

ENIAC Joint Undertaking

Session ICT 2008

Dirk Beernaert

Head of Unit - Nanoelectronics
Ex. Director at interim for ENIAC Joint Undertaking
Information Society & Media Directorate-General
European Commission



Outline of session

- **11.05: Opening & ENIAC Call1**
 - Dirk Beernaert
- **11.25: Update Multi-Annual Strategic Plan**
 - Livio Baldi
- **11.40: ENIAC Scientific Community**
 - Michel Brillouet
- **11.55: Fostering SME participation**
 - Peter Connock
- **12.10: Eniac and Catrene**
 - Enrico Villa
- **12.25: Discussion & Closig - All**

ENIAC & Call 1

- Background
- About ENIAC
- Results Call 1
- Concluding Remarks



Nanoelectronic: An Industry in Movement

Increasing cost for advanced mega fabs & for R&D for next technology; private equity involvement (and financial crises) trigger major changes:

- (Enhanced) **Globalisation of Semiconductor R&D and Manufacturing**
Global alliances, emerging markets, off shoring

- (Faster) **Changing Business Models and Consolidation (digital economy)**
from **IDM to foundry – fab lite - fab less**
handshake between design, product, technology and manufacturing; solutions rather than technology;

-Changing R&D Models

Global alliances for process R&D; in-house more application R&D and system integration; cost of infrastructure, multi-disciplinarity, complexity, fab is the lab

-4 Generations to Go ? - What is Next ?

« **Alternative** » solutions to replace and extend the lifetime of traditional CMOS;

21/21

**How remain competitive ? How to compete (and cooperate) globally? Will
RTD follow production ? RTD is big business!!**

Nanoelectronics: a European Answer is Needed

Europe needs a coordinated R&D and Innovation Policy and more efforts in Nanoelectronics

(critical research mass in entire value chain – process, materials, equipment, design, integration and manufacturing -; building on lead markets: technology + market driven applied R&D; better linked industry and academia, suppliers and end-users ; invest in multi-disciplinarity and system approach)

High impact of non - R&D factors!!!!

(trained multidisciplinary engineers; access to foundries & infrastructure - for research & SMEs - ; state aid policy complementary to industrial and research policy; new investments and IPR protection)

nean (
 mati

Excellence, competence, risk taking, entrepreneurship, and action

be at the top

A fast, flexible and coordinated action is needed

- European industry published his SRA. What is next???

(Europe has often the best ideas but is slow or lacking when it comes to implementation, to action.)

- Do we (Member States, European Commission, Industry, Research Centres) have a strategy for its' implementation?
- Do we have a common view on its' implementation?

The European landscape is very fragmented!! How to turn this diversity into an advantage?

