

DE LA RECHERCHE À L'INDUSTRIE

cea



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European HPC/BDA strategy

A vision from inside IPCEI

Proposed roadmap

Thanks to J.P Bourgouin and J.P Nomine CEA/DAS

Disclaimer: this talk is a personal vision shared by the CEA and IPCEI Sherpas and naturally doesn't commit, neither the Commission, neither the Member State of the IPCEI.

The Top Down view of the European Union (1)

Boost European Economy by improving competitiveness, growth and jobs



A single digital market

offering to all Europeans an equal and easy access to European Data on which the applications of the future digital economy will be built



BUT this opportunity for a better European future is clearly occupied by non Europeans



Europe is clearly facing **a market failure** due to **fragmentation** and lack of **coordination**

To face this situation Europe needs an appropriate answer:

The Top Down view of the European Union (2)

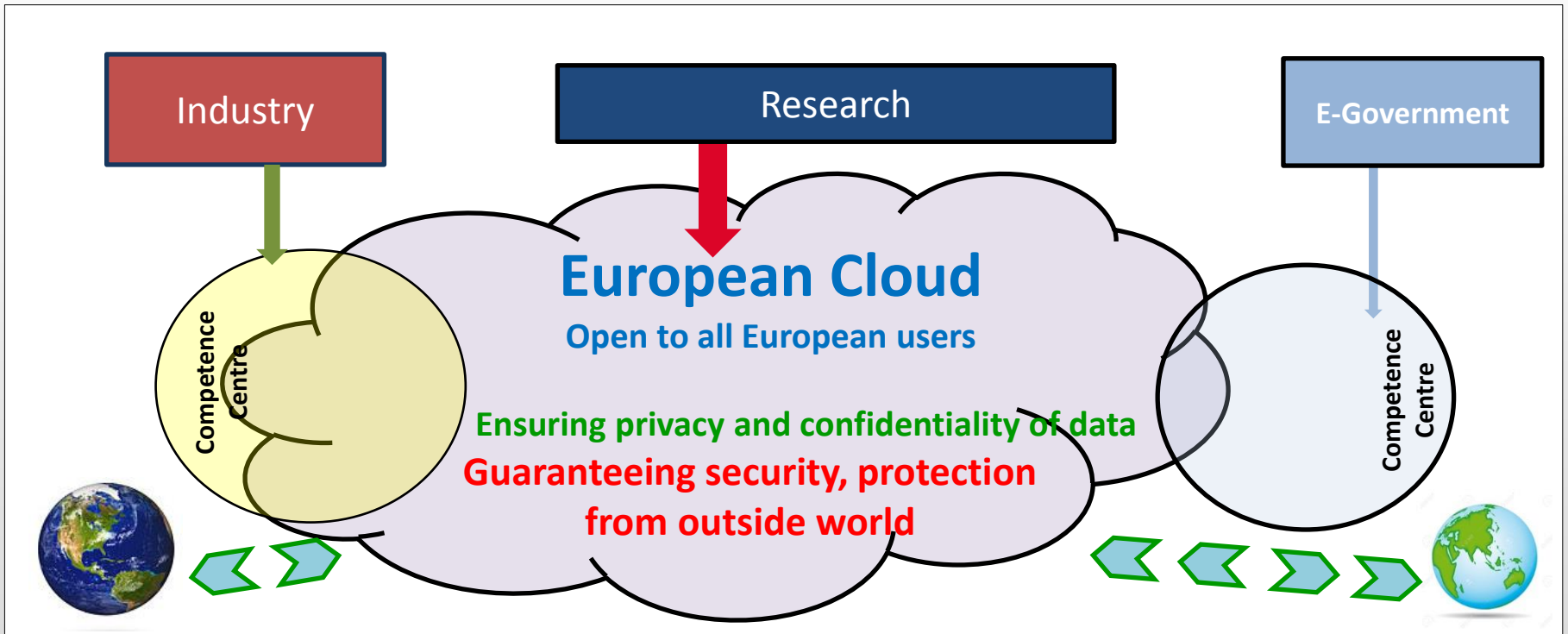
Boost European Economy by improving competitiveness, growth and jobs



