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Promoting Entrepreneurship in Organic and Large Area Electronics in Europe

Issues and Recommendations

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Abstract

This report summarizes the key findings and recommendations produced in the Entrepreneurship Work Packages of two EU-funded projects, Opera and PolyMap. The overall objective of both projects was to enhance the competitiveness of Europe in the field of organic and large area electronics (OLAE) by facilitating co-operation between European OLAE competence clusters. The specific objective of the Entrepreneurship Work Packages was to promote entrepreneurship and, in particular, to identify and help tackle the various business development challenges of European start-ups and SMEs operating in the area. The report provides an overview of the OLAE value chains and markets and a detailed analysis of the identified business development challenges. In addition, the report issues practical, hands-on recommendations for organising entrepreneur training and mentoring, for facilitating start-up and SME access to finance, and for developing the OLAE business ecosystem in Europe. Opera and PolyMap projects received funding from the 7th European Framework Programme. For detailed project descriptions, please visit http://quadriga-org.eu/index.php?id=11&lang=EN.

Executive summary

The key driver of organic and large area electronics (OLAE), including printed intelligence, is the promise of completely new product concepts combined with low production costs, low energy consumption and environmentally friendly materials and processes. Flexible electrical components and surfaces expand the application space of electronics, introducing it to products and contexts where we have not seen it before. As a result, the world markets for OLAE are expected to grow steeply for the foreseeable future.

But there are many challenges. In short, the material, product and production technologies are still relatively immature and generally inferior to those of the traditional silicon-based electronics in terms of performance, reliability and also cost. With the exception of displays the OLAE applications market is consequently in a nascent stage. Especially Europe lacks large product companies that could generate the much needed market pull for OLAE technologies. This puts European OLAE start-ups and SMEs in a difficult position.

For small companies the miscalculation of business opportunities and insufficient financing are among the major risks of being involved in OLAE development. A new entrepreneur might find it difficult to figure out what it really takes to develop a competitive offering to the market and what the most promising market actually is or could be. This in turn makes it very difficult for small companies to generate revenue, attract private capital and, consequently, finance their R&D and marketing efforts. The most developed European SMEs are at the same time attractive acquisition targets for large Asian product companies investing OLAE.

This report summarizes the key findings and recommendations produced in the Entrepreneurship Work Packages of two EU-funded projects, Opera and PolyMap. The overall objective of both projects was to enhance the competitiveness of Europe in the field of organic and large area electronics by facilitat-

ing co-operation between European OLAE competence clusters. The specific objective of the Entrepreneurship Work Packages was of course to promote entrepreneurship and, in particular, to identify and help tackle the various business development challenges of European start-ups and SMEs operating in the area. Opera and PolyMap projects received funding from the 7th European Framework Programme. For detailed project descriptions, please visit http://quadriga-org.eu/index.php?id=11&lang=EN.

Our key recommendations for the promotion of OLAE entrepreneurship in Europe are as follows:

For entrepreneurs in OLAE

Pay special attention to the development of the product concept and the identification of pilot customers. The product concept is a tool for incorporating the key characteristics of the offering, the underlying technologies, the co-operative arrangements needed to develop, produce and market the offering, and the envisaged business logic into a comprehensible entity. The product concept is an evolving set of documents, supporting the integration of different viewpoints (e.g. user, product, and technology), definition of new product features, setting of technology development goals, drafting of marketing strategies, and processing of market feedback. A clear product concept and an ability to demonstrate product features are essential in search for potential lead customers. Your business case shall be based on the value created to the customer.

For industry consortia and research institutes

Establish pilot production facilities and related services for manufacturing of prototype products and product demonstrators. Such facilities would provide resource-strapped start-ups and SME with the means to test new technologies, demonstrate new product concepts and to boost customer traction. Both small and big companies could make use of the facilities in exchange for a use-based fee, and especially smaller companies would benefit by not being forced to make expensive upfront investments. It is also essential to involve players from all branches of the current / potential value chain, including big product companies and brand owners, to stimulate the development of the OLAE value chain and the applications market. For established companies the benefit of being involved would be networking with new potential suppliers and technology providers (first-mover potential).

For government and municipal agencies

Develop markets for new technologies, products and services through public procurement. The "Small Business Act" for Europe (SBA), adopted in June 2008, stresses the importance of facilitating SMEs' participation in public procurement and helping SMEs benefit more from the Single Market. While many member countries have taken concrete measures to facilitate SMEs' access to markets, e.g. by dividing large public contracts into smaller lots, governments could do much more by assuming the role of the lead customer in new emerging technology sectors with a large potential economic, societal and/or environmental impact (e.g. by promoting the use of energy-efficient OLED lighting in public offices). Using this governmental entry market as a „platform' for technology, product and service development, companies would gain invaluable experience and would be better equipped to address other markets, too.

For European OLAE clusters

Create New Electronics Finance Platform (NEFIN). The general scarcity of seed and early stage funding (risk capital) combined with the challenge of generating steady cash flows constitute a severe impediment to the development of European start-ups and SMEs in OLAE. An intermediating body (NEFIN) should be created to facilitate start-up and SME access to finance and to scan and evaluate potential investment targets for investors. NEFIN would not set up a fund of its own, but would carry out its own research, provide advice for entrepreneurs, investors and financial intermediaries, and coordinate related activities, such as Venture Forums. The technology focus would be on „new electronics', including related fields of electronics, photonics and printed intelligence to secure broader investor interest, where risks are high and lead times are long, but where the envisaged long-term societal impact is also significant. NEFIN could be first structured as a Work Package or Work Task in a EU-funded Coordinated Support Action. One of the project objectives would be developing a long-term operating model for NEFIN, preferably a legal entity capable of financing its own operations.

Contents

Scope and organisation of this document

This report is based on the final deliverable of Opera Work Package 4 (Entrepreneurship) and PolyMap Work Package 3 (Entrepreneurship). The report summarizes the key results of the two Work Packages and issues practical recommendations for promoting entrepreneurship in the field of organic and large area electronics (OLAE) in Europe. The report consists of four key chapters:

- Chapter 1 provides an introduction to the OLAE value chain, present and potential applications based on OLAE technologies, and the development of OLAE world markets. In addition, the main findings on the current situation and business development challenges of European start-ups and SMEs are presented.
- Chapter 2 describes how to organise for entrepreneur training and mentoring, and what are the topics to be addressed. The findings are based on three OLAE pilot training events that were carried out as part of the project.
- Chapter 3 is devoted to funding. The main focus has been set to private funding schemes, especially venture capital, but the key funding instruments offered for SMEs by the European Investment Bank (EIB) and the European Investment Fund (EIF) are also briefly discussed. In addition, the chapter describes how to organise for Venture Forums to facilitate entrepreneur-investor match-making.
- Finally chapter 4 issues recommendations to support the development of OLAE business ecosystem.

1. Introduction

1.1 OLAE value chain and potential applications

The organic and large area electronics (OLAE) value chain is developing rapidly. Some of the actors are dedicated to OLAE, while many others supply the OLAE value chain with specific materials, equipment or technologies, or make use of OLAE-based applications as part of their wider product portfolio. Of the more traditional lines of business especially the chemical and plastics, mechanical engineering, electrical engineering, printing, packaging and consumer goods industries are currently involved in the OLAE value chain.

There are alternative ways of partitioning the OLAE value chain. On a general level the value chain consists of

- research and consulting organizations,
- materials suppliers,
- manufacturing equipment suppliers,
- processing technology developers and service providers,
- device developers,
- system integrators, and
- product companies.

The roles are overlapping in the sense that organizations may occupy several positions in the value chain. A generic OLAE value chain is depicted in Figure 1.

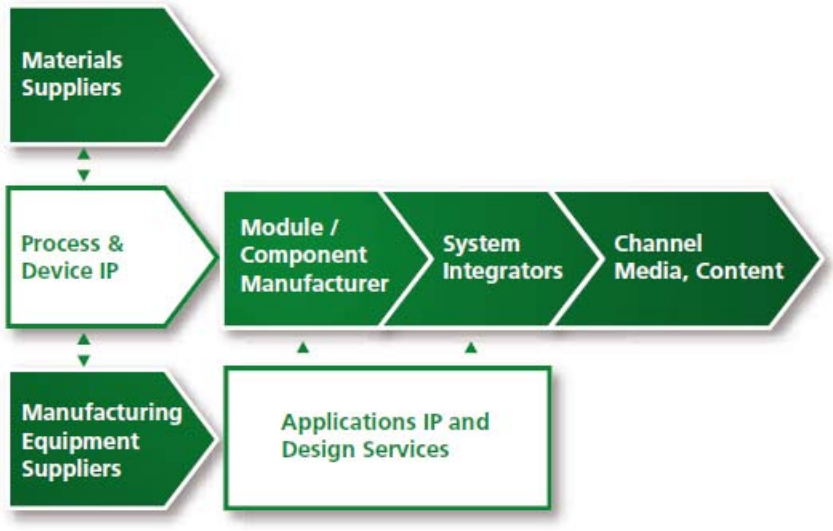

Figure 1. A generic OLAE value chain (OLAE SRA 2009).

On the other hand, the technologies used and the applications developed determine the structure of each particular value chain. Figure 2 presents a printed intelligence / electronics value chain as defined by Pira International in 2007.

Figure 2. Printed electronics value chain (Pira 2007).

OLAE technologies make use of a wide variety of materials and their combinations. They include e.g. organic semiconductors, low-temperature solution and vacuum process able organic, inorganic and hybrid materials, biomaterials and bioactive materials, small particle and nano-particle materials. Substrates like plastic, steel, paper and textiles are used.

Manufacturing involves many processes from other domains than traditional electronics manufacturing, such as roll-to-roll printing, evaporation, laser processing and other low-temperature processes. These methods aim at cost-

efficient, high-throughput production of functional foils and films consisting of basic passive and active electronic components, organic LEDs (or OLEDs), solar cells, batteries and sensors.

Through lamination and interconnection of such functional foils and films it is possible to create both flexible and rigid displays, luminous surfaces and large area sensors, autonomous energy sources, disposable point-of-care diagnostics, and so forth. OLAE manufacturing concepts may also be integrated into existing manufacturing lines to add functionality for example into product packages, print media and textiles. (Table 1.)

Table 1. Examples of present and potential future OLAE applications.

Technology area	**Present/short-term**	**Mid-term**	**Long-term**
OLED displays	Colour displays for mobile phones, PCs and TVs	Interactive, high resolution displays	Flexible, high-quality all-organic displays
OLED lighting	Decorative lighting for households	Robust lighting solutions for households and businesses	Flexible, high-quality all-organic luminous surfaces
OPV	Off-grid power sources for small electric devices	Off-grid power sources for residential use	Off and on-grid power sources for residential and industrial use
OTFT and integrated smart systems	Printed RFID and low-capacity memory	Affordable point-of-care diagnostics	Integration of print and digital media

The motivation for R&D comes mainly from the promises of low production costs, low energy consumption, ability to develop flexible electrical components and surfaces, new applications, and a low environmental impact. But there are many challenges. With respect to OLED technologies they relate e.g. to the difficulty of developing high-quality displays and lighting elements on flexible substrates. In organic photovoltaics (solar cells) they relate e.g. to low performance and lack of large-area production capabilities. In short, the product and production technologies are still relatively immature and therefore generally inferior to those of the traditional silicon-based electronics in terms of performance, reliability and also cost.

1.2 World markets and Europe's competitive position

Perhaps the most important impediment to the development of the whole value chain is the lack of market pull. Most OLAE-based product concepts are yet to be commercialized.

The display market is currently the only economically significant application area for OLAE technologies. The organic display market is currently dominated by emissive OLEDs and reflective (electrophoretic) displays. OLEDs are mainly used for manufacturing displays for small handheld devices, such as mobile phones. First OLED-based computer and TV displays have also seen the daylight but that market is still marginal. Reflective displays (also referred to as e-paper) have found their ways to the increasingly popular e-readers. Both display types are currently available only on rigid substrates (glass backplanes).

The major research and development challenges in this area relate to the development of colour reflective e-paper and flexible, high-quality OLEDs. Such developments are crucial for the development of the applications market. For example, Deutsche Telekom, owner of the T Mobile brand, has indicated that both e-readers and tablet computers need significant improvement to host digital newspapers and magazines (PlusPlasticElectronics, June 2010). Frost & Sullivan (2010) estimates that the production of colour reflective e-paper could commence as soon as in 2011. On the other hand, they estimate that flexible, high-quality OLEDs will not be available before 2017.

There are a few companies that already manufacture and market OLED panels for commercial lighting applications. For the time being they all come with rigid backplanes, have limited self-life, and are expensive to produce. As a result, the product market is still marginal, mainly consisting of a limited number of expensive designer creations. The first products applying organic photovoltaics are also entering the market, including power generating window panels, textiles and apparel. Like OLED lamp they also fall in the category of „concept products' lacking substantial supply and demand.

Other product concepts based on the development of printed electronics, such as disposable point-of-care diagnostics and intelligent packaging applications, are still a few years away from commercialization. For example, according to Frost & Sullivan (2010) high-end brand protection and authentication applications may become commercially available by 2013, while a complete lab-of-chip, including sensors, sufficient memory, digital processing blocks and an internal power source, would take four more years to enter the market.

According to Databeans (Dataweek, August 2010) the current size of the OLED display market is USD 1.4 billion (corresponding to 130 million units sold). The market is estimated to grow to USD 3.5 billion (348 million units) by 2013 and to USD 6.3 billion (810 million units) by 2015. These figures correspond to the compound annual growth rate of 35% for the revenue and 44% for the volume. A great majority of these displays would be installed in small handheld devices, such as mobile phones. The OLED TV display market, which is still very small, is expected to grow at much faster rate and reach EUR 1.4 billion by the end of 2015 (OLAE SRA 2009).

There are a number of projections for global sales of dedicated black-and-white e-readers in 2010. Projections for units sold in 2010 range from 6 million by Yankee Group to 10 million by Display Search, an Austin-based research firm, and 12.2 million by London-based Informa Telecoms & Media. Earlier this year Informa reckoned that while the sales of black-and-white e-readers is expected to grow to 14 million in 2013, the figure will start to drop afterwards because of pressure from emerging colour e-readers that offer multimedia access. Another factor influencing the demand for black-and-white e-readers is competition from full-colour tablet computers, such as iPad, which offers multimedia functionality and a LED display. (ComputerWorld, August 2010.)

When it comes to the whole OLAE market, including the all key technologies and potential application areas, market projections become highly speculative. Figure 3 shows IDTechEx (2010) market forecast for 2010–2020 for printed and potentially printed electronics, including organic, inorganic and composites. The market forecast has been prepared by component type. Therefore the figures do not include the entire cost / market price of the actual end products which in most cases also contain conventional electronics.

