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Innovazione e ricerca

**L'innovazione tecnologica
dell'industria italiana verso
la visione europea del
prossimo futuro**



Mercoledì 2 Aprile 2014

Corrado Carretti, SAES Getters S.p.A.

**Dispositivi Optoelettronici e Materiali Abilitanti per la
Fotonica Organica**





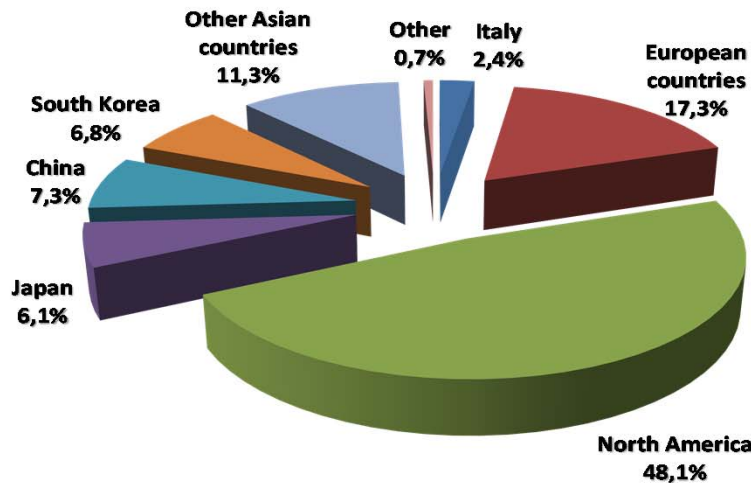
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SAES Group: a Short Identikit



Global Market: \approx 130 M € in 2013



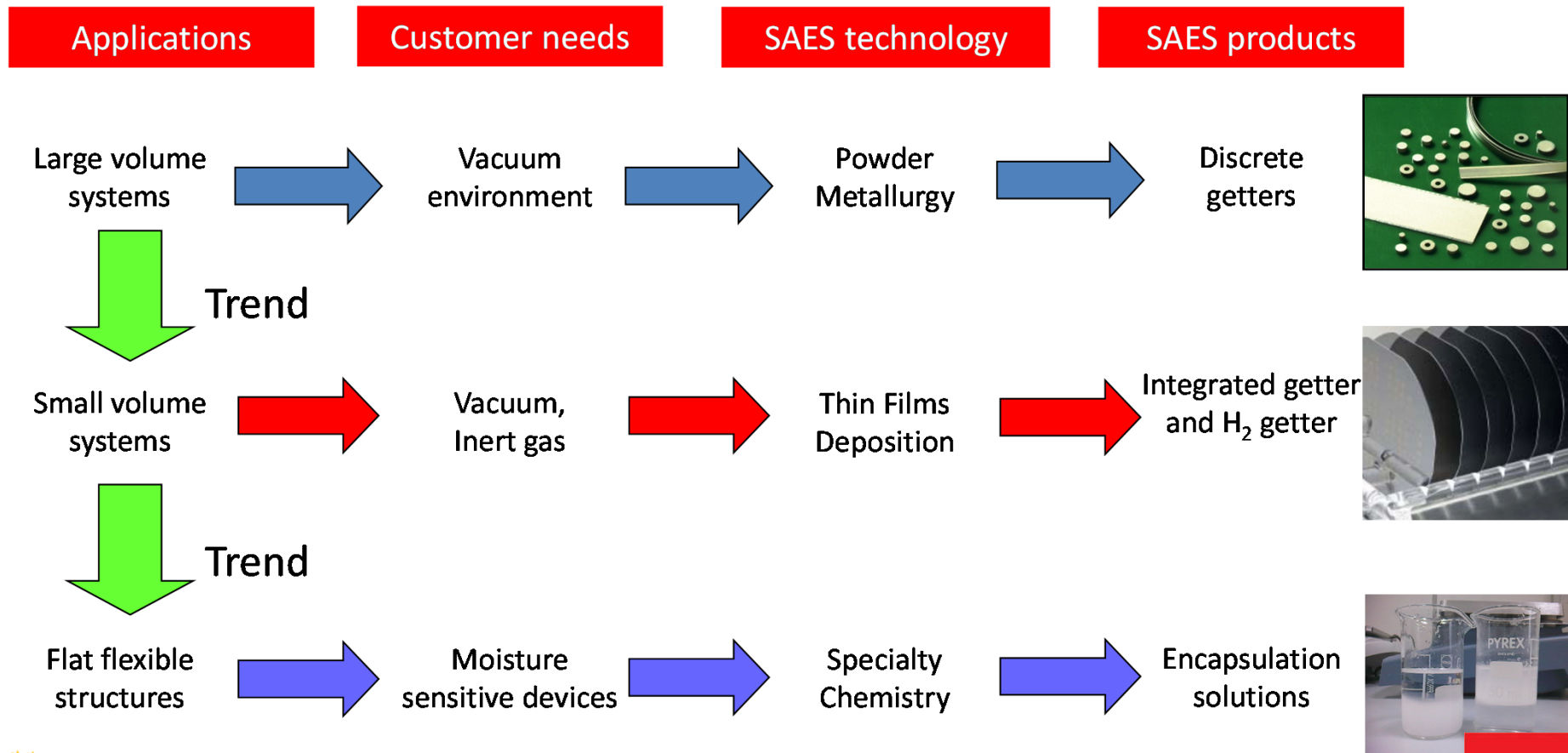
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Technology and Market Trends



