Technology Manufacturing Engineering

TME EMEA Collaboration Program

Making High Impact technologies happen

Paula Goldschmidt

TME EMEA Development Director

Outlook

- TME EMEA Program Milestones
- The collaboration model-key competence
- Intel technology Development Process
- Future Tech Areas of Interest
- Engagements

Intel's global operations

Ireland
Fabrication
Systems

United Kingdom
Test
Sales & Marketing

Germany
Design Center
Sales &
Marketing

Nizhny &
Moscow
Design Center
Sales &
Marketing

Hudson
Fabrication

Washington
Systems
Manufacturing

PRC
Assembly/Test
SW Design Center
Sales & Marketing

Utah
Development
Center

Oregon
Design Center
Fabrication
Systems

Japan
Sales & Marketing

Hong Kong
Sales & Marketing

California
Design Center
Fabrication
Sales & Marketing

Ireland/Israel
4 Design Centers
&5 **Fabrications**

Philippines
Assembly/Test

Arizona
Design Center
Fabrication
Assembly/Test

New Mexico
Fabrication

Costa Rica
Assembly/Test

India
Design Center

Malaysia
Assembly/Test

The Intel EMEA TME Program milestones

- **Launched at 1996 driven by an agreement with the Government of Israel to drive commercialization /development of Israeli goods and technology based services.**
- **Developed evaluation / collaboration practices and BKMs , strongly supported by the Israeli Intel Fabs / resources. (Beta projects, engineering support).**
- **Qualified >50 suppliers to Intel and supported >100 technology initiatives**
- **Intel Israel industry development program has reached its 10th year with total of > $1.5B accumulated program driven sales**

The EMEA TME program milestones cont..

- Europe based TME enabling activity started at September 2003. operates under tight alignment & interaction with the TME US
- EMEA - Intel Capital (venture capital arm) and TME operations joined forces for close collaboration to best support the European Semi industry needs.
- The collaboration framework with industry associations and Intel EMEA Fabs is in place, program operates as the TME front line, enabling force in Europe .

The Commercialization mission

The potential contribution of intellectual property and $$$ invested in research

The commercialization efforts in the region will:

- Add value to inventors & universities thus stimulate further innovation
- Bring benefits to Intel and the market from new discoveries
- Support economic development in this region
- Foster entrepreneur spirit to encourage new companies formation

TME EMEA Collaboration Model
A Commercialization Proven Method

The charter is to Enable new or improved technologies for Intel and the Semiconductor Industry by fusion of Intel leadership & resources with the EMEA technological innovation

The objective is to Identify and execute upon high-value Si related engagement opportunities with the potential to significantly impact Intel core business

