Building a globally competitive European
world-class HPC technology value chain

Motivation and context
HPC ecosystem & H2020

What we do

High-Performance Computing (HPC)

An essential tool for Science, Society and Industry

High-Performance Computing (HPC)

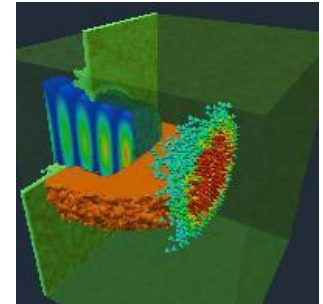**An essential tool for Science, Society and Industry**

Supercomputers: essential tools for powering numerical simulation, data analytics and big data processing, machine learning and AI

HPC
From leading edge to pervasive computing

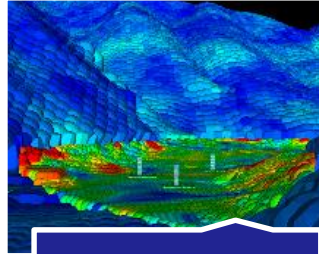A **strategic driver** to push advanced computing **beyond its limits** from core technologies to usage

ETP 4 HP C

HPC : An enabler for all scientific fields
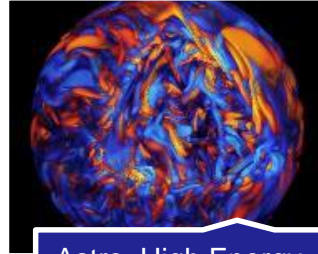
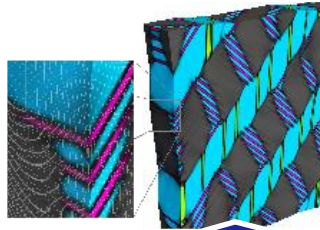## An essential tool for Science, Society and Industry

Life Sciences & Medicine

Earth Sciences

Astro, High Energy & Plasma Physics

Materials, Chemistry & Nanoscience
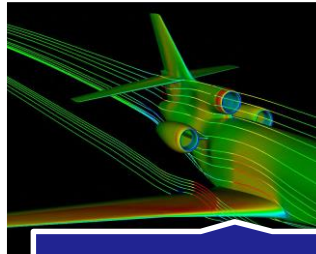
Engineering

Advances leading to:
- Improved Healthcare
- Better Climate Forecasting
- Superior Materials
- Sustainable Energy
- More Competitive Industry
- …

ETP 4 HPC

Key document: 2012 EC Communication

COMMUNICATION FROM THE EUROPEAN COMMISSION

High-Performance Computing
Europe's place
in a Global Race

Brussels, 15.2.2012
COM(2012) 45 final
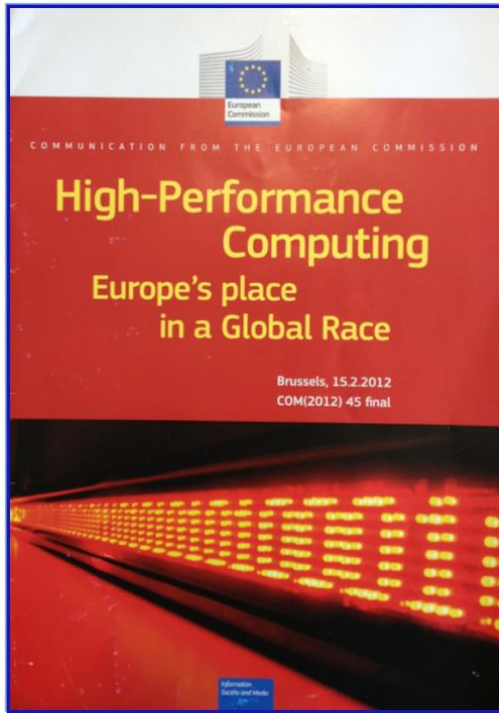
EU needs independent access to HPC technologies, systems and services

=> ETP4HPC created end of 2012 to contribute to this objective

ETP 4 HP C

European HPC Ecosystem

Approx. 21 FETHPC projects and 9 CoEs running

And more coming in 2018 - 2020

EuroHPC Joint Undertaking

An integrated framework for HPC in Europe

What is EuroHPC ?

