

EMS Europa, deep insights

for InCap Corp.

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in4ma Marketresearch & Analyses

Miniaturization, an important driver in the electronics industry

A combination of new technologies with reduced component sizes is changing our world



Stereo systems didn't need to have this size after the tubes were replaced by transistors, but still had the size to show the customer that he got something big for his money

In the past, it was companies who developed such products, manufactured them as well = the Original Equipment Manufactures (OEM)



Compact towers were developed next which only had one chassis and were designed smaller



With the implementation of surface mounted technologies for components it could be reduced further



When cassette tapes became obsolete, it could be further reduced



Today the best example of miniaturization is the mobile phone which is not a phone anymore but a computer, a calculator, a camera, a music player, a navigation device, a play station, a news service and much more, depending on the apps you have loaded

Today nearly every second electronic device is being manufactured by a separate company = the Electronics Manufacturing Services (EMS)

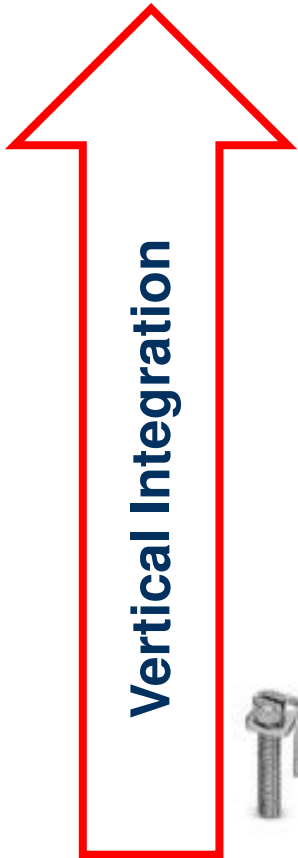
Nomenclature in electronics

Example of a complete system

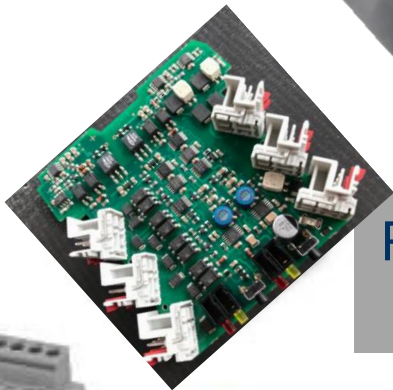


Picture: Zollner

Vertical Integration



Components



Printed Circuit Board Assembly
PCBA



Complete Module



Complete Device



Complete System

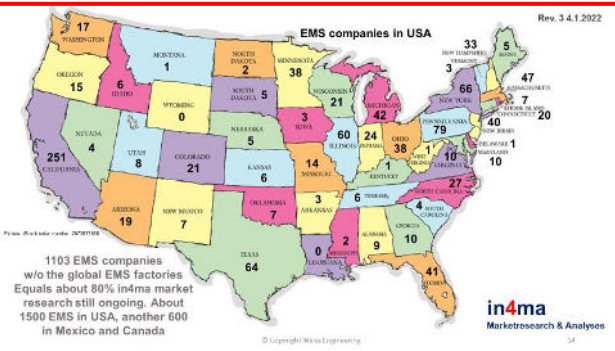
Modules can contain metal and/or plastic parts and several PCBA

Main differences are type and size of components (SMD, axial, radial) and single- or doublesided assembly

Most components are supplied by manufacturers
With some exceptions such as PCBs, coils and transformers, which some EMS manufacture as well

The global EMS/ODM Industry

2022



Global numbers are relatively inaccurate as market researchers often take all products of a company rather than subtracting business which has nothing to do with electronics. e.g. Jabil EMS and DMS



~1850
~350
~400

~2200

~200

~7500

~2500

~1000



about 16,000 EMS/ODM
TOP 100 = ~84% of the market
2.4 Mio. employees
Europe has ~9% des Market
USA has ~13%, America ~19%

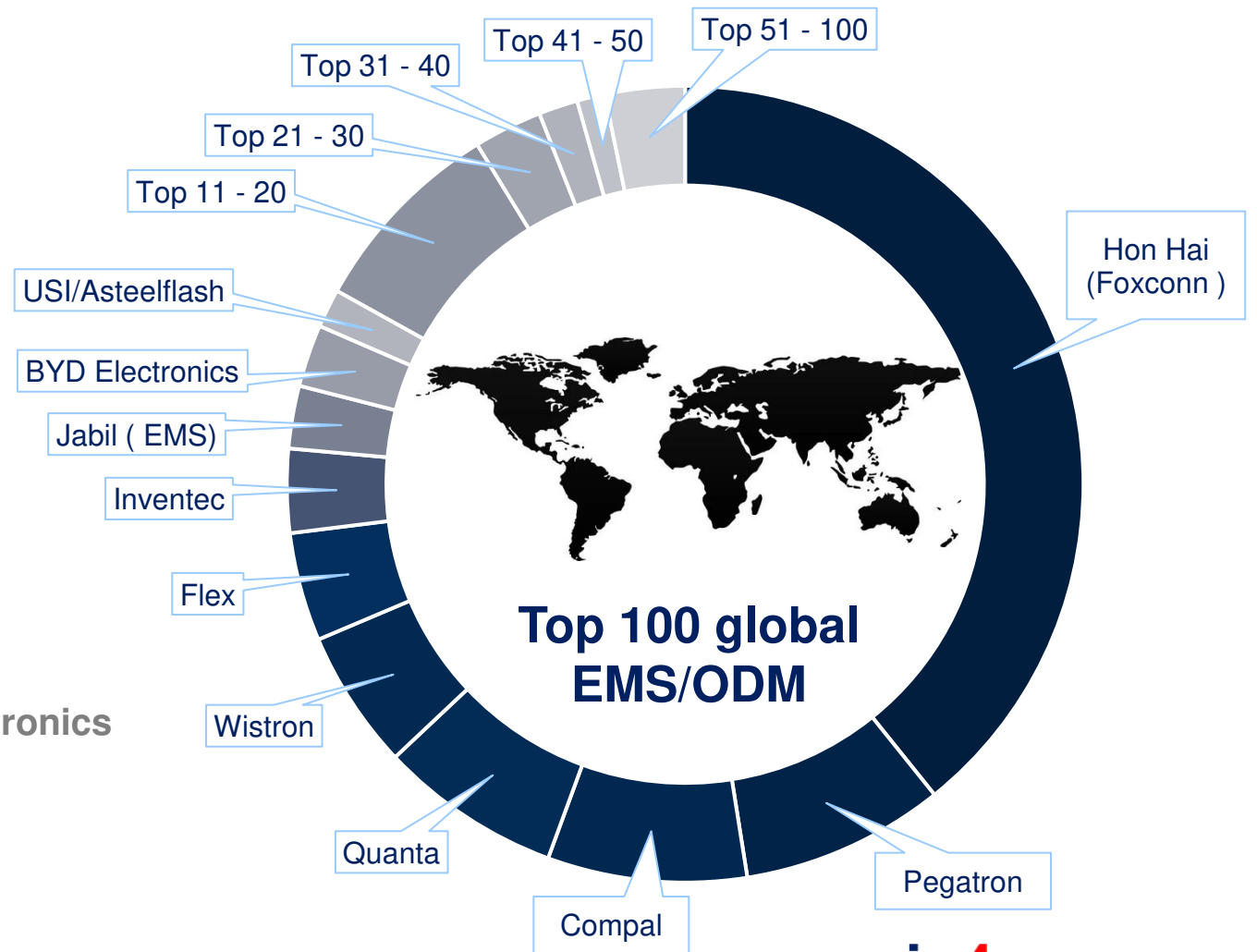
Global TOP 30 EMS/ODM from global TOP 100 2022*