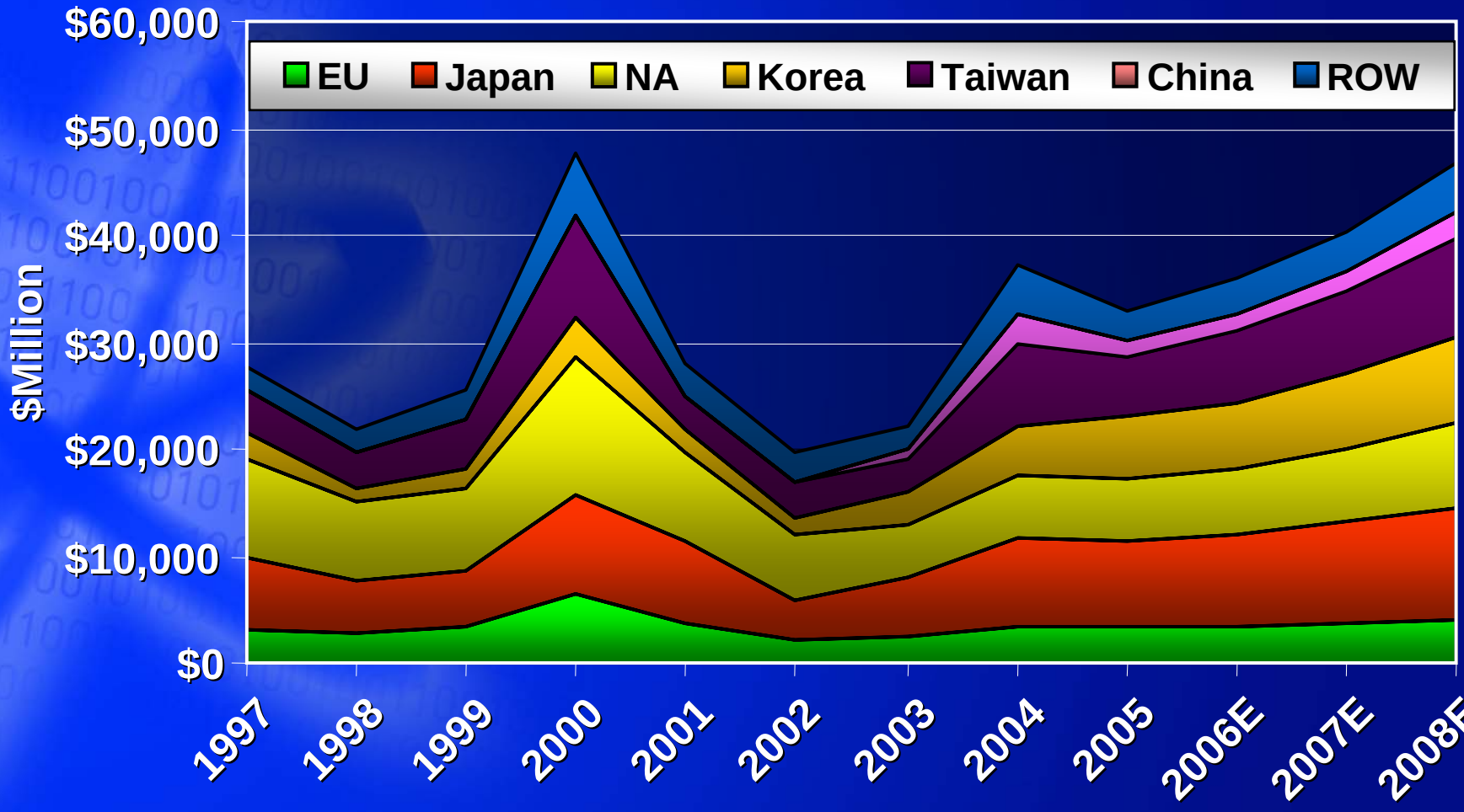
- Focus on OGA (one generation ahead)

Focus on making high-impact technology collaboration happen

- Pro-actively source & develop high-impact opportunities
  - Joint work by TME EMEA and Intel Investment Arm to support Intel's supply chain and supplier ecosystem
    - Engage with R&D institutes for spin-offs with unique, 'best-in-class' technology
- Shape engagement structures, build & facilitate syndicates to support production ramp , lead technolgy/application development and product improvement.
    - Engage with Corporate Collaboration Programs
- Support companies growth by making them investment ready
  - Pre-investment technolgy development activity
- Bring in the local, cultural perspective