saes
getters





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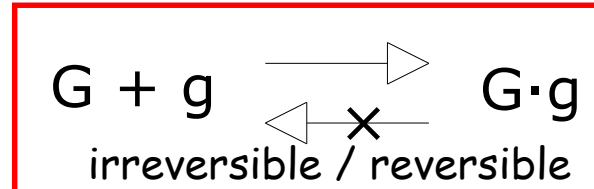
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SAES Core Technologies



Getter Materials

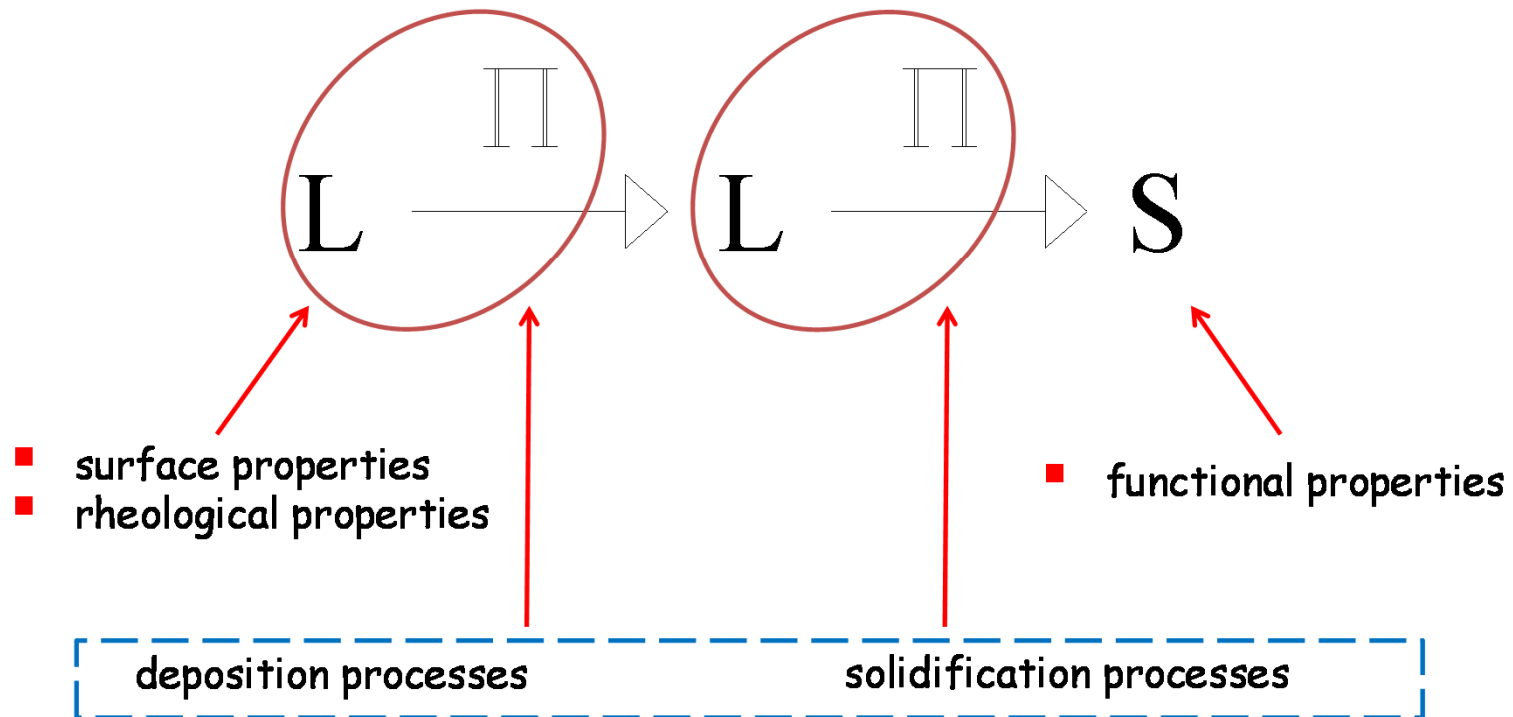
- Key properties of getter materials are:
 - kinetics of the capture process (adsorption, absorption, chemical reaction)
 - capacity (weight of specific chemical species captured by unit weight of getter)
 - partial pressure of a specific chemical species in equilibrium with getter