Global TOP 100 have
revenues of
547 bil. USD

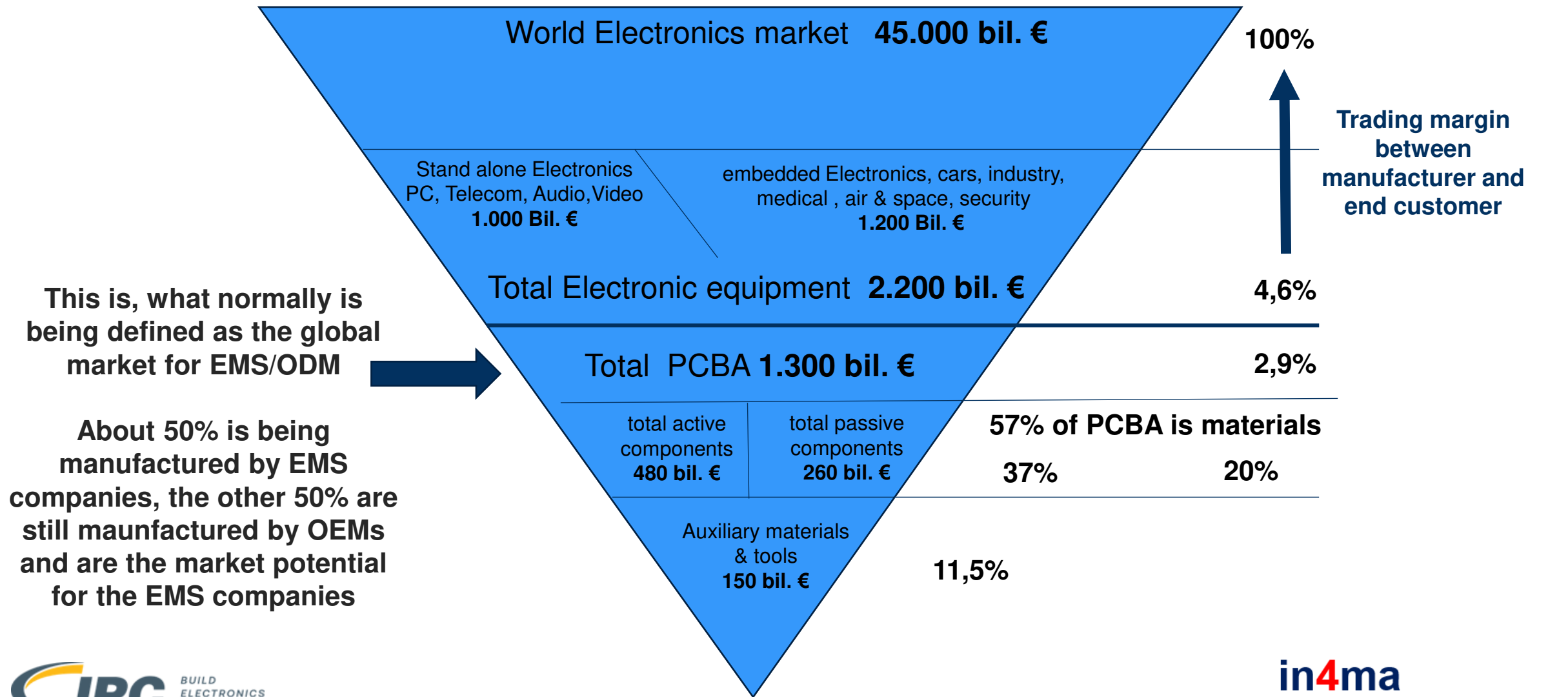
Foxconn/Hon Hai is
the biggest with
39,2%

Global TOP 10
of TOP 100 represent
83,07 %
(454 bil. USD)

11. Qisda
12. Sanmina
13. Lite-on
14. Celestica
15. Kinpo
16. Plexus
17. Zollner Elektronik
18. Shenzhen Kaifa
19. Wistron
20. Venture
21. Benchmark
22. SILX
23. Fabrinet
24. MiTAG
25. Sumitronics
26. Integrated Micro-Electronics
27. Kimball
28. UMC
29. Xiamen Intretech
30. NEO Tech

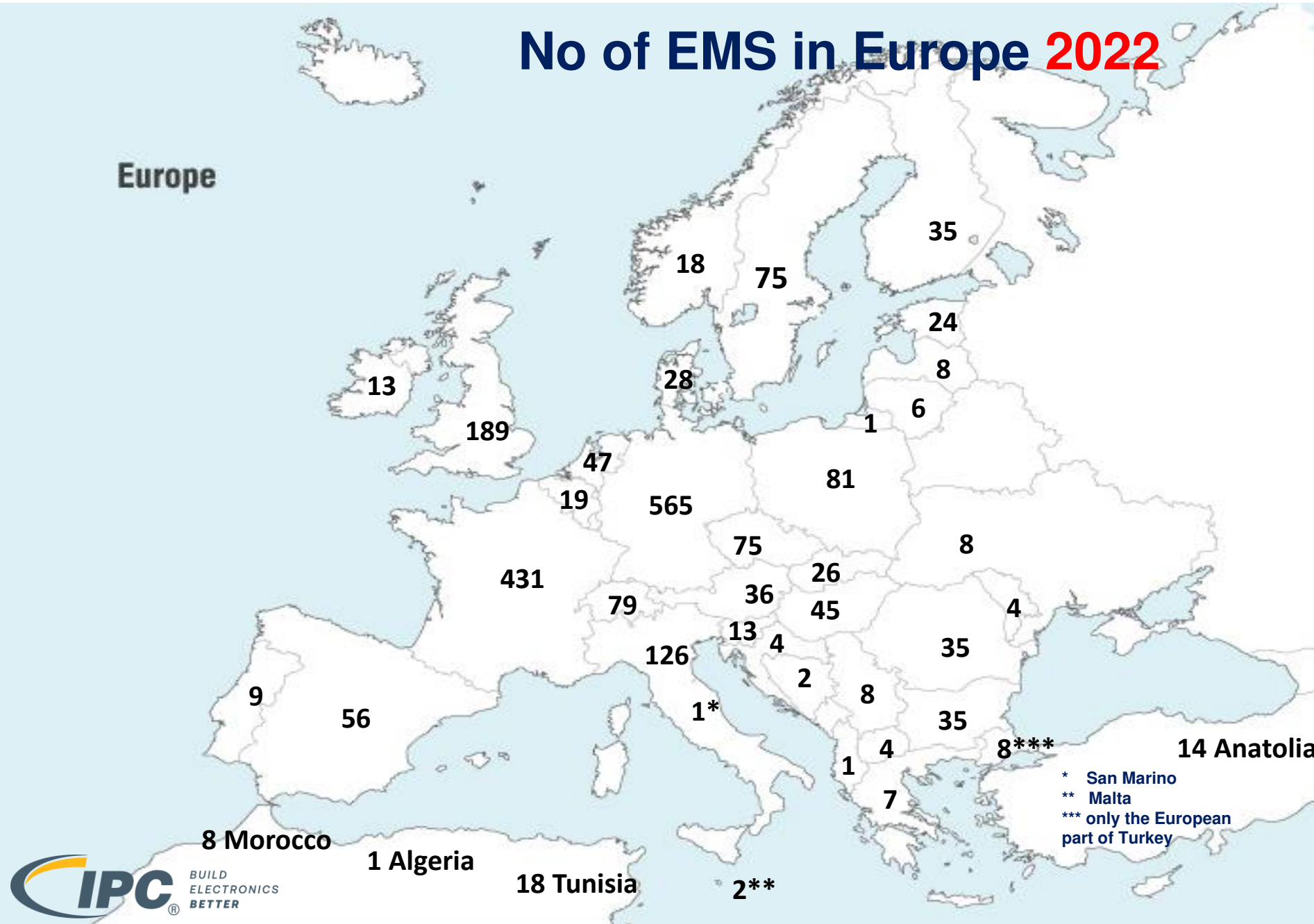


Global Electronics value chain



No of EMS in Europe 2022

Europe



~ 2.200 EMS in EU
2.179 EMS
identified &
analysed

*each legal entity is separately counted, those 2.179 separate legal entities belong to 1.876 companies.

In Middle East and North Africa (MENA) there are another 74 EMS in the in4ma Databank of which 27 belong to European EMS.

EMEA has 2.252 separate legal EMS entities, which belong to 1.923 companies

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31 European EMS/ODM in the global TOP 100 2022*

