

Teratec fosters its European reach

Establishing EuroHPC by the European Commission with joint financing of all projects by participating member States will provide Europe with exascale computing capacities, as high-performance applications as well as fully dedicated supply chain show clear evolution of the HPC market in Europe. Teratec achieved to adapt to this new situation by strengthening its participation in European projects, while pursuing the industrial initiatives already launched in France, particularly in the fields of quantum computing, autonomous systems and additive manufacturing...

More than 70 people were present last February 27th in the amphitheater of the **TGCC at CEA** for the 29th General Assembly of Teratec. Participants represented 64 of the 87 member entities as well as the CEA hosting this meeting, and the Teratec staff.

By way of introduction, **Daniel Verwaerde**, President of Teratec thanked the audience for their presence at this 1st General Assembly of the year, providing an opportunity to take stock of achievements for the past year and draw up the many prospects for the coming year. «Your presence is even more critical as 2019 has confirmed the importance of European actions in favor of HPC and their intensification for the years to come.»



He then gave way to the «distinguished guest» **Neil Abroug** in charge for monitoring works on HPC and Quantum computing, among other responsibilities, at the **Directorate General for Enterprises** of the **Ministry of Economy and Finance**, «I asked him to provide us with his vision of Teratec's contribution on these subjects, as well as on projects and initiatives in which the association could participate.»

Teratec hand in hand with State services

Today, the DGE's Digital economy department is particularly interested in supporting the digital transformation of companies, for example with the **SiMSEO program**. Jointly led by **Teratec** and **Genci**, this program already helped several hundred SMEs in their transition to digital simulation.

«This programme is now considered a success at all levels of the French government, illustrating the contributions of Teratec in its role as a federator of the many HPC players in France», says Neil Abroug.



«For next years, we are at a stage where French State is building the new phase of the Investments Program for the Future (or, Programme d'Investissements d'Avenir - PIA 4). And Digital technology plays an important role hereto making France a country of technological breakthrough. Several joint ministerial working groups (Finance, Research, Energy Transition) are being set up to define and monitor multiple programs that will be shared by digital sector and other branches (health, ecology, etc.). All such programs are targeted where digital simulation has a fundamental role in the digital transformation of industry.»

«In this context we are working closely with the French Ministry of Research, Teratec and all concerned players in the HPC ecosystem on the **EuroHPC initiative**, aiming to provide Europe with Exascale computing capacity. One of the important results of 2019 is the designation of the triad **Teratec, Cerfacs, Genci** as the French Competence Centre to carry out this initiative.»

Another hot topic is **Quantum computing**. «After the exascale era, it will certainly be very difficult to go on at reasonable energy costs with Moore's Law (dealing with progression of processors), because the level of engraving reached becomes close to the atomic scale. So we're thinking about new computing paradigms. >>

The first step will be hybrid machines containing classical CPUs matched with accelerators (GPUs, neuromorphic ...). Quantum belongs to this framework, as a particular type of accelerators to solve some complex problems.»



*«This is why we initiated a joint ministerial reflection to be achieved in France (identification of actors, strengths, weaknesses...), pursued with the setting up of a parliamentary mission led by MP **Paula Forteza**. The mission auditioned some fifty French and international industrial and academic players, to produce its report **«Quantum: the technological shift that France will not miss»** submitted to the four sponsoring ministers on 9 January.»*

*«This report is now being examined by joint ministerial taskforce in dialogue with research (**CEA, CNRS, INRIA...**) and industrial players whether end-users (**EDF, Total...**) or technological players (**Atos/Bull, Intel...**), almost all being Teratec members aiming to supply and integrate the various technological building blocks (computing capacity, sensors, communications...).»*

Anticipating the future

Neil Abroug then engaged in a round of questions and answers with the audience. Answering to **Jean-Laurent Philippe** from Intel concerning the State's willingness to invest in equipment for HPC, Neil Abroug pointed out that focus was more on the integration aspects than on the development of specifically French materials. Addressing a question from **Christian Saguez**, Honorary President of Teratec, on practical follow-up given to the report of Deputy **Benoît Potier** "Making France an economy of technological breakthrough", Neil Abroug specified: «This report prioritizes a certain number of sectors, some of which currently being evaluated, that will be working axes for the State as soon as surveys by its services are completed. This must also be in line with the **Multannual Research Programming Law**, the **Productive Pact**, as well as the **PIA 4**. All these subjects converge, but the support tools have yet to be built in the light of feedbacks from the 3 previous PIAs, with the objective of full deployment in 2021».