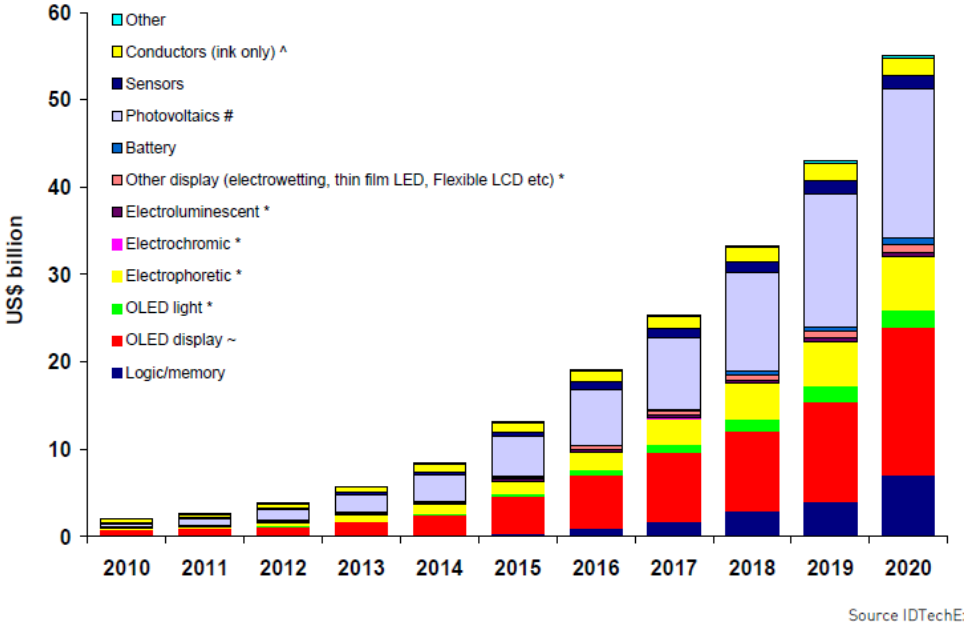

Figure 3. Global market for printed electronics (IDTechEx 2010).

IDTechEx predicts that OLED displays and photovoltaics (power generation) are assumed to possess the greatest market potential for the foreseeable future. From 2015 logic and memories are also expected to play an increasingly important role in the OLAE market. Perhaps surprisingly, the relative market share of OLED lighting, an area of great importance especially for Europe, is predicted to remain fairly modest. The combined market size for printed and potentially printed electronics was estimated to around USD 2 billion in 2010. The market is expected to grow to USD 13 billion by 2015 and reach USD 55 billion by 2020. The geographical split by territory is presented in Table 2.

Table 2. The market for printed electronics by territory in USD bn (IDTechEx 2010).

Territory	**2010**	**2015**	**2020**
North America	0.44	2.75	11.74
Europe	0.50	3.14	12.84
Asia Pacific	1.06	7.19	30.31
Rest of World	0.00	0.01	0.22
Total	1.99	13.10	55.10

Europe's competitive position in OLAE is different in different parts of the value chain. The level of R&D on organic materials is very high in Europe. Companies like Merck, Novaled, CDT, AGFA, H.C.Starck, Evonik and BASF are leading materials suppliers in the various OLAE markets. As the chemical industry is and must remain strong in Europe, it is of strategic importance that Europe stays the global leader in materials for OLAE.

In the next step of the value chain, device design, Europe is currently also a global leader: Both in organic LED and solar cells, current record values are held by European groups. In transistors and other circuit development Europe is leading as well. Again, the challenge is to defend and extend this position. In particular, this requires a joint effort of university labs and industry to quickly transfer new developments in technology into new product concepts.

When it comes to manufacturing, the picture is less rosy: Although European toolmakers have made significant innovations like inline coating, novel printing techniques, and OVPD, the actual organic device manufacturing (predominantly displays) is completely dominated by big Asian players. According to MarketsAndMarkets (2010) Asia Pacific holds a 90.1% share of the global OLED manufacturing market, followed by Europe with a 6.2% share and Americas with a 3.8% share.

To keep the full value chain in Europe it is necessary to ensure that manufacturing is established in Europe, too. This calls for a proactive approach from European product companies. In particular, they should apply the new technology to their new products and thereby help create healthy market pull for the whole value chain. Companies like Philips and Osram, the European pioneers in OLED lighting with strong consumer brands, will play a key role in this endeavour.

1.3 The position of European start-ups and SMEs

The challenges and support needs of European OLAE start-ups and SMEs were charted as part of Opera and PolyMap projects by means of three online (web-based) questionnaires. The first one, „Stakeholder survey', was aimed at the industry and its major stakeholders in general, while the two others were tailored to small and medium-sized European ventures. In addition to the data generated by the three questionnaires, this report builds on numerous discussions with entrepreneurs and the information and insights gained in Opera and PolyMap project events, such as the Finance and Investment Roundtable that was held on

27 October 2009 in Dresden, Germany, and the first Organic Electronics Entrepreneur Training Day that was held on 10 November 2009 in Oulu, Finland.

For small companies the miscalculation of business opportunities and insufficient financing are among the major risks of being involved in OLAE development. These risks largely stem from uncertainties pertaining to the performance, robustness and cost of technology, which hinder the development of the applications market. A new entrepreneur might find it difficult to figure out what it really takes to develop a competitive offering to the market and what the most promising market actually is. This in turn makes it very difficult for small companies to generate revenue, attract private capital and, consequently, finance their R&D and marketing efforts.

Being largely deprived of private (venture) capital, small companies take advantage of various public, mostly national and regional funding schemes. They also provide a range of consulting and subcontracting services, often outside their (intended) core business, to help accumulate working capital and finance their R&D operations. These measures, however, typically fail to secure the necessary funds for effective product development and marketing.

This is not to say that nothing is being done. The European Investment Fund (EIF), for example, has got various financing instruments to support demanding R&D and business development activities in SMEs e.g. in the form of equity, loans, guarantees and grants. But such instruments can only supplement the necessary private equity investments which are in short supply. In addition, EIF funding needs to be applied for through the so called financial intermediaries, such as banks and venture capital companies, whose knowledge of these instrument – as well as their interest in getting involved in bureaucratic transactions that do not directly increase the expected return on their own investments – is limited. It can be argued that insufficient start-up company funding is an important impediment against creating higher commercial value and more jobs in Europe in the field of OLAE.

Various financial issues often manifest themselves in the form of diverging business interests or unwillingness to share economic risks, which effectively hamper co-operation between SMEs, their prospective customers and also research institutes. Especially pilot customers are difficult to find. According to entrepreneurs and SME managers a good pilot customer would “accept that the product is not ready”, “be more open to share their problems and needs”, “engage in joint-development”, and perhaps also “co-invest” or “pre-finance development”. Our surveys suggest that this is not happening to any significant de-

gree. One important contributing factor is the lack of large European product companies applying OLAE technologies in their end products. This lack of strong market pull is difficult to circumvent by public support schemes.

On the other hand, large research organisations can be “uncooperative, expensive and competitive on IP”, and are not always “able to listen to market needs”. The problem is that the knowledge and technologies that the universities and other research institutes have developed, often using public funds, may be off limits to SMEs. For some small research-oriented companies public R&D organisations are also competitors. Their superior facilities and subsidized prices make it difficult for small companies to compete.

It has also become evident that EU framework programmes do not currently serve the interests of small companies in the best possible way. While big companies can often take advantage of EU projects, this is not always the case with SMEs due to the unreasonable administrative burden. Secondly, the projects are often too ambitious or rigid for small companies. For a SME the most effective way of contributing to the competitiveness of Europe is the creation of new business and jobs, not necessarily that of engaging in long and tedious processes to develop new standards, platforms or policy papers.

The result is a system of interconnected factors which collectively hinder the development of the OLAE applications market and the manoeuvring space of especially small European companies (Figure 4).

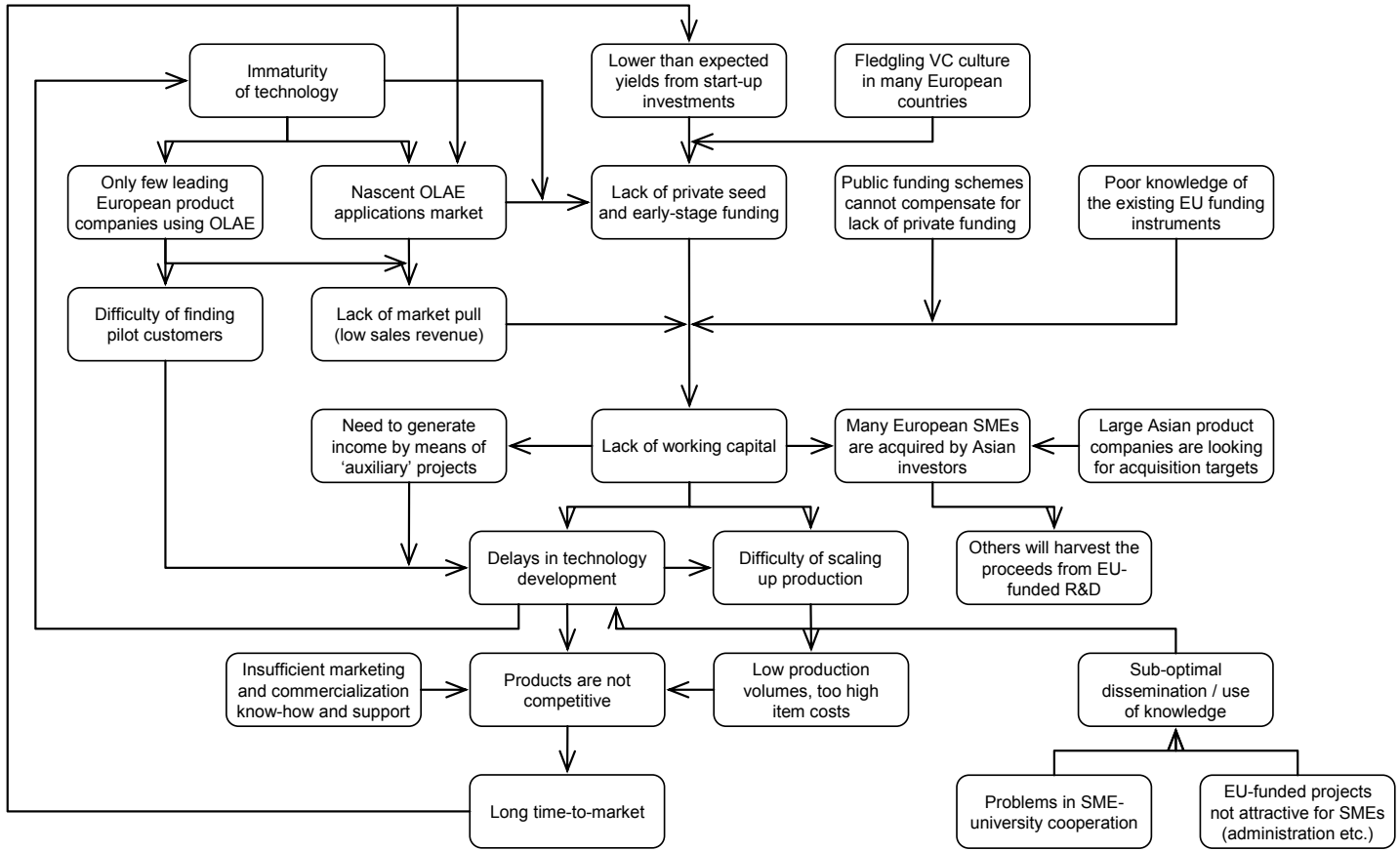

Figure 4. Selected factors contributing to the business development challenges of European OLAE start-ups and SMEs.

It must be noted, however, that there is also a great deal of optimism amongst the companies that took part in our surveys and events. The optimism seems to stem from the perceived future growth potential of the OLAE applications market, the inherent benefits of OLAE in comparison to silicon-based electronics, and the prospects of creating a viable industry cluster, covering a large part of the whole value chain, in Europe. In a way we are running against the clock. Provided that the potential is there the question for small companies is about making sound strategic decisions and surviving while crossing the valley of death.

SMEs themselves maintain that they need additional know-how and support especially in relation to commercialisation, marketing and funding. It is proposed that before all new entrepreneurs need hands-on guidance provided by other, more experienced entrepreneurs. Publicly funded business incubators and local development agencies can provide invaluable help, but all development agencies cannot possibly be filled with experienced entrepreneurs or people possessing in-depth understanding of OLAE technologies or the OLAE value chain. Therefore special attention should be paid to establishing and developing industry-specific support mechanisms. In this report we will describe, based on our own experience, how to develop and implement entrepreneur training and mentoring events to help new and would-be OLAE entrepreneurs move forward, e.g. to assess their business ideas, to develop their business plans and to manage the whole commercialization process.

Scarce seed and early-stage financing is likely to remain a big problem in the foreseeable future. While it is extremely difficult to influence the general mood of the private equity markets, it is however possible to help entrepreneurs take full advantage of the existing opportunities. As a result, this report contains a concise introduction to the most relevant forms and instruments of public and private funding. Moreover, we are going to describe, again on the basis of our own personal experience, how to facilitate investor-entrepreneur interactions in practice through the venture forum concept. Since venture capital (VC) is still a relatively young concept in many parts of Europe, a proactive approach is needed to make the playing field more level for European start-ups and SMEs vis-à-vis their American (where the VC market is much more developed) and Asian (where big product companies create market pull) counterparts.

Finally we need to ask ourselves what can and should be done to develop the whole OLAE business ecosystem in Europe. This is especially important for small companies. A small company can seldom alone develop demanding tech-

nologies or assume responsibility for supplying globally operating conglomerates with materials or products that are needed in large quantities. The key is to make the whole European OLAE value chain supportive for small companies. In the final section of this report we will issue recommendations on how to make it easier for small companies to test and demonstrate new technologies and product concepts, to open up new application markets, and to acquire growth financing. In addition, we will provide guidance for entrepreneurs.

2. Entrepreneur training and mentoring

2.1 To whom and why

Relatively few Europeans prefer to embark on an entrepreneurial career in comparison to the USA. This may partly stem from structural matters, such as job security, taxation, bureaucracy, labour laws or limited access to venture capital, but there are also cultural and educational factors affecting the equation. Entrepreneurship is seldom brought out as a natural choice of career at school. The European university system is geared towards producing highly-specialised professionals for big industry, scientists for academia and traditionally also civil servants for the administration. Especially academic curricula have proved grossly incapable of providing students with hands-on knowledge of how to identify and assess business opportunities or to deal with the practicalities of setting up and running a business. It is no wonder that most entrepreneurs do have a non-academic background. Now the question is: how to promote entrepreneurship within high-tech domains, such as OLAE, where the substance is essentially academic?

The OLAE Entrepreneur Training Concept that was piloted in Opera and PolyMap projects targeted especially academic would-be entrepreneurs (individuals as well as research teams) and start-ups that were under preparation or recently incorporated. The main entry requirement for each participant (individual or team) was at least a preliminary OLAE-related business idea and willingness to develop the idea further.

Training may of course cover a range of issues. But the most important thing is to provide feedback and to help people move forward. This entails striking a sound balance between constructive critique and encouragement, as well as analysis and experimentation. An important element of any training programme is to link the new entrepreneurs to each other, as well as to other more experi-

enced entrepreneurs and subject-matter experts who could act as mentors. While occasional training events can equip the participants with selected facts, case examples and reference models, a good mentor network can provide specific advice and support when most needed.

2.2 Key topics of training and mentoring

The key topic areas of OLAE entrepreneur training are technology and market overview, technology entrepreneurship and business development support. The first area, technology and market overview, should provide insights into the latest trends and new emerging opportunities in technology development and applications markets. This would help the participants assess their position in the OLAE value chain. The second section, technology entrepreneurship, would be of generic nature and provide introduction to the common aspects of setting up and running a business. The third section shall be tailored to the specific needs of the participating entrepreneurs and teams with a view of providing them with hands-on support and advice on concrete business development challenges. The weight of the three areas shall match with the prior experience and (assumed) needs of the participants. The check-list below provides examples of related items in more detail.

Technology and market overview (OLAE specific)

- Technology development (materials, equipment, processes, devices)
- Applications market development
- Market participants, structure of the value chain
- Balance of supply and demand in different parts of the value chain
- New emerging opportunities.