Important Project of Common European Interest

A Luxembourg, France, Italy, Spain initiative
open to all European States sharing the same vision

With the support of the Commission



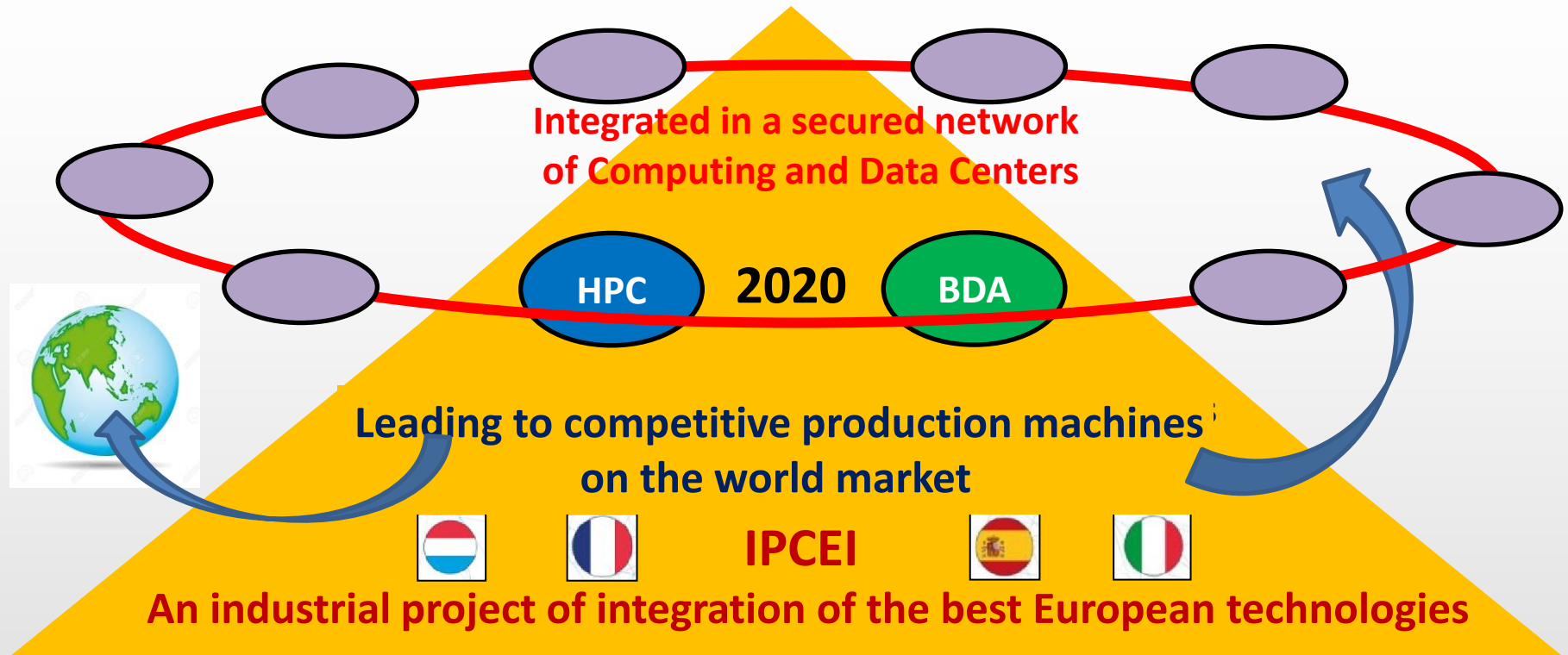
To face this situation Europe needs an appropriate answer:

- A strategy
- A new governance and funding tool

The European cloud
The IPCEI

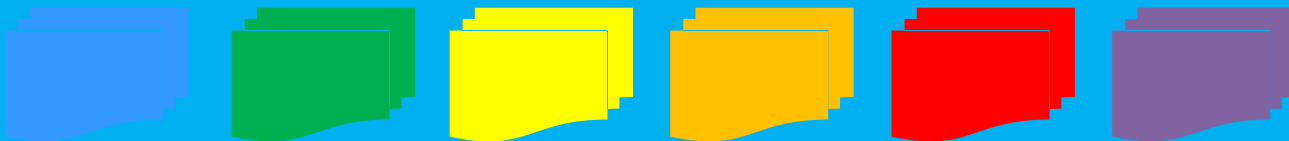
The bottom-up answer of the IPCEI (1)

Implementing an industrial solution through mastering technology



H2020

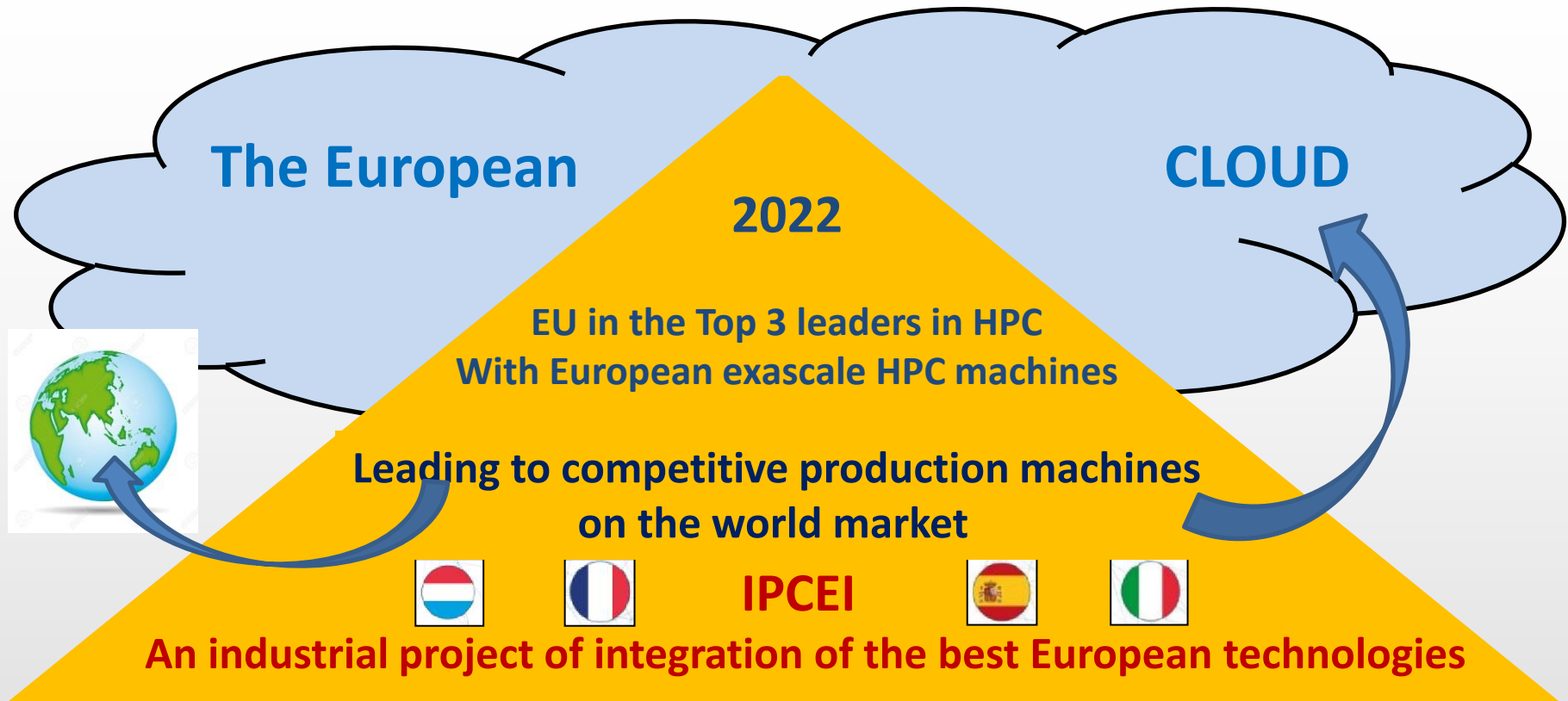
Extreme Scale Demonstrators



Developing technology bricks under a Strategic Research Agenda
A partnership between the Commission, the scientific community and industrials