Daniel Verwaerde resumed on EuroHPC: «Teratec considers this European initiative to be critical, especially as it is based on a strategy aligned with the French vision. EuroHPC plans for co-financing with 50% from Europe / 50% from country partners. While preparing future budgets, has the DGE taken such themes into account for the Commission to launch projects with budget forecast in order to anticipate those co-financing?»

«The general trend is clear for the European Commission's 2021/2027 multiannual program aiming to generalize co-financing tools. Therefore, we are examining at joint ministerial level how best to support those who submit projects to be financed in this manner. We are trying to find flexible national mechanisms to achieve this, even though finding the right balance between State and the Regions might be difficult».

«Also, is there a development plan setting out France's objectives (development of supercomputers, irrigation of industry in terms of usage, development of world-class applications, etc.)? This is critical because the Commission is always looking for good ideas and is more willing to co-finance them. Being a driving force behind our proposals we would thus be almost certain to see our good ideas financed», added Daniel Verwaerde. «A subsidiary topic remains as to know how Teratec and its members could help.»

*«This is a good way of taking things and it is part of the vision that we share with the Directorate General for Research and Innovation (**DGRI**), trying to influence the orientations of the Commission as well as European Programs. We are thus in the middle of a European discussion on the strand of EuroHPC for 2021/2027, and having concerted action with all French players (state, industry, academia, associations, etc.) is key», said Neil Abroug.*

Harmonizing the rules

Christian Saguez then asked whether we are moving towards harmonizing the rules for financing EuroHPC projects among various States involved. As for some there are subsidies and for others repayable advances, it does not put all European industrialists involved in a consortium on an equal ground. «There does not seem to be any willingness to move towards harmonization. States remain sovereign and follow their own budgetary rules. However, the Commission is trying to force states to release their national budgets to the Joint Undertakings, such as EuroHPC to manage them, while encountering very strong opposition mainly from highest industrialized states», Neil Abroug explained.

Finally, another Teratec member asked whether to expect from the BPI and the ANR a unification of management of candidacies to EuroHPC projects. «In the first phase of EuroHPC (2019/2020) no budget envelope has been dedicated to such initiative. Co-financing was therefore managed by each of the entities with their own procedures. This was not an optimal way of operating and that should be simplified in PIA 4», Neil Abroug concluded.

Daniel Verwaerde warmly thanked Neil Abroug for his presence and his intervention, before resuming usual course of the 29th General Assembly of Teratec.

Always new members

The President presented candidacies of two new members for 2020: **Amazon Web Services (AWS)** and the **Centre national d'études spatiales (CNES)**.

AWS is a division of the American e-commerce group Amazon, specializing in on-demand cloud computing services for businesses and individuals.

CNES is a public institution of an industrial and commercial interest, responsible for developing, proposing and implementing French space program ruled by the government

Both have in common there very large use of HPC. They were welcomed into the association by a unanimous vote.

They joined us in 2019 :

- NAG
- Tweag.io
- Western Digital
- Xilinx

Strengthening the Team

The continuation of the General Assembly was then devoted to Teratec's Activity Report for the past year. Daniel Verwaerde began with describing the organization of Teratec (Board of Directors, Bureau and Team) and recalled that the Board of Directors and the Bureau will have to be renewed next September at the end of their mandate.

For its part, the Teratec team has been strongly reinforced between the beginning of 2019 and the beginning of 2020 with the arrival of three people, to cope with the start of European projects around the Centers of Excellence: **Samir Ben Chaabane**, Project Director, **Marie-Françoise Gérard**, Project Manager and **Paul d'Escoda de Boisse**, Business Engineer.

