



Photonics Finance in Europe

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European Photonics Venture Forum 2016

ACTPHAST initiative hosted by Photon Delta Eindhoven



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Status



- Photonics market rapidly increasing worldwide. Big opportunity but needs commensurately large investment (and timing is critical: competition)
- Photonics21 very successful to date in uniting community and increasing financing
- EC H2020 financing now grown to €100M/year. Likely total EU photonics investment (countries, VCs...) probably €700M/yr. But sector probably needs €5-10B/year: 10x
- Larger/different sources of money exist
- P21/EC task force launched to think about actions to bring more financing to photonics – ideally 10x more (not easy...). Big support from Commission
- It's work-in-progress but some identified opportunities exist.
- European Investment Bank initiatives may potentially make a major difference if we work together to realize the potential opportunities (soon)



Reminder: Photonics sector big and high growth

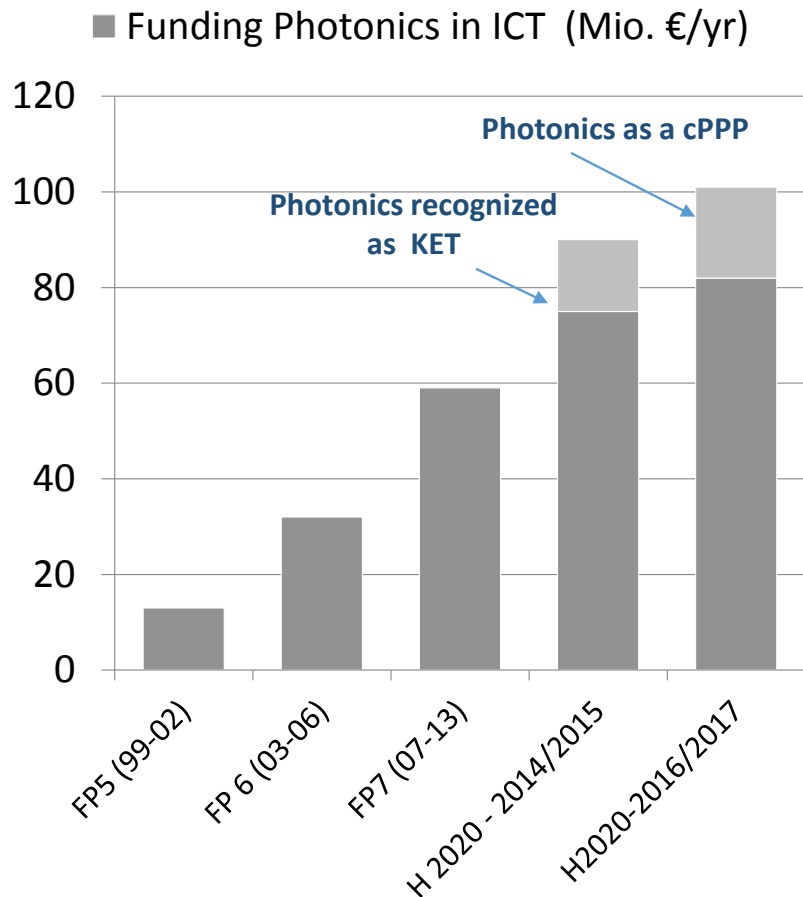
- Global photonics market ~€373 B (2013), growing to ~ € 615B (2020)
- European photonics market ~€65 B (2013): 18% market share
 - SME based
 - ~330,000 employees
- Market shares of European companies
 - Manufacturing technology 55%
 - Optical components & systems 40%
 - Measurement & automated vision 35%
 - Medical technology & life sciences 30%



Above numbers include a few large groups where photonics is key enabler but only a small part of activities; vast proportion of entities are small SMEs



Working with Photonics21, European Commission Financing of Photonics Has Grown to €100M/year