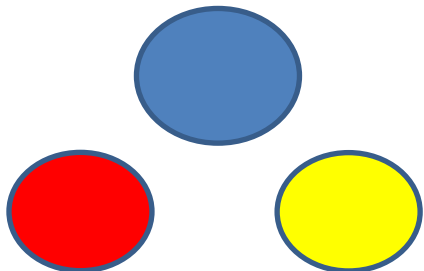
The bottom-up answer of the IPCEI (2)

Implementing an industrial solution through mastering technology



Facing another market failure: European market represents 30% of world market
European industry provides less than 5% of it!

Other Regions



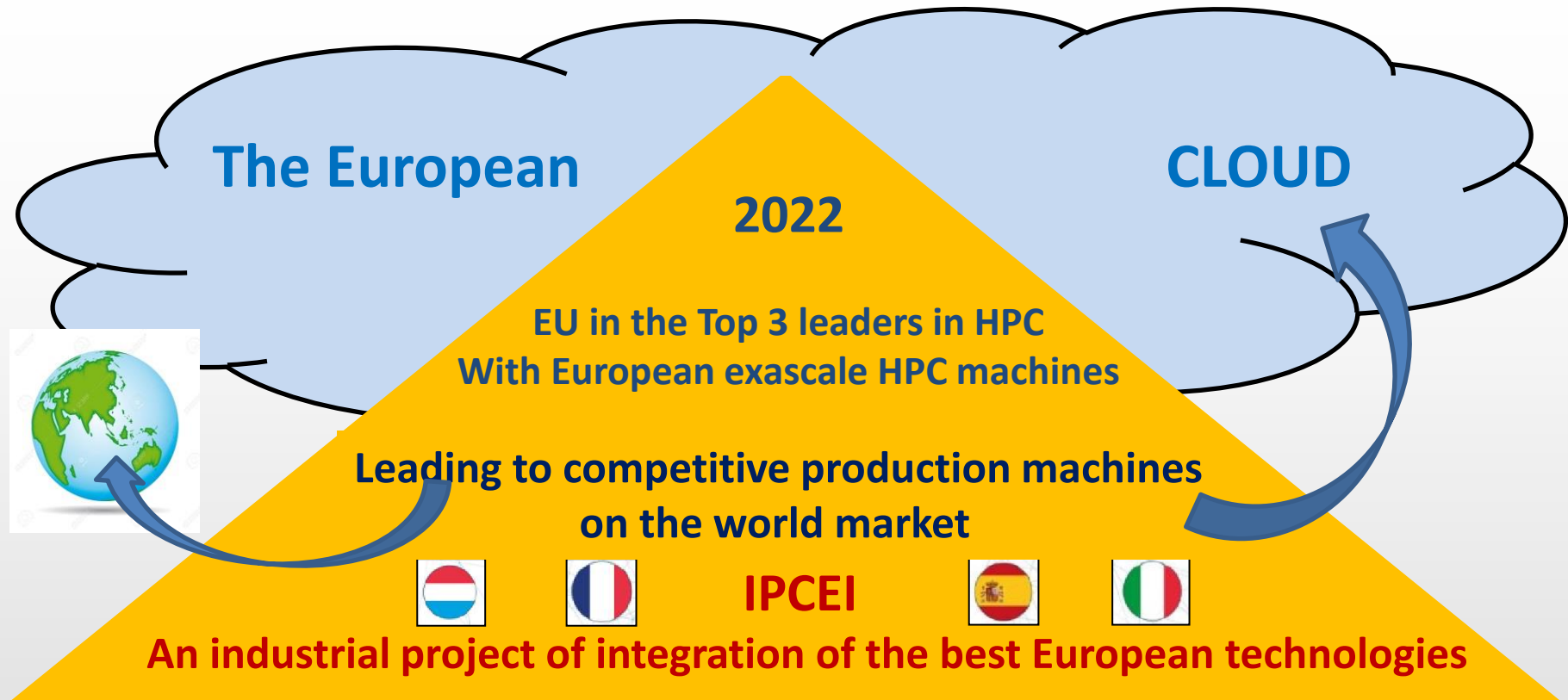
- Massively support R&D
- Have closed public market