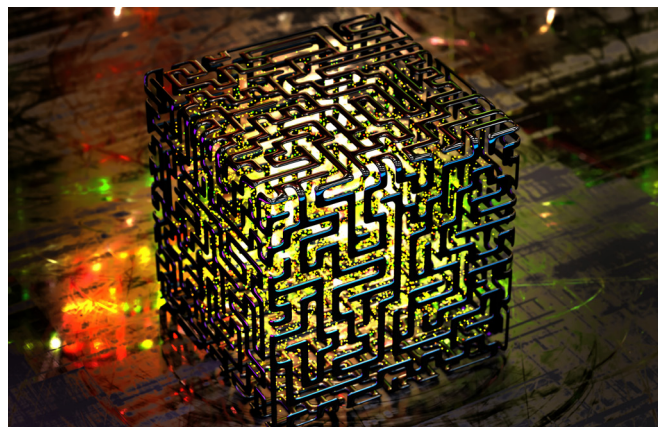
Programs and initiatives

Teratec participated in a number of programs and initiatives during 2019. Daniel Verwaerde recalled the success of **SiMSEO**, which contributed to raise awareness of 730 French SMEs in the manufacturing and construction industries facing the use of digital simulation and helped 360 of them to invest. This support program for SMEs ended at the end of September 2019.

« Beyond its participation in projects financed by Europe or France, other initiatives being at the core of Teratec's associative work consist of Work Groups that have been created on themes that we believe can be developed in many ways to benefit our members through genuine collaborative work ».

Thus Teratec worked in 2019 on three major initiatives: **Quantum Computing (TQCI)**; **Autonomous Systems** and **Additive Manufacturing**. Three other topics are under study and could start in 2020: **Space Data Exploitation** and **Natural Resources**; **Digital and Agri-Food**; and **Health** and **Personalized Medicine**.

Then, Daniel Verwaerde detailed works carried out so far by Teratec in the field of Quantum Computing and Autonomous Systems.



The Teratec Quantum Computing Initiative

Gathering 10 partners around Teratec, the objective of the Teratec Quantum Computing Initiative (**TQCI**) is to create a dynamic ecosystem bringing together industrial users, technology providers and research centers, to readily build up our skills and develop know-how in the field of quantum computing. *«We decided to launch this initiative as we noted the acceleration in research along with proposals for quantum computers and accelerators over the past two years. Therefore, it is the right time to prepare ourselves to build these architectures and learn how to benefit. This fits in well with our approach of co-design where technology providers and application developers work together in harmony.»*

The resulting roadmap consists of three main phases:

- design the programming environments (basic software bricks, scientific libraries);
- work on the possible uses (optimization, numerical simulation, data processing) to check which algorithms could take advantage of quantum architectures and determine which should be created to make them work at best;
- look at how large applications could benefit from quantum architectures, starting with the case of molecular chemistry.

*«Participating whenever requested, we contributed significantly to the approach set up by the French State around quantum and actively collaborating in the reflections of the DGE, the DGRI and Bpifrance, as well as in the parliamentary mission mentioned earlier being led by Deputy **Paula Forteza**. In June, we also took part in the **Quantum Computing Business** international conference organized by **Bpifrance**.»*

On its side, Teratec also organized two TQCI scientific seminars: one in April on *«Technologies - hardware and programming environment - for quantum computing»*, and the other in November on *«Initial feedback from TQCI partners.»*

Autonomous Systems

«Similarly in 2019 with 7 members of Teratec, we carried out a very large amount of work on Autonomous Systems in which digital simulation has an essential role, by drawing up a roadmap detailing scientific and technical contents and all means to

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be implemented. It seems important to us to create a shared resource center for simulation work, validation and storage of the associated data, because we will hardly find all opportunities, compatible with time to market to be able to physically test them in all the situations where they need to be validated. We also propose to carry out a research project on the theme of validation of Autonomous Systems by means of simulation. Finally, we are ready to respond to calls for projects launched through various national and European initiatives.»

Teratec Campus

Hervé Mouren, Director of Teratec then spoke to present the activities carried out on the Teratec Campus in 2019.

After reminding companies present on the Campus and start-ups housed in the business incubator managed by the Chamber of Commerce and Industry of Essonne Region, he presented the activities of the industrial research laboratories. «*There has been a strong evolution in Atos' activities, with the core of HPC R&D being hosted here in the Extreme Computing laboratory.*»

He also stressed the significant improvement of access to the Campus by public transport and the creation of a bus station facing the Campus. He also recalled the increase in range of local services offered to employees working on the site, as well as connecting the Campus to high speed fiber.



