

DE LA RECHERCHE À L'INDUSTRIE

cea

www.cea.fr

TOPIC GROUP ON ELS ISSUES IN ROBOTICS

RockEU plenary meeting, March 6th, 2014 Francfort,
Christophe Leroux, CEA LIST

DE LA RECHERCHE À L'INDUSTRIE

cea

OBJECTIVES OF THE WORKSHOP

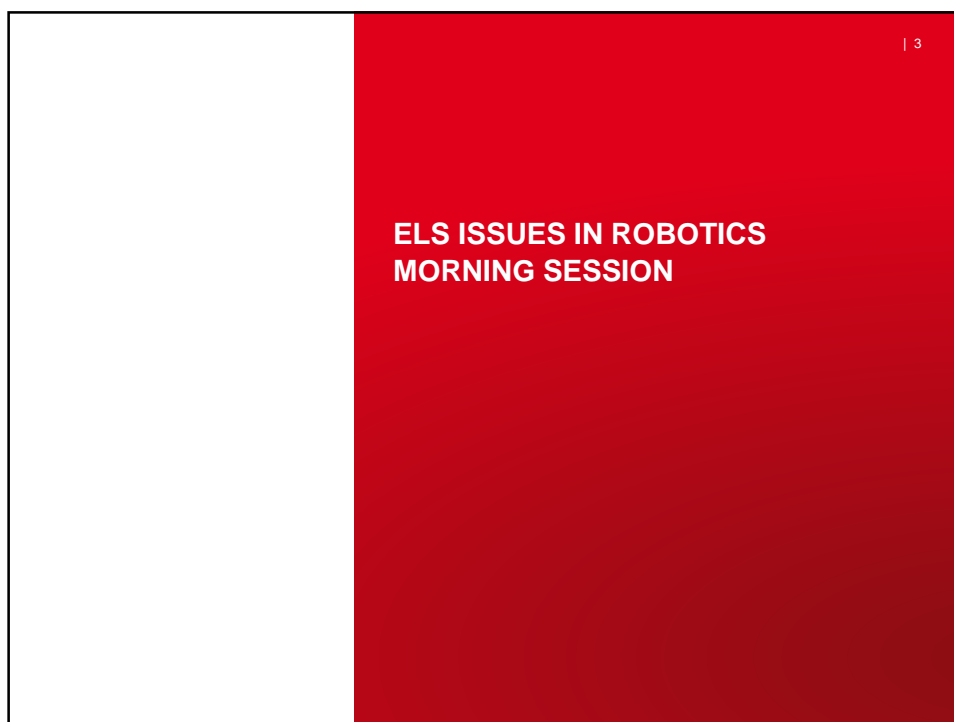
| 2

Objectives

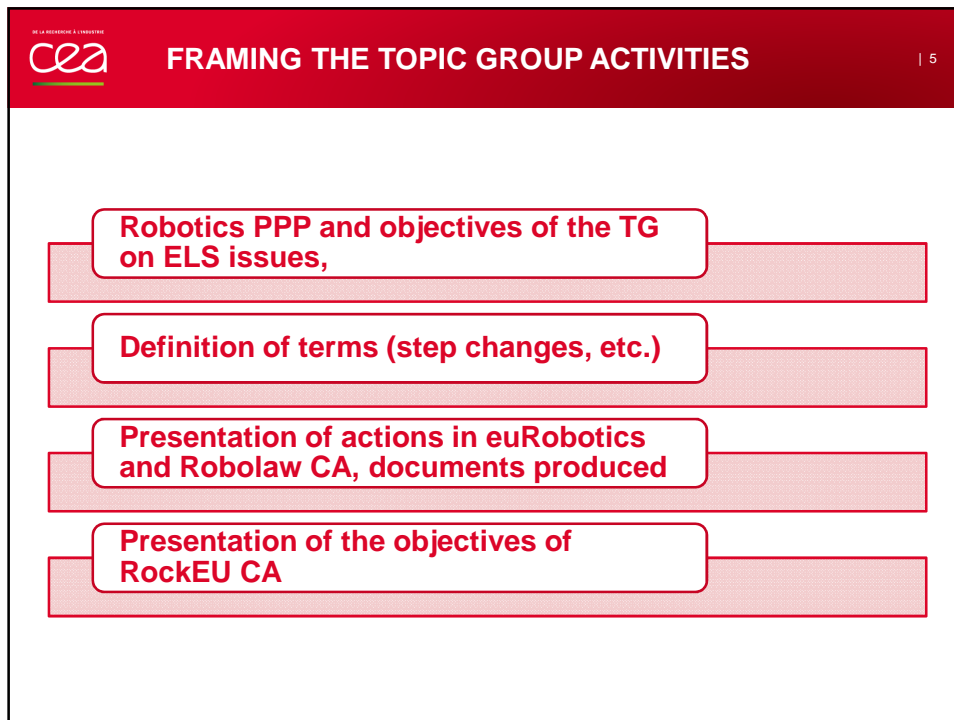
- Debate about Ethical Legal and Socio-economic issues in robotics
- Organize the activities of the Topic Group on ELSE issues regarding the research roadmap of the robotics PPP

