



« SME perspective:

The importance of a vibrant and well-connected ecosystem in Europe »



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OSEO Excellence member

- 1 – Introduction - RECIF Technologies, a European SME**
- 2 - Importance of EU ecosystem & Environment for SME's**
- 3 – Use case: 450mm migration, a successful approach**
- 4 – Importance of collaborative framework and public policy**

>30 years experience in semiconductor Business



Vacuum Handling Systems

1982



First Wafer sorters

1996



Recif 300mm Wafer sorters installed on production line

2000



New generation 300mm sorter development

2005



EEM450 founding member

2009



Task leader in 450mm EEM450-PR project

2012

1985 1990

Manual and Automated tools



1998

Early developer of 300mm Wafer sorter



2002

300mm wafer sorter World Leader



2007

Contribution to the 450mm Semi Standards definition



2011

Project leader in NGC450 project

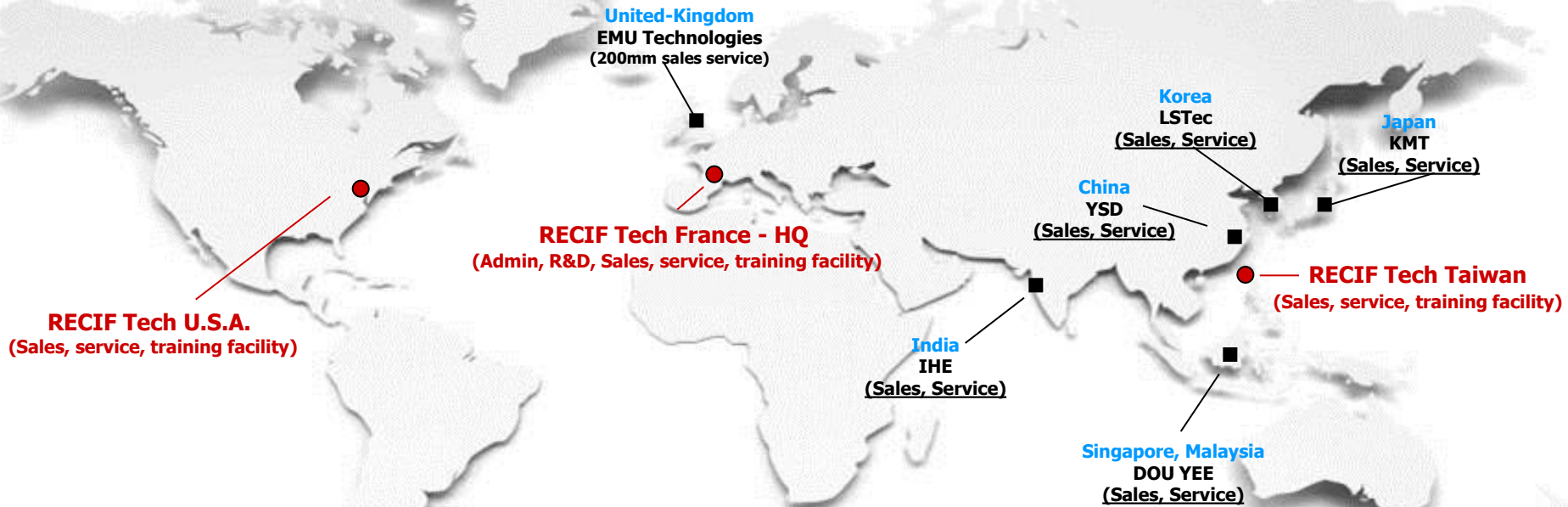


2013

Work package leader in E450-EDL project



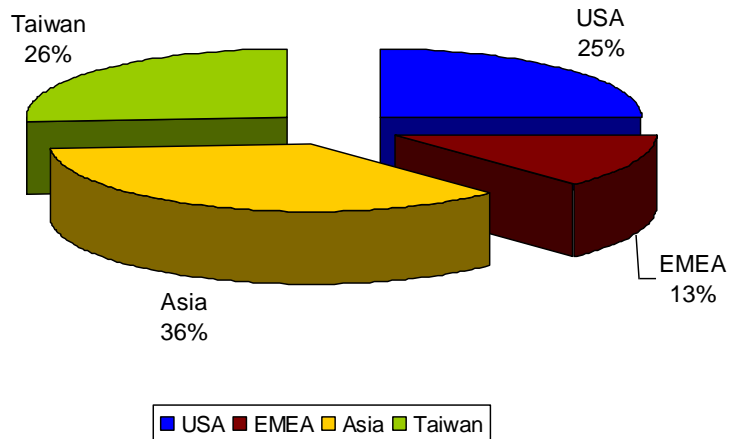
Worldwide Locations



3 corporate entities
Corporate headcount

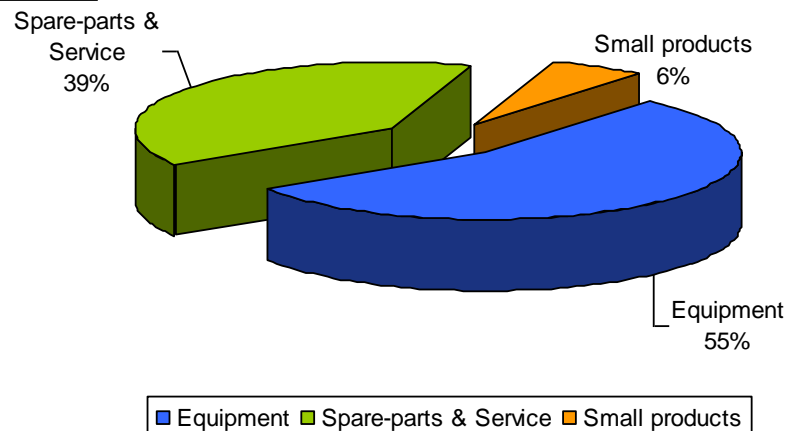
= EU (HQ) - USA - Taiwan
= 65 persons

2010-2012 Billing distribution



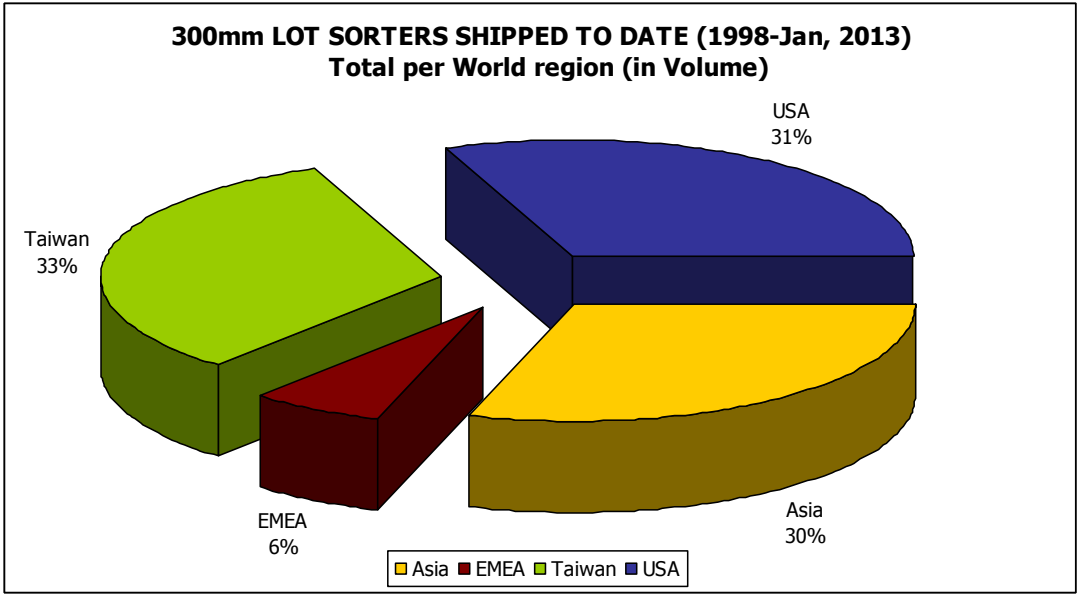
~ 90% business done outside EU

2010 - 2012 Semiconductor Turn-over Worldwide distribution - Total per activity



RECIF's customers are End Users
(IDM / Foundries / Labs...)

300mm equipment shipped to date



750+ equipment install worldwide 300mm



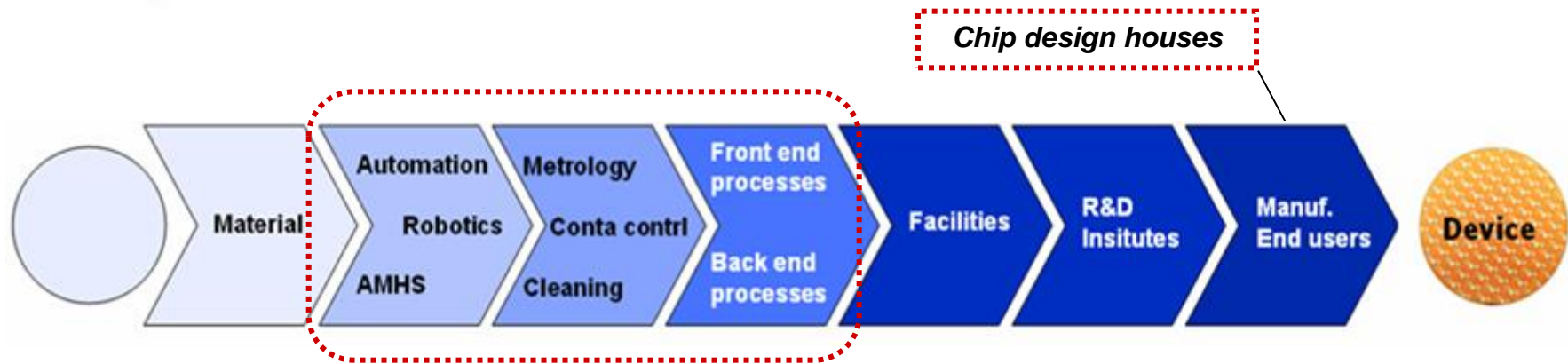
G5 sales represents 80% of total RECIF Sorter business worldwide from 2010

