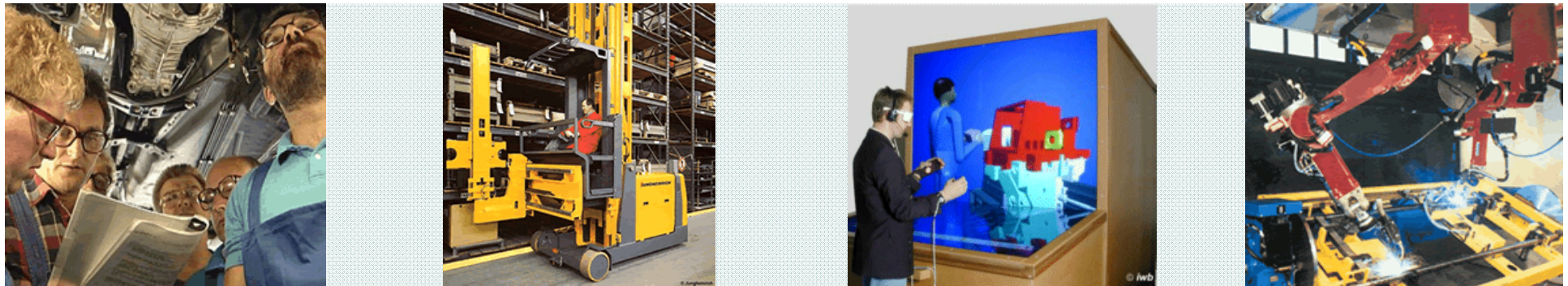


Research Topics Factories of the Future 2015



Jens Korell

Project Management Agency Karlsruhe, National Contact Point Production

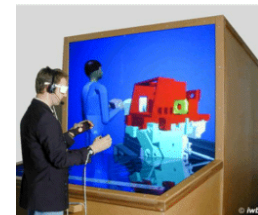
■ National Activities

- Management of Research Programs on State and Federal level
- Framework Concepts
 - ◆ „Research for Tomorrow’s Production“
 - ◆ „Research for Sustainability“
- Baden-Württemberg Programmes

■ International Activities

- National Contact Point Production
- EUREKA Umbrella PRO-FACTORY-PLUS
- ERA-NET Projects (MANUNET, M-ERA.NET)
- ETP (MANUFUTURE, SUSCHEM)

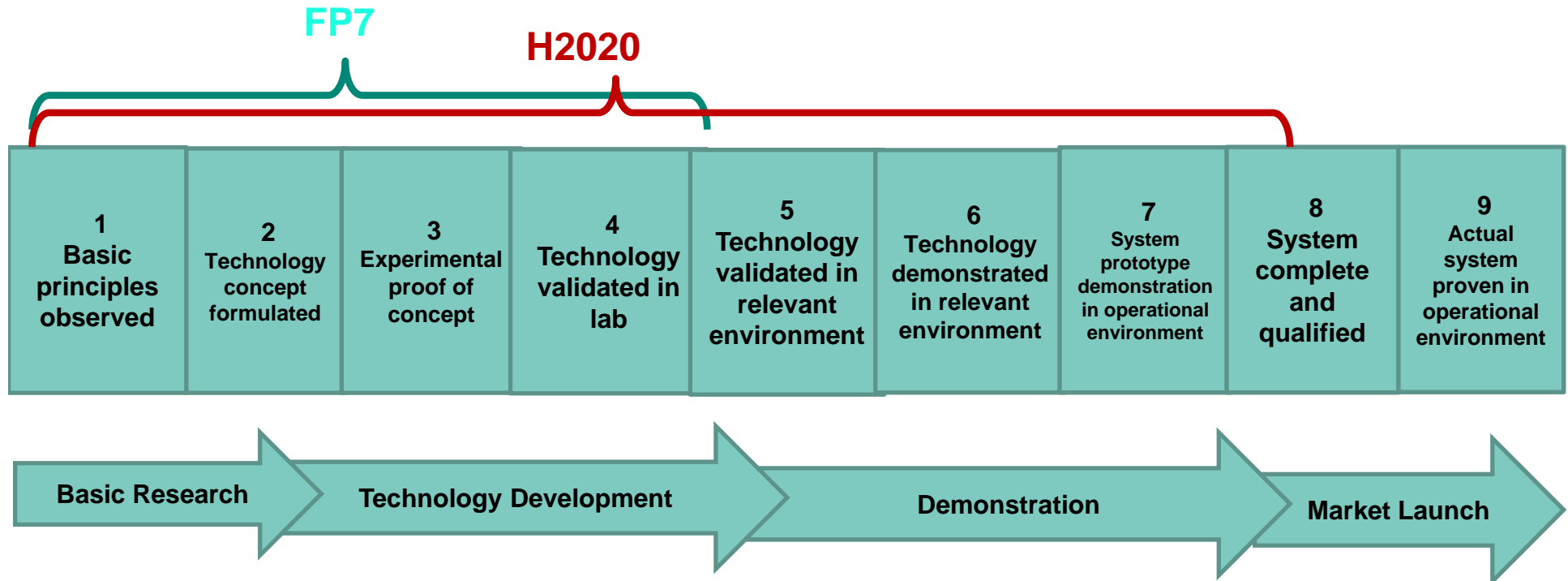
- **Staff:** 90 (Karlsruhe and Dresden)



