

TECHNOLOGY INFRASTRUCTURES FOR INDUSTRIAL LEADERSHIP AND SUSTAINABLE FUTURE

EARTO Annual Conference

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Technology Infrastructures for Industrial Leadership – Setting the Floor



RTOs research labs, universities and industries with synergetic core competences, interconnected via communication and cooperation for the development of technologies



Redundant infrastructures with the same purpose in various locations and member states



Very large scale infrastructure which brings member states together for fundamental research

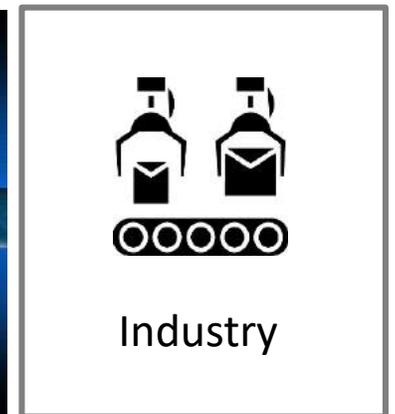
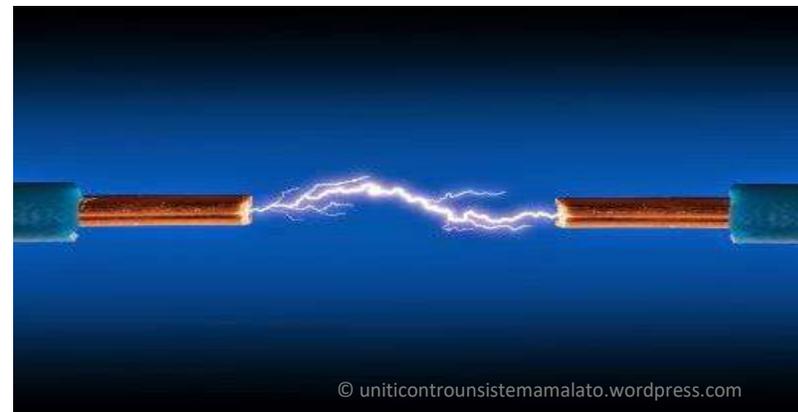
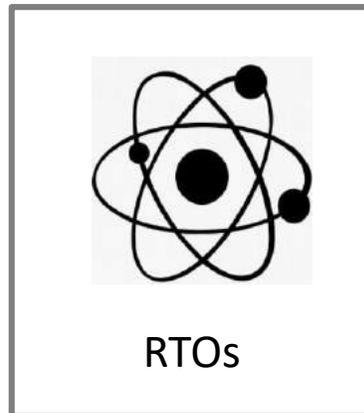
Europe Needs a Strong Industry for Economic Prosperity and Competitiveness

Industrial leadership and sustainable future in Europe requires ...

- rapid and revolutionary technological developments
- access to **appropriate infrastructures** to test, scale-up and disseminate Key Enabling Technologies (KETs) for strategic value chains

... before deploying them to the market.

➔ **RTOs and industry need to set up close alliances in order to create benefit and sustainability**



European Technology Infrastructures Form a **Mixed and Wide-Ranging Landscape**

Example Fraunhofer – The current, wide-ranging landscape of technology infrastructures is a mix of installations of all forms and sizes_

- **Local Impact** 73 Institutes
- **Regional Impact** 17 High Performance Centers
- **National Impact** 6 Clusters of Excellence
- **European Impact** 1 Virtual Research Fab

