European Processor Initiative

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European Processor Initiative

1. Genesis
2. Setup
3. Benefits of scalability
3. Roadmap
4. Challenges
5. Conclusions


2023
Exascale Supercomputers
1, 000, 000, 000, 000, 000, 000, Operations per sec.
10-20MW
Hundreds of Exa-Byte Data

From Supercomputers to Autonomous cars

(source = Gartner, July 2018)

	Class		
Compute, Data & Communication	**3**	**4**	**5**
Processing Capacity (TFLOPS)	40	80	120
DRAM (GB)	1	10	20
Non Volatile Storage GB)	100	300	500
data link interface (Gbps)	0,1	1	1

Only 10 Class 5 Vehicles in 2024 are equivalent to a current Top500 Supercomputer

compute power consumption (watts to reach processing power capacity)	**3**	**4**	**5**	
35 Gflops/w (GPP exascale class proc >2023)	1 143 W	2 286 W	3 429 W	General Purpose (very) high-end processors in 2024
What if … 70 Gflops/w	*571 W*	*1 143 W*	*1 714 W*	Accelerator high-end processors in 2024
What if … 140 Gflops/w	*286 W*	*571 W*	*857 W*	Accelerator (Most) high-end processors in 2024
What if … 280 Gflops/w	*143 W*	*286 W*	*429 W*	Likely unrealistic in 2024

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NSA May Have Backdoors Built Into Intel And AMD Processors

Amazon exec and Super Micro CEO call
retraction of spy chip

The US Cloud Act v The EU's GDPR - Data Privacy & Security

A jet sale to Egypt is being blocked by a US regulation, and France is over it

S can be hacked and stolen in seco using
$600 worth of equipment

USA TODAY

Car hacking remains a very real threat as autos become ever more loaded with tech

HPC for

Citizens

Addressing major societal challenges of modern society (e.g. health, more efficient public services, cybersecurity, safer and greener transport)

Industry

+ innovative
+ efficient (resources and time)
– costly

Researchers and scientists

Underpinning innovation in almost all scientific disciplines

Deeper insights into unexplored systems of high complexity

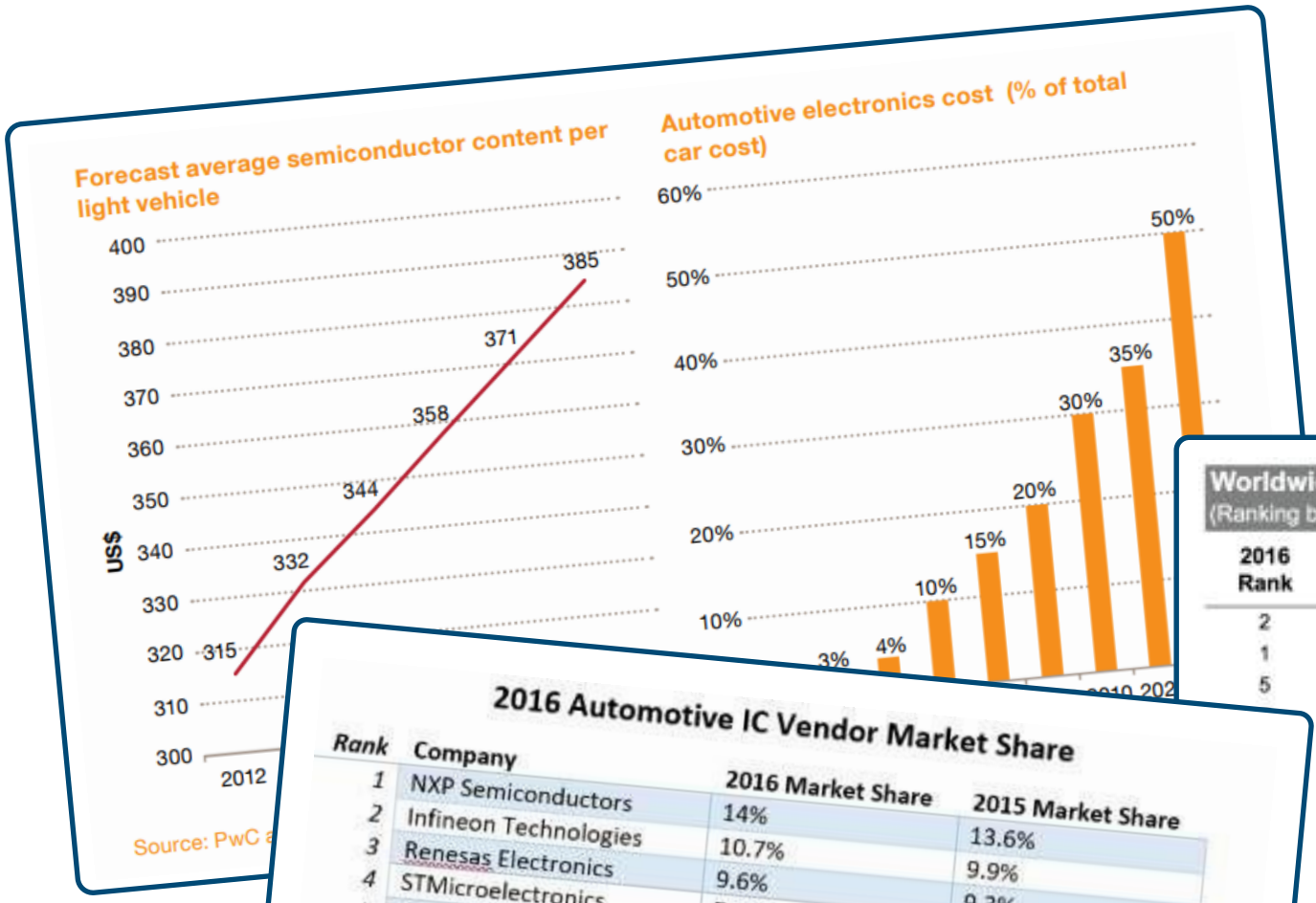
Currently, **EU industry provides about 5% of supercomputing resources worldwide**, but **consumes one third of them**.

