

NCP Info Day 13 May 2011, Brussels

Factories of the Future & Next ICT Calls

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Factories of the Future (FoF): Context

- **What:**
 - Part of the Recovery Plan
 - To help manufacturing, in particular SMEs, across a broad range of sectors be competitive after the Crisis is over
- **How:**
 - Industry-driven R&D projects
 - 4 annual co-ordinated calls until 2013 between the two relevant FP7 Themes, ICT and NMP
- **Who:**
 - R&D stakeholders of European Technology Platforms ARTEMIS, ENIAC, EPOSS, EUROP, NESSI, PHOTONICS21, MANUFUTURE
 - Technology providers & industrial users (large & SME), academic researchers
- **Total FP7 budget (2010-2013):**
 - 245 M€ (ICT) + 400 M€ (NMP)



State of the Industry & Expected Impact

- **Europe's manufacturing**
 - More than 25 sectors, 21 % of GDP (= € 6.5 trillion), 30+ million jobs
 - Crisis has reduced Europe's production capacity
 - Export champions (but at risk) in machinery, automobiles, wind turbines, ...
 - Largest global market share in automation & factory equipment
 - Under threat from low wage economies (eg mass-produced goods)
 - Chance to compete through high added-value products (eg quality, services, customisation, clean & energy efficient processes)
- **FoF ICT: Technology leaders to gain market share**
 - Automation/industrial robotics & laser technology solutions for factory environments
 - Product/production design tools (eg software for modelling, simulation, visualisation)
 - Software for enterprise/supply-chain management
- **FoF ICT: European industrial end users to**
 - Integrate latest technology into their production environments
 - Build on new competencies (knowledge, organisation, skills, business models)
 - Use technologies that enable energy-efficient and "waste-less" production



Recovery Plan Objectives: Industrial Competitiveness

Supply side

Technology/manufacturing equipment suppliers to gain market share:

- Automation/industrial robotics & laser technology solutions for factory environments
- Product/production design tools (eg software for modelling, simulation, visualisation)
- Enterprise/supply-chain management tools

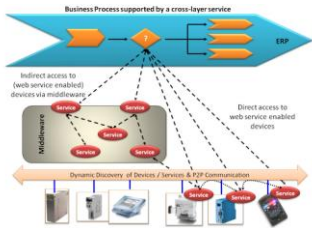


Demand side

European industrial end users:

- To integrate latest technology into their production environments
- To develop new competencies (knowledge, organisation, skills, business models)
- To use technologies that enable energy-efficient and “waste-less” production

Factories of the Future ICT Vision



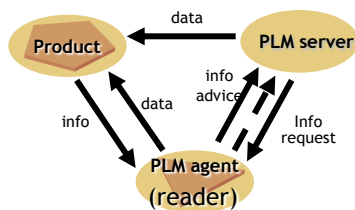
Smart Factories:

- **Goal:**
More automation, better control & optimisation of factory processes
- **Means:**
Software, lasers & intelligent devices embedded in machines & factory infrastructure

Factory productivity

- Less waste
- Less energy use
- Faster time-to-market
- Better quality

Sensors,
Tags



Virtual Factories:

- **Goal:**
To manage supply chains; to create value by integrating products & services
- **Means:**
Software to holistically interconnect & manage distributed factory assets; new business models & value propositions

Supply-chain productivity

- High-value products
- Keep jobs in Europe
- Process transparency
- IPR security
- Lower CO₂ footprint

Digital Factories:

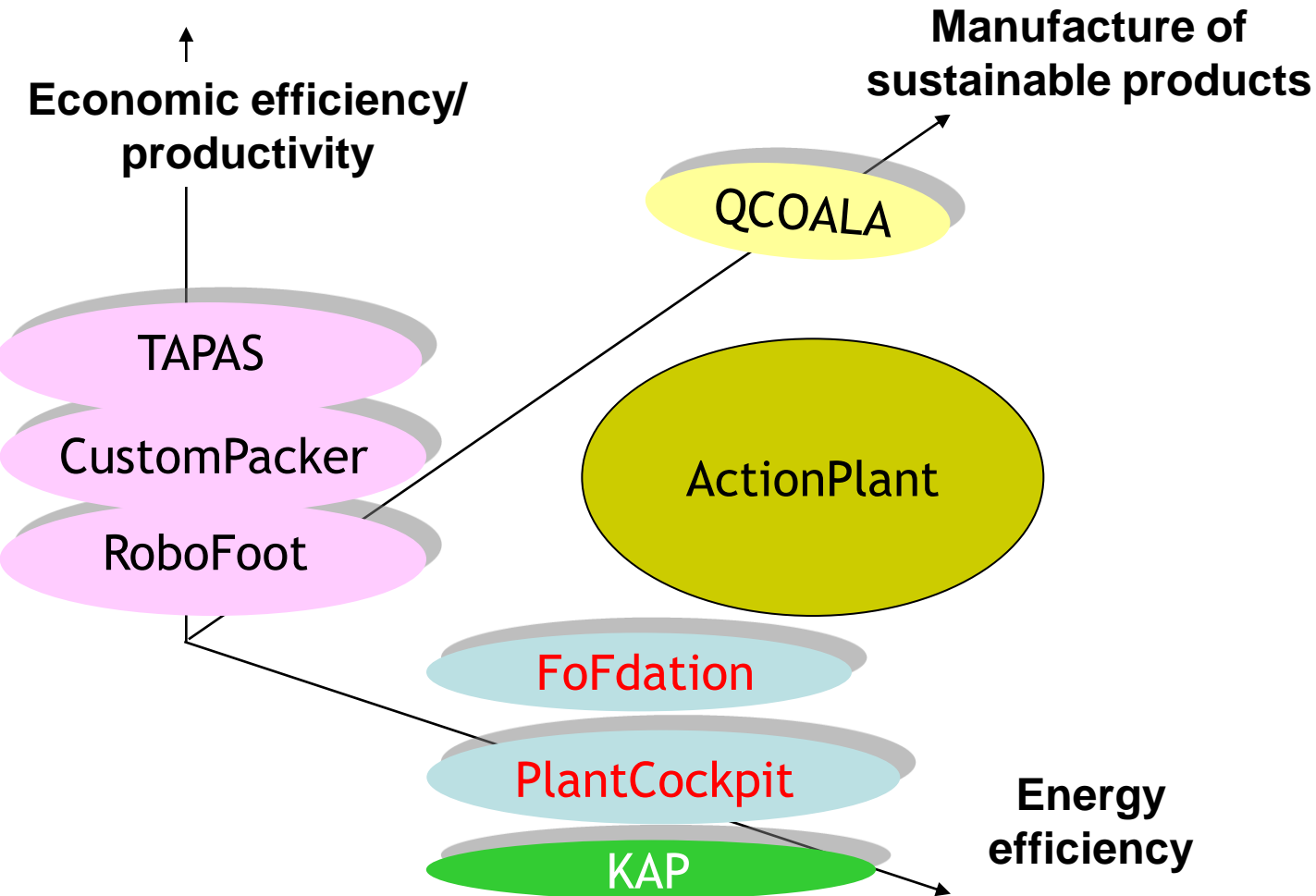
- **Goal:**
To “see” the product before it is produced
- **Means:**
Software for the digital representation & test of products & processes prior to their manufacture & use



Design productivity

- Reduce design errors
- Better & efficient products
- Less waste + rework
- Faster time-to-market