→ **ASYMETRY**



The bottom-up answer of the IPCEI (3)

Implementing an industrial solution through mastering technology



The IPCEI answer to both market failures

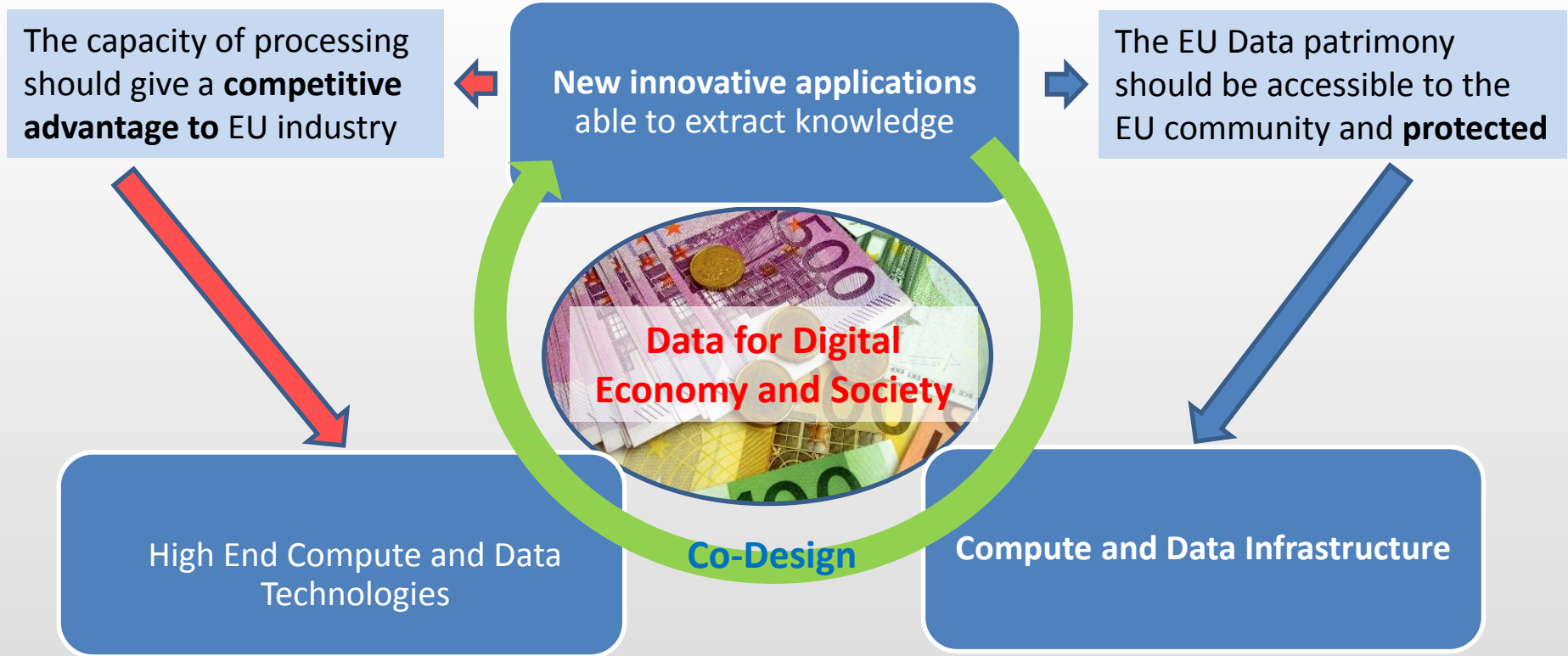
- ❑ Demonstrating the EU industrial capacity to deliver innovative & competitive solutions
- ❑ Giving to all European, on an equal basis, access to computing and data and guaranteeing confidentiality, privacy and security
- ❑ Helping industrials, specially SMEs, to develop the applications of the digital economy