But...

Compared to its competitors in the USA, China and Japan, **Europe** is **underinvesting** in **supercomputing**, with an annual **funding gap of €500-750 million**.[2]

In June 2012, the EU had 4 machines in the global top 10 supercomputers. Today **the fastest system in the EU ranks 13 on the global list** – about 10 times slower than the world's fastest machine.[1]

Source: https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=54437



2016 Automotive IC Vendor Market Share

Rank	Company	2016 Market Share	2015 Market Share
1	NXP Semiconductors	14%	13.6%
2	Infineon Technologies	10.7%	9.9%
3	Renesas Electronics	9.6%	9.3%
4	STMicroelectronics	7.6%	7.3%
5	Texas Instruments	6.9%	6.4%
6	Robert Bosch	5.9%	5.0%
7	ON Semiconductor	4.4%	4.0%
8	Microchip Technology [including Atmel]	2.9%	3.0%
9	Toshiba	2.6%	2.6%
10	Rohm Semiconductor	2.5%	2.3%
	Top 10 Total	67.1%	63.4%
	Others	32.9%	36.6%

Source: Semicast Research

Worldwide Ranking of the Top-10 Suppliers of Semiconductors in 2017

(Ranking by Revenue in Millions of U.S. Dollars)

2016 Rank	2017 Rank	Company Name	2016 Revenue($)	2017 Revenue($)	Revenue Percent Change	Revenue Percent of Total	Revenue Cumulative Percent
2	1	Samsung Electronics	40,389	62,031	53.6%	14.5%	14.5%
1	2	Intel	54,980	61,406	11.7%	14.3%	28.8%
5	3	SK Hynix	14,699	26,638	81.2%	6.2%	35.0%
	4	Micron Technology	12,710	22,843	79.7%	5.3%	40.3%
	5	Broadcom Limited	14,979	17,375	16.0%	4.0%	44.3%
	6	Qualcomm	15,405	16,872	9.5%	3.9%	48.3%
	7	Texas Instruments	12,836	14,525	13.2%	3.4%	51.7%
	8	Toshiba	9,904	11,864	19.8%	2.8%	54.4%
	9	NXP	9,306	8,864	-4.7%	2.1%	56.5%
	10	nVidia	6,030	8,578	42.3%	2.0%	58.5%
		Top 10 Companies	**191,238**	**250,996**	**31.2%**	**58.5%**	
		All Others	**161,356**	**178,112**	**10.4%**	**41.5%**	
		Total Semiconductor	**352,594**	**429,108**	**21.7%**	**100.0%**	

S Markit Q1 2018 Competitive Landscaping Tool

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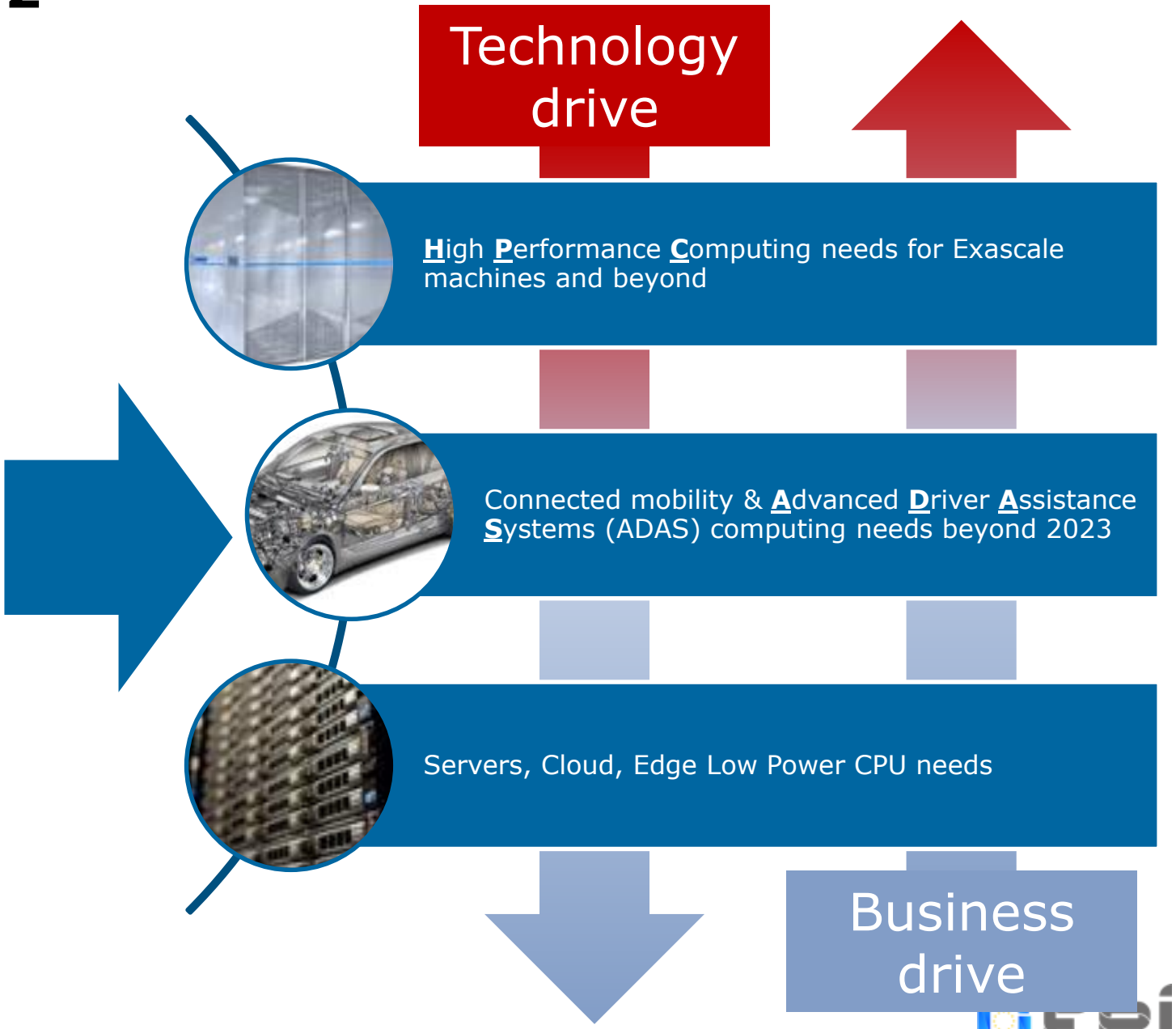
EC expectations from ICT-42 & EPI value proposal

