FF4EuroHPC
Enabling SMEs to benefit from HPC

OPEN CALL-1

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Why use HPC in business?

• High Performance Computing (HPC), High Performance Data Analytics (HPDA), Internet-of-Things (IoT), Artificial Intelligence (AI) and Machine Learning (ML): Indispensable tools for INDUSTRY 4.0

• The current digital revolution is driven by data and intelligence and builds on those tools.

• The increasingly complex, connected and digitized world creates a flood of data – HPC and the new technologies allow us to generate meaning and knowledge from the data ➔ better products, models or processes in virtually all applications

• Advanced HPC services can enable European companies to focus on quality and innovation – and thus be able to prosper in the global marketplace

• Many industrialized economies (both developed and developing) have identified HPC as a key tool for innovation – in the U.S. the phrase “to out compute is to out compete” has been used to make the case to Government
Why use HPC in business?

BENEFITS OF HPC
(SOURCE: COUNCIL OF COMPETITIVENESS)

- Time to solution: 24%
- Inability to solve the problem by any other means: 23%
- Reduced costs compared to physical methods: 16%
- Improvement in quality or features: 9%
- Utilization rate: 8%
- Inability to solve the problem by any other means: 23%
- ROI: 19%
- Other: 1%
Political context

- All major economies world-wide are investing in large supercomputers on the road to Exascale
- EuroHPC is a major commitment by the European Union
- Business Case is for **Science and Industry**
- European citizens expect their taxes to be spent wisely for the good of everyone
- We must ensure our Universities and our Companies can access and benefit from investment in supercomputing
The Fortissimo Approach

• Central theme: the successful execution of „experiments“ with SMEs, delivering **real business impact** through HPC

• The bulk of project funding is used for those experiments and the highest quality, innovative SME-oriented experiments are acquired through the execution of **open calls for proposals**

• Two prior projects (Fortissimo and Fortissimo-2) executed 92 experiments generating 79 impressive, business-oriented success stories
Success Story: Improved flange tightening

- Texas Controls - a Spanish SME offering tightening and sealing solutions to large industrial facilities in the industrial, power generation and oil & gas sectors.
- HPC Simulation based design of flange tightening operations leads to:
  - 33% time-saving
  - Reduced manpower costs & reduced “down time” of the equipment
  - End-user savings of 180 K€ per tightening
  - Estimated annual savings of 5,4 M€ for Texas customers

Experiment Partners:
Texas Controls
AIMEN
CESGA

- SME Industrial End-user
- Technology provider
- HPC Centre / experts
Ergolines success story

- SME based in Italy
- Speciality steels technology
- Simulation of slag carry-over from ladle to tundish
  - New monitoring system developed
  - Better overall steel quality
  - Reduced re-melting
- On average 6,000 tonnes of lost steel per year saved
- Saving between €420,000 - €600,000 per year

Experiment Partners:
Ergolines
Arctur

Ergolines received the IDC HPC Innovation Award 2016 for their demonstration of economical benefit of using HPC during their Fortissimo experiment.

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HPC-based Urban Planning - IES

IES is a Scottish SME (with offices world-wide).

HPC-Cloud approach enables pay-as-you go customer options reducing large model simulations from days/weeks to hours/days.

Comparison with in-house costs: 50% reduction

Experiment Partners:
IES
U. Edinburgh (epcc)

• SME - Industrial consulting and ISV
• HPC Centre / experts
Sports-car aerodynamics - Koenigsegg

The SME Koenigsegg designs & manufactures high-performance sports-cars.
Aerodynamics development for the Koenigsegg One:1 - HPC-based CFD:
250 km/h → 250% higher down-force
440 km/h → 50% higher down-force

Benefits of Cloud-based HPC
• Reduce design costs by 30%
• Reduce wind tunnel testing by 50%
• Reduce prototyping costs by 60%
• Reduce time-to-market by 30%
The FF4EuroHPC project

- FF4HPC: HPC Innovation for European SMEs
- Funded under the H2020-JTI-EuroHPC-2019-2 Call
- Commenced 1.9.2020; 36 months duration
- Coordinator:

  ![HLRS](HLRS.png)

  High-Performance Computing Center | Stuttgart

- Other Partners:

  ![ARCOTUR](ARCOTUR.png)
  ![CESGA](CESGA.png)
  ![CINECA](CINECA.png)
  ![scapos](scapos.png)
  ![Teratec](Teratec.png)
Stimulating the innovation potential of SMEs

- Increase the innovation potential of industry, and in particular of small and medium sized enterprises (SMEs), through the use of advanced HPC infrastructures, applications and services.
- Facilitate access to HPC-based infrastructures and services for a wide range of users of new and emerging data and compute-intensive applications and services.
- Foster wider innovation, for example by exchanging and promoting best practice use cases or application experiences.
- Provide an effective mechanism for inclusion of innovative, agile SMEs lowering the barriers for small actors to enter the market and exploit new business opportunities.
The FF4EuroHPC Methodology

