



# CPS Engineering Labs

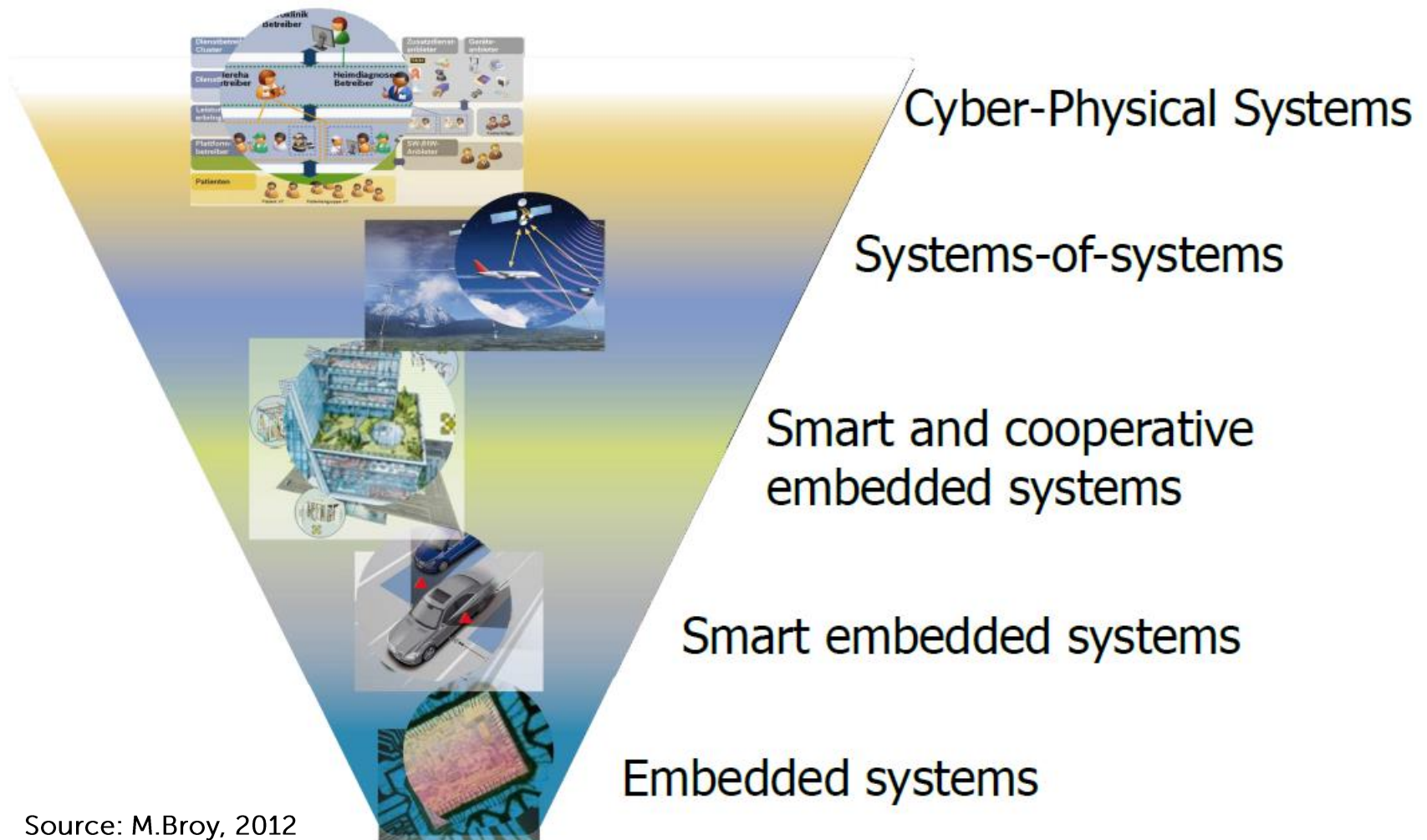
Smart Anything Everywhere Launch Event  
Grenoble, 27<sup>th</sup> March 2015

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# Cyber-Physical Systems (CPS)



Source: M.Broy, 2012

# Characterization of CPS

Vehicle Localization

Obstacle Detection

Brake Assistant

Fleet Management

Congestion Control

Toll Payment



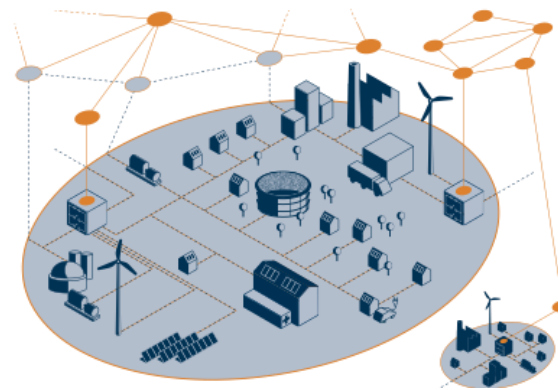
Smart Transport

## Technical Process

Emergency Shutoff

Predictive  
Maintenance

Line Fault Detection



Smart Energy

## Organizational Process

Virtual Power Plant

Load Prediction

Dynamic Pricing

Source: CyPhERS project, 2014

## Integration of technical and organizational processes

# Motivation

## Cyber-Physical Systems Engineering

CPS is considered to be the next revolution in ICT with lots of game-changing business potential and novel business models for integrated services and products.