EPI expected impacts (as per EC request)

- Get a world class processor for the Exascale machines supplied by EuroHPC in 2023
- Develop a sustainable economic model

EPI is an H2020 project but with industrial mindset & product delivery oriented



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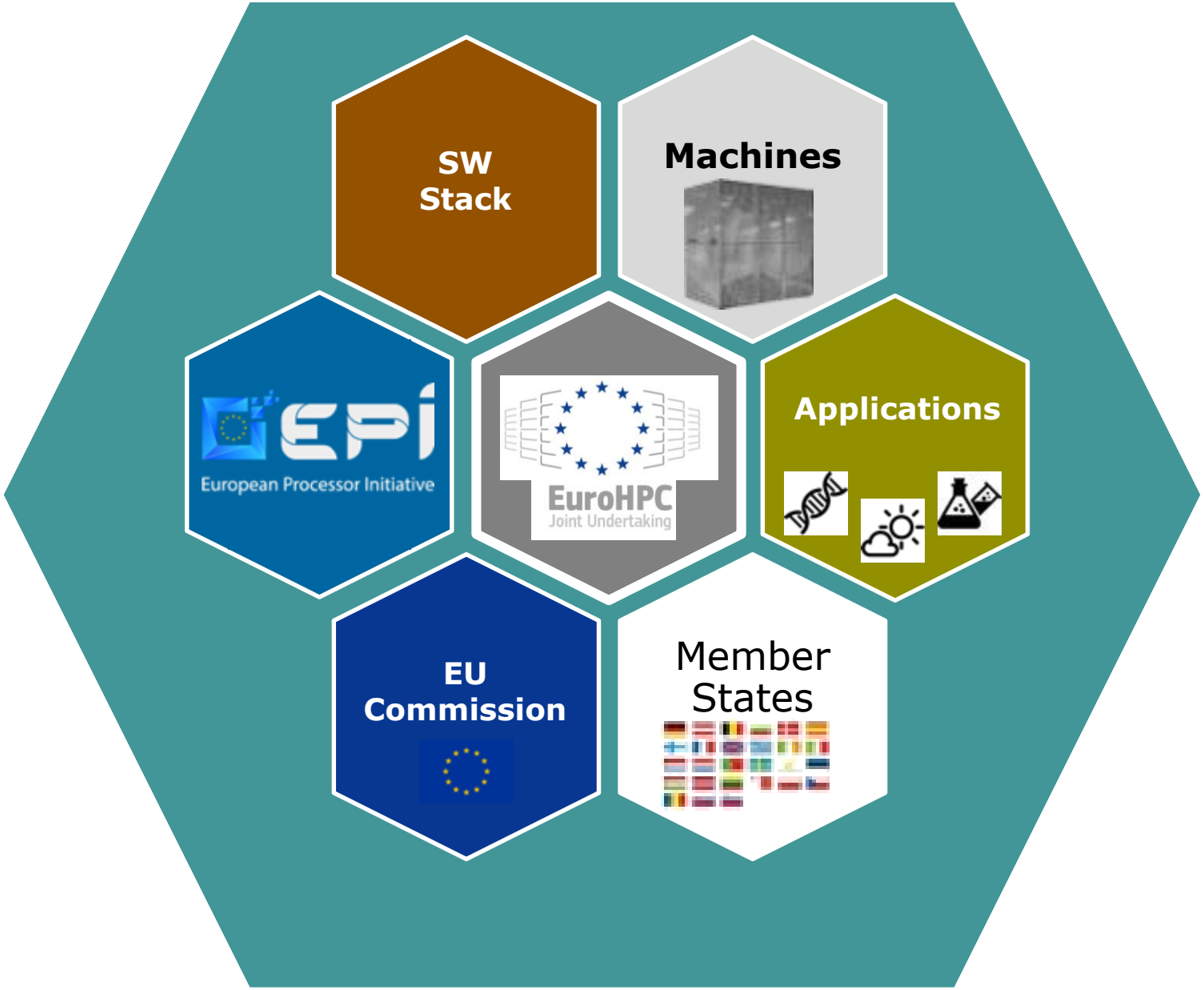
EPI is an essential part of EuroHPC



- **European High Performance Computing Joint Undertaking (EuroHPC JU):**
  - Setup in Nov 2018 (operational until 2026)
  - Composed of public and private members
  - Budget of ~1B€ (50% EU, 50% participating countries)+400M€ from private entities
  - Will provide financial support
  - (public procurement, Research and Innov. Grants)

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23 partners: Wide expertise and excellent combo