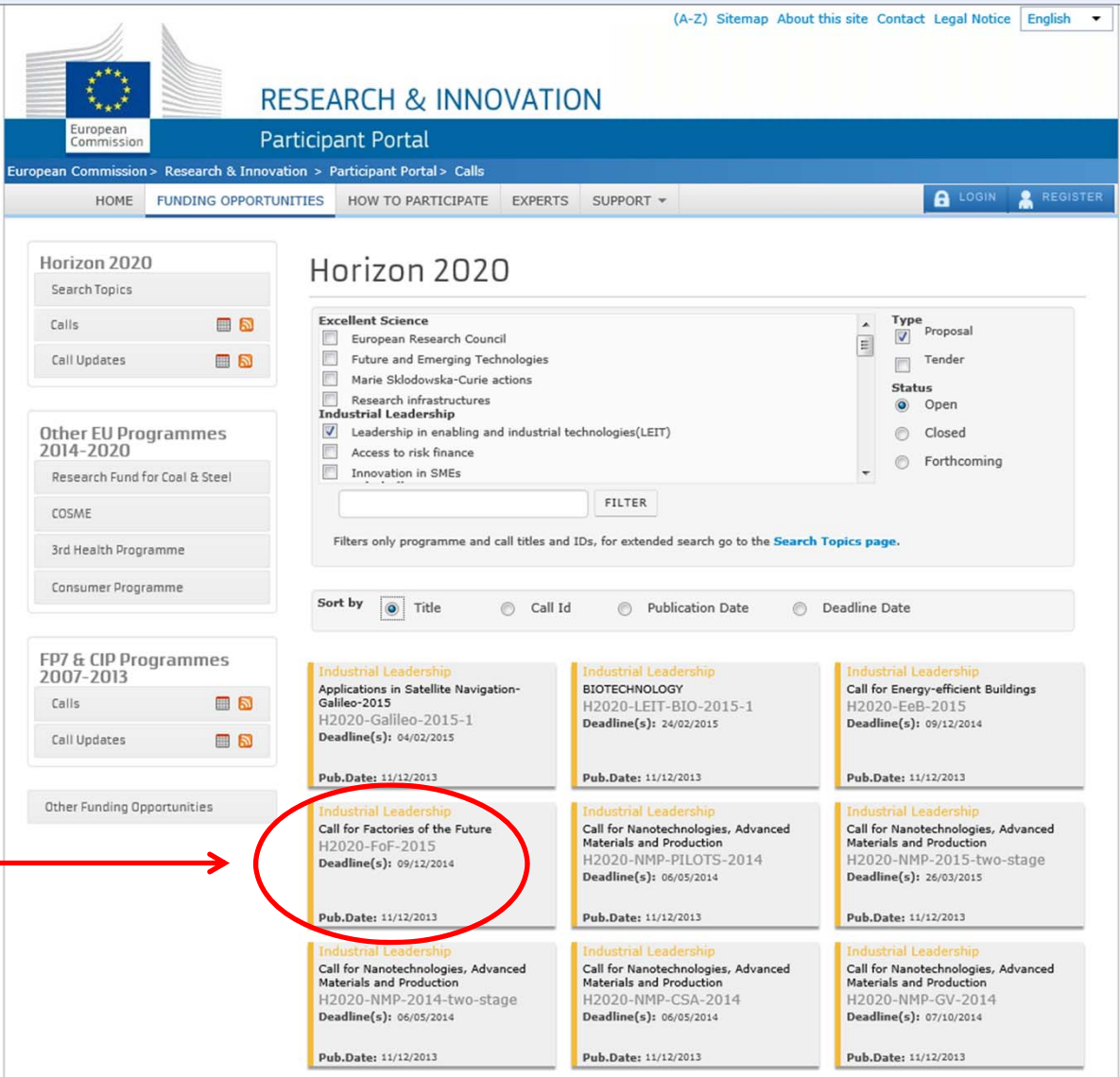
Structure of HORIZON 2020

I Excellent Science	II Industrial Leadership	III Societal Challenges
European Research Council (ERC)	Leadership in enabling and industrial technologies (LEIT)	Health, demographic change and wellbeing
Future and Emerging Technologies (FET)	Access to risk finance	Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the <u>bioeconomy</u> .
Marie-Skłodowska-Curie-Actions (MSCA)	Innovation in SMEs	Secure, clean and efficient energy
Research Infrastructures		Smart, green and integrated transport
		Climate action, environment, resource efficiency and raw materials
		Europe in a changing world inclusive innovative and reflective societies
		Secure societies

