



FF4EuroHPC

Enabling SMEs to benefit from HPC

OPEN CALL-1

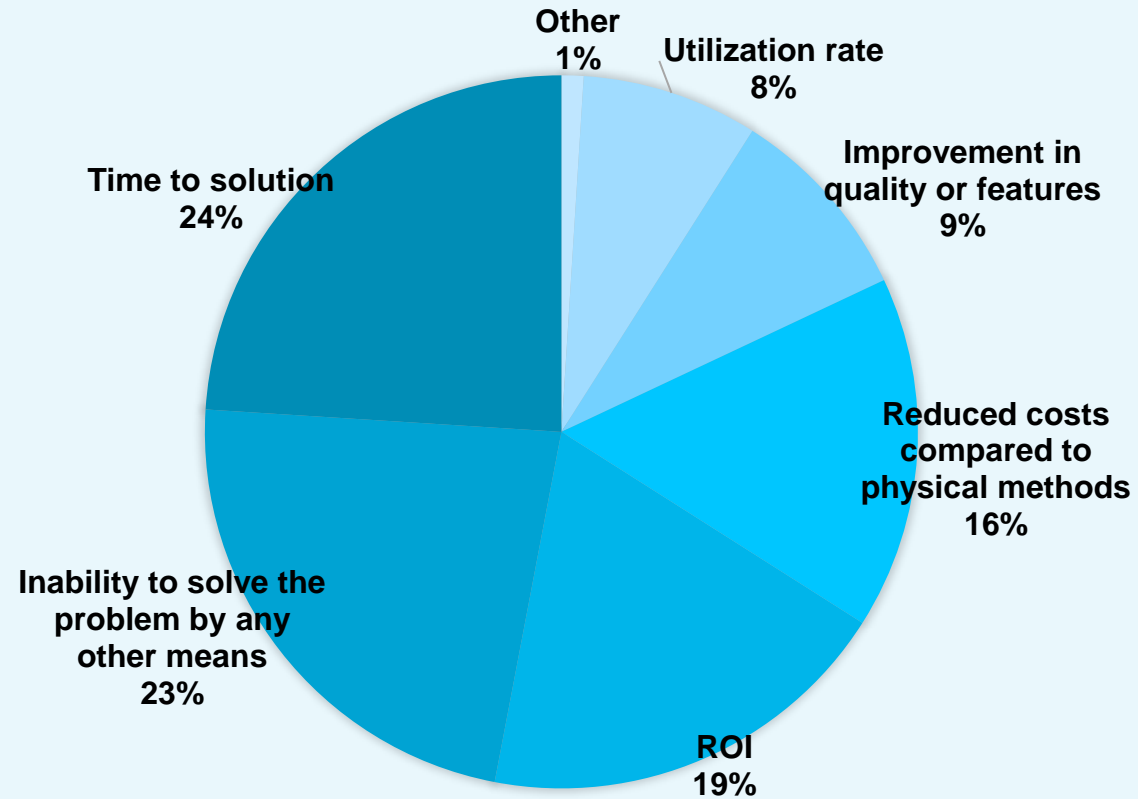
Guy Lonsdale, scapos AG

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): **Indispensible 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)