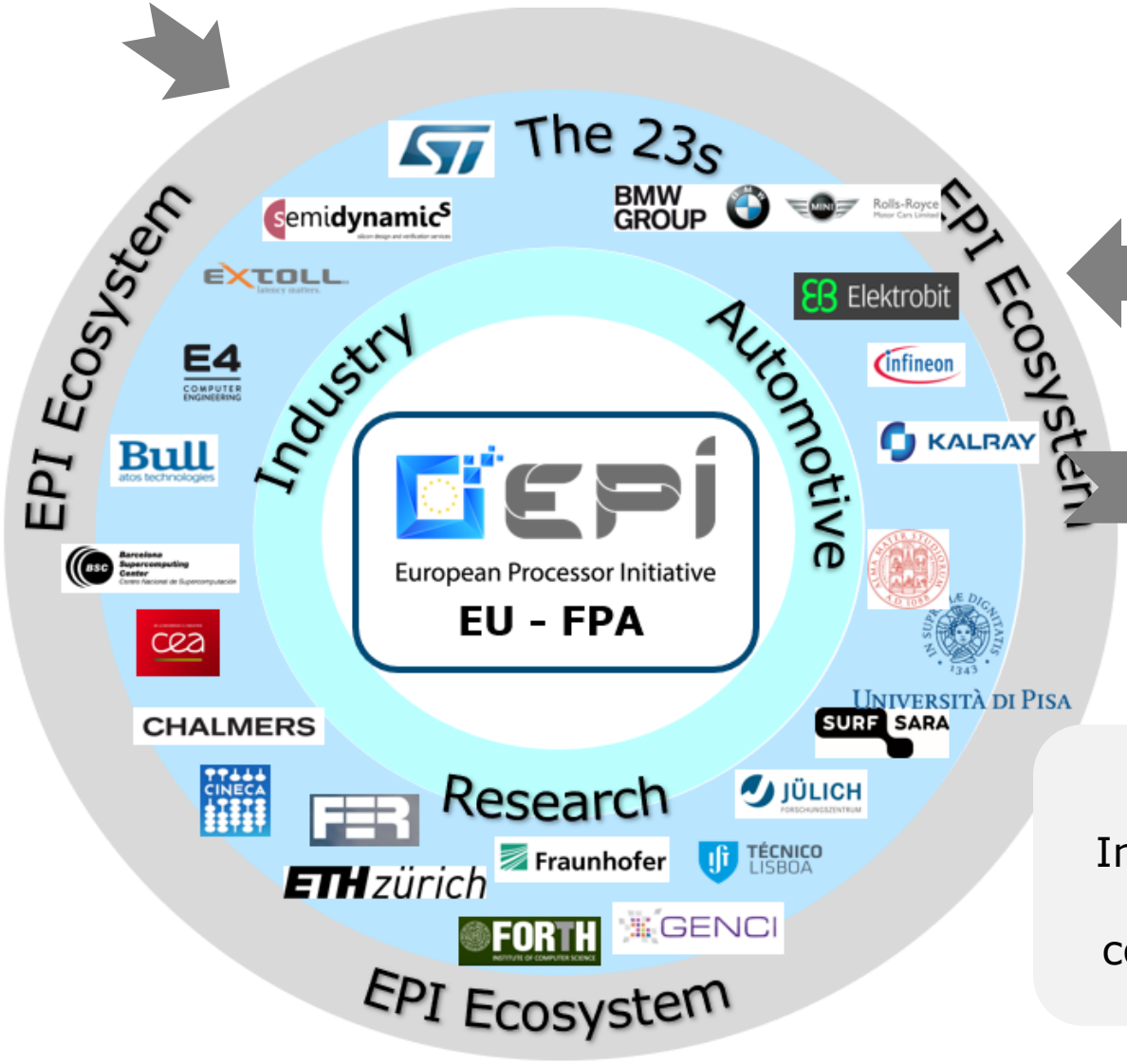
AUTOMOTIVE FOCUS

INDUSTRY FOCUS

HPC & RESEARCH FOCUS

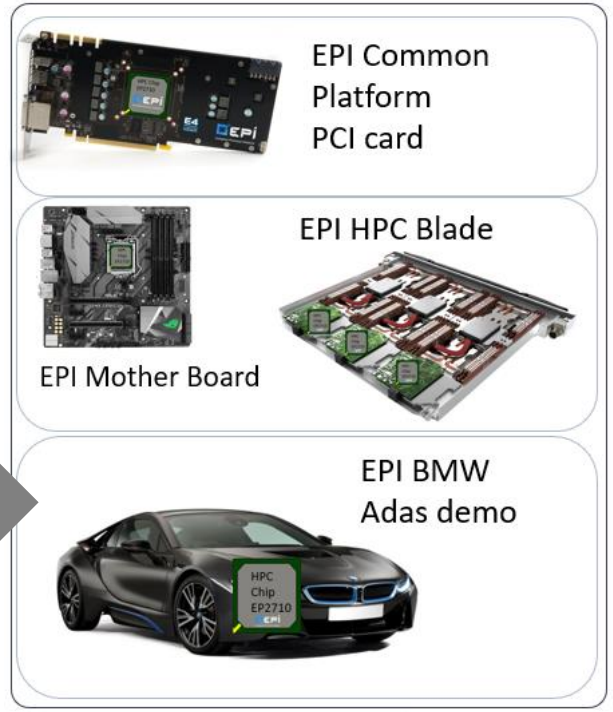
EPI 23 partners, from research to industry from consortium to EU high-tech fabless

