EUREKA in Germany

Dr. Paul Racec

DLR-PT

DLR Project Management Agency

The DLR Project Management Agency at a glance

DLR-PT

Our core competencies

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Our topics

Climate change

Clinical research

Assessment of the impacts of technology

Africa

Industry 4.0

Dementia

Equal opportunities

Electromobility

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Our domains

Society, Innovation, Technology

Education, Gender

Environment and Sustainability

Health

European and International Cooperation

Centers of Expertise and Services

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Our clients and references


Federal Ministries, State Ministries, authorities


Foundations, associations, science organisations, research institutes, educational institutions, companies


European Commission, foreign governmental agencies

Bundesministerium für Arbeit und Soziales

Bundesministerium für Bildung und Forschung

Bundesministerium für Gesundheit

Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit

Bundesministerium für Wirtschaft und Energie

EUROPÄISCHE UNION

Bundesamt für Naturschutz

Ministerium für Kultur und Wissenschaft des Landes Nordrhein-Westfalen

BADEN-WÜRTTEMBERG STIFTUNG
Wir stiften Zukunft

Gemeinsamer Bundesausschuss

DZHK
DEUTSCHES ZENTRUM FÜR HERZ-KREISLAUF-FORSCHUNG E.V.

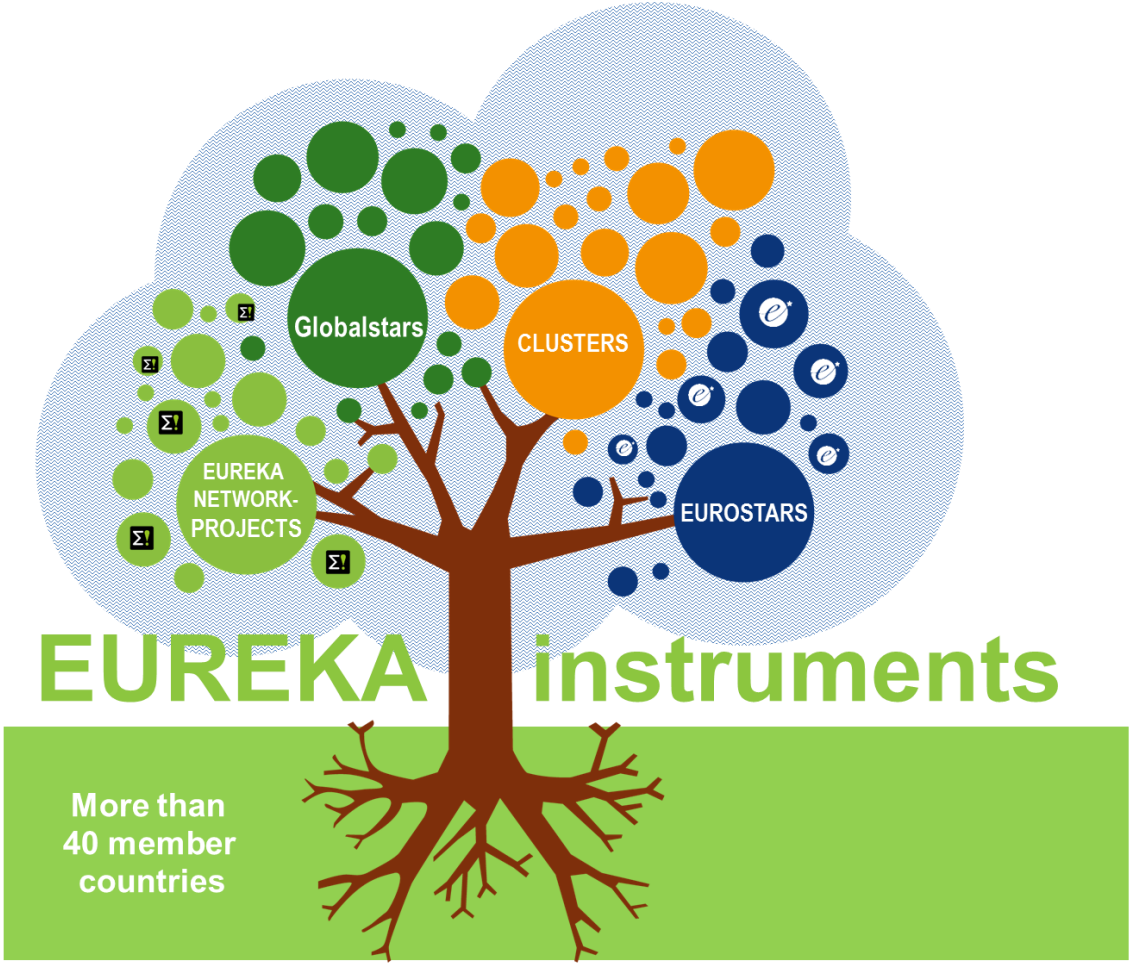
Our key figures

~ 1000 employees, more than half of whom are scientists

2 locations: Bonn, Berlin, 2 offices: Düsseldorf, Brussels

~ Funding of EUR 1.4 billion, > 10,000 projects per year

DLR-PT

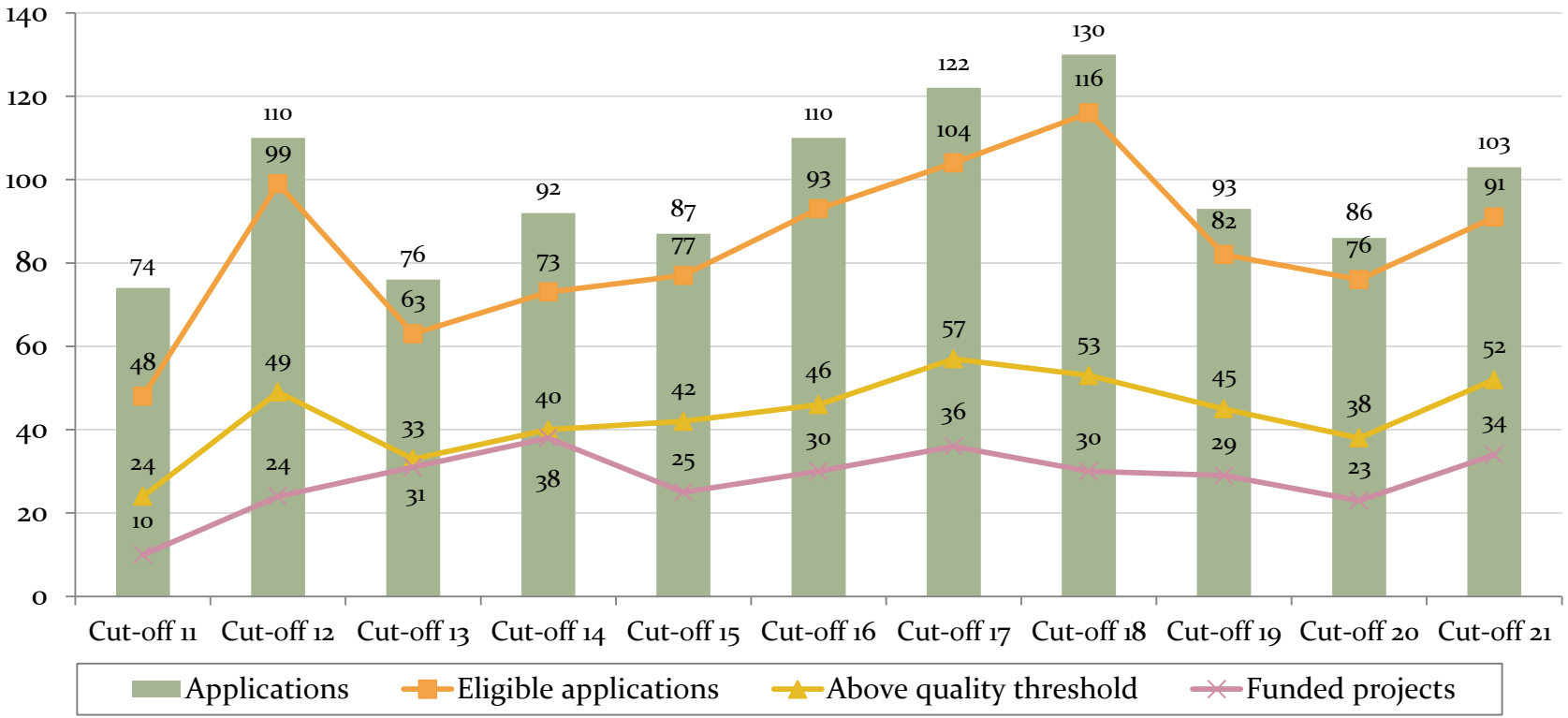

Globalstars
CLUSTERS
EUREKA NETWORK-PROJECTS
EUROSTARS
EUREKA instruments
More than 40 member countries


EUROSTARS

Funding conditions for German partners

- Eurostars-Budget in Germany: **15 Mio. € / year**
- Funding in Germany: **max. 500 T€ / project**, i.e. for all German partners together
- Project costs:
  - Personnel costs,
  - Overhead,
  - Material costs,
  - Traveling costs (to partners),
  - Subcontracting,
  - Others (amortisation of fixed assets, …)
- Funding rate:
  - **50%** for SME,
  - **50-100 %** for Universities and Research organisations
  - **0%** for Large companies

Eurostars-2 projects with German participation



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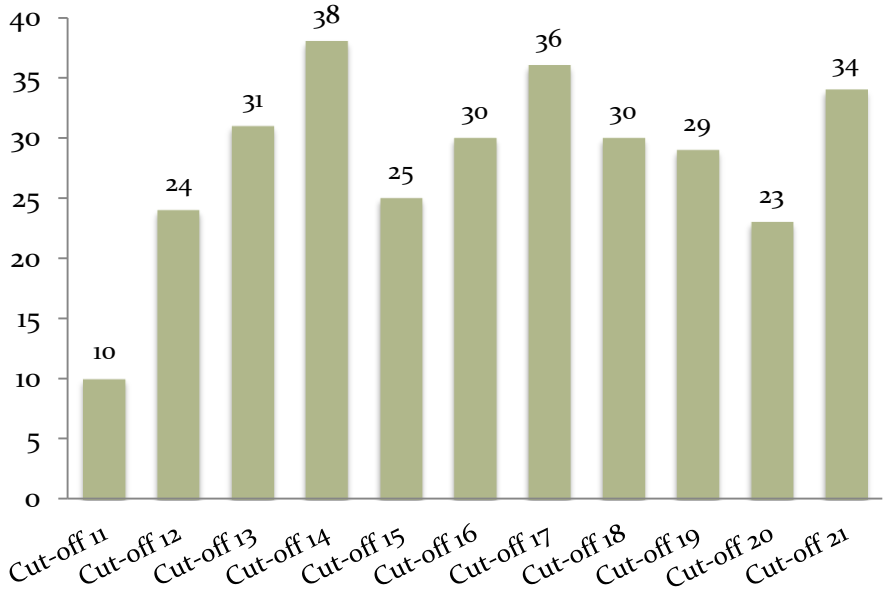
Funded Eurostars-2 projects in Germany

Number of projects



Budget (Mio. €)