2009 FoF ICT Call on “Smart Factories”: Successful Proposals



(a): Process automation
& optimisation

(b): ICT & sensors for
energy efficiency

(c): Robotics-enabled
production

(d): Laser applications



2010 FoF ICT Call - Virtual Factories

Work Programme coverage

	a	b	c	d	Target outcomes Main theme
ADVENTURE	X				Factory process optimisation
BIVÉE	X				Business innovation
COMVANTAGE (IP)				X	Product-centric collaboration
EPES			X		Dynamic composition of services
Extreme Factories	X				Industrial SME innovation
GloNet	X			X	Cloud-based networks of SMEs
IMAGINE (IP)	X	X	X	X	Integrated management of networked manufacturing
MSE (IP)	X	X	X	X	Distributed, autonomous, interoperable innovation ecosystems of manufacturing assets
PREMANUS			X		Re-manufacturing
VENIS	X			X	Large enterprise/SME interoperability



2010 FoF ICT Call - Digital Factories

Work Programme coverage

Objective FoF-ICT-2011.7.4	Retained Proposals	Issues covered	Issues not covered
a) Comprehensive engineering platforms (IP, STREP)	RLW Navigator I-Conik (IP) amePLM LinkkME (IP) Vistra	All	
b) Simulation & virtual prototyping tools for product/process design (IP, STREP)	Simposium (IP) Terrific FFD	All	
c) Holistic modelling & simulation of full complex Products / processes (IP, STREP, CSA)	Simposium (IP)	Digital evaluation & simulation of material properties - from micro- to macro-scale	Digital modeling and simulation of product & process behaviour



Results of first FoF ICT+NMP Calls

	July 2009	July 2010
• Success rate:	26% (25 funded of 98)	19% (36 funded of 193)
• Share by Org. Type:		
- Higher Education:	23%	24%
- Private for Profit:	54%	50%
- Research Org.:	22%	24%
• Share of funding of SMEs:	31%	29%
• Countries of funded partners:	25	26

