



**ARTEMIS**

**Introduction to the ARTEMIS  
Multi-Annual Strategic Plan and  
Annual Work Programme**

Alun Foster, ARTEMISIA Association

# The story of ARTEMIS

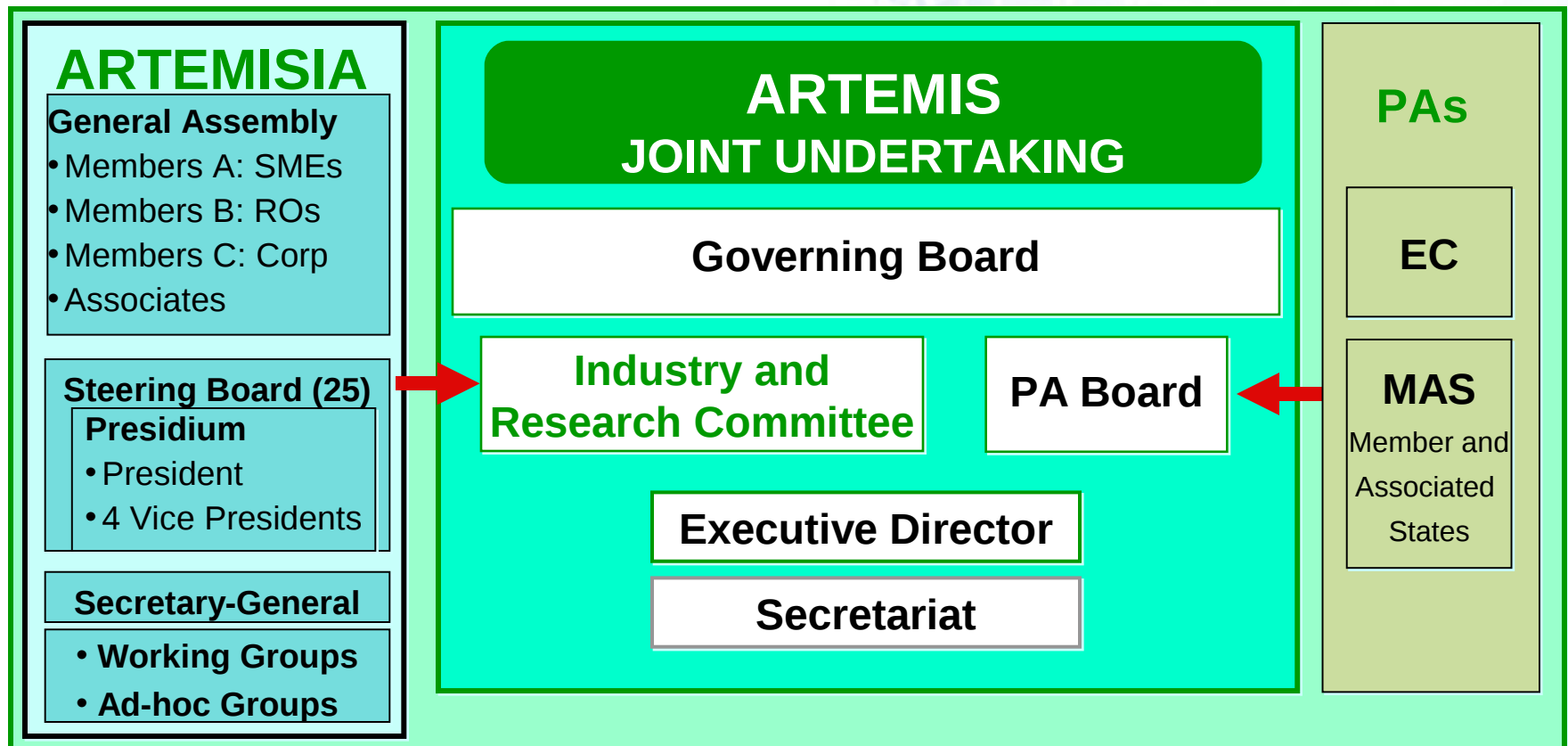
- **ARTEMIS - The European Technology Platform on Embedded Systems : Advanced Research & Technology for EMbedded Intelligence and Systems**
  - **Embedded Systems know-how is fundamental to European industrial competitiveness**
- **An initiative of European Industry and the EC**
  - DG Information Society and Media
  - Initiated by 10 of the top-25 EU companies in terms of global R&D
    - Industry, academia, SME federation, ITEA2, MEDEA+ involved
    - 24 countries + EC involved
- **Aim: develop and drive a joint European vision and strategy on embedded systems through a “Joint Technology Initiative”**
  - Create and keeps jobs in Europe
    - Through products and related services
    - Through design and manufacturing excellence
  - **Implemented as a “Joint Undertaking” (JU)**





# The ARTEMIS JU structure

- “Industry” is represented by the ARTEMISIA Association
  - Members of ARTEMISIA Steering Board are also members of the Industry and Research Committee





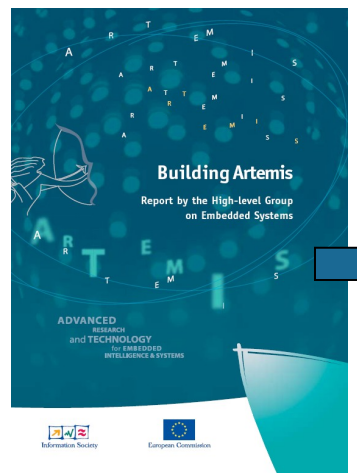
# What is ARTEMISIA?