Application	G5 node adoption					
	90nm	65nm	45nm	32nm	28nm	20nm
Foundry		X	X	X	X	X
Logic		X	X			
Memory		X	X	X	X	

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Value chain (place of SME's)

- SME's can exist thanks to value chain as a whole from material to IDM's



*SME's in Europe are **mainly**, either Equipment vendors or, Design houses*

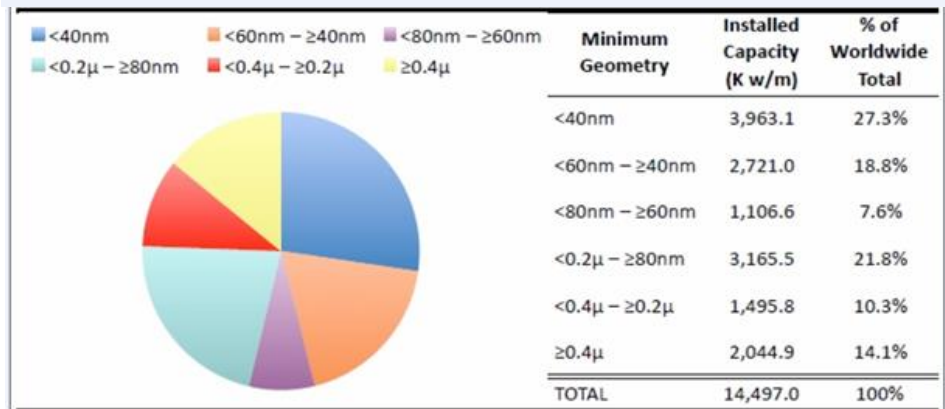
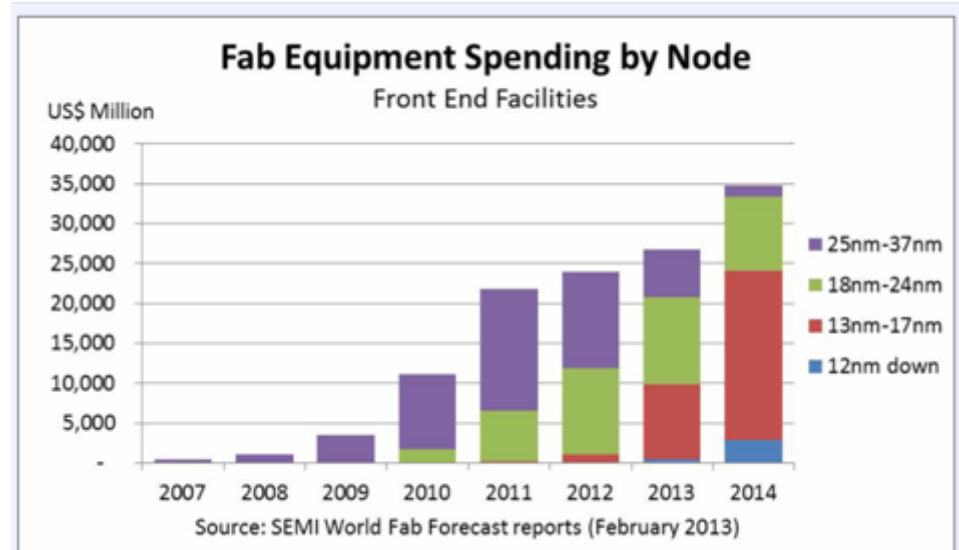
Comments:

Today all bricks of the value chain are present, but

- EU IDM's are becoming less and less integrated for advanced nodes
- Value chain is diverging – Manufacturing decorelates from Applications

WW competitive landscape 1/2

- Fast ramp-up of advanced nodes
- Advanced nodes are mainly supported by 300mm
- ~ 50% of WW capacity is 300mm



Source: SEMI

WW Competitive landscape 2/2

>0.2μ "Large Features"	<0.2μ – ≥80nm "Mature"	<80nm – ≥40nm "Lagging Edge"	≤40nm "Leading Edge"
STMicro	TSMC*	SK Hynix	Samsung
TI	Samsung	Micron*	Intel*
TSMC*	UMC	TSMC	Toshiba/SanDisk
Infineon	Toshiba	Elpida	SK Hynix
Renesas	GlobalFoundries	Samsung	Micron*
UMC	STMicro	Nanya*	TSMC
ON Semi/Sanyo	Renesas	Powerchip	Elpida
CR Micro	SMIC	ProMOS	GlobalFoundries
MagnaChip	TowerJazz	Renesas	IBM
Vanguard	Powerchip	UMC	UMC

*Includes estimated shares of capacity from joint ventures.