- Getter materials are (chemical nature):
 - pure metals (Ba, Ca, Ti): evaporated thin films
 - metal alloys (ZrVFe, ZrCo, TiNi, etc.): bulk and thin coatings
 - inorganic, non metal: bulk and thick coatings
 - hybrid organic-inorganic: polymer-matrix composites

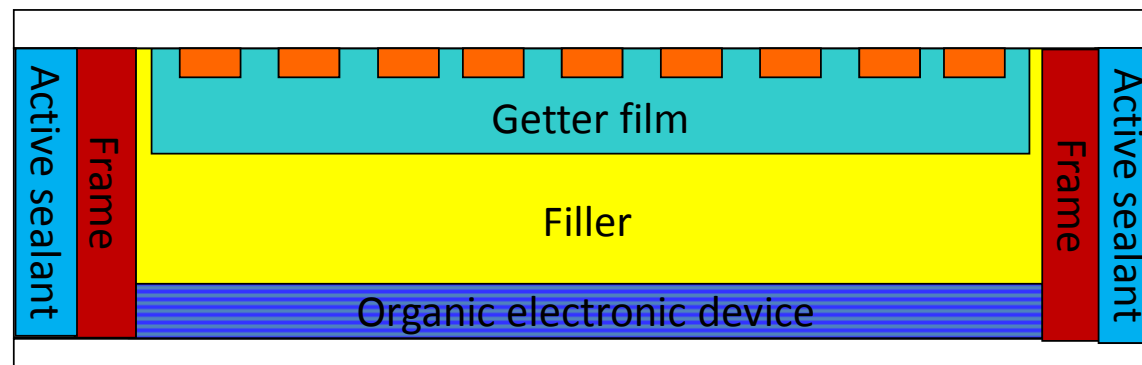
Formulations & Processes

- Getter materials are
(raw material / deposition / use): phase1 -> phase2 -> phase3