Factories of the Future 2011 Call

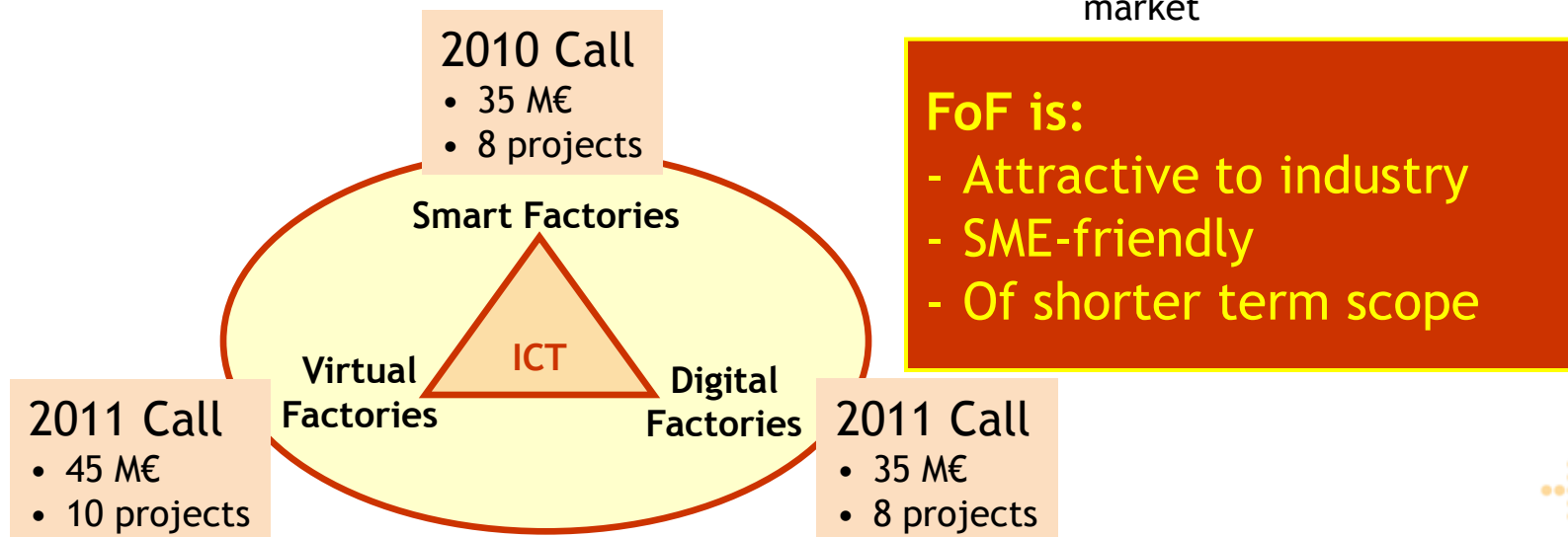
Expected impact & conclusions

“Virtual Factories”

- Higher management efficiency of networked & sustainable business operations.
- ICT tools enabling the participation of SMEs in virtual factory environments.
- New business models & innovation scenarios for a low-carbon economy.

“Digital Factories”