As a fact, EU IDM's have a limited participation in 300mm high volumes & advanced nodes.

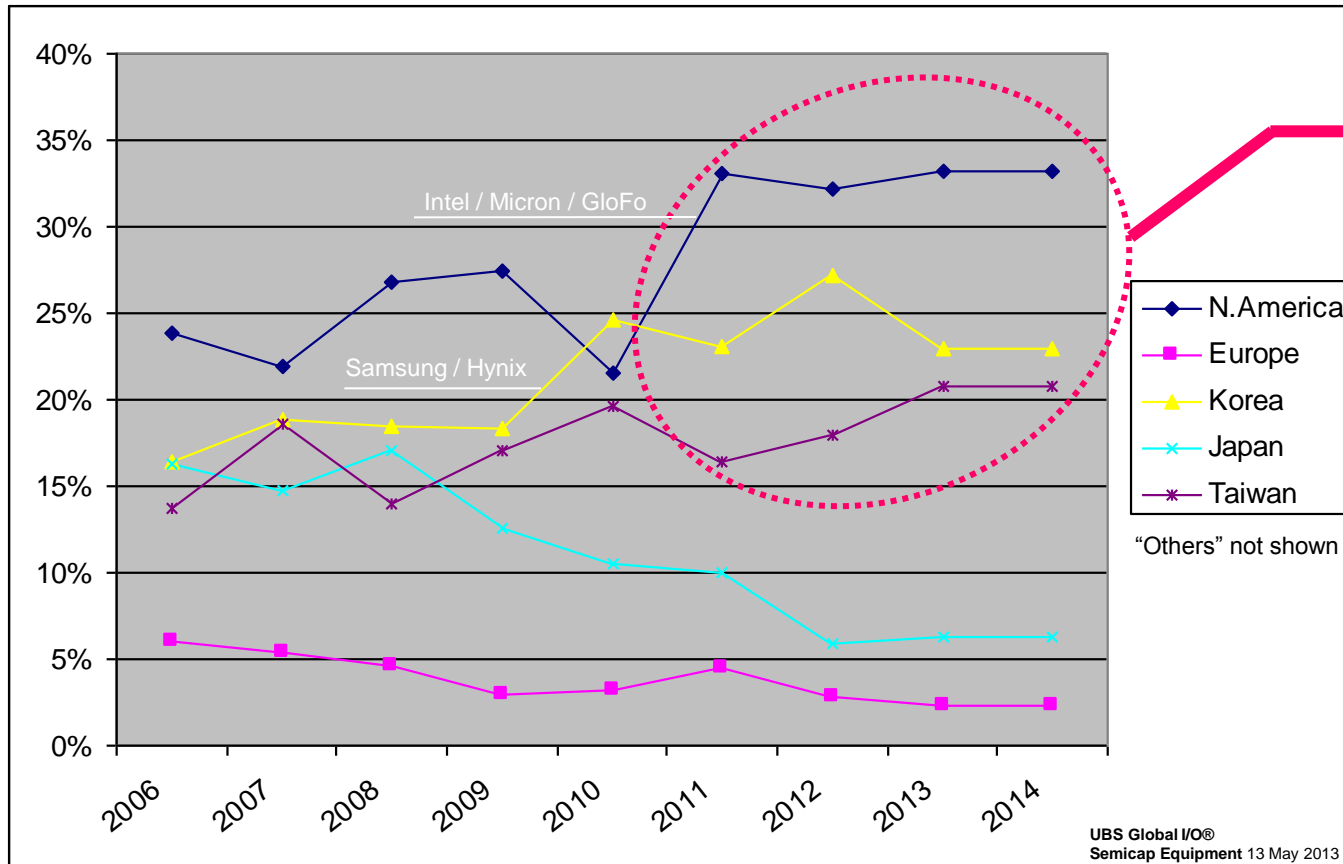
2013F Rank	Company	2012 Installed Capacity (K w/m)	2012 % of WW Total	2013F Installed Capacity (K w/m)	2013F % of WW Total
1	Samsung	675	18.8%	717	18.4%
2	Micron-Elpida*	512	14.3%	536	13.8%
3	SK Hynix	420	11.7%	450	11.6%
4	Intel	388	10.8%	441	11.3%
5	TSMC	356	9.9%	414	10.7%
6	Toshiba/SanDisk	320	8.9%	320	8.2%
7	GlobalFoundries	125	3.5%	150	3.9%
8	Nanya	125	3.5%	127	3.3%
9	UMC	97	2.7%	115	3.0%
10	Powerchip**	125	3.5%	90	2.3%
11	TI	51	1.4%	60	1.5%
12	SMIC	51	1.4%	57	1.5%
—	Top 12	3,245	90.4%	3,477	89.5%
—	Others	346	9.6%	410	10.5%
—	TOTAL	3,591	100%	3,887	100%