Implementation: The JTI

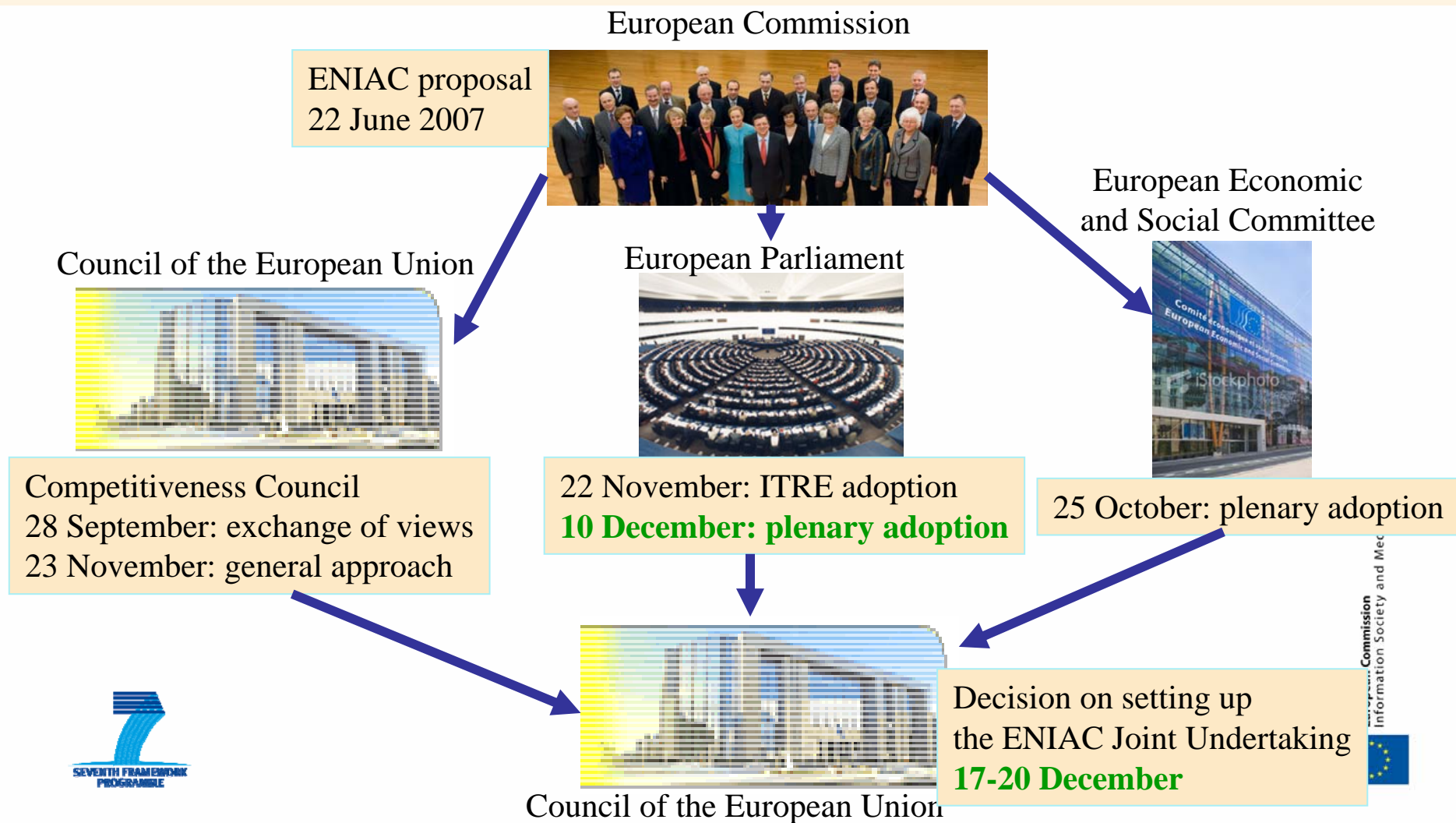
An answer to a need?

- Need for more innovation in applied research
- Need to focus on excellence
- Need to take some risk to address the ‘Grand Challenges’ & ‘Lead Markets’
- Need to overcome fragmentation & duplication
- Need to overcome ‘Eureka deficits’ (not harmonised, limited nr. countries)
- Need to overcome ‘Framework deficits’ (not fast – not direct application oriented – not close to the market – ‘certain type of’ SMEs unfriendly)
- Need to define a common strategy & vision on this strategic field (What to do with manufacturing? Research Infrastructure?)

21

- The Member States, EC and Industry decided to set up a public private partnership in nanoelectronics ENIAC
- The industry decided to set up an Association AENEAS to participate in this PPP

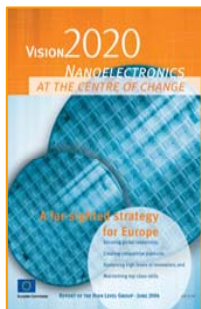
The inter-institutional process





A €3bn (2008-2013) public-private partnership between Industry, Member States and EC to increase the competitiveness of the European nanoelectronics industry

**Combining for the first time
National, EU and private funding
&
Based on a European SRA!**



Making ERA in electronics a reality!

ENIAC a Joint Technology Initiatives adopted by the Council on 20/12/2007, established formally 7/2/2008, first call launched 8/5/2008, first contracts to be launched end 2008.