MONT-BLANC
EUROPEAN APPROACH TOWARDS ENERGY EFFICIENT HIGH PERFORMANCE



European Silicon Technologies

EP27



RHEA E·S·T EPI

Sales to OEM's

Fabless company
Industrial hand of EPI
Incorporated by a couple EPI members

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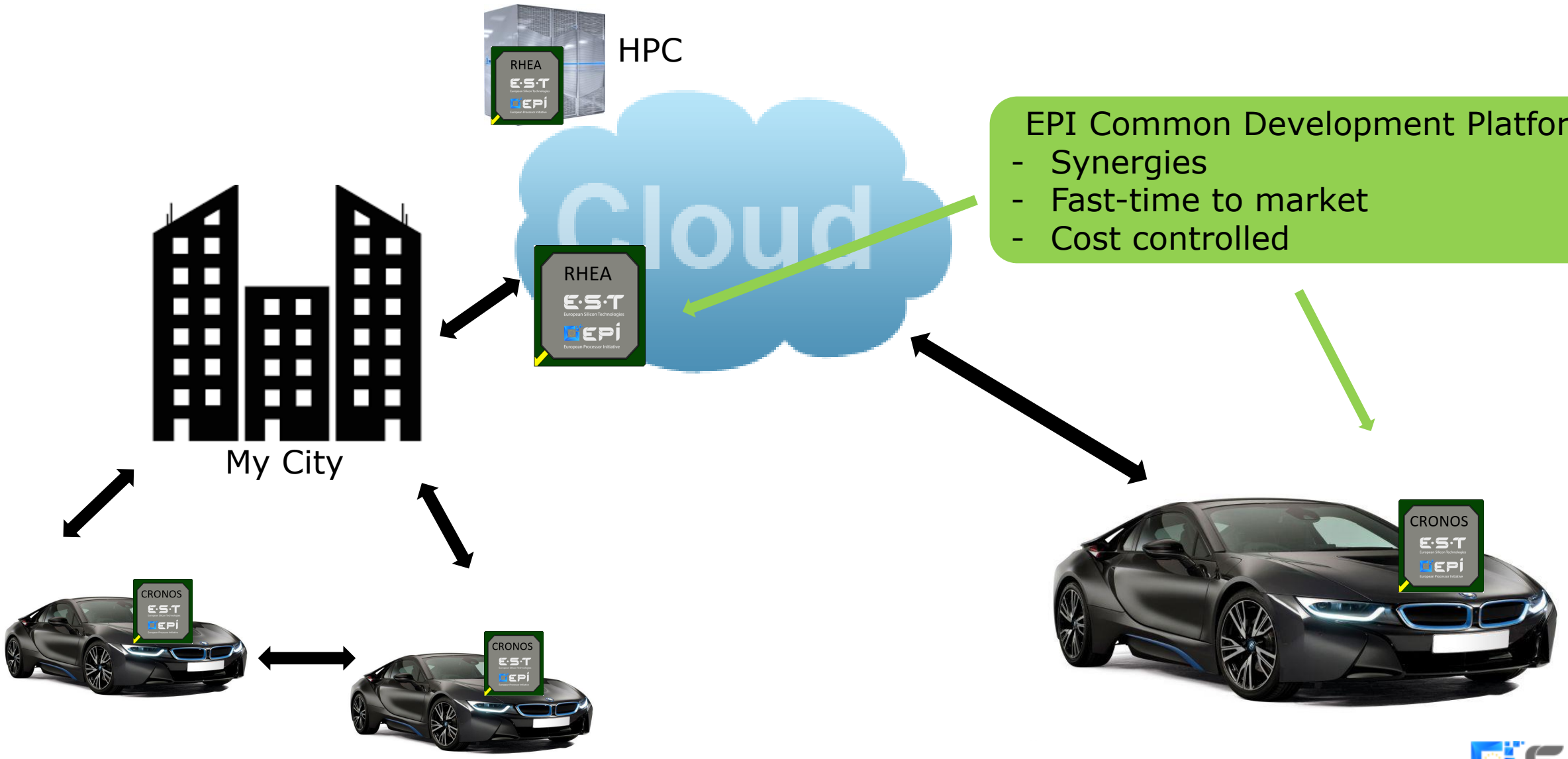
EPI : End2End Solutions for both Servers and Edge



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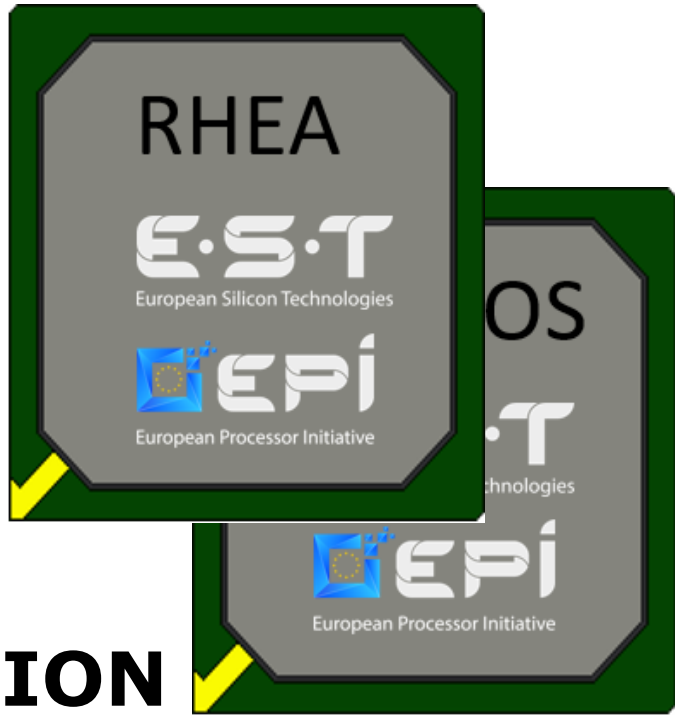
Unique in the universe of H2020 programs : From IP to Product/Solution

IP



SOLUTION

EPI
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E·S·T
European Silicon Technologies

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Scalability allows wide market potential coverage

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Core Developments

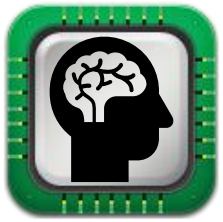
Cost driven

Safety critical

HPC

eHPC
(Automotive)