*Assumes Micron completes acquisition of Elpida in 1H13.
 **Assumes Powerchip either sells or tears down its P3 fab as it plans to do.
 Source: Companies, IC Insights

IC Insight: 21 Feb. 2013

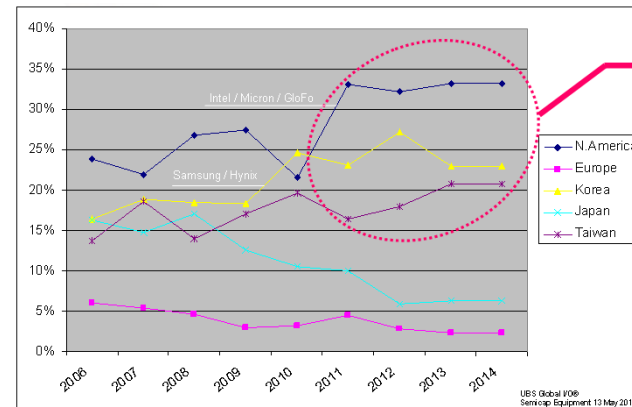
Share of CapEx per region* per Year

* cumulative by player by HQ location



EU Equipment vendors need to catch business in Asia + USA

	2006	2012
Top 3 EU IDM WW Market Share	8 %	6 %
Share of CapEx in EU	6%	3%



Need to catch business in Asia + USA

Notes

- CapEx is to sustain existing capacity & add new capacity @ advanced nodes
- Sketch does not define "where" the capacity is installed
- The problem is more "Strategy", not "Geography"
- EU SME's which are Equipment vendors and Design houses are more and more active with accounts for which decision centers are not in EU

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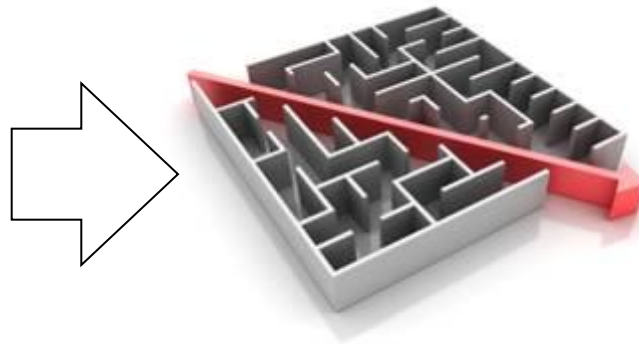
1