ENIAC,

www.eniac.eu

*Driving new high-tech applications by further **integration** and **miniaturisation** of devices, increasing their **functionalities** and **integrating these in (sub)systems***

Mission: implement research and innovation activities, strategic guidance

ENIAC public funding (2008-13) : 440M€ (EC) + 800M€ (MS)

ENIAC public funding in 2008 : 32M€ (EC) + 58 M€ (MS)

ENIAC members: AENEAS industrial association, European Commission and 20 Member States

A €3bn (2008-2013) public-private partnership between Industry, Member States and EC




What can be expected from the JTI? -objectives -

- Industrially driven, **industry oriented applied research program** incl. transfer in applications
- **Major objectives** and capability to mount **larger initiatives** (time and resources) to create needed critical mass
- High level of **SME participation**
- **Long time assured strategic partnerships**
- New type of program implementation with **greater flexibility**, fast cycle time, decentralisation, shortened time to market of RTD results
- Common approach, common processes and **co-funding** by MS and Commission towards common goals
- **Increased R&D funding**

reminder

Boosting the competitiveness of EU industry whilst building the European Research Area

ENIAC Joint Undertaking Call1 2008 Budget

- Member States: 58 M€ 
- JU contribution: 32 M€
(55% of 58 M€)
→ **Total funding: 90 M€**
- R&D actors: minimum 90 M€
(in kind)

Austria	4
Belgium	1.5
Czech Republic	1.5
Estonia	0
France	8
Germany	15
Greece	0.5
Hungary	1.32
Ireland	1
Italy	10
Netherlands	10
Norway	1.5
Poland	1
Portugal	0.5
Spain	1
Sweden	1
United Kingdom	0

ENIAC Call 1 - List of proposals received

Acronym	Title	Total eligible costs	Req. EC funding	Req. Nat. funding
E3Car	E3Car -> Nanoelectronics for an energy efficient electrical car	48 240 361	8 056 143	14 472 531
MODERN	MOdeling and DEsign of Reliable, process variation-aware Nanoelectronic devices, circuits and systems	37 174 217	6 023 436	12 666 076
IMPROVE	Implementing Manufacturing science solutions to increase equipment PrOductiVity and fab pErformance	47 012 373	7 851 066	15 433 385
SmartPM	Smart Power Management in Home and Health	23 404 884	3 908 480	9 291 904
SE2A	Nanoelectronics for Safe, Fuel Efficient and Environment Friendly Automotive Solutions	76 696 283	12 794 327	25 685 654
SOFTBOND	Stressless CNT Interconnections of Mems Chip Sensors	6 193 734	1 034 354	1 737 744
LENS	Lithography Enhancement towards Nano Scale	40 217 892	6 716 388	12 008 637
PORTOS	Portable and Trusted Objects	27 666 480	4 620 295	9 053 910
JEMSiP_3D	Joint Equipment and Materials for System-in-Package and 3D-Integration	48 095 937	8 031 963	13 510 552
NEPTUNE	Micro and Nano Technologies Based on Wide Band Gap Materials for Future Transmitting Receiving and Sensing Systems	5 083 533	848 949	1 362 794
PERFECT	The Performance Enhancement Control Team	65 671 734	10 966 355	6 494 708
BRIO NANOCHIP SP8	BRIO NANOCHIP (CNTs) R&D SYSTEM IN A PACKAGE SP8 ESb85109577	1 585 541	264 784	694 003
TOTAL		427 042 969	71 116 540	122 411 898

ENIAC Call 1 - List of proposals funded

Prior-ity	Proposal Number	Proposal Acronym	ESR score	Total cost proposed (€)	National Funding requested (€)	JU Funding requested (€)
1	120005	IMPROVE	44	47.012.373	15.433.385	7.851.066
2	120001	E3Car	42	48.240.361	14.472.531	8.056.143
3	120003	MODERN	41	37.174.217	12.666.076	6.023.436
3	120011	LENS	41	40.217.892	12.008.637	6.716.388
5	120008	SmartPM	40	23.404.884	9.291.904	3.908.480
6	120017	NEPTUNE	39	5.083.533	1.362.794	848.949
6	120016	JEMSiP_3D	39	48.095.937	13.510.552	8.031.963
8	120009	SE2A	37	76.696.283	25.685.654	12.794.327
9	120018	PERFECT	36	65.671.734	6.494.708	10.966.355
Total				391.597.214	110.926.241	65.197.107

