

Sensor – Global Market

Sensors

- 2014 - \$ 86.3 billion
- 2015 - \$ 95.3 billion
- 2020 - \$ 154.4 billion
- 2025 > \$ 200 billion

CAGR of 10.1% from 2015 to 2020

Smart Sensors

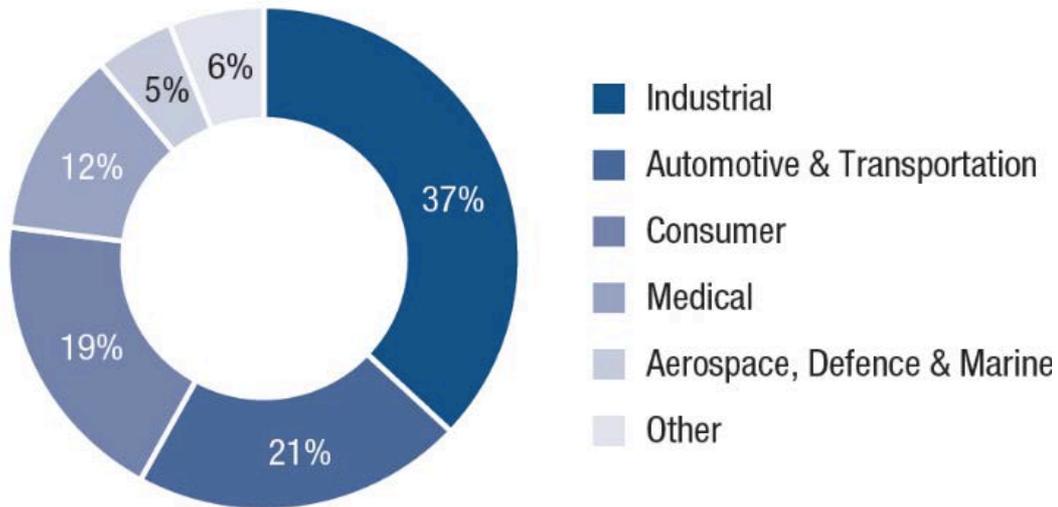
- 2015 - \$ 18.58 billion
- 2022 - \$ 57.77 billion

CAGR of 18.1% from 2016 to 2022

**Sensing and Instrumentation Systems:
claimed to be 7x size of the Sensor market**

Sensor Global Market

Sensor End-Markets

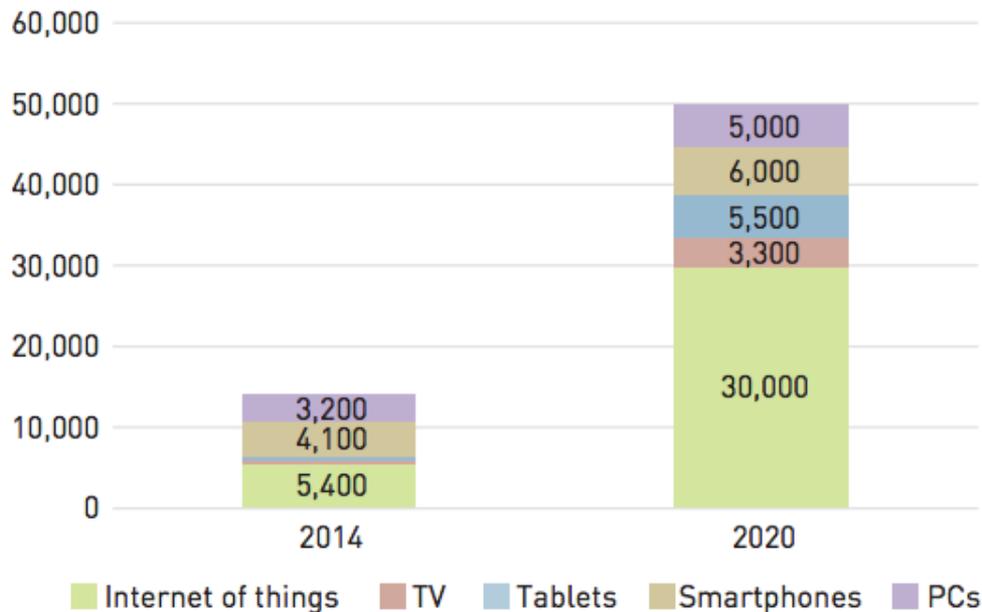


Major growth in:

- Industrial sector
Driven by Industry 4.0
- Automotive
100 sensors -> 200
Autonomous Cars
- Consumer
Smart Home
- Medical
Diagnostics

Sensor Global Market

Figure 2: Connected Devices by 2020 (in millions)