- A not-for-profit Association under Dutch law
- Has two main responsibilities:
  - Represent the interests of the European Embedded Systems industry in the ARTEMIS Joint Undertaking
    - Special responsibility for defining the ARTEMIS research programme
  - Take up custodianship of the ARTEMIS Strategic Research Agenda
    - Scope covers whole of the Embedded Systems domain in Europe, influencing many other initiatives (e.g. FP7, Eureka, National programmes, ...)
- Membership advantages
  - Influence the future R&D strategy and related policies
    - Participation in working groups that define the MASP, Research agenda etc...  
Your voice can be heard!
    - Be a candidate for the Steering Board / Presidium
  - Access a large community of potential partners for collaborative R&D projects
    - Increase your visibility!

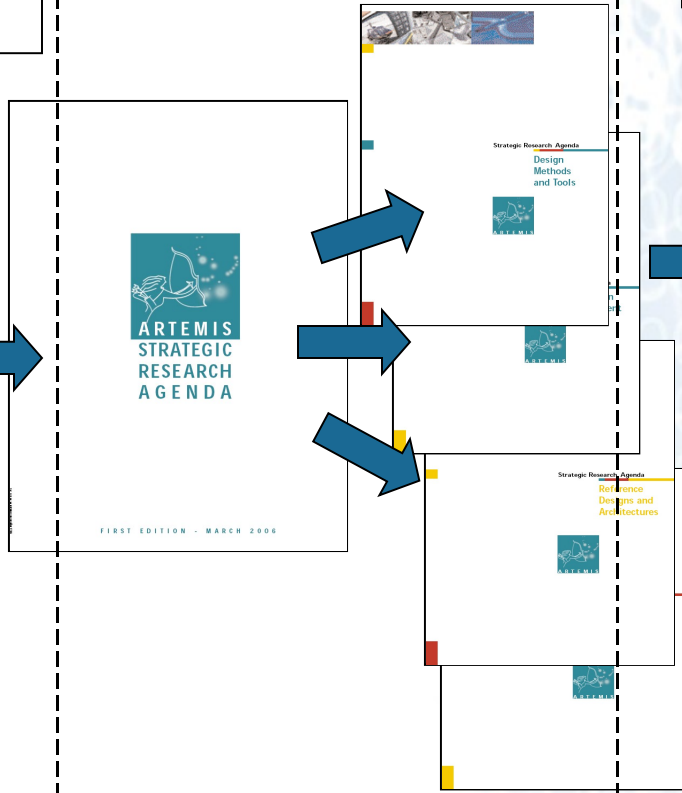


# ARTEMISIA defines the ARTEMIS R&D Strategy From Vision to Implementation

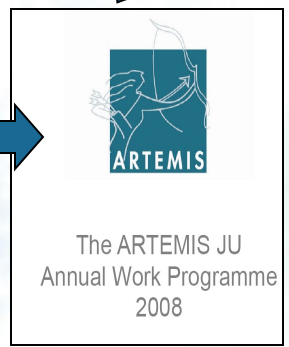
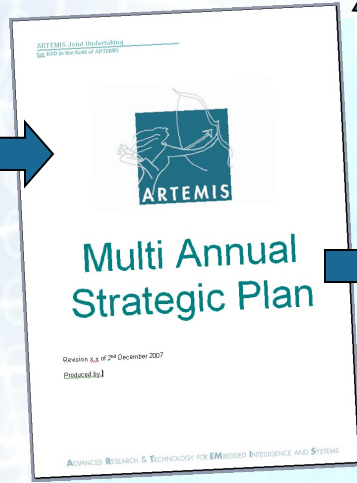
**ARTEMIS Vision**  
Building ARTEMIS



**ARTEMIS SRA**



**ARTEMIS JU**  
MASP/RA and AWP



Annual Updates

2004

2005-2006

2007

2008

- The JU Research Agenda proposal considers the expectations of the JU and resulting projects:
  - **“Think BIG”**
    - = projects with appropriate critical mass and significant societal impact
  - **“Think Different”**
    - = significant and complementary added-value over existing programmes
  - **“Act Socio-Economic”**
    - = improved industrial efficiency “... to strengthen European competitiveness and allow the emergence of new markets and societal applications.”
      - » i.e. a focus on key technical issues, solving high-visibility issues with commercially exploitable results
  - **“Act Multi-national”**
    - = considers national/regional strategic priorities



# The ARTEMIS Multi-Annual Strategic Plan 2009

## ■ The Vision :

- The future world will be supported by intelligent Embedded Systems for the benefit of mankind (as in “Building ARTEMIS”)
  - = Adoption of the ARTEMIS vision

## ■ The Mission:

- Help to realise the vision through European Leadership
  - Embedded Systems know-how is key for competitiveness

## ■ The Strategy:

- Build self-sustaining “Eco-Systems”
  - embracing activities from R&D to innovation
  - exploring new ways of working to reach the objectives
  - providing the environment to make it happen : funding, calls, collaborative environment, SMEs, ...