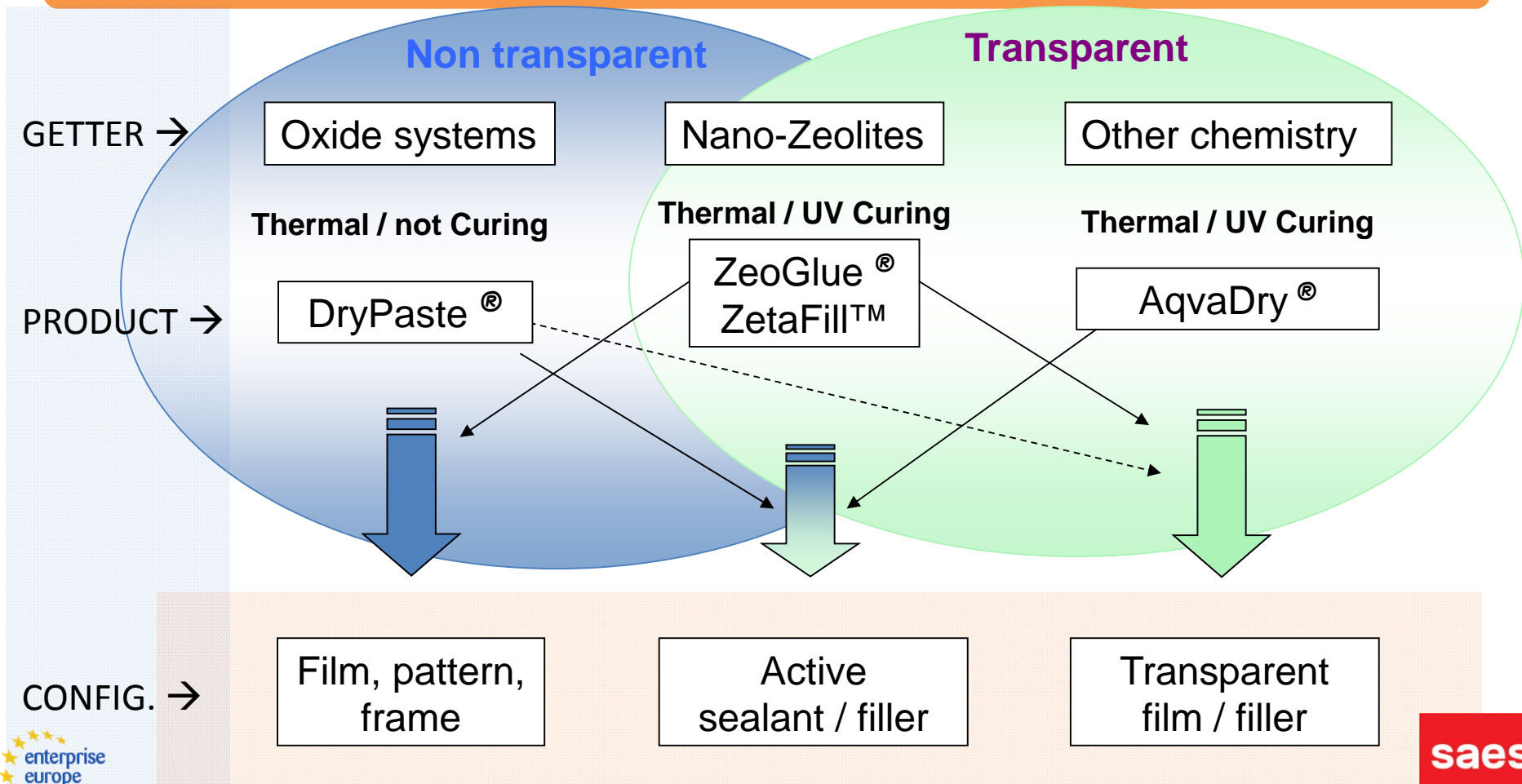
Encapsulation Configurations

- Edge sealant
- Getter (pattern) Frame
- Getter (film) Filler



In order to limit dark spot area growth and pixel shrinkage below values significantly affecting the display uniformity: maximum H₂O pressure inside OLEDs ~ 1.1x10⁻⁴ Torr or ~ 0.1 ppm

Polymer-Matrix Getter Configurations





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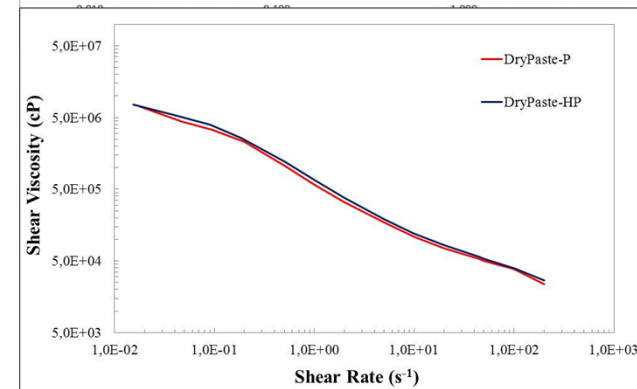
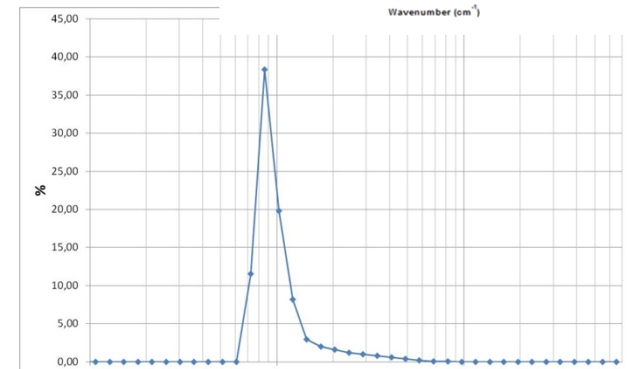
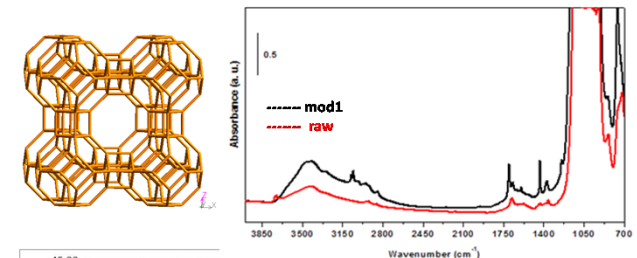
The Materials' Portfolio