In 2019, the activity level on the Campus was consistent. In addition to the visits of the **TGCC** and **CCRT**, a lot happened with inter-company meetings, training workshops, **InHP&CT** and **SISMA** seminars, and numerous internal communication actions (Neighbours' Day, Christmas meal, newsletters, internal newsletters, campus website...). «*But **Student Day on November 28** was the very highlight was. The University of Versailles Saint Quentin-en-Yvelines (**UVSQ**) and the École supérieure d'ingénieurs Léonard-de-Vinci (**ESILV**) sent 210 students in their final year of master's studies in our fields, with their professors to visit the Campus. I would also like to underline the strong mobilization of companies set on the Campus showing their activity through exhibitions and conferences, while putting forward 90 internships, thesis or job offers. This first Student Day worked very well, so we are very keen to renew such initiative. While pace and methods could be refined, we could extend this to all Teratec member companies.*»

Teratec Campus

Technology companies

• Atos • CEA • ESI • Intel • Egis •

Incubator & Business center

• AS+ • Assystem Technologies • Avise Conseil • CESIMat • Distène • ETP4HPC • Fullscale • Ingérop • Mantenna • MicroTrans • NumTech • ParaTools • RTSolution • Sema Software • Synomen • Teratec • WizYoo •

Industrial laboratories

• Extreme Computing • Exascale Computing Research • Intel Big Data Analytics • CESIMat •

European projects

Teratec is currently involved in three projects: the Centers of Excellence (CoE) **POP-2** (Analysis and optimization of codes for parallel calculations), **Excelleratt** (Adaptation of engineering calculation codes to exascale) and **FocusCoE** (Coordination and animation of European HPC CoEs). «*It should be remembered that the Commission decided to launch nine Centers of Excellence in a number of industrial or technical fields around HPC, plus another one with horizontal scope on Performance issue, POP. Started three years ago, these activities are now reaching cruising speed.*»



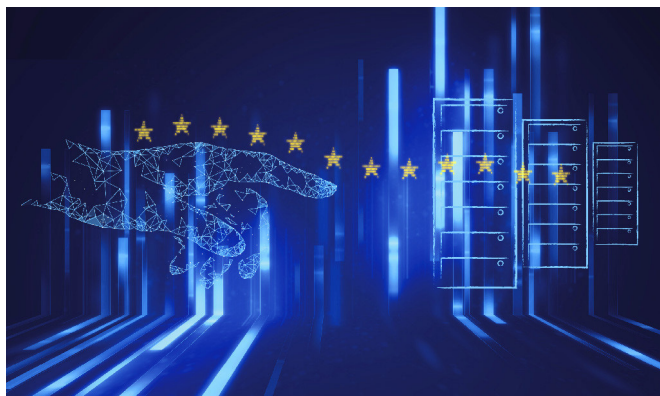
Teratec has also been heavily involved to launch and develop **EuroHPC** as well as in preparation of the French HPC Competence Center and facilitation of the **ETP4HPC** platform.

Hervé Mouren then went on each of the projects into more detail. «***FocusCoE** has the broadest spectrum with an observation and support structure dedicated to the various HPC Centers of Excellence, covering varied fields such as medicine, materials, energy, engineering, etc. In this project, we are associated with our German friends from **Scapos** working in tandem on the industrial scope and development of HPC activities in Europe, and promoting first successful collaborations between industrialists and CoE.*»

The **Excelleratt** Engineering Centre of Excellence is the sole truly sectoral center of excellence in which Teratec participates. «*Our counterparts at the **HLRS** in Stuttgart asked us to join them in this project as we are backed by industrialists also very involved in engineering in fields such as energy, aeronautics and the automotive industry. We actively contribute both on the technical side and on the promotion of services.*»

The **POP** Centre of Excellence, being the oldest and not sector-specific body, focuses on application performance. «*Thereto, we have two tasks: examine with users performance improvements of their dedicated applications; and find potential new users. By the end of 2019, we have provided 170 leads, including 99 SMEs.*»





EuroHPC

Then, Daniel Verwaerde took over and talked about Teratec's involvement in the **EuroHPC** initiative. «This joint venture has two objectives: first is to provide Europe with supercomputers for both research and industry, and second is to develop a European supply chain for HPC in order to produce these supercomputers and all required components on European territory. The European Commission will provide 50% of the funding, with the remaining 50% coming from participating member states. Beyond the technical benefit, it would be absurd as France not to participate, given the size of France's contribution to the European budget otherwise made in vain. The financial amounts are substantial, more than one billion euros for the period 2019/2020 and five billion four hundred million euros for the period 2021/2027.»