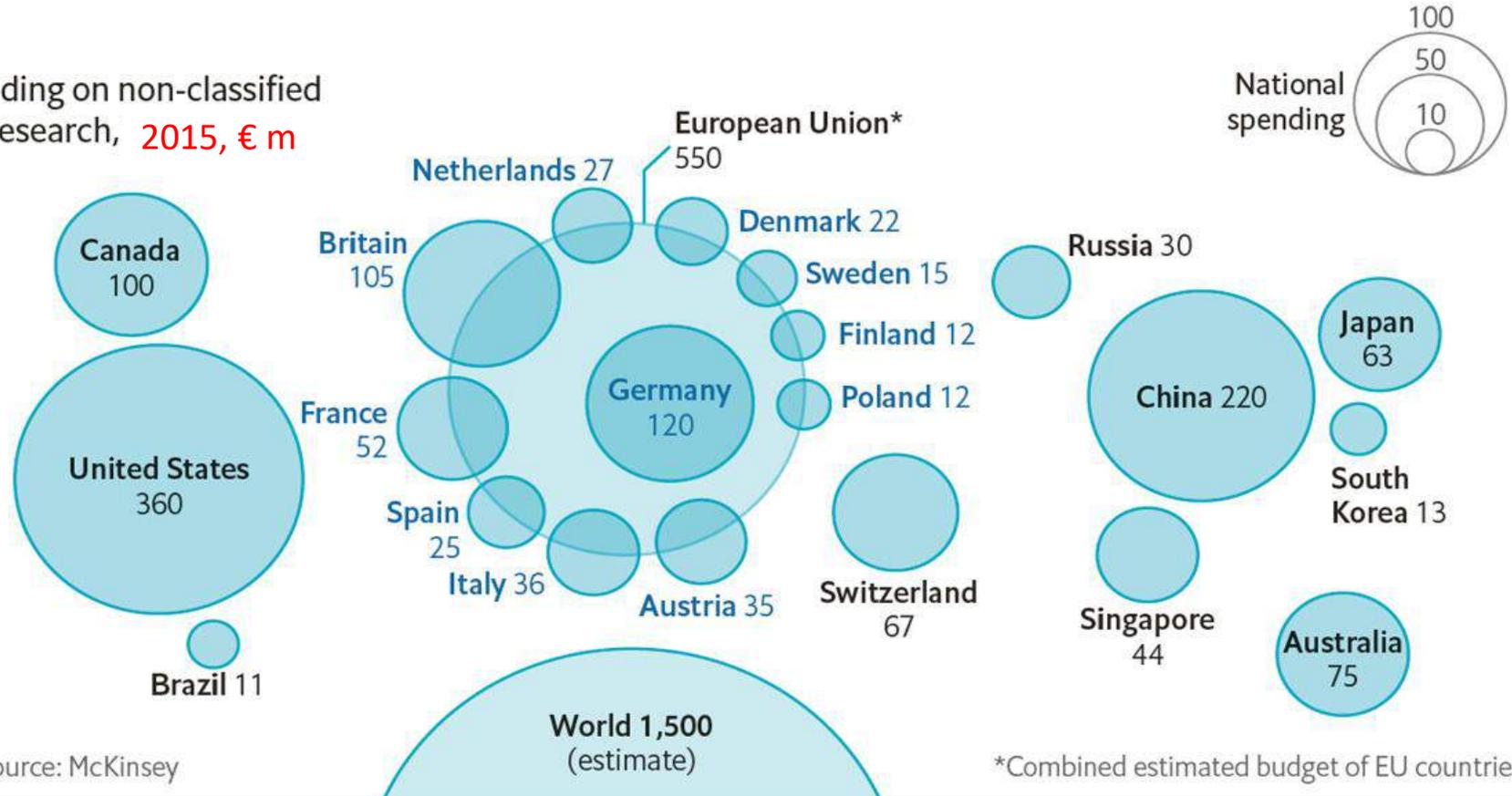


Rapid and Revolutionary Technological Developments

Example: Quantum Technologies

No small effort

Estimated annual spending on non-classified quantum-technology research, 2015, € m



Source: McKinsey

*Combined estimated budget of EU countries

Source: The Economist Technology Quarterly: Quantum Technologies and Their Applications

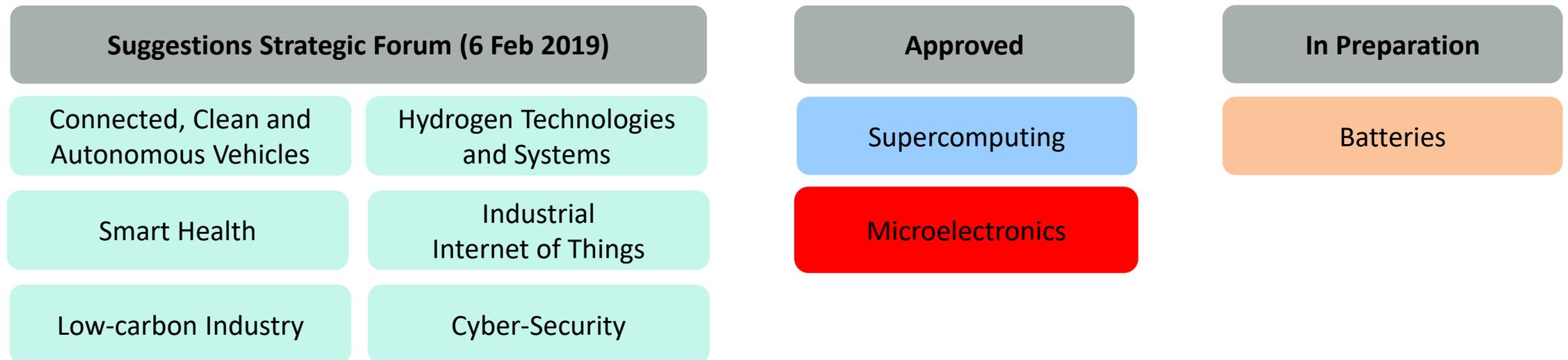


2018:
China's
5 year plan
41 € bn

Challenge: Technology Infrastructures for Industrial Leadership in Future Markets

- Europe's industry is permanently challenged to pick up and implement fast changing technologies rapidly and more effectively
- This requires increasingly access to external technology infrastructures and agreements on priorities for future infrastructures