- Photonics EC funding 10x increase in last 15 years
- Current funding level exclusively photonics at €100M/year
 - Research & Innovation grants
- **Plus** new “pockets” in H2020 program, not specifically earmarked for photonics but accessible (e.g., factory of the future, smart cities, cross-KETs, etc.)
- Plus other financing routes being opened
 - Photonics as a KET gives access to new pockets: SME Instrument, structural funds, etc.
 - Juncker plan for SMEs
- EC photonics activity allows aligning entire EU ecosystem



Photonics Public Private Partnership Established in Horizon2020 Between P21 and Commission To Optimize Financing/Coordination of Photonics Sector



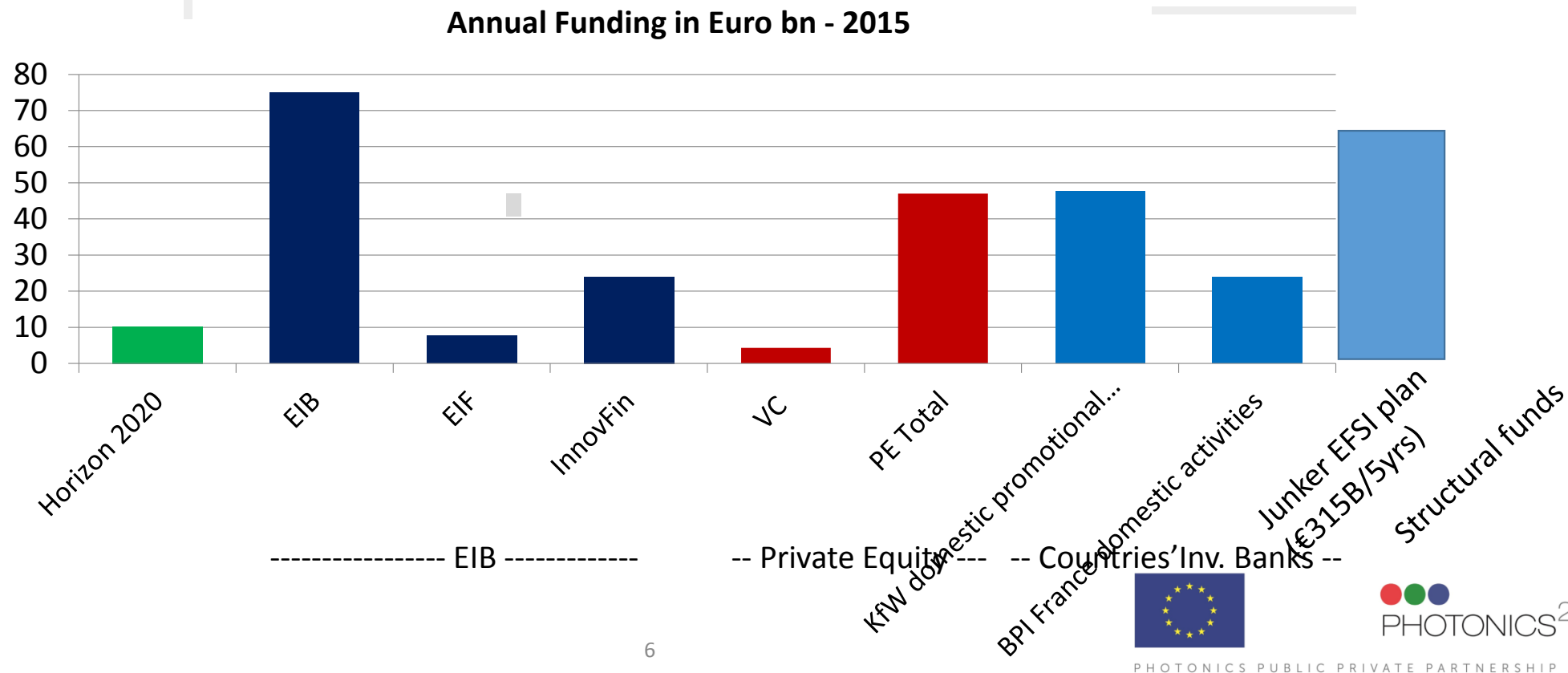
- EC: Investing €700M under Horizon 2020 Program 2014-20
- Private Side: Industry commits to x4 matching
- Co-management of funds: P21 provides roadmap and allocation of funds to calls; EC makes award decision
- Key Performance Indicators of the PPP closely monitored, e.g.
 - Industry/SME participation in calls
 - Jobs created
 - Industry investment



But H2020 Financing Is Small. Where is The Big Money?