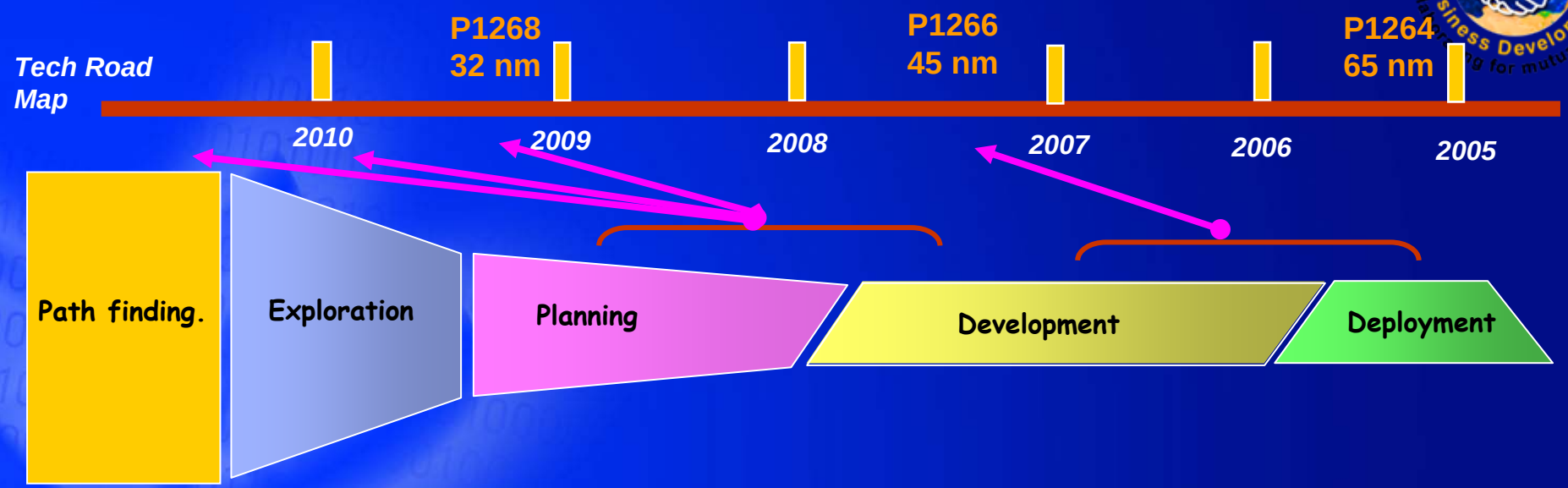
From Idea to Commercialization

Semi Equipment Sales Forecast



Source: SEMI, 12/05

The Development Process methodology



Outsourcing Research

Pilot through collaboration

Application development

ISTG Roadmap

Mobility For Mfg Roadmap

MOSCS Roadmap

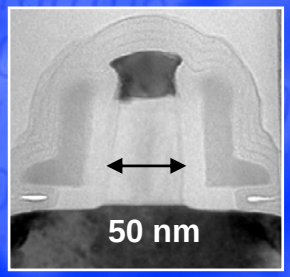
FSM Research Roadmap

Industry collaboration Opportunities

Innovation
Transistor Nanotechnology

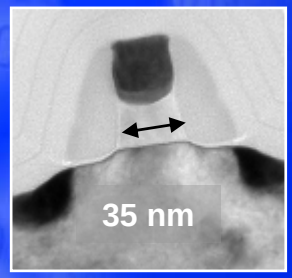
Technology Generation

90 nm	65 nm	45 nm	32 nm	2011+
2003	2005	2007	2009	
Manufacturing		Development		Research



SiGe S/D

Strained Silicon



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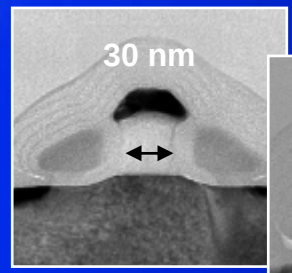
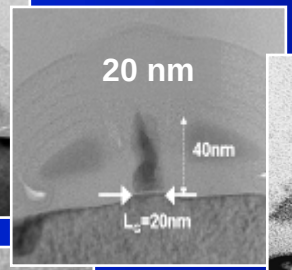
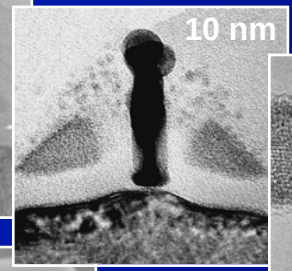
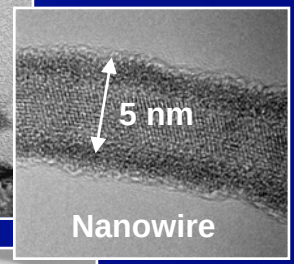
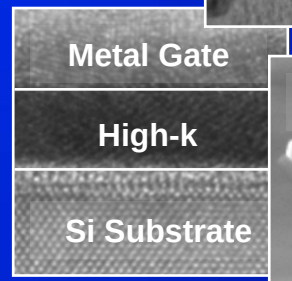
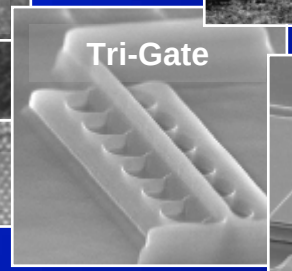