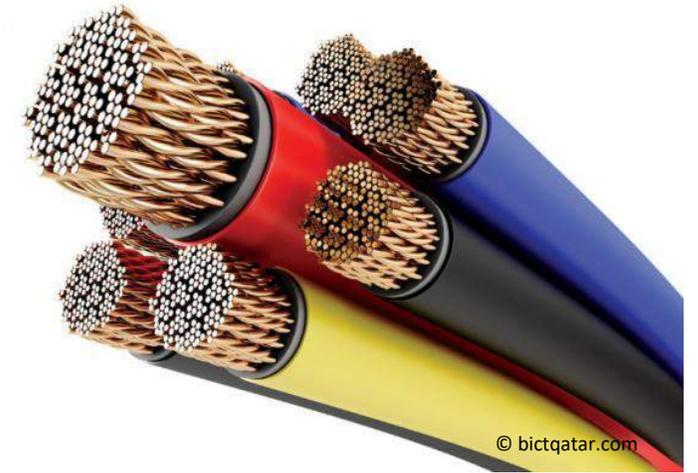
Key European Strategic Value Chains



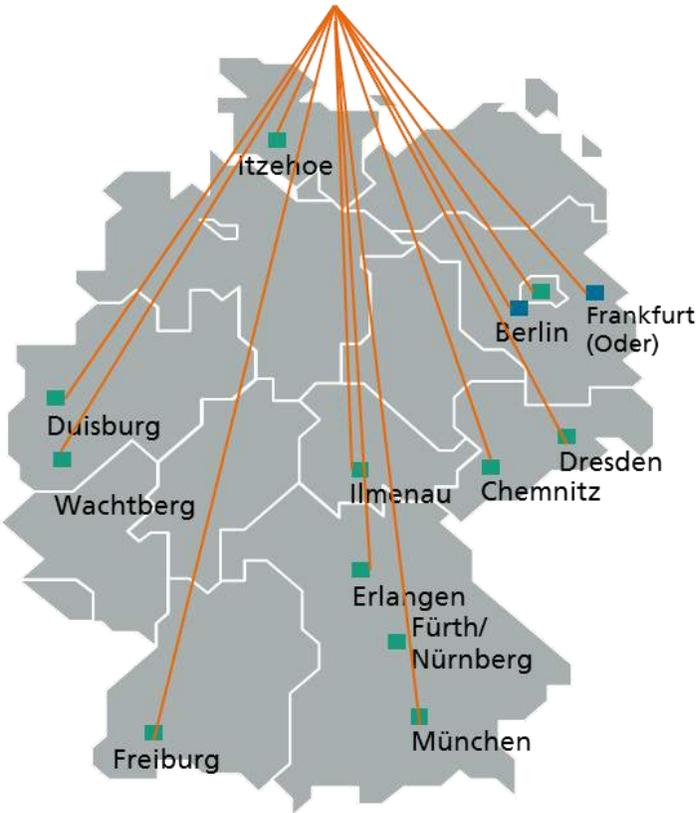
Example: **Microelectronics** Drive a Technological Revolution

New Paradigms beyond Moore's Law (reduction in size):

- Reduction in power consumption – **energy efficiency**
- High speed data transfer (reduction in latency) – **communication efficiency**
- Reduction in data transfer – **data efficiency**



Research Fab Microelectronics (FMD I) as a Lighthouse Project for Successful Implementation



- Funded by German Federal Ministry of Education and Research (2018 - 2020)
- Cooperation Fraunhofer and Leibniz
- Volume: € 350 m (capex)
- One-stop-shop:
 - From design to systems
 - From research to prototyping and pilot manufacturing

Phase II: RTOs Demand Appropriate EU Support to Meet the Industry's Needs

- Demand for strong and complete supply and value chains from research to end-user:
chips, devices and systems »Made in Europe«
- Phase II (FMD II): Next Generation Computing is a **Paradigm Shift for European Industry**
- **Call needed** for a joint effort to develop the new technologies in Europe:
»European Technology Infrastructure for Microelectronics«

Research Fab Microelectronics Requires Joint European Forces

- Three major RTOs join forces in microelectronics on European level:



- Joint initiative for Next Generation Computing TR  1-8

What if ...

... EU loses the battle of distributed intelligence?



Automated cars

Loss of leadership on premium vehicles and market share in mid range



Smart grids

Keys of energy production, transportation and distribution are taken over by the US

... EU lags behind in trustable server fabrication?



Industry 4.0

Whole high tech industry will be bugged



Defense &
Cyber-security

EU loses its sovereignty

Summary

- Technology Infrastructures –
Let us take the European view and seek more large scale collaborations
- Industrial Leadership –
RTOs are very well positioned to support industry's ambition for leadership
- Future Markets –
Let us think big and JOIN FORCES!



KIITOS AND THANK YOU!

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