After evaluation. Projects to be launched: cost & funding

From 427 M€ to

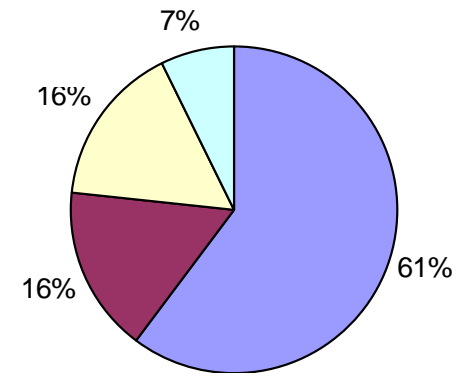
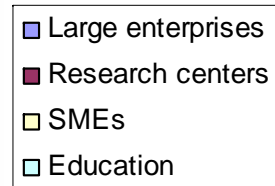
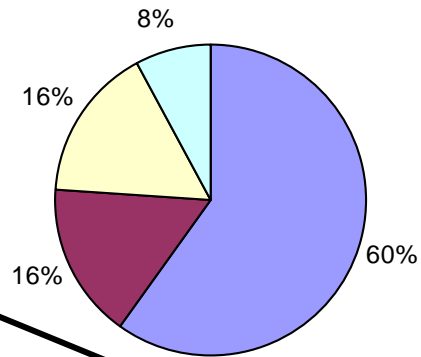
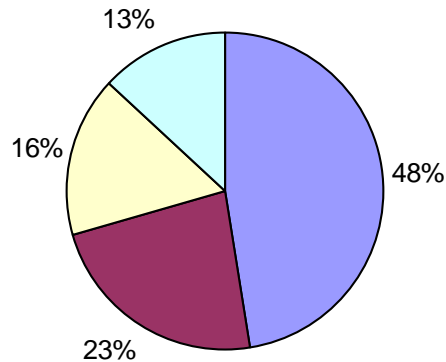
**Accepted eligible costs
213,1 M€**

From 193 M€

**National funding
58,6 M€**

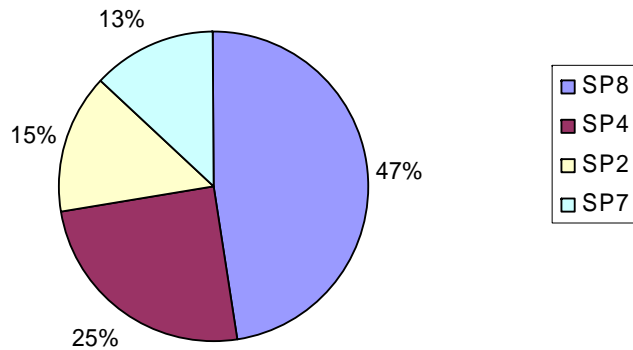
Ratio: 2:1

**JU funding
35,4 M€**

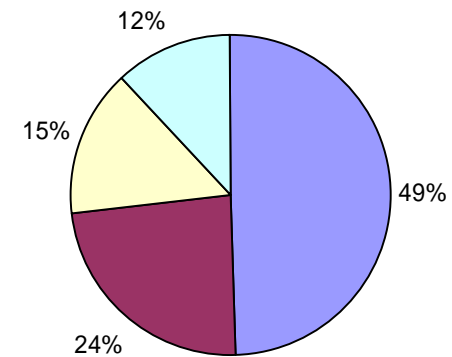


Funded proposals

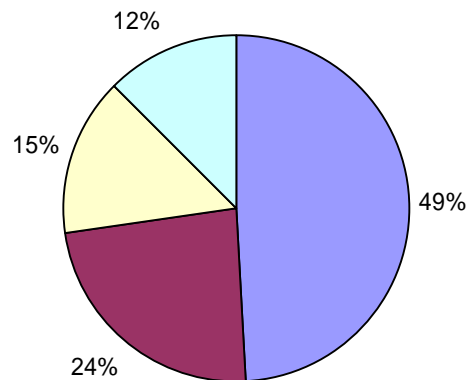
National funding
58,6 M€



JU funding
35,4 M€



Accepted eligible costs
213,1 M€



SP2: Transport and Mobility
SP4: Energy and Environment
SP7: Design Methods and Tools
SP8: Equipment and Materials

