Support Action CPSoS

Towards a European Roadmap on Research and Innovation in

Engineering and Management
of Cyber-physical Systems of Systems

Project concept (1)

- 30 month Support Action

- Provides an exchange platform for Systems of Systems related projects and communities

- Focus is on Systems of Systems where large complex physical systems interact with computing and communication systems – Cyber-physical SoS

Goal:

Define a European research and innovation agenda on Cyber-physical Systems of Systems

Project concept (2)

- **Bridging between communities**
  - Systems and control
  - Computer science
  - Software and systems engineering
  - Physics
  - Tool developers (simulation, verification, software engineering)
- **Bottom-up and top-down approach**
  - Analyse the needs in application domains
  - Analyse the state of the art in methods and tools
  - Integrate the two views to define the most important gaps and actions needed

Goals

- Establish a visionary research and development topic – Cyber-physical Systems of Systems
  - Beyond embedded systems
  - Beyond classical control
  - Stimulate transdisciplinary work
  - Focus on real challenges
  - Integrate new options and concepts – big data, industry 4.0

Working Groups

WG1: Systems of Systems in Transportation and Logistics

Chair: Haydn Thompson, Haydn Consulting

Members:

John AMOORE	Rail Infrastructure Technology Ltd., UK
Carlos CANUDAS DE WIT	CNRS GIPSA-Lab
Uwe CLAUSEN	Fraunhofer IML & ITL, TU Dortmund University
Judith DAHMANN	The Mitre Corporation, US
Charles DIBSDALE	OSyS (Rolls Royce)
Philippe LIATARD	CEA – Leti
Antonio PASCOAL	Instituto Superior Tecnico, Lisbon
María Victoria CENGARLE	fortiss GmbH – Delegate FP7 project CyPhERS
Christina DIAKAKI	Technical University of Crete – FP7 project Local4Global
Hermann KOPETZ	Vienna University of Technology – FP7 project AMADEOS

PUBLIC MEETING: Brussels, 11.9.2014 (at Automotive World Megatrends)

Working Groups

WG2: Physically Connected Systems of Systems
Chair: Sebastian Engell, TU Dortmund

Members:

Göran ANDERSSON	ETH Zürich
Vladimir HAVLENA	Honeywell Prague Laboratory
Alf ISAKSSON	ABB AB Västerås
Patrick PANCIATICI	RTE – Réseau de Transport d'Electricité
Francesco BRANCATI	ResilTech SRL – FP7 Project AMADEOS
John FITZGERALD	Newcastle University – FP7 Project COMPASS
Elias KOSMATOPOULOS	Technical University of Crete – FP7 Project Local4Global
Stefan KRÄMER	INEOS Köln – FP7 Project DYMASOS
John LYGEROS	ETH Zürich – FP7 Project DYMASOS
Radoslav PAULEN	TU Dortmund