https://ec.europa.eu/digital-single-market/en/eurohpc-joint-undertaking

- The Joint Undertaking EuroHPC is a legal entity
  - 03/07/2018: the European Parliament has voted in favor of the Commission's proposal for a Joint Undertaking
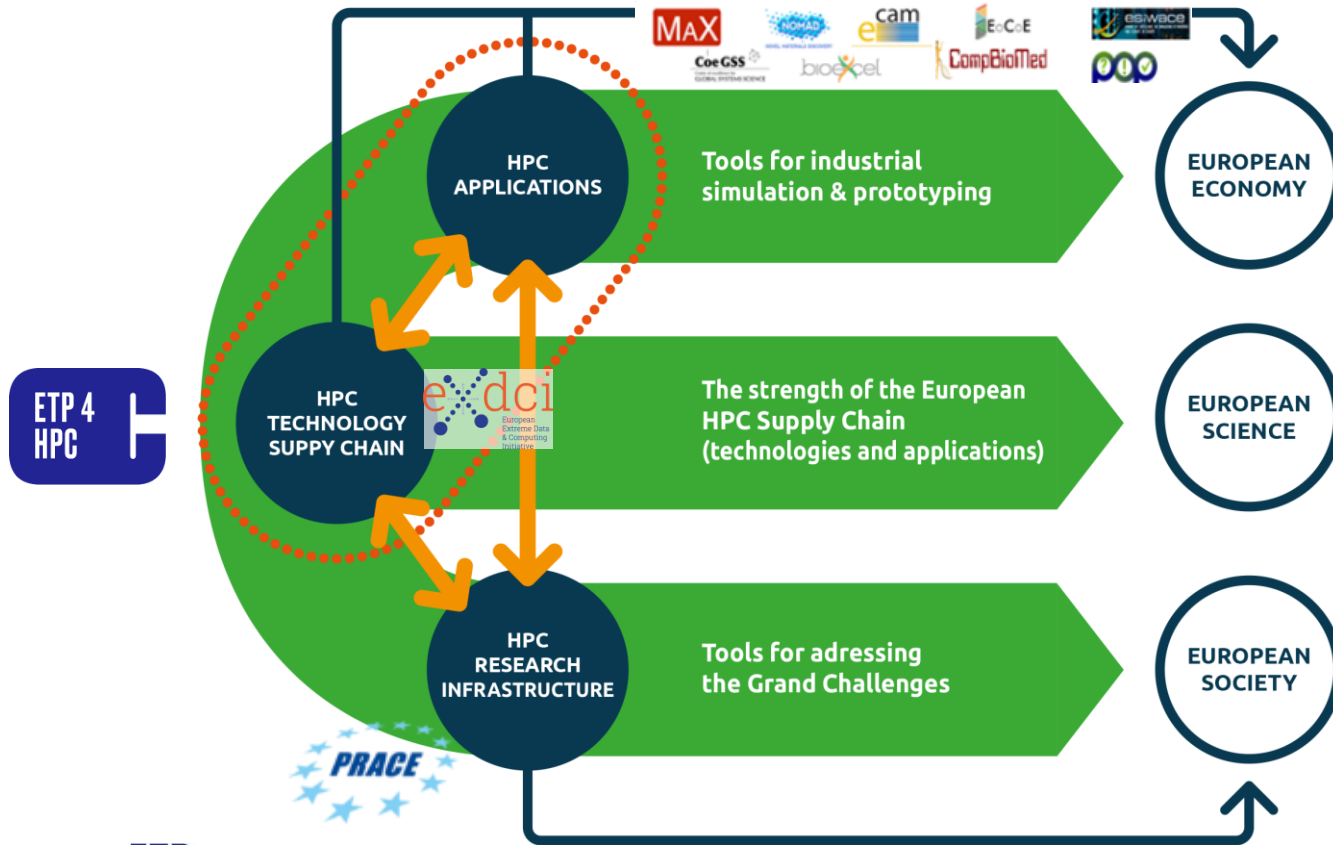 - 28/09/2018: The proposal has been formally adopted by the Council of the European Union http://europa.eu/rapid/press-release_IP-18-5864_en.htm and regulation published
  - Formal existence starts end of October 2018 (October 8 + 20 days) https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2018:252:FULL&from=EN

- Its governing members are:
  - the European Commission and
  - Participating States:
    Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia and Spain

ETP 4 HP C

Benefits of EuroHPC

Bundled European efforts to keep up with the rest of the world:

- **One integrated framework** for funding R&I projects AND procurements AND deployment of infrastructure for EU researchers and EU industry

- **Coordination in HPC strategies** and investments between the EC and Member States

- **Possibility of pooling financial resources** from the EC and from Member States

ETP 4 HP C

One integrated framework

Infrastructure

Research and Innovation

JU Admin/Running costs

HPC Ecosystem

ETP 4 HPC
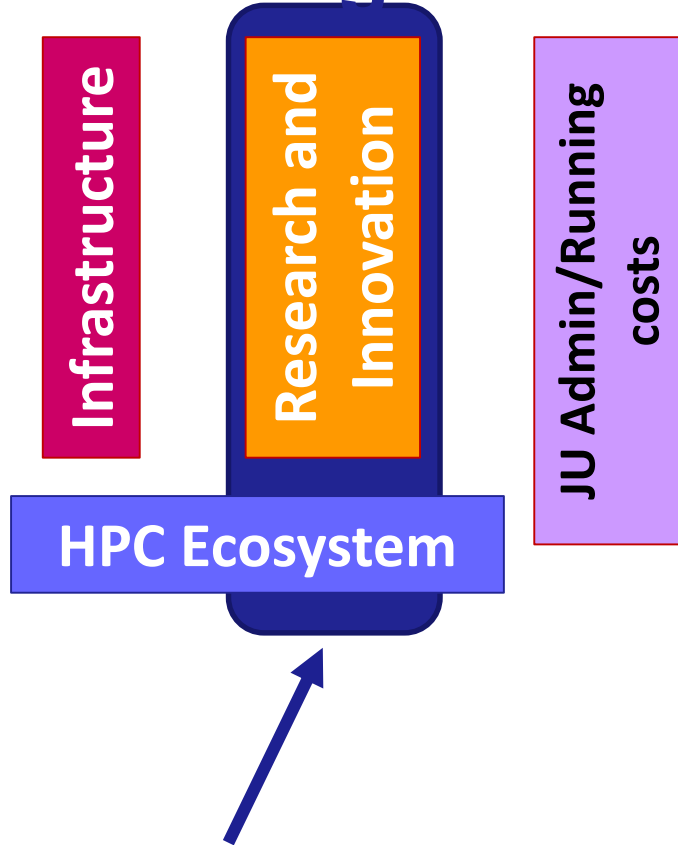
- **The Infrastructure Pillar**