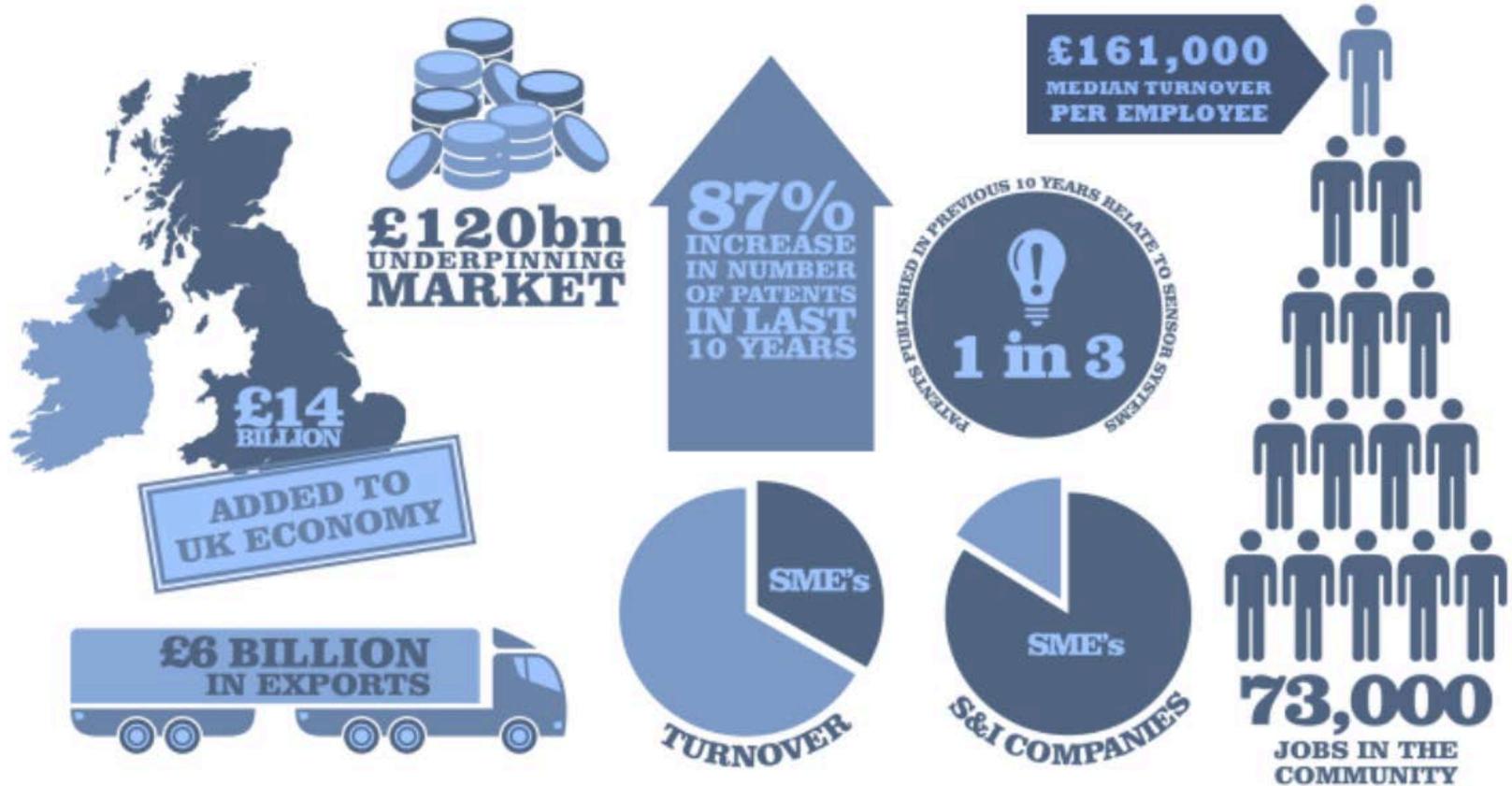


Source: IDC

Major growth in:

- IoT
 - Ease of deployment
 - Location, data links
 - New Applications
 - Environmental etc.
 - Multiple sensors
 - Several sensors of each type

