



Investor Day 2018

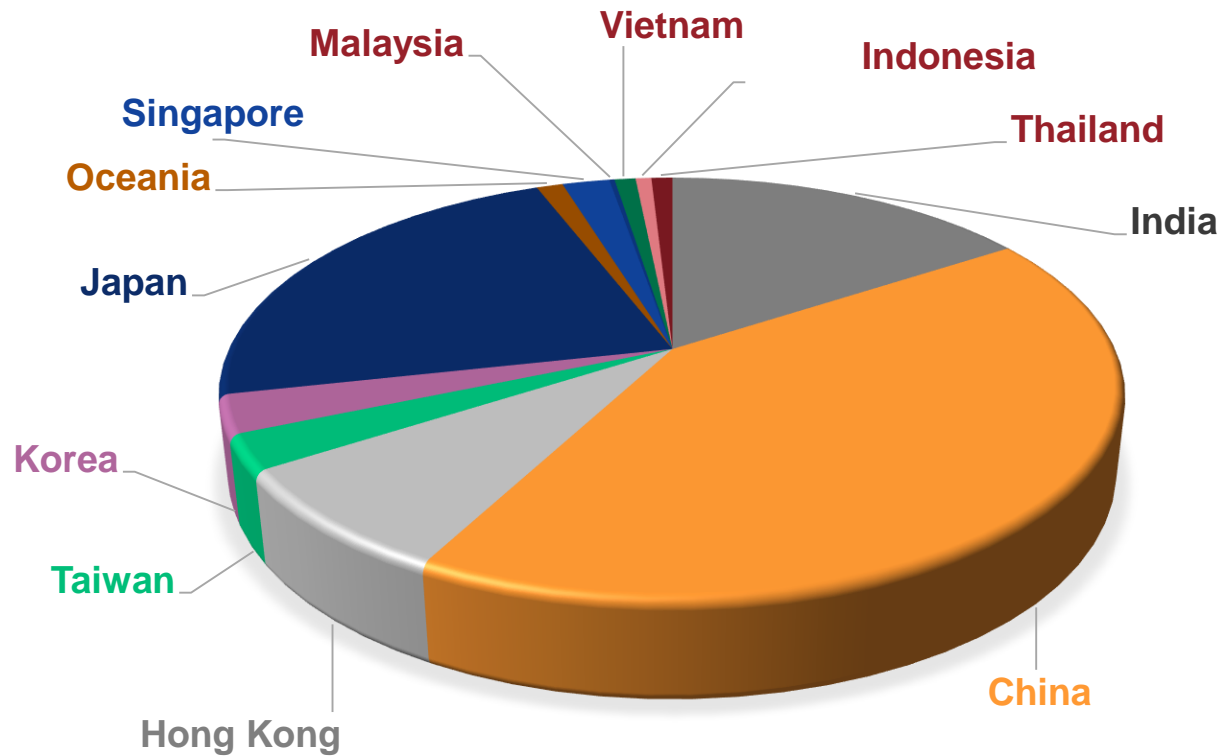
A global perspective - APAC presentation