Technology Readiness Levels (TRL)



HORIZON 2020 Participant Portal



The screenshot shows the Horizon 2020 Participant Portal interface. At the top, there is a navigation bar with the European Commission logo and the text "RESEARCH & INNOVATION Participant Portal". Below this is a breadcrumb trail: "European Commission > Research & Innovation > Participant Portal > Calls". A secondary navigation bar contains links for "HOME", "FUNDING OPPORTUNITIES", "HOW TO PARTICIPATE", "EXPERTS", and "SUPPORT", along with "LOGIN" and "REGISTER" buttons. The main content area is titled "Horizon 2020" and features a search filter panel on the left. This panel includes sections for "Horizon 2020" (with "Search Topics", "Calls", and "Call Updates" options), "Other EU Programmes 2014-2020" (listing "Research Fund for Coal & Steel", "COSME", "3rd Health Programme", and "Consumer Programme"), and "FP7 & CIP Programmes 2007-2013" (with "Calls" and "Call Updates" options). The main filter panel on the right allows filtering by "Type" (Proposal, Tender) and "Status" (Open, Closed, Forthcoming). Below the filter panel is a "Sort by" dropdown menu with options: Title, Call Id, Publication Date, and Deadline Date. The main content area displays a grid of funding opportunity cards. Each card includes the program name (e.g., "Industrial Leadership"), the call title, the call ID, the deadline, and the publication date. One card, titled "Call for Factories of the Future H2020-FoF-2015", is circled in red. A red arrow points from the text "Factories of the Future (FoF)" on the left to this circled card.

Factories of the Future (FoF)



Work Programme

HORIZON 2020
WORK PROGRAMME 2014 – 2015

5. Leadership in enabling and industrial technologies
*ii. Nanotechnologies, Advanced Materials, Biotechnology
and Advanced Manufacturing and Processing*

Important Notice on the First Horizon 2020 Work Programme

This Work Programme covers 2014 and 2015. Due to the launching phase of Horizon 2020, parts of the Work Programme that relate to 2015 (topics, dates, budget) are provided at this stage on an indicative basis only. Such Work Programme parts will be decided during 2014.

(European Commission Decision C (2013)8631 of 10 December 2013)

Contains the
FoF topics

Overview Topics Factories of the Future 2015



FoF 8 - 2015	ICT-enabled modelling, simulation, analytics and forecasting technologies
FoF 9 - 2015	ICT Innovation for Manufacturing SMEs (I4MS)
FoF 10 - 2015	Manufacturing of custom made parts for personalised products
FoF 11 - 2015	Flexible production systems based on integrated tools for rapid reconfiguration of machinery and robots
FoF 12 - 2015	Industrial technologies for advanced joining and assembly processes of multi-materials
FoF 13 - 2015	Re-use and re-manufacturing technologies and equipment for sustainable product life cycle management
FoF 14 - 2015	Integrated design and management of production machinery and processes

ICT-enabled modelling, simulation, analytics and forecasting technologies (FoF 8 – 2015)



Specific challenge:

- Simulation of manufacturing processes
- Forecasting the behaviour of manufacturing systems
- Decision support methods and tools

Scope:

- Innovative modelling, simulation, analytics and forecasting tools for manufacturing at large
(Expected contribution: 2 – 4 Mio. EUR)
- Integrated modelling, simulation and information management systems
(Expected contribution: 5 – 8 Mio. EUR)

Expected impact:

- Increased productivity, higher mass customisation capacity
- Reduced time to production, optimised supply chains
- Enhanced interoperability of integrated product and factory design systems

Type of action:

Research & Innovation Actions (100% funding)
+ Support Action on Road mapping and constituency building

ICT Innovation for Manufacturing SMEs (I4MS)

(FoF 9 – 2015)



-
- Specific challenge:**
- Advances in ICT taken up in engineering and manufacturing
- Scope:**
- Adoption of ICT advances in the manufacturing domain
 - Application experiments, equipment assessment experiments
 - Highly flexible and near-autonomous robotic systems
 - HPC cloud-based modelling, simulation and analytics services
 - Integration of Cyber-Physical-System modules in manufacturing processes and value chains
- Expected impact:**
- New users of advanced ICT in the manufacturing sector
 - More innovative and competitive technology suppliers
 - More competitive European service providers
- Type of action:**
- Innovation Actions (70% funding)
Expected contribution: 5 – 8 Mio. EUR
+ Support Action on a network of innovation multipliers