A global vision carried by the IPCEI

The value is in the data

And in the capacity of processing it



An industrial program with one goal:

Re-establishing a fair share of the market in two fields where Europe is facing a market failure:

- Usage of European Data patrimony because of fragmentation and lack of coordination
- Usage of European technologies because of the asymmetry of the market

IPCEI proposed implementation of EU strategy: An industrial approach

❑ **Accelerating and developing the Digital Economy: “Value is in the data”**

Pilar 3 “Test Beds”: Innovative solutions showing the competitive economic advantage given to EU industry and SME by combining Data and HPC.

❑ **Proposing EU Industry and SMEs a fair access to Data and HPC with security/privacy**

Pilar 2 “Infrastructure” for Industry and e-gov

❑ **Furnishing competitively to the market EU HPC/BDA solutions to these challenges:**

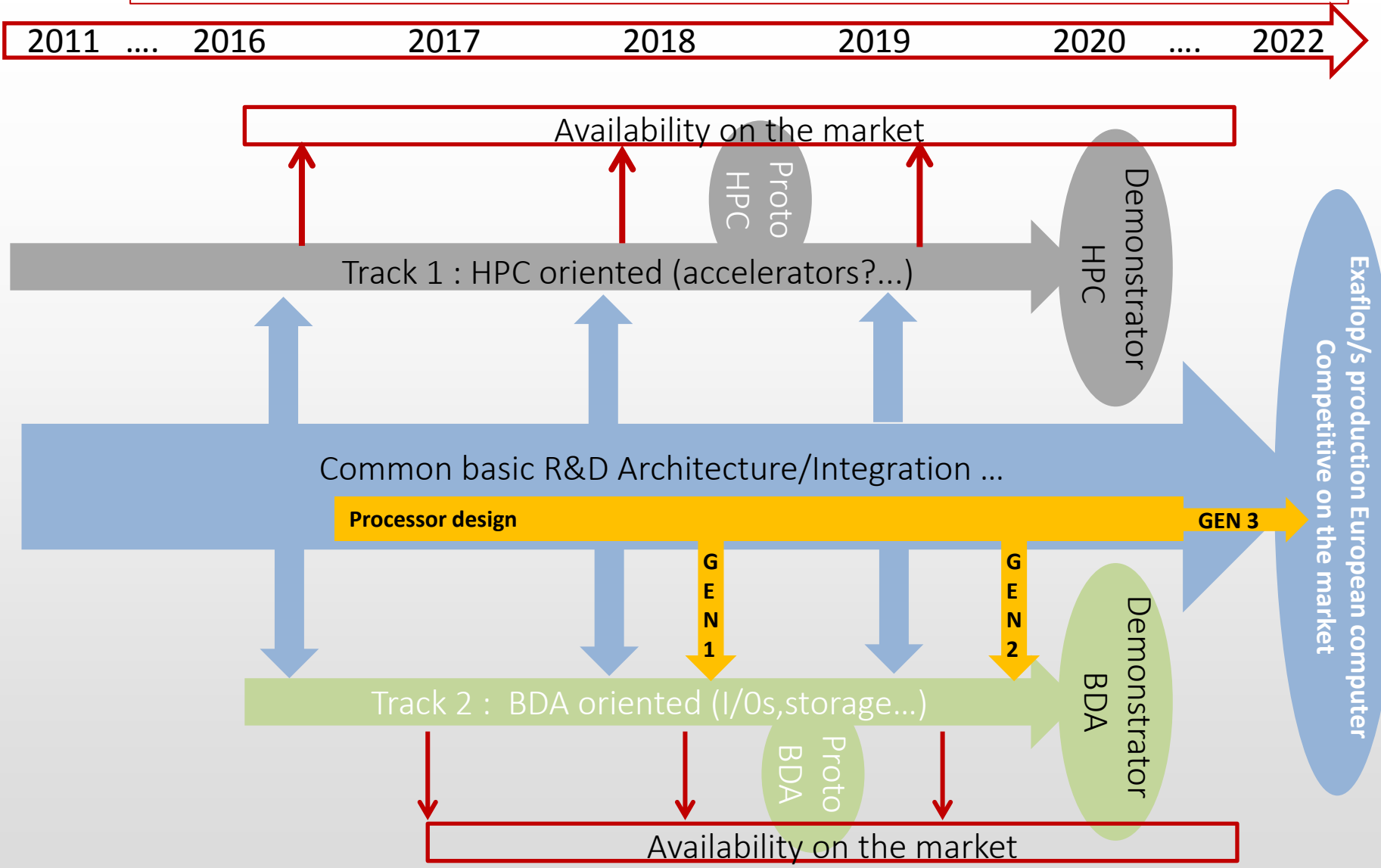
Pilar 1: “Technology”: developing and integrating EU technology answering to the specification issued by the Commission