- Reinforced European leadership in knowledge-driven platforms & tools for product development & manufacturing
- Scaling and higher accuracy of digital design tools & simulation techniques
- Accelerated product design & manufacturing, with a considerably shorter time-to-production & time-to-market



Factories of the Future Multi-Annual Roadmap 2010-2013

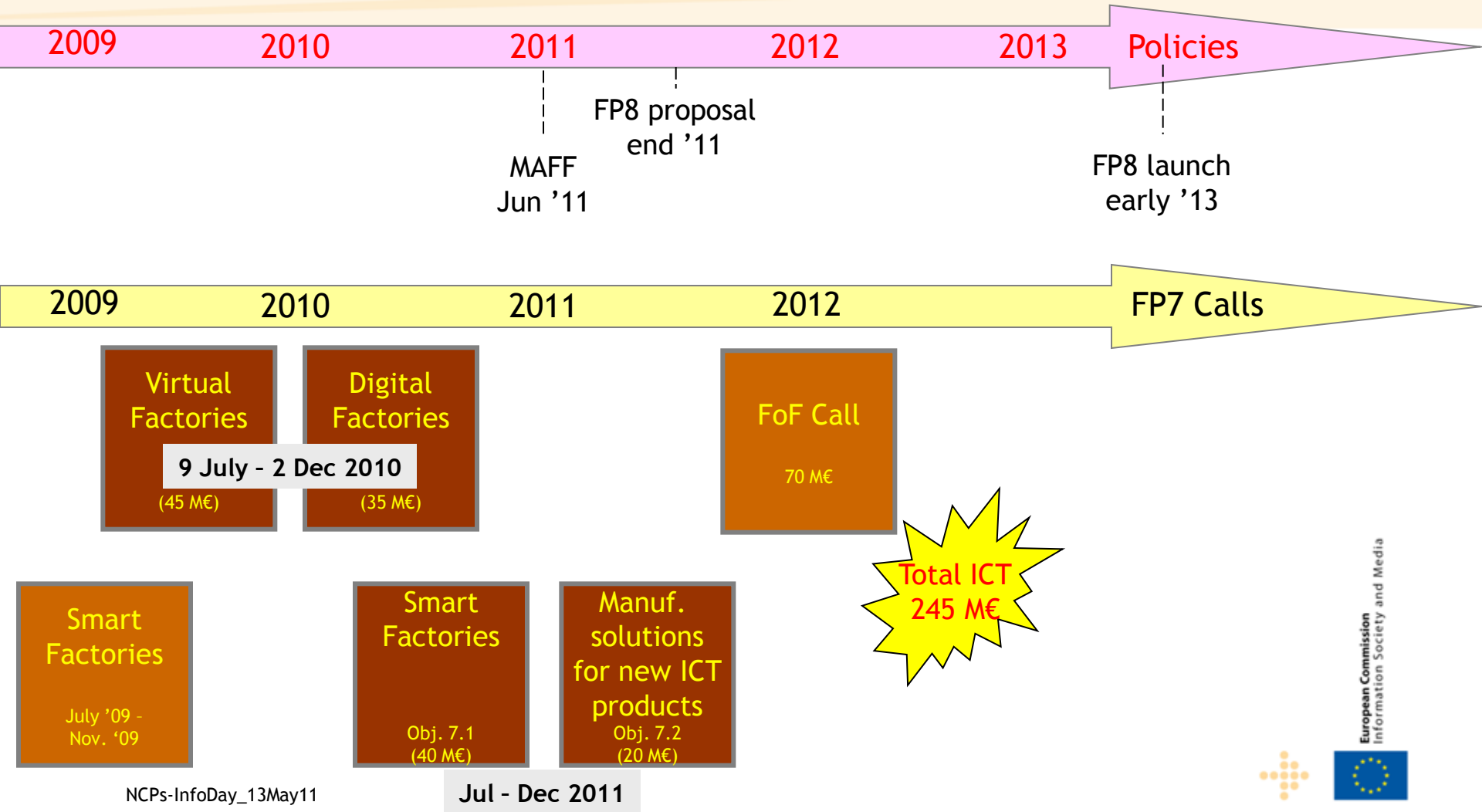
Sub-Domains:

1. Sustainable Manufacturing
2. ICT-enabled intelligent manufacturing
3. High-performance manufacturing
4. Exploiting new materials through manufacturing

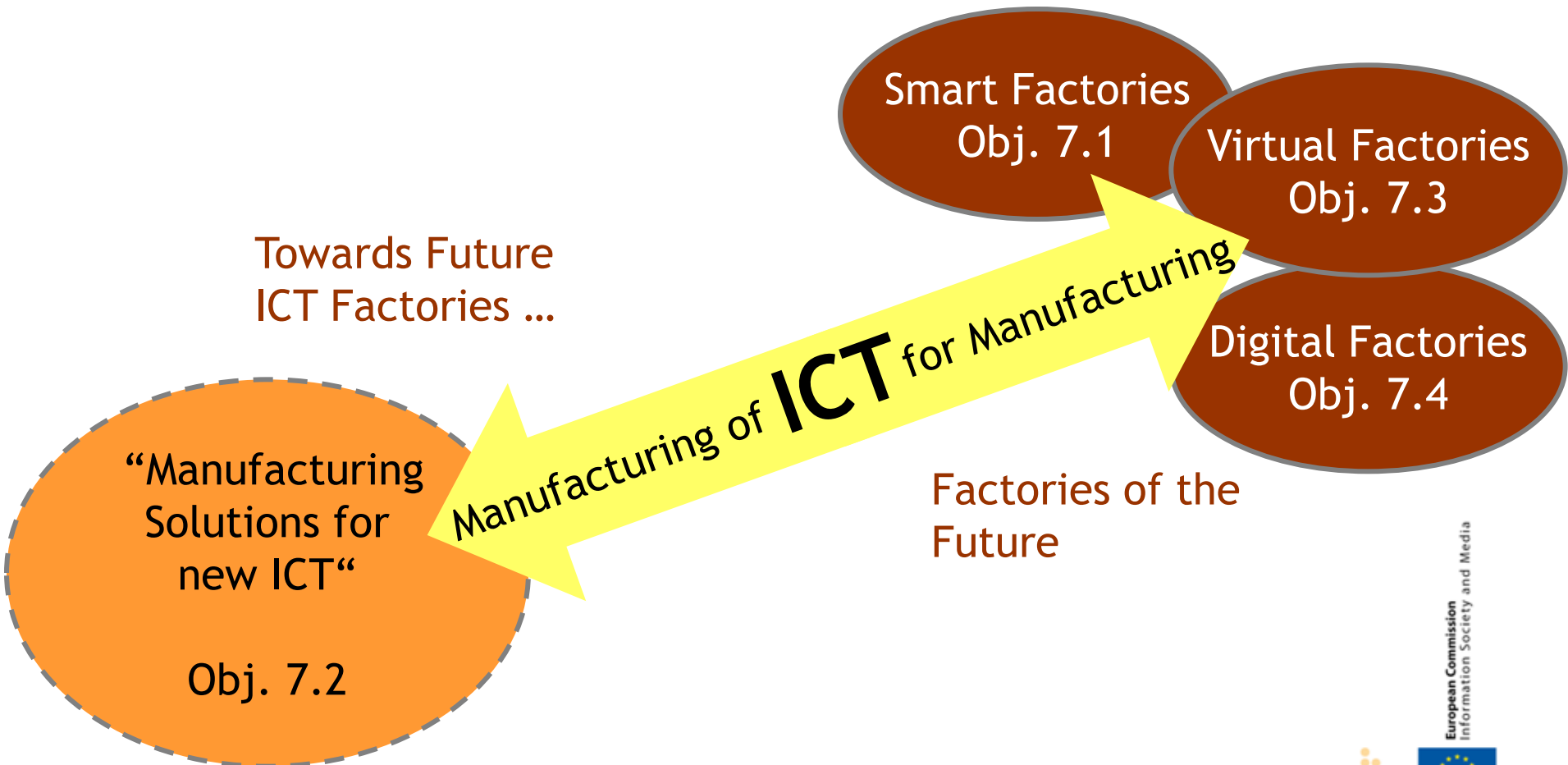


http://ec.europa.eu/research/industrial_technologies/pdf/ppp-factories-of-the-future-strategic-multiannual-roadmap-info-day_en.pdf

Factories of the Future Beyond 2013?



The double role of ICT



Objective 7.1: Smart Factories

Energy-aware, agile manufacturing & customisation

Where do we stand?

- EU:
Global leader in automation, industrial robotics & laser systems
- Key industry players:
ABB, Siemens, Festo, Schneider Electric, Acciona, Bosch, KUKA, COMAU, Trumpf, ...
- EU position:
Increasingly threatened by Japan, USA, Korea, China
- Lack of standardisation

What do we want to achieve & why?

- Maintain & extend Europe's 30% market share: «Factories» as products
- Strong, export-oriented sector needs to maintain competitiveness
- Tackle resource use efficiency of manufacturing (especially reduce 25% share of energy consumption)
- Open new markets for innovative ICT devices & automation systems



Objective 7.1: Smart Factories

Energy-aware, agile manufacturing & customisation

Target outcomes

- a) Demonstration, benchmarking of process automation & control
 - For discrete, continuous or batch industries
 - Key features: flexibility, autonomy, robustness, energy transparency
 - Demonstration in real industrial environments
- b) Large-scale validation of advanced industrial robotics systems
 - User-friendly interaction with & tasking of intelligent cooperative robotic systems
 - Large-scale applicability to flexible, small batch & craft manufacturing
- c) Applications based on factory-wide networks of intelligent sensors, new metrology tools & methods
 - Real-time management of manufacturing information (incl. planning, scheduling, dispatching)
- d) Lasers & laser systems for manufacturing & materials processing
 - High-brilliance diode lasers/laser arrays
 - New wavelengths & online adaptation of beam properties

Call FoF/2011

40 M€

IPs/STREPs



Objective 7.2

Manufacturing solutions for new ICT products

Target outcomes

- Primarily roll-to roll wet deposition, but also other processes, e.g.
 - Evaporation, hot-embossing, laser processing, other low-temperature processes
- Tackle main roadblocks, e.g.
 - Patterning processes, resolution, registration accuracy, process stability, multilayer lamination, encapsulation, automation, in-line quality control, architectures to cut production costs
- Standardisation issues as appropriate
- Industry-driven, strong quality control, testing & validation elements

Feasibility
demonstrators

Call FoF/2011

20 M€

IPs



Thank you

FoF on the web:

http://ec.europa.eu/research/industrial_technologies/lists/factories-of-the-future_en.html

PPP Information Event in Brussels, 9 July 2010

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