- Polymer-matrix micro- and nano-composites based on metal oxides
- Polymer-matrix nano-composites based on nano-sized zeolites
- Liquid getters based on perfluoropolymers
- Polymer-matrix solid solutions of inorganic hydrophilic salts

A wide, flexible technological platform has been developed, allowing adaptation to several application fields.

Distinctive Features

- Functionalization of the micro/nano particles, making possible an easy integration in different polymeric matrices.
- Fine tuning of the grain size, allowing the deposition of very thin films.
- Optimized control of rheological properties, allowing the best matching to the customers' production facilities.





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ETC s.r.l. – A New Photonics Company

- ❑ ETC has been founded on february 10th, 2010. The new company leveraged on a relationship established between SAES and CNR, taking advantage of the huge amount of high-quality research skills on organic photonics available at Bologna's CNR and of the long standing experience of the SAES Group in solving problems of contaminants control in sealed devices.
- ❑ VISION: to be THE organic field-effect photonics company
- ❑ MISSION: to develop know-how and IP on organic photonics and, in particular, to develop components and devices based on organic light emitting transistors (OLETs) and on organic light sensing field effect transistors (LSFETs), targeting hi-tech niche markets.



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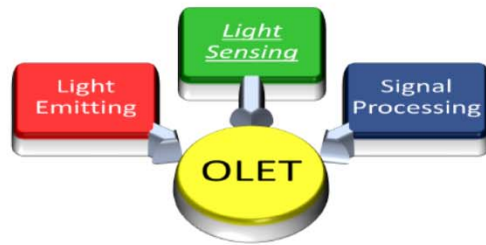


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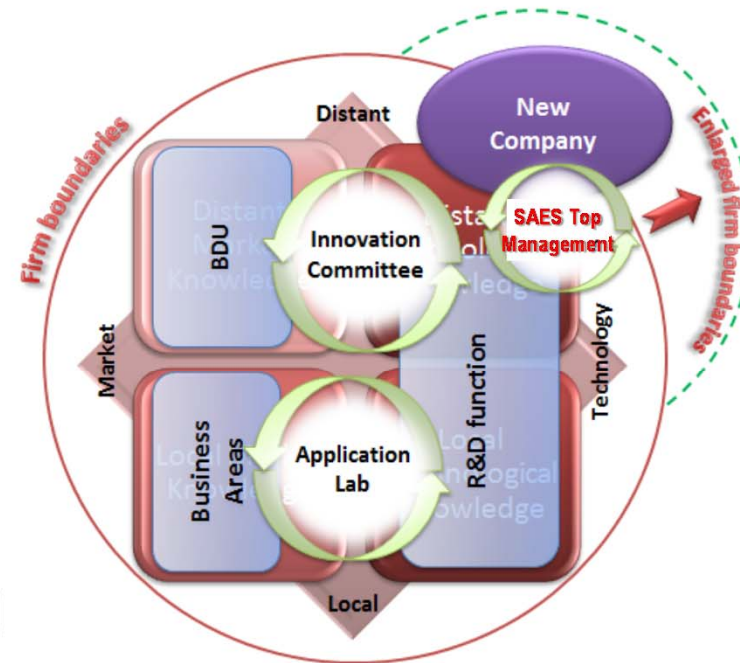
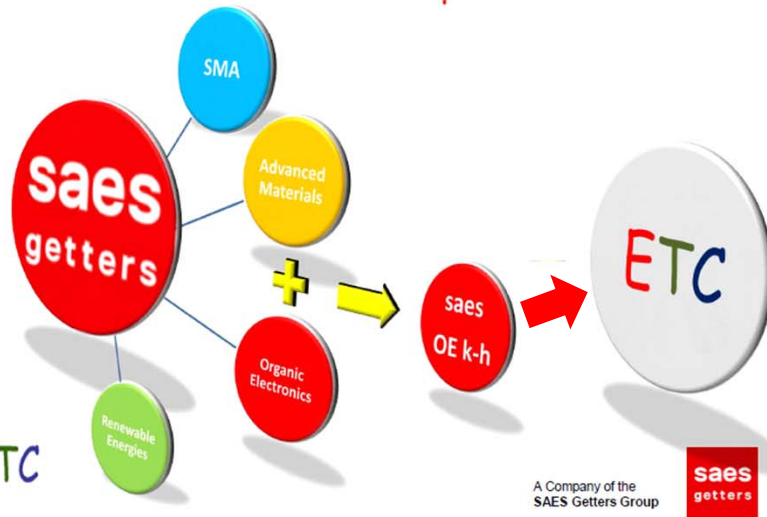
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A Systemic Approach