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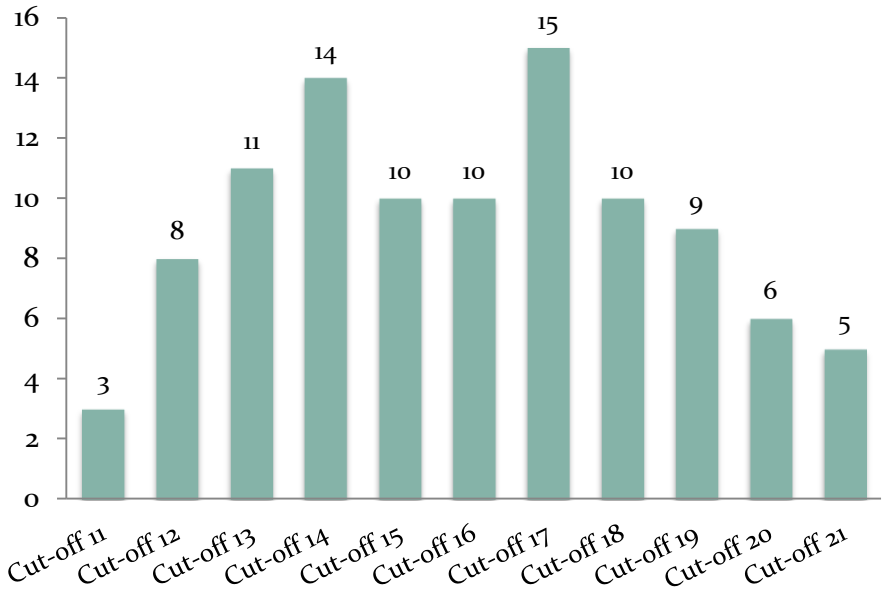
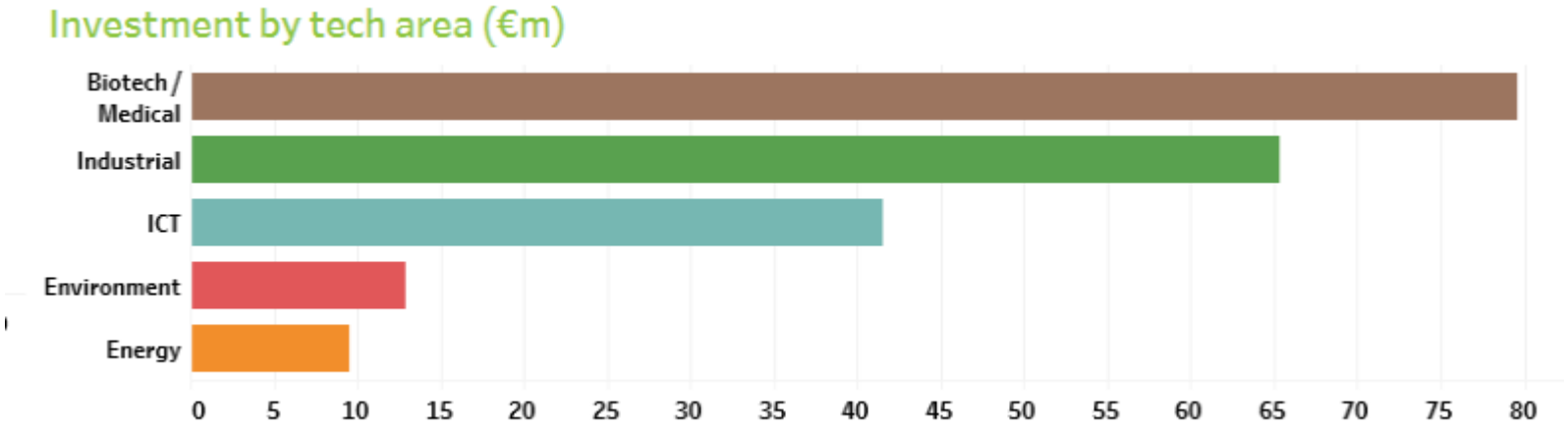


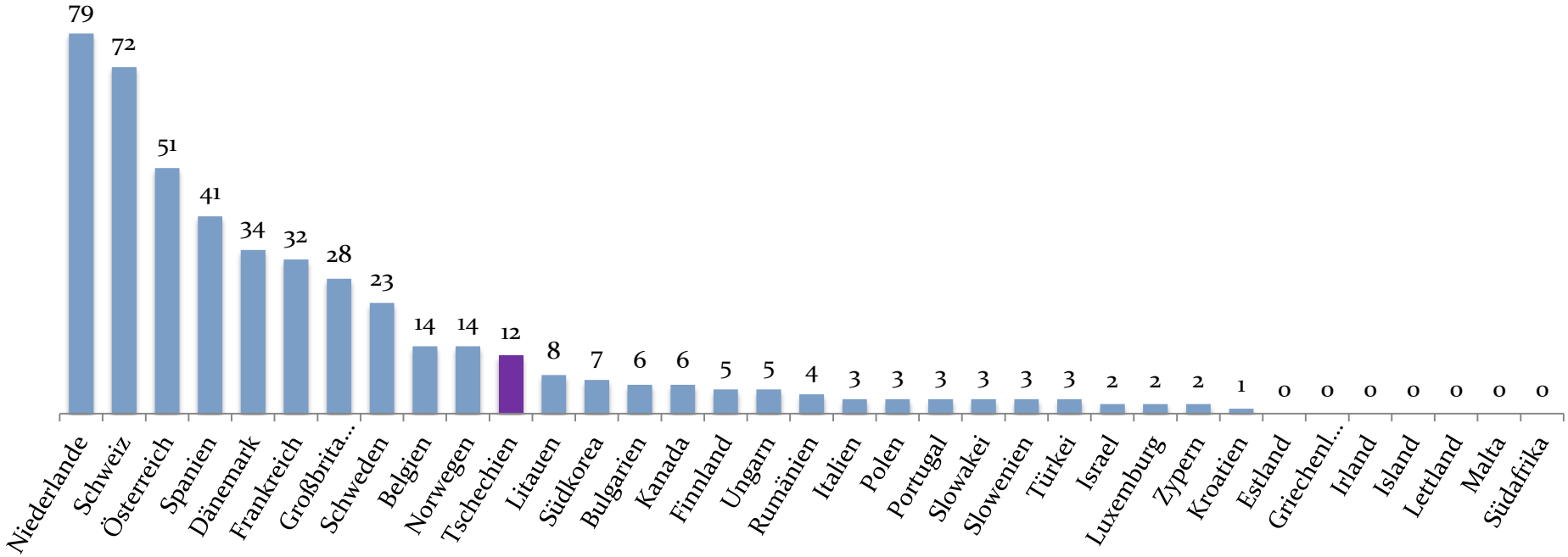
Eurostars-2 projects with German participation

