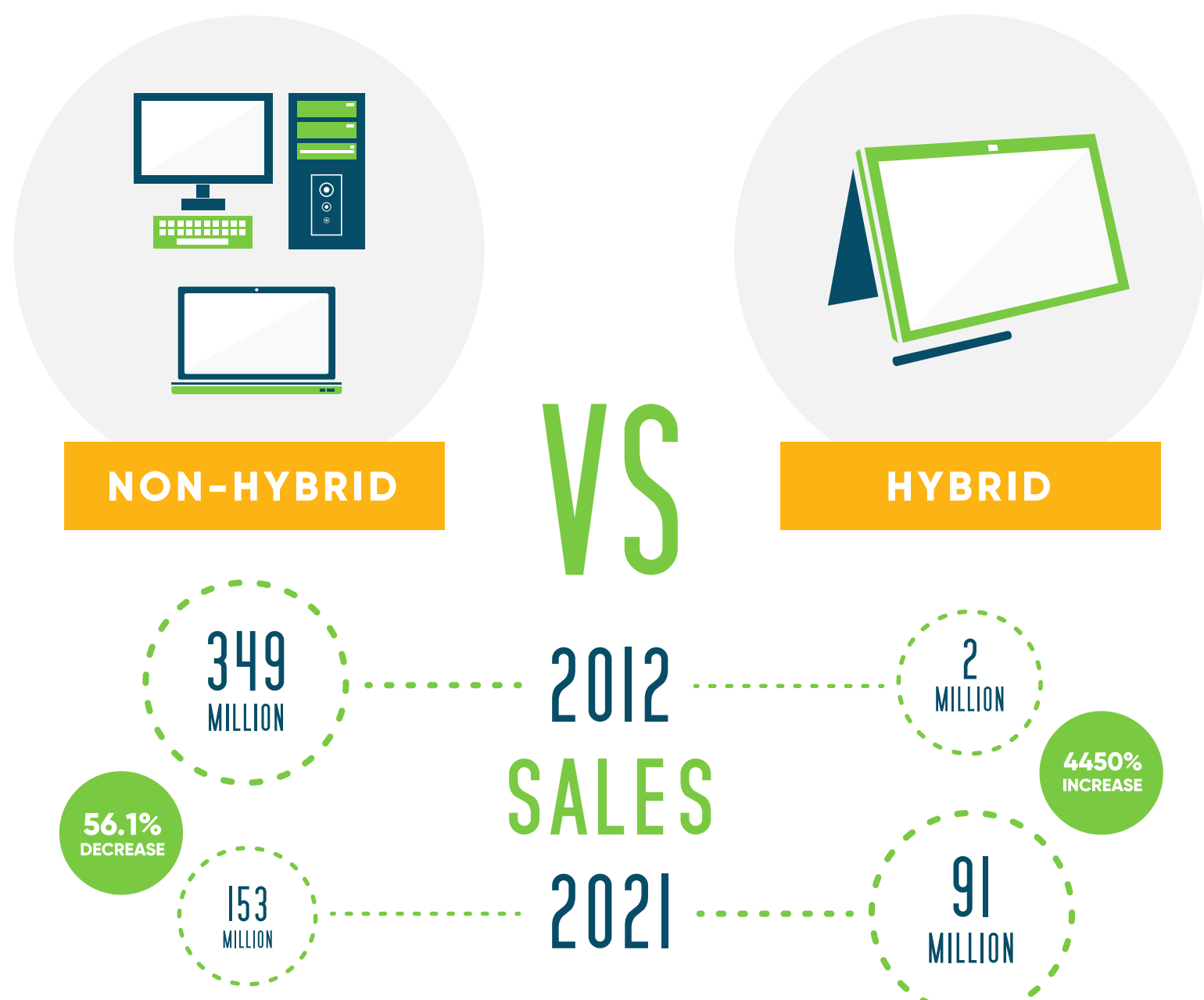


STORAGE SOLUTION TRENDS

Consumer Notebook Market

CHANGES IN PERSONAL COMPUTING

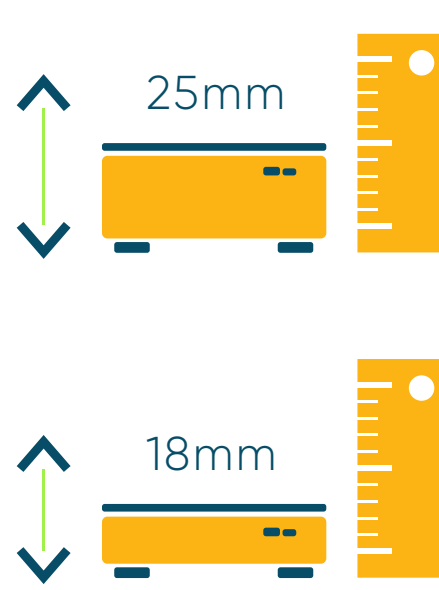
Back in 2012, more than 351 million PCs were sold, nearly 349 million of which were laptop/notebook or desktop systems. Fast forward to 2021, we forecast 244 million PCs will be sold, of which only 153 million will be desktops or laptops.