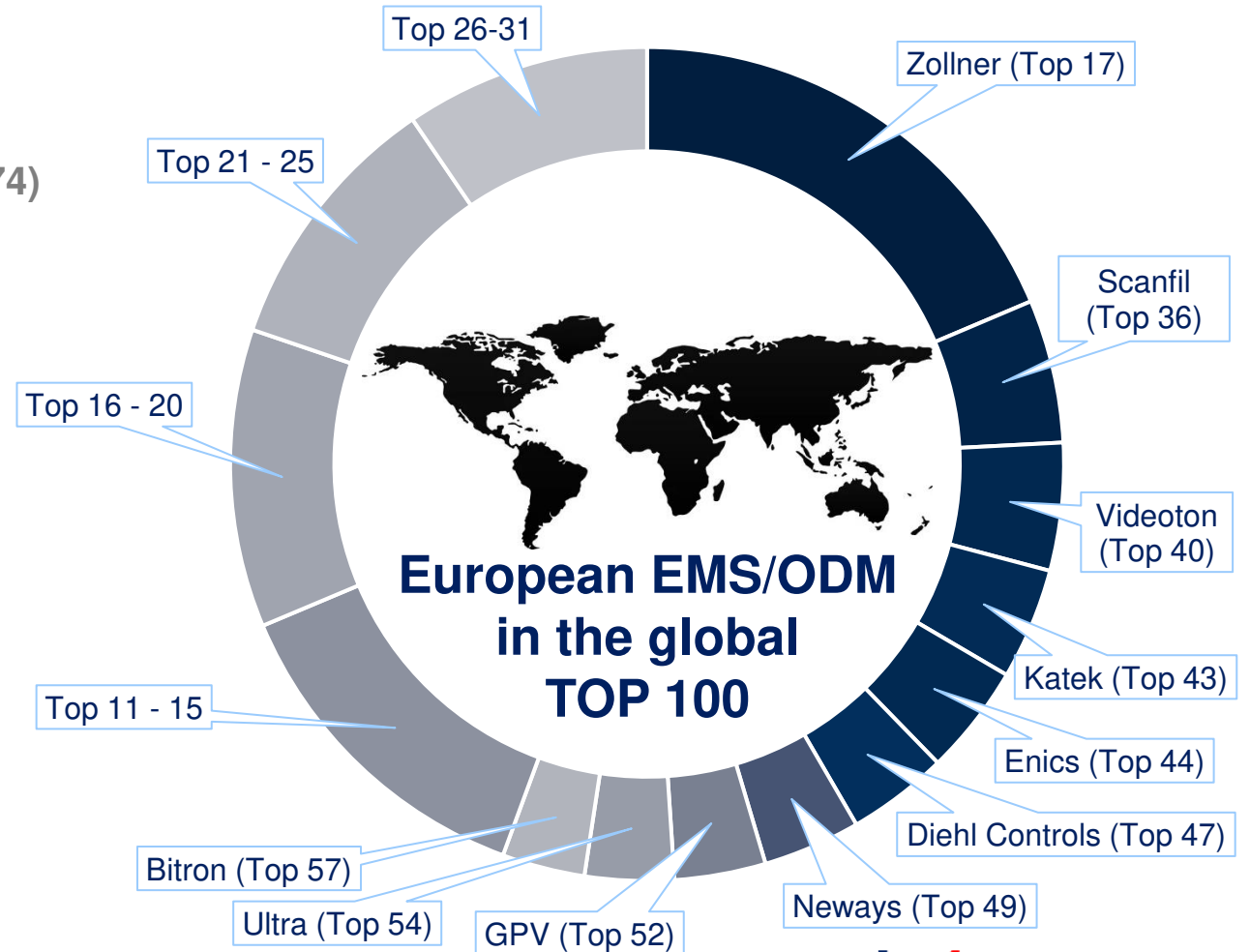
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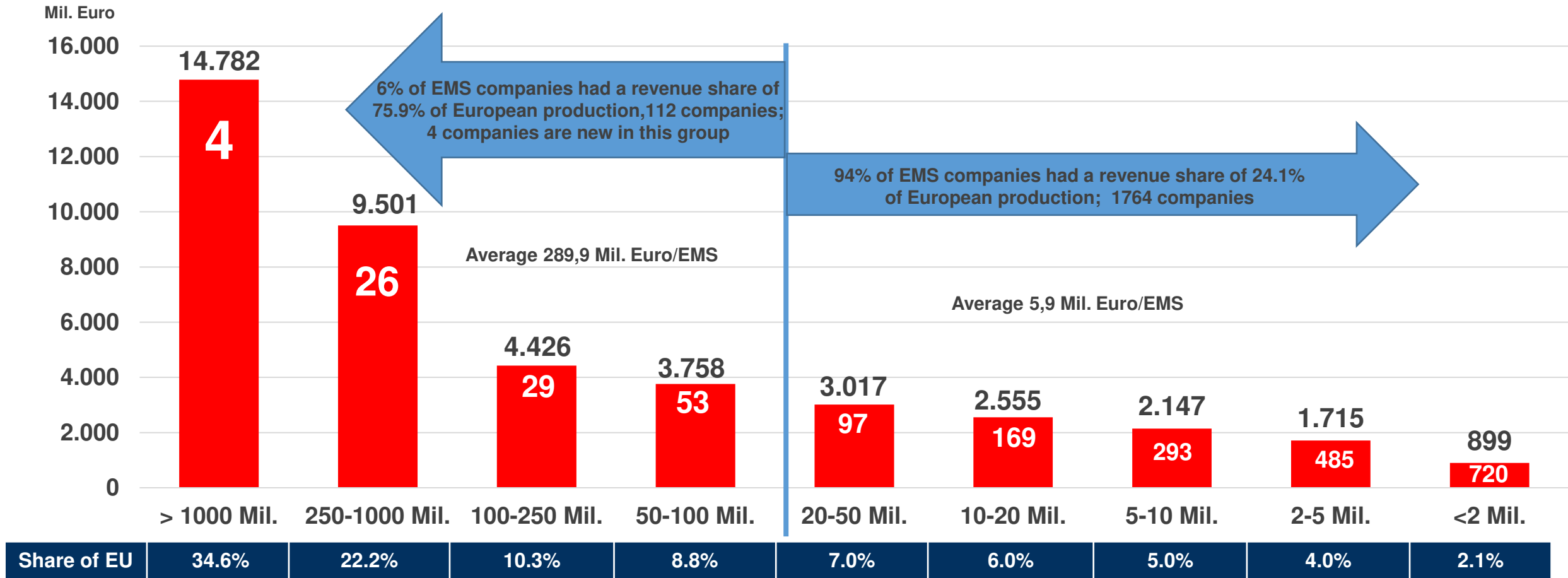
31 European EMS in
the global Top 100 just
have in total
2,7 %
(14,8 bil. USD)

*Which is revenues 2021 as one
cannot have 2022 revenues already

11. Kitron (60)
12. Lacroix (69)
13. RAFI (70)
14. Melecs (72)
15. Prodrive Technologies (74)
16. Fideltronik (75)
17. TQ-Systems (76)
18. All Circuits (78)
19. Eolane (79)
20. Elemaster (80)
21. Cordon Electronics (81)
22. Note-EMS (82)
23. BMK (83)
24. TT electronics (84)
25. Hanza (87)
26. Connect Group (88)
27. Duotec (92)
28. Cicor (93)
29. InCap (96)
30. Technisat (98)
31. Bosch France (99)