- Some numbers to give an idea..



P21 PPP Has Established a Finance Task Force To Understand Better the Opportunities To Increase Photonics Financing



Scope of the Task Force

- Understand better the photonics finance supply and demand
- Facilitate a better understanding of available financing instruments
- Establish a concrete action plan on how the photonics industrial community - in particular high-potential, high-growth SMEs - can be served with financial investments beyond the H2020 grants.

Specific objectives

- Demand Side Needs Analysis: Establish a good understanding on the needs for financial investment by Photonics SMEs and Early on Investment Stage companies
- Match those needs with the Supply side offers
- Organise relevant workshops and events for bringing the necessary actors together

Expected Results

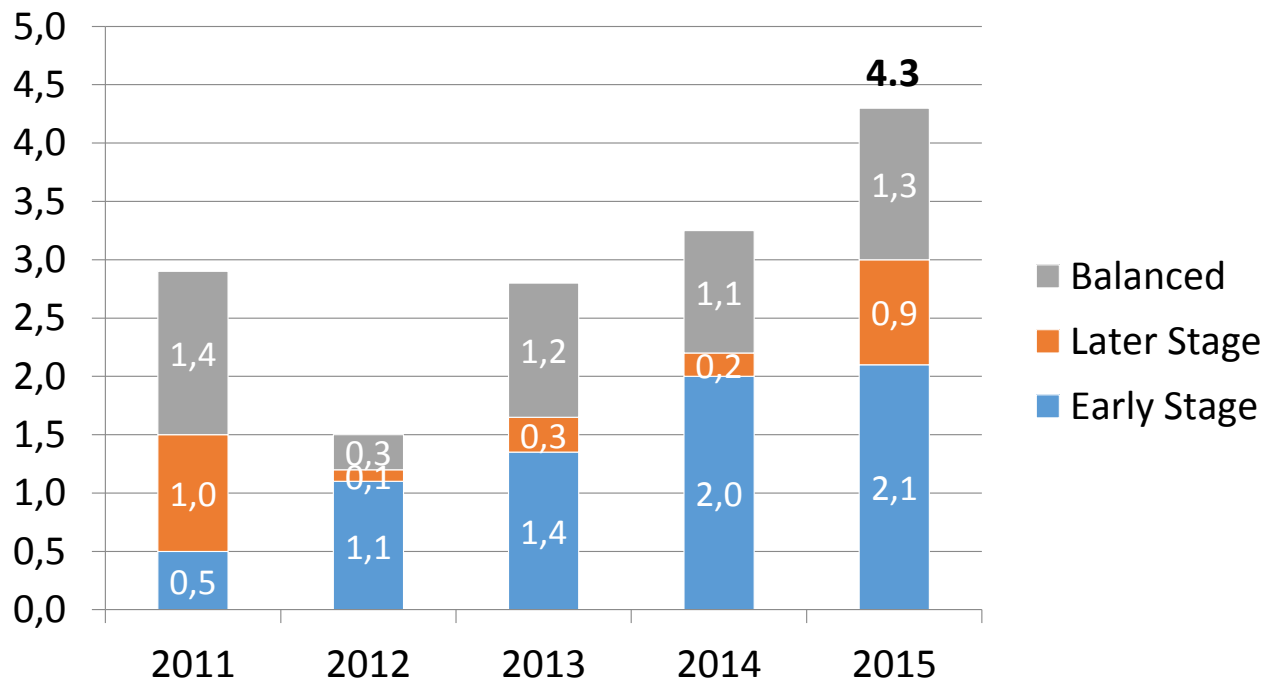
- Start building an invest-in-photonics strategy and action plan to leverage additional funding for companies to bring new products to the market
- Thereby allowing faster growth, bigger market shares, more job creation in higher risky environments



VC Financing in EU: Only about €4B, All Sectors and all countries combined (low!)