Technology entrepreneurship (generic)

- From lab to market: what does it take?
- Elements of a business plan
- Nature of the technology commercialisation process
- IPR issues
- Financing instruments
- Company form, ownership structure, shareholder agreement
- Leadership, teambuilding, commitment, incentives.

Business development support (case specific)

- Defining the „product focus'
- Targeted markets / customer segments
- Competitor analysis
- Assumed / pursued competitive advantages
- Technology maturity, research and development needs
- Competence base and recruitment needs
- Technology and business development plan, milestones
- Partners and pilot customers
- Financing needs and plans
- Mentoring.

In practice the available time frame, and the availability of suitable speakers and coaches, will limit the scope of training events. It is not feasible to try to squeeze everything in one event. Instead, it is generally far more effective to address the selected topics properly and to reserve enough time for interactive coaching and discussions. In the following section we will describe, based on our own experience, how to organise for training events.

2.3 How to organise for training events

Effective training involves the use of different methods. The most important thing is to keep the objectives clearly in mind and to organise the event around the key topics to be addressed. Another important principle is interactivity between the trainees and the mentors. Irrespective of the method of training, be it group work or lecturing, the trainees should be encouraged to pose questions and comment on the subject matter presented. At least the following methods have been used as part of Opera / PolyMap entrepreneur training sessions:

- Homework
- Invited presentations
- Case presentations
- Group work (workshops)
- Plenary sessions.

Homework. The trainees are requested to prepare a short presentation on their business idea, ideally 5 informative slides covering the following issues: 1. Technology; 2. Team (and ownership in case the company is already up and

running); 3. Products / services to be developed; 4. Customers in focus; and 5. Particular needs / expectations concerning the training event. These case presentations are to be sent to the organisers prior to the event. The trainees may also be requested to read selected articles covering some of the topic areas of the event. For example, if special attention is to be paid to IPR issues, an overview of different forms of IPR and related processes could make a good read.

Invited presentations. The key purpose of having invited presentations is to provide information of the selected focus areas of the training event. They may cover e.g. the development of OLAE technologies and markets, personal experiences of establishing and running a new venture, elements of a good business plan, local business incubation and mentoring services, and so forth. Presentations may be given e.g. by researchers, other entrepreneurs, representatives of public funding agencies or venture capital companies, and local incubators. The optimal number and length of the presentations is determined by the length of the training event. If the length is one working day, no more than 3–4 invited presentations should be included in the programme to preserve enough time (and energy!) for trainees' case presentations, case-specific group work and plenary session(s). In addition, around 10–15 minutes should be reserved for questions and discussion after each presentation.

Case presentations. These are to be given by the trainees on the basis of the homework (see above). The case presentations and related homework serve two main purposes. First, they train the new and would-be entrepreneurs formulate and present their ideas in a concise and informative way. Presentation skills play an increasingly important role e.g. in fund raising and marketing and therefore should belong to the core competence of each team developing a new business. Second, through the case presentations the other attendees get to know what the team is doing. The case presentations lay the foundation for the subsequent group work sessions (see below) and may also provide new ideas for the other trainees. The duration of the initial case presentations should be limited to around 10 minutes per entrepreneur/team, followed by 5–10 minutes for questions and discussion. This is one way of simulating and coaching the trainees for investor pitching events, where the time slot is typically limited to 10–15 minutes per company.

Group work. The entrepreneur training model developed as part Opera and PolyMap projects places great emphasis on group work. The objective is to provide tailored coaching to each entrepreneur/team. Coaching is to be provided by experienced mentors with a strong entrepreneurial background. Each entrepre-

neur/team should be assigned with one or two mentors on the basis of the mentors' preferences (two mentors may be needed if the team requires both generic guidance and specialist advice e.g. in relation to legislation or finance). The mentors' main job is to get acquainted with the present status of the corresponding case, identify its major strengths, weaknesses and development needs, and help the team identify and assess their future options and specify the next steps forward. The mentors can be instructed to resort to their own personal experience and views, and to place special emphasis on the attendees' explicitly expressed information needs and expectations. The organisers of the training event may also develop a common coaching framework in association with the selected mentors to ensure uniformity of mentoring across the participating teams. For example, if drafting a business plan is the special topic of the day, the framework could include the common elements of a business plan that are to be addressed in each group. In one-day event the group work sessions could take e.g. two hours. The trainees document the advice given and prepare for presenting the main results in the following plenary session (see below).

Plenary sessions. Each team presents the results of coaching in a plenary session. The idea is to stimulate discussion and collective problem-solving by making the identified challenges, uncertainties and open questions visible. A related objective is to train the attendees to speak about their ideas and plans with trusted colleagues and mentors, and to seek for and utilise feedback as part of the concept development process. The summarising presentations can be relatively short, e.g. 10 minutes per team, but more time should be reserved for resulting discussions (e.g. 15–20 minutes per team). Key discussion points should be documented by the organisers. In addition, after the group presentations and discussions the organisers should wrap up the key findings, such as obvious similarities between the cases, identified challenges and proposed development measures.

There are other practical issues to be taken into account when organising for a training event, such as

- Personnel
- Geography
- Timetable
- Venue
- Non-disclosure agreement
- Documentation.

Personnel. The key stakeholders are the organisers, trainees, speakers and mentors. The organisers should nominate the event chair and his/her assistants. The event chair will host the training event and, in cooperation with the assistants, also assume responsibility for the preparations, including drafting the programme, inviting speakers and mentors, enrolling the entrepreneurs, booking the venue, and so forth. The attending people make up the event. Therefore it is worthwhile investing time and effort to identifying genuinely interested trainees, as well as inspiring and experienced speakers and mentors.

Geography. In case of would-be OLAE entrepreneurs, who often work at university and national labs as researchers or team leaders, close contacts to the local academia are extremely useful. This implies, for example, that a successful training event is likely to have a limited geographical scope (irrespective of the technologies and products being developed). Being well-known among the local research community may also prove essential from the trust-building point of view.

Timetable. A good length of the training event is one full working day. If the event is shorter, then the scope of the topics to be covered shall be correspondingly limited, too. If the duration is longer, e.g. two working days, then enrolling trainees and mentors is likely to get increasingly difficult (presuming that all the attendees have full-time jobs). Don't forget breaks – drilling and genuine learning are two different things. The programme of the first Opera Entrepreneur Training Day is presented in Appendix 1.

Venue. One large meeting room capable of hosting all the attendees and separate break-out rooms for each team are needed. All the rooms should be equipped with Internet access, electricity, projectors, and flip charts. The presence of skilled IT support is highly recommended. Refreshments and snacks should be available throughout the day. The lunch should not take too much time. Therefore if there is no restaurant in the immediate vicinity of the meeting facilities, the organisers should consider using professional catering services. If and when all the attendees won't be local residents, it is advisable to select a venue that can be easily reached thru major road, railway and/or air links, thus minimising the need to stay overnight (this can prove crucial when recruiting external speakers).

Non-disclosure agreement. A key prerequisite for a successful training event is the creation of confidence among the attendees. It is of utmost importance that trainees can openly discuss about their ideas and plans involving business-critical information. One way of fostering such open atmosphere is to sign a mutually-binding non-disclosure agreement (NDA). All the attendees, including the trainees, lecturers, mentors and organisers, should sign the NDA. The dura-

tion of the NDA can be set to 3–5 years. The draft contract should be sent for comments prior to the event. The final version can be signed e.g. at the outset of the event. The organisers can archive the original NDA and send certified copies to the attendees after the event.

Documentation. The organisers should document the discussions and summarise the key findings of the event. After the event the organisers should collect all written material, including invited and case presentations, group work reports, discussion notes and so forth, and distribute them to the participants of the event, presumably in pdf format. Should the trainees wish to exclude selected parts of their presentations from this package, they can be instructed to prepare new distributable versions. In any case the event material should be defined as „confidential information' in the non-disclosure agreement (see above).

2.4 The role of mentors

Effective mentoring is a key success factor for new entrepreneurs, especially in new technology areas, such as organic electronics and printed intelligence, where proven operating and business concepts for SMEs are still largely missing. Perhaps paradoxically this entails that also the mentors need to critically assess how and to what extent their own experience applies to this new emerging business area.

However, new enterprises have a lot in common irrespective of the technology or market area concerned. Assembling a capable team, defining the product focus, finding a pilot customer, demonstrating the feasibility of the chosen technologies, drafting a credible business plan, preparing for fund raising and so forth are examples on such common tasks entrepreneurs need to undertake. In this respect experience in one business domain can surely contribute to other domains as well.

The most valuable asset of a mentor is his or her own personal experience. Therefore people with a practical entrepreneurial background are the best mentor candidates. A present or ex entrepreneur cannot perhaps answer all questions but he / she can help build the big picture, evaluate what is really important and what is not that important, and provide practical advice on a wide range of issues. Specialists can complement that knowledge when need be. Lawyers can help in IPR issues and researchers can provide insights into the development of technology e.g. when the core team needs to operate outside its own competence

base. Business incubators are typically good at providing detailed business planning support, including funding options.

Entrepreneur training events provide excellent networking opportunities. It is essential that the organisers of training events persuade local and regional development agencies and business incubators, other experienced entrepreneurs, financiers and business angels to attend and contribute as speakers and team coaches. Moreover, the organisers should facilitate the establishment of longer term relationships between the trainees and other attendees. Therefore the representatives of attending support organisations should be encouraged to give short introductory presentations to their services. Single events cannot compensate for the lack of confidential, long-term co-operation relationships that may be based on contractual arrangements as well as on informal personal ties.

Industry associations can play a meaningful role in building mentor networks. Each mentor network could have a specific geographical or technological focus, depending on the experience and personal interests of available mentors. In an ideal world the mentors could be consulted when needed, and they would also receive a fair compensation for their service. These arrangements are discussed in more detail in chapter 2.6.

2.5 OLAE entrepreneur training pilots: Experiences

Altogether three entrepreneur training events were organised as part of Opera and PolyMap projects:

- the first on 10 November 2009 in Oulu, Finland,
- the second on 20 May 2010 in Heidelberg, Germany, and
- the third on 1–15 November 2010 in Oulu, Finland.

The first and the second were one day events and were organized applying the same concept described above. The third event comprised in total seven working days and a much larger group of trainees.

Oulu, November 2009. Four teams, in total eight trainees, attended the first event in Oulu. Most trainees were lacking the experience of running a business. Only one did have prior experience in managing a small business. The technology / application areas represented by the teams included roll-to-roll printing of OLEDs, nanomaterials production and characterization, microfluidic solutions for printing process validation, and bioactive paper for diagnostics. The event was generally well-received and considered useful. The attendees said that the

event had helped them clarify the status of the development process and identify the areas where further development was most needed. The key challenge of the attending teams appeared to be the specification of the product focus. During the discussions it was generally acknowledged that the business plans develop in tandem with the underlying product concepts and market knowledge, and that the nature of the development process is essentially experimental and iterative. In particular, the experience gained through pilot projects was considered indispensable. Some time was devoted to the general challenge of raising sufficient amounts of money to fuel new business creation. A sort of conclusion from these discussions was that one needs to carefully explore the possibilities of raising funds from outside Finland and the EU, especially in the USA.

Heidelberg, May 2010. Five teams, in total seven trainees, attended the second training day in Heidelberg. The technology / application areas represented by the teams included synthesis services for optoelectronic materials, consulting and programming in the field of simulation, optical system technology, storage and exchange of item-level data, and organic lasers for sensor systems. Also the attendees of the second entrepreneur training day considered the event useful. Especially the „open discussion atmosphere' was appreciated by the attendees. One of the key discussion themes was funding. One attendee stated, for instance, that for the first time he could discuss his idea with a VC specialist in an open way because he wasn't in the situation to apply for funding. In general, discussions helped create a better understanding of what VCs really think, expect and how they select the ideas they support. There were three major generic recommendations for the attending entrepreneurs. First, they were requested to focus more on potential customers and the transfer technology and research results into useful products. Second, the attendees were urged to keep their organizations simple and to establish a clear division of responsibilities between the founders and other key members of their organizations. Third, they were told to identify the competencies and experiences they already had in the team, as well as those which were still needed for success.

Oulu, November 2010. This seven-day event comprised the third part of a series of events that were organised in cooperation with Yritystakomo and Oulu Innovation, two Oulu-based incubators, and PrintoCent, a VTT-managed business development programme for printed intelligence. The training events were designed for industrially experienced people who had resigned from their previous positions and were looking for a new start through entrepreneurship. In total 11 people, working in three teams, attended the third part. Their backgrounds

were in electronics, mechanics, logistics, system design, and software design. They possessed a lot of technical expertise, but were lacking hands-on marketing and sales experience. In addition, the trainees had no previous knowledge of organic electronics or printed intelligence.

The first part (week 41) provided an introduction to the technologies behind printed intelligence. The second part (week 42) introduced the participants to the business landscape of printed electronics. The third part (weeks 44–46) focussed on the development of the attendees' business ideas with experienced business mentors. The mentors provided guidance and feedback to the teams, with special emphasis on the market/customer perspective. Three coaching meetings were held with each of the three teams. The key topics of coaching were:

- customer identification (to whom),
- customer need and solution (what),
- product benefits to the customer (why), and
- competition (how to win).

The business cases were presented on 15 November 2010 in a workshop-type seminar to a selected audience. The business cases represented different levels of maturity. One of the teams had already made the decision to proceed and to apply for funding to demonstrate the technology and to develop a prototype product. In addition, their plan was to establish a company in the 1st quarter of 2011. The two other teams did not manage to come up with a focused business idea and did not have a clear plan to proceed. The training process was positively received by the trainees. The participants said that the process with an emphasis on customer needs had given them a new point of view and also helped them develop a new attitude towards further business development activities. A follow-up session was scheduled for early 2011. A new training was planned to be carried out nine months after the first one.

Mentors and networking in the training events. Nine mentors and lecturers participated in the first training pilot in Oulu (on average 2.25 per team), 12 in the second event in Heidelberg (2.4 per team) and seven in the third event in Oulu (2.33 per team). They represented both small and big product companies, professional incubators, venture capital companies, law firms, consultants, and Opera project partners (VTT, InnovationLab, PEF and CSEM). Around half of all the mentors and lecturers were currently entrepreneurs or had an entrepreneurial background (i.e. personal experience from having a key position in a start-up or SME). In each event a great majority of the mentors also represented

the local business / research community or were employed by a local business incubator. This may be regarded as a strength as well as a weakness of the events: strength because the contacts made between the trainees and the mentors will be easier to maintain and exploit in the future, and weakness because of the limited exposure to views not representing the local business practices or commonly held beliefs. The mentors and lecturers have been listed in Appendix 2.

2.6 Who should act and who should pay

Relevant industry associations are perhaps best equipped to assume responsibility for organising OLAE entrepreneur training events and building mentor networks. A good examples of such association are Photonics21 and the Organic Electronics Association (OE-A).

Publicly funded business incubators and local development agencies can provide invaluable help. Since all development agencies cannot be filled with experienced entrepreneurs, nor possess sufficient OLAE-specific know-how to tackle the specific questions and challenges of this line of business, attention should be paid to assembling a suitable mix of generic and industry-specific knowledge and experience. Since many universities and research institutes already run OLAE and printed intelligence-related research programmes, they can contribute to the design and implementation of training events, especially when it comes to technology development and to the applicability of related technologies to new product concepts. On the other hand, large product and materials companies are best positioned to express what it takes to become a trusted supplier or technology partner.

Industry associations should be able to finance single training events from their membership fees. Another option is project finance when the event is organised as part of an ongoing development project, such as Opera and PolyMap. When it comes to the building of mentor networks, dependence on short-term project finance is not a good long-term solution, however. Part of the costs could be covered by participation fees. Entrepreneur support does not have to come for free. Setting up a business is anyway going to take a lot of money, so a modest fee for valuable mentoring should not become an issue.