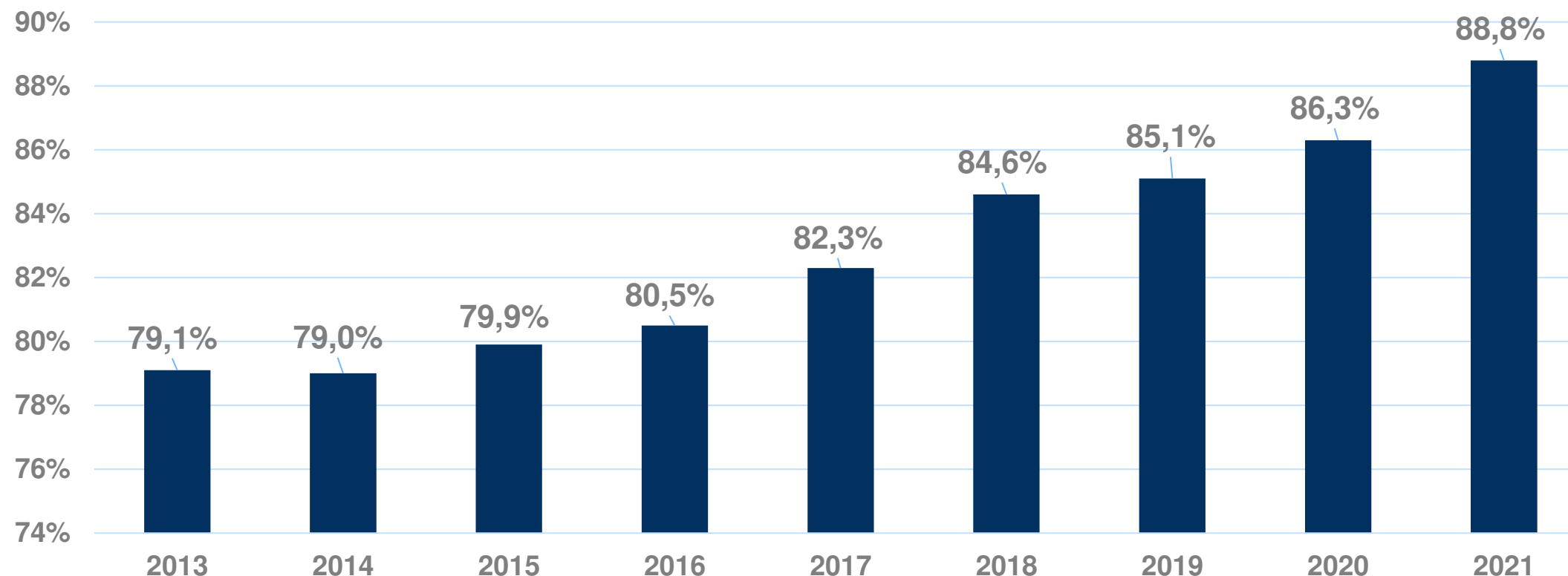


No. of EMS/ODM by revenue group in Europe 2022*



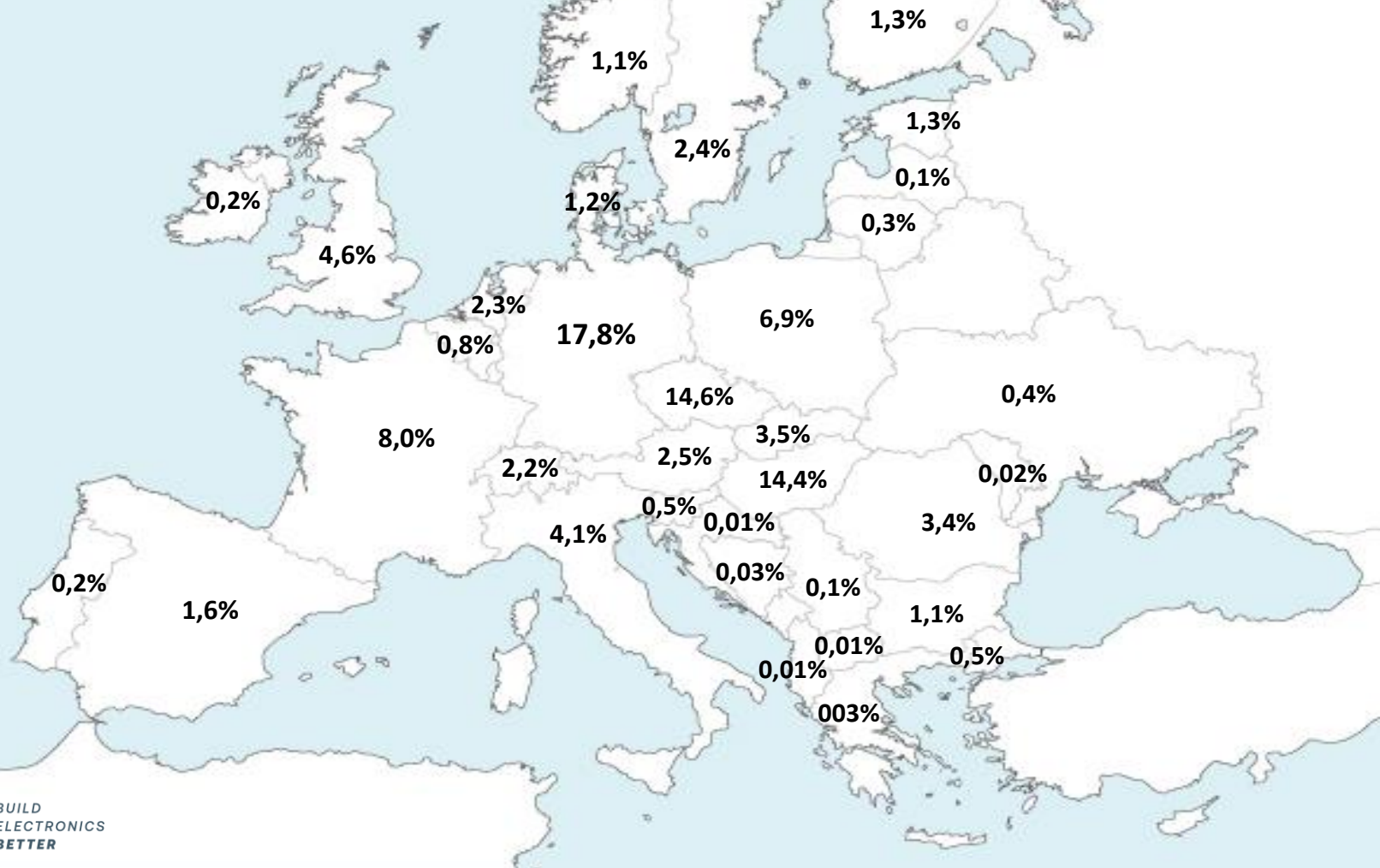
The Electronics Manufacturing Services Industry is consolidating

305 EMS companies in Europe >15 Mil. Euro **2021** accounting for 88,8% of revenues



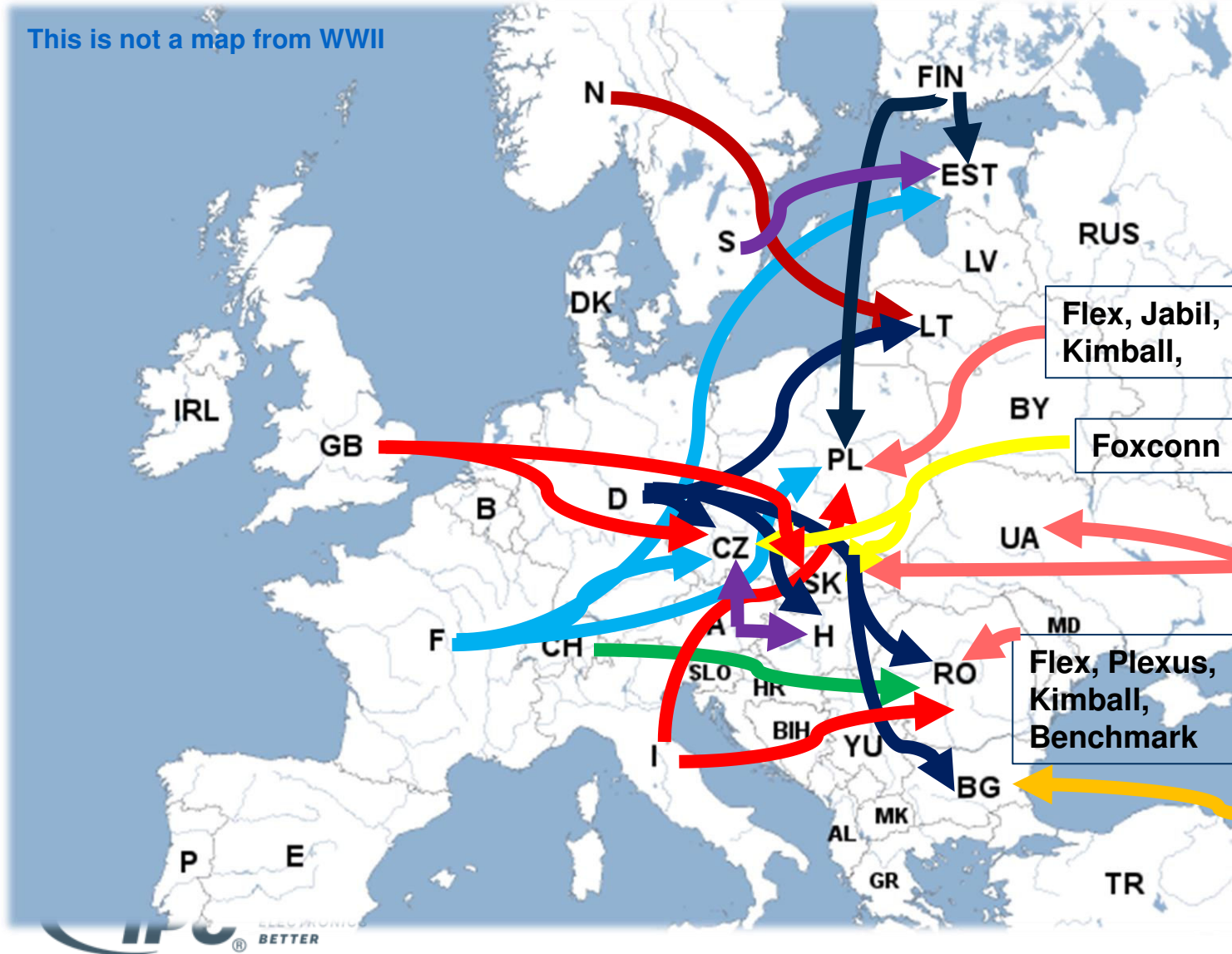
EMS Production in Europe 2022

Europe



EMS Production transfer from West to East in Europe

This is not a map from WWII



26% EST from Enics
17% EST from F (Eolane)
14% EST from S (Note, LEAB, Inission)
4% EST from FIN (InCap)
26% EST from FIN (Scanfil + 7 EMS)
83% in total

49% LT from Kitron
10% LT from D (Prettl/Litalka)
~60 % in total

32% PL from Flex
12% PL from Jabil
8% PL from Kimball
8% PL from I (Bitron)
7% PL from F (Lacroix)
5% PL from FIN (Scanfil)
72% in total

84 % CZ from Foxconn
4 % CZ from Wistron, Pegatron, IMI
0,6% CZ from D
0,5% CZ from CH
0,4% CZ from B
0,3% CZ from F
90% in total

24% RO from Celestica
16% RO from Zollner
12% RO from Plexus
11% RO from Flex
10% RO from CH
4% RO from Benchmark
4% RO from Kimball
4% RO from GDS
85% in total

39% H from Flex
22% H from Jabil
19% H from Foxconn
10% H from D
0,5% H from A
90% in total

78% SK from Foxconn
4% SK from SIIX
4% SK from Enics
1% SK from InCap UK
87% in total