Specifications from the Commission used for Pilar 1

EU in the TOP3 of “digital Power” in 2022

- ❑ **“2 exascale computers with at least one based on EU technology in 2022”, capacity demonstrated by 2 pre-exascale “Demonstrators” in 2020 / 2021**
 - The EU TIER0s: “world class machines” , “in the TOP3?”
 - **They should be of world top level technology on energy, reliability, security**
 - These machines will be bought by States hosting the EU TIER0 with participation of the Commission (EUROHPC) through “open process (PPI)”
 - **They should be competitive on the market**
 - Envisaged cost 100/150M€ (Demonstrators)- 250M€ (exascale)
 - **competitive production machines with high reliability**
 - **“vendors” should have the financial assets to warranty them**
 - The visibility (success) of this Commission
 - **The demonstrators should be delivered on time**
- ❑ **These machines (One of ?) will be “based on a “European processor”**
 - To satisfy first criteria it should be at world top level in energy but more in reliability (meantime to failure in years...)
 - **Timing**

IPCEI proposed macroscopic Roadmap for technology pillar



EU processor design

❑ **WHY?**

- Better final price for the machine (Processor to day >20% growing)
- Better time to market for EU applications (Codesign)
- No legal problem for EU exports (ITAR)
- Better and guaranteed security...

❑ **Problem:** NO HPC designer in EU for decades – restarting from ZERO

❑ **Opportunity:**

- New business model give place to innovative solutions (ARM...)
- The end of Moore Law places the usual vertical model in front of a wall

❑ **How?:** Starting a new company

- ✓ Gathering expertise from where it exist in Europe
- ✓ Gathering funds from Industrials of the technology and end users interested
- ✓ Finally asking support from the Commission

Summary

There is a Political objective and a strategy

- Expressed in the April 2016 declaration
- Approved unanimously by a Competitiveness Council
- In the final process of approval by the Union Parliament



The necessary expertise does exist in Europe

- Gathered under the banner of ETP4HPC, working on a permanent updated Strategic Research Agenda
- Supported by the Commission through a 700M€ cPPP



The EU industrial capacity with the necessary financial assets to share the R&D costs is here

- With a clear technical program, including costs, milestones and KPIs
- An EU consortium ready to commit to the Commission objectives



All lights are green... After 20 years of struggle we have a global opportunity

What are the hurdles?

INSTRUMENTS – GOVERNANCE

deploy suited tools, and efficiently, from R&D to machines procurements

CONSISTENT INDUSTRIAL VISION

beyond words and even financial R&D support, HPC industry needs **CONTRACTS**

The success is in OUR HANDS of deciders/procurers

Contribute to HPC/BD R&D that goes into products and in fine BUY EUROPEAN