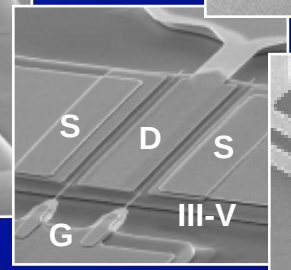


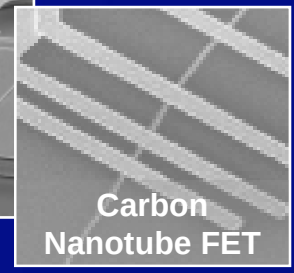












Future options subject to change

Paula Goldschmidt -Litho2006

Source: Intel

2006 OGA Areas of interest

Transistor

- Alternate High k
- Alternate Metal Gate
- Dual Orientation Substrates
- III/V on Si

Interconnect

- ALD Barrier/Alternative Seed
- Direct Plating on Barrier
- Electropolish/Advanced CMP
- Alternate barrier CMP
- Lower k ILD
- Optical Interconnect
- Metallic CNT

Litho / Etch / Cleans

- Photo Resists
- EUV Resist
- Develop
- ILD Cleans
- Mask technologies

Interface / Assembly

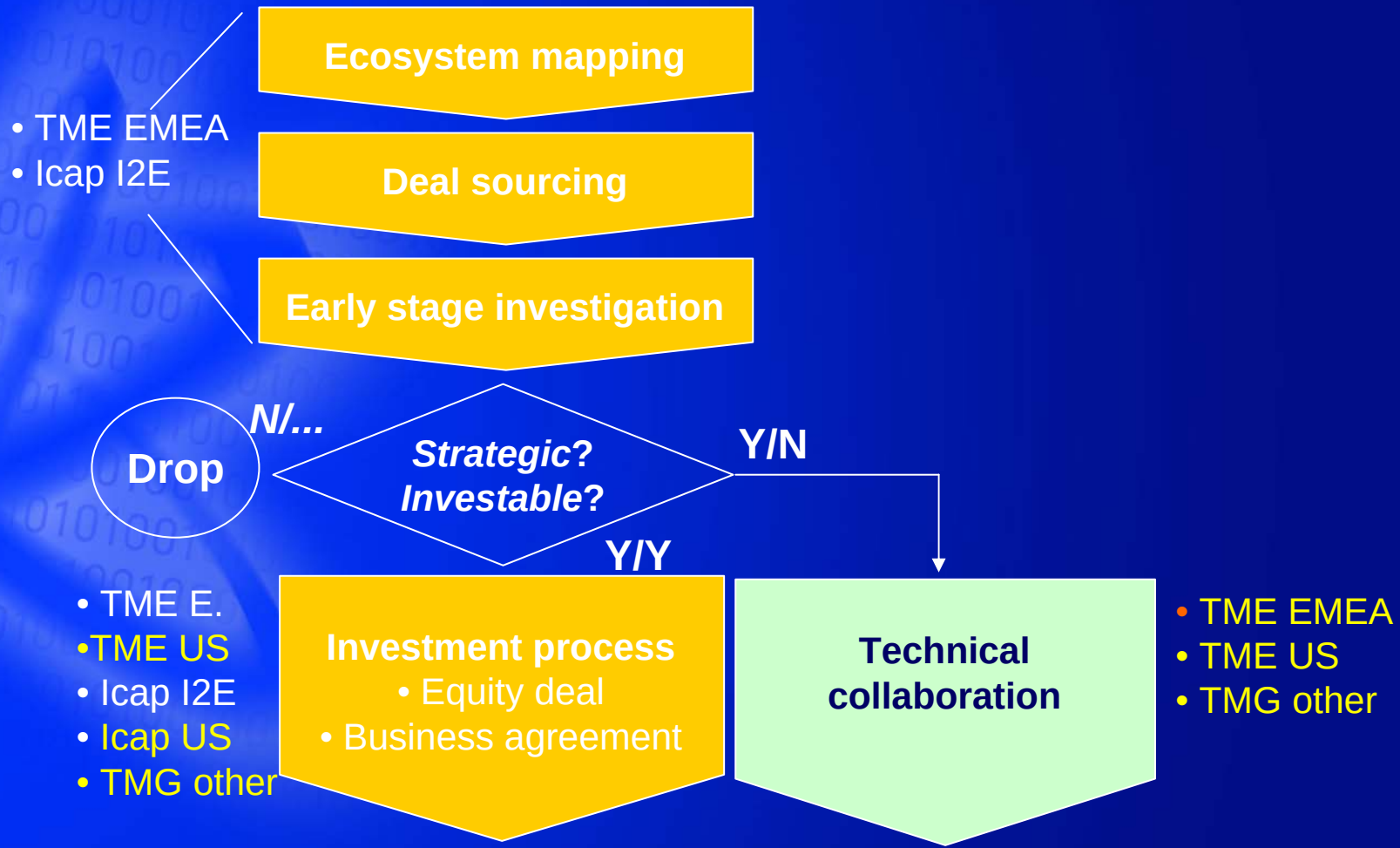
- 3D Interconnect

Metrology

- Fast e-beam defect inspection

New Materials
New Structures
New technologies

A structured enabling process by TME & Intel Capital in EMEA



A Structured approach by TME and ICap in EMEA & US

The proven way to develop next Gen. Technology .....

Intel TME

- Defining the Industry Long Term Barriers
- Technology early validation
- Collaboration ,Support development of specific application
- Ramp up support (Eng. &MFG)