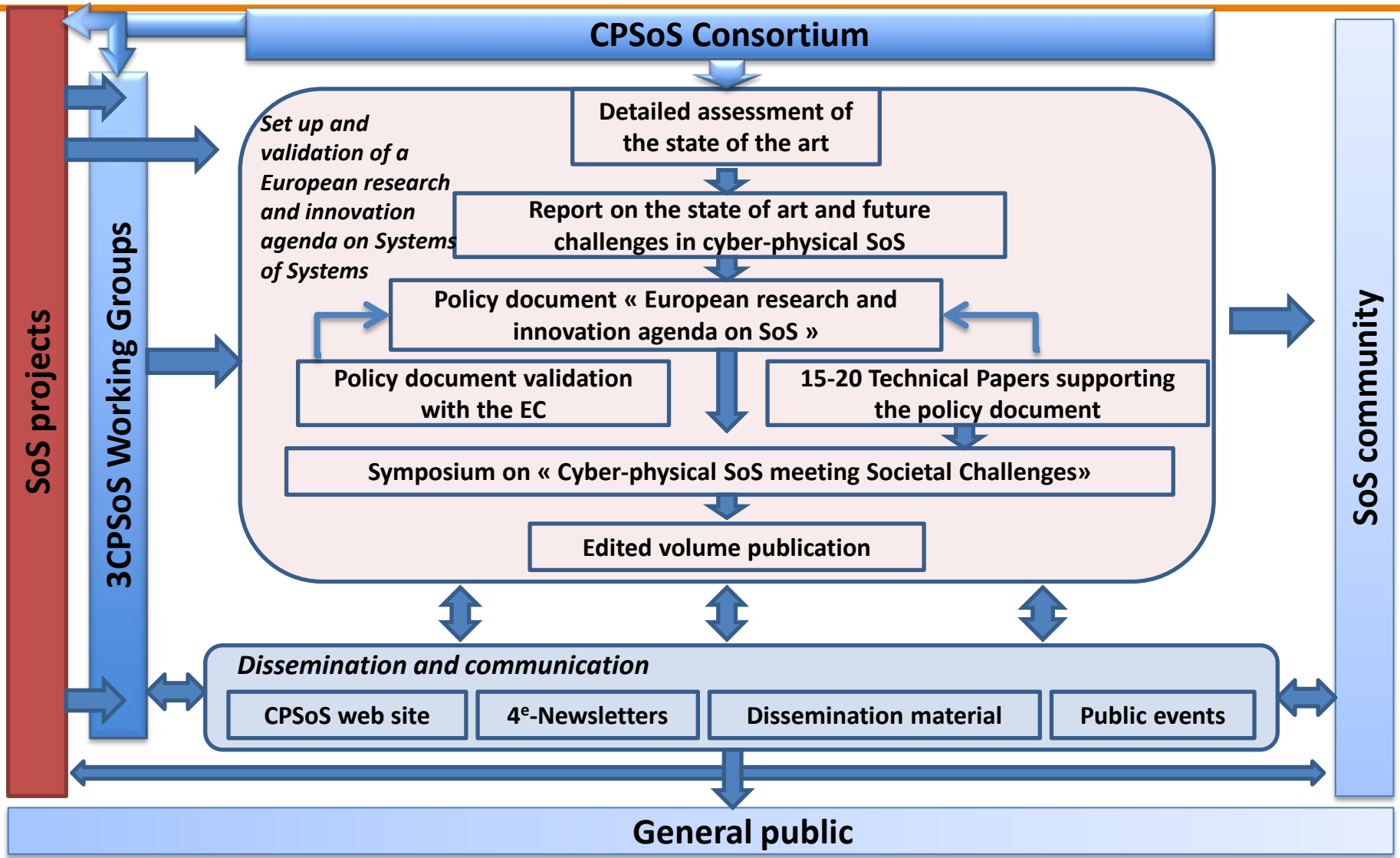PUBLIC MEETING: ETH Zürich, 1.10.2014 (jointly with DYMASOS)

Working Groups

WG3: Tools for Systems of Systems Engineering and Management
Chair: Wan Fokkink, TU Eindhoven

Alberto BEMPORAD	IMT Lucca
Alessandro CIMATTI	Bruno Kessler Foundation
Marika DI BENEDETTO	University of l'Aquila
Peter FRITZSON	Linköping University
Stefan KOWALEWSKI	RWTH Aachen
Erwin SCHOITSCH	Austrian Institute of Technology
Will VAN DER AALST	Technische Universiteit Eindhoven
Peter Gorm LARSEN	Aarhus University – FP7 Project COMPASS
Martin TÖRNGREN	KTH Stockholm – FP7 Support Action CyPhERS
Michel RENIERS	TU Eindhoven
Christian SONNTAG	TU Dortmund / euTEXoo
Bertrand COPIGNEAUX	inno TSD

PUBLIC MEETING: Bertinoro, Italy, 12.9.2014 (at iFM 2014)

Work Flow

CPSoS Consortium

Detailed assessment of the state of the art

Report on the state of art and future challenges in cyber-physical SoS

Policy document « European research and innovation agenda on SoS »

Set up and validation of a European research and innovation agenda on Systems of Systems

Policy document validation with the EC

15-20 Technical Papers supporting the policy document

Symposium on « Cyber-physical SoS meeting Societal Challenges»

Edited volume publication

Dissemination and communication

| CPSoS web site | 4ᵉ-Newsletters | Dissemination material | Public events |

SoS projects

3CPSoS Working Groups

SoS community

General public

Work process: January – December 2014

Kick off of 3 Working Groups (35 members)

Analysis of relevant programmes

38 interviews across Europe

94 written contributions

Consultation of Networks - ARTEMIS, IFAC, SoS cluster ...

