

**ARTEMISIA ASSOCIATION**

*The association for R&D actors in the field of ARTEMIS*



**Building:**

**ARTEMIS  
ARTEMISIA  
ARTEMIS-JU**

Advanced Research & Technology for EMbedded Intelligence and Systems



# Contents



1. ETP scope and relevance of Embedded Systems
2. From ETP to JTI
3. JU to implement JTI
4. Conclusions



# ARTEMIS ETP



- European Technology Platform on Embedded Systems
- Initiated in 2004 by European industry and Commission
  - 10 out of top-25 EU companies in terms of global R&D
  - Industry, academia, SME federation, ITEA2, MEDEA+ involved in Board
  - 24 countries + EC represented in Mirror Group
- Aim: develop and drive joint European vision and strategy on Embedded Systems
  - R&D as well as innovation environment: IPR, including open source software, standards, research infrastructure, education, ...
- Scope: ubiquitous, interoperable & cost-effective Embedded Systems



# Embedded (Computer) Systems



- Comprising software, processors, hardware and connectivity
  - “Computer” is “invisible” to user
- Used in airplanes, cars, consumer electronics, white goods, robotics, machines, medical equipment, public infrastructures, buildings, mobile phones, ...
  - Increasingly permeating daily life
- 98% of processors worldwide are in Embedded Systems
  - Mobile phone contains 5-10 processors
  - Typical car has 60 processors or more
- 16 billion Embedded Systems by 2010
  - Conservative estimate



# ARTEMIS vision



... An ongoing, major evolution of our society in which all systems, machines and objects will become digital, communicating and self-managed ...

... with important societal and economical consequences

- Competitiveness of most industry sectors will rely on Embedded Systems (ES) innovation capability
- ES technologies are critically important in rebalancing Productivity Growth between Europe vs. US and Asia
- Security, Safety and Quality-of-Life in our society will increasingly depend on ES technologies

Artemis objective: world leadership in intelligent electronic systems



# Embedded Systems applications



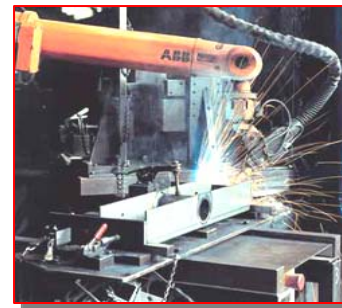
- Embedded Systems bring intelligence and ease of use

- To products
- For manufacturing etc...
- In addition: energy savings, reduced costs, ...



- Demanding applications compared to general purpose computers

- Ever increasing complexity (design and maintenance)
- Reliability,
- Availability (24/7),
- Safety, security,
- Time critical, ...





## Challenges and opportunities



- Increasingly complex system design; demanding applications
  - At all levels: semiconductor chips, large-scale networked systems
  - 100% reliability, safety and time criticality challenge computer science
  - Software development has become major bottle neck
- No dominant player; fragmented industry
  - Convergence and cross-fertilisation between industries, *e.g.* aeronautics / automotive / consumer electronics
  - Opportunity and need for cross-industry cooperation
- Fastest growing sector in Information Technology



## Crucial for Europe's competitiveness



- Key enabler for innovation in major industries
  - Innovative, knowledge-based, high value-added products
  - Innovative manufacturing, distribution & maintenance systems
  
- Key for growth and jobs in Europe
  - Through products and related services
  - Through design and manufacturing excellence
  - Car industry estimates 600,000+ new jobs in Europe
  - Up to 50% of development cost of airplane is in Embedded Systems
  - 40% of world's manufacturing industry is in Europe







