

IMEC's Micro- and Nanoelectronics R&D Activities and Interactions with Japan – Present and Future



Akihiko Ishitani
IMEC Representative in Japan



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2

Where it all started ...

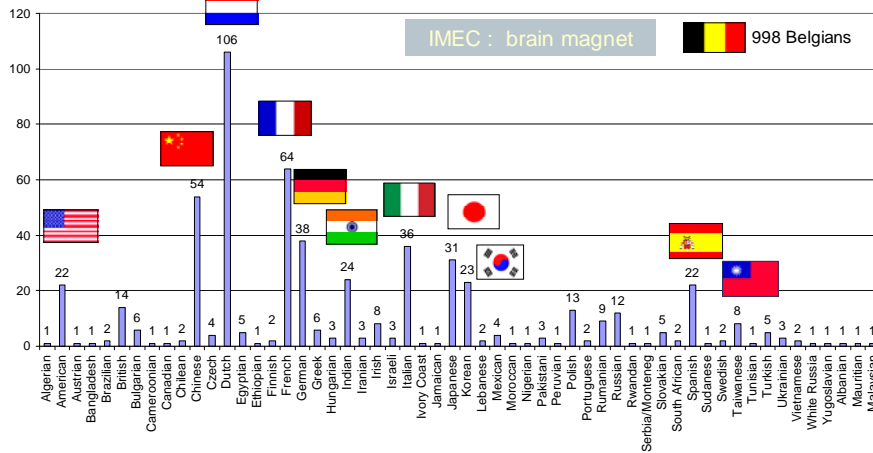
1984, in front of the Arenberg Castle ...



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More than 50 nationalities at IMEC

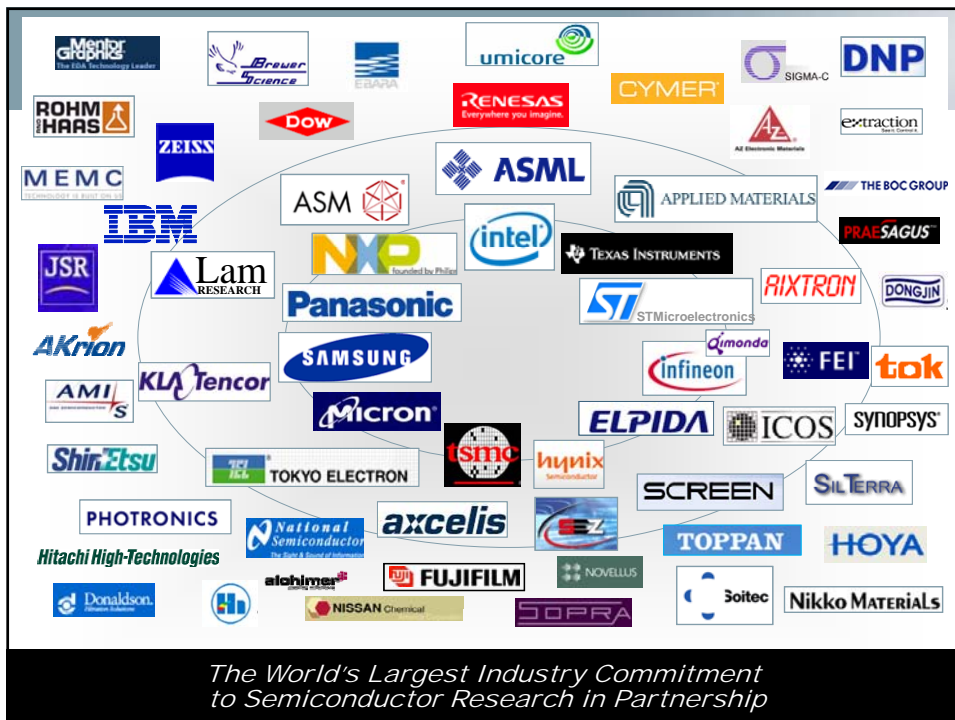
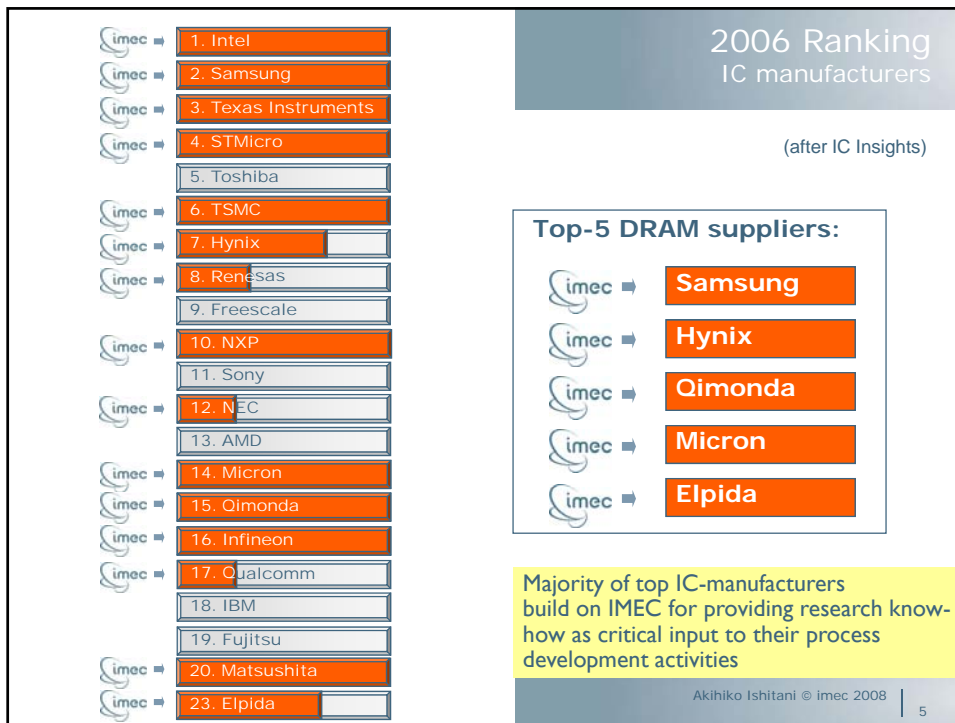
Foreign coworkers (PR + NPR): number per nationality
56 foreign nationalities, 998 Belgians
(information dd. 31/08/2007)