Jean-Marc Meffre
President – APAC

Video containing animation of the Renishaw offices in APAC region

Staffing split per country

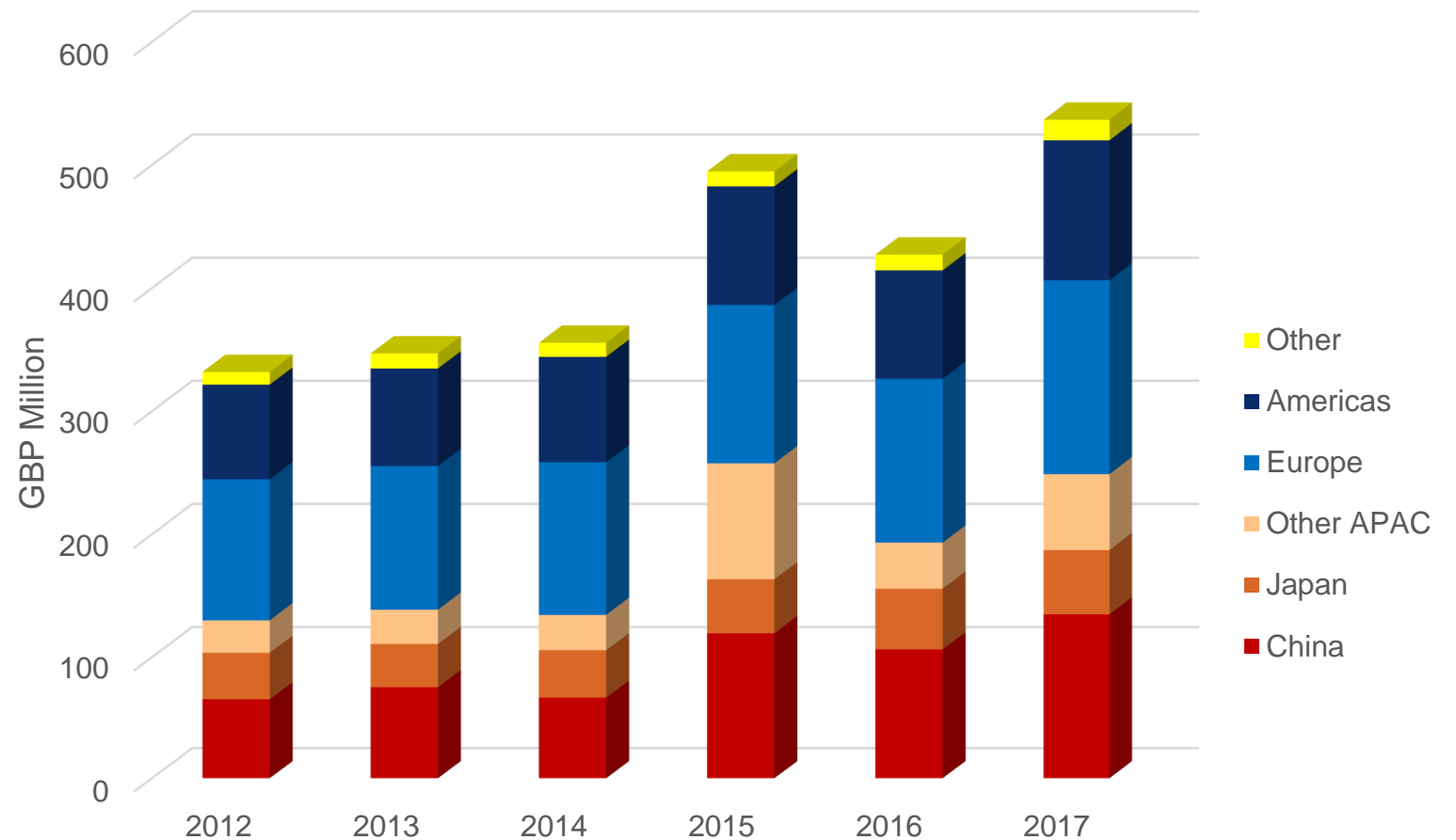
TOTAL REGIONAL EMPLOYEES



- **China, Japan and India, our biggest subsidiaries**
- **Taiwan and Korea staffing relatively low when compared to their revenue, because of use of dedicated distributors**
- **When possible, we are open to collaborate with good local partners**

WORLDWIDE SALES SPLIT

- APAC region represents 40 to 50% of Group sales
- 14% compounded annual growth in APAC region but important variations due to the nature of our business



Machine tool market

- Reminder of the basics
- Worldwide machine tool consumption
- Installed base for probes