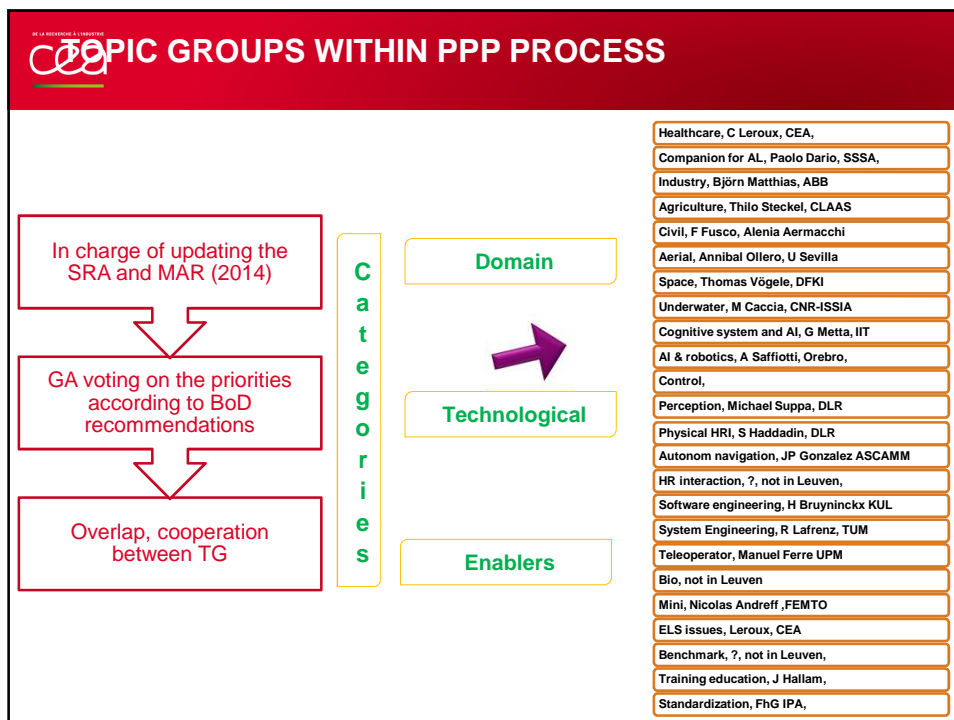
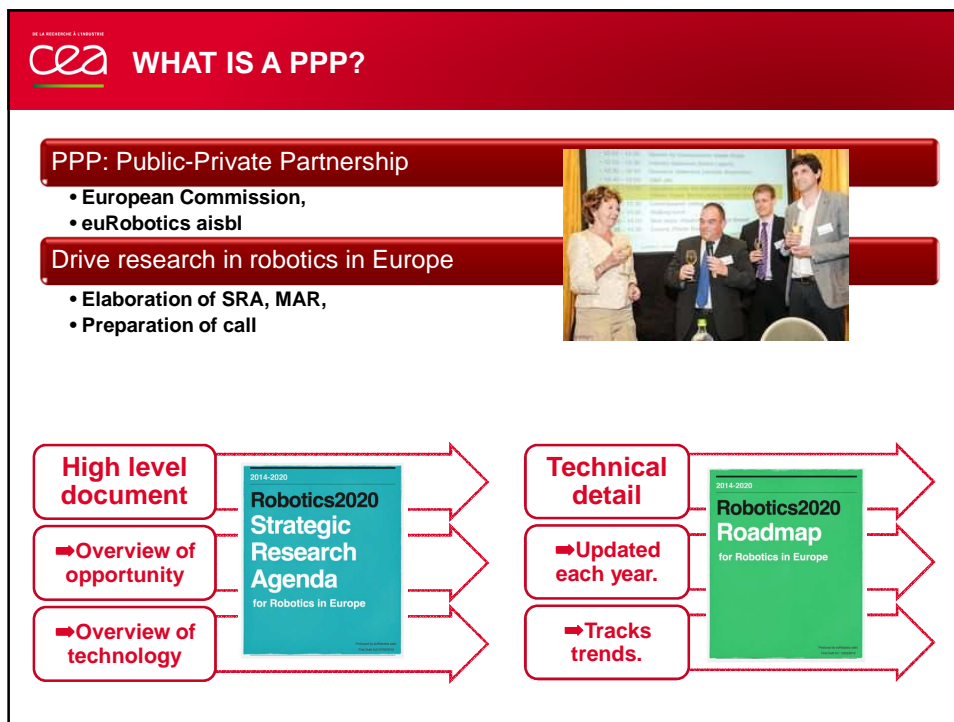
Two sessions