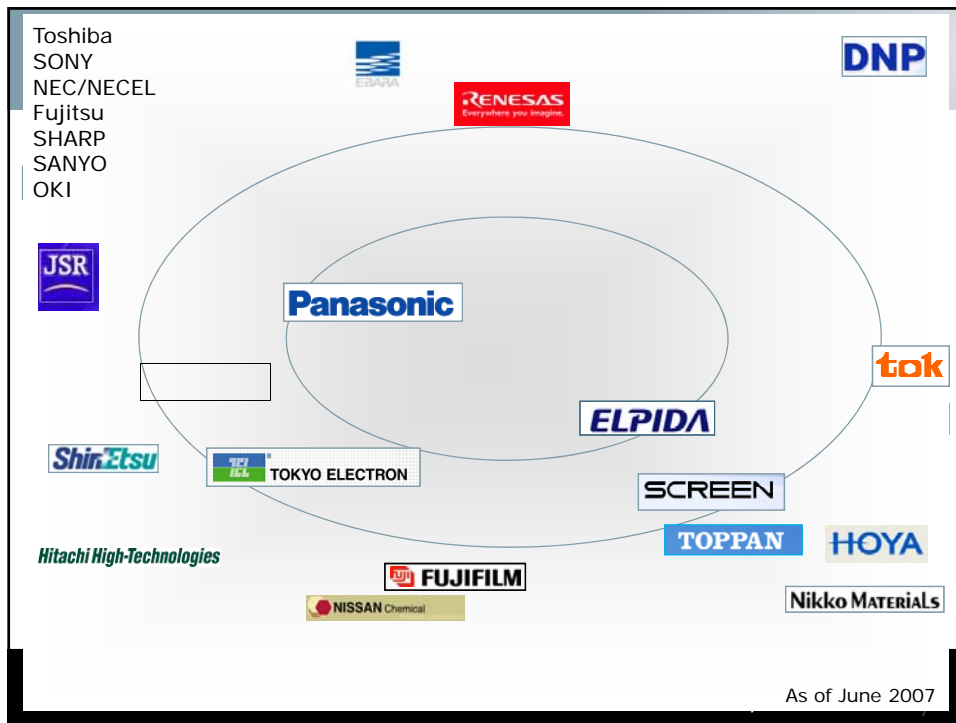


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4





IMEC 1984 - 2007 - 2009

1984

Established by state government of Flanders in Belgium
 Non-profit organization
 Initial investment: 62M€
 Initial staff: ~70