In 2019, EuroHPC set up its governance and two Advisory Groups, one for technology, research and innovation, the second for uses. In parallel, two calls for tenders have been launched. One to equip Europe with «pre-exascale» class supercomputers (around 200 PFlops), which will multiply by ten the installed capacity already. The other call involves the acquisition of «petascale» supercomputers. «These two calls for tenders were each intended to select two consortia applications but given generated enthusiasm, EuroHPC finally selected eight applications, three for «pre-exascale» machines and five for «petascale» machines. The Commission has therefore decided to increase the funding allocated to these acquisitions, yet potentially cutting back assistance on planned technological developments, a subject on which we will remain vigilant». Now that choices of consortia and their location have been made, we are engaging the process of purchasing the supercomputers. The manufacturer **Atos-Bull** responded to a majority of these eight calls for tenders.

During 2019, EuroHPC also published a document expressing its vision and strategy («Vision paper») for next decade 2021/2030. «It is intended to create a very large ultra-fast network interconnecting all these machines, on one hand, to produce on European soil as many supercomputers as we use on another and, finally, to regularly acquire supercomputers in order for Europe to rely at least on 1 or 2 machines classified among the 5 largest computers in the world (Top 5).»

In 2019, EuroHPC also launched calls for projects on:

- the creation of Competence Centers;
- technological developments to design future machines;
- spreading the use of HPC throughout the economy (**Fortissimo 4**).

In this context, Teratec played a major role in setting up governance, with 4 Teratec members among the 24 members forming the Advisory Boards. «I welcome this because it shows the dynamism of the French HPC ecosystem – as that of Teratec – which is well known in Brussels, but I also regret that the rest of us in Europe remain too undersized in terms of HPC capabilities», states Daniel Verwaerde.

There is also one organization responsible at French level for setting the national position with regards to the governance of EuroHPC, the **Groupe Miroir**, involving Teratec.

«We also responded to 3 calls for tender for: the French Competence Center; the coordination of the European Competence Centers and Fortissimo 4. We have also been asked by the Commission to set up a mechanism to help express the needs of European industrial users for EuroHPC in terms of applications they expect, and for access mode to these supercomputers. We started consultations and released a progress report with the Commission at the beginning of December. The Commission then asked us to set up an entity (Body) which could become one of the major interlocutors of the Commission and EuroHPC, in the same way as the **BDVA** (Big Data Value Association) or other associations, which reinforces our role», concluded Daniel Verwaerde.

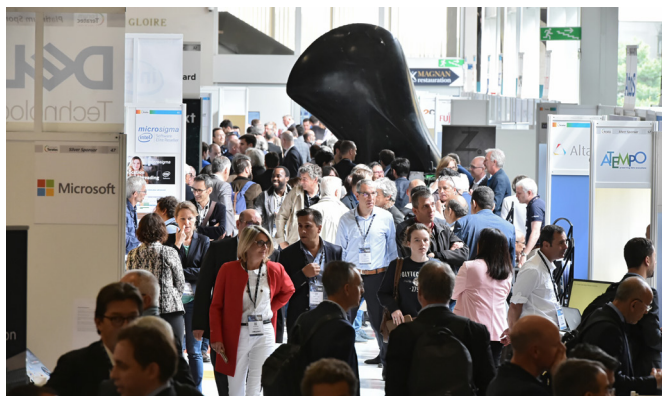
Teratec, French Competence Centre for HPC

Hervé Mouren then went again into more details. «With a «call» addressed to the Member States, the Commission would like to rely in each country participating in EuroHPC on a correspondent to coordinate local actions and act as its access point in that country. Both Ministries of Finance and Research have designated Teratec as the leader of the French Competence Center. The French response to this Call has been notified to this effect.»