- 8h30 - 10h30 Ethical and legal issues
- 16h00 – 18h30 Societal issues



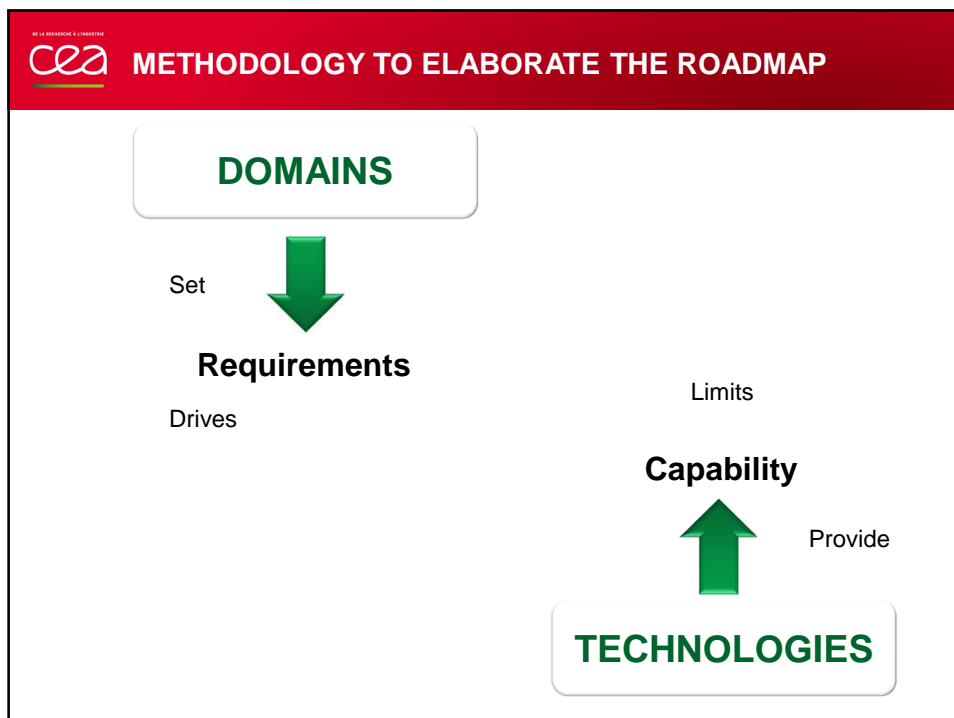
SUMMARY OF THE WORKSHOP	
<i>Morning session</i>	
Framing the Topic Group activities,	8h30-9h30
Round table: ELS in robotics roadmap	9h30-10h15
Debriefing	10h15-10h30
<i>Afternoon session</i>	
Expert view point,	16h00-17h00
Round table: ELS in robotics roadmap	16h20-17h30
Wrap up	17h30-18h30





DE LA RECHERCHE À L'INDUSTRIE

TOPIC GROUPS

- ✓ Each Topic Group should nominate two persons who are the primary contact point, Topic Group Coordinator (TGC) and Topic Group Deputy (TGD). The Topic Group Coordinator (TGC) must come from an organization that is a member of euRobotics aisbl.
- ✓ The TGs should provide input to each MAR Cycle.
- ✓ Each TG will be allocated an euRobotics aisbl director who can mentor and convey information to and from the TG.
- ✓ euRobotics aisbl will organise at least two workshops per MAR cycle open to TG members. One to review the outcome of a funding cycle and one to overview material prior to the MAR release, plus any others on an as needed basis.
- ✓ TG contact point should maintain a mailing list for the TG members.
- ✓ A Topic Groups Technical Activities Board (TG TAB) will oversee the operation of the Topic Groups.
- ✓ euRobotics aisbl will provide access to a Wiki dedicated to each TG, the content and membership of this wiki is the responsibility of the TGC and TGD.

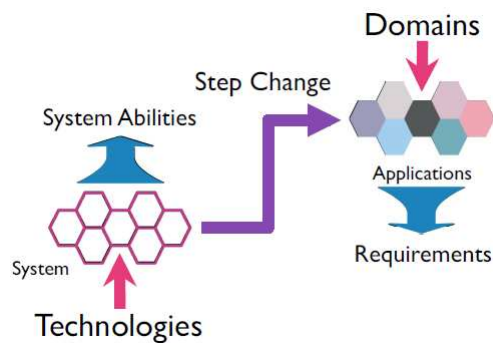




IDENTIFYING STEP CHANGES

“Step Change”

- It is **not** incremental improvement.
- A “Step Change” is a significant improvement.
- It enables new market opportunities.



A Step Change is:

- An order of magnitude improvement:
 - cost reduction, parameter improvement, reduction in resource requirement
- Or categorical step in capability:
 - Moving from procedural to declarative controller, Specification developed by reasoning rather than hand construction, From rigid robots to joint compliant robots to segment compliant robots, Multi-scale integration of perception and control of base, arm, hand, finger systems.



IDENTIFYING STEP CHANGES

Domain focus

- What step changes are needed to enable an application?
- What is the impact on end user function?

Technology focus

- What needs to be done to achieve the step change?
- What will the scope of the step change be?
- How will it impact on abilities?

Answering these questions builds links between Domain Applications and Technologies.