2007

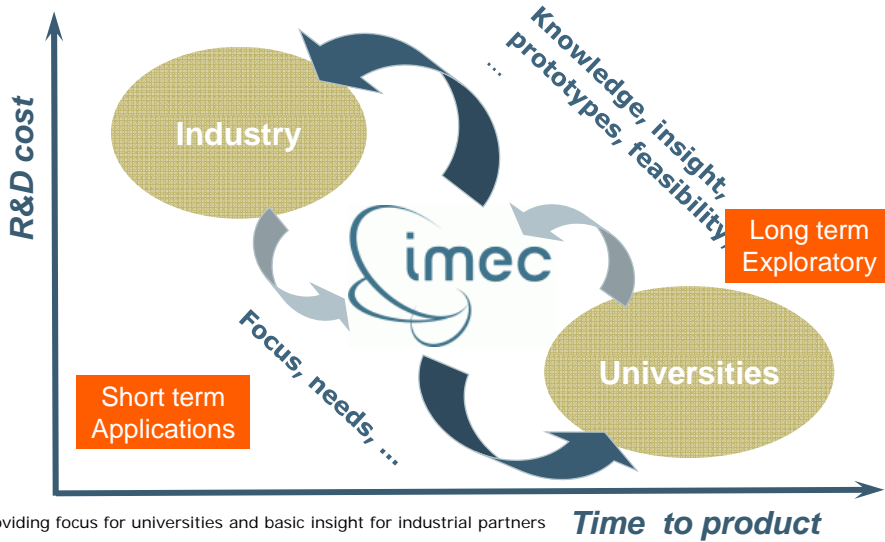
One of the largest independent R&D organizations in its field, worldwide
 Revenue (P&L) : 240M€ (includes 39 M€ grant from Flanders government)
 16% government/state funding
 Staff: > 1550
 Worldwide collaboration with many partners

2009

We will celebrate 25 years IMEC with a number of events



IMEC as a "Transformer"



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9

Mission statement

To perform research and development, ahead of industrial needs by 3 to 10 years, in microelectronics, nanotechnology, design methods and technologies for ICT systems

Performance criteria

- **being a worldwide center of excellence**
(total contract revenue, publications, invited papers)
- **being excellent in exploratory work**
(number of Ph.D.s, projects and publications with universities)
- **with impact on local industry**
(new spin offs, collaborations, training, interaction with local SME's)



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IMECAMPUS

Clean Room 2
 3200 m² Clean Room
 300 mm pilot line
 Ball Room, Clean sub-FAB
 Continuous operation:
 24hrs / 7 days

Clean Room 1
 4800 m² Clean Room
 1750 m² Class 1
 200 mm pilot line
 Continuous operation:
 24hrs / 7 days