Technology areas



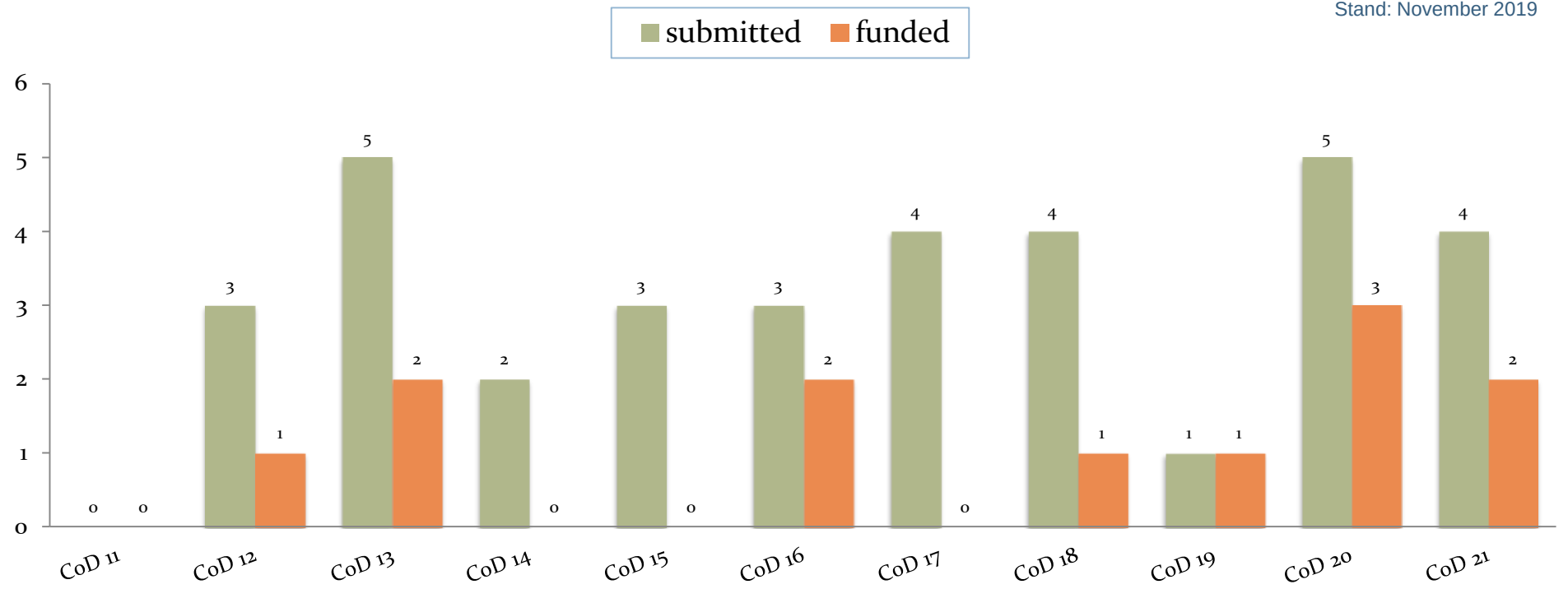
German collaboration in Eurostars-2 projects
(Cut-off 11 - 21)

Stand: November 2019



Czech Republic – Germany collaboration in Eurostars-2

Stand: November 2019



Success Story: 5468 HELI-FLR

- Main: RST Radar Systemtechnik GmbH, *Germany*
- Partners: Elbit Systems Ltd., *Israel*
  DRF Stiftung Luftrettung Gemeinnützige AG, *Germany*
- High-frequency radar navigation systems, using interferometric 3D-topograpy. The radar can see through rain, fog, dust, snow and glare and maps the area surrounding the helicopter, warning pilots of obstacles and uneven landing surfaces.
- Total costs: 3 399 760 Euro
- Duration: 31 months (2011-2013)
- https://www.eurostars-eureka.eu/content/high-stakes-high-frequency-helicopter-radar


EUREKA EUROSTARS PROJECT
5468 HELI-FLR

HIGH STAKES FOR HIGH-FREQUENCY HELICOPTER RADAR

German and Israeli industrial R&D teams have pulled off a flying feat with their innovative bespoke radar system to help helicopter pilots navigate even the most difficult conditions. Successful test-flights demonstrated the system in action at low altitudes. Refits to the sensor hardware are now under way to make the radar fully flight-ready. As an innovation frontrunner, the stakes are high.

The system they designed and tested under the Heli-FLR Eurostars project is based on high-frequency radar navigation systems using interferometric 3D-topograpy. The innovation means the radar can see through rain, fog, dust, snow and glare as it detects obstacles and maps the area surrounding the helicopter, warning pilots of obstacles like antenna, cables/wires, buildings and uneven landing surfaces.

As the name suggests, interferometry measures the interference or observed change in waves (light, radio, sound) and the materials or objects they are interacting with. The 'wave displacement' that takes place when bouncing off, for example, treetops can be analysed and calibrated into a 3D topographic map.