3. Start-up and SME financing

3.1 Between a rock and a hard place

European OLAE start-ups and SMEs are mostly relying on their own resources, i.e. founders' investments, cash flow financing when available, and various public financing schemes, such as national and EU-level R&D grants, to finance their R&D. In general, relatively few small European companies are actively seeking for private investments outside the „inner circle' of friends and relatives. The situation can be partly explained by the fact that venture capital is still regarded as somewhat „strange' in the European SME scene, especially outside the ICT sector and the UK and Nordic countries. Also the scarcity of seed and early-stage capital and the range of alternative public support mechanisms, which according to the representatives of SMEs work relatively well in many European countries, affect the current situation.

R&D grants do not, however, solve the equation. Especially the EU-funded research programmes are designed from the point of view of large research institutes and companies. Planning and administration takes time and energy, participants' interests are diverse, projects are long, and the distance between the project objectives and market needs may grow wide. R&D grant, gained through a tedious application process to fund a particular technology development project, is not a very flexible instrument in the SME context. Moreover, they cannot be used to finance investments or marketing activities. This rule also applies to national (public) funding schemes, which are subject to EU-level regulation. This implies the need for private money with reasonable terms.

It is no surprise, therefore, that start-ups and SMEs are keen to develop co-operation with larger companies. A good customer is invaluable for a new start-up not only because of the much needed cash flow but also because of the learning opportunity. Larger companies are requested to be more open, to share their

problems and needs with the new entrants in the market, and to engage into flexible co-operation arrangements with capable start-ups and SMEs. However, the lack of market pull in many areas of OLAE, and especially the lack of strong European product companies that could create such a pull for smaller companies, has resulted in a cumbersome „catch 22' situation: the product market is underdeveloped (with the exception of rigid displays) due to immature technologies, and technologies are immature due to the underdeveloped product market (see Figure 4 in the previous chapter).

3.2 OLAE investment activity and investor concerns

According to IDTechEx (2009) investments in US and European OLAE companies between January 2008 and early 2009 reached almost USD 2 billion. Of that money only USD 0.57 billion was invested in European companies. Corresponding data from Asia is not available.

Almost USD 1.3 billion of all identified fund-raisings in OLAE have related to organic photovoltaics. Also the investors that have attended Opera and PolyMap events have indicated organic photovoltaics as an interesting investment area. Other technology areas identified by IDTechEx (2009) included e-paper displays (USD150 million), batteries (USD 75 million), OLEDs (USD 69 million), inks (USD 4.4 million) and sensor applications (USD 0.26 million) (Figure 5). These figures do not mean that inks are underfunded, however. Many large companies are conducting significant internal investments for printed electronics materials, such as BASF, Solvay, Merck and Kodak (IDTechEx, 2009).

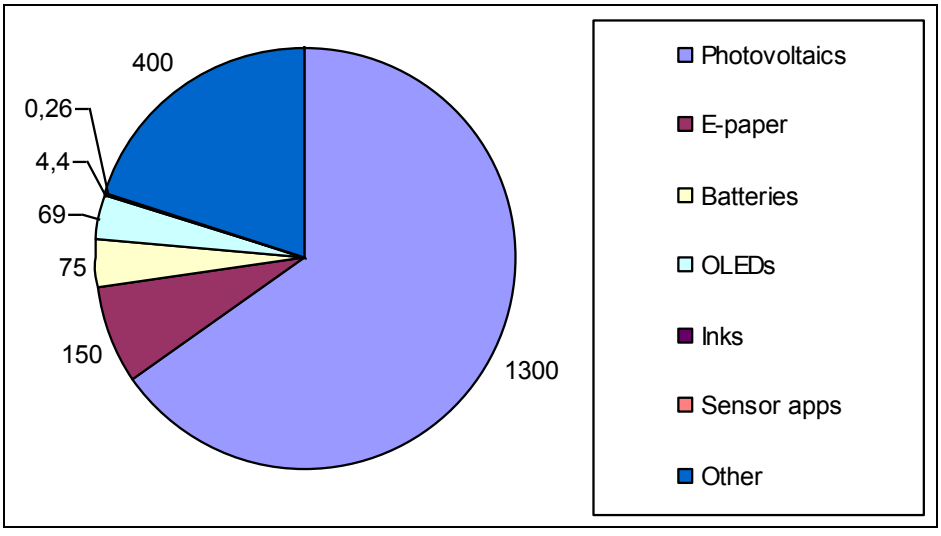

Figure 5. Investments in US and European OLAE companies between January 2008 and early 2009 (Millions of USD; IDTechEx, 2009).

Two most important factors contributing to the perceived investment risk appear to be

1. the nascent stage of the whole industry in general, and
2. the uncertainties relating to the development of the applications market in particular.

While investors tend to agree with OLAE developers and entrepreneurs upon the long-term market potential and the relative advantages of OLAE with respect to silicon-based electronics, the long and capital-intensive development cycles and market readiness concerns make investors restrained. If a venture capital company is planning to exit an investment within 5–7 years' time, then at least in most cases they will expect the applications market to be already „there' at the time of the investment. The investors' „wait-and-see' tactics result in extensive reliance on various public funding schemes.

3.3 The problem of scarce pre-seed and seed capital

In general, the US financial system seems to provide a better support for growing enterprises than its European counterpart. It has been stated that a developed financial system is not only a consequence but also a cause of economic growth.

For example, Financial Times has argued that Europe needs more private equity and venture capital, and in particular more sophisticated finance offerings, including high-yield bonds, mezzanine capital and other debt instruments that are needed by young as well as service-oriented companies without tangible assets to be used as collateral (FT 2008).

It is worth noting that this view cannot be disproved on the basis of the recent financial turmoil in world markets. The problem has not been risk investments per se, but reckless speculative trading (i.e. betting) with leveraged, highly structured and often non-transparent financial products, fuelled by unsound incentives and insufficient regulatory oversight.

The financial crisis has taken its toll, however. Loan margins have risen, requirements for collateral have increased, companies intentionally cut spending and delay payments, and investors are wary. The most recent sovereign debt concerns in peripheral eurozone countries have further complicated the situation. Risk appetite is in short supply.

The limited access to (private) seed stage funding is perceived to be a particular problem. While in many European countries local and national development agencies run and also partly finance business incubation, and where well-established private equity and venture capital firms focus on financing growth (i.e. companies with a proven product concept and an existing customer base), the number of players providing proper seed-stage funding after incubation but before the active growth stage is fairly limited.

But Europe is not alone. In the Finance and Investment Roundtable, an event organised by Opera project and Pira International in connection with Plastic Electronics Europe 2009 in Dresden, Dr. Jelto Smits of Prime Technology Ventures, a Dutch venture capital company, presented rather depressing statistics on the US VC markets. It emerged that the share of VC investments to seed and early stage was well below 40% of total investments already in 2004. In that year seed stage investments alone accounted for less that 5% of the total volume – a significant drop from the year 1980 when their relative proportion was almost 30%. According to Dr. Smits the main reason for this downward development trend has been the lack of exit opportunities. For example, by 2004 the average time from the initial VC investment to the initial public offering (IPO) had increased to 8.3 years, which is much longer than the typical targeted life span of a VC fund.

Informal discussions with European investors suggest, correspondingly, that generally low (i.e. „lower-than-expected') returns on seed-stage investments

during the past ten years have discouraged investors from directing more money in seed-stage companies. As an example, Capman, a major Finnish venture capital company, announced on 18 November 2010 that it will quit investing in new technology start-ups due to a meagre one percent average return on investment. It is also worth noting that only one of the respondents of our investor questionnaire, that was distributed as part of the Opera Organic Electronics Venture Forum on 19 May 2009 in Brussels, indicated interest in financing start-up companies, and none of them provided (pre)seed funding (before incorporation).

The difficulty of receiving seed-stage funding seems to be a generic problem, and not particularly OLAE-related. In the short term there seems to be no other way around this scarcity of seed capital than strong public involvement and co-operation with the private equity and venture capital industry as well as corporate investors.

3.4 Overview of EU funding schemes for SMEs

The European Investment Bank (EIB) and the European Investment Fund (EIF) have developed alternative funding instruments to support R&D and technology commercialization in small and medium-sized enterprises. The most important ones are:

- Competitiveness and Innovation Framework Programme (CIP),
- Joint European Resources for Small and Medium-sized Enterprises (JEREMIE), and
- Risk-Sharing Finance Facility (RSFF).

CIP and JEREMIE are intended to channel equity, loans and guarantees to start-ups and SMEs. RSFF is an instrument to finance ambitious research, development and innovation projects of mid-sized and larger companies and research institutes by means of loans and guarantees. A common feature of the these instruments is that they are not directly available to SME: funds are to be applied for and distributed through approved „financial intermediaries', such as banks, venture capital companies and regional development funds (see on next page). Another common feature of the instruments is that they do not provide R&D grants (which are channelled through the EU Framework Programmes). The scope of the three instruments is shown in Table 3.

Table 3. Overview of selected EU funding instruments for SMEs.

Type of support	CIP	JEREMIE	RSFF
Grants	–	–	–
Loans / guarantees	X	X	X
Equity	X	X	–

Competitiveness and Innovation Framework Programme (CIP). The aim of the CIP is to facilitate SMEs' access to debt finance and equity. CIP instruments complement other financial schemes at national level. The instruments address SMEs' needs for financing at various stages of development, including start-up and early-stage. The CIP financial instruments are implemented by the European Investment Fund (EIF) and selected financial institutions (financial intermediaries). Small businesses are requested to contact approved national financial institutions to get access to investments or guaranteed lending (see below).

Depending on the SME's stage of development and its particular financing needs, the CIP provides different types of instruments:

The High Growth and Innovative SME facility (GIF) provides

- Risk capital for innovative SMEs in their early stages (GIF1). EIF can usually invest 10–25% of the total funds raised by the intermediary venture capital fund.
- Risk capital for SMEs with high growth potential in their expansion phase (GIF2). EIF can usually invest 7.5–15% of the total funds raised.

The SME Guarantee Facility (SMEG) provides guarantees for

- Debt financing via loans or leasing. Available to SMEs with growth potential, in particular to reduce their difficulties in accessing finance due to the perceived high risk or the lack of sufficient collateral. Guarantee rate $\leq 50\%$.
- Micro credits, loans of up to EUR 25 000. Available to enterprises with up to 9 employees, particularly for entrepreneurs starting a business. Guarantee rate $\leq 75\%$.

- Cover equity and quasi-equity investments, including seed capital, capital in the start-up phase, mezzanine financing or risk capital operations. Available to businesses with up to 249 employees. Guarantee rate ≤ 50%.
- Support securitisation structures to assist financial intermediaries in mobilising debt finance for SMEs. Guarantee rate ≤ 100%.

Further information on CIP is available at http://ec.europa.eu/cip/index_en.htm.

Joint European Resources for SMEs (JEREMIE). JEREMIE offers EU member states, through their national or regional managing authorities, the opportunity to use part of their European Union (EU) structural funds to finance SMEs by means of equity, loans and guarantees (Figure 6).

	Start-up	Early stage	Expansion
Equity	Venture Capital		
Debt	Microcredit/Global Loans/Subordinated Loans		
	Guaranteed Operations		
Quasi-equity	Participating Loans	Mezzanine Lending	
Other instruments	Technology Transfer Funding	Business Angels	

Figure 6. The selection of JEREMIE products. JEREMIE brochure 2009.

The initiative was developed by the European Commission and the European Investment Fund (EIF), which is part of the European Investment Bank (EIB) Group. Funds are channelled through a holding fund, JEREMIE, and selected financial intermediaries. Small businesses are requested to contact approved national financial institutions to get access to investments or guaranteed lending (see on next page).

EU member states implement the JEREMIE initiative by establishing a holding fund funded through their structural funds. The holding fund can be managed either by the EIF or by other financial institutions. Acting as an umbrella fund, the holding fund will partner a wide spectrum of local SME financial institutions such as venture capital funds, banks and guarantee funds. The funds made available to these financial institutions by the holding fund will be used to finance the creation and development of SMEs (Figure 7).

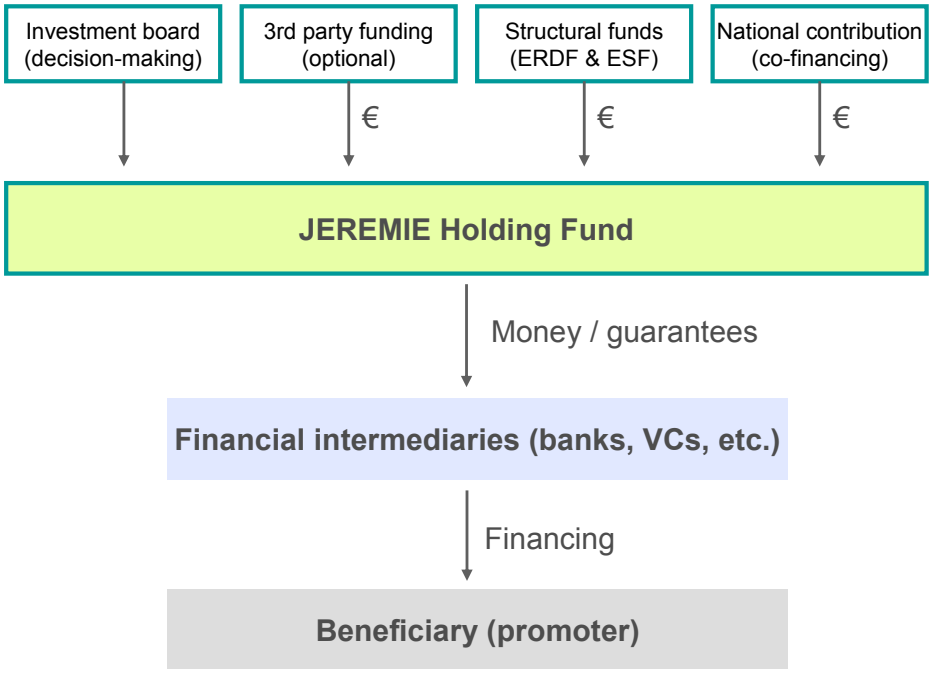

Figure 7. Channelling money through the JEREMIE Holding Fund. Modified from JEREMIE brochure 2009.

Further information on JEREMIE is available at http://www.eif.org/what_we_do/jeremie/faq/What%20is%20JEREMIE.htm?lang=-en.

Risk-Sharing Finance Facility (RSFF). The RSFF is an instrument of the European Community and the European Investment Bank (EIB) to provide loans and guarantees for riskier but creditworthy research, development and innovation (R&D&I) projects. The facility is intended for mid-cap and larger corporations (who may find it difficult to raise loans with reasonable terms e.g. due to a sub investment grade credit rating), SMEs, research institutes, universities, and project companies.

RSFF can provide financing up to 50% of the total eligible costs in the form of

- Corporate loans (senior / junior)
- Guarantees
- Project finance (limited / non recourse)
- Mezzanine loans
- Risk-sharing facilities with banks, and
- Other structured products.

The eligible costs may include project capital expenditures in tangible assets, as well as research staff salaries, working capital, and the acquisition of necessary intellectual property rights. The minimum size of a RSFF loan is EUR 7.5 million. Another instrument, Risk-Sharing Bank Facility, is available for smaller projects.

For the financing of small and medium sized R&D&I projects, i.e. project cost of less than EUR 15 million, and enterprises, the EIB is cooperating with a large number of financial intermediaries, through which smaller loans can be made available (see below). For projects with a total project cost of EUR 15 million and above, the Bank can be contacted directly e.g. via EIB „s Head Offices in Luxembourg, address: 100, bvd Konrad Adenauer, L-2950 Luxembourg. The functioning of RSFF is illustrated in Figure 8.