Total: **8000 m²** Clean Room

IMEC and TNO start Holst Centre At High Tech Campus Eindhoven

Wireless
Autonomous
Transducer
Solutions

Technology
Integration

System-in-Foil
Products and
Production

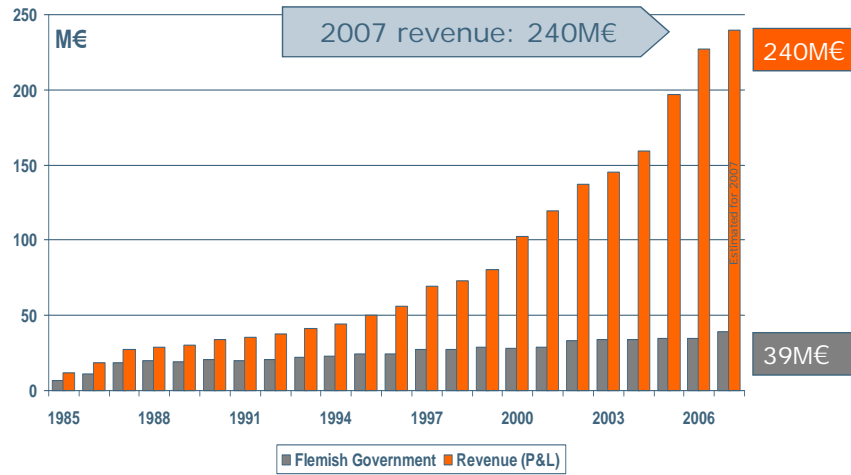




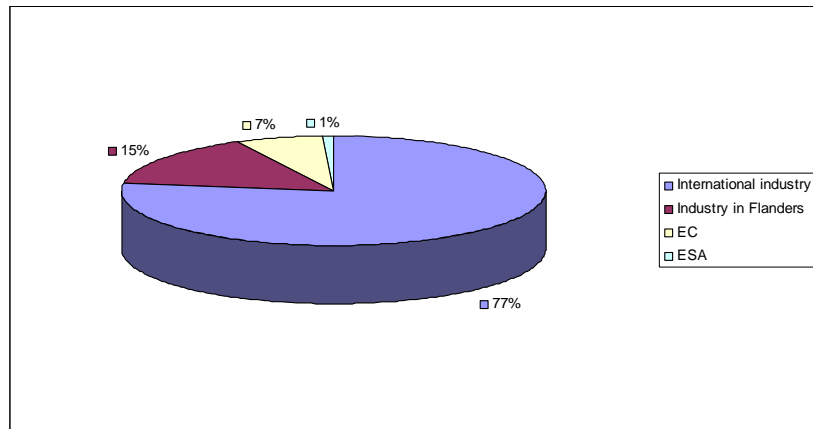


Holst Centre
Open Innovation by IMEC NL and TNO

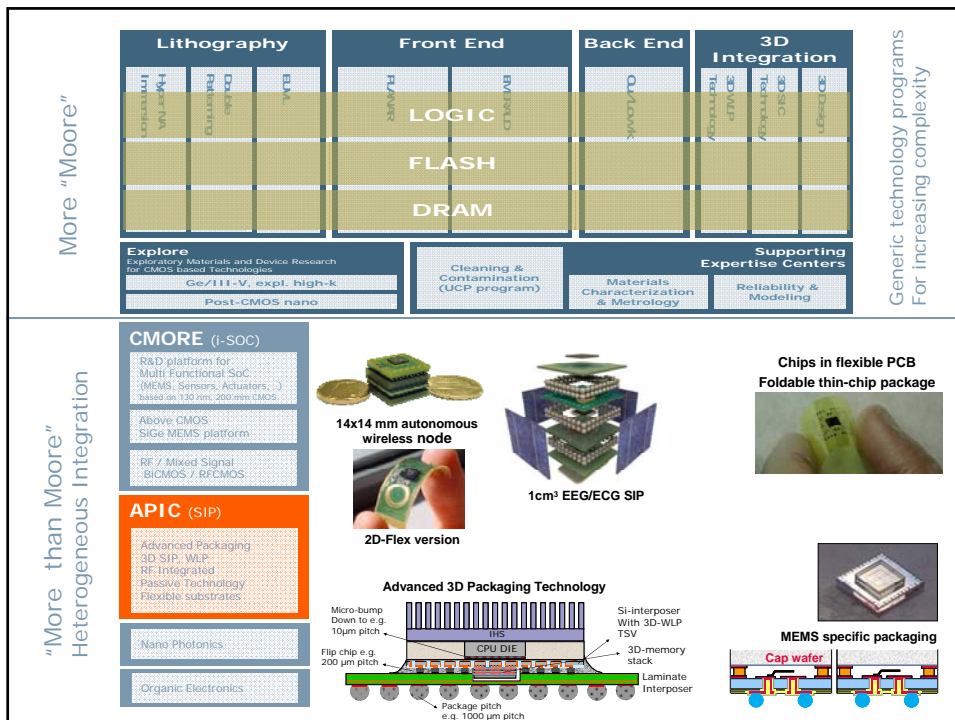
IMEC's total revenue (P&L) versus research grant



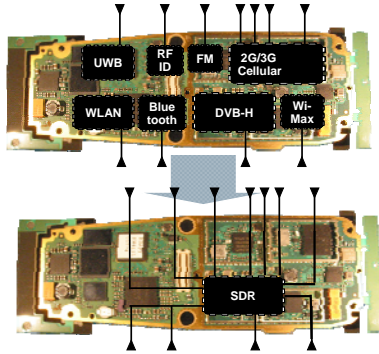
Distribution of revenues (status September 2007)