VC Investment in Europe – final closing (in €B)



Source: Invest in Europe – PEREP_Analytics – 2015 Private Equity Analytics - €bn

- About €4.3B/year, all sectors
- 150 VC funds in Europe actively seeking investment
- This counts for 12 % of global VC Funding (vs. US 60%, China 18 %)
- To be competitive, it's about 5x too low

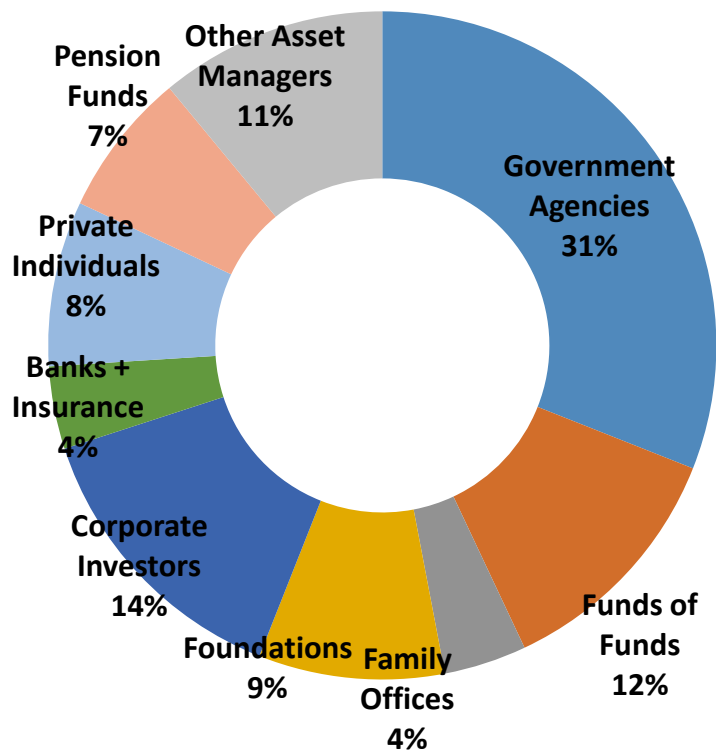


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Government funds have been invested to help VC financing to recover in post-2007 crisis; very welcome