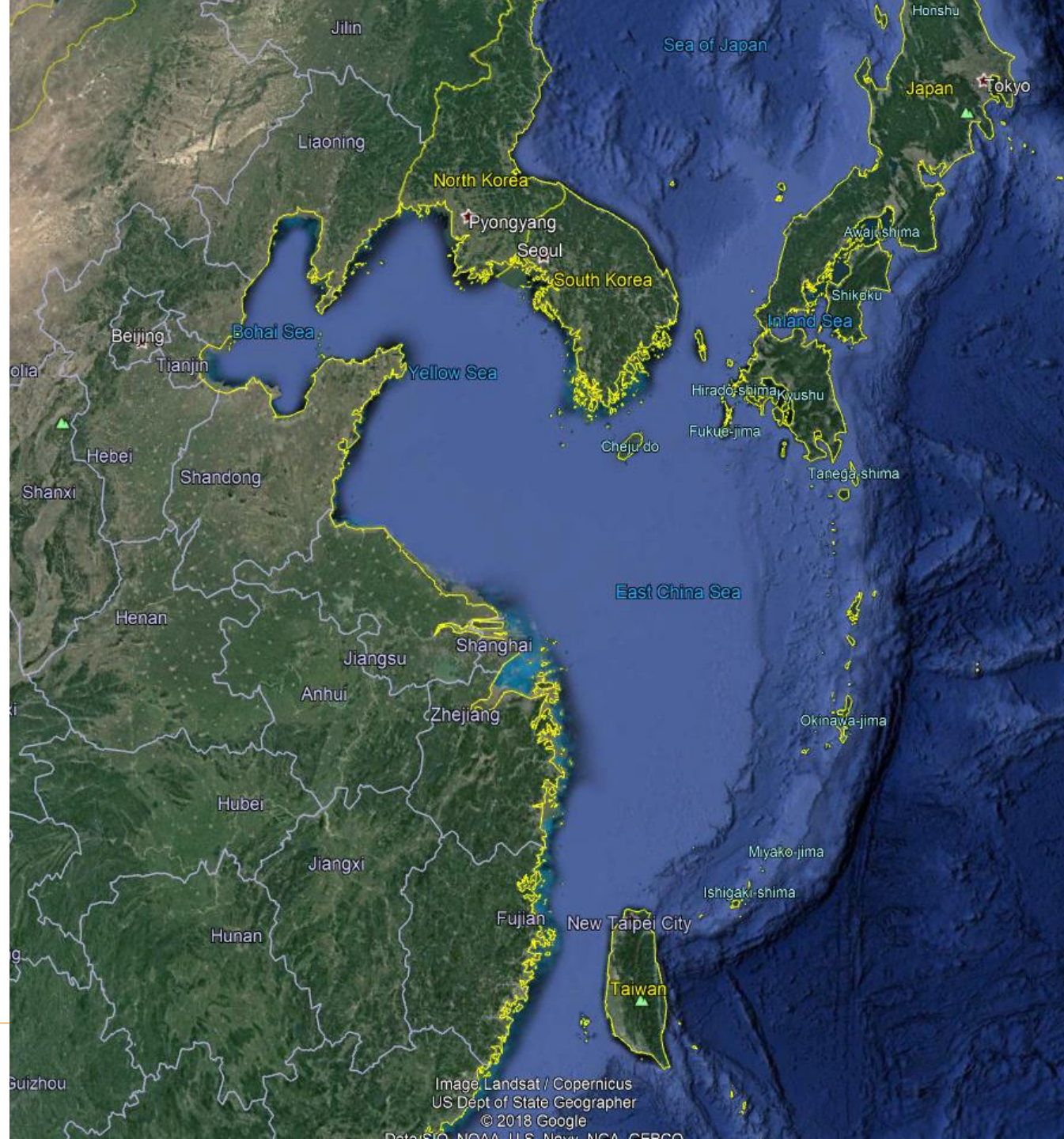
Considerations about the machine tool market

- Machine tool market is global, though with wide differences in volume and level of technology in each country
- As a probe/sensor supplier, Renishaw address two main markets:
 - Machine tool manufacturers (OEMs)
 - Machine tool users, large and small, with installed base from 5 to 50,000 machines!



Machine tool technology transfer in key APAC markets:

- Japan
- Korea
- Taiwan
- China



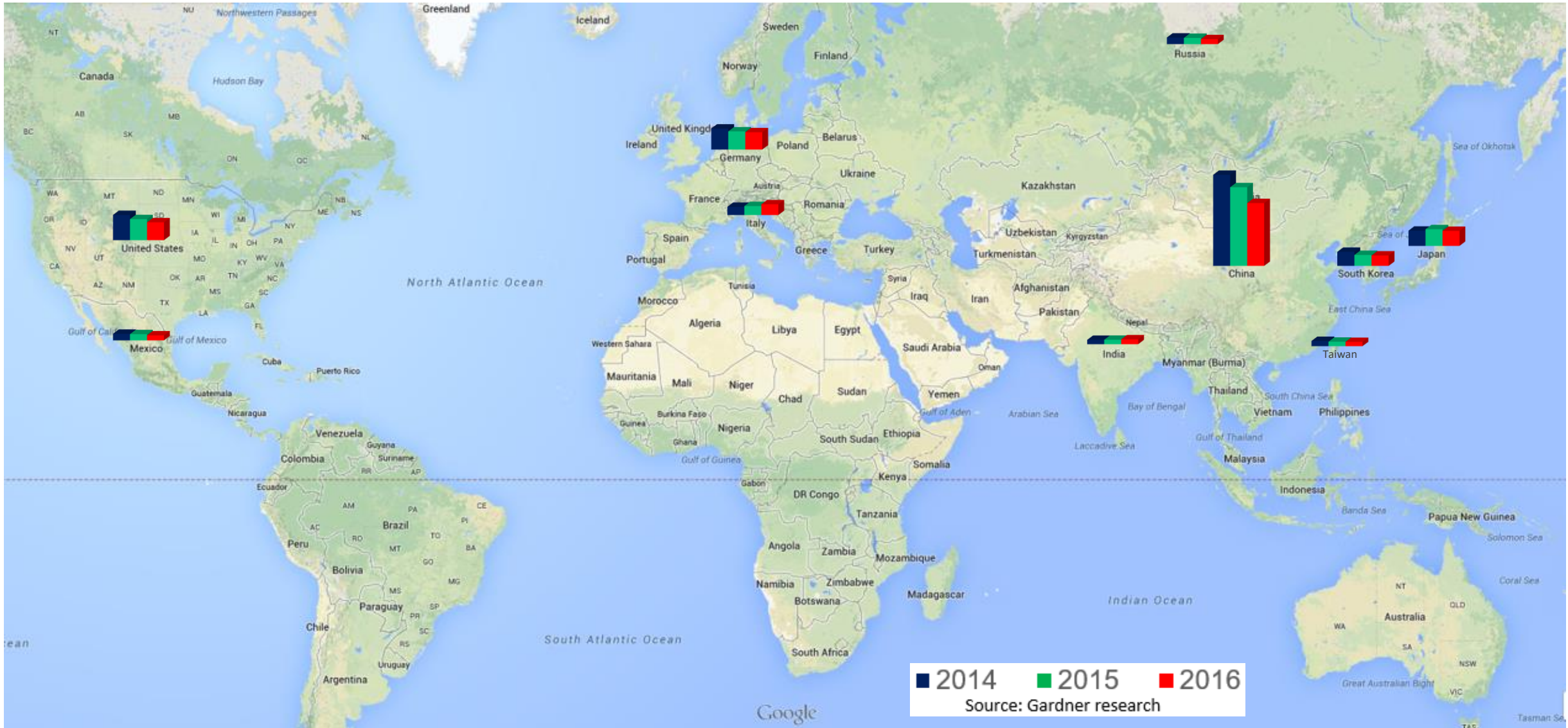
Statistics, a delicate matter!

Machine tool statistics have to be analysed in detail as they usually show values. Several considerations:

- **Statistics usually mix manual and CNC machines, a major issue as probes cannot be fitted on manual machines**
- **Even within CNC machines, technology and therefore value can vary enormously. A CNC machine tool costs from US\$40,000 to US\$500,000**



Top machine tool consumers by value



Probe fitment estimates

- Assessing probe fitment is certainly not an exact science!
- We sell probes to OEMs in one country and they can end up anywhere in the world without our knowledge
- We estimate probe fitment in major markets, giving an indication of potential future expectations in developing economies
- Have to be cautious about arriving at conclusions too fast!



Example communications

The need for part setting probes



RENISHAW

We believe that machining a part that requires better than 100 microns accuracy will make the use of a part setting probe indispensable.

All 5-axis machines should also need a probe.

As a result, the probe market is very dependent on the machine installed base and the quality of the jobs being performed in any each country.



