Photonics is a Key Enabling Technology

European Key Enabling Technologies (KETs)
are technologies most capable of improving the EU’s industrial competitiveness:
- Advanced materials
- Nanotechnology
- Micro and nanoelectronics
- Manufacturing
- Biotechnology
- Photonics

Photonic Challenges
- Exploring the full disruptive potential of photonics
- Cross-fertilisation between various photonic technologies

Societal Challenges
- Health & ageing of society
- Climate change
- Security
- Growing need for sustainable energy
- Employment generation

Expected Impact
- Revolutionise health care
- Enable high-volume & low-cost manufacturing
- Produce energy efficient lighting with intelligent management
- Overcome the limitations of electronics
- Constant environmental monitoring
- Reduce pollution and carbon footprint

Strategic Research Areas
- Life sciences & healthcare
- Manufacturing & quality control
- Light harvesting & renewable energy
- Lighting, electronics & displays
- Information & communication
- Sensors & security

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GoPhoton! partners:
Illumination, Vision and Green Photonics

Photonic Challenges
- Solid-state enabled intelligent lighting
- Double the current efficiency of solar cells
- Improvement in cost-performance ratio
- Development of new materials
- Enabling mass production

Societal Challenges
- Ever growing energy needs
- Controlling green house gas emissions
- Reducing impact of climate changes
- Accessible domestic lighting

Expected Impact
- 3 times reduction of energy consumption
- 20-50% improved energy savings
- Reduction in global CO₂ emission by 1000 million tones per year
- 47000 new jobs in display technology alone
- 20% share of renewable energies in EU energy consumption by 2020

Strategic Research Areas
- Solid-state lighting
  Ex: LEDs, OLEDs
- Organic photovoltaics
  Ex: Solar cells, Rechargeable batteries
- Display technology
  Ex: Laser TV, smart gadgets

Material scientists  Physicists  Mathematicians
Entrepreneurs  Environmentalists  Architects
Electronic engineers  Interior designers  Computer scientists
Mechanical engineers  Industrial engineers  Chemists

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GoPhoton! partners:
Health and Life Sciences

Photonic Challenges
- Reliable low-cost diagnosis
- Mobile point-of-care
- Fast and portable water and food quality control
- Accurate imaging
- In vivo tissue manipulation

Societal Challenges
- Ageing society
- Affordable healthcare
- Increased pandemics
- Unmet medical needs
- Contamination

Expected Impact
- 20% reduction in European health care costs
- 30% reduction in cancer mortality aided by biophotonic tools
- Significant growth in the worldwide healthcare market for optical technologies

Strategic Research Areas
- Biophotonics
- Clinical research
- Oncology
- Ophthalmology
- Infectious diseases
- Neuro-monitoring & imaging
- Spectroscopy
- Nanotechnology


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SCIENTIFIC PARTNERSHIPS BETWEEN BUSINESS & RESEARCH IN EUROPE

BIOPHOTONICS | OPTICAL SHARPENING | BIOTECHNOLOGY

GoPhoton! partners:
Information and Knowledge Society

Expected Impact
Transmission capacity of several 100 Terabits per second (Tbps)
Wireless communication at 10 Gbps
Doubling the broadband speed leading to a 0.3% increase of GDP
Revolutionise online business

Societal Challenges
- Exponentially growing data traffic
- Increased network security
- High bandwidth optical interconnects
- Universal access

Strategic Research Areas
- Fiber optics
- Wireless communications
- Silicon photonics
- Quantum information & communication
- Quantum cryptography
- Photonic system design

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GoPhoton! partners:
Industrial Processes and Quality Control

**Photonic Challenges**
- Quality and cost benefits
- New production solutions
- Broadening the spectrum of applications for laser production technologies
- Fabrication and laser treatment of functional surfaces and advanced material
- Processing of composites and dissimilar materials

**Societal Challenges**
- Sustainable and green technologies
- Reliable and durable manufacturing
- Zero-fault and resource efficient production
- Quality control
- Lower industrial pollution

**Strategic Research Areas**
- High power or energy lasers
- Light matter interactions
- Material science and coatings
- Nanotechnology
- Solid state physics
- Quantum optics

**Expected Impact**
- **50% reduction in emissions**
- Maintenance **free** manufacturing
- **Longer** lasting recyclable components
- **Reduced** energy consumption

**Miniaturization**
- **Cost** reduction
- **Leadership** shift of global manufacturing technologies to EU

**An initiative of:**
- GoPhoton!

**Funded by:**
- ECFP

**In support of:**
- International 2050 Vision

**partners:**
- [List of partners]

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Art, Culture and Lifestyle

Photonics helps us understand and preserve our past, impacts and surrounds our present and opens endless possibilities for our future.

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By...