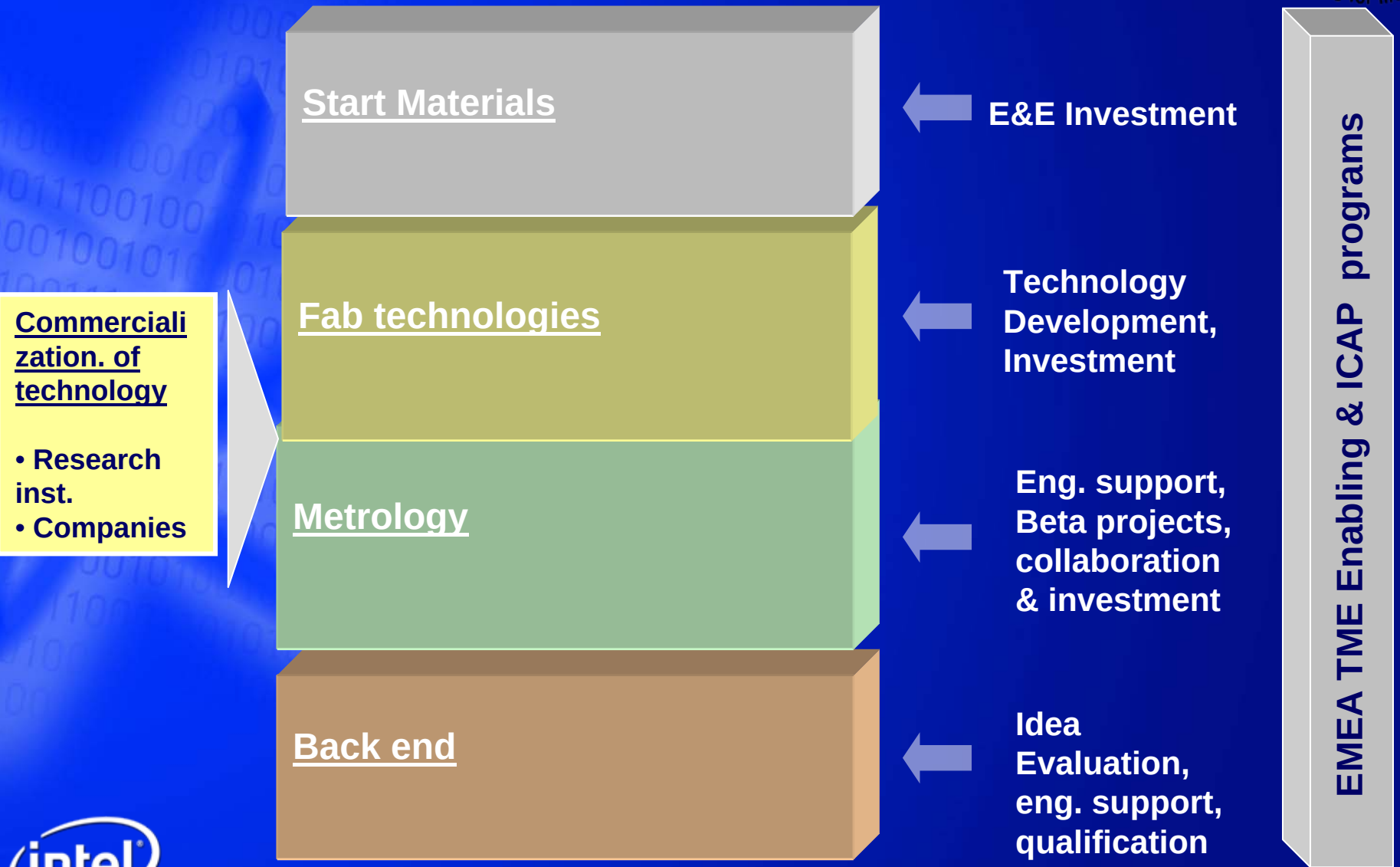
Industry

- Introduce novel ideas
- Develop innovative Technologies & Tools
- Collaboration ,focus on development of applications
- Product improvement processes
- Product affordability

The classic engagement model

Engage with	Project Stage	Time to Market
• Large/Med. Business	Final Product	5 months Ave.
• Large Business	After Prototype	9 months Ave.
• Medium Business	After Prototype	1.5 Yrs Ave.
• Medium Business	Before Prototype	2.5 Yrs Ave.
• Small business:	Start ups	3.5 Yrs. Ave.
• Early Stage business	Incubators	4.5 Yrs. Ave.
• Research	University	6-9 Yrs. Ave.

EMEA Portfolio impact along the Si value chain



EMEA program line-up of all TME resources Summary

The EMEA enabling arm of TME Corp. developed domian expertise in order to Keep Moore's Law going:

- **We cover the entire Si chain ,support :**
  - **Roadmap gap fillers and OGA approach**
  - **Supply chain development (ecosystem)**
    - **Capacity & product availability**
    - **Intel supplier health**
    - **Cost reduction projects**
  - **Eyes & Ears**
    - **Adjacent & disruptive technologies.**

Contact TME EMEA Team to discuss new ideas

- TME EMEA Web site
- TME EMEA program manager

Mazal.Shrem@intel.com

Paula.Goldschmidt@intel.com

Thanks

Paula Goldschmidt

TME EMEA Director