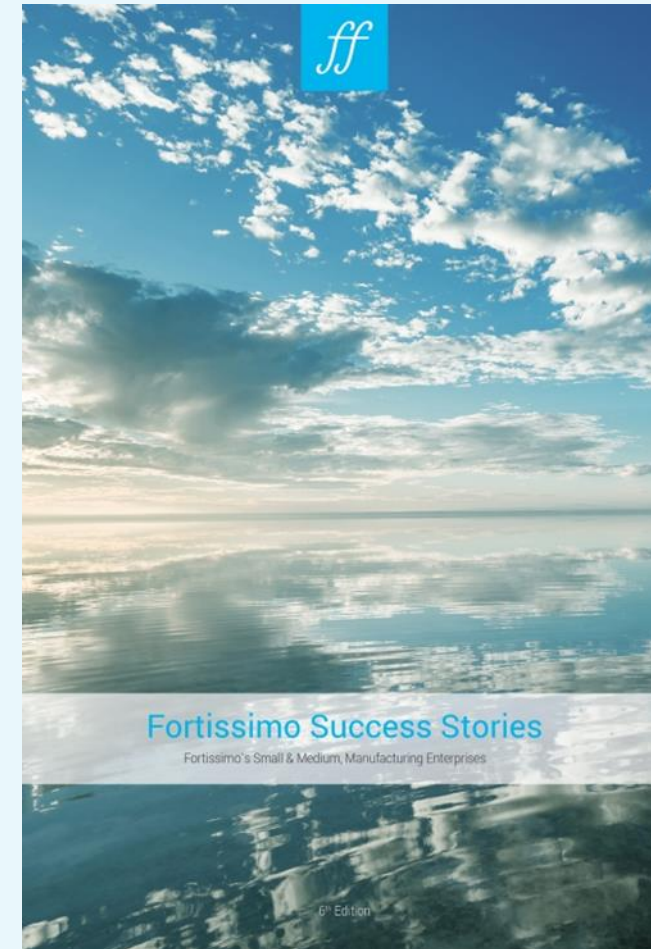
Political context

- 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

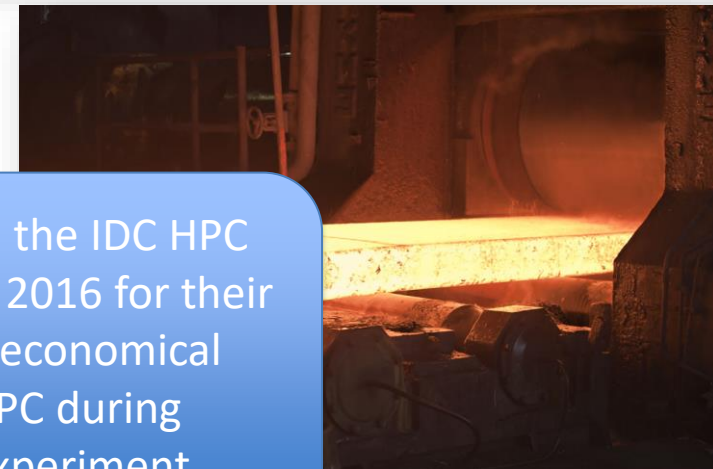
- SME based in Italy
- Speciality steels technology
- Simulation of slag carry-over from ladle to tundish
 - New monitoring system developed
 - Better overall steel quality
 - Reduced re-melting
- On average 6,000 tonnes of lost steel per year saved
- Saving between €420,000 - €600,000 per year

Experiment Partners:

Ergolines

Arctur

- SME Industrial End-user
- HPC Centre / experts



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



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.

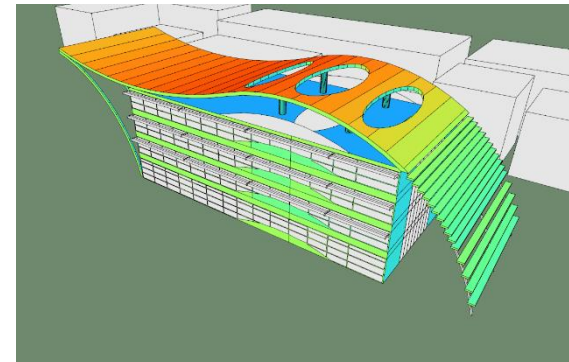
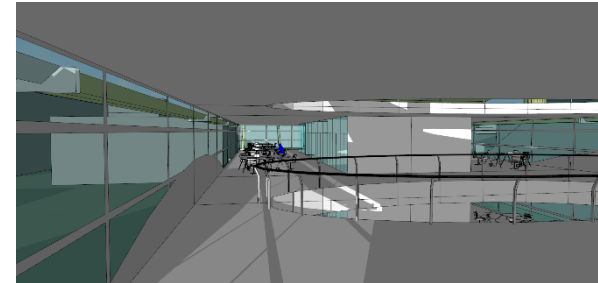
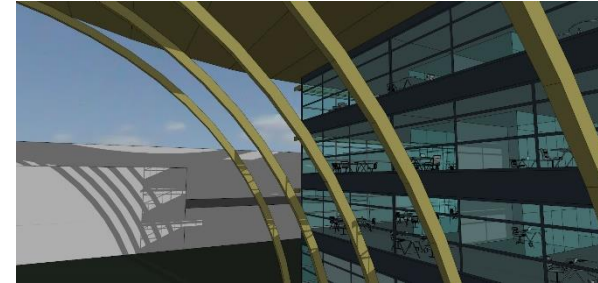
Comparison with in-house costs: 50% reduction