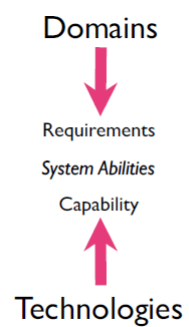
EXAMPLE OF STEP CHANGES

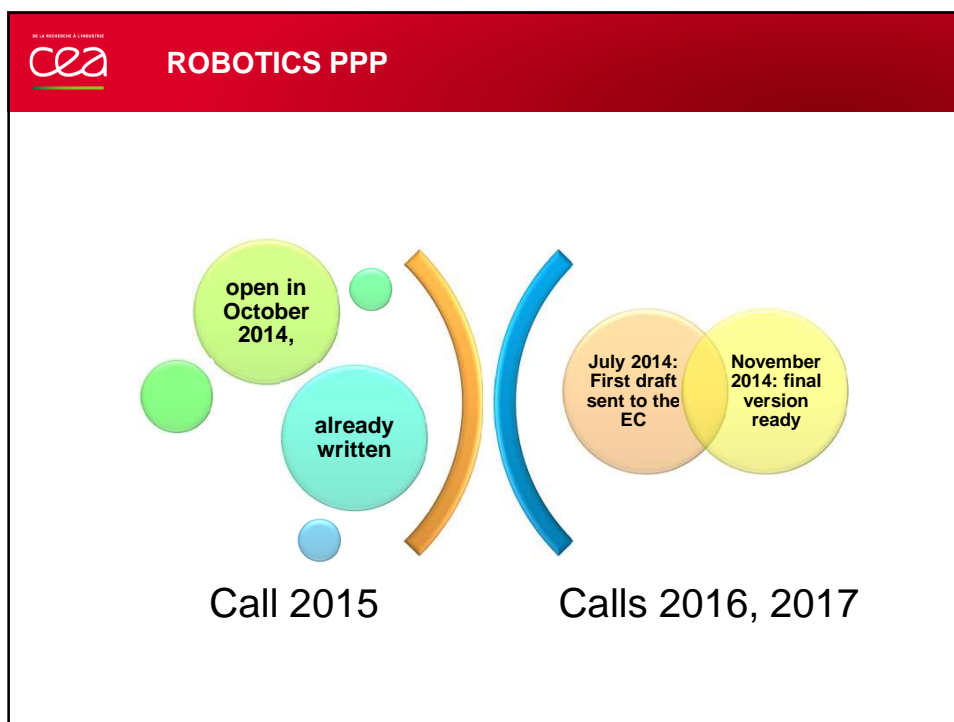
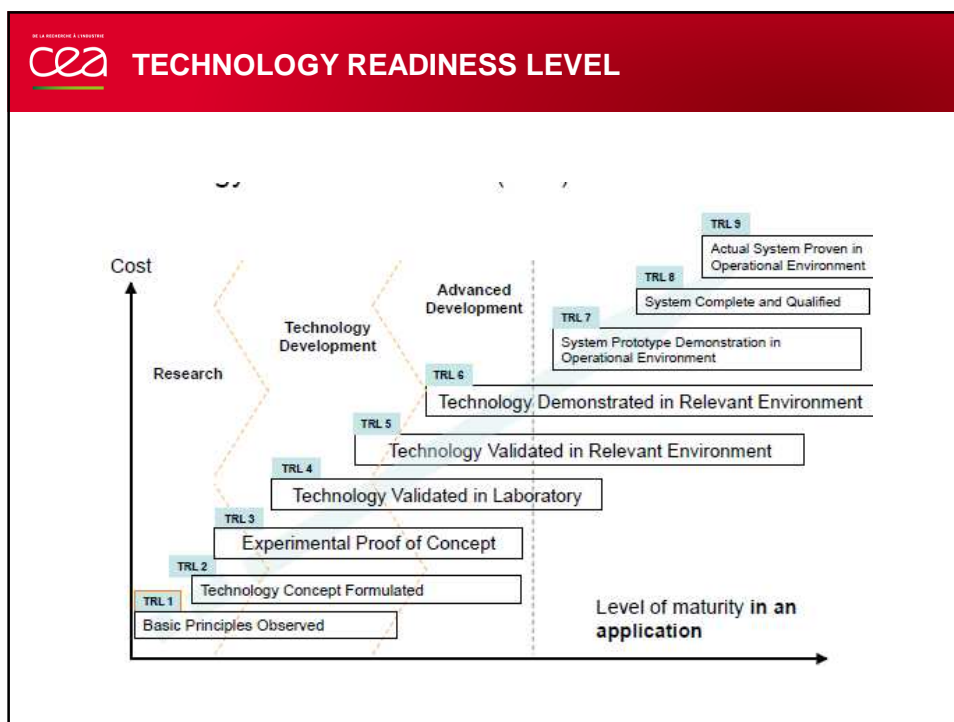
Listed Mechatronic “step changes” from the MAR:

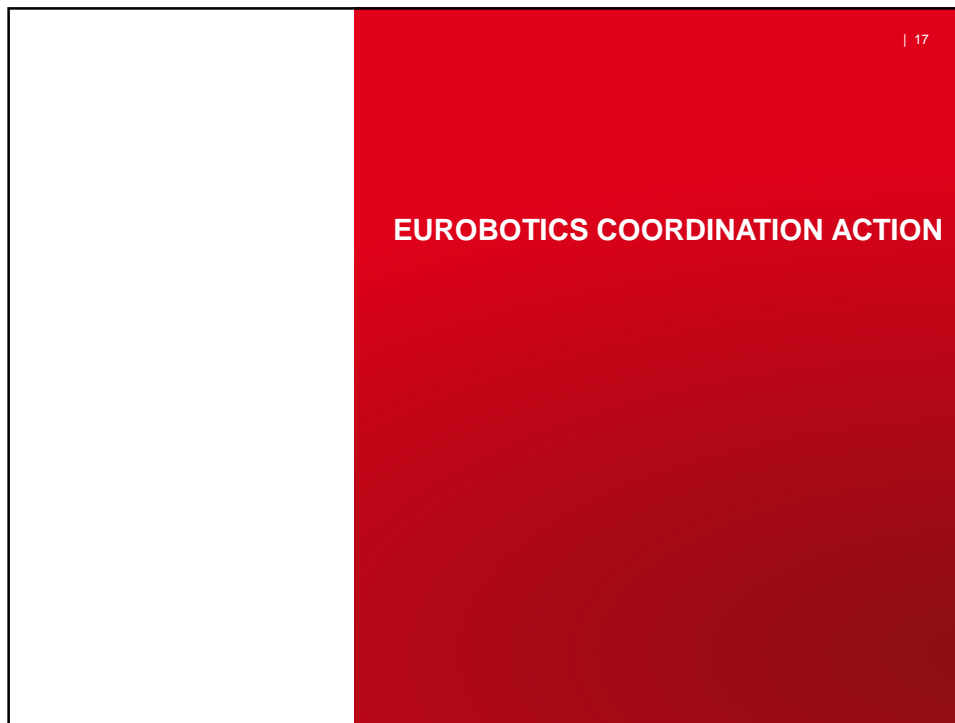
- *Smarter mechatronic design*
- *Robust control methods*
- *Smarter Mechanical System Design*
- *Interface standardisation*
- *Modular mechatronic components*
- *Soft robotic systems*
- *Bio-compatible robotic components*
- *Reducing mechatronic component cost by a factor of ten*
- Need to describe as a step from X to Y



SYSTEM ABILITIES





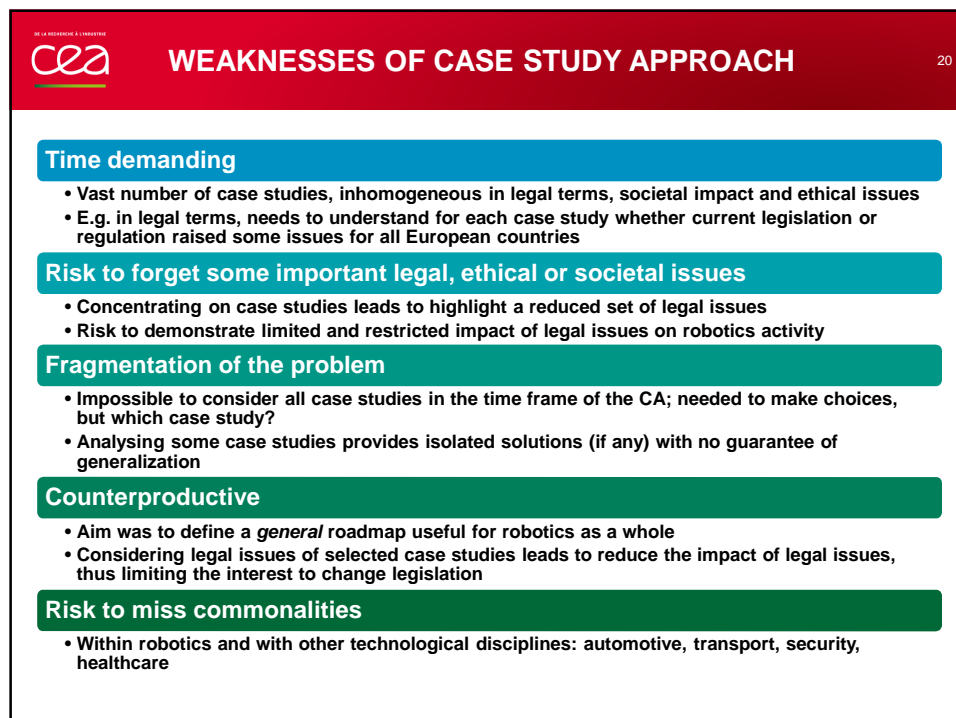
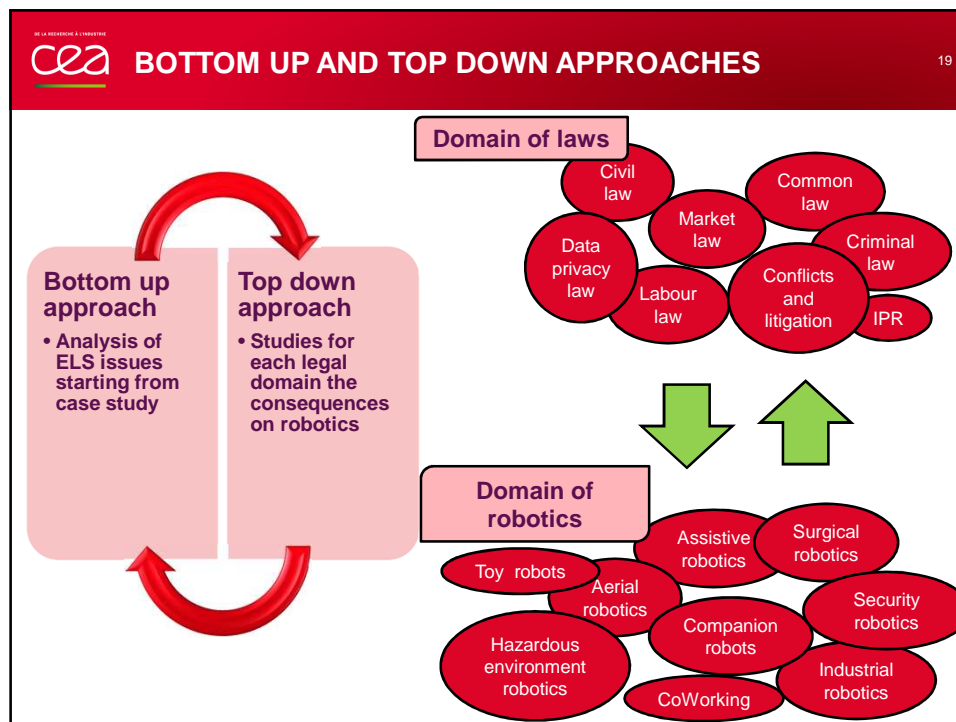