• Support the EuroHPC initiative to promote industrial uptake of HPC technology and increase the innovation potential of European industry
  → focus: small and medium sized enterprises (SMEs)

• Extend and continue the Fortissimo Approach: Portfolio of business-oriented application “experiments” that are driven by SME end-users needs

• Furthermore…
  • Collaboration with the national HPC Competence Centres (& EuroHPC projects CASTIEL & EuroCC)
  • Support the participating SMEs in establishment of HPC-related innovation
Shift your business to the next level with the help of HPC – OPEN CALL-1

Call for proposals targets highest quality experiments involving innovative, agile SMEs and with work plans built around innovation targets arising from the use of advanced HPC services.
OPEN Call-1 Objectives

- Experiments should address business challenges from European SMEs from varied application domains
  - Preference being given to engineering and manufacturing, or sectors able to demonstrate fast economic growth or particular economic impact for Europe.
- Priority will be given to consortia centred on SMEs that are new to the use of advanced HPC services
Expectations for experiments – 1/2

• Involve all necessary parties required for the effective and efficient execution of the investigation and impact demonstration to address SME business challenges through the use of HPC

• Define the resources they need and budget for them
  • FF4EuroHPC will not be in a position to provide computing resources.

• Define the data protection and data/information access issues that impact its proposed work plan and ensure that the operation of the experiment adheres to those requirements.
Expectations for experiments – 2/2

- Generate publishable success stories based on solution of the SME’s real-world problems that clearly identify the business benefits realised or obtained.
- Align, where appropriate, with regional priorities, such as industrial specialisation areas.
- Be complementary to those already included in the past Fortissimo and Fortissimo 2 projects.
Evaluation

• The criteria for evaluation will comprise:
  1. Impact including industrial relevance and exploitation plans;
  2. Soundness of concept, innovation and quality of the work plan;
  3. Quality of the consortium as a whole and of the individual proposers;
  4. Effective and justified deployment of resources

• For Criteria 1 to 4, each criterion will carry a score ranging from 0 to 5. Criterion 1 will have a weight of 2, Criteria 2 to 4 a weight of 1 (leading to a maximum score of 25 points). A threshold score of 3 will apply to the first three criteria.
Funding of Experiments

• FF4EuroHPC will make use of the Financial Support for Third Parties method to enable the inclusion of new experiment partners.
  • Funding of Third Parties to follow the same principles as used for FF4EuroHPC beneficiaries, which receives European Commission funding within the R&D&I programme of the EuroHPC Joint Undertaking. In particular, Third Parties will receive 100% funding of eligible costs arising.

• The funding for an individual experiment may not exceed € 200 K (covering all participants).

• The maximum funding that can be allocated to any Third Party, across all FF4EuroHPC experiments in which that Third Party is involved, is € 150 K.

• The participation of certain FF4EuroHPC beneficiaries in experiments is eligible, but the costs for their activities in experiments are not included within the requested funding for experiments.
Key Call Details

**Submission Deadline:** 27th January 2021, 17:00 Brussels local time

**Funding for Call-1:** The indicative total funding budget is **EUR 3 M.**

**Expected duration of experiments:**
- **maximum 15 months**
- with expected commencement 1st June 2021

**Maximum funding request per proposal:**
- **EUR 200,000** (covering all participants)

**Proposal submission:** in **electronic form**

**Language:** **English**

**Submission site:**
- [https://www.ff4eurohpc.eu/calls/submission](https://www.ff4eurohpc.eu/calls/submission)
Proposal Submission

• Proposals must be submitted in English & must comprise 2 parts: Part A (administrative information), Part B (body of the proposal).
  • Part A: cover page and a set of tables to provide administrative data – no additional info to be included!
  • Part B: Cover page + max. 10 pages
• Proposals not adhering to the page limit & content guidelines will be rejected!

Detailed instructions for proposal submission, together with information about the evaluation criteria to be applied, are provided online at: https://www.ff4eurohpc.eu/calls/submission

Submission will be exclusively in electronic form and all submissions must be made by 17:00 Brussels local time, 27th January, 2021.
OPEN CALL-1 Documentation

• Documents:
  • Call Text (“introduction”)
  • Guideline for proposers (“proposers guide”)
  • Proposal Exemplar as Word documents (Part A & Part B “exemplars”)

• Online info (sub-pages):
  • Proposer-Evaluator check-list (“check-list”)
  • Frequently Asked Questions (“FAQ”)

Available at: www.ff4eurohpc.eu/open-call
Have more questions?


Still have questions?
ff4eurohpc-calls@scapos-tools.de
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