UK Sensor Market



KTN Report on UK Sensor Market

2013 Study of 874 organisations

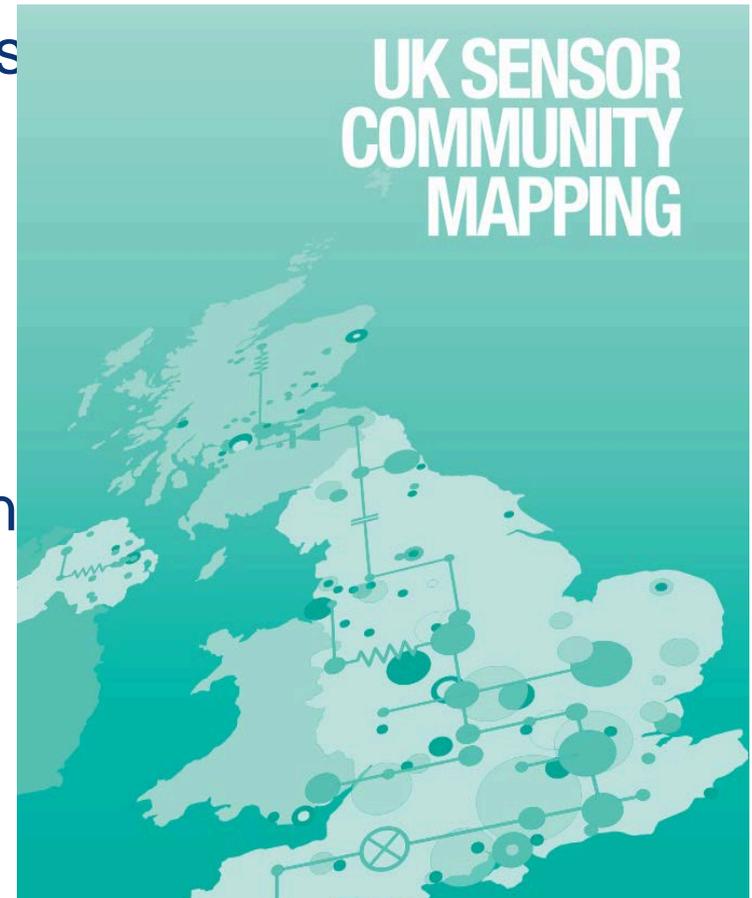
Biosensor - £2.7 billion

Transport - £7.7 billion

Aerospace - £6.9 billion

Defence & Security - £7.6 billion

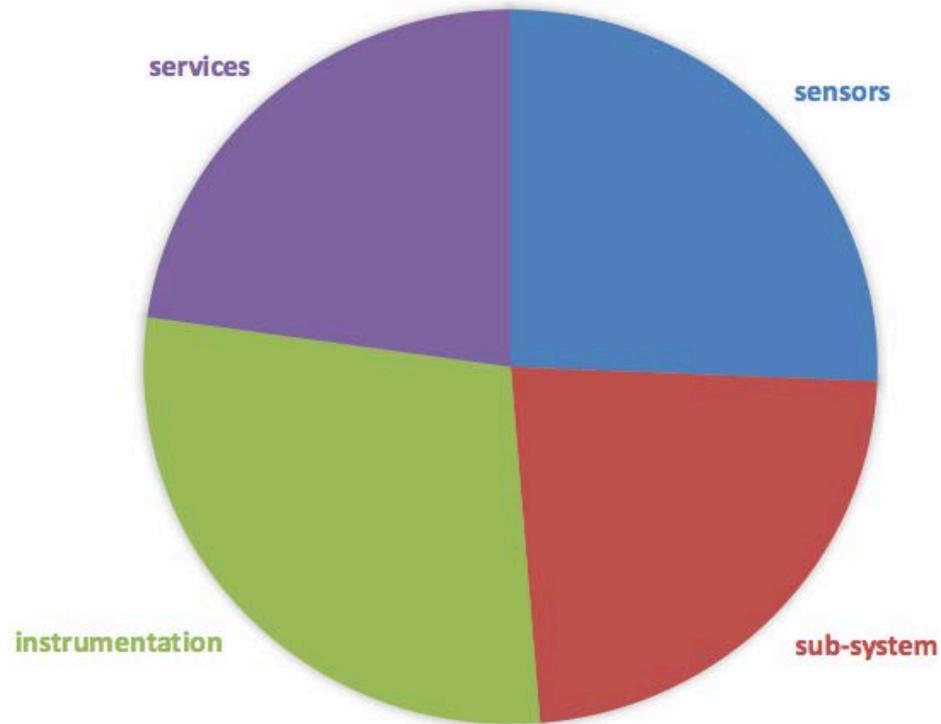
bit.ly/UKsensorlandscape



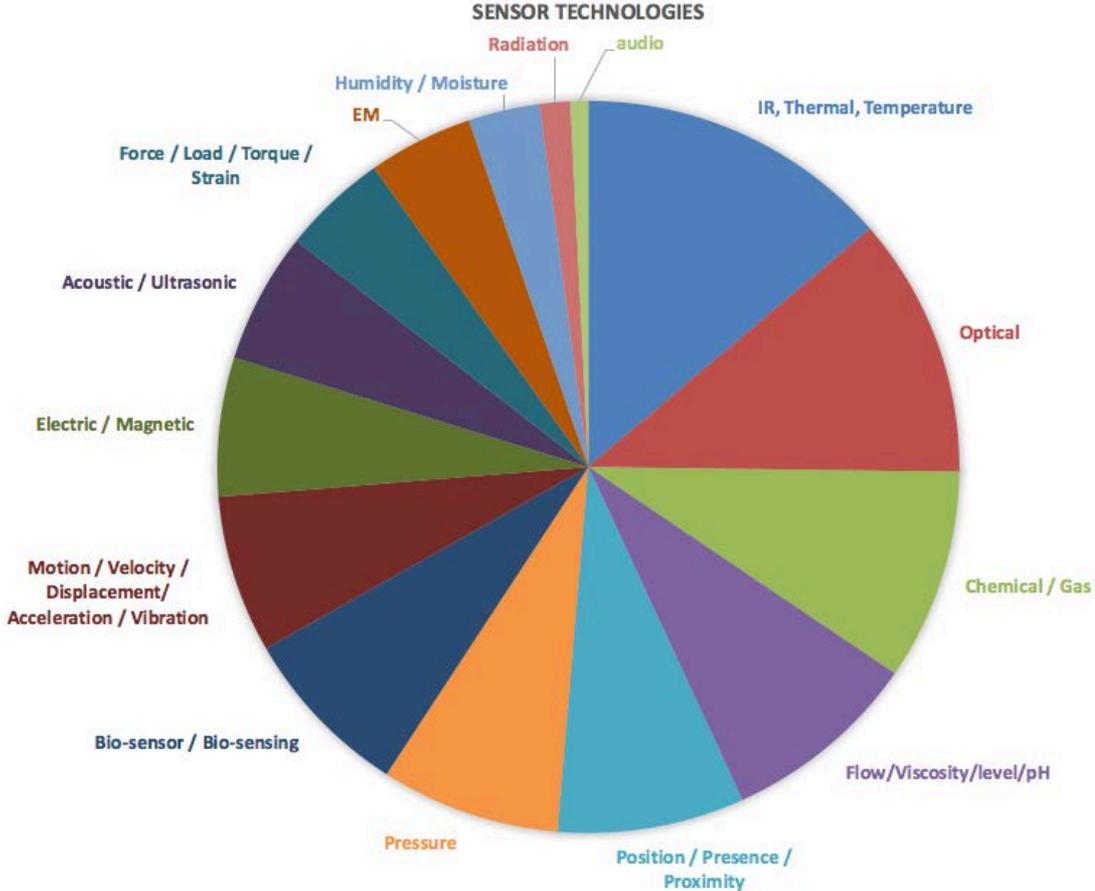
UK Sensor Market

Product Offerings

PRODUCT OFFERINGS

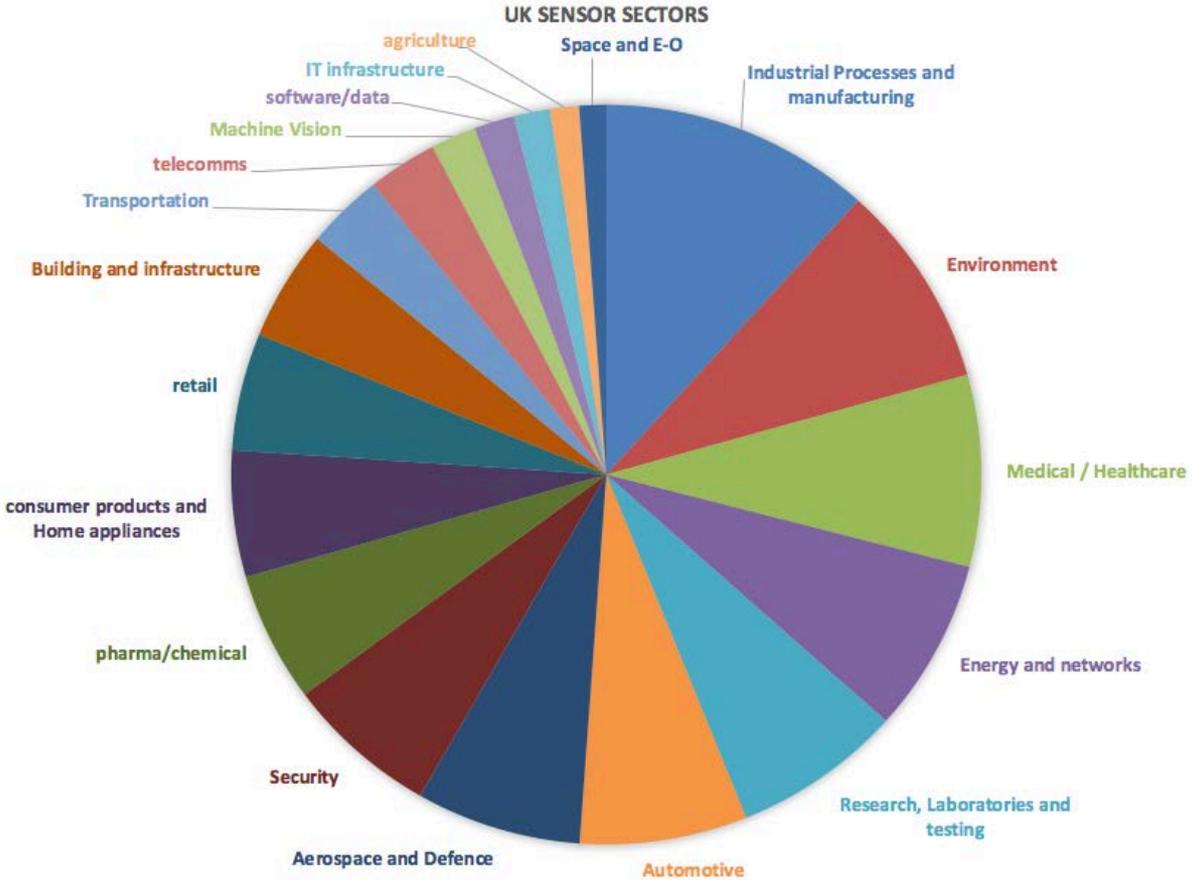


UK Sensor Market Technologies



UK Sensor Market

Industry Sectors



UK Sensor Market