## Four Application Contexts

Focus research on technologies with high re-usability

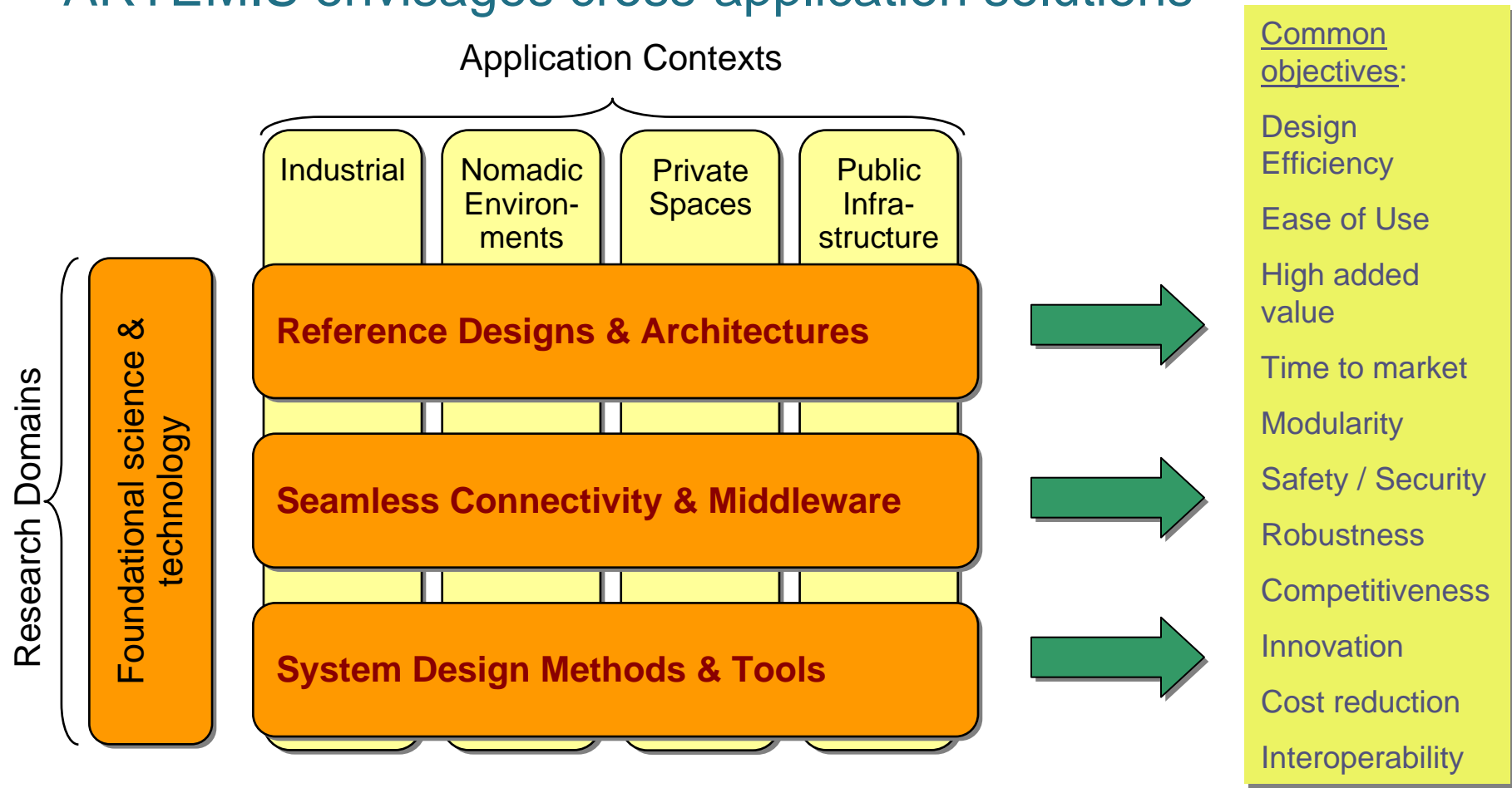
- Four strategically significant “Application Contexts”
  - **Industrial systems**
    - Automotive: “Frugal, safe car”
    - Aerospace: “Customisable, efficient, safe air transport ”
    - Manufacturing & process Industries: “Efficient, flexible manufacturing”
  - **Private spaces:** “Efficiency, safety and pleasure in the home”
    - Including healthcare sector
  - **Nomadic Environments:** “Walk, Talk, Hear, See”
  - **Public Infrastructure:** “Secure and dependable environment”
- Common critical challenge of complexity
  - Emphasis on re-usability of solutions across Application Contexts



# Strategic Research Agenda



## ARTEMIS envisages cross-application solutions





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# Starting point: no ERA yet in Embedded Systems



## Information Society Technologies within FP6



- Embedded Systems, ...
- Continued in ICT/FP7



## ICT cluster projects within EUREKA

- MEDEA+: systems on silicon
- ITEA 2: software for software-intensive systems & services