84% UKR from Jabil

60% BG from IMI
7% BG from Katek

The TOP 40 EMS / ODM in Europe 2022

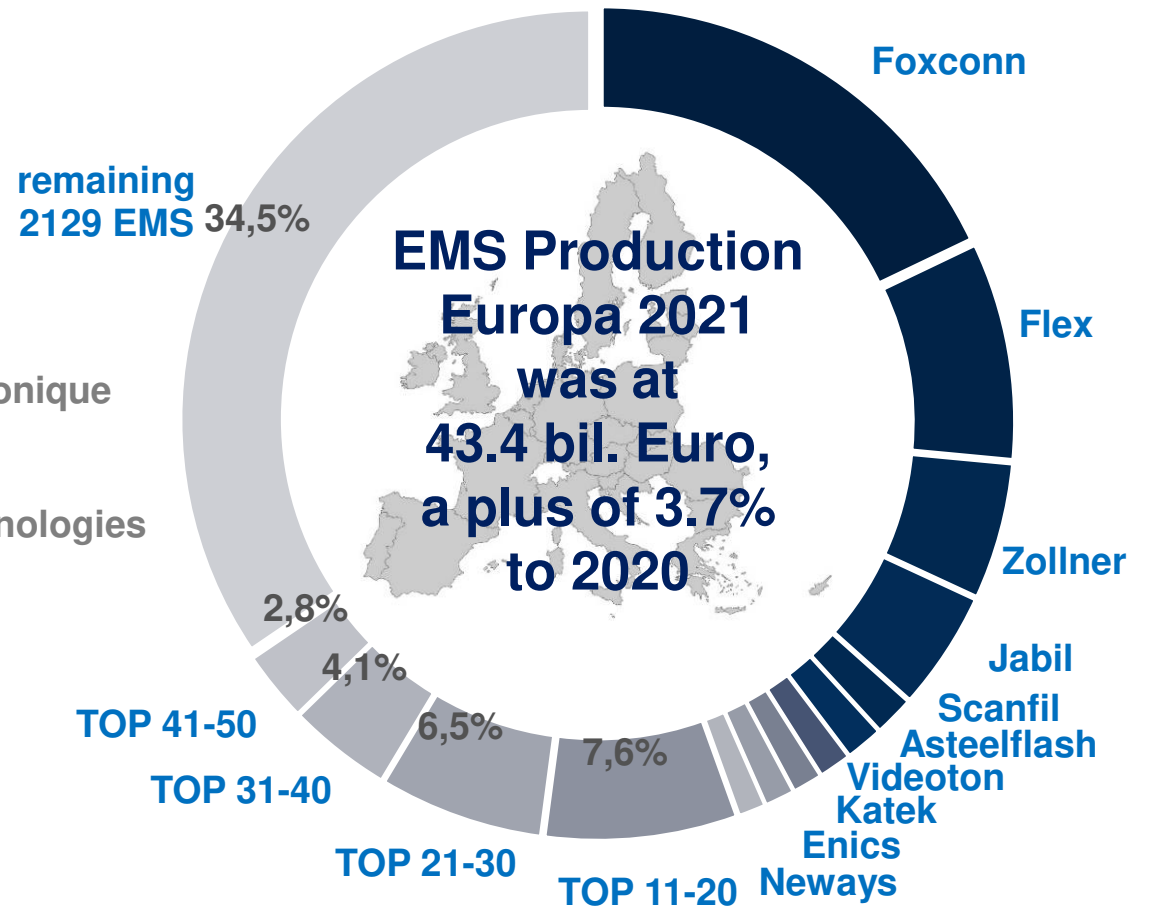
Foxconn has a
Marketshare of
17.7%

The TOP 10 EMS have
a Marketshare of
43.5%

The TOP 40 EMS have
a Marketsshare of
63.6%

2.139 EMS fight for
the remaining
36.4%

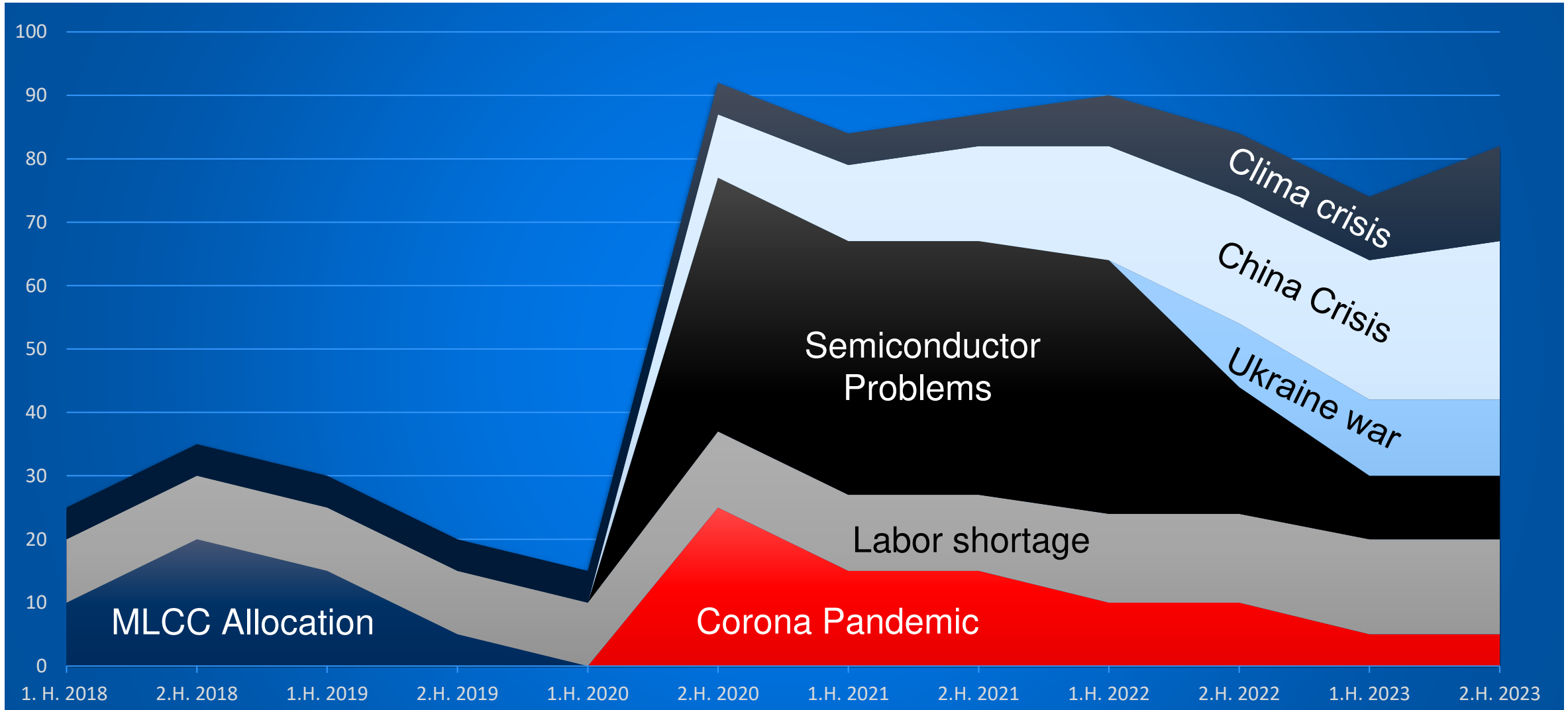
- | | |
|------------------------|---------------------------|
| 26. Elemaster | 11. GPV |
| 27. Cordon Electronics | 12. Inventec |
| 28. Note-EMS | 13. Bitron |
| 29. Plexus | 14. Kitron |
| 30. BMK | 15. IMI |
| 31. Hanza | 16. Lacroix electronique |
| 32. Connect Group | 17. RAFI |
| 33. Duotec | 18. Melecs |
| 34. Cicor | 19. Prodrive Technologies |
| 35. Mektec | 20. Celestica |
| 36. Sanmina | 21. Fideltronik |
| 37. Diehl | 22. TQ Systems |
| 38. Ultra Electronics | 23. All Circuits |
| 39. Incap | 24. Éolane |
| 40. Technisat | 25. Kimball |



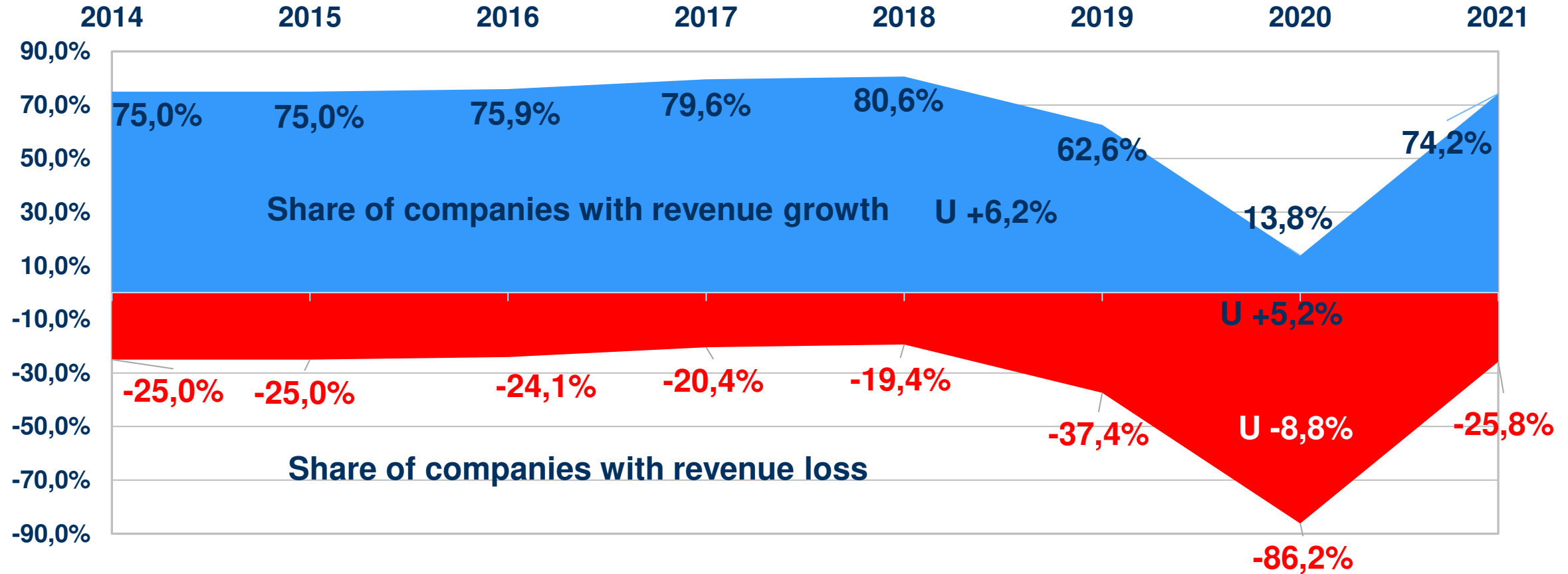
The ranking only considers European revenues,
not the global revenues of a company.