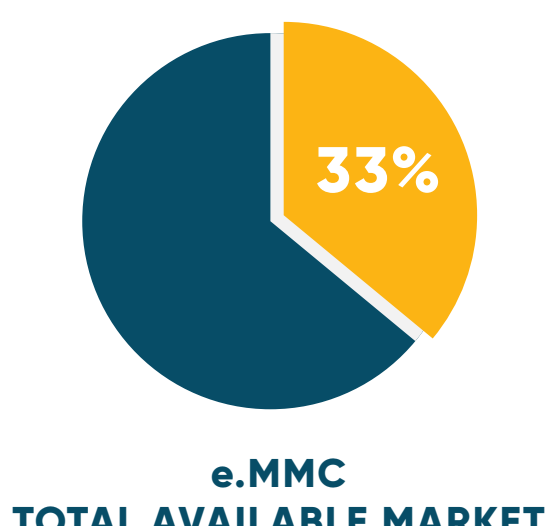
CHANGES IN STORAGE SOLUTIONS

All these shifts in the PC marketplace have an impact on – and in turn are impacted by – storage solutions.

As hard disk drive (HDD) technologies have grown smaller, laptops using HDD have been able to slim down from 25mm thick to around 18mm thick – without sacrificing capacity. These changes are significant as users continue to migrate towards lighter, portable devices.



EMBEDDED FLASH STORAGE GAINS TRACTION

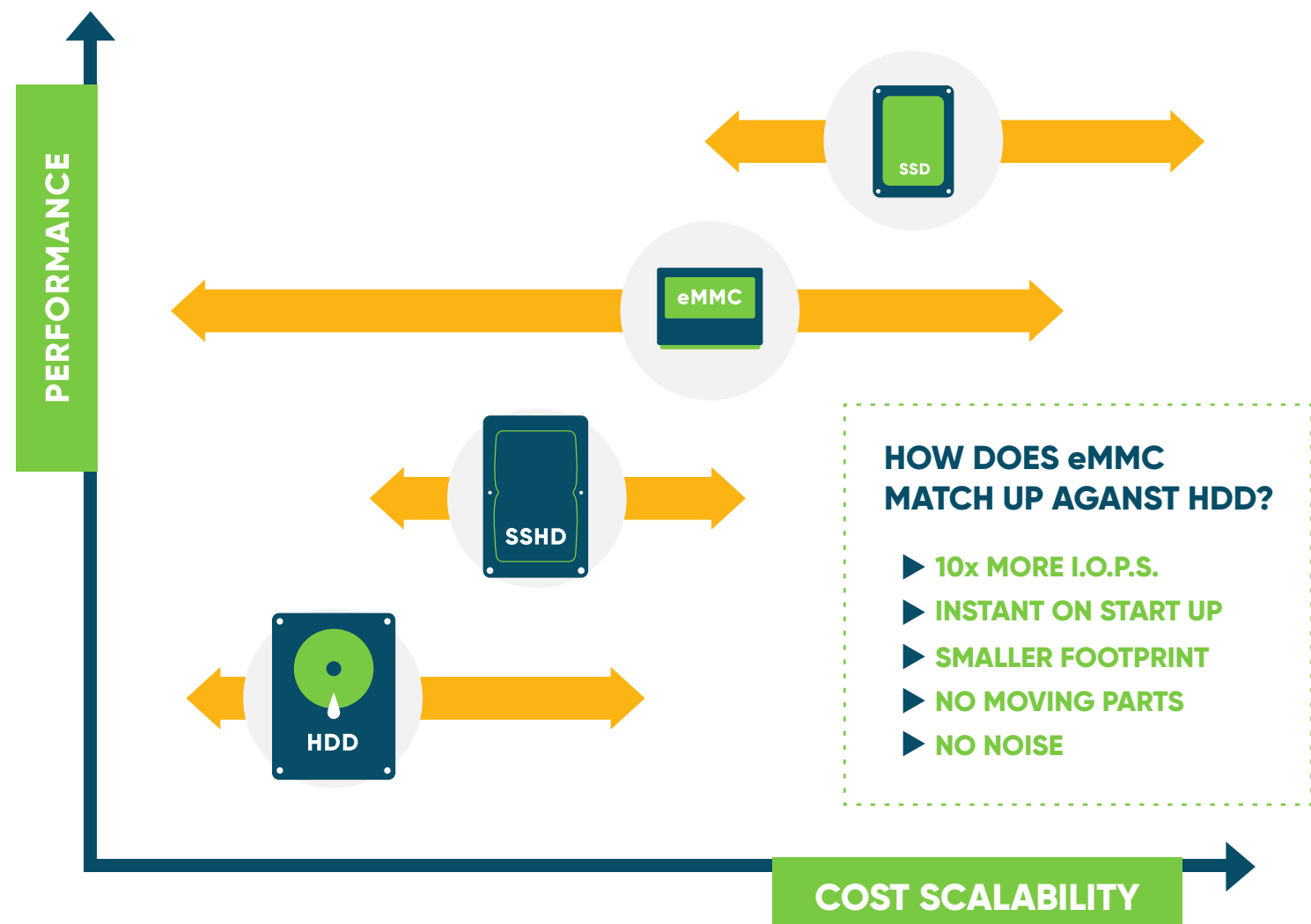


e.MMC memory storage solutions in the 32GB to 128GB range are less costly than SSDs and have a smaller footprint than HDDs.