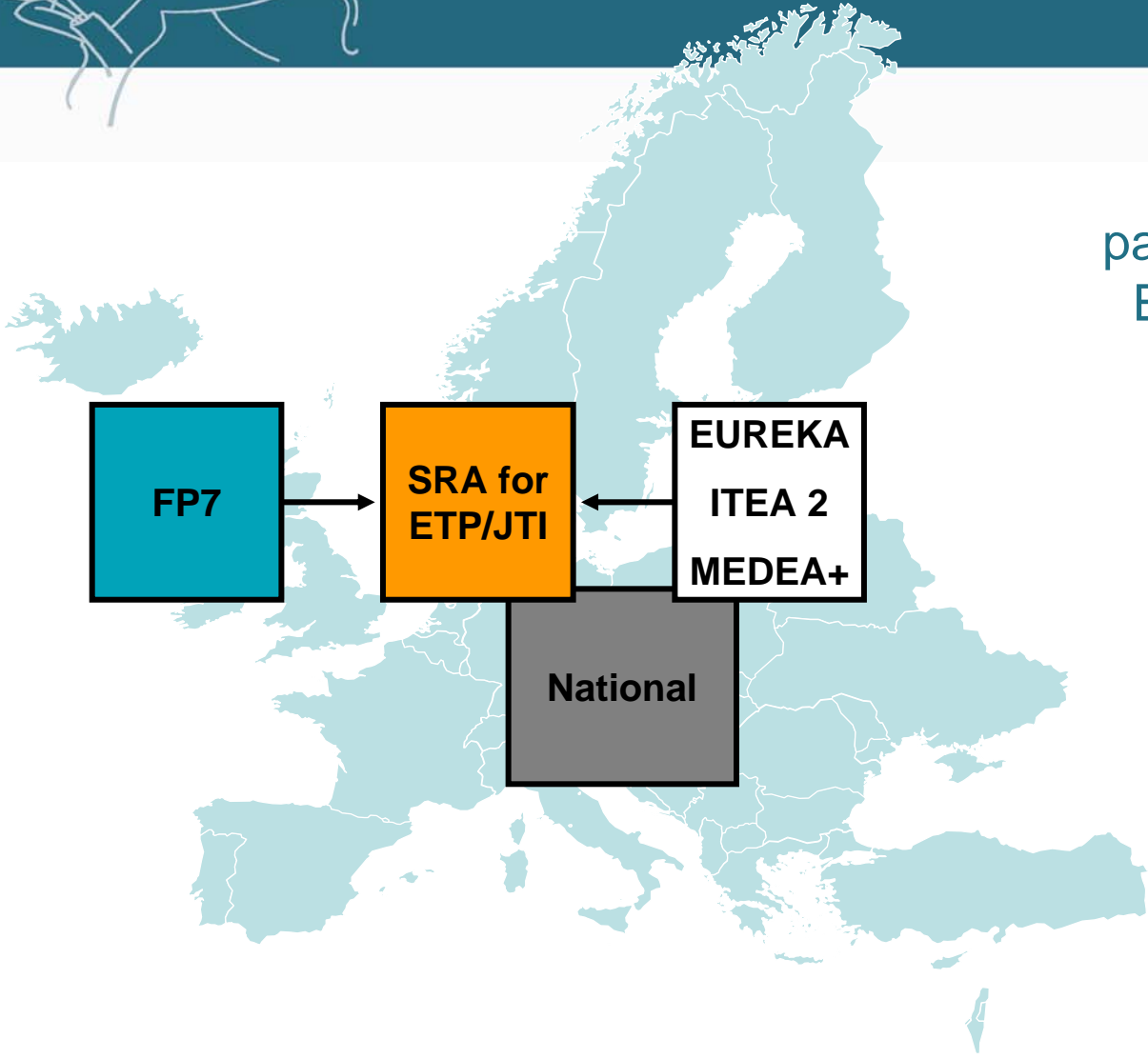
## National/regional programmes

## Key challenges for ARTEMIS

- Closer cooperation and more synergy between FP and EUREKA, as requested by EU Competitiveness Council and EUREKA Ministers in 2004
- More resources with better harmonisation/synchronisation between countries