**“Self-Sustaining Innovation Eco-Systems  
for European Leadership in Embedded Systems”**

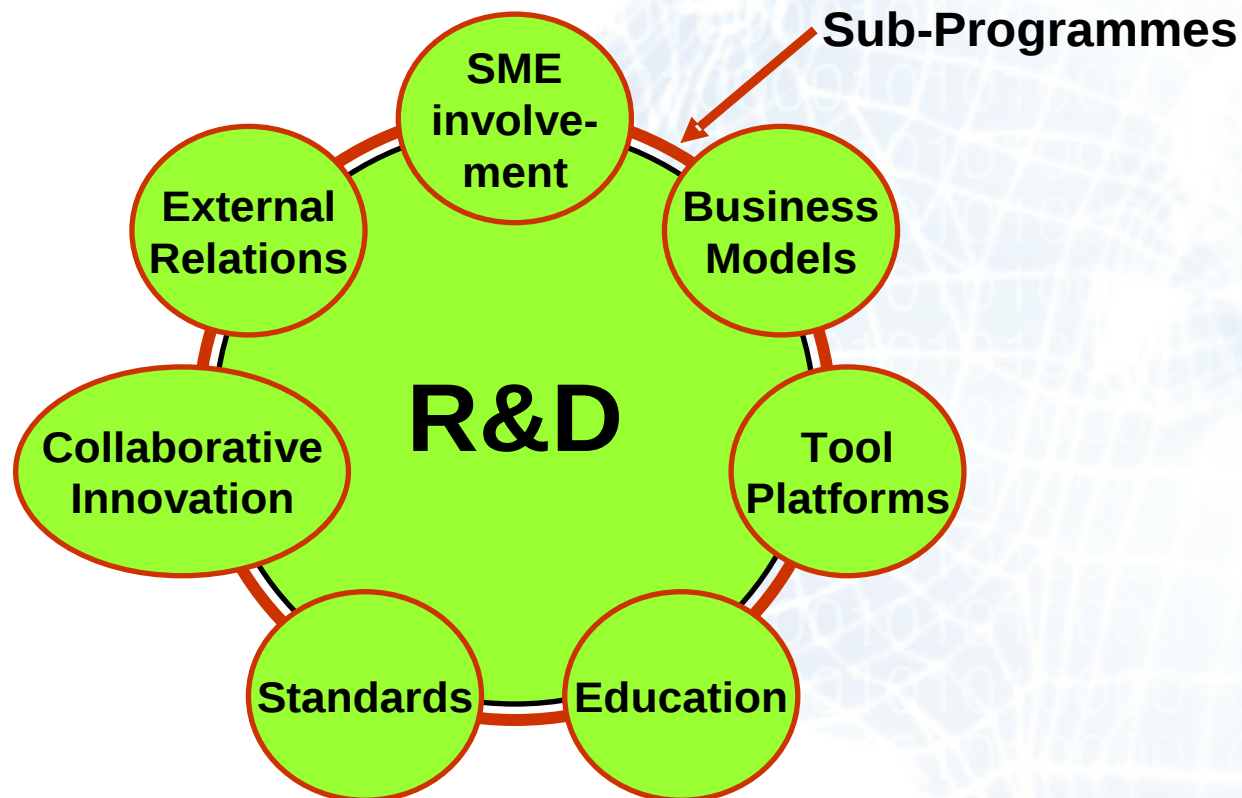
## “Self-Sustaining Innovation Eco-Systems for European Leadership in Embedded Systems”

- Innovation Eco-Systems
  - The MASP clearly identifies a vision and strategy based on Innovation Eco-systems, built around the core of the **ARTEMIS Sub-Programmes**.