### Key challenge:

Mastering the engineering and operation of high-performant CPS upon which people can depend with high confidence

- **Integrated cross-domain architectures**
- Required **trustworthiness versus evolving** CPS
- **Design-operation continuum** (continuous deployment, live experiments)
- Engineering methods and tools able to **cope with the full scale and complexity of CPS**
- **Integrated cross-disciplinary models and analysis** for distributed analog/digital control and management
- **Human-technology interaction**

# CPS Engineering Labs Mission

Expediting and accelerating the realisation of trustworthy CPS

- Foster an open, Pan-European network of design centres committed to transitioning science and technology for engineering trustworthy and dependable CPS into the marketplace
- Identify, define, and execute focussed and fast-track experiments with a specific innovation focus
- Spread best CPS engineering practices and promote cross-regional and cross-sectorial learning among industry and academia
- Establish a marketplace for CPS engineering assets

# Network of Design Centres

Centre Sweden

- KTH

Centre UK

- Univ. of Newcastle

Centre Germany North

- Offis

Centre German South

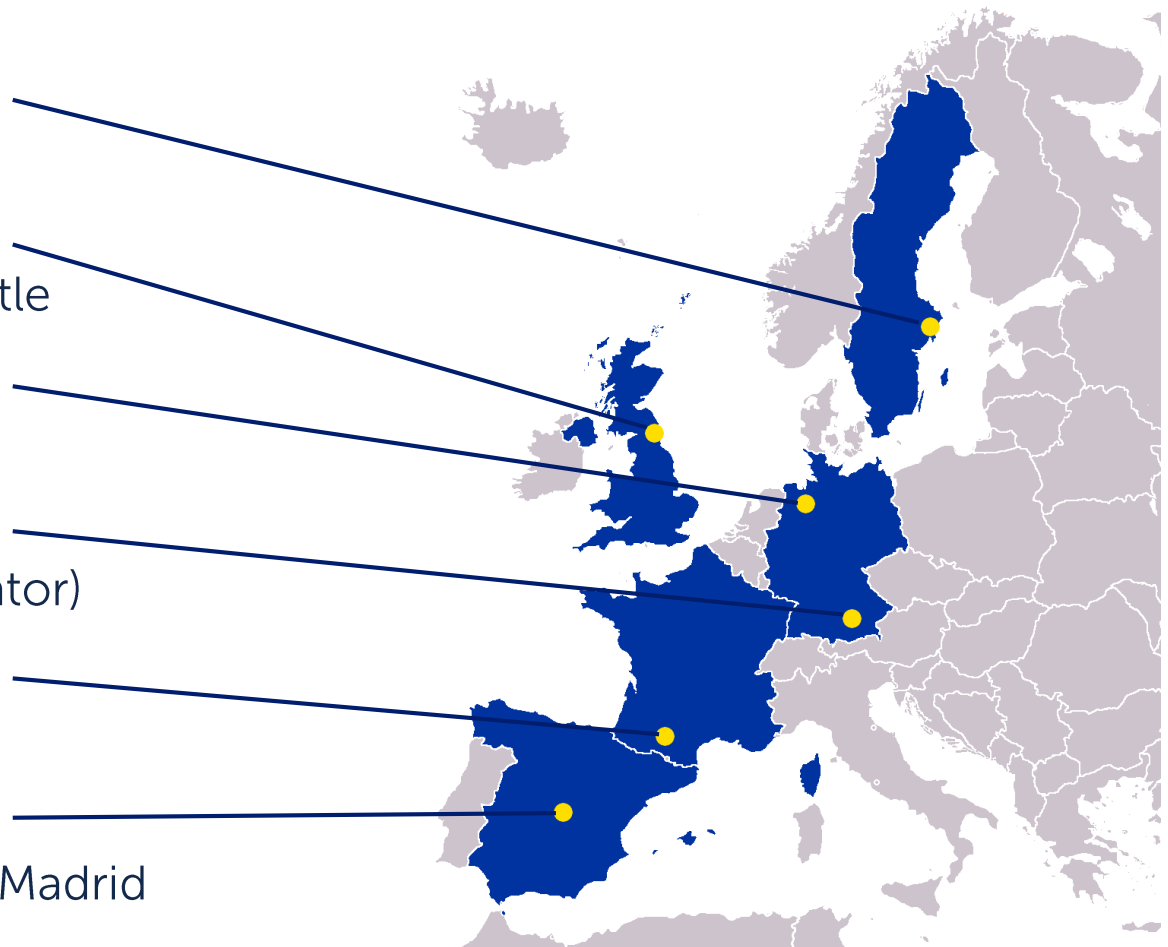
- fortiss (Coordinator)