# Aligning fragmented R&D efforts within ERA



ARTEMIS:  
pan-European SRA for  
Embedded Systems





## From ETPs to JTIs



- **European Technology Platforms (ETPs)**
  - Bring together key stakeholders in specific domain
  - Define Strategic Research Agenda (SRA)
  - Provide input to FP7 Workprogrammes
  - Implement SRA through collaborative R&D in FP7 and other resources
- **Joint Technology Initiatives (JTIs)**
  - Public-Private Partnership to execute (part of) SRA
  - Critical mass of public and private resources
  - Dedicated legal structure
  - 2 JTIs envisaged for FP7 in ICT: Nanoelectronics, Embedded Systems
  - JTI roadmap presented by Commission on November 9, 2006



# Synergetic instruments for executing SRA Embedded Systems



## ETP ARTEMIS

Industry-driven vision  
Common pan-European SRA  
Coordination and policy alignment in ERA

### FP7

Upstream  
ICT collab. R&D  
ERC  
Marie Curie  
Research infrastr.

### JU

Downstream  
Unified processes  
National contracts  
EC co-funding  
Calls operated by  
ITEA 2 Office ?

### EUREKA

Downstream  
ITEA 2, MEDEA+  
National contracts

### National / Regional Programmes



## Benefits expected from ARTEMIS JTI



- **Creating ERA for Embedded Systems**
  - Bringing together fragmented efforts and building critical mass
  - Combining for first time Community, national and private resources in single programme with common objectives (SRA)
- **Ramping up R&D investments in Europe**
  - Providing incentives to industry and Member States
- **Combining best elements of FP and EUREKA**
  - Harmonised and synchronised national funding
  - No more budget uncertainty
  - Common proposal submission, evaluation, criteria, selection
  - No more duplication of evaluation & monitoring procedures
  - Contracting & processing of cost claims at national level
  - Shorter time-to-contract





# Principles of ICT JTIs



- **Governance**
  - Transparency & openness in participation & operations
  - Public-private partnership
  - Separation of powers: industrial policy, public funding, operations
  - Allocation of public money decided by Public Authorities
  
- **Legal structure: Joint Undertaking (Art. 171 EU Treaty)**
  - To receive and manage funds from EC, industrial association, other sources
  - To guarantee agreed JTI processes, as basis for EC and national funding decisions



# ARTEMISIA

*The association for R&D actors in the field of ARTEMIS*

- Origin of ARTEMISIA name
  - Originally explained as ARTEMIS Industrial Association
  - Plant containing Chinese malaria cure
  - Wife of King Mausolus of Halicarnassos, for whom she had Mausoleum built in 353 BC as one of 7 Wonders of the World
- Established on January 17, 2007
  - In Eindhoven as association under Dutch law
  - By DaimlerChrysler, Nokia, Philips, STMicroelectronics, Thales
  - Being joined now by many other R&D actors
- Dual purposes
  - Continuing ETP activities of R&D actors
  - Representing R&D actors in JU





## Member Status ARTEMISIA January 2008



	<b>Intend</b> (to become member)	<b>Member</b> (in progress)	<b>Member status January 2008</b>
A-member SME	11	-	22
B-member RO	10	3	47
C-member < 500 m	2	-	6
C-member > 500 m	2	-	21
C- member AFC	-	-	5
Associates	9	1	7
	<b>34</b>	<b>4</b>	<b>108</b>



## ARTEMIS-JU proposal - timeline



- Proposal adopted by Commission on 15 May 2007
- Proposal presented to Competitiveness Council on 22 May 2007
- Opinion of European Parliament
  - Discussion in ITRE Committee (September – November)
  - Vote at EP Plenary (11 December 2007)
- Opinion of European Economic Social Committee
- General approach agreed at Competitiveness Council on 23 November 2007
- Council Regulation adopted on 20 December 2007
- JU establishment 3 days after publication in EU Official Journal
  - Publication: Feb. 4, 2008
  - JU officially established: Feb. 7, 2008
- First call for project proposals expected in April 2008