DE LA RECHERCHE À L'INNOVATION
cea GENERAL APPROACH | #18

Differentiate Ethical, Legal and Societal issue analysis

Top down approach starting from Ethical values, legal concepts, societal issues

- **To investigate impacting solutions,**
- *transverse* to robotics applications
- Non specific to robotics: e.g. considering legal issues in autonomous transport and automotive identically or considering privacy issues in robotics as subset of privacy issues with computers)



GENERAL APPROACH 21

Two documents

- Ethical, Legal and Societal Issues in Robotics
- Green Paper on Legal Issues in Robotics

CONCLUSION AND RECOMMENDATIONS ON ETHICAL ISSUES

- Refer to values presented in the Fundamental Charter of Human Rights**
 - Charter founded on the indivisible, universal values
 - dignity, personal integrity, privacy, protection of personal data, justice.
- Resituate ELS issues in robotics in a larger technological context**
 - No ethical issue specific to robotics
 - avoid considering robotics as a weird technology, avoid stigmatisation of robotics
 - Analysis in a general context provide more impacting solutions
- Investigate further more societal challenges**
 - **Socio-economic issues are probably the most hindering obstacles** for the development robotics
- Regular surveys and communication to the public**
 - **a lot of wrong ideas** (robotics cut jobs off) and fake images (robots will over power humans)