3 State of the art – reports

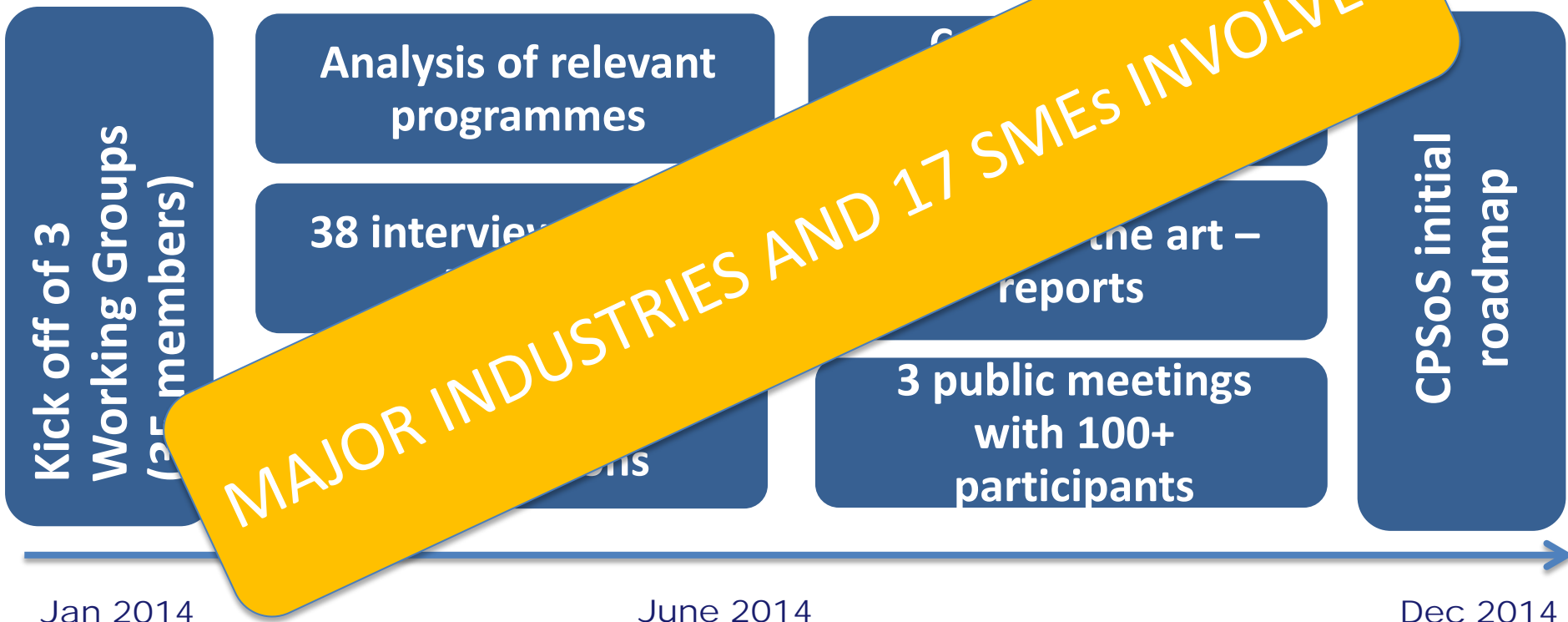**3 public meetings with 100+ participants**

CPSoS initial roadmap

Jan 2014

June 2014

Dec 2014

Work process: January – December 2014

Kick off of 3 Working Groups (25 members)

Analysis of relevant programmes

38 interviews

State of the art – reports

3 public meetings with 100+ participants

CPSoS initial roadmap

MAJOR INDUSTRIES AND 17 SMEs INVOLVED

Jan 2014   **June 2014**   **Dec 2014**

Work process: Next steps
December 2014 – July 2015

Meeting with EC Dec 3rd, 2014	Update of the initial roadmap	Public consultation	SoS cluster public workshop	Finalised roadmap	Dissemination, targeting European industries
Dec 2014	Jan 2015	Feb-March 2015	May 2015	July 2015	Dec 2015+