Teratec has also launched the «**European Industry User Taskforce**» initiative, an operation designed to unite major European HPC user industries, bringing together twice over two days a group of major manufacturers to express their expectations of EuroHPC, both in terms of applications and machine access. «Taking into account the report and resulting recommendations which we forwarded, the Commission asked us to organize a targeted workshop for them to better understand the needs of those industrialists as well as to formalize our approach. The whole team of the Commission in charge of EuroHPC was thus able to attend the presentation of these problems by industrialists, for a full day. At the end of this meeting, the Commission asked Teratec for proposals in association with our German friends from HLRS, in order to meet the specific needs of manufacturers and to turn the taskforce into an association that could become the third private partner of EuroHPC.»





A good vintage for the Teratec Forum 2019

Hervé Mouren then mentioned all communication achievements carried out by Teratec in 2019 (Simulation special issue with Magazines **L'Usine Nouvelles** et **Industrie & Technologies**, distribution of 6 newsletters...), as well as the **Teratec Forum**. «This 14th edition was a good vintage with 1,300 participants, 90 speakers and 60 exhibitors. We particularly appreciated the speeches by **Philippe Varin**, President of **France Industrie**, steering the development strategies of all industrial sectors in France; by **Jean-Yves Le Gall**, President of **CNES**; and by **Mariya Gabriel**, European Commissioner for the Digital Economy and Society - being retained by other commitments in Brussel, who sent us a very clear video message; a number of users such as **Matthias Traub** of **BMW** or **Emmanuel Chiva**, the new director of the **Defence Innovation Agency** at the Ministry of the Armed Forces, as well as suppliers such as **Marc Hamilton** of **Nvidia** or **Mohamed El Bouchouafi** of **Hexagon** also contributed to this annual event.»

The whole event was completed by 2 round tables and 8 workshops of very high level, as well as a quality exhibition for the greatest benefit of participants and exhibitors.

This formal presentation of Teratec's 2019 activities ended with unanimous adoption of the Activity Report by the General Assembly.

Financial Report 2019

Then, Treasurer of the association, **Hélène Bringer Garlain** presented the Financial Report for the year 2019. «The «associative» (i.e. not-for-profit) resources were down compared to those of 2018, as several projects came to an end (SiMSEO, DataPoC). On the other hand, hired services increased slightly which includes the Forum, leading to a decrease in operating income compared to 2018. On the side of fixed expenditure, operating expenses have decreased correlatively following the closing of the above mentioned projects. Preparing for the future, the important point is a strong increase in personnel costs related to hiring of 2 people in 2019, as Daniel quoted earlier during the General Assembly. Negative result for 2019 corresponds for the main part to investment expenses in future projects (mainly European), those being not bonded yet. This «loss» is therefore not alarming and we propose to carry it forward into our business plan for 2020.»

Patrice Cousin, Auditor of **Action Expertise** then came to certify the association's accounts.

The General Assembly unanimously approved the Financial Report presented by the Treasurer, as for the Accounts for financial year ending 31 December 2019. General Assembly also unanimously discharged members of the Board of Directors from the execution of their mandate for the past financial year, and decided to allocate the deficit of the year to be deferred the following year's budget.



The 2020 outlook for 2020

Daniel Verwaerde went on to present the prospects for 2020. «There are many follow-ups to what we undertook in 2019 some of which we have just presented to you. As far as European activities are concerned, we can trace actions already undertaken:

- **EuroHPC**;
- Centers of Excellence (**POP-2**, **Excellerat**, **FocusCoE**);
- **French Competence Center** in HPC.

For the latter, we are very hopeful that our proposal made to EuroHPC at the end of 2019 will be accepted. Our work will then be to set up the French HPC Competence Centre with **Cerfacs** and **Genci** and to finalize, with you, actions to be implemented. We will also launch the **Fortissimo** project to promote the use of HPC and complete our task for needs expression amongst industrial users. In response to the Commission's request, we are going to set up a European federation of industrial users.»