Experiment Partners:

IES

U. Edinburgh (epcc)

- SME - Industrial consulting and ISV
- HPC Centre / experts



Sports-car aerodynamics - Koenigsegg

Experiment Partners:
Koenigsegg
ICON
NTUA
CINECA

- SME Industrial End-user
- ISV
- HPC Expert
- HPC Centre

The SME Koenigsegg designs & manufactures high-performance sports-cars.

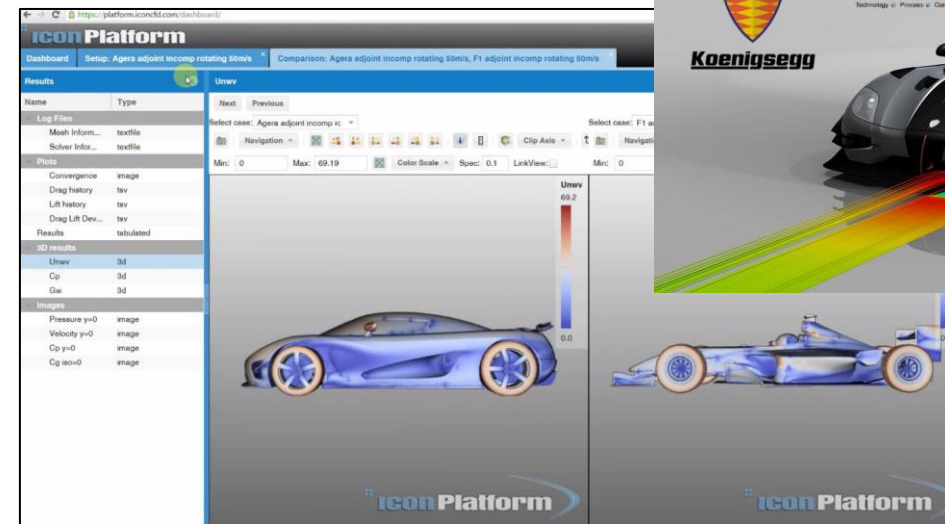
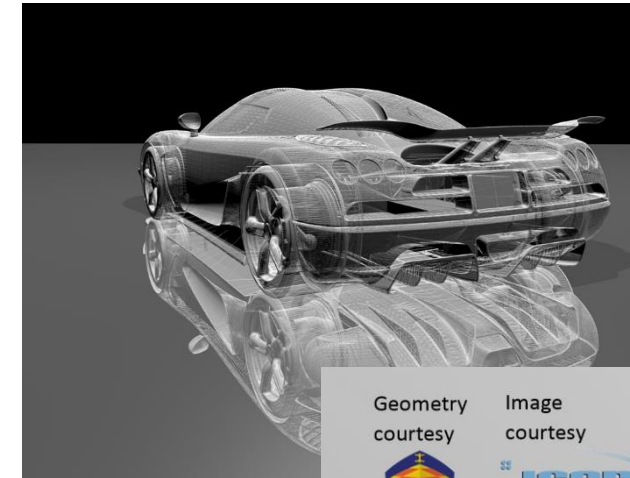
Aerodynamics development for the Koenigsegg One:1 - HPC-based CFD:

250km/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:



- Other Partners:



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.**

- 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>



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?

- Online FAQ: www.ff4eurohpc.eu/en/open-calls/faq/



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



Thank you



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