**\*\* THIS IS A NEW IMPETUS! \*\***

# What is an ARTEMIS Eco-system?

- ARTEMIS-JU R&D Strategy identifies 8 Sub-Programmes
  - Sub-programmes address key Embedded Systems domains
  - Eco-systems build upon publicly financed R&D to generate the constituents, based on the ARTEMIS Sub-Programmes



- Self-sustainability: the ability to generate new innovations in a highly complex environment
  - **proactive and dynamic**
    - generating new ideas, guiding R&D directions
    - linking R&D projects' results to the eco-systems
  - **autonomous and competitive**
    - able to generate agile response to new market developments
    - sufficient “critical mass” to have lasting impact
  - **embracing all stakeholders**
    - including National Public Authorities and EC
  - **The complexities faced are such that all available forces must work together to be effective and “Self Sustaining”**

## ■ Integrates R&D and Innovation

### ➤ R&D

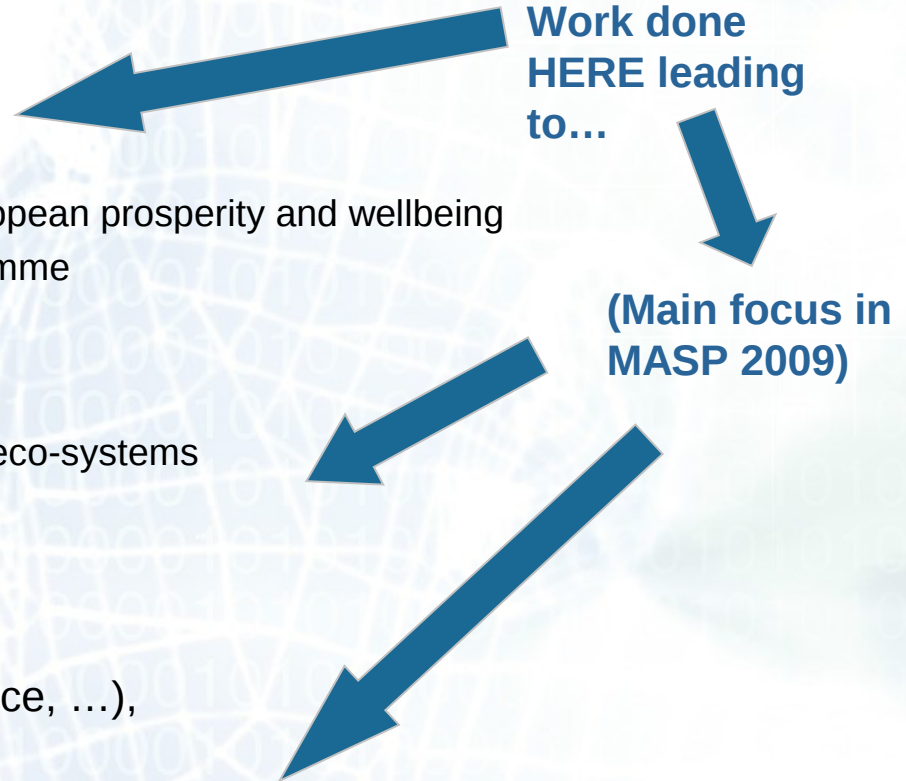
- 8 Sub-programmes:
  - » application-oriented eco-systems
  - » address key applications for European prosperity and wellbeing
  - » Priorities within each sub-programme

### ➤ Innovation

- Collaborative Innovation
  - » “CoIEs”, which are the kernel of eco-systems
- SMEs,
- Education,
- Standardisation
- Business Models (e.g. Open Source, ...),
- Tool-Platforms
  - » New concept, addressing long-standing obstacles
- External Relations: with existing initiatives (FP7, ITEA2, NSF,...), and new ones

Work done  
HERE leading  
to...

(Main focus in  
MASP 2009)