Geographic Distribution



UK Sensor Market

Manufacturing, Environmental and Automotive

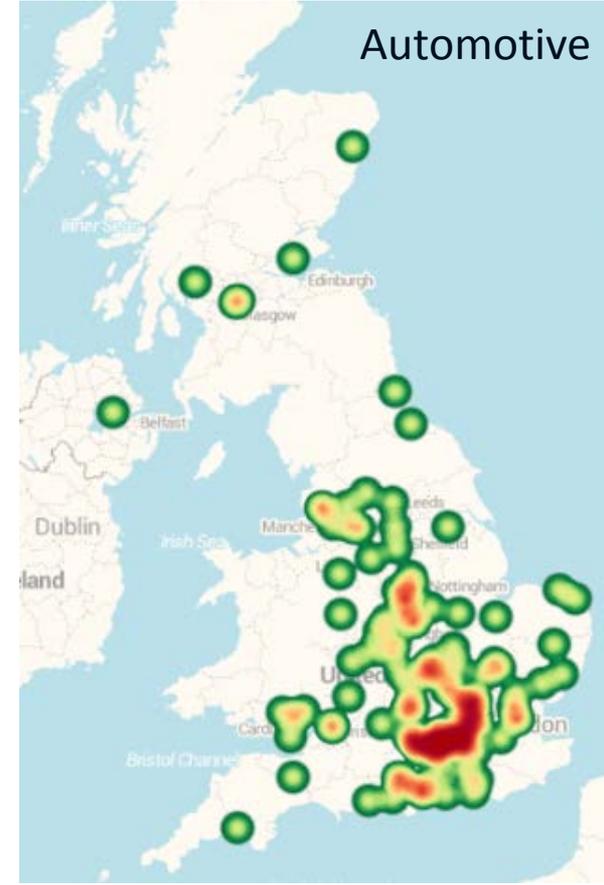
Manufacturing



Environmental



Automotive



UK Sensor Market

Research Activity



Top 20 Universities



How to grow the future?

Inventors - love Technology Push

The largest mousetrap in the world



Sensor and Sensor Systems Market

The “value” of sensor systems



Vital for:

- Aerospace
- Smart Transportation
- Smart Cities
- Smart Manufacturing
- Precision Agriculture
- Medical Monitoring
- Environmental Monitoring

Sensor Systems underpin IoT

Spencer and Fry



Post-It Notes

1968, a scientist at 3M in the United States, **Dr. Spencer Silver**, was attempting to develop a super-strong adhesive. Instead he accidentally created a "low-tack", reusable adhesive.

For five years, Silver promoted his "solution without a problem" within 3M both informally and through seminars but failed to gain acceptance.

In 1974 a colleague who had attended one of his seminars, **Art Fry**, came up with the idea of using the adhesive to anchor his bookmark in his hymnbook.