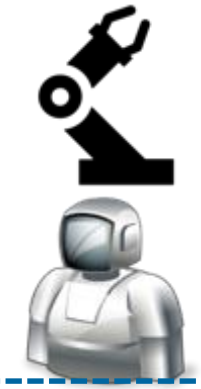
AI & BigData



Cloud
& Servers

Space

Industry 4.x



Committed

future

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EPI technologies will be everywhere to protect you or your business

To control your autonomous car safely

To help National and European sovereignty, science and research

To protect your digital life and your personal data’s

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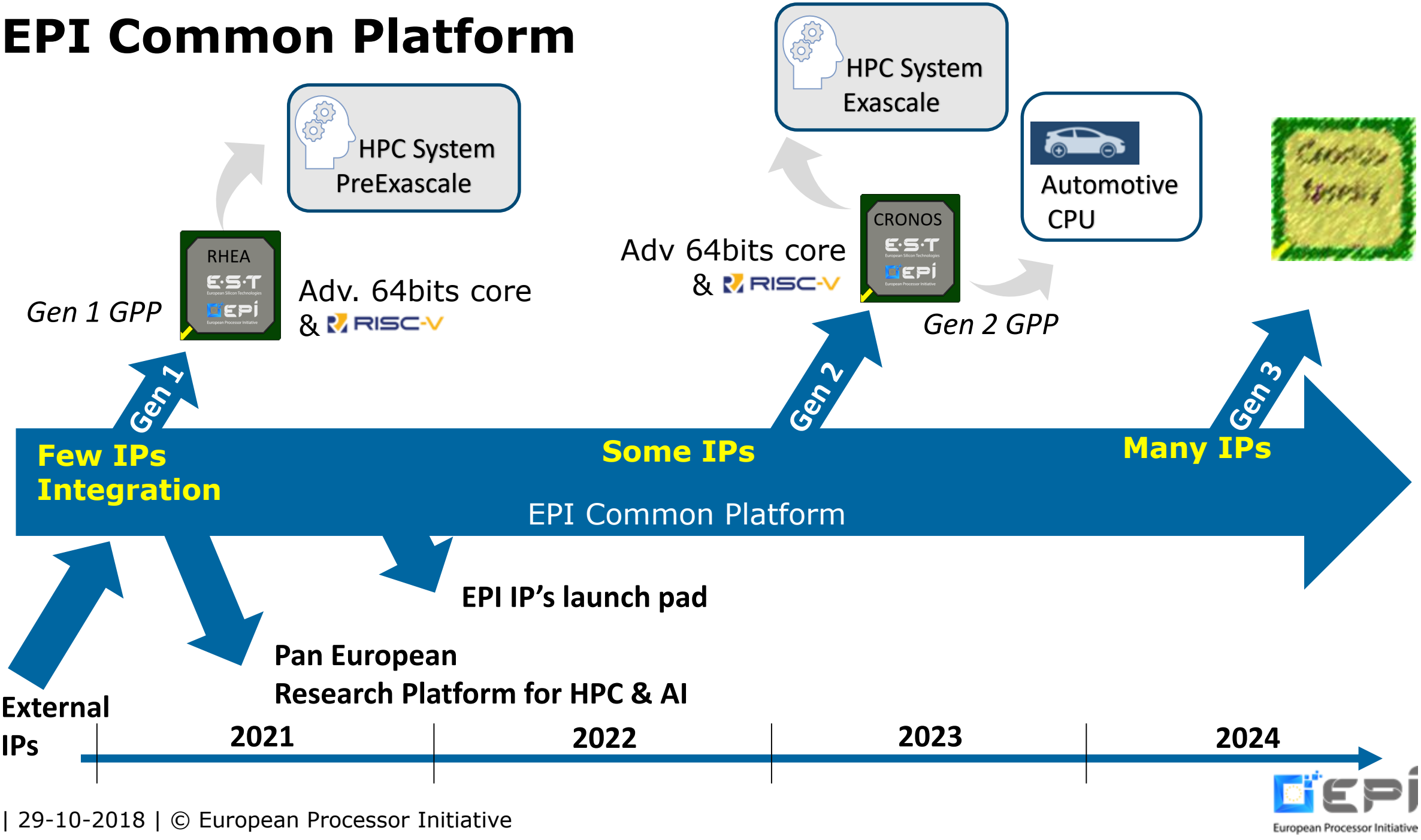
EPI Common Platform



