TMBC – DC Migration
Business Value Assessment
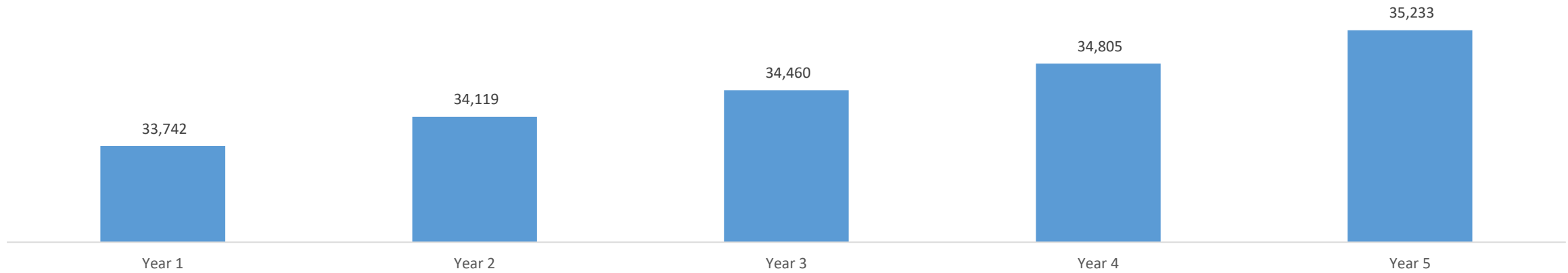
Microsoft

Carbon Footprint analysis

Carbon foot print On-Premises Vs Cloud

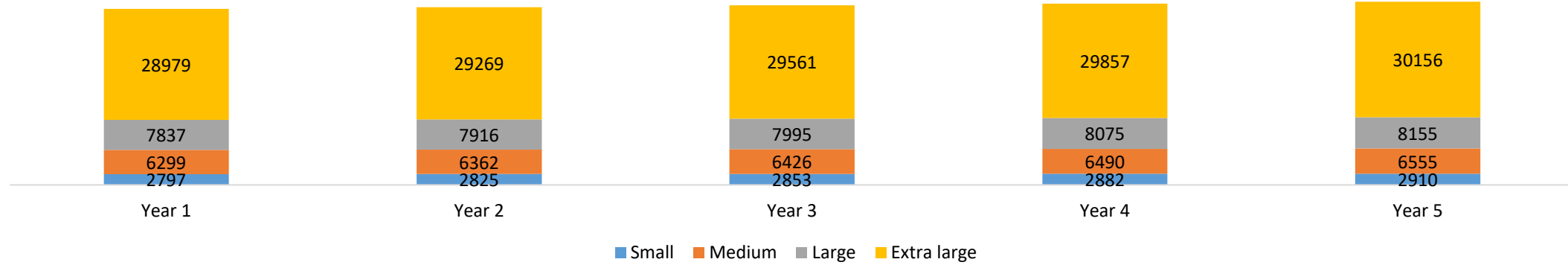45,912 | 12,170 | 46,371 | 12,252 | 46,835 | 12,375 | 47,303 | 12,498 | 47,776 | 12,543

Year 1   Year 2   Year 3   Year 4   Year 5

■ Total Carbon foot Print of all the servers On-Premises   ■ Total Carbon foot Print of all the servers in Cloud
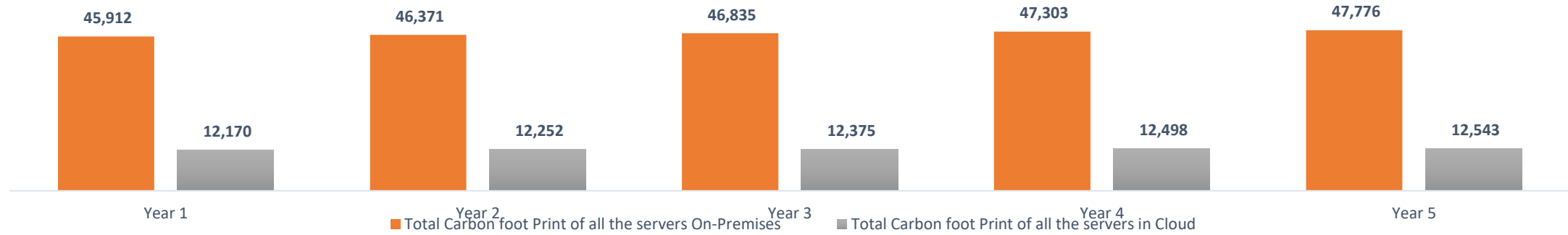
Reduction in Carbon footprint per year (Kgs of CO_2)