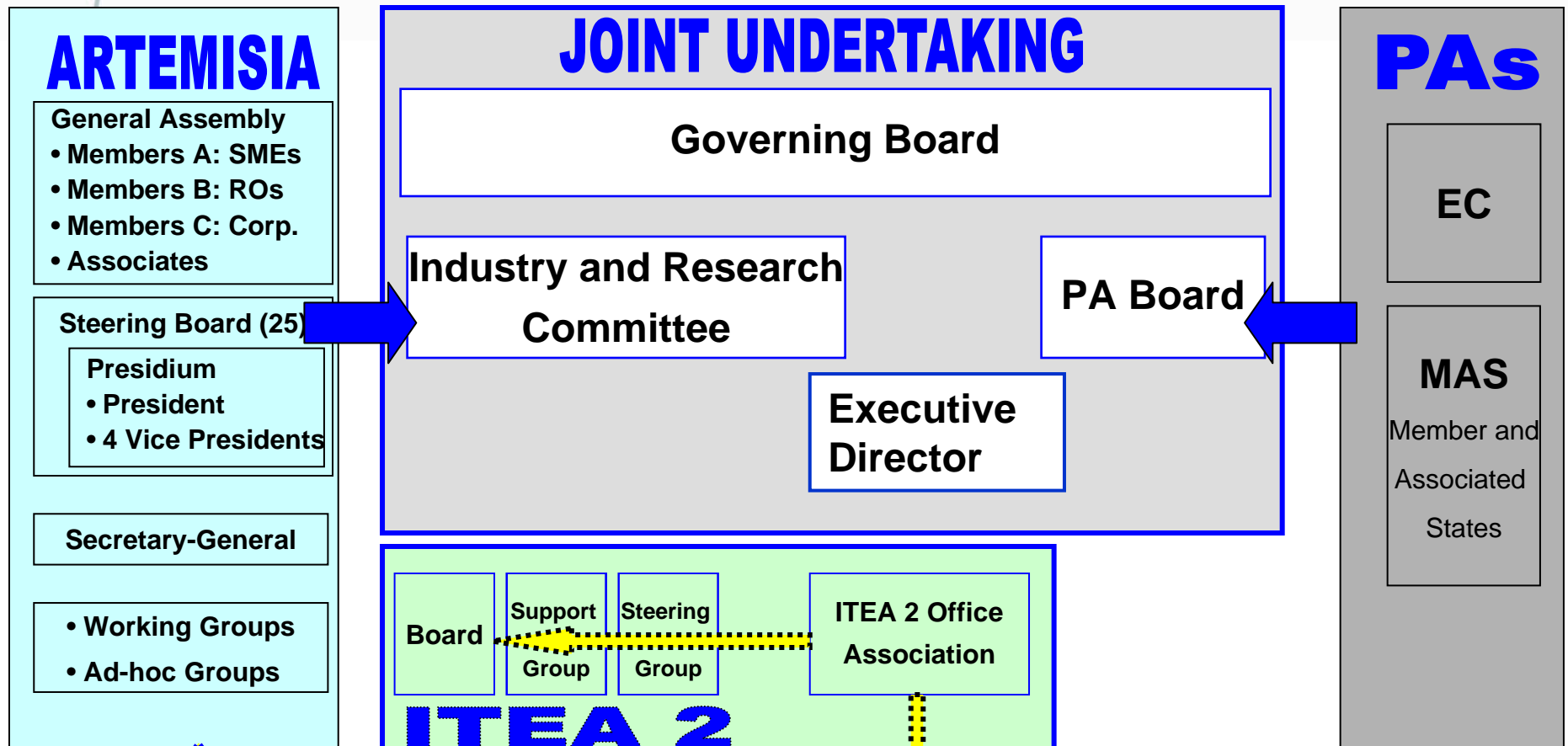


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# Governance structures



→ : Provision of services

→ : Provision of members



## Founding members



- European Community
- 18 Member States
  - Belgium, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Hungary, the Netherlands, Austria, Portugal, Romania, Slovenia, Finland, Sweden, the United Kingdom
- ARTEMISIA



## Joint Undertaking



- Community body
- Duration: till 31 December 2017
- Seat: Brussels
- Funding of R&D
  - Calls for proposals with JU and national earmarked budgets
  - JU budget = 55% of total national budgets
  - Calls open to all participants from EU and associated countries
  - Consortia to include at least 3 organisations from 3 ARTEMIS Member States
  - Evaluation and selection on the basis of “excellence and competition”
  - JU funding: up to 16.7% of costs
  - ARTEMIS Member States co-fund up to (nationally) desired level