"From the moment we realised we qualified for EU funding, we were convinced of its potential and dedicated ourselves to the project," notes Birgit Jackson of Germany's RST Radar Systemtechnik Gmbh, a leading player in radar technology which coordinated Heli-FLR. "Without the funding, the financial risk would have been to high. The Eurostars programme and helpful team, including support from National Contact Points, made this large and rather complex multi-partner project possible!"

It enabled the team to develop and flight-test the beta version in cooperation with end-users. And according to Jackson, the pilots who first tested the demonstrator remarked that it represented a "big step in the right direction". Easy-to-interpret visual feedback on an aircraft's position in relation to its surrounds is vital intelligence for pilots facing stressful flights and landings, especially in built-up areas.

Heli-FLR's Israeli partner, Elbit Systems Ltd., is active in a range of aerospace and defence sectors including command and control for air, land and naval applications, advanced electro-optics, unmanned aircraft systems, data links, intelligence, surveillance and communications.

The project's end-user partner, DRF Stiftung Luftrettung Gemeinnützige AG, is a German helicopter-based rescue organisation. DRF's pilots provided essential feedback on tricky flying conditions during their trials of the new radar system.

Not all smooth flying

The Heli-FLR's airborne radar system is designed to help pilots make critical decisions in any conditions, day or night, and during flight and landing. The innovative 'final approach mode', with colour-coded altitude 'visualisation' tools, is tailored so crews can quickly recognise obstacles in the landing zone.

But according to the team, the testing phase was not all smooth flying: "The demonstrator worked perfectly at altitudes of up to 30m, which was a strong proof of concept, but due to technical limitations in our hardware we couldn't reach the 100m level required in real-world flying conditions."

This was a bit of a set-back, but RST and partners remain convinced that, with the sensor design update currently under way, the 100m mark is within reach. The patents

> ***High-frequency radar cuts through any prevailing weather or obstructions, giving an accurate reading of the surrounds***

originally filed are on pause until the new specifications are finalised.

"Though this refit is likely to take some time, we still firmly believe that our system will be a winner once it's ready because the competitors have yet to reach this level of technical sophistication."

And in the meantime, the R&D-led cooperation has opened up several avenues for future partnerships and the sharing of best practices in a complex domain. "Working with experts in their fields and discovering different solutions to problems was a great benefit to all of the organisations involved in Heli-FLR," concludes Jackson, "The experience and know-how offered by DRF's pilots was especially important."

MAIN PARTNER
RST Radar Systemtechnik Gmbh, Germany
https://www.rst-group.biz/
a.braun@rst-group.biz

OTHER PARTNERS
Elbit Systems Ltd., Israel
DRF Stiftung Luftrettung Gemeinnützige Ag, Germany

TOTAL R&D INVESTMENT
€ 3 399 760

DURATION
March 2011 - September 2013

COUNTRIES AND NATIONAL FUNDING BODIES INVOLVED
BMBF - Bundesministerium für Bildung und Forschung
ISERD- Israel Europe R&D Directorate

EUREKA is a European network for market-oriented R&D.

www.eurekanetwork.org

Success Story: 7080 HYLASE

- Project coordination: Fianium Ltd, *UK*
- Other participants: neoLASE GmbH, *Germany*
- Ultra-compact high energy laser systems capable of printing and cutting even the trickiest materials like glass and plastics
- Total costs: 825 733 Euro
- Duration: 27 months (2012-2014)
- https://www.eurostars-eureka.eu/content/timing-everything-laser-printing


EUREKA EUROSTARS PROJECT
7080 HYLASE

TIMING IS EVERYTHING IN LASER PRINTING

British and German laser specialists joined forces to develop a new standard in ultra-compact high-energy laser systems capable of printing and cutting even the trickiest materials like glass and plastics. Their timing could not have been better as the laser printing market took off on the back of a consumer manufacturing boom.

A constant pipeline of new, increasingly complex consumer electronics and devices – and the innovative techniques to manufacture them – has been credited for a growth spurt in the laser industry. Making a smartphone, for example, involves myriad laser-based processes, such as engraving parts, grooving circuit boards, and glass-cutting.

"It should come as no surprise that 2017 was a great year for the laser industry," according to LaserFocusWorld's annual laser review and forecast. Global laser revenue grew by 18.1 % compared with 2016. This was largely driven by the materials processing sector, where year-on-year laser revenues jumped more than 26 % (fibre lasers alone grew by a "staggering" 34 %, the analysts report. But they caution that more moderate growth is expected for 2018 and beyond "as capital equipment spending cools for certain materials processing laser systems".

Compact, high-energy lasers with ultra-compact laser heads, such as those developed in the Eurostars HYLASE project, are tailor-made for the printing, etching and cutting of complex surfaces like glass and thin-films, according to the management team behind the project from Fianium in the UK and neoLASE in Germany.

HYLASE's work in this cutting-edge field drew the attention of major laser manufacturers looking to reinforce their expertise in ultra-short pulse fibre laser systems and amplifiers which can be quickly realised as compact, reliable products suitable for real-life applications.

> *The HYLASE solutions proved to be reliable as well as easy to integrate and maintain in existing manufacturing set-ups*

Apart from their excellent processing speed and accuracy, which boosts output and minimises heat build-up in the affected zone, the HYLASE technology demonstrated superior beam quality at all repetition rates. The solutions proved to be reliable as well as easy to integrate and maintain. This work was reinforced thanks to neoLASE's background in durable, modular lasers and amplifiers.

Pure focus

neoLASE has established a reputation for producing fast and highly focused pico- and femtosecond lasers (one trillionth and one quadrillionth of a second respectively). For example, its neoMOS ultra-compact laser head is reported to have the smallest footprint currently available, which makes integrating it into new and existing industrial and scientific applications much easier, from gravitational wave detection to micro-machining jobs, such as those demonstrated in HYLASE.