E.T.C. S.r.l.



The Organic Field-Effect Photonics Company

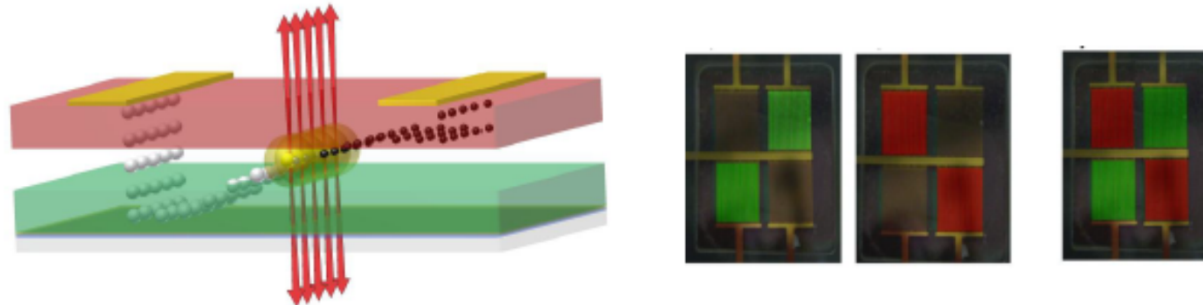


ETC

A Company of the
SAES Getters Group



OLET Distinctive Features



Distinctive features of ETC OLET technology

- Better electrical characteristics in terms of current density and charge mobility balance
- Control over the position and the extension of the illuminated area
- Operational bias \approx 3 times lower than competitors
- Maximum brightness at lower voltage (currently at about 20 V)
- Simple manufacturing and easy chip integration



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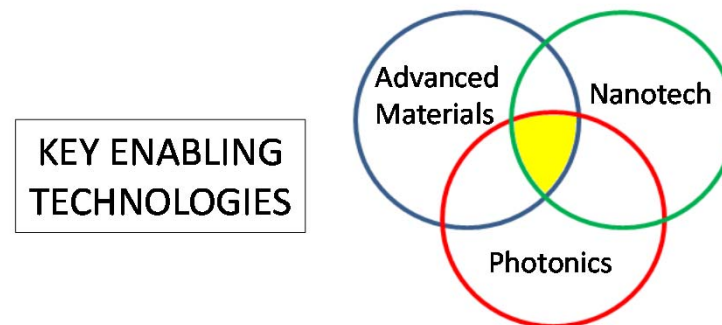


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Conclusion

- SAES is developing two tightly correlated technological platforms (hybrid getters and organic transistors) at the intersection among Advanced Materials, Nanotechnology and Photonics KETs.



- The know-how presently available in SAES Group allows evaluating the use of these advanced materials and devices in several applications, such as organic electronics, active packaging, healthcare, etc.





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Thanks for your attention

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