Status external revenue September 2007: 200 million euro



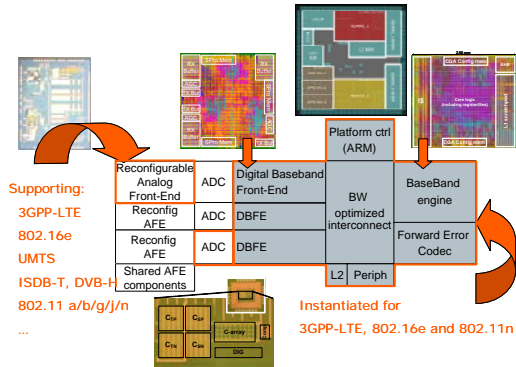
Nomadic Embedded Systems



M4: delivered its promises:
Full SDR solution available

SDR Approach:

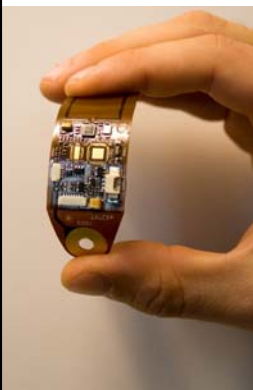
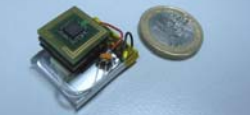
Cover several standards with one programmable chip
Flexible -> TTM



Human++ technology demonstrations

New generations of WATS modules

tested in clinical settings



Wireless EEG system powered by body heat
Wireless, flexible and stretchable ECG patch for comfortable cardiac monitoring

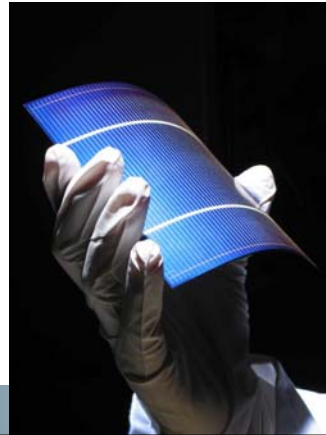


powered by thermal energy scavengers:
head band (2mW)



IMEC boosts solar cell efficiencies to their limits

- Thin-wafer silicon solar cells expected to exceed 20% efficiency
 - Currently 17.4% with industrial applicable i-PERC process
- Organic solar cells
 - Aim: high-efficiency, reproducible solar cells
 - Benchmarking printing and evaporation



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Types of industrial collaboration