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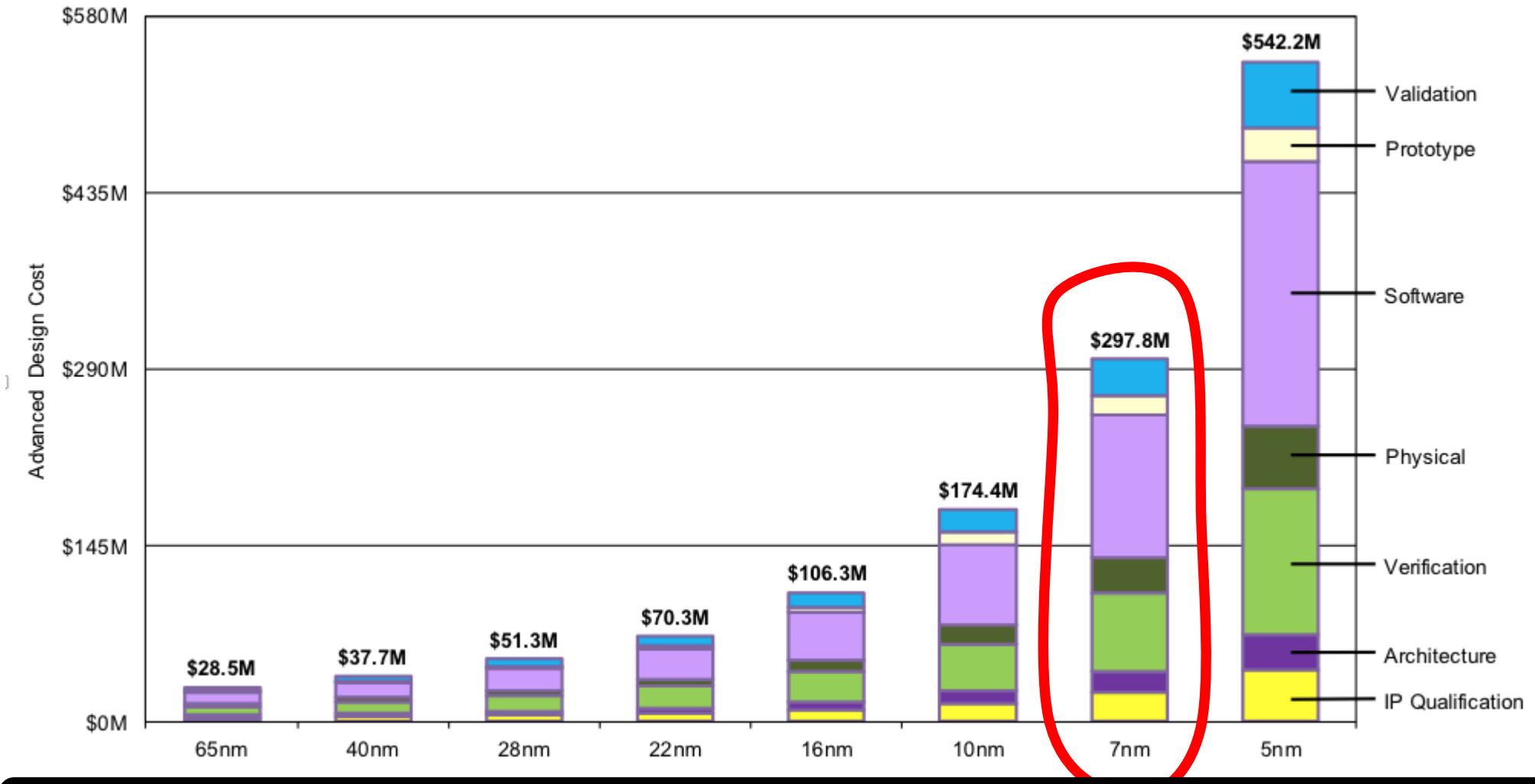
Challenge 1: Cost of Advanced Design SoC