# ARTEMIS

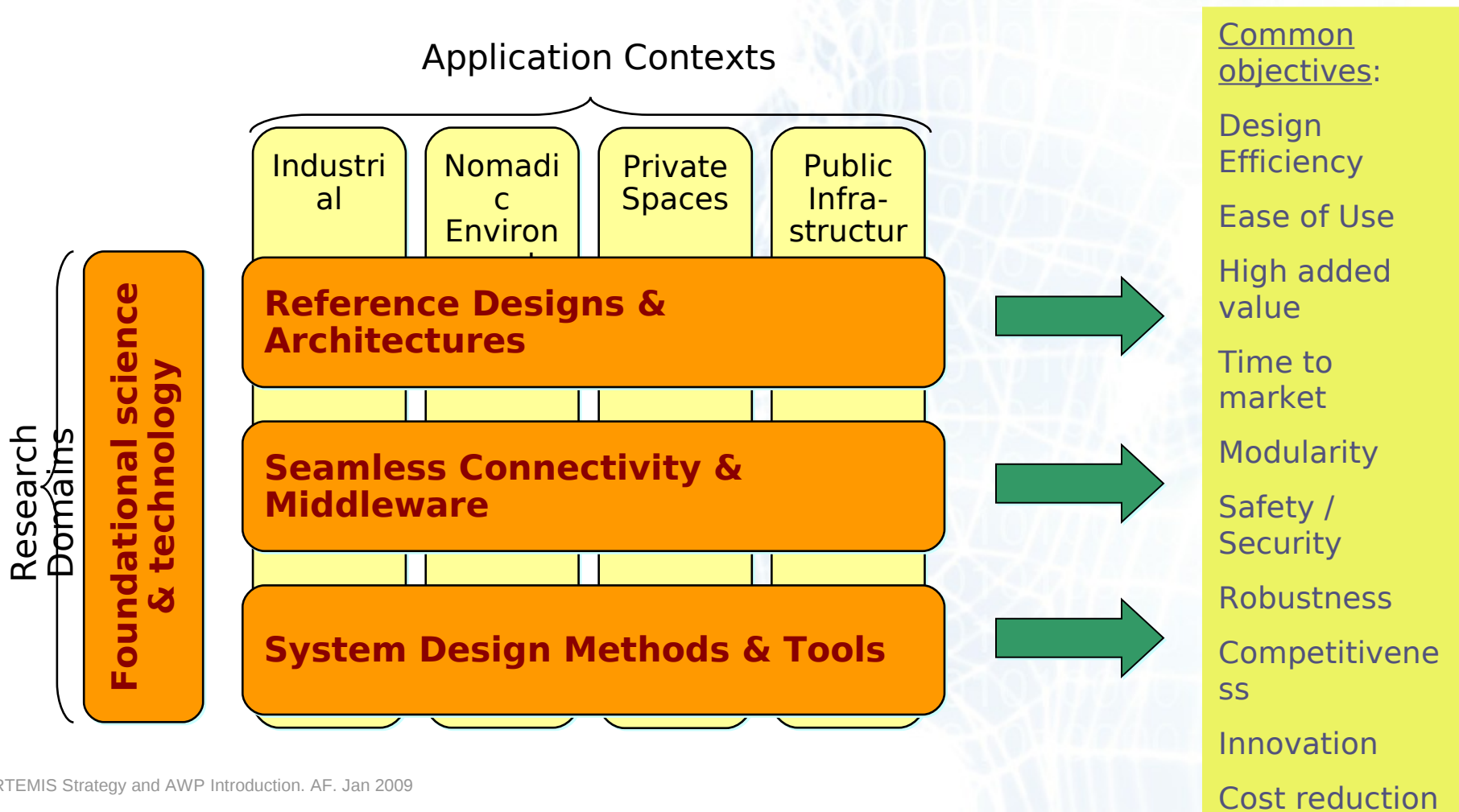
## Introduction to the Annual Work Programme for 2009

Alun Foster, ARTEMISIA Association

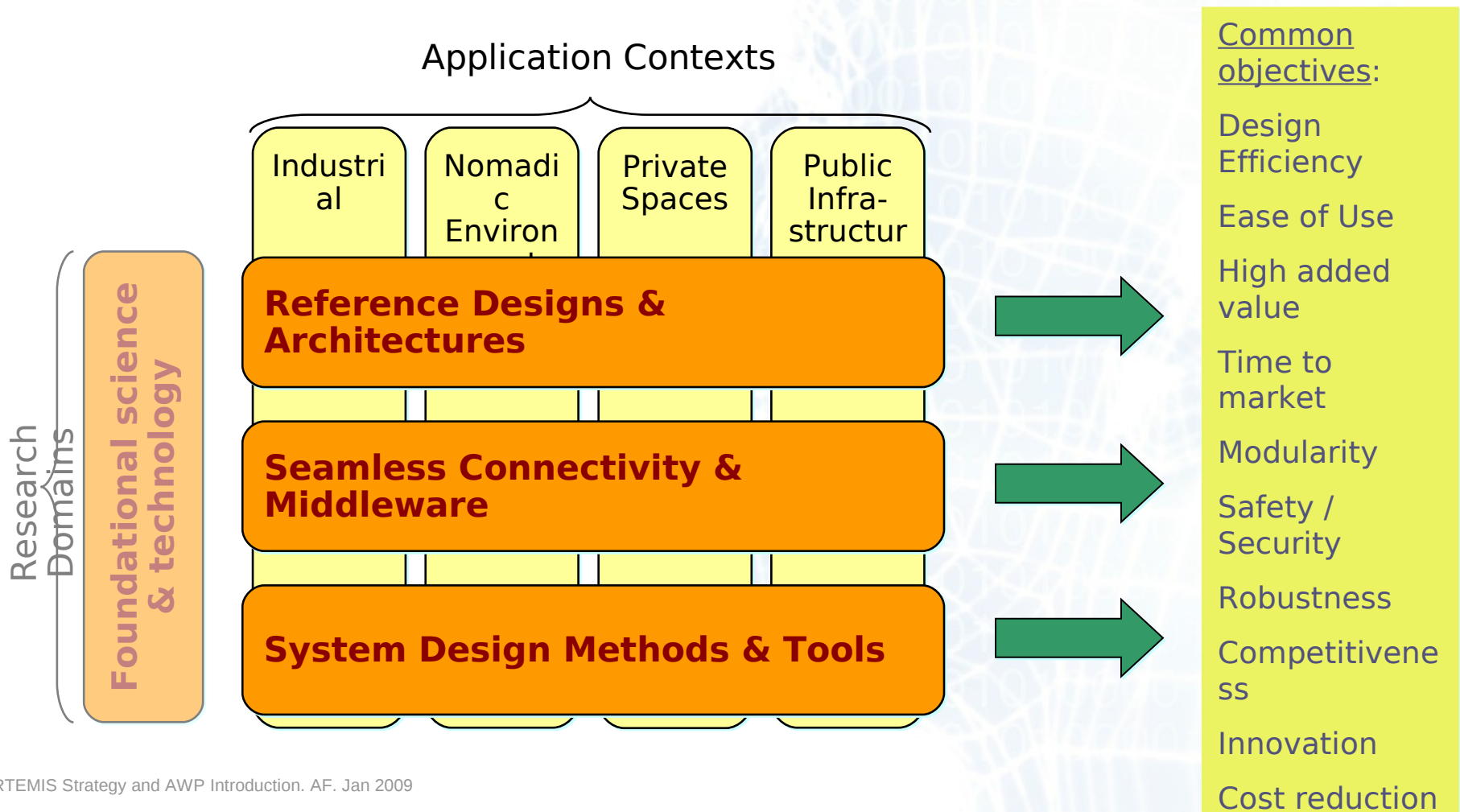
# Back to the Source: the High Level view