For three more years Fry utilized 3M's officially sanctioned "pet project" to develop the idea.

Post-It Notes

The original yellow color was chosen by accident, as the lab next-door to the Post-It team had **only yellow scrap paper** to use.

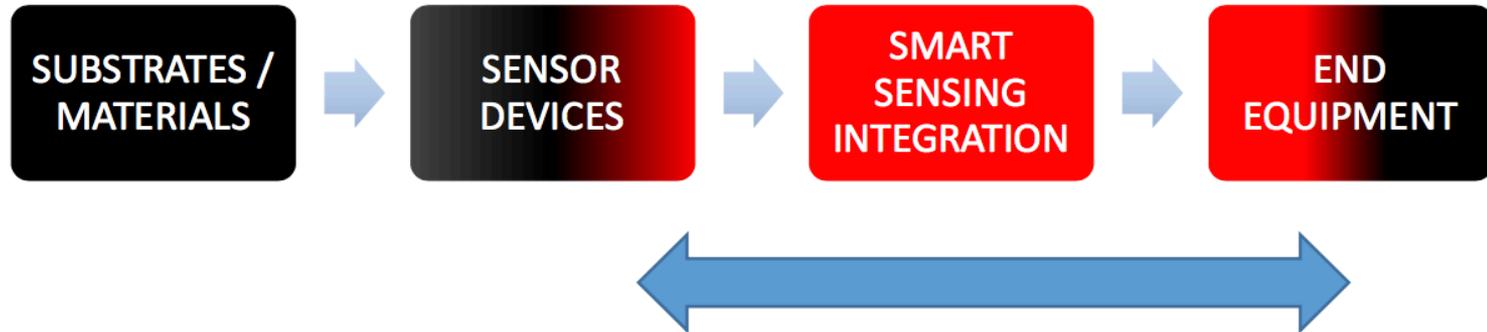
In 1977 3M launched the product as "Press 'n Peel" in stores in four cities but results were disappointing.

A year later 3M instead issued free samples directly to consumers in Boise, Idaho, with 94 percent of those who tried them indicating they would buy the product.

In 1979 the product was sold as "Post-Its when the rollout introduction began

It was sold across the United States from **April 6, 1980**.

Sensor Systems Catapult



Market Failures to be addressed:

- 1) Technology Companies bringing product to market
- 2) Provide understanding of technology developments and end-user needs
- 3) Bring together Technology Suppliers and Technology Users
- 4) Focus for the sector – demonstrations - showcase

Funding

Emerging and Enabling Competition

£15 million to stimulate new products and services

Aim: help businesses innovate to find new revenue sources

Projects £35,000 to £2 million; 6 months and 3 years.

- **Stream 1** projects under 12 months duration and £100k
 - can be single company (SME)
- **Stream 2** projects over 12 months or costing over £100k
 - must be collaborative including an SME

<http://www.gov.uk/government/publications/funding-competition-emerging-enabling-technologies>

Encouraging proposals that address:

Systems: multiple technologies to deliver real-world outcome

Smart Sensor Systems: miniaturisation, low-power processing and comms

Smart Technologies: richer and more informative output to the end user

Photonics: for manufacturing, healthcare and imaging

Digital Technologies: potential to change and disrupt sectors of the economy

Proposals should include **user/customer perspectives or participation**

ERA-NET Cofund Photonic Sensing

PhotonicSensing is an €18 million transnational call for R&D projects

Focused on development and implementation of photonics based sensing technologies

Innovate UK is to invest up to to €1.8M

Topped up by the European Commission to €2.7M

The competition opened on 1st September 2016

Projects must be collaborative, application-oriented & pre-competitive

ERA-NET Cofund Photonic Sensing

Everything goes through the website <https://photronicsensing.eu>

Stage 1 (pre-proposals) is “light touch” and projects are not formally assessed

Cannot enter Stage 2 without having uploaded a Stage 1 application

The Lead Partner should upload the application form for whole project

The screenshot shows the website for PhotonicSensing. At the top left is the logo for PHOTONIC SENSING. To the right are navigation links: Home, CALL 2016, Find Partner, News, FAQ, Contacts, and a LOGIN button. Below the navigation is a blue banner with the text: "PhotonicSensing is a transnational call for collaborate R&D funding". Underneath the banner is a "REGISTER" button. The main content area is titled "Photonics Based Sensing ERA-NET Cofund". It contains a paragraph describing the initiative, a list of participating countries and regions, and a paragraph about the funding details. At the bottom of the main content area are logos for various funding partners: ISE R&D, FCT, Innovate UK, The National Centre for Research and Innovation, Regione Toscana, and FFG. At the very bottom, there is a small text block stating: "PhotonicSensing has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688735". On the right side of the page, there is a "NEWS" section with a sub-heading "PhotonicSensing" and a paragraph of text: "9 countries and regions participate in this call with an overall funding budget of some 1B M EUR. Deadline for submitting preproposals is 5th Dec 2016, 17:00 CET. Organisations interested in submitting preproposals must get in touch with their national/regional contact point (see Guide for Proposers)".