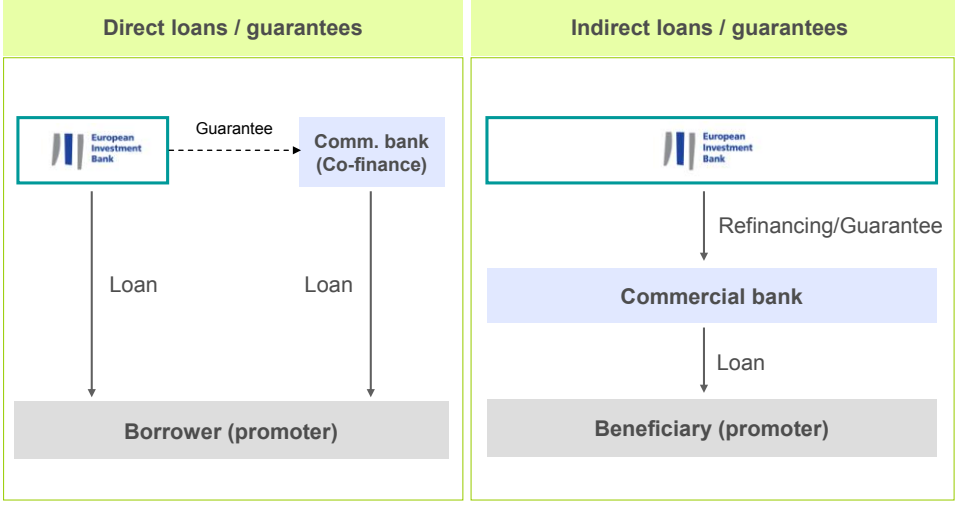

Figure 8. Access to RSFF financing. RSFF website, 2009.

Further information on RSFF is available at http://www.eib.org/products/loans/special/rsff/index.htm.

Financial intermediaries: the problem. The EIB and EIF documents often refer to the so called „financial intermediaries' through which funding is to be channelled to the SMEs. A financial intermediary can be a bank, a leasing company, a guarantee fund or a venture capital company / fund that has been formally approved by the EIB or EIF. The selection is made after a due diligence process on the basis of the applications received through Calls for Expression of

Interest. From the SME point of view the problem is that such financial intermediaries are hard to find.

For example, a quick review of the website to list the financial intermediaries for CIP funding (http://www.access2finance.eu/) revealed that it does not contain any contact information for Finland, the Netherlands or the UK, and only one contact for Germany. If this information is up-to-date, thus indicating that CIP funding is not currently available in the three above-mentioned countries, the programme that was launched in 2007 must be regarded as failed. But is the website up-to-date?

The EIB hosts another website for the intermediary banks and financing institutions for credit lines (http://www.eib.org/about/news/the-intermediary-banks-and-financing-institutions-for-credit-lines.htm). A quick review reveals that the website lists three financial intermediaries for Finland, three for the Netherlands, six for the UK, and ten for Germany. Based on the structure of the website it can be assumed that the listed institutions provide RSFF funding (loans and guarantees). Whether the same institutions can also issue loan and equity guarantees or invest risk capital within the CIP framework, or channel structural funds within the JEREMIE initiative, remains a question mark. The JEREMIE-related websites do not provide any clear guidance for SMEs on how to identify or approach the designated financial intermediaries.

The EIF equity investments are made thru (early stage) venture capital funds. In other words, the EIF does not invest directly in SMEs, but indirectly thru funds that invest in a portfolio of European companies. It appears that EIF has made in total 322 investments in private equity and venture capital funds from inception to October 2010. The deals, including fund names and their (generalized) investment strategies, have been listed on the EIF website (http://www.eif.org/what_we_do/equity/deals/index.htm). The problem, again, is that the information is of no particular use for the representatives of SMEs.

The three EIB/EIF-backed funding instruments can provide added value to start-ups and SMEs only if they are aware of them and if they know how to apply for funding in practice. Presently the system emphasizes the role of the financial intermediaries. For SMEs those financial intermediaries are hard to find. This alone implies that the system cannot function as well as it could or should. Secondly, we need to consider the incentives for a financial institution to participate. For example, we cannot expect a CV fund manager to be overtly enthusiastic about any of the three EIB/EIF instruments, because organizing will surely take a lot of extra work and because supplementing the fund with EIF money

does not have any effect on the expected return on investment. The fund manager can be presumed to be interested only if he or she finds it difficult to attract other investors to invest in the fund, or if the management fees to be paid by EIF can compensate for the cost of the related paperwork, including the submission of the Expression of Interest and the subsequent due diligence process. For the investee companies, however, the EIF money could make the difference. Therefore it is recommended that the CIP, JEREMIE and RSFF programmes are carefully reviewed from the SME point of view.

3.5 Overview of private funding schemes

In theory, an entrepreneur has a range of alternative financing options. The main instruments, or types of financing, are grants, loans, guarantees, and equity. Immaterial (such as IPR) and material (such as production equipment) assets handed over to a company in exchange for a share of ownership can be regarded as equity. The most prospective source of financing depends primarily on the amount of capital needed and the type of financing preferred. Table 4 provides on overview of typical growth financing options. With the exception of ‚public sponsors' (such as national development agencies and the EU), the sources identified below are private.

The remaining part of this chapter focuses on the structure and interests of private equity and venture capital (VC). The next chapter will address specific issues relating to the search for VC funding and the characteristics of the VC process in more detail.

Private equity refers to investments (securities) in companies that are not publicly traded on a stock exchange. Investments in private equity most often involve either an investment of capital into an operating company or an acquisition of an operating company. Capital for private equity is raised primarily from institutional investors, such as state and private pension funds, foundations, insurance companies, banks and mutual funds, but also from the venturing arms of larger (industrial) companies and from wealthy individuals.

An investor may invest directly in a privately held company, or indirectly through a private equity / venture capital fund. In the latter case the investor will end up owning a share of the fund (instead of owning shares in individual companies). Moreover, the selection of the investee companies is made and the transactions are carried out by the private equity / venture capital firm that manages the corresponding fund.

Table 4. Examples of growth financing options. CV = venture capital company / fund.

Stage	Capital need	Source of financing	Type of financing
Pre-seed / Idea development	EUR 10–100 k	Entrepreneurs Family / friends Public sponsors Banks Business angels Internal (corporate)	Equity Equity, Loan, Grant Grant, Loan Loan Equity Project finance
Seed / Start-up	EUR 0.1–1 M	Entrepreneurs Family / friends Public sponsors Banks Business angels Some VCs Internal (corporate spin-off)	Equity Equity, Loan Grant, Loan Loan Equity Equity Equity, IPR, Equipment, Loan
Early stage	EUR 1–3 M	Public sponsors Banks Business angels VCs Corporate investors	Grant, Loan Loan Equity Equity Equity
Expansion	> EUR 3 M	Public sponsors Banks Some business angels VCs Corporate investors	Credit guarantees Loan Equity Equity, Mezzanine loan Equity

There are different types of private equity, and the term private equity has different connotations (interpretations) in different countries. Typical investment strategies in private equity include e.g. venture capital, leveraged buyouts and mezzanine capital. The following definitions are largely based on those given in Wikipedia:

- Venture capital (VC) is a type of private equity capital that is typically invested (thru intermediating funds, see below) in early-stage companies with a high perceived growth potential. Venture capital investments are generally made as cash in exchange for shares (common or preferred stock) in the investee company. The money is raised to finance the growth of the company when other means of financing, such as bank loans, public R&D grants or cash-flow financing, are not available, are insufficient or do not serve the spe-

cific purpose. The investment risk is typically high, so the investors correspondingly expect to generate a high return on their investment. The fund manager is looking forward to realizing the (potential) profits e.g. through a trade sale of the company or an initial public offering (IPO). The targeted investment period, i.e. the time between the investment and exit, is often 5–7 years.

- In a typical leveraged buyout transaction, a private equity firm (or a financial sponsor) acquires a controlling interest in a company's equity. A significant percentage of the purchase price, typically more than 50%, is financed through non-recourse (secured) debt, which effectively leverages the purchasing power of the capital invested. The assets of the acquired company are used as collateral for the borrowed capital. The sale to a financial buyer might prove attractive for the founders of the company e.g. if they lack other viable exit routes, or if the company is considered to be too small to be taken public. For the financial buyer the incentive may relate e.g. to the perceived need for company restructuring or change of strategy, both of which necessitate a controlling interest in the company.

- Mezzanine capital can be used in conjunction with other securities to fund the purchase price of the company being acquired (e.g. as part of a leveraged buyout). Mezzanine financing can be structured either as debt (typically an unsecured and subordinated note) or preferred stock. Mezzanine capital is often a more expensive financing source for a company than secured debt or senior debt. This is the result of its location as an unsecured obligation in a company's capital structure. In the event of default, the mezzanine financing is less likely to be repaid in full after all senior obligations have been satisfied. Due to the higher premium, financial sponsors will typically exhaust other sources of capital before turning to mezzanine capital.

Venture capital companies are typically structured as (limited) partnerships (LP) or limited liability companies (Ltd. or equivalent) (Figure 9). In the former case the general partners serve as the managers of the company and assume responsibility e.g. for investment decisions and the management of the investments. In addition, they usually devote a great deal of their time to monitoring and advising the investee companies. Investors in venture capital funds are known as limited partners. In the latter case the firm's managers are known as managing members or managing partners (in case they are also shareholders). Especially the so called corporate venture capital companies, which invest the proceeds of the businesses of their parent company, are structured as limited liability companies.

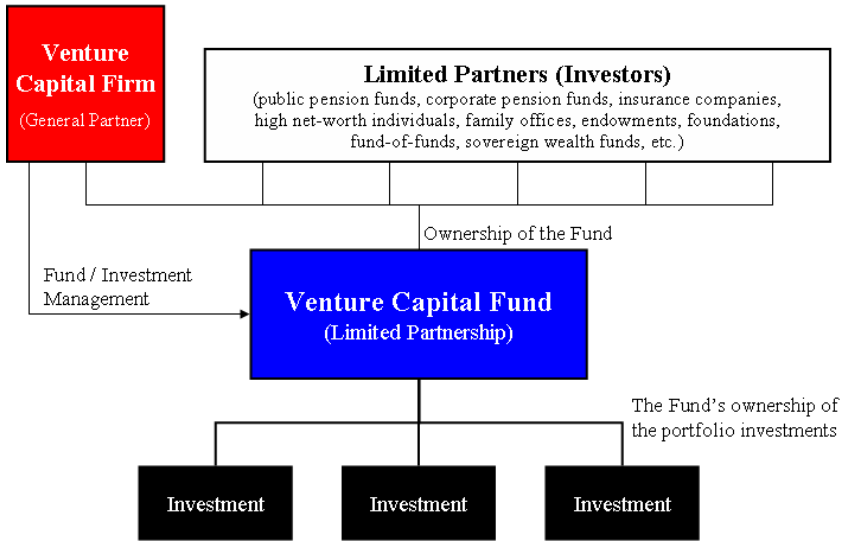

Figure 9. Stru cture of venture capital (http://en.wikipedia.org/wiki/File:Venture_Capital_Fund_Diagram.png).

The high-risk nature of VC investing means that VC funds expect a relatively high return on their investment. Many technology start-ups fail, or survive but never manage to embark on a sustainable growth path. In consequence, the fund manager may consider him or herself successful if two or three out of every ten investments prove really profitable. This means, in practice, that the most successful investments have to produce a yield that is manifold relative to the capital invested, so that the combined yield of the whole investment portfolio (including the less-successful cases) could clearly exceed the average or expected return from more conventional and less risky securities, such as government bonds or stocks of well-established, listed companies. The targeted internal rate of return on the whole portfolio is typically in the order of 20–30%.

For this particular reason the managers of venture capital companies evaluate potential investment targets very carefully. Venture capital companies are often looking for

- generic and well-protected technologies with a range of potential application areas,
- scalable applications and solutions with a large market potential, and
- companies with a credible growth strategy and an experienced management team.

Since most new companies cannot obviously fulfil such requirements and expectations, investment decisions are rare in comparison to the number of companies seeking venture capital. It is a common belief that less than 2% of the proposals (business plans) received by VC firms eventually result in a positive investment decision. Most proposals are rejected upon their first preliminary review.

However, if the process leads to an investment decision, it is in the interest of the investor to provide the investee company with the best possible business advice and support. This support may take different forms and cover a range of issues from human resources to sales and distribution channels. The biggest investors usually want and/or are invited to appoint their representative to the company's board of directors, which is an effective way of securing fluent co-operation and exchange of information between the two parties. In general it is important to understand that the VC firm/fund and the entrepreneur(s) do have a partnership relationship and a common interest to succeed.

This does not mean, however, that conflicts of interest could not arise. The investors expect that whatever the management team does also contributes to the market value of the company. For the entrepreneur(s) the company, however, is seldom just a rational attempt to harness a business opportunity. The entrepreneurs' interest in the subject-matter and willingness to organise one's work in a meaningful way usually play an important motivational role. These two modes of rationality do not always meet.

Fund managers (e.g. general partners) are compensated for their work through a combination of management fees and performance bonuses (or carried interest). Management fees are generated by means of annual payments made by the investors in the fund to the fund's manager. The annual management fee received by the fund managers may equal to up to 2% of the committed capital. Carried interest refers to a share of the profits of the fund (typically around 15–20%, e.g. depending on general market sentiments, risk appetite and competitive factors) that is paid to the fund management company as a performance incentive. The major share of the proceeds is disbursed to the investors, i.e. institutions, companies and individuals who initially invested in the VC fund and therefore also carried the investment risk.

For an entrepreneur considering private equity (VC) funding it is of utmost importance to understand what sort of factors drive VC investments, what does it take to attract fund managers, and what are the „strings attached' in case of a positive investment decision.

3.6 VC funding: Why, how and what to expect

In the previous chapter we learned that only a small proportion of all companies can possibly qualify for VC funding. It is therefore perhaps too easy to conclude that CV money is always worth raising if offered. However, this is not the case. In this chapter we are going to summarize our key recommendations for entrepreneurs who consider venture capital as a financing option.

You may consider raising (read: applying for) VC money **if**

- You need a lot of money relative to the size of your present business to finance growth
- The revenue is not yet there or is insufficient relative to the amount of money needed
- You cannot get enough money, with reasonable terms, elsewhere
- You want to proceed fast, e.g. to take advantage of an emerging market opportunity
- You can live with the fact that the investor is expecting a high return on investment
- You are prepared to offer the investor a seat in the company's board of directors
- You can allow the investor to participate in strategy formulation and decision-making.

Most VC investors are looking for a lucrative exit within five to seven years' time. At that time it is the market value of the company and its business, measured in terms of the prospects for a successful IPO or a trade sale, that counts – not the quality of the products or services per se that the company has managed to develop. This translates into the expectation of a high growth potential.

"In the right circumstances", writes Tuomas Maisala (2009), a representative of a Finnish incubator Technopolis Ventures Ltd., "VC money can be the catalyst that can help you make it big". However, he also notes that:

- VC money is the most „expensive' money you can get (due to stock dilution)
- If you do not need VC money, don't raise it
- If you are not growth and exit-oriented, it is probably not worth it.