## ARTEMIS-ETP: Strategic Research Agenda

- ARTEMIS envisages cross-application solutions

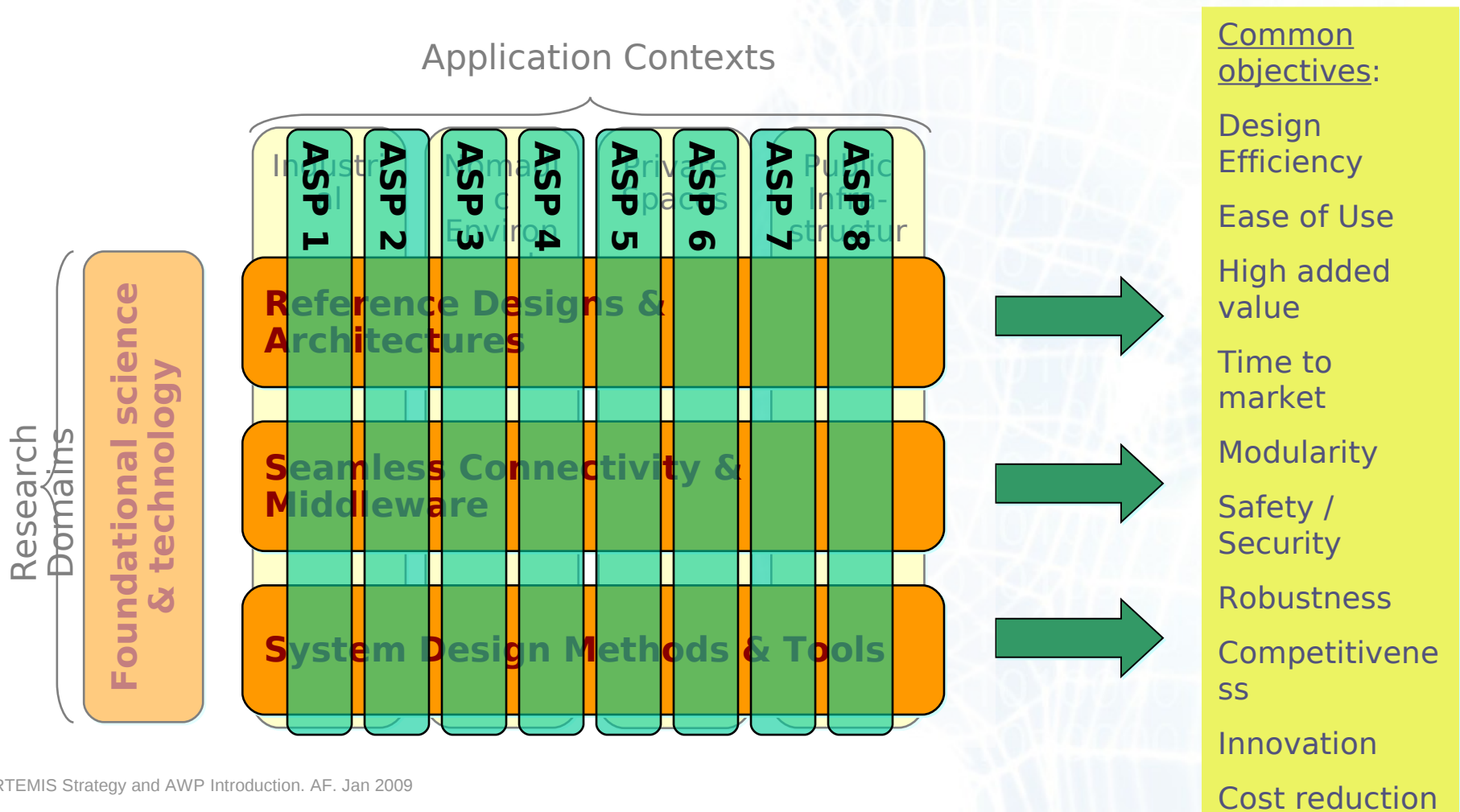


- With DOWNSTREAM focus (Innovation)



