



ICT 2013

Vilnius, 07 November 2013, 14:00 – 14:45

Room H1G

WP 2014-15

Photonics &

Thin, Organic and Large Area Electronics

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Photonics Unit

<http://cordis.europa.eu/fp7/ict/photonics>

DG CONNECT - European Commission

Overview of the session



- Introduction to the photonics PPP and its 2014 call topics (5')
- Presentation of ***ICT 26 – 2014: Photonics KET*** (10')
- Presentation of ***ICT 29 – 2014: Development of novel materials and systems for OLED lighting*** (5')
- Presentation of ***ICT 3 – 2014: Thin, Organic and Large Area Electronics Technologies*** (10')
- Specific guidelines for proposers (5')
- Questions and Answers (10')

Horizon 2020

R&I in the EU: 2014-2020



77 B€

- **Excellent Science (32 %)**

*ERC, Marie Curie actions, FETs,
Research infrastructures*

- **Industrial Leadership (22 %)**

*Leadership in Enabling Technologies (ICT,
Nanotechnology materials, Biotechnology,
Production Technologies, ...) ,
Access to risk finance, Innovation in SMEs*

- **Societal challenges (38 %)**

*Health & Ageing, Energy, Transport, Resource
Efficiency, Climate Challenge, ...*



Photonics

Implement Photonics in Horizon 2020 through a Public Private Partnership (PPP)



- The proposed **Horizon 2020** legal text foresees a potential **PPP for Photonics**
- **~1.6 B€** foreseen for both **photonics** and **micro- and nano-electronics**

Photonics PPP

Vision and General Objectives



A long-term commitment between the EC and the Photonics Stakeholders
to invest in Europe with the aim to:

Secure EU's industrial leadership in those application areas where photonics is driving innovation and Europe is strong or where there is potential for creating new markets

- **Foster photonics manufacturing, job and wealth creation in Europe**
(through a long term investment commitment by both industry and the EU)
- **Accelerate Europe's innovation process and time to market by addressing the *full innovation and value chain* in a number of market sectors where European photonics industry is strong**
(e.g. lighting, medical photonics, optical components & systems, laser-based production)



- **Mobilise, pool and leverage public and private resources to provide successful solutions for some of the major societal challenges**



