

## THE FUNDING GAP OF KEY ENABLING TECHNOLOGIES (KETs)

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KET companies are defined as micro and nano-electronics, nanotechnology, industrial biotechnology, advanced materials, photonics, and advanced manufacturing technologies (1). They are the foundation for new products in fields such as automotive, food, chemicals, electronics, energy, pharmaceuticals, construction, and telecommunications, and new emerging industries like robotics and drones. They enable mobile devices to be more robust with less power. **They make cars lighter and safer. They create new medicines that cure diseases. They make many other products stronger and more efficient**, ranging from biofuels to military armor, they are important for our future well-being, in Europe and around the world.

Northern European countries spend more resources on R&D than other European Union (EU) countries. In 2014, the R&D expenditures in Denmark, Finland and Sweden were all above 3% of GDP versus the EU average of 2% (2). **KETs are a major focus of Nordic R&D and a priority for EU industrial policy.** Northern Europe is currently going through a wave of very successful new entrepreneurial activities, mainly in the fields of software based on various mobile platforms, such as new "apps" and mobile games. These fields are successfully attracting capital from domestic and international funds, in other words, this sector is doing quite well.

Today, **KET research does not translate into a sustainable economic and employment benefit for Europe.** In the '80's and '90's, European research created successful KET companies such as Axis and Micronic (Sweden), Trolltech (Norway), Q-Cells (Germany), ASML (Holland), and Bookham and ARM (UK). But since the '90's, very few major KET-based companies have been spawned in Europe, despite the large R&D effort.

### We should care about these KETs because :

- 1) KETs represent technological innovation that are of importance for societal development.
- 2) KET companies take a long time to develop (years 10-20).
- 3) KET companies need a lot of investments (~€100M) before reaching self-sustainability.
- 4) KET companies create many valuable jobs.

It is not too challenging for many technology innovations to get early funding from various sources, such as grants from various foundations or various SME initiatives. These seed funding sources usually advance the idea from "Proof of Principle" to "Proof of Concept". **When attempting to move beyond the "Proof of Concept" phase, however, KET startups enter the "Valley of Death".** This phase usually requires more significant financial resources. The ramp-up in costs coupled with the pressure to get to market in a "reasonable" time frame, often means that the access to capital is very scarce.

Today, financial resources are more readily available for the KET company after it has crossed this "valley" and are ready for true commercialization, when the risk is reduced and true customer relationships are nurtured. This is when customers want to see supply capability, as well as sufficient financial backing before incorporating the new innovation into their future products.

Many KET companies require time and money to reach a sustainable level. The so called "funding gap" appears at an early stage of the technology development cycle. **New solutions are clearly needed, such as a new venture capital model that has the staying and fire power to support future KET companies.**

(1) KETs Communication (Com (2012) 341)

(2) Eurostat News Release 209/2015 November 30, 2015