VC Sources of Funding in Europe by Type of Institution

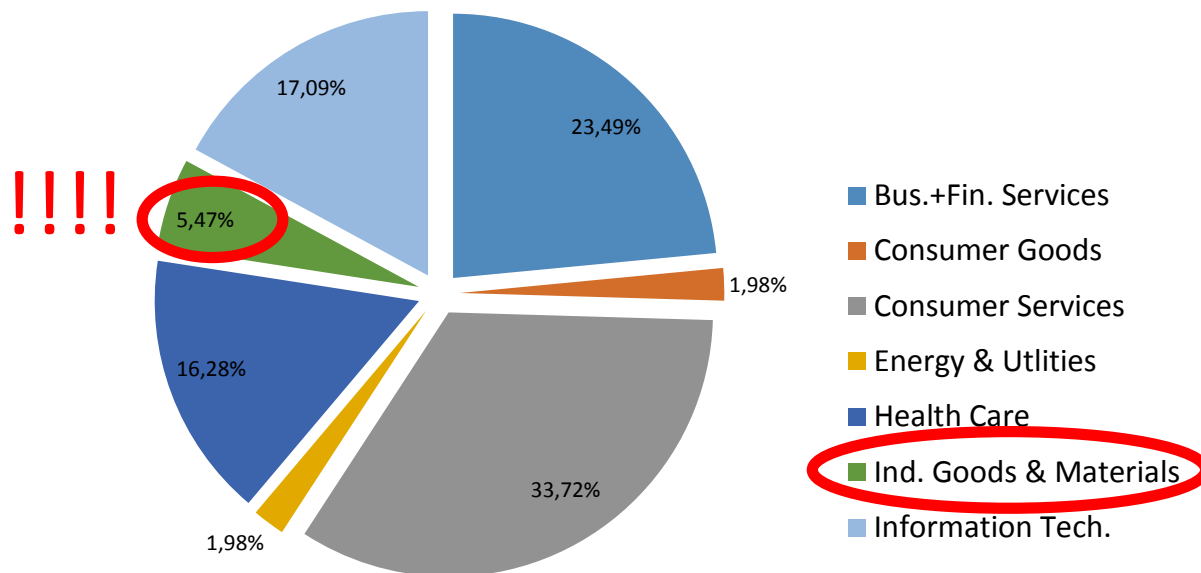


- Governments now playing big role
- 31 % of 2014 EU VC funds from state-backed sources, up from 14% in 2007
- EIF alone put €600m into VC 2014, of a Europe total of €4bn (15%)
 - EIF is involved in 80-90 % of EU VC funds, providing 25-35 % of capital
- Nearly every country has own pet program to back VCs
- Debate on potential distortion effect of such high public involvement; Photonics welcomes public € and seeks it out
- In addition, corporates have been increasingly investing in VC funds



Photonics Getting Small Share of Small VC Funding

Global VC Investment Amount by Industry
(2014; Total: €4.3B)



- Most of photonics investment is under Industrial goods; more limited amounts are in health care, etc.
- Photonics in general has characteristics not well suited to VC financing
 - Long timelines to exit/prototypes
 - High capital intensity in early phases
 - Often need specialized knowledge to assess technology

Improvement options? What are the action steps?

Demand side: Recent Study of EU Photonics SMEs*

- Depends on definition (degree of photonics usage) and on how much of larger multi-technology systems companies are included (skew distribution)
- This study (narrow definition) estimates 400 SMEs in EU with photonics technology and applications
- Maybe do €0.5B/year in sales and €1B/year in financing
 - Financing appetite is low due to low expectations
 - low expectation leads to low ambition
 - Typical EU photonics VC financing of a company is significantly lower than in US for example
- USA x5 finance flows, Silicon Valley x20, China matches EU
- Competing with web apps and mobile/internet for funds
- With more competitive ambitions, we estimate sector financing would need to be at least €5-10B/year (10x)

Demand comment: we clearly need to understand much better our photonics ecosystem; currently we have 10x error bars

* Source: James Cogan

Best Routes For 10x Improvement Appear To be With EU Institutions That Are Finally Eager To Channel Funds To KETs (incl. Photonics)



- Key Enabling Technologies (KETs), incl. photonics, agreed by all to be key for Europe's future competitiveness
- EU institutions truly desire finding ways to channel investment quickly to KETs
 - Commission was actually the one who pushed P21 to start financing task force...!
- Already some new regulations favouring KETs have been implemented
 - KETS can access (huge) structural funds
- Major (€315B) Juncker plan (EFSI) aims to provide major near-term stimulus, in particular to new industrial companies and especially SMEs
- European Investment Bank under big political pressure to lend money fast – e.g., €24B InnovFin to finance innovation. Risks covered at 25% level by Juncker Plan
- EIB truly trying to learn how to do it.



EIB findings for KETs: Instruments OK For Larger, Safer Companies (Traditional Financing), Not OK For SMEs or Riskier Entities

1 Access-to-finance: the market is favourable but only for relatively established KET companies

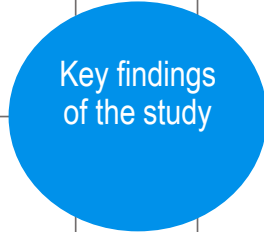
With regard to KET company financing, we see no systemic shortcomings within the European banking sector. Most relatively established KET companies experience favourable access-to-finance conditions in a very low interest rate environment. However, this is not the case for all KET company segments.