# Organising Research and Development: ARTEMIS Research Domains

- For applications mapped onto 8, ARTEMIS Sub-Programmes





# ARTEMIS Sub-Programmes (ASPs)

1. ***Methods and Processes for Safety-relevant Embedded Systems***
2. ***Person-centric Health Management***
3. ***Smart Environments and Scalable Digital Services***
4. ***Efficient Manufacturing and Logistics***
5. ***Computing Environments for Embedded Systems***
6. ***Security, Privacy and Dependability***  
*in Embedded Systems for Appliances/Networks/Services*
7. ***Embedded Technology for Sustainable Urban Life***
8. ***Human-centric Design of Embedded Systems***

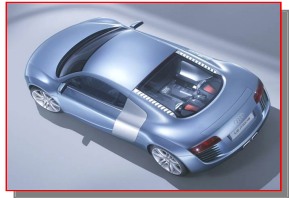
## ■ ASP1: Methods and Processes for Safety-relevant Embedded Systems

### ➤ Embedded Systems for enhanced safety and efficiency

- Special relevance for the Transport & Manufacturing sectors

- » Automotive, Aerospace, Plant, ...

- » Cost-effective design and integration of new systems used in safety-critical situations



## ■ ASP2: Person-centric Health Management

### ➤ Improved prevention, care, cure and well-being through Embedded Systems

- Rising cost of health-care demands new paradigms supported by ICTs
- Approach: start by keeping people healthy!



## ■ ASP3: Smart Environments and Scalable Digital Services

- New (service / software) architectures for enhanced user experience of (mobile) media and applications
- Enable the creation of new services that bring the “Ambient Intelligence” experience to the user



## ■ ASP4: Efficient Manufacturing and Logistics

- Embedded Systems supporting sustainable, competitive, flexible manufacturing, delivery and support of products over their complete life-cycle



## ■ ASP5: Computing Environments for Embedded Systems



- New architectures and design paradigms for embedded systems
- Transversal technology, with positive impact on all ES application domains
  - Processing throughput, low power, ...

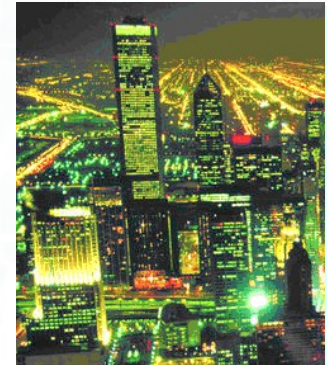
## ■ ASP6: Security, Privacy and Dependability (in Embedded Systems for Appliances/Networks/Services)



- Protect the individual, the supplier and the (data) infrastructure from abuse
  - Increase trust and confidence in the use of ICT-based services
- Protect the public at large (infrastructure protection)
- Transversal technology, with positive impact on all ES application domains

## ■ ASP7: Embedded Technology for Sustainable Urban Life

- Sustainable delivery of energy and other utilities
- Improved energy use through cost-effective and intelligent embedded systems (smart buildings)
- Also benefitting non-urban communities



## ■ ASP8: Human-centric Design of Embedded Systems

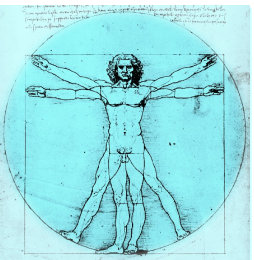
- New ways to interact with technology
  - ... Or better, for the technology to interact with the user!

Easier-to-use, friendly electronics for home, work and play

- Reduces the “digital gap”