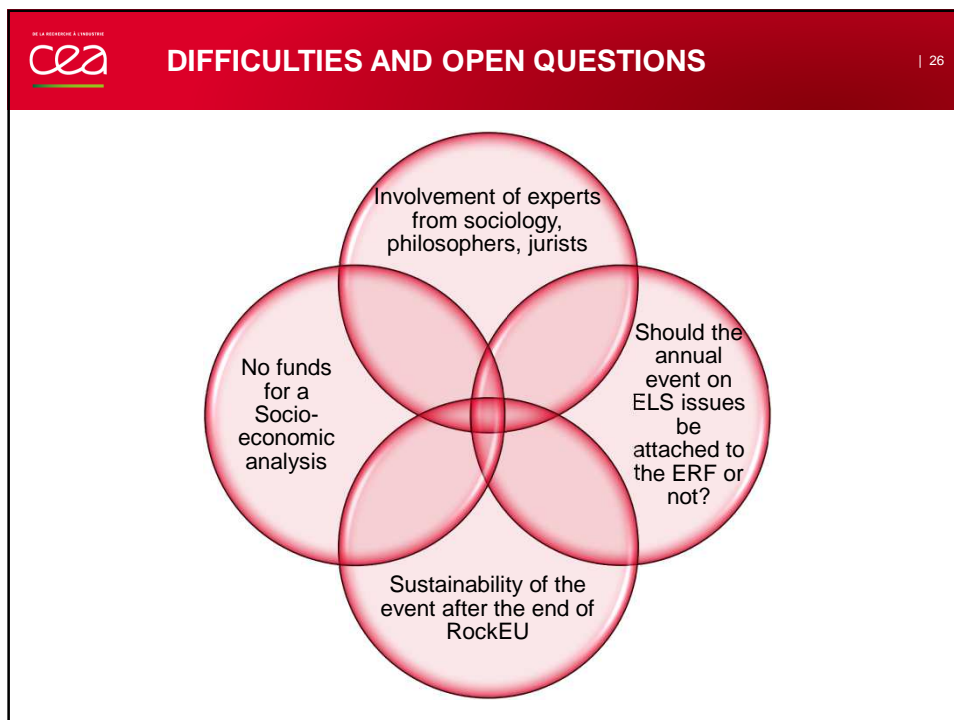
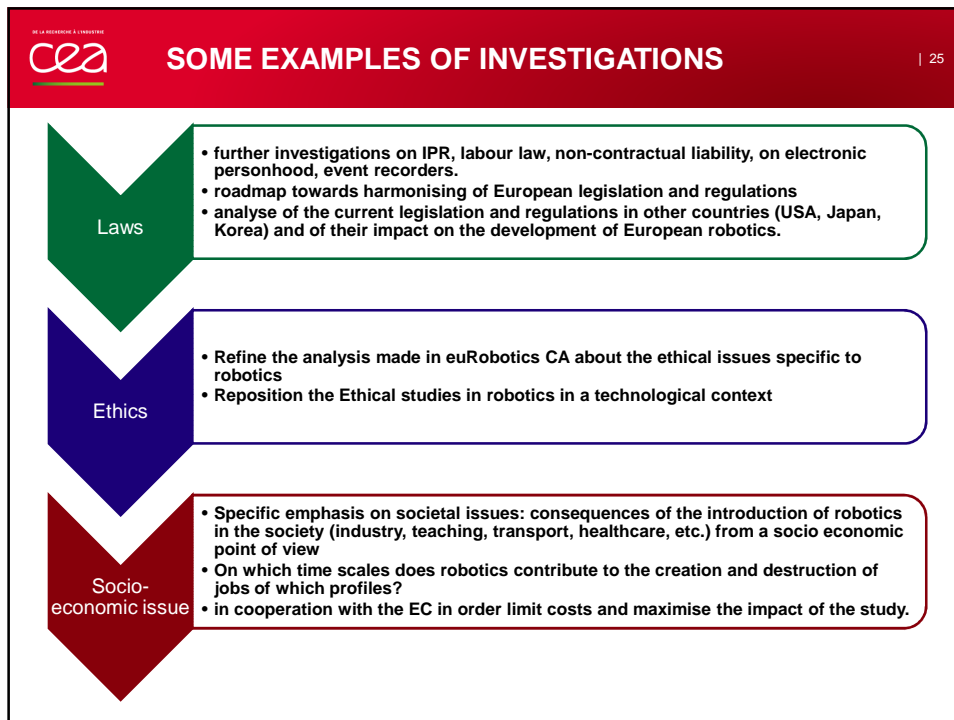


CEA logo: DE LA RECHERCHE À L'INNOVATION

MOTIVATION, OBJECTIVES AND APPROACH

24

Organise and run a Topic Group on ELS issues in the context of the robotics PPP	<ul style="list-style-type: none"> Contribute to the roadmap investigate solutions and roadmaps to overcome the ELS matters hindering the development of robotics in Europe
Identify key organisations and major actors involved in ELS issues in robotics in Europe	<ul style="list-style-type: none"> Provide information to the robotics PPP about the procedure and actors in Europe
Provide guidelines for robotics stakeholders on how to take ELS issues into consideration	<ul style="list-style-type: none"> Practical guidebook on ELS issues in for robotics stakeholders
Help public understand the actual capacities and risks linked to robotics	<ul style="list-style-type: none"> Dissemination, adequate communication
Organize an ELS issues event in Europe	<ul style="list-style-type: none"> Major event on ELS issue in robotics