In other words, if you think that you may finance your business development activities by „conventional' means, such as your own money (equity), bank loans, grants (that public sponsors or R&D and local development agencies may provide for new innovative companies) and/or cash-flow financing, or if your business model or personal targets do not necessitate aggressive growth, then there is probably no particular reason seek venture capital. In addition, should you wish to do so later, it is useful to know that the more mature your business is when you apply for risk money, e.g. in terms of the size of the customer base or defendable intellectual property, the stronger will your position be when you negotiate for investment terms with the potential investors.

Figure 10 depicts the phases of a typical VC process, including the typical length of each phase in calendar weeks and the number of cases (companies) that on average make it to the next phase (when the initial set is 500 companies).

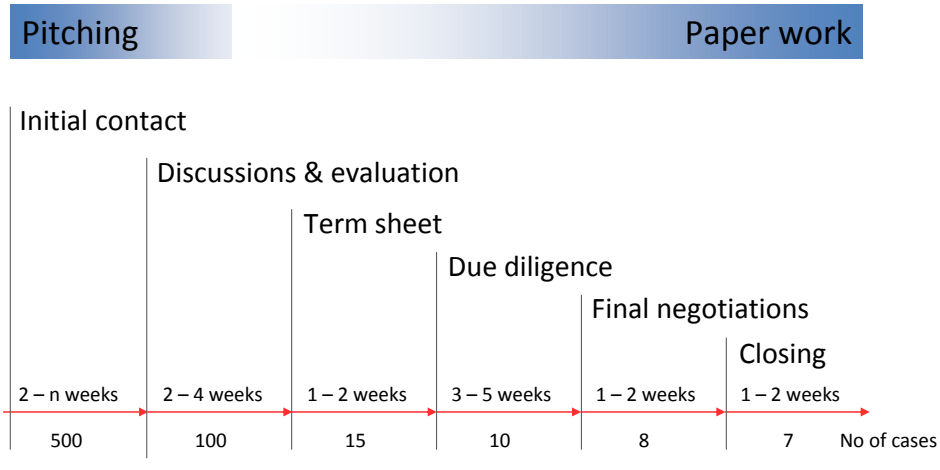

Figure 10. The VC process (Credit: Tuomas Maisala, Technopolis Ventures (2009), Statistics by Gearshift Group).

For an entrepreneur the four most critical aspects of the process are:

- identification of most prospective VC companies and funds,
- preparation and presentation of the business plan,
- valuation (as part of due diligence), and
- terms and conditions (term sheet, final negotiations).

VC companies and funds. Venture capital companies are managing funds, and each VC fund has an investment strategy. The investment strategy is specified in

the fund prospectus. In general, the strategy defines what sort of investment opportunities the fund manager is looking for, including the targeted / preferred technologies, application areas and industries. Moreover, the strategy usually outlines the targeted size of investments, the applied follow-up investment strategy, and the company's exit policy. Such information is usually freely available on the Internet, and if it is not, VC's will provide it upon request. In addition, VC companies typically list generic investment criteria on their websites. It is advisable to get acquainted with such publicly available information before approaching any particular VC company and to approach only such VC companies that might consider investing in your company. The website of the European Private Equity and Venture Capital Association (EVCA) is a good general source of European VC companies (http://www.evca.eu/).

Business plan. The main function of a business plan is to explain how the company is planning to make money. This typically entails describing the core offering, the targeted customers, the key benefits with respect to the competing offerings, the operative arrangements needed to produce and deliver value to the targeted customers, the costs of running the business, and the revenue and pricing models, i.e. mechanisms through which the company is planning to generate revenue and profits. In case of a new enterprise and a new product idea special attention shall be paid to customer demand and growth potential (i.e. that the market is „out there'), product concept and the maturity of technology (i.e. that we can get something useful done), and growth strategy (i.e. that we know how to exploit the identified growth potential). Especially in relation to the latter topic it is important to identify the strengths of the management team, to establish concrete and realistic milestones for commercialization and market entry, and to provide at least a preliminary estimate on the near-to-mid-term financing needs. The entrepreneur might need different versions of the business plan for different occasions, including the so called pitch deck (a set of around 15–20 slides). The guidelines for preparing a pitch deck that were developed for companies presenting at Opera Organic Electronics Venture Forum on 19 May 2009 in Brussels, Belgium have been enclosed to Appendix 4.

Valuation. Valuation refers to the process during which a company's value is estimated in money terms. Although the outcome of the process is always uncertain in the sense that the assessment will be partly based on subjective judgement and future predictions, it is by no means indifferent. For example, if the value of a company seeking venture capital is estimated at one million, and if the entrepreneurs are looking forward to raising another million, the investment – should

it realise – would provide the investor with a 50% stake in the company and the founders would lose the controlling power. The three most commonly used valuation approaches are asset approach, income approach and market approach (Livson 2009, Zwilling 2007). In the asset approach the company's value is determined by its balance sheet, mainly on the basis of the company's financial (or liquid), capital and floating (inventory) assets. In this approach IPR, such as patents and trademarks, are valued at acquisition cost. The income approach is based on the calculation of the present value of projected future cash flows using a reasonable discount rate. These projections are obviously very uncertain, because nobody really knows about the future and because there is no science-based rule for defining what a reasonable discount rate is or could be. Finally the market approach is about searching for similar companies that have recently received funding and taking their valuation, subject to the constraint that such information may not be publicly available, as a starting point for the valuation of the company. In addition, there are a number of other sources of company value that the entrepreneurs need to identify and firmly present as valuable assets to the potential investor, such as good networks or exclusive contracts, that add to the company' competitive advantage.

Terms and conditions. The investor specifies the conditions, or terms, of the investment in the so called „term sheet'. The term sheet is analogous to a letter of intent, a nonbinding outline of the principal points which the formal legal documents (assuming a financing closes) will cover in detail. A receipt of the term sheet is good news to the entrepreneur: it signals the investor's interest in the company and willingness in principle to close the deal. The prospective lead investor usually requires a significant minority stake in the investee company, typically between 25% and 50%. The proposal is based on the end result of the evaluation. Consultants say that the entrepreneurs cannot usually expect to elicit a better offer than the first one made by the prospective investor. A requirement for a bigger stake, however, may be regarded as a warning signal: either the VC is taking one's chance for a cheap takeover, or then the business concept is just not mature enough to command a significant market value. But the stake is not the only matter to be addressed. To protect its position the investor typically wants one or more seats in the board of directors, a veto right to key decisions, and a control on the firm's capital structure. According to Wadhwa (2006) and Bapat (2004) these conditions may involve:

- Preferred stock. Like common stock preferred stock represents partial ownership in a company, but it also provides the owner with specific advantages, such as the dividend that is paid before any dividends are paid to common stock holders, and preference in the event of liquidation.
- Anti-dilution protection. New financing is called dilutive if it reduces the existing investors' stake, i.e. percentage interest and/or the earning power of the stock, in the company. The prospective VC usually requires protection against dilution that may happen in the future. Such provisions may include, for example, that if the company's stock is later sold below the price the investor has paid for it, the investor gets compensated by getting additional stock for free. In addition, the investor may want the right to participate in any future share issue to maintain their percentage interest in the company. These provisions, however, are exercised at the expense of the founders of the company whose interest (stake) gets diluted as a consequence.
- Mandatory redemption. The venture capital firm may require a redemption clause to secure an exit from the investee company in the event that an IPO or acquisition does not happen within the targeted time frame. It requires the company to buy back the stock owned by the investor by a certain date, establishing a deadline for an exit.
- Engaging the founders. It has been often said and written that the investor primarily invests in the company's management team that is supposed to do the hard work and to make things „click'. In addition to the future earning prospects there are also other, often more restrictive means of engaging the founders. The founders are typically expected to invest their own cash (the so called hurt money) to make sure that they do have a personal interest in the undertaking. Moreover, the founders are not usually allowed to sell their stock away to anyone without an approval from the VC company, and the VC company may also demand that the founders' stock vests over a three to four year's period in the company. The founders and the key personnel are often required to sign a series of agreements concerning confidentiality, proprietary rights, competition ban, and employee stock repurchase, etc.

There are good and not that good venture capital companies around there. Although a lot depends on the corresponding fund / investment manager the entrepreneur is dealing with, i.e. his or her personal abilities and interests, it is the strategy of the venture capital company that to a large extent determines how the

entrepreneur is going to get handled. It is therefore of utmost importance for the entrepreneur to at least try to identify such venture capital companies that have a track record of being supportive to the investee companies. Therefore, in addition to the published investment strategies the entrepreneur should be looking for the following characteristics when mapping for potential VCs:

- Development focus, ability and willingness to provide assistance
- Extensive networks (other investors, other companies along the same value chain)
- Prepared for follow-up investments
- References from similar cases
- Other entrepreneurs' recommendations.

Various problems may arise, however. Unlike the founders of the company, the CV may not be that interested in the substance of the company's business *per se*. For a VC company an investment will serve one purpose only: to make money for the fund, and subsequently for the investors and for the fund manager. If the VCs have a controlling interest in the company and if they conclude that they can make more money e.g. by demerging the company, they may well do that. In such a situation they may also fire the founders and other senior people working for the company, should they conclude that recruiting a new CEO and management team is the most efficient way of getting things moving to the direction of their choosing. In case of a corporate venturing the interests of the parent may also come into play. This may sometimes result in strategy alignments and decisions that primarily serve the interest of the parent company at the expense of the investee company. The founders shall keep these possibilities in mind when inspecting draft term sheets and shareholder agreements.

3.7 The Venture Forum concept

The Venture Forum is a match-making event for entrepreneurs (or presenting companies) seeking private equity and for investors seeking new investment opportunities. In addition, the Venture Forum can serve as an efficient networking event. For entrepreneurs it provides an opportunity to market their products and services, to identify new potential partners and of course to get feedback and guidance. For investors, such as venture capital companies, large industrial play-

ers (strategic investors) and business angels, attending may prove an efficient way of obtaining information on new technologies and products in the pipeline. Also other (non-presenting) companies can take advantage of the event e.g. by scanning for potential suppliers and partners to support their own product development work. This chapter provides an overview of the Venture Forum concept tested as part of Opera project on 19 May 2009 in Brussels, Belgium.

The following areas need to be carefully considered when planning for a Venture Forum:

- Technology / market focus
- Geographical scope
- Event format
- Organising and marketing
- Documents.

Technology / market focus. The usability of the event is largely determined by the match between the selection of presenting companies and the investment strategies of the attending investors. Therefore it is essential to define what sort of presenting companies the event is targeted for. The key variables are technology base, application market and company size / development stage. Investors are typically very busy and will attend only if they are interested in the chosen technologies and markets, if the sizes and development stages of the presenting companies correspond to the amount of money they are prepared to invest and to the level of risk they are willing to assume, and finally if they think that the organisers are capable of putting together a good show. In addition, the focus should be broad enough to attract investors with different preferences, but also precise enough so that the event focus and the target audience can be clearly defined and communicated! One of the key challenges in OLAE is the novelty and small size of the industry. Only a small fraction of all VCs are knowledgeable of OLAE. It may therefore be worth trying to promote OLAE-related technologies and companies using terms that are more familiar to the investment community, such as cleantech (OLED lighting, OPV), electronics (integrated smart systems, memories, batteries), life sciences (sensors, point-of-care diagnostics), packaging (OLED signage, RFID, printed electronics), and so forth.

Geographical scope. Most small to mid-sized VCs and especially business angels are only investing in local companies, i.e. in companies having their headquarters or a substantial part of their operations in the same region or country where the investor is based. This is because of the fact that investing in small

and in general in non-listed companies calls for an ability to interact with the partners and other key employees on a regular basis. Many investors provide active business development support for their investee companies – either informally or through having a seat in the board of directors. This implies that the organisers need to consider already in advance whether to make the event essentially a local one, or whether to strive for an international event. An international event can be justified if the presenting companies command enough respect to attract large, internationally-operating VCs or strategic investors.

Event format. While organising a Venture Forum takes a lot of work (see below), the even format itself is straightforward. The programme can start with one or two keynote speeches, which can e.g. introduce the audience to the latest achievements in technology or developments in the applications markets, or convey the lessons-learned of an entrepreneur operating in the field. The main part of the event consists of company presentations (or pitching). Each company can be given a 10 to 15 minutes presentation slot in the programme and additional five minutes for subsequent questions and discussion. When the compulsory lunch and coffee breaks are taken into account, the maximum number of presentations per day is around twelve. The rest of the day after the presentations can be reserved for pre-scheduled and ad-hoc meetings. It is essential to draft the programme and to send it to the attendees already in advance, and to make sure that each presenter sticks to the schedule. The schedule of the Opera Organic Electronics Venture Forum is presented for reference in Appendix 3.

Organising and marketing. A minimum of six months shall be reserved for organising a Venture Forum. This is because of two main reasons. First, marketing will take a lot of time. Identifying the potential participants, both presenting companies and investors, and selling the event to them – irrespective of the level of the participation fee – is a hard job. The preparations for the Opera Organic Electronics Venture Forum that was held on 19 May 2009 in Brussels started in December 2008 and involved literally hundreds of phone calls and e-mails. Second, investors' calendars are typically fully booked for the short to mid-term future. This applies especially to VC companies managing several funds. The organisers should also consider appointing a small steering group, consisting of the representatives of the investment community, to support their work. Investors are not willing to assume any operational responsibilities but they are typically keen to exchange ideas on the definition of the focus of the event and the selection of presenting companies. In addition, having a few investors in the steering group is one way of committing investors to the event itself, adding to

the credibility of the event and thus helping in marketing towards other potential participants. The organisers are naturally responsible for producing and distributing the necessary documents, such as flyers and presentation guidelines (see below), booking the facilities, processing registrations and payments (if any), compiling the schedule of the event (see Appendix 3) and persuading the presenting companies to submit a least preliminary versions of their presentations already in advance. A website is an invaluable tool. Help provided by a professional event management company can prove valuable (consider organising the event e.g. in connection with a conference managed by such an organisation, and the charge may be reasonable). Finally, the organisers should not be afraid of setting a reasonable fee for the event to help cover incurring expenses. A fee of around EUR 200–500 won't determine the participation of a serious entrepreneur or investor. Instead, it is the anticipated quality the event, which is determined by the participants themselves, that counts.

Documents. At least the following documents are needed:

- Flyer, e.g. a 2-sided A4, to summarize key information, incl. title, date, venue, technology and market focus, event format, keynote speakers, instructions for presenting companies, participation fee, registration instructions, important deadlines, list of registered organisations, organisers, contact information, and so forth.
- Presentation guidelines. A document to be submitted for prospective presenting companies to provide instructions on how to prepare the pitch, including a list of key topics that investors are likely to be interested in. The presentation guidelines developed for Opera Organic Electronics Venture Forum can be found in Appendix 4.
- Registration form.
- Detailed presentation schedule.
- Feedback form.

3.8 Opera Organic Electronics Venture Forum: Experiences

Opera Organic Electronics Venture Forum was held on 19 May 2009 in Brussels, Belgium. The Venture Forum was jointly organised by VTT Technical Research Centre of Finland (VTT) and Plastic Electronics Foundation (PEF).

Mr. Ed van den Kieboom, President, PEF, chaired the event. Mr. Jari Kettunen and Dr. Raimo Korhonen of VTT and Mrs. Victoria Plompen of PEF took care of the practical matters, including the programme, marketing, registrations, and the facilities.

A steering group was assembled in December 2008 – January 2009 to help compile a sound agenda for the Venture Forum and to ensure a sufficient quality of participating companies and their presentations. The steering group came to consist of four investors representing both independent and corporate venture capital: Dr. Marc Lambrechts of Capricorn Venture Partners (Belgium), Mr. Nicolas Louvet of Sofinnova (France), Dr. Andre Moreira of BASF Venture Capital (Germany), and Mr. Heiko von Dewitz of Intel Capital (UK / Germany). Mr. Ed Sim of Dawntreader Ventures (USA) helped us develop presentation guidelines for the participating companies (Appendix 4).