ENIAC Call 1 - Coverage by thematic area

SP 8: Equipment, materials and manufacturing

- Improve
- LENS
- NEPTUNE
- JEMSIP_3D
- (*PERFECT*)

SP 7: design methods and tools

- MODERN

SP2: Transport and Mobility

- E3Car
- SE2A

SP 4: Energy and environment

- SMART PM
- E3Car
- SE2A

SP3: Security & Safety

- none

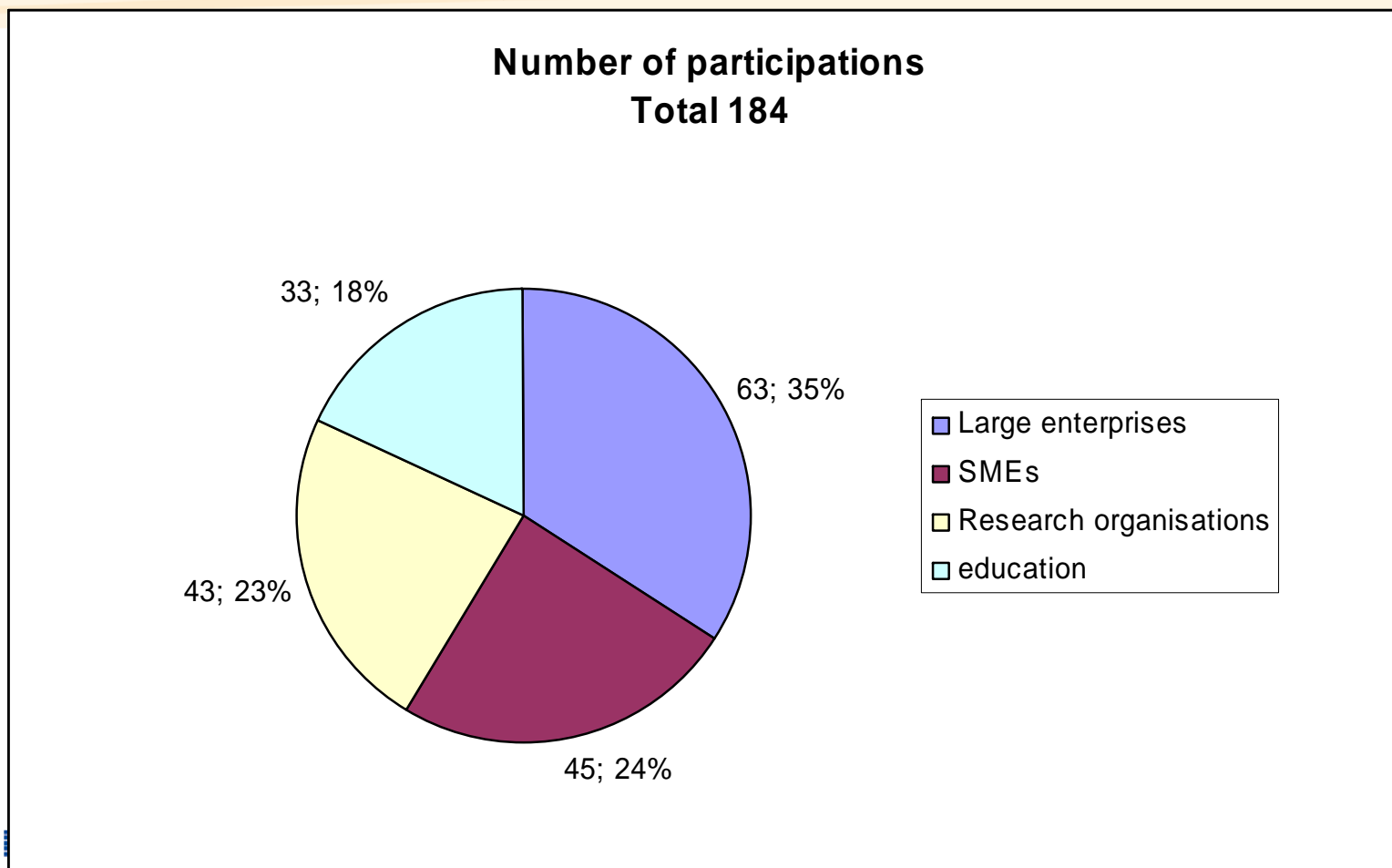


ENIAC Call 1 - Participation by country

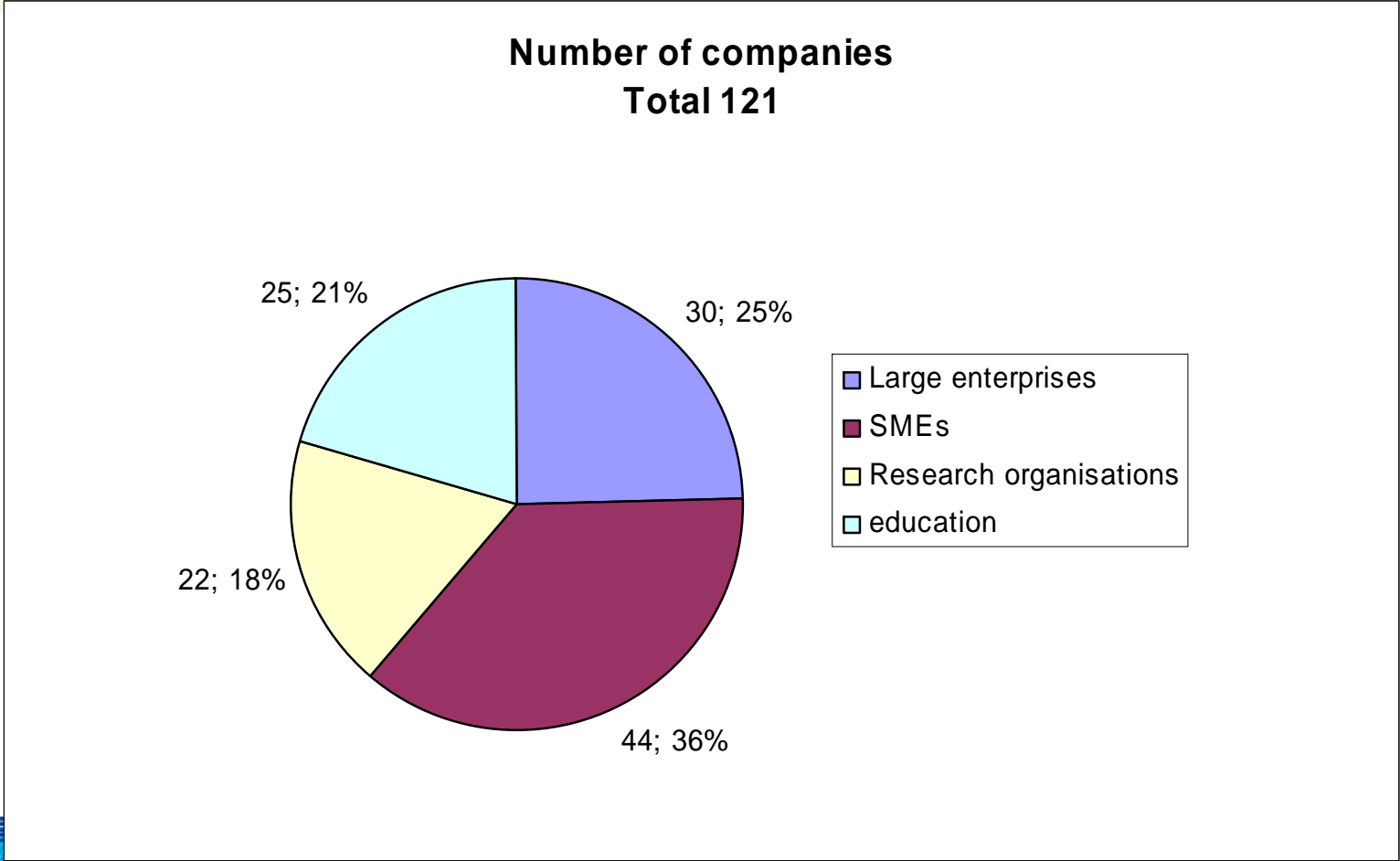
Acronym	AU	BE	CZ	EE	FR	DE	GR	HU	IE	IT	NL	NO	PL	PT	ES	SE	UK	FI	IL	RO	CH	N. Countr.	N. Participants
E3Car	5	1	2		5	5			1	3		3			2			3				10	30
MODERN	4				8	0	1			7	3				2		1				1	8	27
IMPROVE	3				10	9			4	9				1								6	36
SmartPM		1			2	7			2	1	2	2			1	1						9	19
SE2A	0	1			0	0	3	5	0	0	4		3	3	3					1		8	23
SOFTBOND	0	0			0	0									0	0						0	0
LENS		2			3	0			3	2					2							5	12
PORTOS		0			0	0	0		0	0												0	0
JEMSiP_3D					7	6		2	0	0	6	1				1						6	23
NEPTUNE					2	0	1						1							1		4	5
PERFECT		0			0	0			0	0							0		0			0	0
BRIO NANOCHIP					0										0		0					0	0
Total Projects	3	4	1		7	4	3	2	3	5	5	3	2	2	5	2	1	1	0	2	1		
Total participations	12	5	2		37	27	5	7	7	23	17	6	4	4	10	2	1	3	0	2	1		175