Relative Problem-
Weight %

Marco-economic Factors affecting the EMS Industry



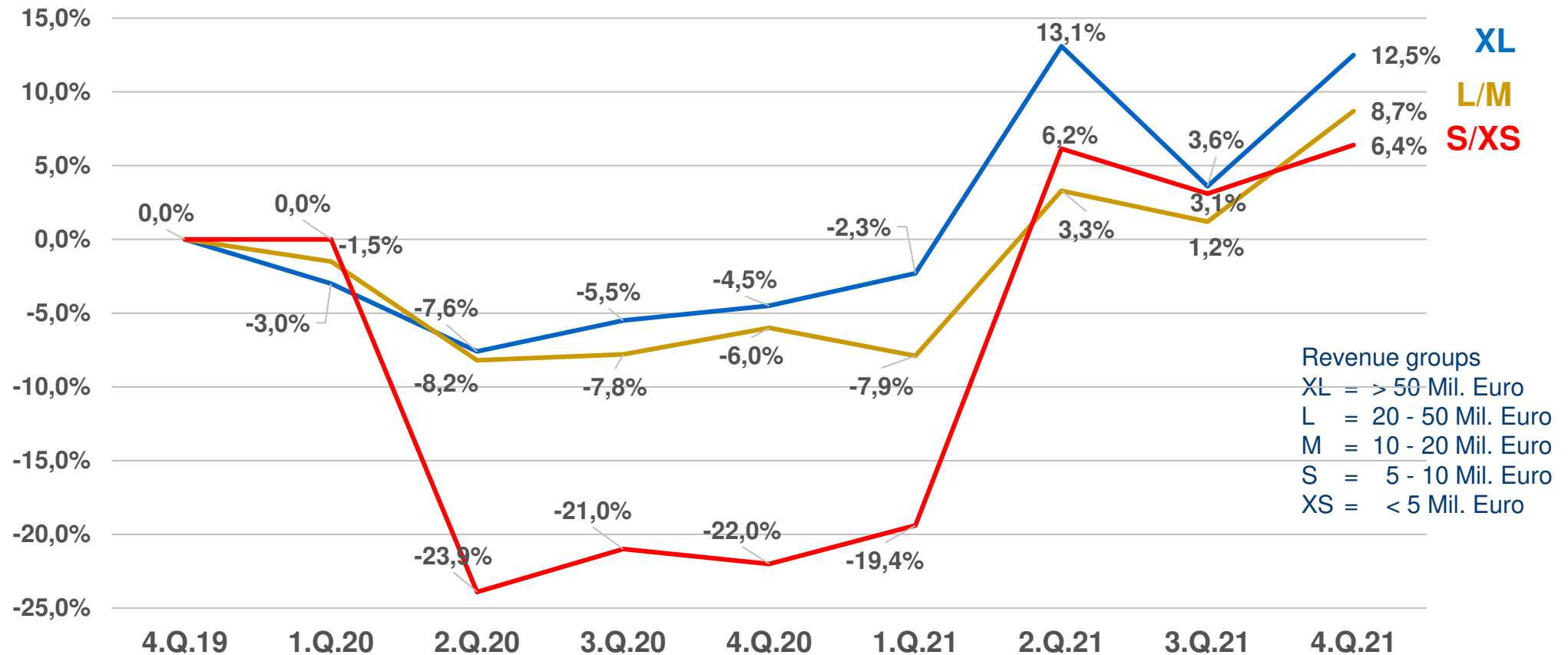
Development of EMS revenue change - 2014 - 2021



Market slowed down in 2019 for smaller companies;
the big dip came with the Corona pandemic

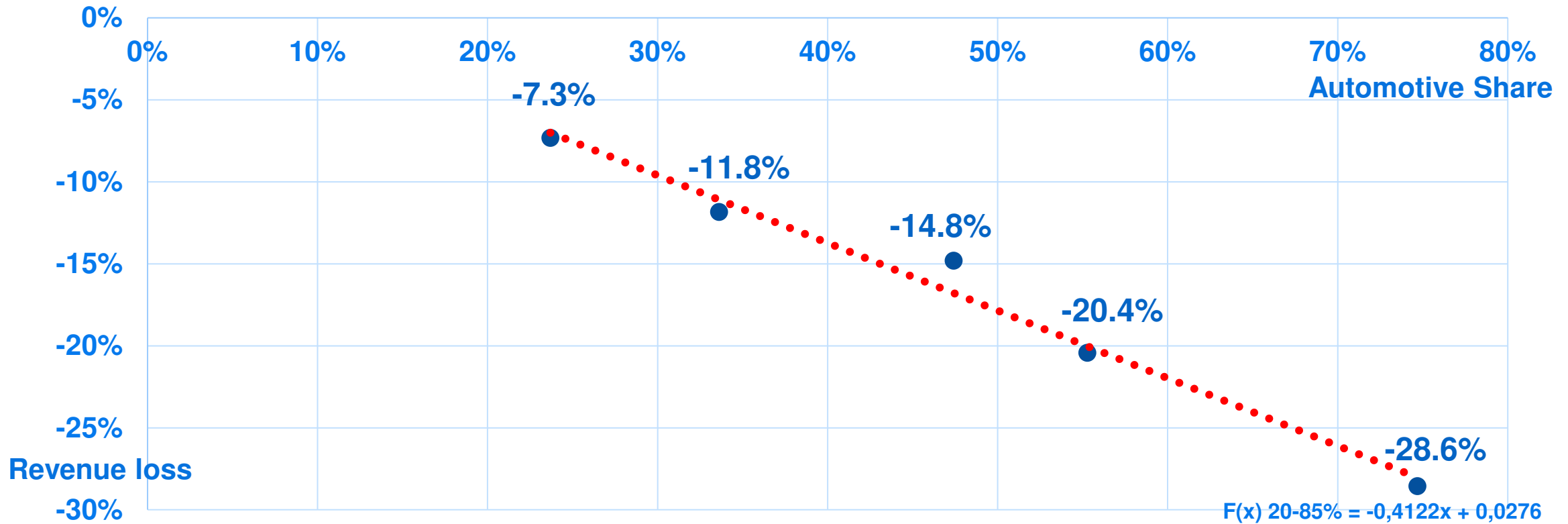
Development of the EMS Industry in DACH during Covid

Revenue changes against the same quarter of the previous year



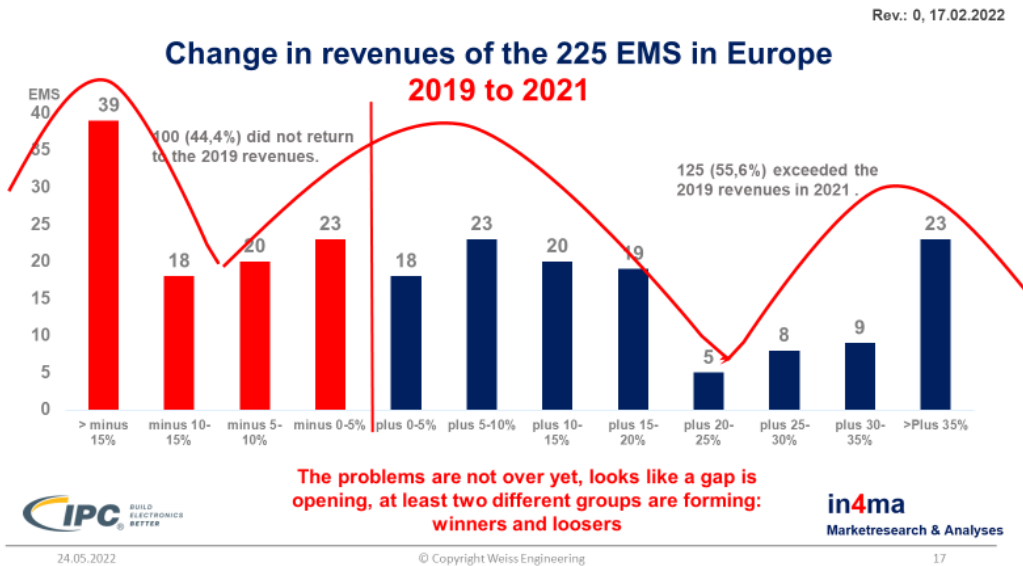
Important note: We talk about averages!
Individual numbers can drastically differ from the average

Revenue loss due to automotive share 1. H. 2020



Revenue share of automotive of <20% were not analysed,
as those companies were normally able to compensate the
loss with products from other market segments

Why are the big EMS growing faster than the small EMS?