Collaborate



2

Define the path



3

Develop

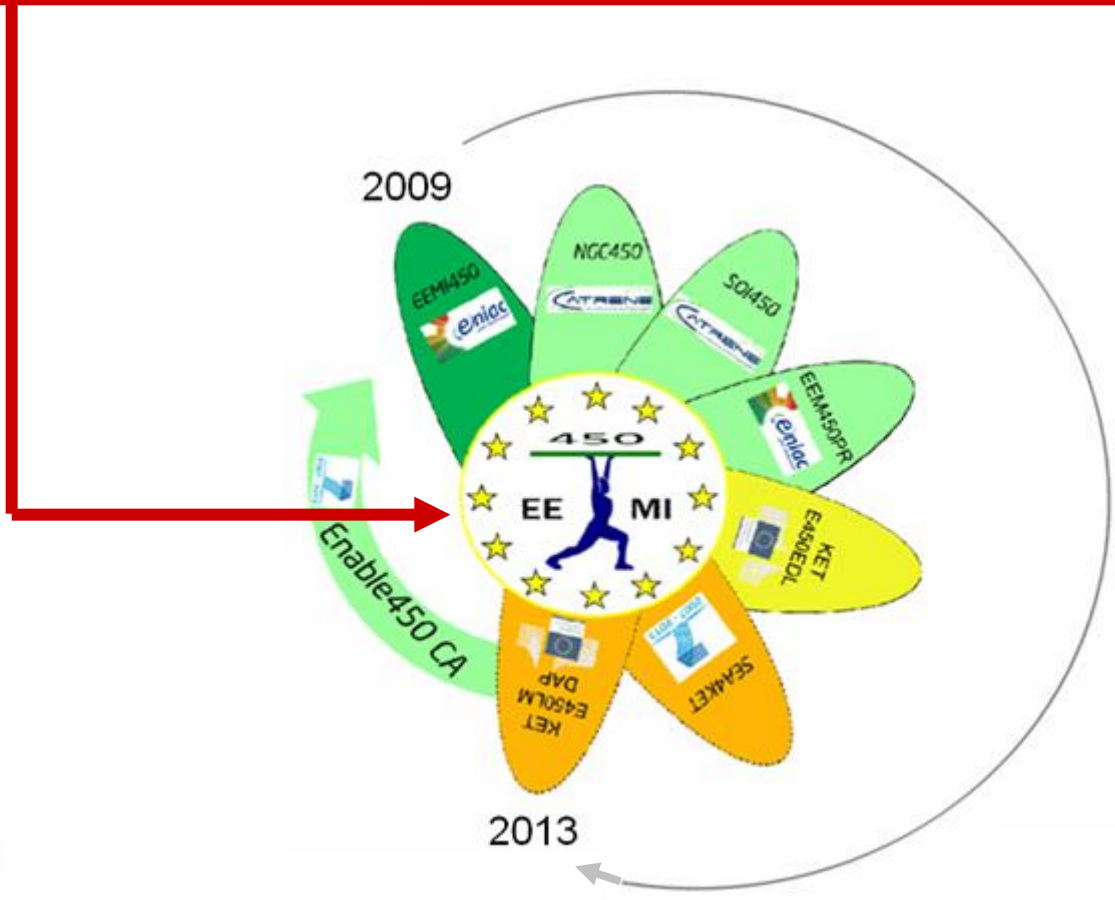




3 - 450mm migration, a successful approach

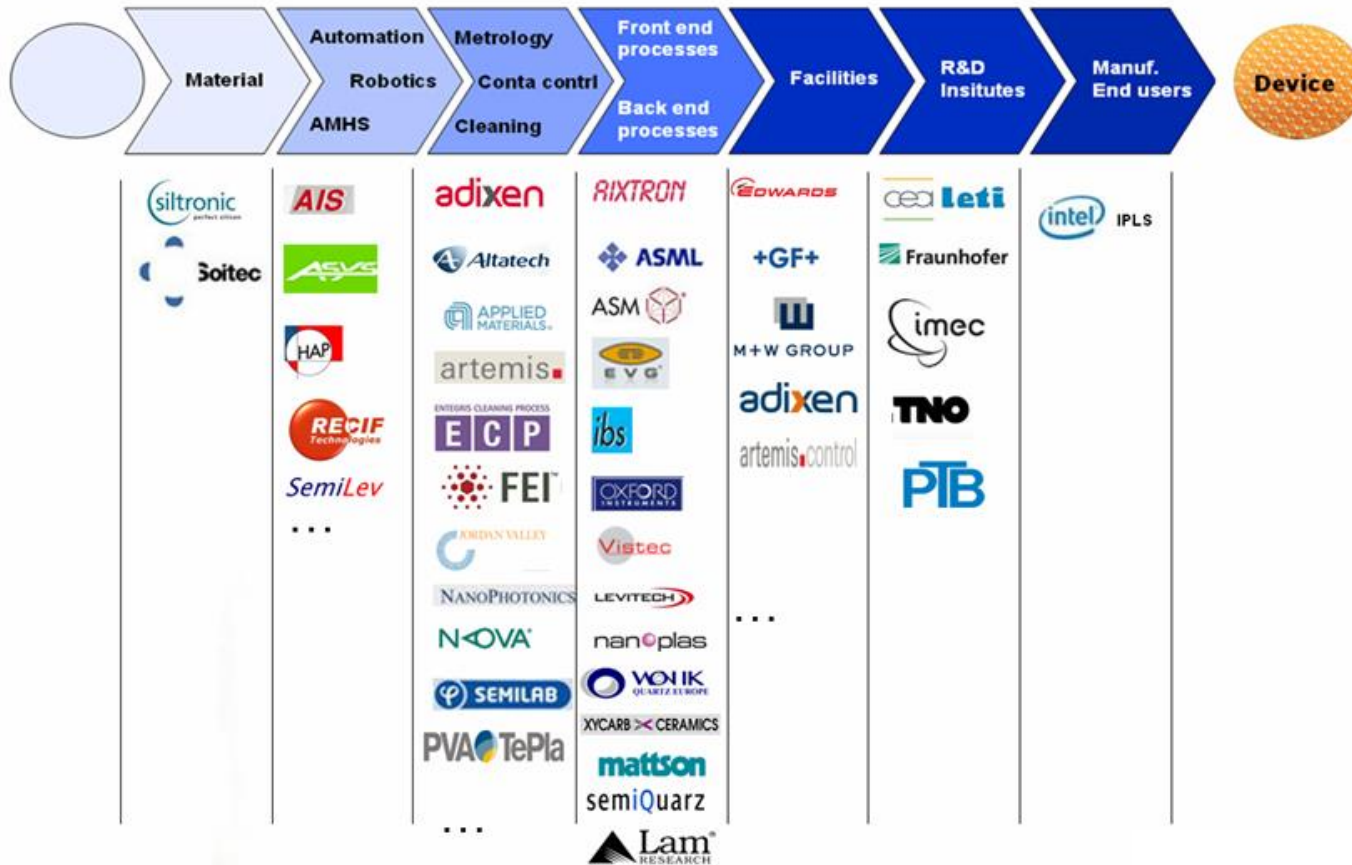


EEMI450 consortium founding members



3 - 450mm migration, a successful approach

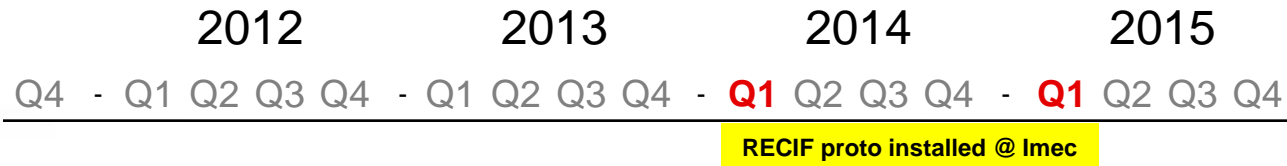
Distribution along a simplified value chain, of companies participating to an EU funded 450mm program (closed, running or pending)



=> Goal is to set-up a European 450mm pilot line at Imec

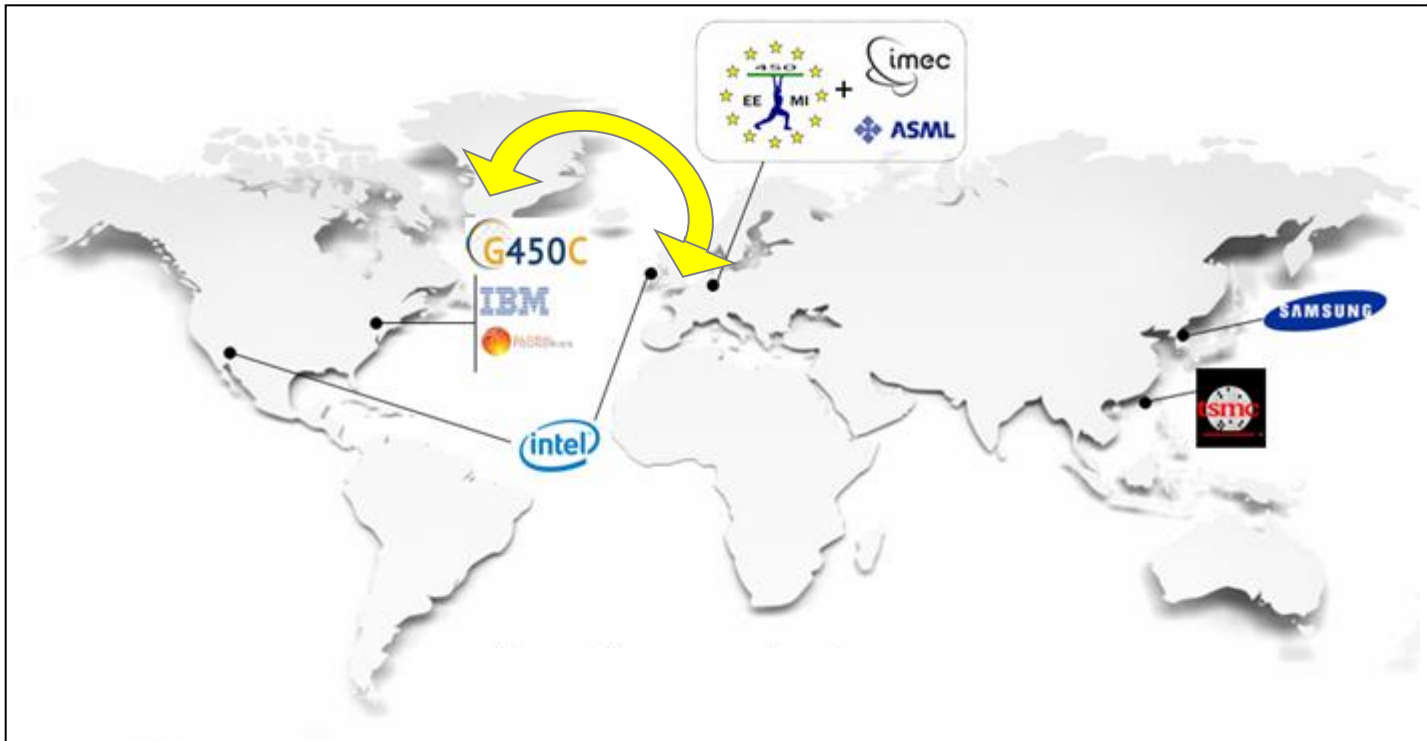
Synergies inter projects (for RECIF)

Leader				
Consortium				
Goals	Proof of concept, Needed for 450mm transition	Develop a wafer handling platform to support 450mm transition	Develop modules and tool sets for EU pilot line readiness	Install an equipment demo line that supports 450mm process development, for 1x nm IC manufacturing



G450C “Demonstration Test Methods” (DTM) will be assessed @ Imec

- Results to be shared with G450C
 - Some of G450C members are partnering also in EU initiative
- } Next step is **cross collaboration**



Imec placed at a central focal point...