Centre France

- Onera, LAAS

Centre Spain

- Indra, Univ. Pol. Madrid



# Network of Design Centres

## Competencies and Application Domains

### Centre UK



#### CPSE Competencies:

- Model-based engineering
- Co-modelling & simulation
- Industrial formal techniques

#### Application Domains:

- Urban CPS
- Environment & Sustainability

### Centre Sweden



#### CPSE Competencies:

- Model-based engineering
- Integrated engineering environments
- Autonomous machines

#### Application Domains:

- Automotive
- Production systems

### Centre Germany North



#### CPSE Competencies:

- HW/SW co-design
- E/E architectures
- Model-based safety & security analysis

#### Application Domains:

- Maritime

### Centre Spain



#### CPSE Competencies:

- Internet of Things
- Geospatial technologies
- Transportation Systems
- Cloud Services

#### Application Domain:

- Smart City

### Centre France



#### CPSE Competencies:

- Robotic SW architectures
- Safety assessments

#### Application Domains:

- Aerospace
- Robotics
- Automotive

### Centre Germany South



#### CPSE Competencies:

- Model-based engineering
- Flexible production systems
- Internet of Things

#### Application Domains:

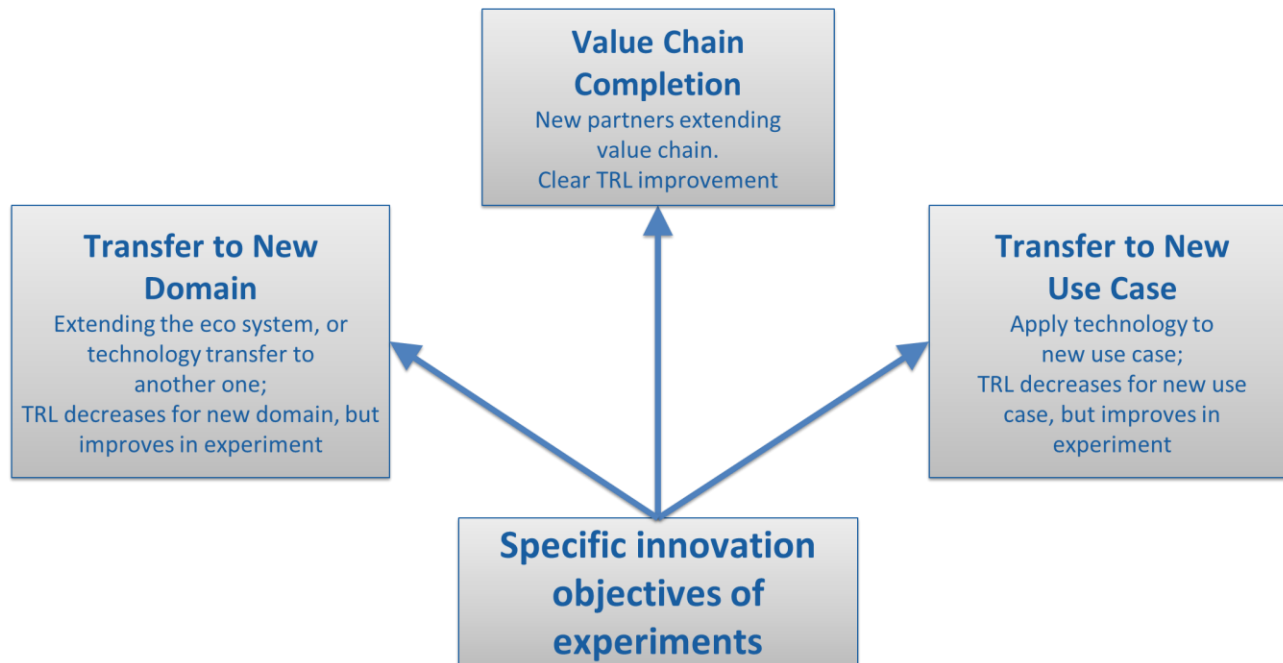
- Automotive
- Production systems
- Avionic

# Experiments

## Innovation Objectives

Experiments **facilitate innovations and CPS-enabled value chains** by

- demonstrating applicability of existing innovative CPS design technologies
- establishing cross-industry and trans-national value chains
- accelerating dissemination by linking national and European projects and networks

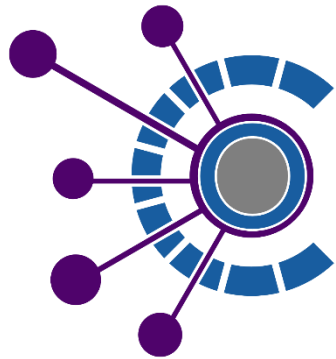




# Open Calls

First open  
calls in  
April 2015

- Innovators/experimenters are invited to propose application development experiments:
  - Fast track (12-18 months) and focussed (2-4 partners)
  - Specific innovation objective: increased maturity, value chain completion, transfer
  - Based on existing reference platforms and technology, tool chains, and standards
- Financial support provided by CPSE Labs Centres through cascading funding
- Development of novel prototypes, pre-products, or products
- Particularly attractive for SMEs



# CPSE Labs

[www.cpse-labs.eu](http://www.cpse-labs.eu)

## Contact us:

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