Currently, the sub-\$400 notebook space garners more than 33% of the total consumer notebooks segment, representing significant total available market opportunity.

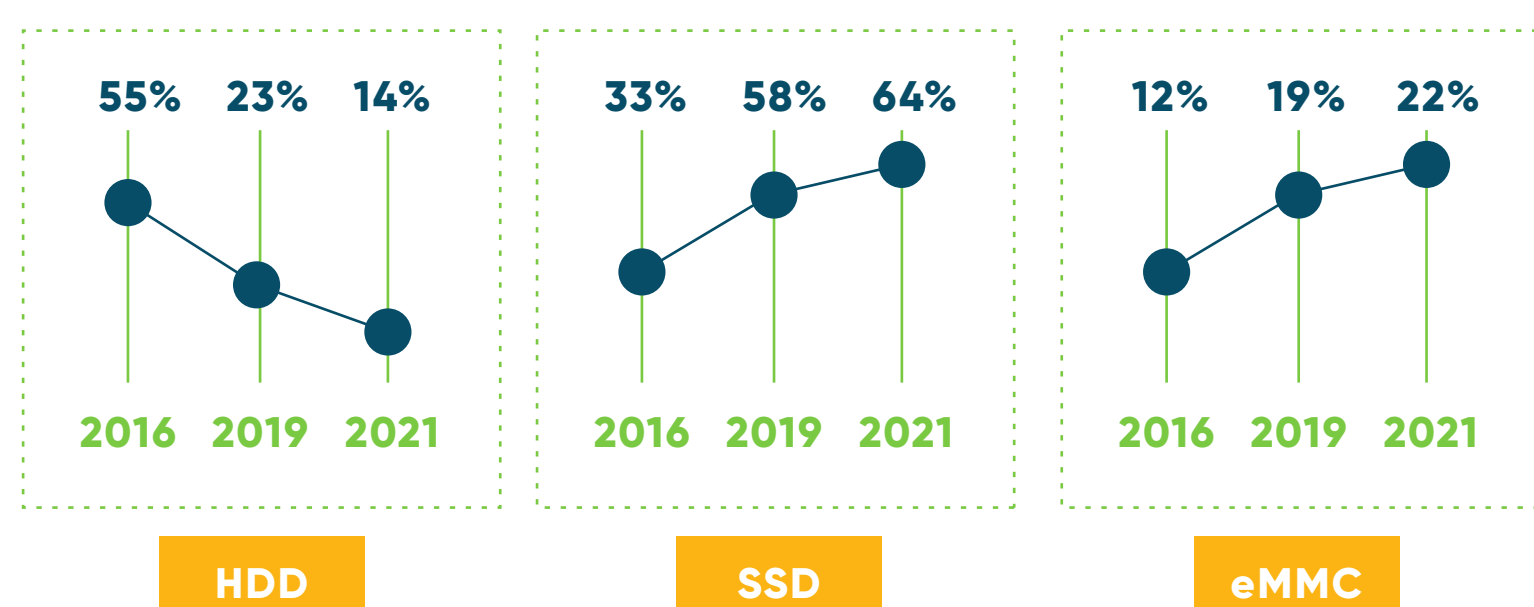
COST VS. PERFORMANCE COMPARISON

Storage solutions based on e.MMC are highly cost-scalable. 32GB and 64GB storage configurations can be ideal for entry-level consumer notebooks and cost less than a 500GB HDD. We estimate that the cost of a 128GB e.MMC Flash storage solution will be on par with (if not less than) a 500GB HDD by 2017.



ADOPTION TRENDS OF MEMORY IN NOTEBOOKS

We estimate that 15 million e.MMC-based notebooks were shipped in 2015, a figure that represents a market penetration of close to 9% (and a growth rate of almost 95% YoY since 2010). By 2021, we project that 40 Million laptops/notebooks – 22% of all laptops/notebooks sold – will contain e.MMC-based storage solutions.



CONCLUSION

The laptop/notebook PC segment is undergoing a significant form-factor evolution as increasing numbers of consumers demand sleeker hardware, lighter weight and snappier performance. These outcomes are possible only with the adoption of a smaller, thinner, lighter storage solution. Since high performance SSDs remain costly and HDDs remain bulky, e.MMC-based storage solutions offer an ideal balance of price, size, and performance to meet the demands of consumers seeking a “mobile computing” solution.

NON-HYBRID = Traditional desktop PCs and laptops.
HYBRID = 2 in 1 PCs, convertibles and PCs in tablet form.