From 265 participants
167 different organisations

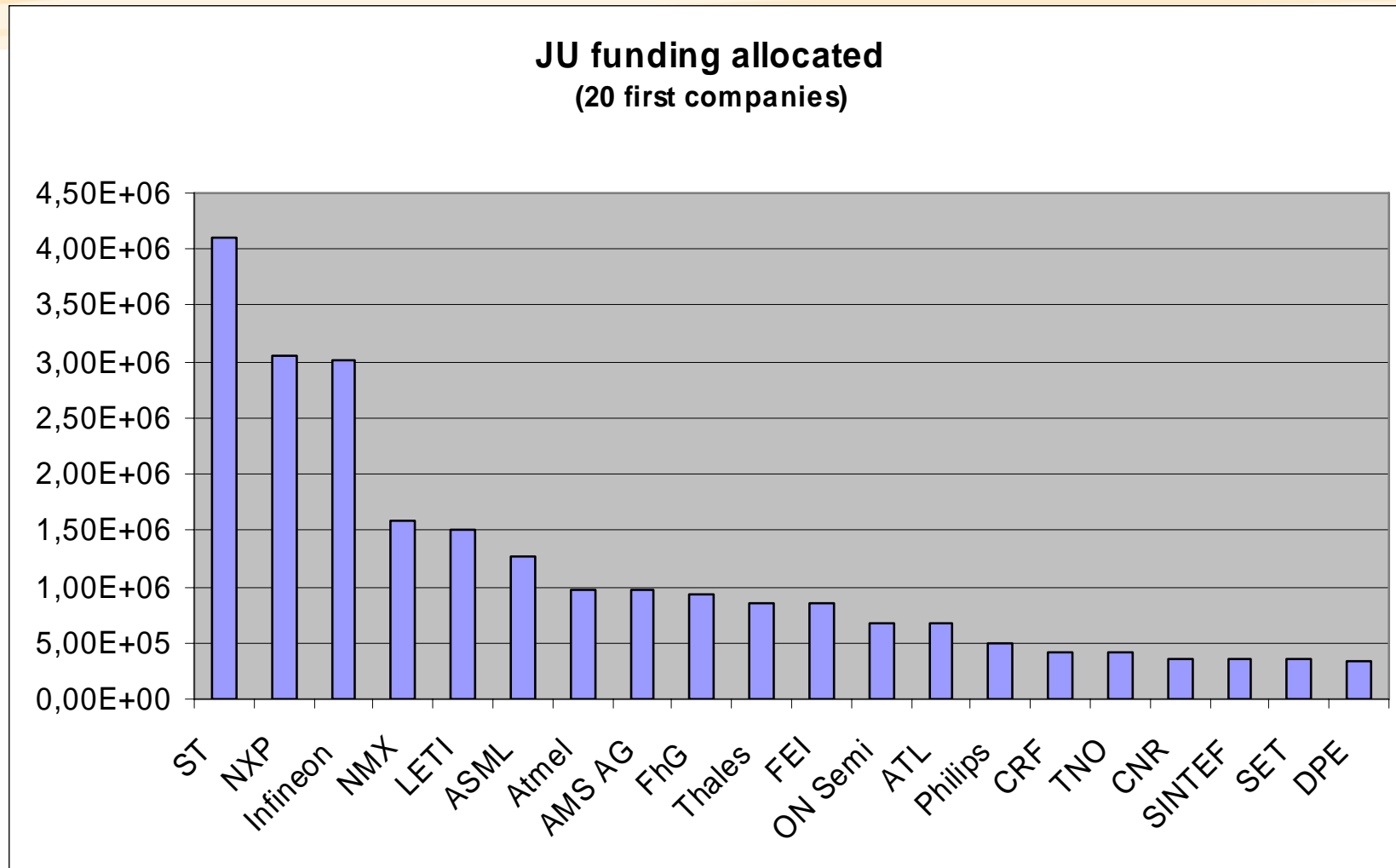
Number of participations



Companies participating



JU funding 20 first companies



Results ENIAC call 1 Funded proposals facts and figures

- Proposals: **8** for a total amount of **210 M€**
- Funding: **94 M€**
- Member & associated states involved: **19**
- Participation: **184 participations**
- Industry: **59%** of participation
- SME participation: **24.5 %** of total participants requesting **16%** of funding
- Large companies: **34.5%** of total participants for **60%** of the total cost requesting **51 %** of the total funding.
- Universities, institutes,...: **41%** of total participants, cover **24%** of the total cost requesting **33 %** of funding.
- Most major actors in European semiconductor industry involved.

ENIAC Call 1 submission

- More than **63 M€** research for the automotive industry (electric and hybrid car mainly) with total more than 45 participants!
- Around **36 M€** research in lithography and metrology!
- **19 M€ / 19 partners** for energy reduction at home!
- **26.5 M€** research for facilitating design in the most advanced processes
- **37 M€ +** for manufacturing
- **30 M€** research for packaging and System in Package integration

8 large initiatives launched as pathfinders and potential backbones for more to come.



ENIAC Call 1 submission

One of the main objectives for launching the Joint Undertaking is clearly met:

!!!!!! IT WORKS !!!!!

"Projects should aim at large strategic initiatives and should bring together major European ICT players with SMEs, universities or research centres to form geographically spread consortia"