Simple animation of the benefits of Renishaw probes for setting operations on CNC machine tools

Summary - machine tool market

APAC market is still a very open field when it comes to probe fitment

Success in one market sector helps to make probe usage popular in others

Marketing actions depend on market penetration:

- First, education of the market through vocational schools or user training/introduction seminars is a big part of our strategy**
- After a certain threshold is achieved, we can adopt pure sales tactics**

Summary - machine tool market

Since 2014 we have participated in the annual China Skill Competition where hundreds of young graduates have to show their skills. We loan numerous products to be used by students



Flat panel display market

- An Asian affair!
- Korea is the global leader in this market; Japan a distant second
- China is playing catch up

Widely used in automotive, advertising and 3C consumer electronics e.g. tablets, laptops, smart phones....

A variety of display technologies have been developed but only a few of them are commercially available today e.g. TFT-LCD, OLED, Flexible OLED, QLED, Micro LED....

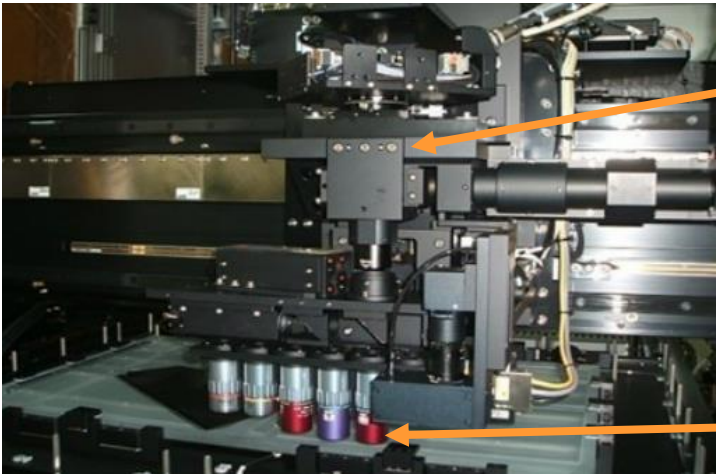


Multiple machine type, US\$ billion investment cycles

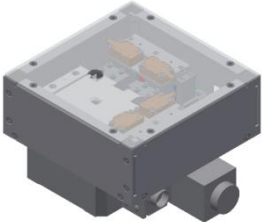
Types of equipment for FPD production potentially requiring position encoders:

- **Glass trimming equipment**
- **Laser annealing equipment**
- **OLED printing equipment**
- **Photolithography equipment**
- **Dispensing equipment**
- **Laminating equipment**
- **Transfer equipment**
- **Inspection equipment**

Renishaw encoder products; present on most machines



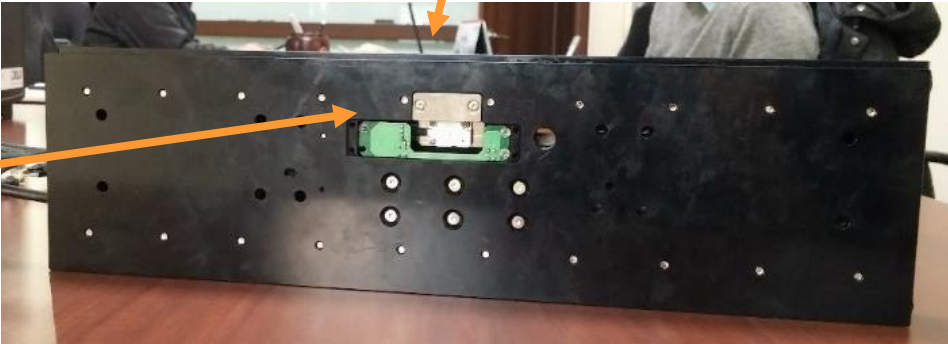
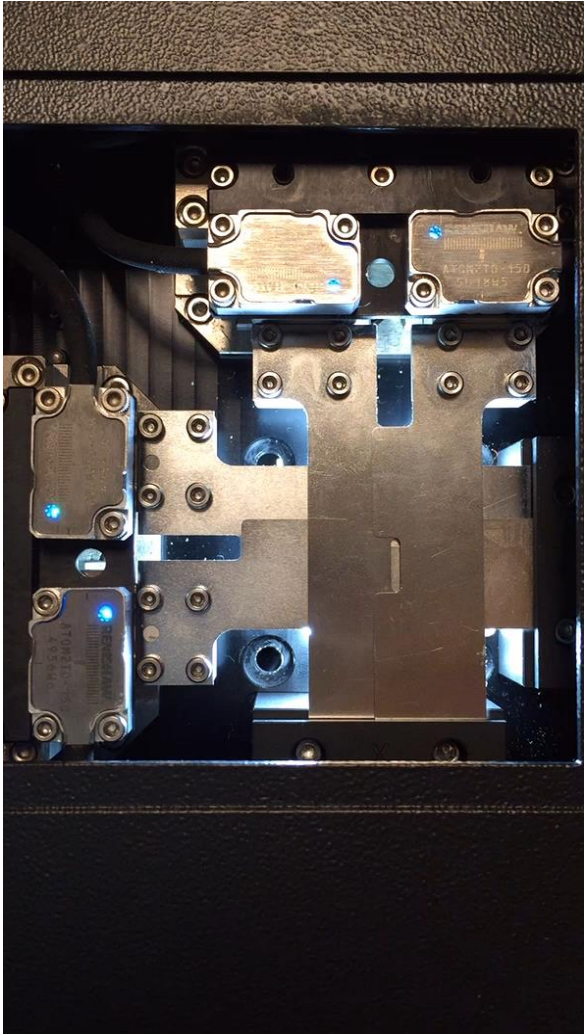
Laser repair equipment