Recently, the company also announced that its laser amplifiers have been installed in the European X-Ray Free-Electron Laser, XFEL, as it is known, produces x-ray flashes with such intensity (a billion times higher than commercial sources) that they can peer into the atomic detail of cells or chemical reactions, providing a "three-dimensional view into the nano-cosmos or the ... activities inside planets", according to neoLASE.

All of this capability was brought to the fore during HYLASE's testing work, which was really made possible thanks to EUREKA backing, the team concludes.

MAIN PARTNER
Fianium Ltd, UK (now part of NKT Photonics A/S)
www.nktphotonics.com

OTHER PARTNERS
neoLASE GmbH, Germany
https://neolase.com

TOTAL R&D INVESTMENT
€ 825 733

DURATION
February 2012 to May 2014

COUNTRIES AND NATIONAL FUNDING BODIES INVOLVED
BMBF
Innovate UK

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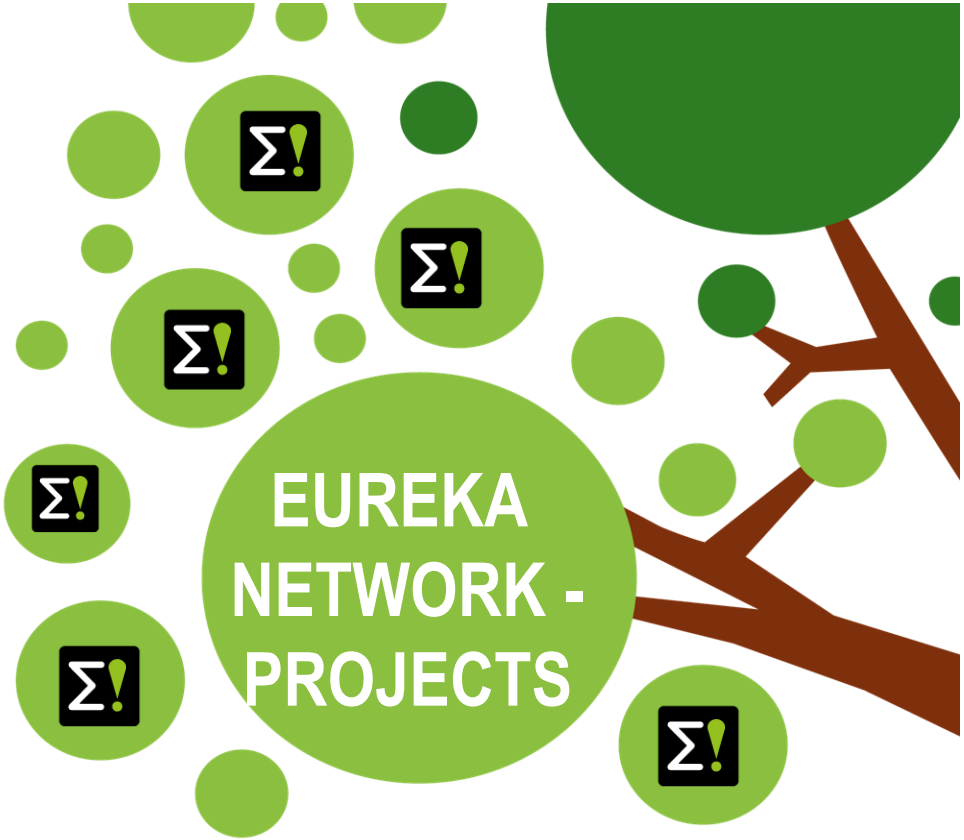
EUREKA
NETWORK -
PROJECTS

EUREKA Network projects: funding conditions in Germany

- EUREKA application ≠ funding application
- Germany does not have an earmarked budget for EUREKA Network projects
- Participants bring funding into the project:

  1. EUREKA Call (funding available BMBF) e.g. DE-CZ-Call
  2. national funding programmes (e.g. ZIM or thematic Calls)
  3. Self-funding

EUREKA Network projects: funding opportunities in Germany

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1. ZIM (Central Innovation Programme for Medium-Sized Industry) of the Federal Ministry of Economic Affairs and Energy (BMWi)

- funding programme designed for SMEs, supports national and international projects (minimum 2 partners like in EUREKA);
- thematically open and bottom up – like EUREKA;
- no deadlines;
- eligible: SMEs (+ research institutes)
- more information: http://www.zim-bmwi.de/zim-overview