Basic principles of the PPP

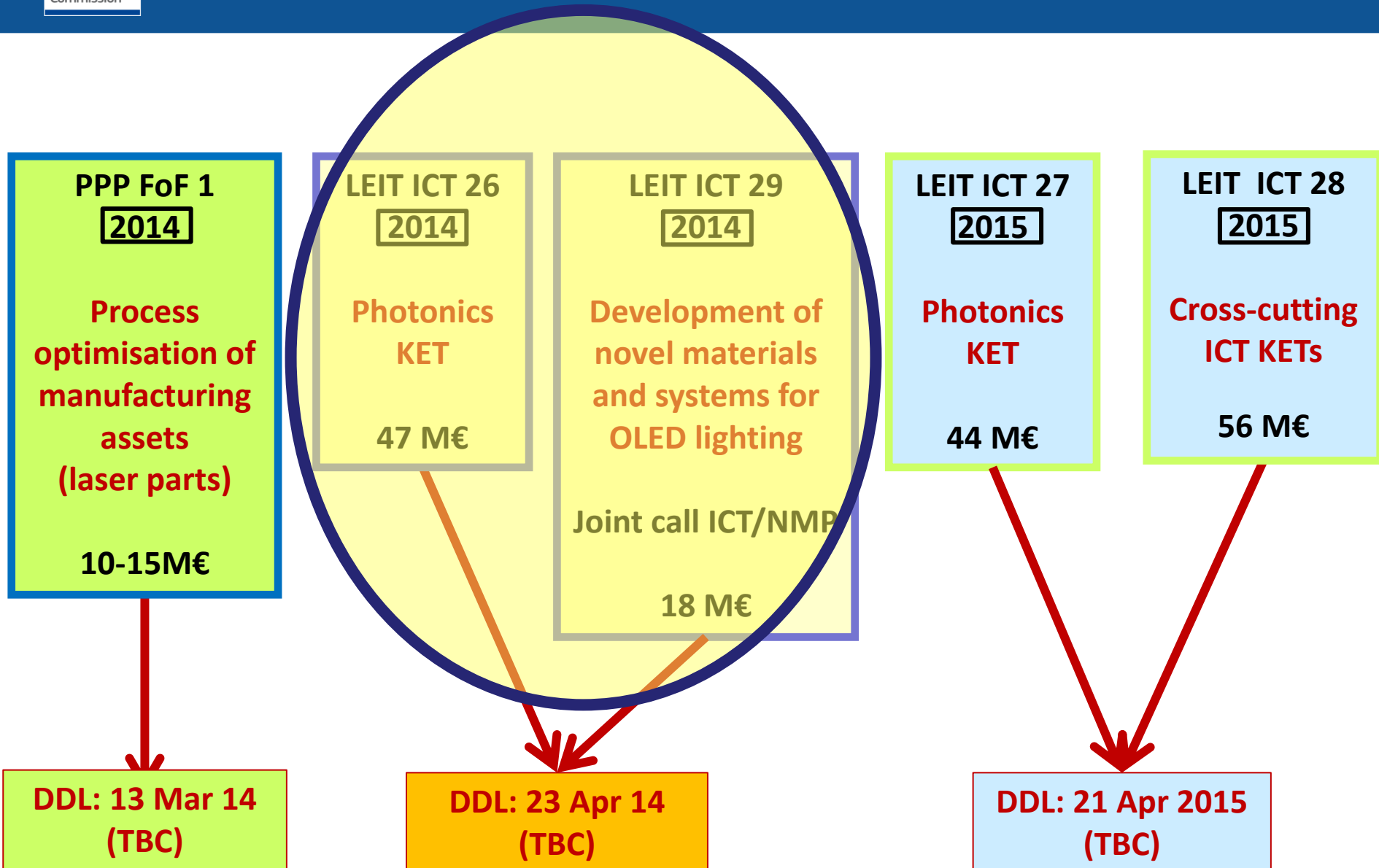
- Open to All, Representative of the Stakeholders, transparent in decision making
- Private sector partners advise the Commission on priorities of H2020 work programmes
- Implementation using H2020 Rules for Participation + comitology (ICT Committee)

What will the PPP change?

- **Commitments:** → **From Commission** to support the field in all Horizon 2020 → **From industry**, to invest on R&I, with greater focus on impact on growth and job creation
- Close interactions to reach agreement on content of calls
- Evidence based monitoring of the PPP performance → through agreed KPIs!
- Large potential to leverage financing from other sources (such as structural funds, EIB)

What will the PPP not change?

- The financial rules are those of Horizon 2020 and calls for proposals open to everybody
- Final responsibility for Work Programme stays with the Commission
- Implementation remains with the Commission: selection and negotiation of proposals, monitoring of projects' progress and payments



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The Specific Challenge

Photonics: Major S&T and R&I progress to sustain competitiveness & leadership in market sectors where Europe has the lead (communications, lighting, laser-based manufacturing, medical photonics, safety & security).

- Address fragmented and uncoordinated developments between national, and regional players → EU value chain(s) and business ecosystem(s)
- Address the "**valley of death**" (turn R&D results into innovative products)
- Exploit the large enabling potential of photonics in many industrial sectors & in major societal challenges (such as health and well-being, energy efficiency or safety)

ICT 26 – 2014: Photonics KET Overview



An Overview of the Actions called: 47 M€

ICT26.a *Research and Innovation Actions*

28 M€

- Application driven core photonic technology developments

Focus is on:

- Biophotonics for screening of diseases
- Sensing for safety and civil security

- Disruptive approaches in sensing

ICT26.b *Innovation Actions*

8 M€

- Open system architectures for Solid State Lighting

ICT26.c *Coordination and Support actions*

5 M€

- Strategic coordination and networking
- The wide uptake of SSL technologies
- EU-wide outreach

ICT26.d *ERANETS*

6 M€

**LEIT ICT Call
DDL: 23 APR 14**

ICT 26.a Research and Innovation Actions

28 M€

■ Application driven core photonic technology developments for a new generation of photonic devices (= components, modules and sub-systems)

– *Biophotonics for screening of diseases*

- ✓ Mobile, low-cost point-of-care screening devices
- ✓ for reliable, fast and non- or minimally-invasive detection of diseases
- ✓ Actions to be driven by medical end-user needs & include validation in real settings
- ✓ No clinical trials

Small projects (2-4 M€)
100% funding

– *Sensing for safety and civil security*

- ✓ Breakthrough advances in cost-effective, high-performance, multi-band optoelectronic devices (incl. sources)
- ✓ for near & mid-infrared sensing applications (0.7 to 50 μm) for high volume markets
- ✓ Device cost in volume production < 10 x cost of devices for visible domain

Small projects (2-4 M€), 100% funding

ICT 26.a Research and Innovation Actions (cnt'd)

28 M€

- Application driven core photonic technology developments for a new generation of photonic devices (= components, modules and sub-systems)

Additional Issues:

- Address related materials, manufacturability, validation of results, standardisation (as appropriate)
- Strong **industrial commitment**, driven by user needs and concrete business cases supported by strong exploitation strategies
- Cover the **value/supply chain** as appropriate

■ Disruptive approaches in sensing

- ✓ **Proof-of concept** for photonic sensing devices offering **breakthrough advances in sensitivity or specificity** from a new technology, new device concepts, new materials or non-conventional light-matter interaction from the research lab
- ✓ Actions should demonstrate the feasibility of industrially relevant devices through a **functional prototype**

ICT 26.b Innovation Actions

8 M€

One large project, 70% funding

■ Open system architectures for Solid State Lighting (SSL)

- Develop & **validate in real settings** new **open** systems architectures (hardware & software) for SSL-based intelligent lighting systems (SSL = LEDs, OLEDs, Hy-LEDs, ...)

Additional Issues:

- Address the specific lighting requirements related to intelligent system control network, cost-effective installation (easy commissioning), safety & security issues, & development of related electronic/photonic devices.
- Architectures should allow interchangeability of the lighting modules
- Focus on **standardisation** of interfaces
- Strong **commitment for industrialising** targeted products in Europe
- **Who should be involved**: microelectronic & SSL manufacturers or suppliers

ICT 26.c *Coordination and Support Actions*

5 M€

- Strategic coordination and networking of Photonics21 stakeholders and other relevant communities for strategic technology road-mapping & coordination with national & regional photonics activities
- The wide uptake of SSL technologies bring together European cities share info, testing facilities, procurement & deployment experiences on SSL, networking European SSL test facilities ensure LED product quality in Europe, training public procurers in SSL technologies
- EU-wide outreach : promoting photonics to young people, entrepreneurs & general public

→ Actions should be driven by key stakeholders in photonics

ICT 26.d *ERANET Actions*

6 M€

A joint call proposals on a photonics topic of strategic interest, to be funded through an ERANET action between national & regional grant programmes

→ Actions should be driven by regional and/or national research agencies

ICT 26.a Research and Innovation Actions

■ **For application driven core photonic technology developments**

- Secured & reinforced technology leadership & substantially increased market presence in diagnostics and in safety & civil security
- Improved business opportunities & value creation in Europe by reinforced cooperation along the value chain
- Substantially improved screening of diseases for more efficient treatment
- Substantially improved sensing solutions for high-volume safety & civil security markets

■ **For disruptive approaches in sensing**

- Secured industrial technology leadership in novel sensing systems targeting applications of high industrial and/or societal relevance