33,742 | 34,119 | 34,460 | 34,805 | 35,233

Year 1   Year 2   Year 3   Year 4   Year 5

CFP – On-premise

CFP by Size of Machines

	Year 1	Year 2	Year 3	Year 4	Year 5
Extra large	28979	29269	29561	29857	30156
Large	7837	7916	7995	8075	8155
Medium	6299	6362	6426	6490	6555
Small	2797	2825	2853	2882	2910

■ Small ■ Medium ■ Large ■ Extra large

Equivalent acres of forest that can absorb the carbon dioxide produced by On-Premises DC

Year 1	Year 2	Year 3	Year 4	Year 5
54	55	55	56	56
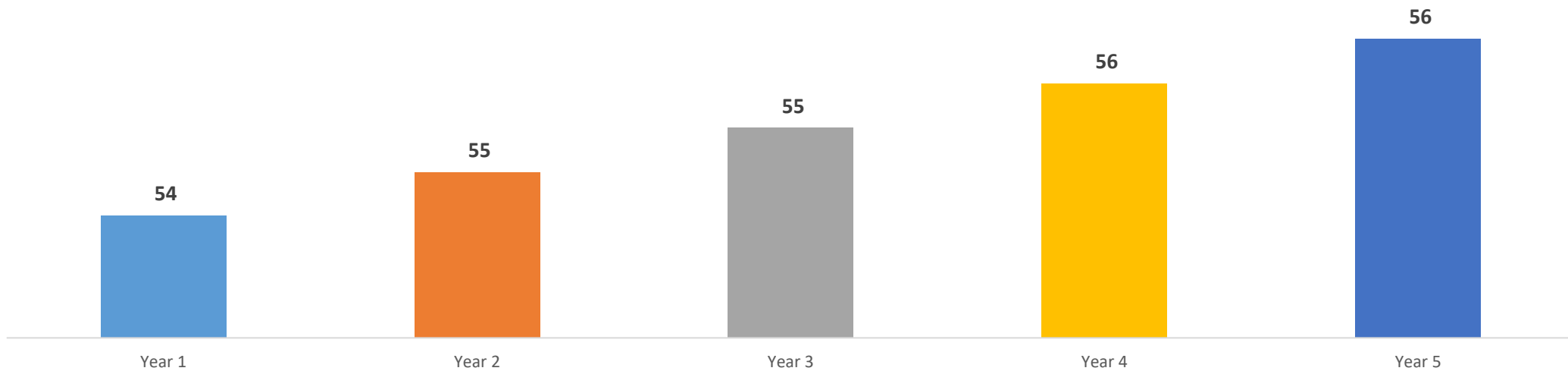
How sustainability analysis was done

- Any analysis of the climate impact of a data center should take into consideration **resource utilization** and **energy efficiency**, in addition to **power mix**.
- Carbon emissions are driven by three items:
    - the number of servers running,
    - the total energy required to power each server, and
    - the carbon intensity of energy sources used to power these servers.
- Using fewer servers and powering them more efficiently are at least as important to reducing the carbon impact of a company's data center as its power mix.

- **Cloud Customers Consume Fewer Servers**
    - On-premises data centers typically have fairly low server utilization rates.
    - In contrast, large-scale cloud infrastructure operators have a much larger pool of customers and applications allowing them to smooth out peaks and run at much higher overall utilization levels.
    - So, with better server utilization rates for the typical large-scale cloud provider when compared to on-premises, it means that when companies move to the cloud, their applications can be supported using fewer server resources, so this means they typically provision fewer servers that they would on-premises. This alone is a material gain.

How cloud customers have less Carbon footprint

Cloud Customers Consume Less Power
- The annual Uptime Institute survey has found average data center PUE to be 1.7
- Azure datacenter PUE is 1.12
- =>For like-powered servers, the power consumption in the cloud would be 33% lower than on-premises data centers.

Cloud Customers Reduce Their Carbon Emissions
- Average corporate data center has bad power mix than the typical large-scale cloud provider. A popular way to look at the climate impact of power mix is carbon intensity (grams of carbon emissions per kWh of energy used).

- Microsoft remains focused on working towards our long-term commitment to 100% renewable energy usage.
- MS commitment: To be carbon negative by 2030 and use 100 percent renewable energy by 2025.
- Microsoft says at the end of 2018 half the power used by its data centers came from renewable energy and it should hit 60 percent by the end of 2019. With the 60 percent milestone in sight, the company is now targeting over 70 percent renewable energy for its data centers by 2023.
- Microsoft is on track to increase its reuse of data center components by up to 90% by 2025.