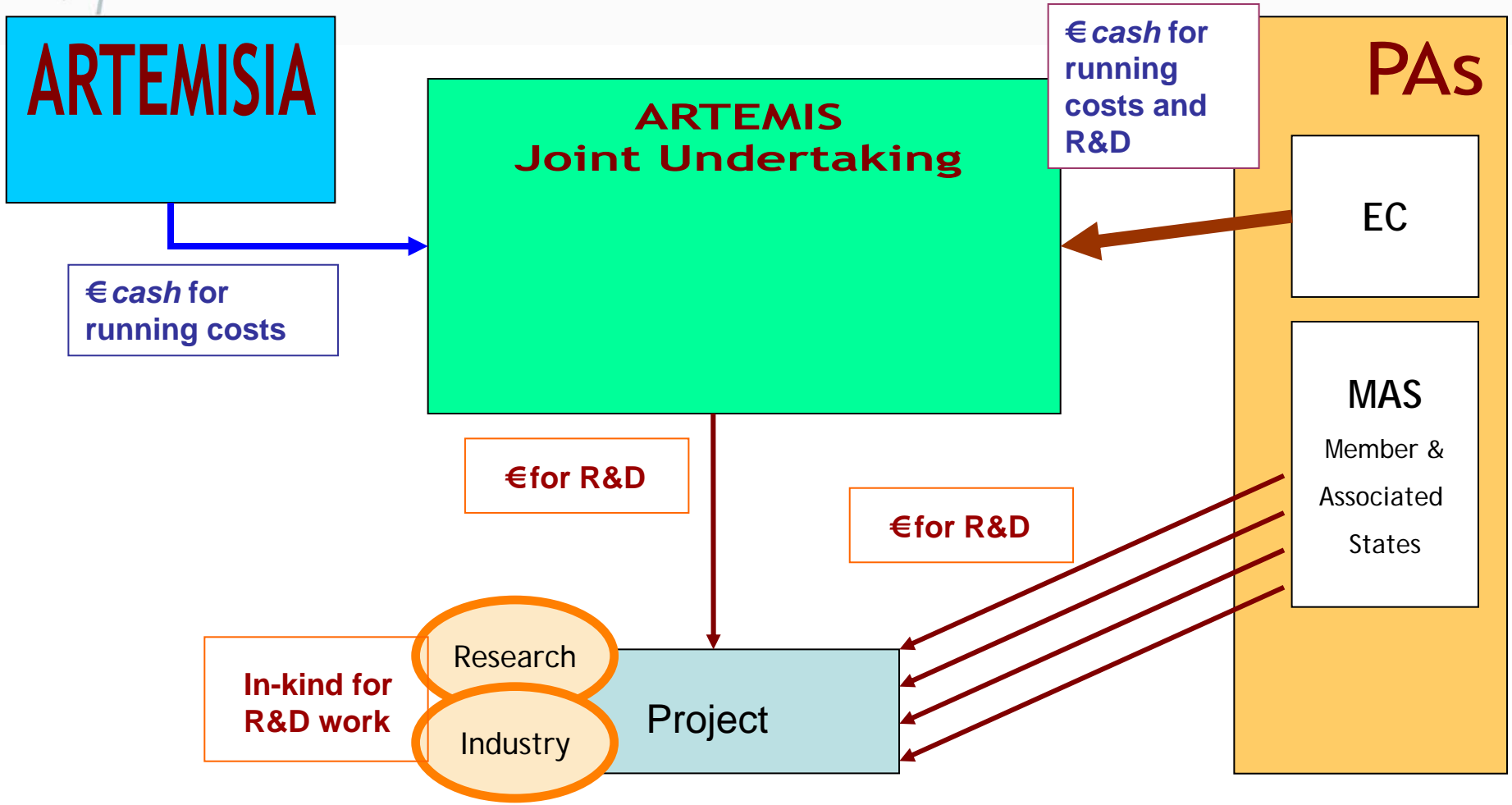
## JU budget



- Operating costs
  - ARTEMISIA: up to 20 M€ or 1% of R&D costs, not exceeding 30 M€
  - Commission: not exceeding 10 M€
  - Member States and associated countries: in-kind
- Total R&D budget (*i.e.* total R&D costs in projects)
  - Community (FP7): ARTEMIS up to 410 M€
  - States: > 1.8x Community contribution
  - R&D actors: in-kind >50% of costs (50% in FP - ~65% in EUREKA)
  - Grand total ARTEMIS ~2.6 B€