PHOTONIC SENSING

Home CALL 2016 Find Partner News FAQ Contacts LOGIN

PhotonicSensing is a transnational call for collaborate R&D funding

REGISTER

Photonics Based Sensing ERA-NET Cofund

PhotonicSensing is a joint initiative which contributes to the fast development and implementation of photonics based sensing technologies and therefore further improve the European market share in this domain. It is organised as a competition for funding and will be implemented jointly by the participating national and regional funding bodies from the following countries and regions:

- Austria
- Flanders Region (Belgium)
- Germany
- Israel
- Poland
- Portugal
- Turkey
- Tuscany Region (Italy)
- United Kingdom

It is expected to fund a mixture of small and large projects, with total costs typically in the range of 60.5m to 64m. Each R&D Project shall consist minimum of two separate legal partners from at least two different participating countries and/or regions. Projects must be collaborative, application-oriented and pre-competitive.

ISE R&D FCT Innovate UK The National Centre for Research and Innovation Regione Toscana FFG

PhotonicSensing has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688735.

NEWS

PhotonicSensing

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Other Innovate UK Competitions

Sensor Systems

are essential to all funding calls

Conclusions

The need for sensors and sensing technologies will continue to grow

Driven by greater automation – Automotive, Manufacturing etc.

Increased deployment of IoT will enable many markets
and make it easier for people to use sensors

There is a move to integrate the sensing element
with additional electronics and data processing

New challenges of energy harvesting, communications and data
privacy

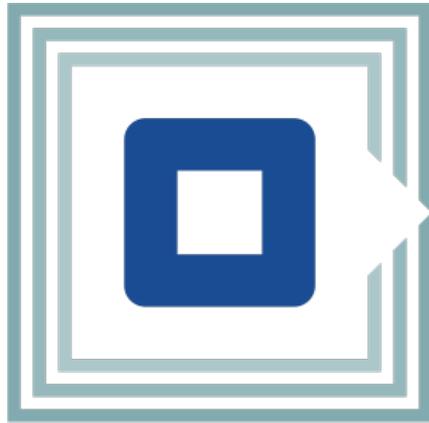
Questions?