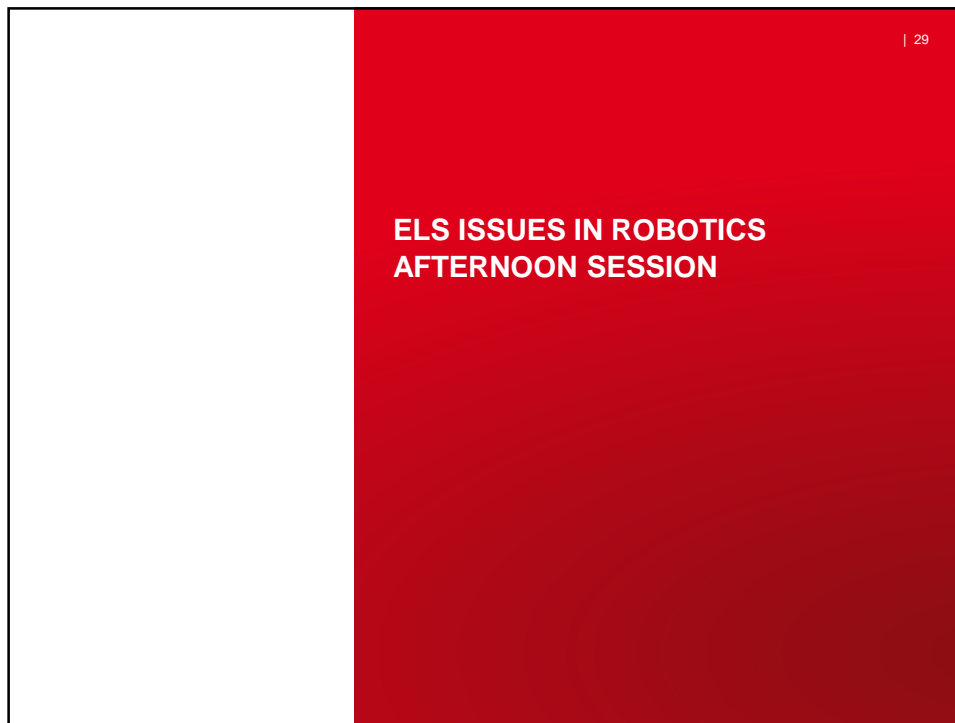


cea RESSOURCES | 27

- ✓ Green paper on legal issues in robotic:
 - » http://www.eurobotics-project.eu/cms/upload/PDF/euRobotics_Deliverable_D.3.2.1_Annex_Suggestion_GreenPaper_ELS_IssuesInRobotics.pdf
- ✓ General document on ELS issues in robotics.
 - » http://www.eurobotics-project.eu/cms/upload/PDF/euRobotics_Deliverable_D.3.2.1_ELS_IssuesInRobotics.pdf
- ✓ CERNA
 - » <http://cerna-ethics-allistene.org/>

cea ROUND TABLE: ELS ISSUES IN THE ROBOTICS ROADMAP | 28

- Why introducing actions on ELS issues in the robotics roadmap?
- Proposition of a methodology for the TG activities: differentiation of ELSE issues, top down approach,
- Interaction with other TG?
- Interaction with other technologies and domains
- Organization of a yearly event
- Debriefing, end of first session

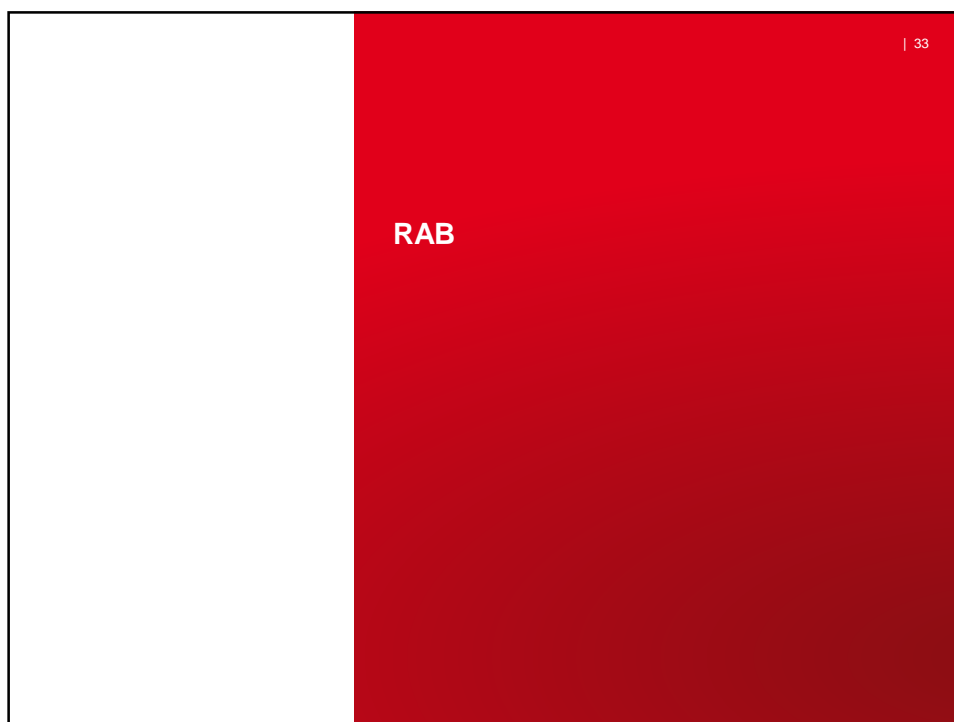


cea **ROUND TABLE: ELS ISSUES IN THE ROBOTICS ROADMAP** | 31

- What are the action to undertake? What are the priorities?
- Communication, guidelines for robotics
- Communication information to public authorities, press, public
- Identification of practices on ELS issues outside of Europe and obstacles to overcome.
- Interaction with other TG?
- Organization of a yearly event
- Debriefing

cea **WRAP UP** | 32

- Unwinding
- Proposition of step changes for next calls
- Scheduling of future activities
- Wrap up of the meeting



DE LA RECHERCHE À L'INNOVATION

ERF FORUM
| 34

- ✓ **Gregor Fitz, University of Oldenburg, sociologist**
 - » Challenges of robotics seen from the societal point of view
 - » Societal perception of robotics (differences Japan, Europe etc...)
 - » Fears on employment
 - » Ageing of population / attitudes toward robots assisting failed people
 - » Gender issues (sex robotics and other)
 - » Actions to address the different societal and ethical issues
- ✓ **Roland de Bruin, University of Utrecht, jurist**
 - » Investigation of the need for (semi-)regulatory solutions that are beneficiary IPR, non contractual liability, etc.
 - » focus on different forms and levels of regulation, varying from self-regulatory modi to (several forms of) EU harmonization instruments.