  Procurement of ≥2 pre-exascale machines and ≥2 petascale machines

- **The Research and Innovation Pillar**

  R&I, exascale technologies and systems (incl. low-power processor); applications; skills

- **JU Admin/running costs**

Pooling resources

Infrastructure

Research and Innovation

JU Admin/Running costs

HPC Ecosystem
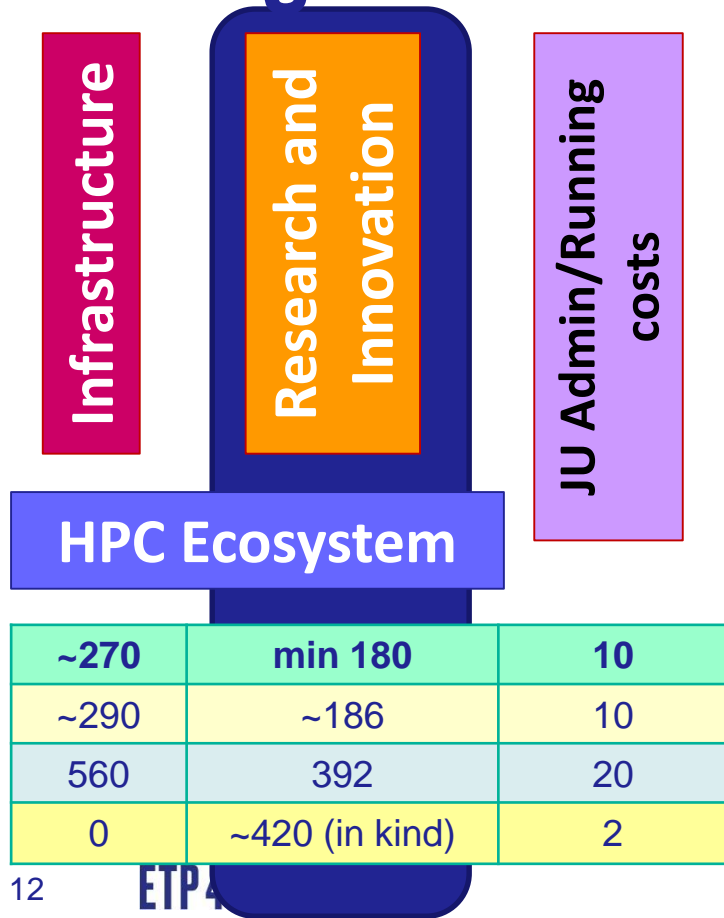
Indicative figures only for 2019 and 2020 activities (in M€)

~270	min 180	10
~290	~186	10
560	392	20
0	~420 (in kind)	2

486	EC
486	Participating States (PS)
972	Total
422	Private Members

12

ETP4

Roadmap

EPI – HPC processor technology

Work in progress

	Gen 1		Gen 2	
2018	2019	2020	2021	2022	2023	2024	2025

EuroHPC JU

R&I

Competence (CoC, SMEs) → Innovation Ecosystem

App & HW & SW → Technologies

Integration → Integration

Pre-Exascale technologies integration

Exascale technologies integration

Procurement

2 Pre-Exa

2-3 Peta

2 Exascale (1 EU)

ETP 4 HPC

EuroHPC Governance

Intelligence gathering → **Decision making & Advice** → **Implementation**

Stakeholders
[academia, industry]

(a) Users forum
- Science Users
- Users of PRACE and HPC Centres of Excellence
- Industry Users

(b) Technology forum
- PRACE, GEANT
- Tier-0 supercomputing centres
- Industry (ETP4HPC, BDVA PPP, etc.)

Governing Board
Public Members

The decision making Board

Industrial and Scientific Advisory Board

Research & Innovation Advisory Group
[academia & industry advising on Pillar 2 activities]

Infrastructure Advisory Group
[academia & user industry advising on Pillar 1 activities]

ETP 4 HPC — BDV BIG DATA VALUE ASSOCIATION

R&I activities

JU funded

HPC machines

Member State-funded activities

PRACE activities

IPCEI activities

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