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KTN

the
Knowledge Transfer
Network



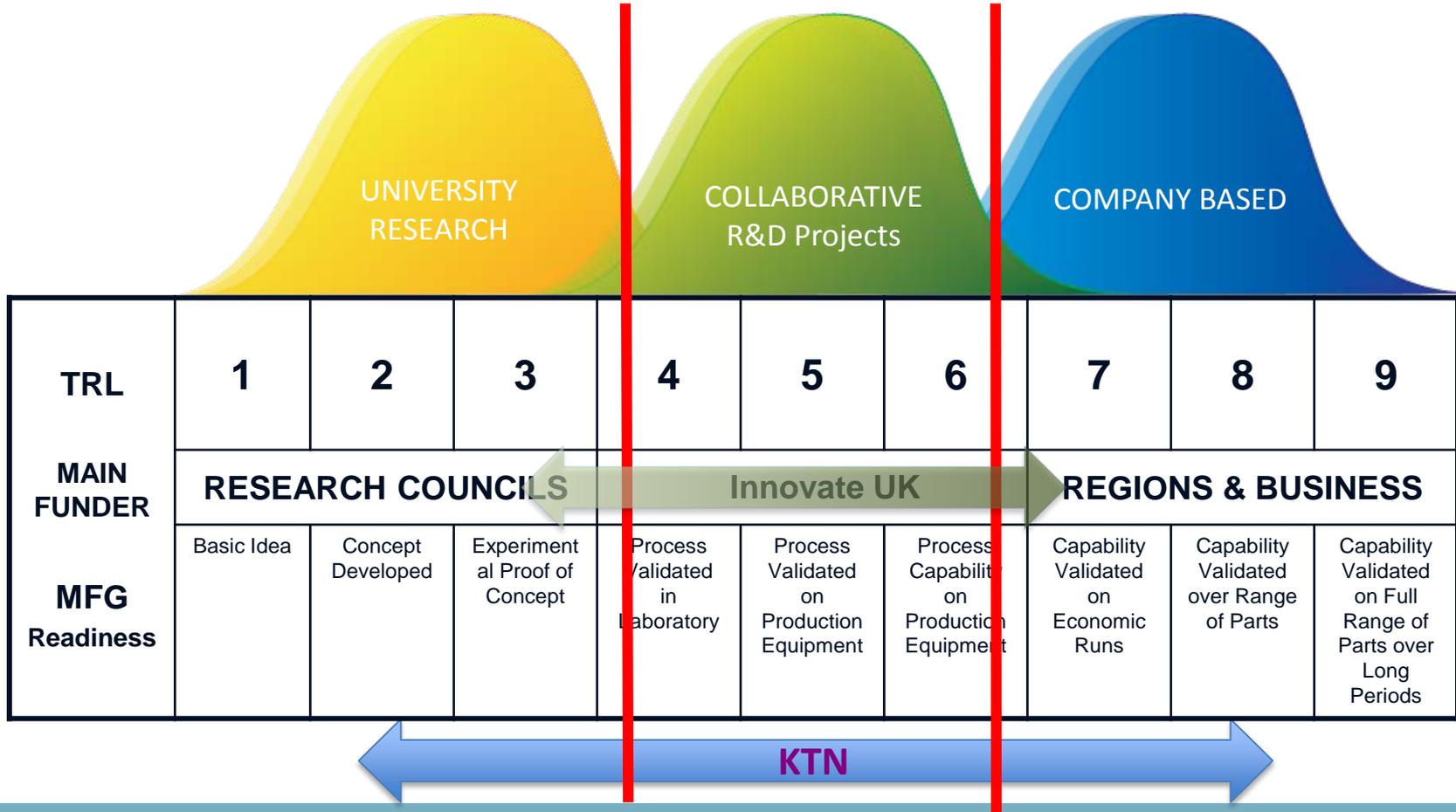
KTN

the Knowledge Transfer Network

ktn-uk.org @KTNUK

Where does KTN operate?

Addressing the “Valley of Death”



Knowledge Transfer Network

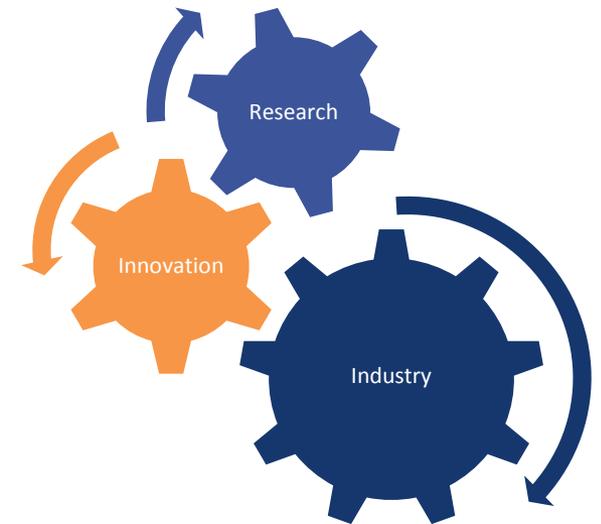
Our Objectives...

- ▣ Increase business-led R&D in the UK
- ▣ Facilitate exploitation of R&D to capture more UK value from innovation
- ▣ Increase collaboration between businesses (B2B) and business to research base (B2R) for UK benefit

The Knowledge Transfer network

What we do...

- Manage the UK's innovation network.
- Connect people
To speed up innovation, solve problems and find markets for new ideas.
- Assist business development
Bring together businesses, entrepreneurs, academics and funders to develop new products, processes and services



The Knowledge Transfer Network

Connecting people to accelerate innovation



Strategic

Connecting people who wouldn't usually meet to solve innovation challenges.



Interdisciplinary

Connecting people with different skills and other disciplines.



Entrepreneurial

Connecting people with investors, business development, entrepreneurs.



Commercial

Connecting people to potential partners to do business.

The Knowledge Transfer Network

- Stimulating dialogue/accelerating innovation

6,000+

Delegates per year

17

Cross-sector Groups

16

Industry Communities

60,000+

Members



KTN

the Knowledge Transfer Network

ktn-uk.org

@KTNUK

In summary...

Keep in contact!

- Contact us at an early stage to discuss potential projects so we can help identify partners and funding options
- Suggest workshops and events you would like to attend
- Let us promote your own events
- Keep us aware of changes, developments and good news stories
- Sign up for our newsletters:

<http://www.ktn-uk.co.uk/subscribe-2/>

Thank you

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The Future. Faster



KTN

the Knowledge Transfer Network

We work with
Innovate UK

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