EUREKA Network projects: funding opportunities in Germany

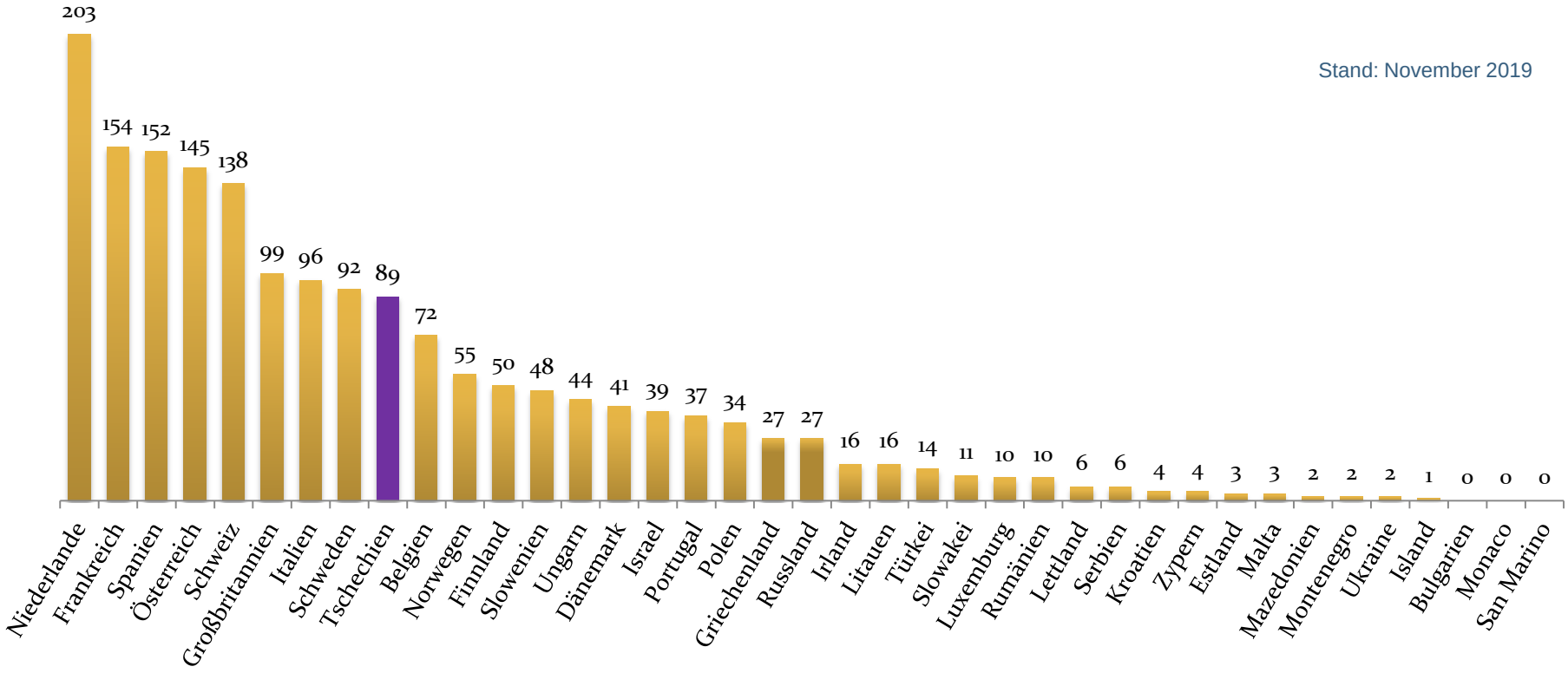
2. KMU Innovativ (Federal Ministry for Research and Education, BMBF)

Part of the High-Tech-Strategy of BMBF, featuring:

- a funding programme designed for SMEs,
- no deadlines but two evaluations per year (15th March/15th October)
- Combination of bottom-up and top-down: General themes, but in itself thematically open, outlines must cover one of the following research areas:

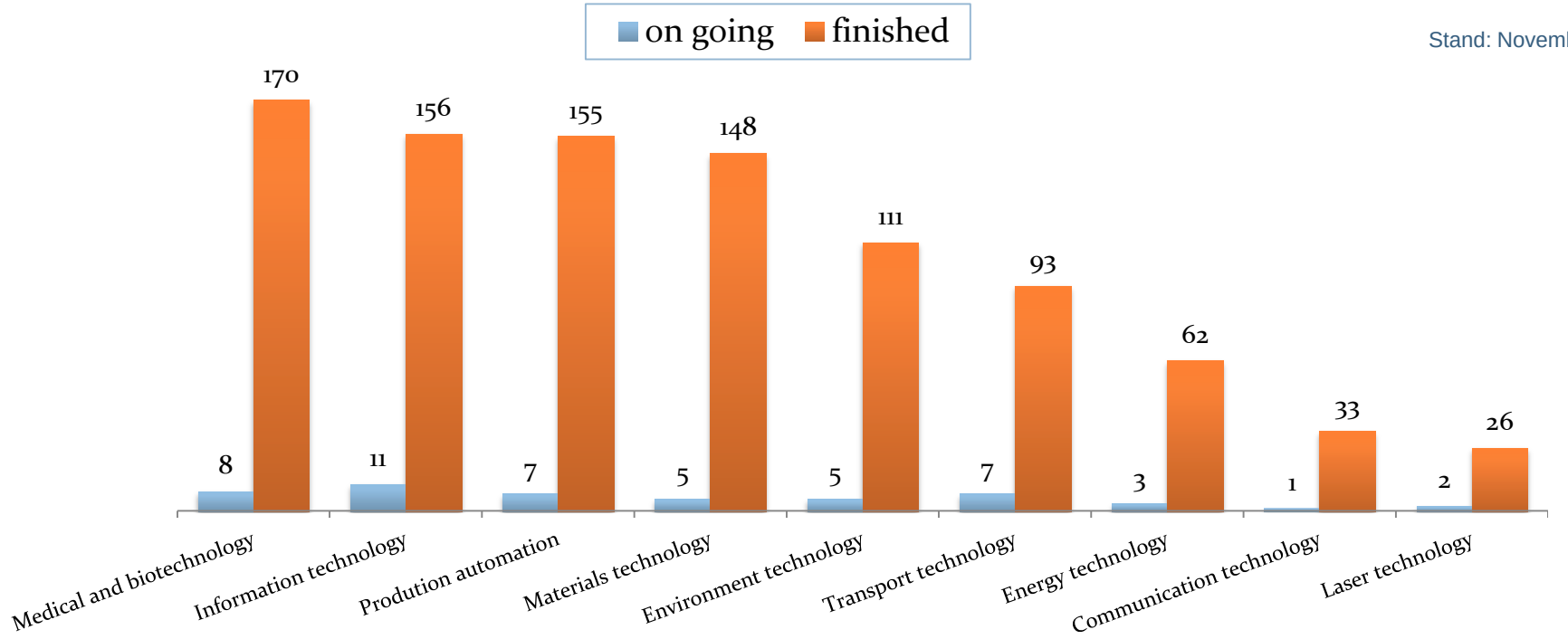
  Bio-Tech / Med-Tech / ICT / Production Technology / Resource and Energy Efficiency / Nanotechnology
- more information: www.kmu-innovativ.de