Central strategy :

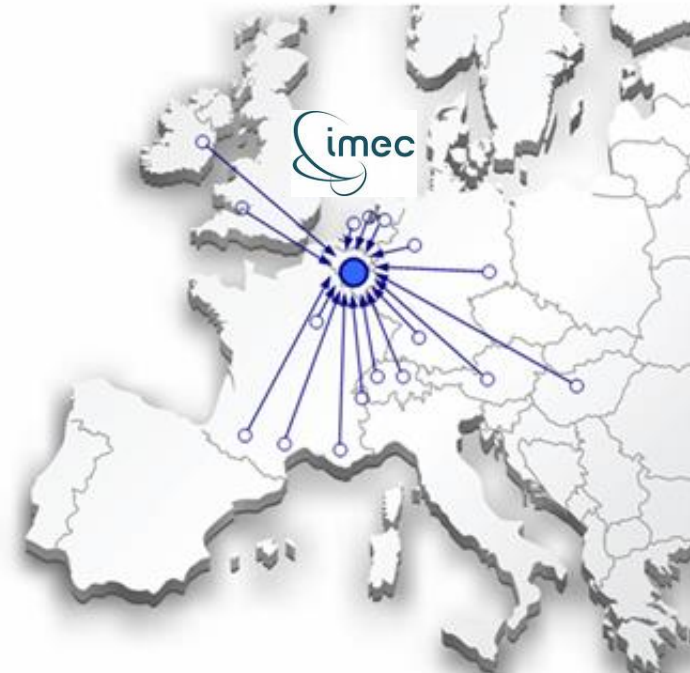
- support “More than Moore”
- support “More Moore”
- support a leading edge 450mm R&D and Innovation platform”

Has to be complementary to the G450C initiative

Source: White paper – “Balanced strategy for Nanoelectronics in Europe” - May 18, 2012

Central position:

- => foster synergies
- => ease modules maturation
- => Helps keeping cost under control



Location of partners participating to 450mm pilot line project

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Collaborative funded programs (1/2)

- **Have a real value by securing the R&D approach for SME's**

RECIF has secured its 450mm migration from "Proof of concept" till "Pilot line participation" thanks to such programs

- **Benefits for SME's**

- Share the risk of R&D path
- Interact with partners => creates emulation and synergy
- Gets supported by funding (which is a mean, not a goal)

- **The role of labs is essential for SME's** (Imec / CEA-Leti / FhG / TNO /...)

"All the Taiwan representatives highlighted that **Europe could bring labs & equipment industry while Taiwan would provide semiconductor manufacturing** capabilities to build a successful collaboration."

Source: Future Horizons (Mike Bryant)

(ENABLE 450mm April 2013 newsletter / The Strategic Conference of EU-Taiwan ICT Technical Cooperation 2013)

Collaborative funded programs (2/2)

Some limits are identified

- New KET handled by “High Level Group” focusing on specific themes
=> A risk remains to become more “Applications driven” than “Manufacturing driven”
 - It is a “Must” to be visible, in order to be consulted or heard for participation
 - Can be difficult to participate due to weight of administrative tasks and door keepers
 - For SME’s to fully benefit from the virtuous circle, big stack holders (IDM’s & OEM’s) have a certain responsibility with consortia buildings
- ➔ The question of a “Small business act” is set
- *allocate a minimum share of public funding within a project for SME’s ?*
 - *give priority to EU SME’s to supply & support EU programs*

Public policy

- If themes which are important to SME's are not addressed by High Level Groups, only "left off" remains for others funded programs
 - Budget remains constant
 - Support of 50% Vs 30% for SME's (cf label "investissement d'avenir" in France)

- Pb when consortium is winner on the paper, but No-Go is known after PO or FPP release, once the project is build.

A need remains to

- ensure the proper segment are considered to let the SME grow
- ensure that a sufficient room is left to SME, to grow

i.e

→ For EU Equipment vendors, preparing the 450mm transition is not a choice, but a MUST

Commission proposes New European Industrial Strategy for Electronics – better targeted support to mobilise €100 billion in new private investments

Neelie Kroes said: *"I want to double our **chip production to around 20% of global production**. I want Europe to produce more chips in Europe than the United States produces domestically. It's a realistic goal if we channel our investments properly."*

The strategy will focus on three complementary lines: making chips cheaper (**transitioning to 450mm-sized silicon wafers**, the raw material for the chips), making chips faster ("More Moore") and making chips smarter ("More than Moore").

Neelie Kroes added: *"With this strategy European industry will be better placed to convert engineering innovations into commercially deployable technologies."*

Successful implementation of this strategy will ensure:

- Greater availability of micro- and nano-electronics to key industries in Europe.
- **An expanded supply chain and eco-system, boosting opportunities for SMEs.**
- Higher investment in advanced manufacturing.
- Stimulating innovation across the supply chain to lift Europe's industrial competitiveness.