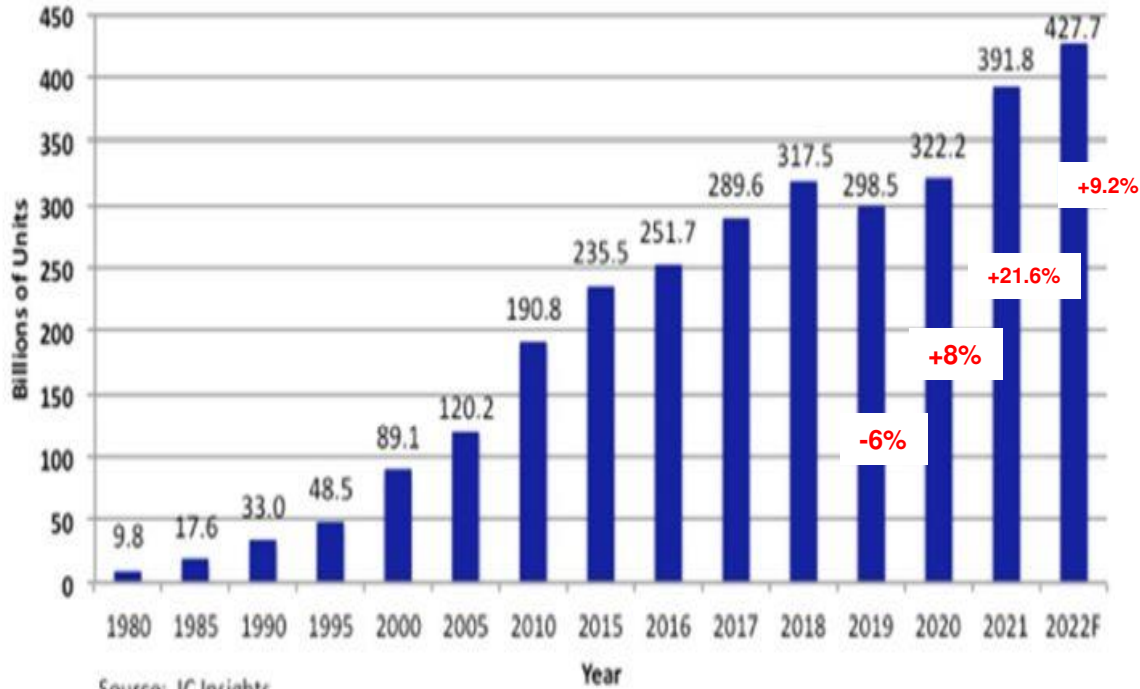
- OEMs are realizing the advantage of manufacturing services
- Low capital binding, focus on R&D, Sales and Marketing
- General trend to transfer full production, not only PCBA
- Small EMS do not always have vertical integration
- Order values are increasing, exceeding the 20% revenue limit for a single supplier
- Bigger EMS grow inorganically with M&A

The gap between small and big EMS is further widening

Smaller EMS need to find a niche or a strong partner for buying or selling

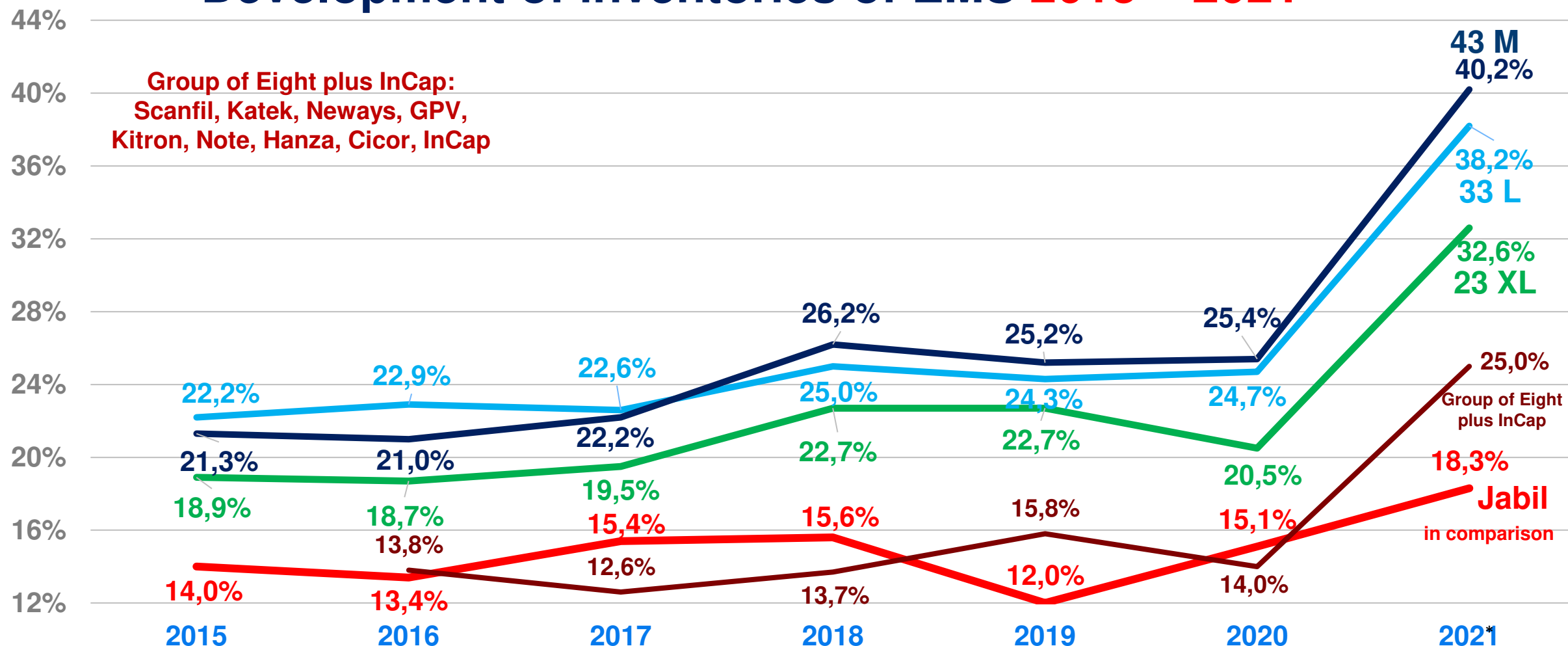
What is this talk about a semiconductor crisis?

Worldwide IC Unit Shipment Growth



- When shipments of semiconductors declined in 2019 by 6% nobody talked about a crisis
- Due to the pandemic in 2020, inventories in many companies went down
- When the automotive industry ramped up production again at the end of 2020, demand for Microcontrollers and analog Chips exceeded supply as other areas needed Microcontrollers as well
- The semiconductor industry increased output by nearly 22%, but the industry demanded more!
- Many other component suppliers felt this was the right climate to increase prices
- The bullwhip effect caused logistics to collapse and no reliable delivery dates were available from most suppliers

Development of inventories of EMS 2015 – 2021



The development of the EMS industry 2022:

- There is a split in fast growing companies (56%) and companies who still did not return to 2019 revenues in 2021
- Revenues increased in Western Europe by 7.3% in 2021. Real big EMS companies (Group of Eight*) increased by 13.9% and InCap grew 59.4%
- Revenues of public companies (Group of Four**) for 1.H. 2022 increased by 37.1%, InCap grew 60.6%
- For 2022 in4ma expects a revenue growth rate in Western Europe of 18.8% of which 2/3 will be quantity and 1/3 price increases
- In summary; **the crisis looks different.** The problem was that demand increased the highest for the last 12 years and could not be met with increasing supplies

*Group of Eight:

Scanfil, Katek, Neways, GPV, Kitron, Note, Hanza, Cikor

* Group of Four:

Scanfil, Kitron, Note, Hanza



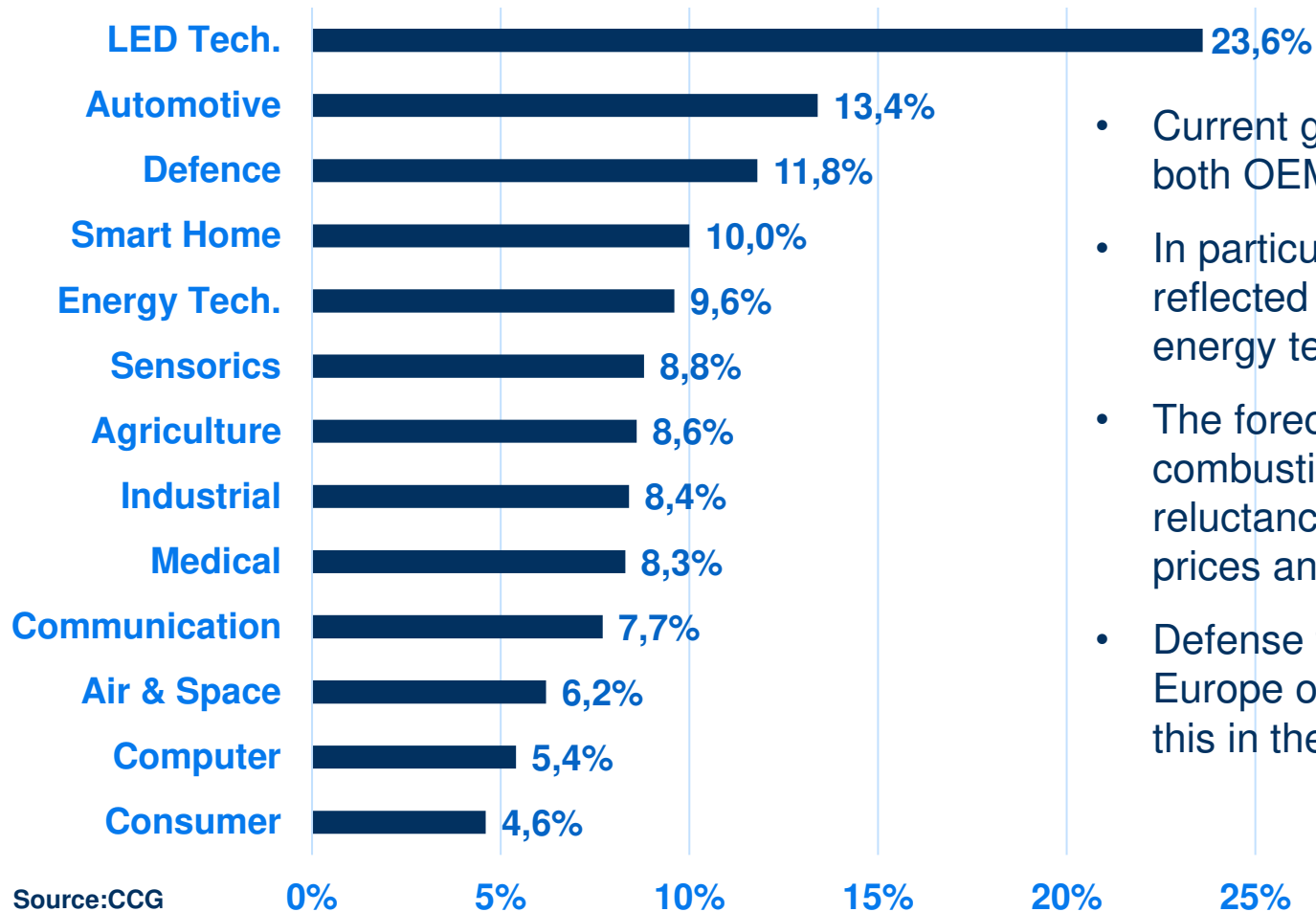
The real Problem:

- Inventories have increased for the industry. For the Group of Eight* plus InCap going from 19.4% to 31.5% of annual revenues in 2021
- At the same time, material content increased, an indicator that the EMS have not been able to forward all extra cost to their customers
- EBIT and Net profit decreased 1.H 2022 compared to 1.H 2021, but are still at comfortable level for the Group of Four plus InCap
- As the situation improves, high inventory levels are becoming a burden and bind too much capital
- Payment practices are deteriorating

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Average annual growth rates in Electronics 2021 - 2026



- Current growth forecasts relate to the global market and affect both OEM and EMS
- In particular, the war and its effects on the energy supply are reflected in the high growth rates of LEDs, smart homes and energy technology
- The forecast for automotive reflects the switch from combustion engines to electric motors. It is too high due to the reluctance of consumers to buy new cars due to high energy prices and a lack of financial resources
- Defense technology will have strong global growth, but in Europe only EMS in Scandinavia, France and the UK will feel this in the order intake

Looks very positive but needs to be broken down based on the market served

The market potential in Europe

- In Europe we have an electronic market with a production value of more than 130 billion Euro
- Europe manufactures about 105 billion Euro
- European OEMs produce about 62 Billion Euro
- Today only 41% is manufactured by EMS/OEM in Europe, which equaled about 43.3 billion Euro

Imports from Far East will reduce

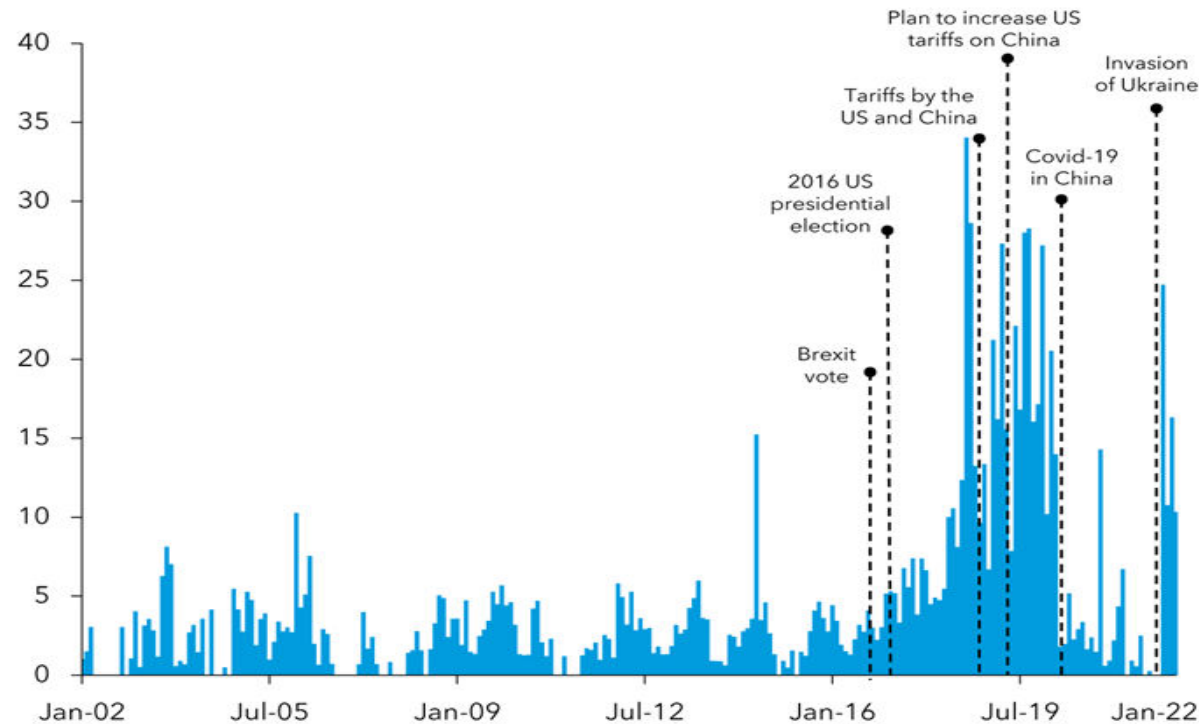
OEMs realize EMS advantages

EMS have not actively marketed the advantages of their services

In some European countries the EMS share is already at 65-70%, in the majority of Europe there is still a huge potential for more EMS business

Signs of trade fragmentation are increasing, with trade-related uncertainty surging in recent years.

(trade uncertainty contribution to World Uncertainty Index, percent)



Source: Ahir, Bloom, and Furceri 2022.

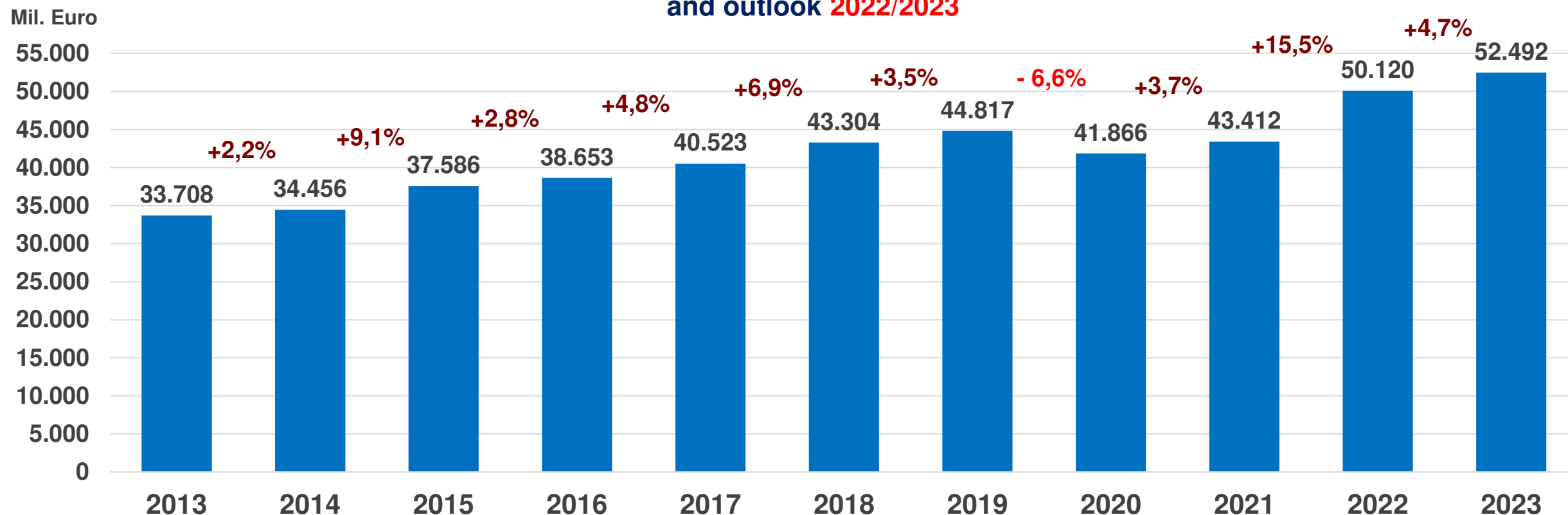
IMF

Turbulence ahead

- Despite high growth forecast, there are many risks in the automotive sector (margin, growth, chip supply).
- 3C (Consumer, Computer, Communication) remain slow, due to saturated market.
- Consumer restraint due to unpredictable future.
- Market consolidation in EMS continues.
- Vertical integration accelerates, OEMs transfer complete systems and after sales services
- Labor costs continue to squeeze margins, automation focus will be on backend (boxbuilding)

EMS / ODM Europe 2013-2021

and outlook 2022/2023



In Mil. USD	44.768	45.775	41.701	42.782	45.781	51.142	50.173	47.819	49.585	50.521	52.912*
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*1 Euro = 1,008 USD