9 digits budget….Building such a Product needs lots of cash…

Source IBS & semiengineering.com

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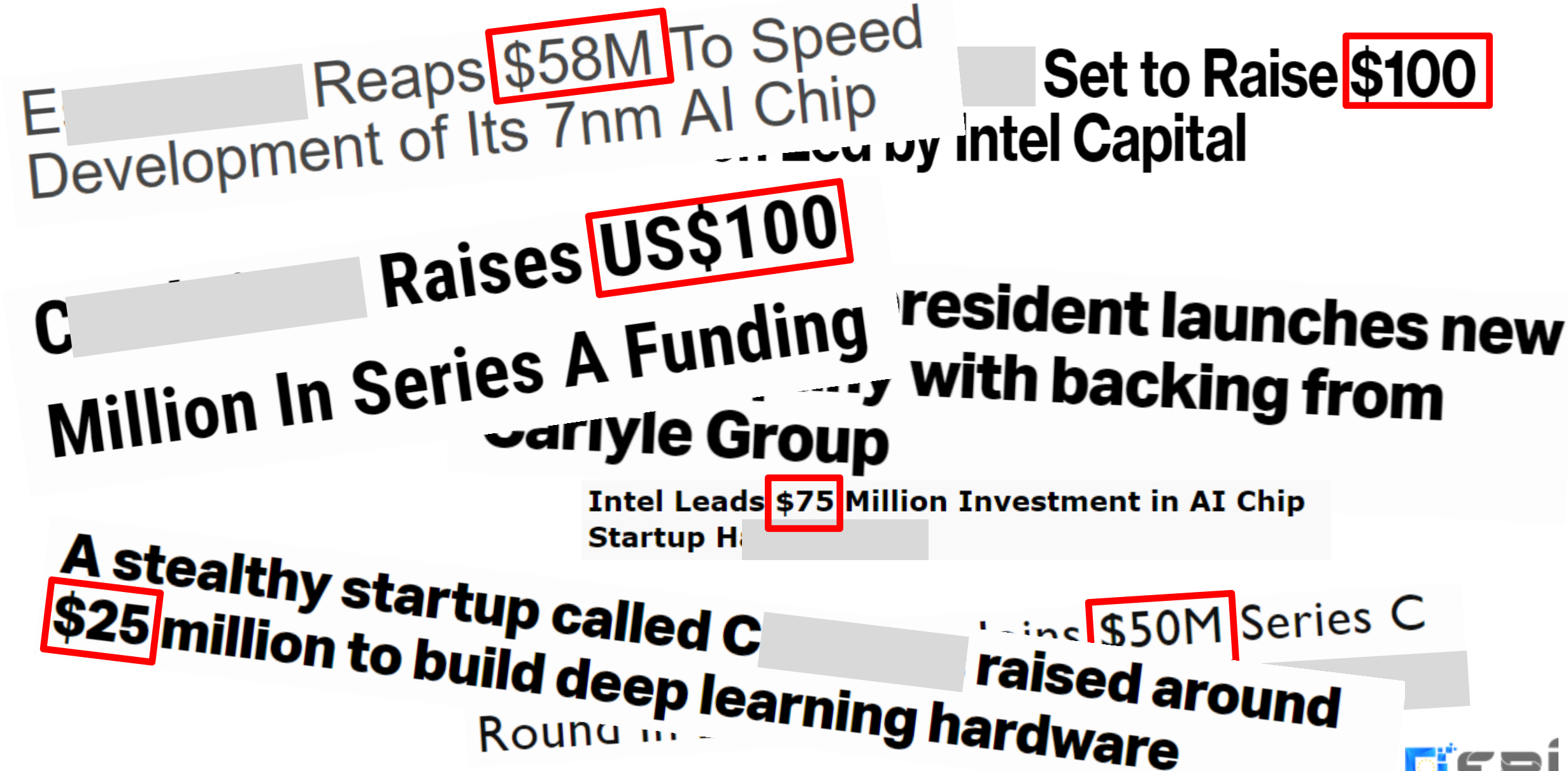
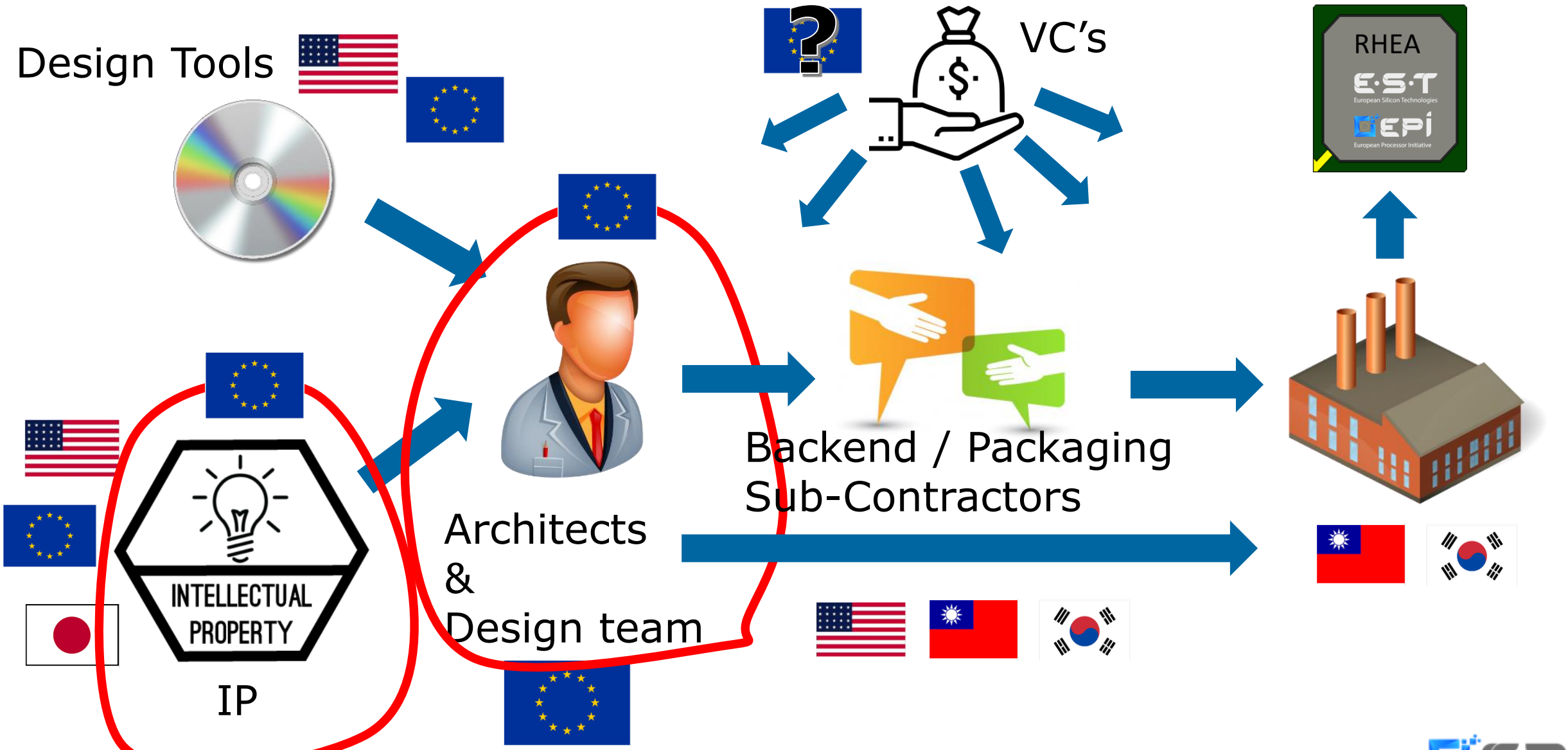
While EPI is warming up, out there….



Challenge 2: What is really European ?



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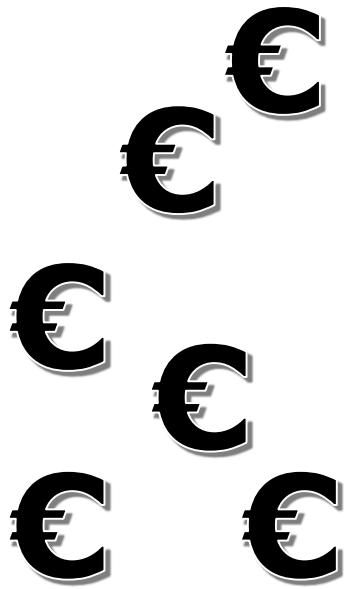
EPI Moon Shot

Airbus
(1969) → 2003 to take over Boeing

With EPI, Europe has the ambition to repeat the Airbus success

EPI program
(2018) → 2023 for ExaScale

To anticipate our 2019 Financial Roadshow



European Union

Automotive

Embedded Computing

Cyber Security

Artificial Intelligence

HPC

ckdoor Free

mputing

nce

European Processor Initiative

is all about this !!

Supercomputer

Supercomputing

Deep Learning

ADAS

THANK YOU

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