# JU funding flow

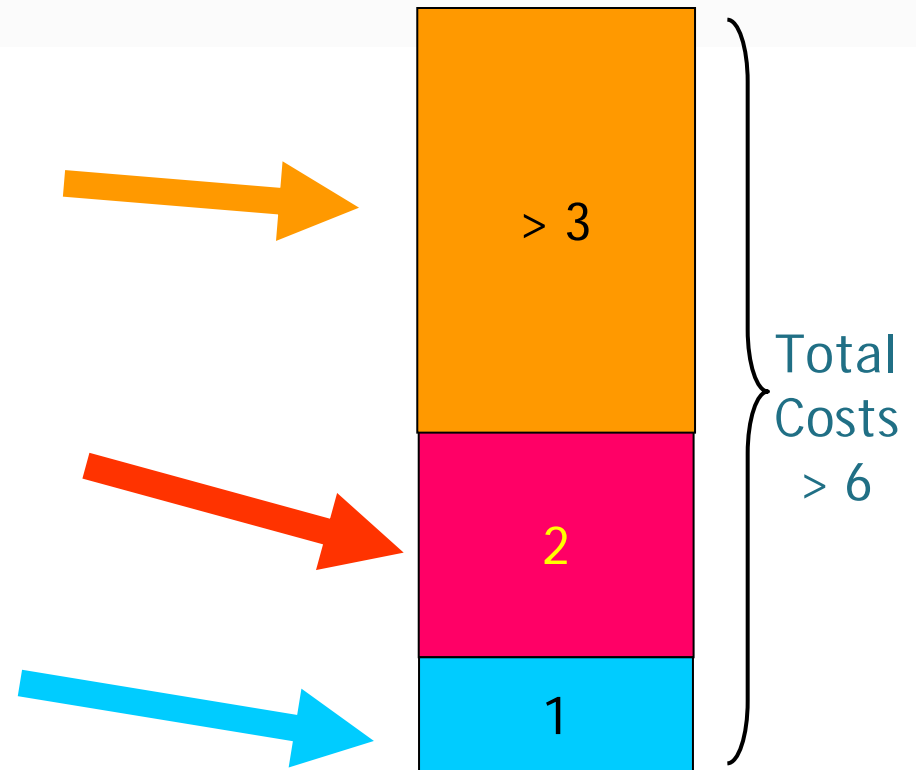




## Example of project financing



- R&D actors
  - At least 50% in-kind
- Participating States
  - National contracts
  - Possibility of cross-border funding & subcontracting to other JU member participants
- Joint Undertaking
  - In addition to national payments





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## Conclusions

- Pan-European SRA developed for Embedded Systems
  - Key technology driving product innovation, fostering industrial competitiveness and enabling societal applications in Europe
- Novel PPP scheme created for operating industrial R&D programme
  - Pioneering innovative mechanism for project co-funding from Community and national budgets
  - Shifting Commission's role from ad-hoc project funding to strategic partner
- True ERA approach devised for Embedded Systems
  - Bringing together Europe's fragmented efforts
- Agreement on ARTEMIS-JU achieved thanks to joint efforts
  - All stakeholders fully committed to make ARTEMIS success



## More information



### ARTEMIS/ARTEMISIA

- <http://www.artemis-sra.eu>
- <http://www.artemisia-association.org>
- <http://www.artemis-ju.eu>

### Commission

- [http://cordis.europa.eu/ist/directorate\\_g](http://cordis.europa.eu/ist/directorate_g)
- <http://cordis.europa.eu/ist/embedded>
- [http://ec.europa.eu/information\\_society/research/priv\\_invest/jti/index\\_en.htm](http://ec.europa.eu/information_society/research/priv_invest/jti/index_en.htm)

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**Thank you for your attention**

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