ICT 26.b Innovation Actions

- Reinforced industrial leadership in intelligent lighting systems & related devices fabricated in Europe
- Major benefits for users through the wide market introduction of intelligent lighting systems based upon open system architectures and standardised interfaces

ICT 26.c Coordination and Support actions

- [*Strategic coordination and networking*] Reinforced value chains & deployment of photonics by closer cooperation key photonics stakeholders & users
- [*The wide uptake of SSL Technologies*] Demonstrable improvement of awareness, & support of/for EU cities to widely deploy SSL with measurable benefits for citizens
- [*EU-wide outreach*] Demonstrable increased awareness & recognition of photonics by the wider public

ICT 26.d ERANET actions

- Closer cooperation & greater pooling of resources between regional, national & EU-wide research programmes in strategic photonics R&I actions

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A Joint Call between ICT and NMP

Research and Innovation Actions

18 M€

Small projects (2-4 M€)
100% funding

Focus is on: Materials, process & device technology for OLED lighting

Aim is to:

- On materials: allow for a competitive lifetime for all colours and white light (lifetime of several hundred hours at 97% of the original intensity)
- Realise OLED devices over larger surfaces, with higher brightness, larger uniformity and longer lifetimes
- **Specific target:** energy efficacy above 100 lm/W, with improved out-coupling efficiency

Additional Issues:

- A **demonstrator** at the end of every project
- **Who should be involved:** Material suppliers, OLED manufacturers or suppliers and OLED system integrators

ICT 29 – 2014: OLED lighting Expected Impact



A Joint Call between ICT and NMP

ICT 29: Research and Innovation Actions

- Cost performance breakthroughs – lighting systems with production costs of 1€/100 lm
- Secured & reinforced industrial technology leadership and substantially increased presence in lighting
- Improved business opportunities & value creation in Europe in lighting by reinforced cooperation along the value chain

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An Overview of the Actions called: 38 M€

ICT3.a Research & Innovation Actions 17 M€

TOLAE technologies and manufacturing processes – Focus is on:

- *Conformable / flexible / stretchable substrates*
- *Advanced materials and technologies*
- *Scalable manufacturing processes*

ICT3.b Innovation Actions 15.5 M€

→ *Demonstrate innovative products enabled by TOLAE*

ICT3.c Technology Take-up and Innovation support Actions 3 M€

→ *Competence centres providing EU-wide access services to industry*

ICT3.d Innovation support through pre-commercial public procurement (PCP) actions 2.5 M€

→ *Target is public authorities (acting as first users)*

LEIT ICT Call
DDL: 23 APR 14



ICT 3 – 2014: Advanced TOLAE technologies Scope (1)



ICT 3.a Research & Innovation Actions

17 M€

TOLAE technologies and manufacturing processes

Focus is on:

- Conformable / flexible / stretchable substrates
- Advanced materials and technologies
- Scalable manufacturing processes

Small projects (2-4 M€)
100% funding

➤ *More functionalities with the device, better performance, longer lifetimes, higher mobility/conductivity, more uniformity, better encapsulation*

Additional Issues:

- ➔ *Projects must be **driven by user requirements with strong industrial and user commitment***
- ➔ *Include **standardisation, validation of results** for the target applications and address the **supply chain**, as appropriate*
- ➔ *May include work on **design tool development, design rules and modelling***
- ➔ *May include **hybrid integration of nano-electronics, photonics and/or organic electronics** or specific needs for **fibre and textile electronics***



ICT 3 – 2014: Advanced TOLAE technologies Scope (2)



ICT 3.b Innovation Actions

15.5 M€

Demonstrate innovative products enabled by TOLAE

- ➔ ***Prototype development and demonstration in smart packaging, advertisement or sensing***
- ➔ ***Using **suitable manufacturing options** with the right balance between performance and volume***

Aim is on building a dedicated innovation value chain

**Larger projects (5 - 8 M€)
70% funding**

Additional Issues:

- ➔ ***Should be **driven by concrete business cases** and take into account **user needs*****
- ➔ ***Target medium- to high-volume markets***
- ➔ ***Include business plans for the targeted product and strong commitment to industrialise and manufacture in Europe***
- ➔ ***May include small scale pilot manufacturing***
- ➔ ***Financial Engineering possibilities***



ICT 3 – 2014: Advanced TOLAE technologies Scope (3)



ICT 3.c Technology Take-up and Innovation support Actions **3 M€**

Access services to industry → targeting first users and early adopters, in particular SMEs for the wider adoption and deployment of TOLAE technologies in innovative products

Access services include: Access to knowledge, prototyping, testing, manufacturing, design or engineering

Additional points:

1 project, 100% funding

→ Should be led by the TOLAE excellence centres and innovation clusters

→ May also include TOLAE skills improvement or large promotion to young people, general public, etc.

ICT 3.d Innovation support through PCP actions **2.5 M€** **PCP cofund**

Enabling the take-up and deployment of **electronic and photonic textile technology developments** for health care applications

→ The action addresses public authorities acting as first users by procuring innovative technology development and its take-up

ICT 3.a *Research & Innovation Actions*

- Reinforced ***industrial leadership*** in TOLAE technologies and products addressing ***high-impact, high-volume applications***
- Demonstrable ***innovations in functionality or performance*** and/or in ***manufacturability*** with high reproducibility and yield
- Improved ***business opportunities and value creation*** in Europe by reinforced ***cooperation along the value chain***

ICT 3.b *Innovation Actions*

- Market introduction of **competitive TOLAE products targeting high impact markets/applications** in smart packaging, advertisement and sensing
- Overcoming the "valley of death" and **building manufacturing capabilities and first exploitation opportunities** in Europe



ICT 3.c Technology Take-up and Innovation support actions

- Reinforced **innovation effectiveness of TOLAE excellence centres and innovation clusters** in particular towards SMEs
- Take-up of TOLAE technologies in innovative products by at least 40 SMEs **substantially improving their innovation capacity and time-to-market and with demonstrable revenue growth**
- Increased awareness and education and training skills in TOLAE

ICT 3.d Innovation support through PCP actions

- **Wide diffusion of innovative and cost-effective electronic and photonic textile technology developments** by PCP at the hospital or point-of-care, **enabling improvement of patient's care** while boosting productivity and employment

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- **Comprehensive coverage of all three H2020 pillars**
- **Detailed list of calls and topics**


Find out more:

ec.europa.eu/research/horizon2020

ec.europa.eu/research/participants/portal/page/home

the Participant Portal to be revamped soon:

- **User friendly Participant Portal**
- **Easy to find funding opportunities**

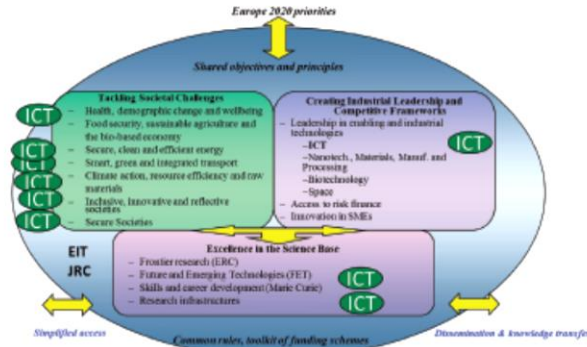


European Commission

A guide to ICT-related activities in WP2014-15

ICT in H2020 – an Overview

As a generic technology, ICT is present in many of the H2020 areas. This guide is designed to help potential proposers find ICT-related topics across the different parts of H2020.