German collaboration in EUREKA network projects



EUREKA network projects with German participation

Technology fields



Stand: November 2019

Success Story: 10382 HSXRF

- Main: Minesense Technologies Ltd., *Canada*
- Partners: Ketek GmbH, *Germany*
- High-Speed X-Ray Fluorescence: a next-generation iron-ore detector and integrated solution which boosts performance by up to 20% and saves on energy, water and chemical use.
- Total costs: 680 000 Euro
- Duration: 14 months (2016-2017)
- https://www.eurekanetwork.org/content/sensing-digital-revolution-mining


EUREKA NETWORK PROJECT
10382 HSXRF

SENSING DIGITAL REVOLUTION IN MINING

What are the chances of two ambitious but very different businesses finding each other across the Atlantic? Rather slim, if it were not for EUREKA, which backed a project to test and roll out an innovative iron-ore 'sensing', sorting and communication system.

MineSense, a Canadian mining technology development and marketing company, teamed up with engineering and detection specialists, Ketek of Germany, to launch the High-Speed X-Ray Fluorescence (HSXRF) project.

MineSense reached out to Ketek in 2015 and, together, they field-tested and, in early 2017, delivered a next-generation iron-ore detector and integrated solution which boosts performance by up to 20% and saves on energy, water and chemical use.

"We both realised quickly that this is a challenge and an opportunity we should not miss. The twofold approach from the technology side and the application side was a perfect match right from the beginning," said Reinhard Fojt, Managing Director of Ketek, about the partnership.

The ground-breaking sensor technology and data analytics platform evolving from the project now provides mining operations with unprecedented real-time information about their ore deposits.

As an emerging global player in mineral telemetry and ore upgrading, MineSense's system not only makes mining low-grade ore feasible, it optimises the whole decision-support process. Penetrating deep into the ground, the sensitive XRF detector provides accurate real-time ore grade data, which means higher yields and, combined with connected machinery like scoops, belts, feeders and chutes, helps to separate unwanted waste from the valuable minerals at an early stage of the mining process.

> *[It] not only makes mining low-grade ore feasible, it optimises the whole decision-support process*

Attracting attention

Not surprisingly, MineSense's solutions have attracted the attention of investors and customers. Company CEO Jeff More announced early in 2017 that MineSense had sealed a $CAN19 million finance deal, led by Aurus Ventures alongside Caterpillar Venture Capital – the investment arm of the mining equipment giant – and existing investors, Chrysalix Venture Capital, Cycle Capital Management, Prelude Ventures and Export Development Canada.

"Having a major player like Caterpillar as a new strategic investor provides a strong partner with global reach. We are also thrilled to have the continued support of our existing investors," noted More in a statement.

"This is one of the most exciting new technologies to come into the mining sector with the potential of significantly improving the industry's profitability," remarked Victor Aguilera, Managing Director of Aurus Ventures, following the deal.

Clean, lean sorting machine

The integrated sensing and communication platform, designed around the XRF detecting and sorting technology, has the ability to generate unparalleled 'whole mine' datasets which can also be used for better planning and modelling. It can monitor changes to the ore body on a daily basis, identify differences in mineralogy, and look for trends to optimise various operations within the mine.

Ketek is working on further refinements to the XRF technology and on expanding the portfolio of applications for semiconductor sensors in the optical area with its Silicon Photomultipliers.

"Having an industrial partner with a shared passion for digital innovation to test our prototypes and devices in demanding sectors can mean the difference between success and failure," concluded Fojt.

MAIN PARTNER
Minesense Technologies Ltd., Canada
http://minesense.com/
info@minesense.com

OTHER PARTNERS
Ketek GmbH, Germany
www.ketek.net
info@ketek.net

TOTAL R&D INVESTMENT
€ 680 000

DURATION
January 2016 to March 2017

COUNTRIES

NATIONAL FUNDING BODIES
National Research Council Canada

EUREKA is a European network for market-oriented R&D.

www.eurekanetwork.org

Germany funding budget for all EUREKA projects

Number of projects	On going	Finished	Total
Netzwerk projects	23	274	297
Eurostars projects	167	277	444
Total	**190**	**551**	**741**

Funding budget (Mio. €)	On going	Finished	Total
Netzwerk projects	6	787	793
Eurostars projects	47	110	157
Total	**53**	**897**	**950**

Stand: November 2019


CLUSTERS

EUREKA Cluster-projects in Germany

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Supported by BMBF:

CELTIC-Plus: Telecommunication www.celticnext.eu/

ITEA3: Software-Systems itea3.org/

PENTA: Micro-/Nanoelectronics www.penta-eureka.eu/

Funding in Germany to be sought from other progammes:

EURIPIDES²: Smart electronic systems www.euripides-eureka.eu/

EUROGIA 2020: Energy-Cluster www.eurogia.com/

METALLURGY EUROPE: New materials metallurgy-europe.eu/

SMART: Advanced manufacturing technology www.smarteureka.com/

EUREKA Cluster-projects in Germany

- Information on EUREKA Clusters and upcoming calls:
  https://www.eurekanetwork.org/eureka-clusters

- Joint Call PENTA-EURIPIDES² (19.11.2019 – 28.02.2020)
  http://penta-eureka.eu/calls/2020EURIPIDES-PENTACall.php

- BMBF Call and SMART-Cluster (01.11.2019 – 10.02.2020)
  https://www.smarteureka.com/en/news-events/new-german-call-on-artificial-intelligence/
  https://www.bmbf.de/foerderungen/bekanntmachung-2665.html

Further Information

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Thank you for your attention!

Eurostars-2 projects
Technology and Market areas