IMEC with one or two partners

Bilateral project on a specific research topic

Microelectronics Training Center
Annual Research Review Meeting
Workshops

IMEC with many partners

Industrial Affiliation Program

Technologies Transfers,
Licenses

R&D
Collaboration

Training

Mature
Technologies

Exclusive
License

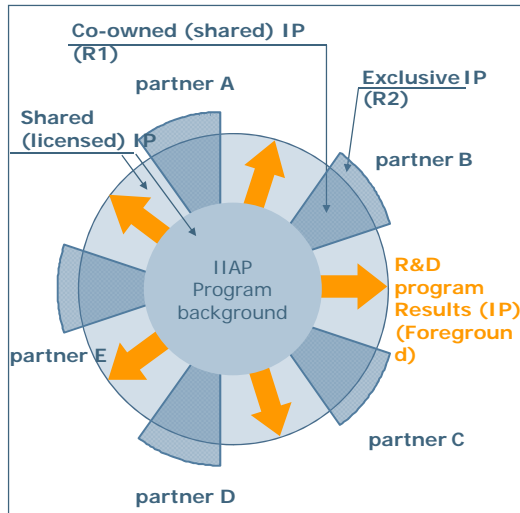
Spin-Off

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22

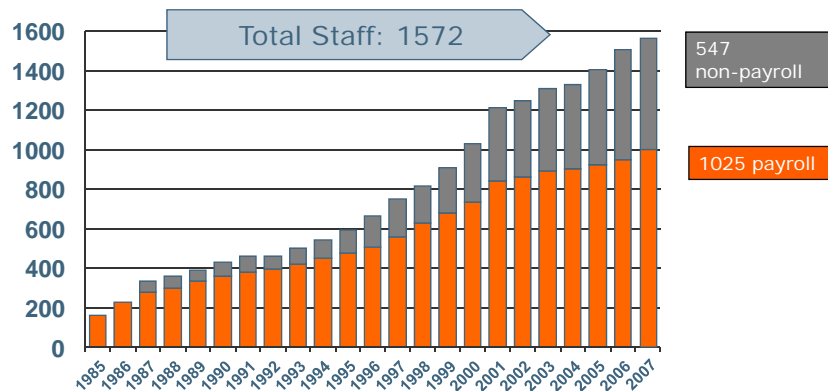
IMEC's IIAP IP Model



- Partner obtains co-ownership (with IMEC) on results to which partner has contributed* (R1);
- Partner gets a free, non-exclusive, non-transferable license on results generated by IMEC or other partners in the program;
- Partner gets a free, non-exclusive, non-transferable license on IMEC's background, necessary for exploitation of the results of the program;
- For each partner there is possibility to generate limited proprietary results (R2); (type of results should be agreed upfront)

* Contributed result means a result to which there is a clear contribution from the partner's assignee

Evolution of staff (Dec 2007)



- 175 PhD students and visiting scientists
- 390 industrial residents

Collaborations with Japanese Institutes and IMEC Executive Seminar in Tokyo



Research Cooperation Agreement in Biodevice and Semiconductor Material Fields with Belgium's IMEC

(January 25, NIMS) – The NIMS Biomaterials Center and Advanced Electronic Materials Center signed a memorandum of understanding (MOU) with the Belgian organization IMEC (Interuniversity Microelectronics Center).



IMEC, established in 1984, is a nonprofit research organization in the field of microelectronics with financial support from local governments, universities, and industry in the Flanders region of Belgium. It is engaged in research and development which anticipate industrial needs by 3 to 10 years and promotes the popularization of microelectronics and nanotechnology in society. It is also involved in the search for and cultivation of research "seeds" through joint research with research institutes in a number of countries. As part of these efforts, during a visit to NIMS, the Vice-President of IMEC, Dr. Deferm, and IMEC's representative in Japan, Dr. Ishitani, signed an MOU aiming at an ongoing exchange of views and technical exchanges.

In the future, the two Centers will jointly conduct development of biodevices that integrate semiconductor micro-fabrication technology and biotechnology and the material development demanded by next-generation integrated circuits, and will promote an interdisciplinary cooperative relationship taking advantage of the strengths of the two institutes, including training of human resources by mutual visits by researchers and other activities.

Kumamoto Project



内閣府、NIMS、JEITA-JSIA、NBCI、Niac、Fraunhofer、IMEC、Leti、NSF、SIA、SRC、

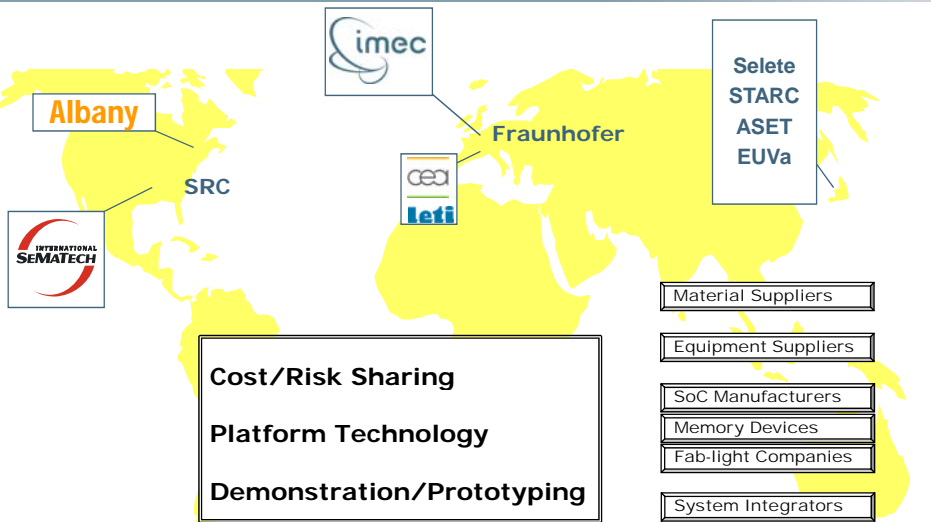
IMEC Executive Seminar

The 1st in 2000, and the 8th in 2007



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Complementary Positioning



aspire invent achieve

Thank you for your attention