The diagram illustrates the integration of ICT across the H2020 pillars. At the top, 'Europe 2020 priorities' lead to 'Shared objectives and principles'. The three main pillars are:


- Tackling Societal Challenges** (green box): Health, demographic change and wellbeing; Food security, sustainable agriculture and the bio-based economy; Smart, green and integrated transport; Climate action, resource efficiency and raw materials; Inclusive, innovative and reflective societies; Secure Societies. ICT is shown as a vertical stack of five icons on the left.
- Creating Industrial Leadership and Competitive Frameworks** (purple box): Leadership in enabling and industrial technologies. ICT is shown as a vertical stack of three icons on the right.
- Excellence in the Science Base** (purple box): Frontier research (ERC); Future and Emerging Technologies (FET); Skills and career development (Marie Curie); Research infrastructures. ICT is shown as a vertical stack of two icons on the right.

 At the bottom, 'EIT JRC' is mentioned on the left, and 'Common rules, quality of funding schemes' is at the bottom center. Arrows indicate 'Simplified access' on the left and 'Dissemination & knowledge transfer' on the right.

In work programme 2014-15, ICT-related topics are covered as follows:

- Advanced research to uncover radically new technological possibilities and ICT contributions to research and innovation are addressed in the 'Excellent science' part of the work programme, respectively under 'Future and Emerging Technologies' and 'European research infrastructures' ('infrastructures').
- Research and innovation activities on generic technologies either driven by industrial roadmaps or through a bottom-up approach are addressed in the 'Leadership in enabling and industrial technologies' (LEIT) part of the work programme, under 'Information and communication technologies'.
- Multi-disciplinary application-driven research and innovation leveraging ICT to tackle societal challenges are addressed in the different 'Societal challenges'.

The figures above and below provide synthetic overviews of the presence of ICT in Horizon 2020:



Evaluation of Proposals

Award criteria



1. Excellence

- Clarity of the objectives;
- Soundness of the concept, including transdisciplinary considerations;
- Credibility of the proposed approach;
- Progress beyond the state of the art.

2. Impact: [...] contribution to:

- The expected impacts listed in the work programme
- Enhancing innovation capacity and integration of new knowledge;
- Strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global markets;
- ...measures to, disseminate and exploit the project results,... communication.



3. Quality and efficiency of implementation

- Coherence and effectiveness of work plan, ... allocation of tasks, resources;
- Competences, experience and complementarity of the individual participants, as well as of the consortium as a whole;
- Appropriateness of the management structures and procedures....risk management.

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Additional Slides

TOLAE: An emerging technology, the basis for advanced products in large area electronics that are *thin, light weight, flexible and/or stretchable*

➤ Suitable for large market sectors such as automotive, health, ...

The Specific Challenge

38 M€

- Address the main technology barriers of TOLAE:
 - Lack of more efficient and stable materials
 - Lack of more complex TOLAE circuitry and functionalities
 - Increase the performance of components and the integration level
 - Improve route to manufacturability (reproducibility, yield)
- Further develop the TOLAE value chain – become *more application-driven*
- Pay attention to *recyclability* issues

ICT 27: Photonics KET 2015: 44 M€	
Research & Innovation (30 M€)	<i>Optical communication</i> for data centres
	High-throughput <i>laser-based manufacturing</i>
	Device, circuit and fabrication technology for <i>Photonic Integrated Circuits (PICs)</i>
Innovation (PPI) (5 M€)	Pilot deployment of <i>software-defined optics in backbone networks</i>
ERANETs (6 M€)	Actions with the Member States
Coordination & support actions (3M€)	Open access of Researchers and SMEs to advanced facilities; Networking of clusters and national platforms for increasing SME innovation potential

ICT 28: Cross-Cutting ICT KETs 2015: 56 M€	
Innovation (14 M€)	ICT-KET integrated <i>platforms for the healthcare and food sectors (13 M€)</i>
	Coordination of stakeholders in the health sector (bio-photonics and micro-nano-bio solutions) (1M€)
Pilot Lines (3x14 M€)	Pilot line for <i>OLEDs on flexible substrates</i>
	Pilot line for <i>analytical mid-infrared (MIR) micro-sensors</i>
	Pilot line for <i>PIC fabrication on III-V and/or dielectric based platforms</i>