Hervé Mouren then detailed the work that will be carried out involving the French Competence Center. «We have joined our forces with Cerfacs, with which we have a long standing and very comprehensive relationship, to meet the Commission's requests, and with Genci for the French funding as well as interface with the academic research world. We are going to work around 6 themes imposed by the Commission on all the Competence Centers:

- Training and skills development
- Technology transfer and business development
- Collaboration with Industry
- Mapping of HPC/Big Data/AI technical competences
- Facilitation of access to scientific and technical expertise
- Creating awareness and sustaining collaboration

The topics on training, know-how and required skills will be important for us, as it involves mapping of existing training and identifying needs. Without giving any details yet, the Commission has indeed planned an important component for training. It is therefore critical to be in line with the options that will be selected and possibly the calls for projects that will be launched. If the Commission meets its deadlines, a decision should be made in May or June with potential implementation in the summer. We

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will then be able to hold a major event bringing together all significant stakeholders on these subjects and determine the implementation of these operations precisely, to ensure in advance that we rely on significant content as much as possible.»

«We are going to get a large volume of work, particularly in terms of coordination with the Academic & Research world as with the Industry in close association with the three major structures dealing with HPC in France (CEA, CNRS, INRIA), as well as **France Industrie** through digital correspondents in the 16 selected industrial sectors.»

On the European side, Teratec will be heavily involved next to **HLRS** in the coordination of European Centers of Excellence through **FocusCoE**. «This will enable Teratec to strengthen its European team in a structure that is self-financed by these projects.»

In summary, the priority axes for Teratec in the European HPC ecosystem are:

- a good understanding of Exascale applications (all areas combined) with a focus on engineering applications (Teratec's DNA) and code performance;
- the support of SMEs and Large Groups to access the required technologies.
- The key action topics will be to:
 - enable SMEs to benefit from the HPC and Numerical Simulation initiatives;
 - promote HPC and contribute to the development of training and exchanges of experience;
 - implement the national strategy and support regional initiatives.

In terms of industrial initiatives in addition to **TQCI**, Autonomous Systems and Additive Manufacturing being already launched, we would like to work on three priority areas in terms of applications: Personalized Medicine; Cybersecurity; Natural Resources.



Communication

Hervé Mouren announced the release, by end of next April of the new Simulation Special issue made in collaboration with magazines **L'Usine Nouvelle** and **Industrie & Technologies**, dedicated and sponsored primarily by Teratec members and partners, covering the theme of **digital twin** in a wide variety of fields: aeronautics, automotive, naval, energy, smart city. This supplement will be distributed in 5 different media, reaching more than 3.4 million contacts.



15th edition of the Teratec Forum, next June 16 and 17 at the Ecole Polytechnique

The **plenary sessions** are being finalized with participation and testimonials of major industrialists, as well as presentations by leading technology companies in the field.

The **workshops** selected for this edition will focus on : Satellite Data and Environment; Quantum Computing; Cloud Computing and HPC; 3D Printing and Additive Manufacturing; Artificial Intelligence in Scientific Computing; Exascale Architecture; Digital Twin in Medicine; HPC, Digital confidence and Cybersecurity.

Few booths only remain available for the **Exhibition** this year which welcomes two new thematic areas:

- The **Innovation & Startups Village** sponsored by three major companies which will host 12 startups in the fields of Artificial Intelligence, Big Data, Simulation and HPC.
- **Europa Village**, a specific area dedicated to all organizations working to develop the European supercomputing infrastructure and to the success of European technological innovation in the field of HPC and related domains such as Big Data and AI, particularly within the framework of the Horizon 2020 program.

2020 Budget forecast

Hélène Bringer Garlain returned to present the budget forecast for 2020. «We came up with a very «conservative» provisional budget since it does not take into account the signature of projects for which we applied in 2019 with a very high probability of success in 2020 (European projects for example). The associative («not-for-profit») resources will recover thanks to continued or newly launched projects (POP2, Excellerat, FocusCoE), while «prospecting» expenses will decrease, as we expect to carry out more services internally thanks to new recruits. Corollary is for payroll to increase sharply, but the financial year 2020 will be balanced.»

The General Assembly then unanimously adopted two resolutions, keeping the membership fee at €2,000 for 2020 and the approval of the 2020 budget as presented by the Treasurer.

Daniel Verwaerde finally closed this 29th General Assembly of Teratec.

Jean-François Prevéraud