2 Conservative financing eco-system not in favour of most dynamic innovators

The prevailing debt financing "eco system" is very conservative: Banks seek to lend to low-risk KET companies with conservative business models and strong track records. "Most dynamic" innovators and research-driven newcomers find it hard to thrive in this environment.

3 Knowledge of KET is key for financing decisions – and in short supply with many banks

KET-financing is a highly knowledge-driven business. Enhanced technology and market expertise is needed but not always available to assess investment plans and business outlooks.



4 Big is beautiful – smaller KET companies face more difficulties

In general, smaller KET companies (revenue < EUR 25 m) find access-to-finance harder than larger ones. Financing conditions in Southern Europe are moderately more difficult than in Northern Europe. Biotech/nanotech companies seem also to face slightly more difficult conditions, due to their average smaller size.

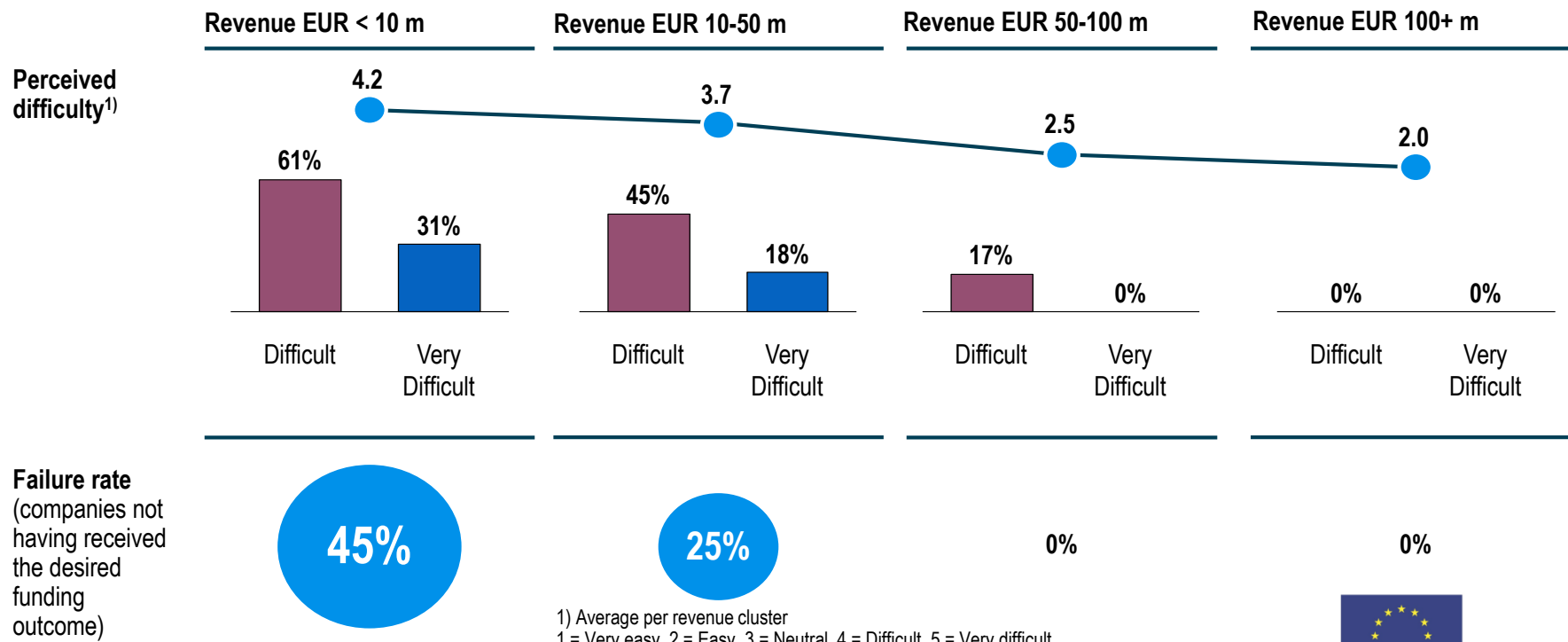
5 Public support well suited to compensate for specific shortcomings

Despite of a number of innovative approaches, commercial banks alone fail to cater to the financing needs of many KET companies. Public sector support would be required in order to significantly leverage the growth and employment potential of KET companies.