Optical slit

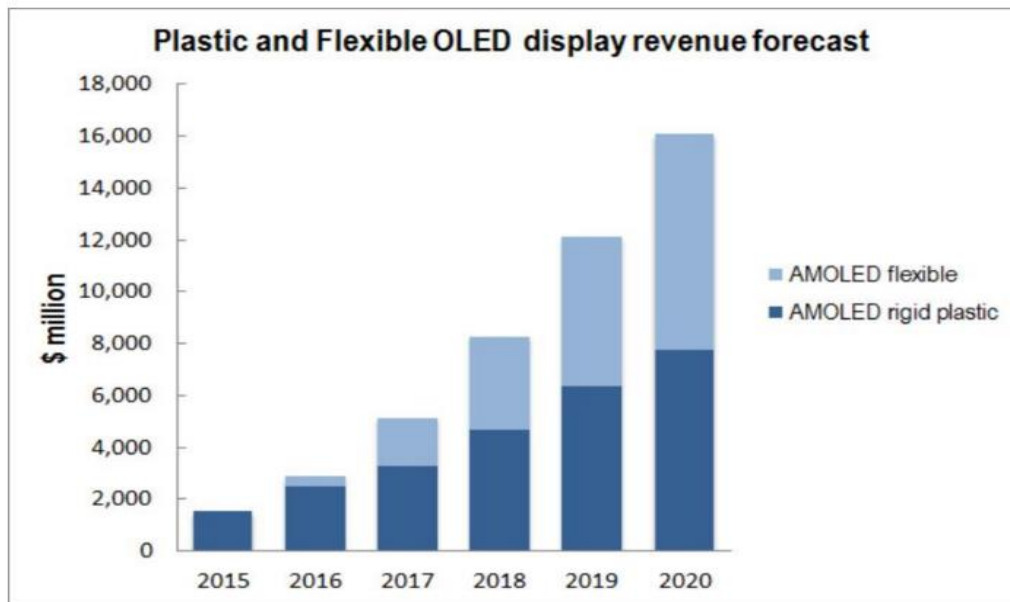


Lens changer



Market growth expectations

- Consumer electronics is now growing slower but is still the key driver of FPD market:
 - Small size panel (smart phone): slight growth
 - Medium size panel (tablet / laptop): drop as saturated market
 - Large size panel (TV): steady growth due to upgrade and demand for big screen TV



IDTechEx Research

- Growth drivers

- Switch to higher resolution panel
- China-based panel makers are expected to expand capacities (accounting for 25% of global supply in 2017), but production capability is still lower than Samsung (*according to PIDA*)

Summary - flat panel display

Flat panel market is booming in Asia with China becoming a major player

Investment cycles are difficult to predict with decisions taken at the last minute depending on market conditions

Requires very agile production as the winner is often determined by the ability to deliver in a short time

Renishaw latest investments in design and production automation gives us the flexibility and technical edge to respond to this challenging market