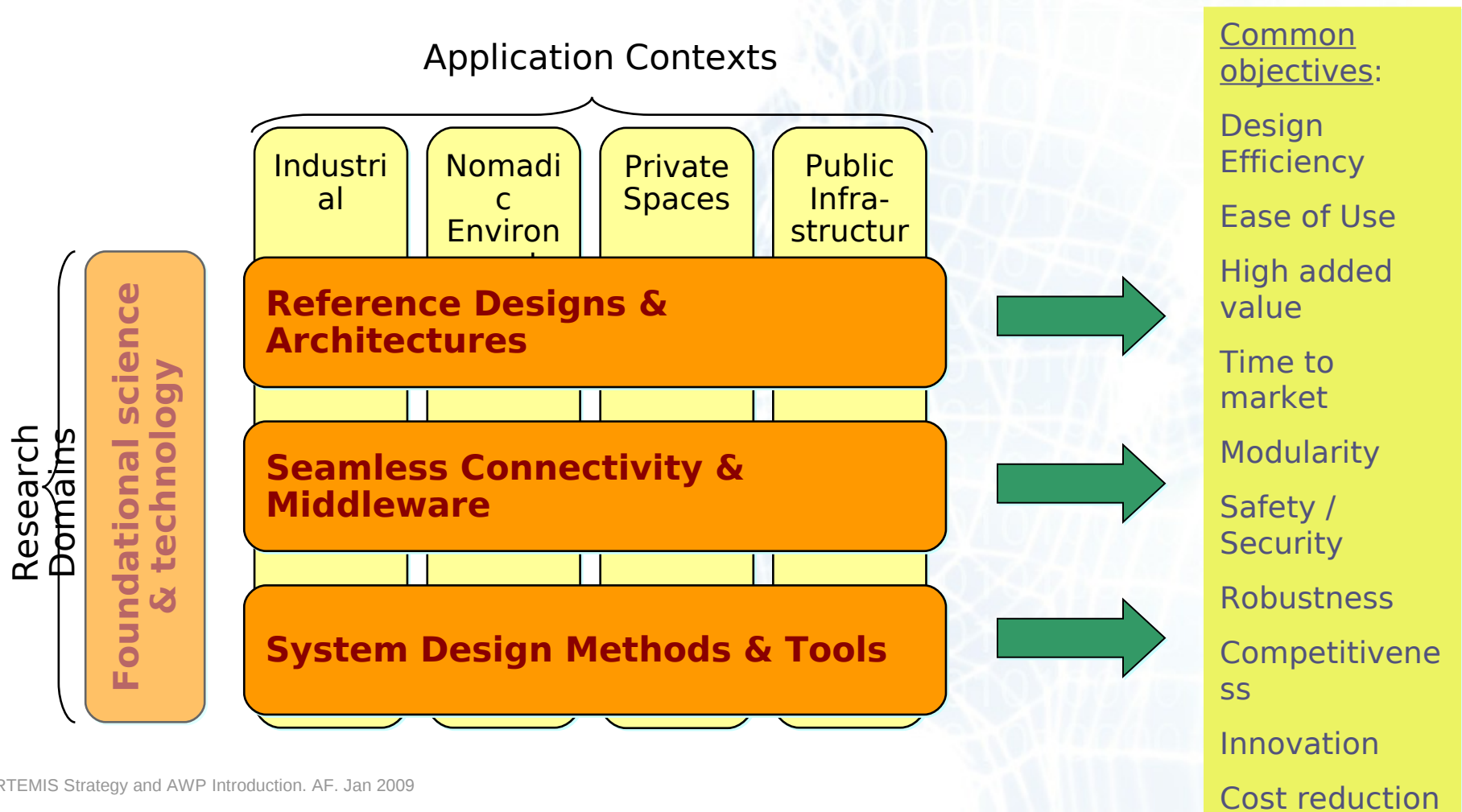
Improved operator monitoring and control of transport and industrial systems

- Eliminate operator error, for safer plant, safer car/train/plane, ...



AWP: “Proposals should address at least one ARTEMIS Sub-Programme and address within that at least one of the Research Priorities.”

- ARTEMIS envisages cross-application solutions



Common objectives:

- Design Efficiency
- Ease of Use
- High added value
- Time to market
- Modularity
- Safety / Security
- Robustness
- Competitiveness
- Innovation
- Cost reduction

# Priority topics for Reference Designs & Architectures

- Highest priority
  - Composability
  - Architecture Dependability
  - Design for Safety
- High priority
  - Design for Manufacturing limitations
  - Reference architectures for Parallel systems
  - Multi-aspect Trade-off in Designs
  - Resource management
  - Design for (Inherent) Security
  - Self Organisation of systems



# Priority topics for Seamless Connectivity & Middleware

- Highest priority
  - Resource management
- High priority
  - Robustness & diagnosis
  - Programming
  - Organization & deployment
  - Provably correct systems
  - Global connectivity
- Medium priorities
  - Security
  - Data distribution



# Priority topics for system Design Methods & Tools

- Highest priority
  - System-level modelling: Model-based Design / System Engineering
  - Test / validation / verification
- High priority
  - Tool Integration
  - Tools and methods for affordable certification
- Medium priorities
  - Resource management
  - Tools for Product Line Engineering
  - Simulation environment that can mix physical elements and virtual models (“co-simulation”)
  - Traceability: Requirements to product, visible at any step of the process



- Open for all ASPs
  - All 8 ASP's are in the Call.
  - Priorities in each ASPs are extracted from the RA
  - No pre-budget allocation per ASP, but ASPs 2, 4 and 6 are “especially welcome”
- Encouraging SME involvement
  - all ASPs
- Impact on standards, regulation, open source and Tool Platforms are recommended to be addressed
  - High-potential for establishing Tool Platforms : ASP 1,3,5
- Identify contribution to the achievement of the ARTEMIS targets

# **“Self-Sustaining Innovation Eco-Systems for European Leadership in Embedded Systems”**