A database of around 90 small European companies, compiled in association with the Opera project partners, was the starting point of our marketing activities. Active marketing started in late 2008 and continued until early May 2009. The database was supplemented along the process e.g. by the members of the project group and the steering group. The most important means of marketing were emails, phone calls and personal discussions e.g. in connection with various conferences. At least 62 new start-ups and small companies were contacted by phone.

In tandem with the search for prospective presenting companies an initial list of private equity and venture capital companies, that were presumed to be interested in OLAE, was first assembled by PEF and VTT. The members of the steering group also helped us identify potential companies and investors who might be interested in attending the Venture Forum and distributed information on the event within the venture capital community. In addition to extensive email marketing, around 40 venture capital companies and private investors were approached over the phone and / or in person at conferences and in other meetings.

The Venture Forum webpage was established under the Opera website. The page contained a general introduction to the event, instructions for the presenting companies, contact information and so forth. All key documents of the Venture Forum, i.e. the brochure, the registration form and the presentation guidelines, were downloadable from the webpage. After the event the participant list and the presentations were also uploaded to the webpage. URL: http://opera-project.eu/index.php?id=13&lang=EN.

In total 41 people from ten European countries finally registered for the Opera Organic Electronics Venture Forum on 19 May 2009 in Brussels. They represented twelve presenting companies, ten venture capital companies, larger industrial organisations, consultancies, business incubators, industrial associations and research and development organisations. Seeking for funding / investment opportunities was the single most important reason to register in case of commercial players. Other important motivators included the ability to follow industry trends and to network.

There were two keynote speeches at the outset of the event. First, Dr. David Fyfe, Chief Executive, Cambridge Display Technology Ltd., talked about opportunities for innovation in the OLAE value chains and presented the key milestones of the CDT case. The second talk was given by Dr. Johannes Canisius, R&D Director, Merck Chemicals Ltd., who draw the attention to the challenges of and prerequisites for creating new businesses from emerging technologies, using the evolution of liquid crystals as an example.

In general, feedback has been very positive. The selection of presenting companies was considered good. The event was considered successfully organised, too, although the 30-minute-slippage in the schedule caused some problems for those who had booked the breakout rooms for late afternoon meetings.

Perhaps the most significant weakness of the event was the limited participation of international (other than Belgian) investors. Of the ten registered venture capital companies only two came from outside Belgium: one from the Netherlands and the other from France. One of the Belgian venture capital companies, however, represented a Finnish investor. For this particular reason some of the attendees were of the opinion that in the future it might be wise to organise the event in connection with some existing, more established event. On the other hand, also the „stand alone' concept received support.

In retrospect it can be said that the Venture Forum was a definite success, especially when the starting-point is taken into account: the Opera „brand' was „brand new', and the event was organised by the Opera project partners without professional event management support. The hit rate proved fairly good with respect to the size of the whole industry in Europe. On the other hand, the amount of work needed to contact potential presenting companies and investors and to persuade them to register was much greater than initially expected.

3.9 Who should act and who should pay

Venture Forums can be organised e.g. by relevant industry associations, such as Photonics21 and the Organic Electronics Association (OE-A), in case of which the incurring costs can be covered using membership fees, participation fees, or the combination of the two (allowing a reduced participation fee). Business incubators are also well equipped to do the job (funding thru participation fees), as are professional event management companies. For commercially operating organisers the Venture Forum concept is difficult, however, because the size of the event is perforce limited in comparison to mega-conferences. The smaller the event, the greater is the challenge of making it profitable for the organisers, too.

Another option is project finance. The Opera Organic Electronics Venture Forum was largely financed by Opera and PolyMap projects. The event was free for the presenting companies and the members of the steering group, while for others the participation fee was EUR 295 per person. The participation fees covered by and large the facilities cost, but taking into account the huge amount of work needed to put everything together (especially marketing), the event could not have materialized without substantial project finance.

A much greater challenge relates to the organising and funding of day-to-day finance consulting for start-ups and SMEs. We estimate that especially to the major EIB/EIF funding instruments for SMEs, such as CIP, are not widely used due to the sheer lack of clear information and practical advice. Again, (publicly funded) business incubators, local development agencies and industry associations should be able to help. This takes a lot of expertise but before all recognition of the obvious mismatch between the opportunities and the reality.

4. Developing a SME-friendly OLAE business ecosystem

The OLAE vision paper (OLAE Vision, 2009) produced by Opera Task Force lists a number of recommendations for strengthening the competitiveness of Europe in different fields of organic and large area electronics. The key recommendations were as follows:

- establish a strong European Platform on OLAE to actively link with EC programs that represent application areas for OLAE technologies,
- take specific measures, e.g. establish pilot production centres, to close the gap between R&D and products,
- nurture the emergence of an European OLAE industry through new policy initiatives,
- increase the funding budget in proportion to the huge expected markets and establish new ways to access venture capital,
- develop an "Era-Net Plus" approach for cooperation in and beyond Europe,
- take measures to develop standards for new technologies and products, and
- establish new training schemes which fit to the interdisciplinary nature of the OLAE field and which range from basic science through engineering and business planning.

In this chapter we are going to develop some of the ideas further. As always, the challenge is to come up with concrete proposals on how to proceed in practice. Nevertheless, we hope that the views and recommendations given below will help practitioners, policy makers as well as researchers in their work.

4.1 Product concepts drive the development of the value chain

Both new and experienced entrepreneurs always highlight the necessity to define the product and to find the first pilot customers as soon as possible. Small businesses just cannot afford the luxury of waiting for EU policy instruments to work or research programmes to yield ground-breaking results. Nor can they expect customers to start ringing their doorbells. They must act to generate cash flow.

Product concept is the linking element between technologies and markets. The product concept defines, on a rough level, the key features of the offering and related benefits to the customer. In addition, it covers the underlying technologies, the co-operative arrangements needed to produce, distribute and sell the product, the costs of running the business, and of course the mechanisms through which the company is going to make money and profits. In the broad sense of the term, the product concept includes the business model, too (Figure 11).

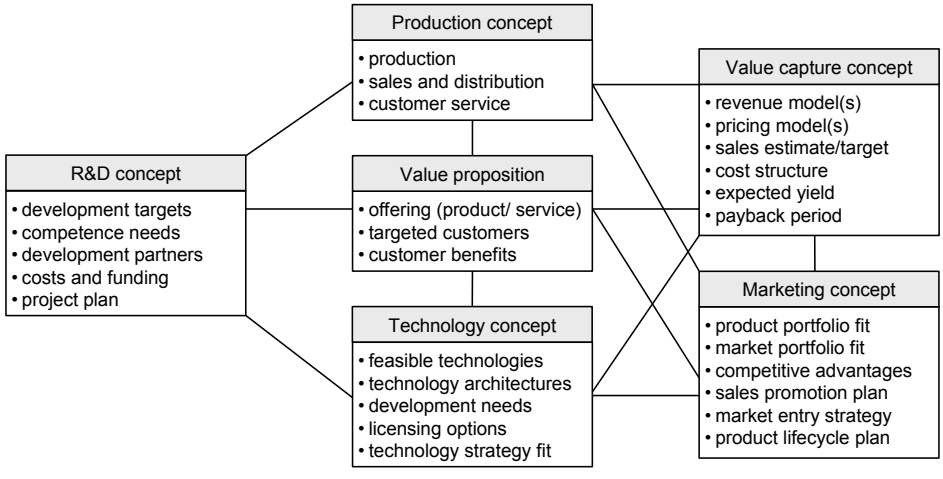

Figure 11. Product concept reference model. The product concept is an evolving document – different elements of the concept shape up in the course of time and also change as a result of development work and changing market conditions. Originally published in Kettunen et al. (2007).

The development of the product concept, especially in case of a start-up, typically proceeds in collaboration with key partners, such as technology providers and pilot customers – barring trade secrets. The product concept is an evolving thing, e.g. a set of documents, supporting the integration of different viewpoints (e.g.

user, product, and technology), definition of new product features, setting of technology development goals, drafting of marketing strategies, and processing of market feedback (Figure 12). In other words, when the network development becomes an essential part of the product development work, less time will be spent on projects that have no prospects of success in the prevailing business environment (i.e. the value chain is missing and cannot be created in due time).

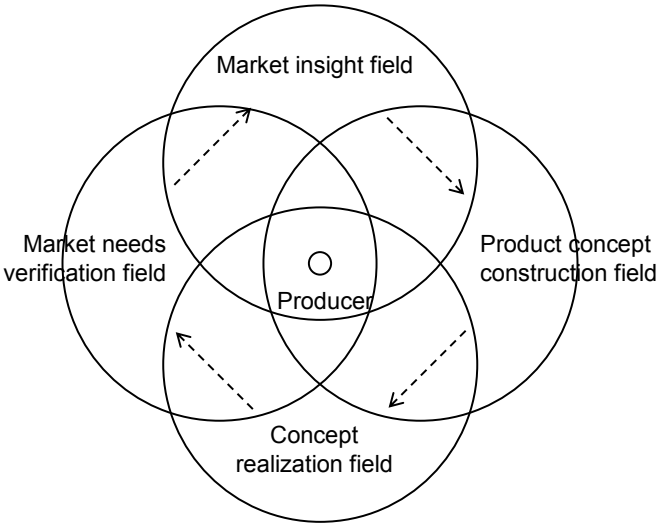

Figure 12. Product concept development cycle. Originally published in Orihata and Watanabe (2000).

Market pull and development support provided by larger scale enterprises (LSEs) is of paramount importance to new ventures. A typical problem regarding SME-LSE cooperation is the demand for scalability, e.g. when the technology / product / service developed by a smaller supplier is to become an element in the principal's high-volume offering. One way of mitigating this problem for a SME is to set the strategic focus on developing products based on well-protected IPR. In such a case mass production may be either outsourced to third-party subcontractors or, alternatively, transferred to the principal. The revenue model would be based on licensing and technology transfer contracts. Pilot production facilities are nevertheless needed to demonstrate and develop product concepts in terms of product features as well as design for manufacturability.

Industry associations shall assume an active role in helping SMEs build their value chains to the upstream and to the downstream. The European OLAE plat-

form, should it be established, as well as organisations like OE-A can make a difference. They cannot conclude business deals on behalf of other players, but they can facilitate match-making between potential suppliers and customers. Such activities should not be confined to separate events, such as trade fairs, but supported continuously e.g. in exchange for a cost-based fee, perhaps a modest success fee, too, in case of a major contribution. Also OLAE consultants could consider developing their offerings in the area of supply chain development and marketing.

4.2 Pilot production facilities are essential

The gap from research to product is the most difficult one to bridge for OLAE products, and worldwide competition in getting new products to the market is intense. In this respect Europe is clearly disadvantaged in comparison to many Asian countries. In Asia, there are many companies with vertically and horizontally integrated businesses which are willing to carry R&D to products even if it were a time-consuming and expensive process. Moreover, in Asia the public is rather open to gadgets which demonstrate new technologies, even if parameters like lifetime are not fully satisfying. European companies generally tend to stay away from such products.

Pilot production facilities are needed to support the manufacturing of prototype products and product demonstrators. In particular, they would provide the means of demonstrating new product concepts and boosting customer traction for start-ups and SME with limited resources. Both small and big companies could make use of the facilities in exchange for a use-based fee, and especially smaller companies would benefit by not being forced to make expensive upfront investments. It is also essential to involve players from all branches of the current / potential value chain, including big product companies and brand owners, to stimulate the development of the value chain and the applications market – a particular problem for OLAE. For established companies the benefit of being involved would be networking with new potential suppliers and technology providers (first-mover potential). A good example of such a pilot facility is PrintoCent, an Oulu-based centre for business development in the area of printed intelligence (http://printocent.net/).

Funding may become an issue. A limited company building and running the facilities should be able to cover all the costs and to generate return on the partners' investments thru the sales of related services. Because production equipment are expensive and the size of the industry is still small, developing a viable

business model may prove challenging. But there are other alternatives. PrintoCent, for example, was established as a tree-year programme and is mainly financed by project partners, including VTT, local authorities and development agencies, and big (foreign) industrial companies. Supplementary funding can be generated by the provision of services for external parties (use fees). The advantage of this model is in the involvement of the much sought-after product companies from the very beginning, and the ability to receive public support. On the other hand, public sponsors of R&D can also make it easier for small companies to purchase services from the companies or programmes managing the pilot production facilities, e.g. in the form of R&D grants or debt financing.

4.3 Develop markets for new technologies through public procurement

The "Small Business Act" for Europe (SBA), adopted in June 2008, reflects the European Commission's political will to recognise the central role of SMEs in the EU economy (http://ec.europa.eu/enterprise/policies/sme/small-business-act/). The SBA aims to improve the overall approach to entrepreneurship, to anchor the so called "Think Small First" principle in policy making from regulation to public service, and to promote SMEs' growth by helping them tackle the remaining problems which hamper their development.

The SBA policy paper consists of a set of 10 principles to guide the conception and implementation of policies both at EU and Member State level. The three major overreaching themes of the SBA are diminishing the administrative burden, facilitating access to finance, and facilitating access to market. In particular, SBA stresses the importance of facilitating SMEs' participation in public procurement and helping SMEs to benefit more from the opportunities offered by the Single Market.

One of the key challenges for SMEs regarding public procurement has been the generally high volumes of public contracts, which has effectively prevented SMEs from tendering their products and services. The Commission working report on the implementation of the SBA from December 15, 2009, shows that the SME Code, adopted as a part of the SBA in June 2008, has had an effect (COM (2009) 680). In France, for example, the legislator clarified in the general public procurement Act that setting minimum capacity levels for tenders is optional. In Hungary, the Act on public procurement was modified in April 2009 and includes some new elements such as the subdivision of contracts into lots

when appropriate. And in Sweden, the Legal, Financial and Administrative Services Agency is, as from January 2009, responsible for providing practical help and guidance both to procurers and tenderers nationwide. To what extent the new rules are actually applied in practice, however, is still another question.

From the point of view of creating market pull for new emerging technologies, an issue of particular importance to OLAE, both the SBA policy paper and the Commission report fail to come up with any new ideas for, or signs of, development. One such area could be, for example, environmental technologies. One of the ten principles mentioned in the SBA policy paper entails "enabling SMEs to turn environmental challenges into opportunities". This sounds good, but further reading reveals that instead of supporting market creation for SME-developed environmental technologies, the underlying intention has been to help turn SMEs ‚greener' through the implementation of environmental management systems.

Our strong view is that public authorities could effectively help SMEs develop new technologies and create markets for new products by assuming the role of a lead customer in selected technology areas. For example, a government agency planning for a significant new building could require that novel technologies with societal benefits, like low energy consuming OLED lighting, are used, and invite European companies to tender for these products and related services in accordance with the principles of the SBA. Using this governmental entry market as a ‚platform' for technology, product and service development, companies would be much better equipped to address other markets.

4.4 Establish New Electronics Finance Platform

Lack of capital delays technology and product development, and hinders scaling up of production in various field of OLAE. Therefore the problem of the nascent OLAE applications market is partly created and maintained by insufficient financing (see Figure 4). In addition, the shortage of capital makes promising European SMEs prospective acquisition targets for large Asian players with deep pockets and high risk tolerance. This is not necessarily bad news for the entrepreneurs themselves. But from the point of view of European innovation policies and economies it is somewhat problematic if the future proceeds of European R&D investments, which have been partly financed by the European taxpayer, are harvested by non-European investors.