Proposals launched cover 2 key lead markets targeted in this call: transport & mobility; energy & environment as well as enabling design, equipment, material and manufacturing.

---It is new and could not be done with actual instruments---

ENIAC Call 1

What about red tape? Additional investments? Strategic long term partnerships ?????

!!!!!!Need a path for continued success (even in difficult times) !!!!

- Need again and more €€€€ from MS & JU
- Need more support, involvement and visible commitment for a common strategy from industry
- Need to be more convincing and more belief in a common strategy, increase trust in the system and between the actors and more personal involvement

Stop looking for perfection, stop looking for the detail, we need belief and action.

Conclusion

- If Europe wants to survive, grow and take the lead in nanoelectronics.
- If Europe thinks this industry is necessary, strategic and need to be supported for Europe's competitiveness and its social and environmental aims.

Then **we can not wait** and must support Research and Innovation with visionary, large, mid term oriented and economical and public appealing initiatives.

but

Equally this industry and its associations incl. AENEAS must take into account the whole ecosystems they are operating in incl. political environment, manufacturing aspects & represent all actors on European ground.

It is essential to act NOW.

Extra Conclusion

Can Europe be competitive in nanoelectronics?

Yes **WE** can!

Can **WE** do better?

Of course **WE** can!

Can we make ENIAC a success?

Yes, **altogether WE can.**