Manufacturing of custom made parts for personalised products (FoF 10 – 2015)

Specific challenge:

- New strategies integrating design with manufacturing
- Quick realisation from design to production
- Economic production systems down to single lot sizes

Scope:

- Advanced design and manufacturing technologies
- New machines and processes integrating advanced materials
- Seamless data integration across process and supply chains
- TRL 4-6

Expected impact:

- Rapidly follow the market dynamics
- Reduction by 50% in the lead-time for manufacturing one part
- Cost reduction of customised parts manufacturing by 20%
- Reduction of time to market of customised parts by 30%

Type of action:

Research & Innovation Actions (100% funding)

Expected contribution: 3 – 6 Mio. EUR

Flexible production systems based on integrated tools for rapid reconfiguration of machinery and robots (FoF 11 – 2015)



Specific challenge:

- Fast reconfigurable machinery and robots
- React to rapid changes in market demands

Scope:

- Demonstration activities
- Integrated tools for management of agile production systems
- Standardisation of communication protocols (plug & produce)
- Interconnection of production and plant management systems
- Automatic monitoring and optimisation of energy usage
- Demonstration in at least one existing production environment
- TRL 5-7

Expected impact:

- Ability to produce at least 50% smaller lot sizes and 50% more product variations
- Reduction of at least 30% of setup and changeover time / cost
- Reduction of energy consumption by 5%

Type of action:

Innovation Actions (70% funding)
Expected contribution: 4 – 7 Mio. EUR

Industrial technologies for advanced joining and assembly processes of multi-materials (FoF 12 – 2015)



Specific challenge:

- Increased strength-to-weight ratio
- Multi functionality
- Low carbon footprint

Scope:

- Improved, new or hybrid joining and assembly processes
- Maximise performance of the joints
- Implementation of numerical simulation techniques
- Non-destructive inspection techniques
- Prototype or pilot implementation in pre-industrial settings
- TRL 5-7

Expected impact:

- 20% decrease in the consumption of high cost materials
- 30% improvement of the product performance
- Higher level of automation and lower production times

Type of action:

Innovation Actions (70% funding)
Expected contribution: 4 – 7 Mio. EUR

Re-use and re-manufacturing technologies and equipment for sustainable product lifecycle management (FoF 13 – 2015)



- Specific challenge:
- Manufacture added-value products with fewer resources
 - Innovative product recovery approaches
 - Recovery of advanced materials in high-tech products

- Scope:
- Eco-innovative approaches for product design
 - Effective disassembly/separation of advanced materials
 - Generation and validation of new business models
 - Suitable for IMS, TRL 4-6

- Expected impact:
- Significant reduction of energy consumption
 - Significant reduction in non-renewable materials
 - Reduction of 20% in greenhouse gases emission
 - Reduction of waste generation by 10%
 - Enabling the manufacturing of eco-products
 - Increase of above 20% in productivity rates

Type of action: Research & Innovation Actions (100% funding)
Expected contribution: 3 – 6 Mio. EUR

Integrated design and management of production machinery and processes (FoF 14 – 2015)



- Specific challenge:
- Computational models simulating machine-to-part process
 - New integrated approaches in simulation methods

- Scope:
- Simulation models and algorithms for model based control
 - Tool programming strategies that can be rapidly modified
 - Demonstration of the reliability of model-based machines
 - TRL 4-6

- Expected impact:
- Improved system adaptability
 - Reduction of lifecycle costs by 30%
 - Machine reliability improved by 10%
 - Reduction of maintenance costs by 20%
 - Increase of 30% in energy efficiency, reduced waste

Type of action: Research & Innovation Actions (100% funding)
Expected contribution: 3 – 6 Mio. EUR

Information Service (FoF 10 – 14)



National Contact Point Production

Team

Jens Korell

Erik Mertens

Dorothee Weisser

e-Mail: eu.production@ptka.kit.edu

Internet: <http://www.produktionsforschung.de/international>

Hotline: 0 7 2 1 / 6 0 8 - 2 4 5 7 5

Information Service (FoF 8 + 9)

National Contact Point Information and Communication Technologies

Team

Dr. Friedhelm Gillessen

Stefan Hillesheim

Andrea Köndgen

Dr. Uwe-Michael Schmidt

Dr. Manuel Spaeth

e-Mail: eu-ncp@dlr.de

Internet: <http://www.nks-ikt.de>

Hotline: 0 2 2 0 3 / 6 0 1 - 3 4 0 0