6 Boosting growth will require smart, well targeted instruments

With regard to their financing needs, KET companies can be clustered into three clearly cut categories. Each category requires a distinct financing strategy, involving targeted public sector support.

EIB KET Study Finds SMEs have hard time with Financing... So EIB Is Trying To Improve Instruments



New focus of EIB InnovFin Finance On SMEs/Midcaps €24B To Be Spent By 2020 On Financing Innovation



SMEs	Midcaps	Large Caps	Thematic Finance	Advisory
<p>InnovFin SME Guarantee</p> <p>InnovFin SME Venture Capital</p>	<p>InnovFin MidCap Guarantee</p> <p>InnovFin MidCap Growth Finance</p>	<p>InnovFin Large Projects</p>	<p>InnovFin Energy Demo Projects</p> <p>InnovFin Infectious Diseases</p>	<p>InnovFin Advisory</p>
SMEs and small Mid-Caps < 500 Employees	Mid-Caps < 3,000 Employees	Large Caps Typically > 3,000 Employees	SPV, Mid-Caps and Large Caps	Public and Private Sector Promoters
Intermediated SME/Mid-Cap Financing	Intermediated and/or direct Corporate lending	Direct Corporate Lending	Project Finance and/or Direct Corporate Lending	Financial Advisory

Hot spot
for
photonics

direct products
 indirect products

We must work with them to optimize instruments and help channel the funding



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Additional Financing Coordination Actions: Regional industrial investment strategies

- Big ambitions in Photon Delta, Ireland, Berlin..
- Bring together regional, national, EC and EIB leaders
 - make it happen
 - leadership, lobbying, agility
- 3-6 years to get off the ground
 - need task forces in 3-6 regions now
 - each regional programme custom designed



Some Possible Bottoms-Up Action Steps To Stimulate Photonics Investment – Work In Progress



Increase Access to Institutional Lending

- Create some form of *Photonics Investment Plan for Europe* based on active application of the current Investment Plan for Europe to the photonics sector
- Integrate “Photonics InnovFin” and “Photonics Access to Risk Finance” sub-divisions of these programmes into the *Photonics Investment Plan for Europe*
- Joint EIB-EC examination of each of the InnovFin offerings for SME innovation finance with the aim of determining the extent to which they are reaching innovating photonics SMEs
- Create a “forgivable” loan instrument to support innovating SMEs (including high scoring SME Instrument applicants)

Sector Development and Marketing (Sector Investor Readiness)

- Create and promote a Photonics 500 list of firms and a “Photonics 100 most investible companies”. Match this with a “Photonics 100 investors” to include equity funds, corporates, institutions and public sources of development money

Stimulate Photonics Venture Capital

- Catalyse creation of one or more photonics investment funds. The EIF and other public providers of equity finance could actively solicit proposals for funds oriented towards the sector
- Join forces with other KETs areas to reach a consensus on resources to be invested and financial instruments/actions to be developed in the context of InnovFin and of Juncker Plan.



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In Summary



- Current financing of photonics is very low – probably by 10x vs competitive demand
- P21 PPP task force on financing set up and beginning to look at what to do
- Big political support for increasing public financing to KETs including photonics. Pressure on EU institutions/financing entities to help
 - Commission fully supportive
 - Opportunities and support for changing the rules – if we understand how
 - Already EIB/EIF has become a major supplier of money to EU VC funds.
- Large pockets of money available, we need to work with fund-holders to understand how to channel funding to where it's needed
 - E.g., EIB's €24B into InnovFin by 2020 to finance innovation, esp. SMEs. To be spent now.
 - e.g., Juncker's €315B Plan, structural funds, etc
- Also bottom-up and top-down opportunities to improve the VC financing of photonics
- We have work to do...

Donations welcome...