The European private equity and venture capital market has never been as vivid as its American counterpart. While this is part of the problem, the real chal-

lenge stems from the ongoing, global trend of dying seed and early-stage VC funding. As noted before in the report, lack of exit opportunities for investors, especially new initial public offerings, and generally lower-than-expected returns from seed and early-stage investments, translating into an increasingly unfavourable reward/risk ratio, have cast out most investors from this market. The perceived risk is exceptionally high in new technology areas, e.g. in organic and large area / printed electronics. As a result, investors prefer „proven' cases. The conclusion is clear: something needs to be done.

While the European Investment Bank (EIB) and the European Investment Fund (EIF) are in accordance with EU level policies allocating increasing attention to small business development activities, the current situation is far from satisfactory. First, the EIB / EIF funding instruments are not directly available to SMEs, but are channelled thru selected „financial intermediaries' (e.g. banks and VCs). For SMEs such financial intermediaries that have been approved by EIB / EIF are hard to find. Second, banks or VCs cannot be expected to be overtly enthusiastic about EIB / EIF instruments, because organizing takes a lot of work and the economic reward for making the effort is questionable. For example, if EIF supplements an equity invest made by a VC fund, this would not have any effect on the VCs own return on investment. Now the question is as follows: if someone facilitated the process, then could this make a difference?

There is an obvious need for something that can be called a „New Electronics Finance Platform' (NEFIN). In this connection „new electronics' refers to OLAE, as well as to other related technology areas that have relevance for OLAE and which are generally interesting for investors (Figure 13). The widening of the scope was deemed necessary on the basis of numerous discussions we have had with VC representatives. OLAE alone is for the time being simply too narrow a field to generate enough new ventures to be financed, or to attract major VCs.

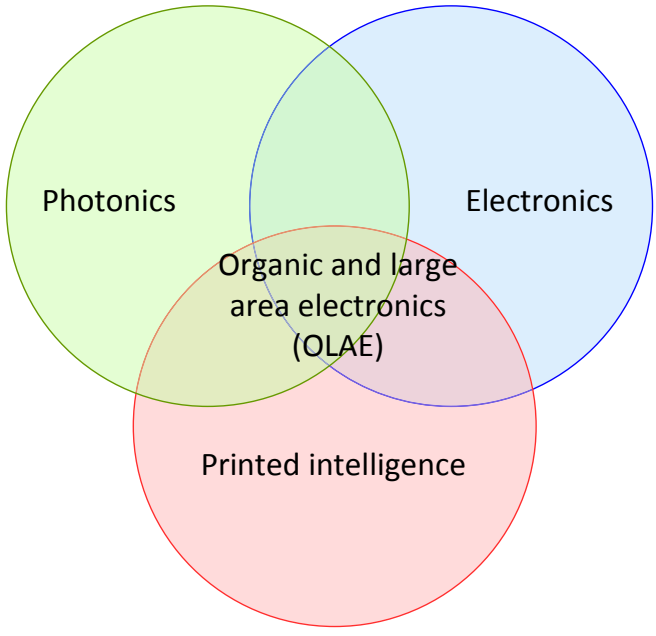

Figure 13. New electronics defined.

The major function of NEFIN would be to facilitate start-up and SME access to finance and to scan and evaluate potential investment targets for investors. NEFIN would not set up a fund of its own, but would carry out its own research, provide advice for entrepreneurs, investors and financial intermediaries, and coordinate various activities, such as Venture Forums. The types of funding to be covered should include equity, debt and guarantees from both private and public sources (including EIB / EIF). The technology focus would be on „new electronics' where risks are high, lead times are long, and the envisaged long-term economic impact is significant. In terms of the development stage the focus would be on seed and early stage. The geographical focus would be on Europe. When it comes to the domicile of prospective investors, a decision on whether to target also non-European investors shall be made, too.

For starters, NEFIN could be structured as a Work Package or Work Task in a EU Coordinated Support Action. The minimum duration of the project is estimated to around two years. Fully-committed, professional people are needed to market and run the operation. As part of the project a longer term operating model for the NEFIN should be developed, however. If there is demand for the service in the market, the platform should be able operate without public fund-

ing. Expectedly, in such as situation, NEFIN could be established as a legal entity financing its operations mainly through membership fees (if cooperative), chargeable services and/or success fees (if limited company).

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Appendix 1: Organic Electronics Entrepreneur Training Day Programme (Oulu, Finland)

Organic Electronics Entrepreneur Training Day: Programme

10 November 2009, Oulu, Finland

Time	Programme item
07:15–08:00	Breakfast
08:00–08:15	Opening of the programme, objectives, agenda, practical issues Ilkka Kaisto, Micropolis Oy
08:15–08:45	Keynote speech: Emerging opportunities in organic and large area electronics Harri Kopola, VTT Center for Printed Intelligence
08:45–09:30	Keynote speech: Avantone, a company that did not cross the chasm Matti Koivu, Oulu Innovation Oy
09:30–09:45	Break, refreshments
09:45–10:15	Keynote speech: The elements of a good business plan – VC perspective Vesa-Pekka Kursu, Veraventure Oy
10:15–11:15	Idea presentations by the participants, Q&A Facilitated by Ilkka Kaisto, Micropolis Oy
11:15–11:30	Introduction to coaching Ilkka Kaisto, Micropolis Oy
11:30–12:15	Lunch at VTT
12:15–14:30	Coaching in 4 groups The owners of the idea + 1–2 mentors per group
14:30–14:45	Break, refreshments, organising for the next session
14:45–16:25	Presentations of the results of coaching, Q&A Facilitated by Ilkka Kaisto, Micropolis Oy
16:25–17:15	PrintoCent presentation, Matti Koivu, Oulu Innovation Oy Oulu area incubation and mentoring support Martti Särkelä, Technopolic Ventures Oy OPERA and PolyMap project info Jari Kettunen and Raimo Korhonen, VTT Discussion on experiences & further actions Ilkka Kaisto, Micropolis Oy

Appendix 2: Mentors and Lecturers of the Three Entrepreneur Training Events

10 November 2009, Oulu, Finland

Name	Affiliation
Mr. Aimo Savukoski	Arctic Crossing Consulting
Mr. Markku Tapio	Market Insight (Switzerland)
Mr. Ilkka Kaisto	Micropolis Oy
Mr. Jouko Strand	Micropolis Oy
Mr. Matti Koivu	Oulu Innovation Oy
Mr. Martti Särkelä	Technopolis Ventures Oy
Mr. Vesa-Pekka Kursu	Veraventure Oy
Dr. Harri Kopola	VTT
Mr. Jani-Mikael Kuusisto	VTT

20 May 2010, Heidelberg, Germany

Name	Affiliation & Position
Dr. Jan Adams	EMBL Ventures GmbH, Managing Director
Dr. Alexander Dick	Herzog Fiesser & Partner, Patent Attorney
Dr. Michael Geisser	ubivent GmbH Managing Director Market Development
Mr. Ilkka Kaisto	Oulu Innovation Ltd. Program Director Nanotechnology Cluster
Mr. Ed van den Kieboom	Plastic Electronics Foundation, CEO
Dr. Raimo Korhonen	VTT Technical Research Centre Senior Research Scientist
Dr. David Müller	Merck KGaA, Senior Project Manager
Dr. Engelbert Quack	SAP AG, Partner Management
Mr. Bernhard Schweizer	InnovationLab GmbH, Managing Director
Dr. Jörg Sievert	SAP AG, Head of Venture Capital Europe
Dr.-Ing. Matthias Stössel	Herzog Fiesser & Partner, Patent Attorney
Dr. Carsten Winnewisser	CSEM, Senior Manager Business Development

1–15 November 2010, Oulu, Finland

Name	Affiliation
Dr. Jukka Hast	VTT
Mr. Ilkka Kaisto	Micropolis Oy
Mr. Matti Koivu	Oulu Innovation Oy
Mr. Aimo Savukoski	Arctic Crossing Consulting
Mr. Markku Tapio	Market Insight (Switzerland)
Mr. Eero Kaikkonen	Minero Oy
Dr. Raimo Korhonen	VTT

Appendix 3: Organic Electronics Venture Forum: Programme and Presentation Schedule

19 May 2009, Brussels, Belgium

Time	Programme item
–10:00	Breakfast
10:00–10:05	Opening of the OPERA Venture Forum Mr. Ed van den Kieboom, President, Plastic Electronics Foundation
10:05–10:25	Keynote speech: Opportunities for innovation in the OLAE value chains Dr. David Fyfe, Chief Executive, Cambridge Display Technology Ltd.
10:25–10:45	Keynote speech: Creating new businesses from emerging technologies Dr. Johannes Canisius, R&D Director, Merck Chemicals Ltd.
10:45–11:00	DisaTech – Mr. Christophe Renard, Mr. Stephane Poughon
11:00–11:15	isiQiri Interface Technologies GmbH. i.G. – Dr. Richard Ebner
11:15–11:30	Break – Coffee, refreshments and snacks (Foyer, 2nd floor)
11:30–11:45	Braggone Oy – Mr. Ari Kärkkäinen
11:45–12:00	Heliatek – Dr. Andreas Rückemann
12:00–12:15	Canatu Inc. – Mr. Mikko Kärkkäinen
12:15–12:30	Intrinsiq Materials Ltd. – Mr. Joe Raguso, Dr. Paul Reip
12:30–13:30	Lunch buffet (the main restaurant, 1st floor)
13:30–13:45	Enfucell Ltd. – Mr. Juha Koskinen
13:45–14:00	Nano ePrint Limited – Mr. Scott White
14:00–14:15	Nicanti Oy – Mr. Paul Wilkinson
14:15–14:30	Novaled AG – Mr. Harry Boehme
14:30–14:45	Break – Coffee, refreshments and snacks (Foyer, 2nd floor)
14:45–15:00	NTERA Inc. – Dr. David Corr
15:00–15:15	Vision Dynamics / Innophysics B.V. – Dr. Alquin Stevens, Dr. Paul Blom
15:15–15:30	Wrap up by Mr. Ed van den Kieboom
15:30–17:30	Meeting rooms available for pre-scheduled and ad-hoc meetings (optional)

Appendix 4: Organic Electronics Venture Forum: Presentation Guidelines

19 May 2009, Brussels, Belgium

Preparing for the Venture Forum

The following list provides an overview of topics that investors might want to know about your business. Please note that you will have no more than 10 minutes to present your case. Therefore you should consider

1. focusing on the issues that you think are most relevant to your case – i.e. you may not have enough time to go through your entire pitch deck, and
2. presenting your case in a clear and concise manner.

These guidelines have been prepared especially for new start-ups with no prior or only limited experience in seeking venture capital. The guidelines have been compiled in co-operation with Mr. Ed Sim, Managing Director, Dawntreader Ventures[1].

Topics to be addressed

1. The value proposition – Describe in few words the offering, the customers, and the benefits your offering will provide (1 slide)

2. Brief history – When was your company founded, what are the major milestones so far, how much capital have you raised to date and from whom, and how much capital is needed in the new round (1 slide)

3. Who/Team – Who are you and what is your background? Provide an overview of your past successes and failures. This helps the potential investor get an idea of your ability to deliver and surround yourself with experienced talent. Also include any board members that may be relevant (1 slide)

4. What is the problem that you are going to solve? – Is it a known problem that has not been adequately solved so far, or a new one that has recently become

[1] Ed's blog on venture capital, technology and markets is available at www.beyondvc.com.

relevant? Justify the problem statement! Otherwise the potential investor might wonder whether the world really needs the new technology, product or service to be developed (1–2 slides)

5. How do you uniquely solve the problem? – Solving the problem just like everyone else makes it more difficult to differentiate from your competitors and to build a profitable business (1–2 slides)

6. Technology – Provide insights into the underlying technology and its advantages. Is it specific to your offering or does it also have other potential application areas? Is it licensed or self developed? How are you planning to protect the technology? Make the potential investor interested, but do not reveal any business critical information since there will be other companies listening! (1–2 slides)

7. Customer traction – Is the product already in hands of customers? If so, share some data on your customers and their experiences (1–2 slides)

8. Market size/Competitive Overview – How big is the market and how did you come up with that number? How are you positioned in the market and the OLAE value chain? Note that it will be "a sin" to claim that you have no competition (1–2 slides)

9. Go-to-market Strategy – How are you planning to grow and use the capital in an efficient manner? How are you going to market and distribute your offering? Provide information on your present or potential partners that will help you develop, market and deliver your offering. (1 slide)

10. Business/Revenue model – Explain how the economics of your business work. What are the mechanisms through which you are going to generate revenue? To what extent and how is your business success linked to the success of your customers and the activities of your partners? Can you operate efficiently enough to cover the costs of running the business with the projected revenues – and still make profit? Finally, what are the major risks involved? (1–2 slides)

11. Financials – Estimate how your business will grow, and what the revenue numbers look like over the next 3 years. Help the potential investor understand how the business scales, what does it take, and what are the true cash needs for the business to get to breakeven (1 slide)

12. The financing round – Lay out the amount of Euros you are asking for, how it will be used, and how long the cash will last (1 slide)

13. Milestones – What milestones have you hit so far and what do you plan on realizing during the next year with the new cash (1 slide)

Presentation summaries

The presenting companies are requested to submit a brief summary of their presentation prior to the Venture Forum. The presentation summaries should cover the following areas:

- The value proposition (item 1)
- Brief history (item 2)
- The problem (item 4)
- The solution (item 5)
- The financing round (item 12).

Note that we are not asking for a complete pitch deck – 5–7 slides will do. Please send them to the event co-ordinators.

Programme and registration

The latest programme of OPERA Organic Electronics Venture Forum is available on our website at http://opera-project.eu/index.php?id=13&lang=EN.

To register, please contact the event co-ordinators.

Series title, number and
report code of publication

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VTT-TIED-2579

Author(s)
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Title

Promoting Entrepreneurship in Organic and Large Area Electronics in Europe
Issues and Recommendations

Abstract

This report summarizes the key findings and recommendations produced in the Entrepreneurship Work Packages of two EU-funded projects, Opera and PolyMap. The overall objective of both projects was to enhance the competitiveness of Europe in the field of organic and large area electronics (OLAE) by facilitating co-operation between European OLAE competence clusters. The specific objective of the Entrepreneurship Work Packages was to promote entrepreneurship and, in particular, to identify and help tackle the various business development challenges of European start-ups and SMEs operating in the area. The report provides an overview of the OLAE value chains and markets and a detailed analysis of the identified business development challenges. In addition, the report issues practical, hands-on recommendations for organising entrepreneur training and mentoring, for facilitating start-up and SME access to finance, and for developing the OLAE business ecosystem in Europe. Opera and PolyMap projects received funding from the 7th European Framework Programme. For detailed project descriptions, please visit http://quadriga-org.eu/index.php?id=11&lang=EN.

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This report summarizes the key findings and recommendations produced in the Entrepreneurship Work Packages of two EU-funded projects, Opera and PolyMap. The overall objective of both projects was to enhance the competitiveness of Europe in the field of organic and large area electronics (OLAE) by facilitating co-operation between European OLAE competence clusters. The specific objective of the Entrepreneurship Work Packages was to promote entrepreneurship and, in particular, to identify and help tackle the various business development challenges of European start-ups and SMEs operating in the area. The report provides an overview of the OLAE value chains and markets and a detailed analysis of the identified business development challenges. In addition, the report issues practical, hands-on recommendations for organising entrepreneur training and mentoring, for facilitating start-up and SME access to finance, and for developing the OLAE business ecosystem in Europe. Opera and PolyMap projects received funding from the 7th European Framework Programme. For detailed project descriptions, please visit http://quadriga-org.eu/index.php?id=11&lang=EN.

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