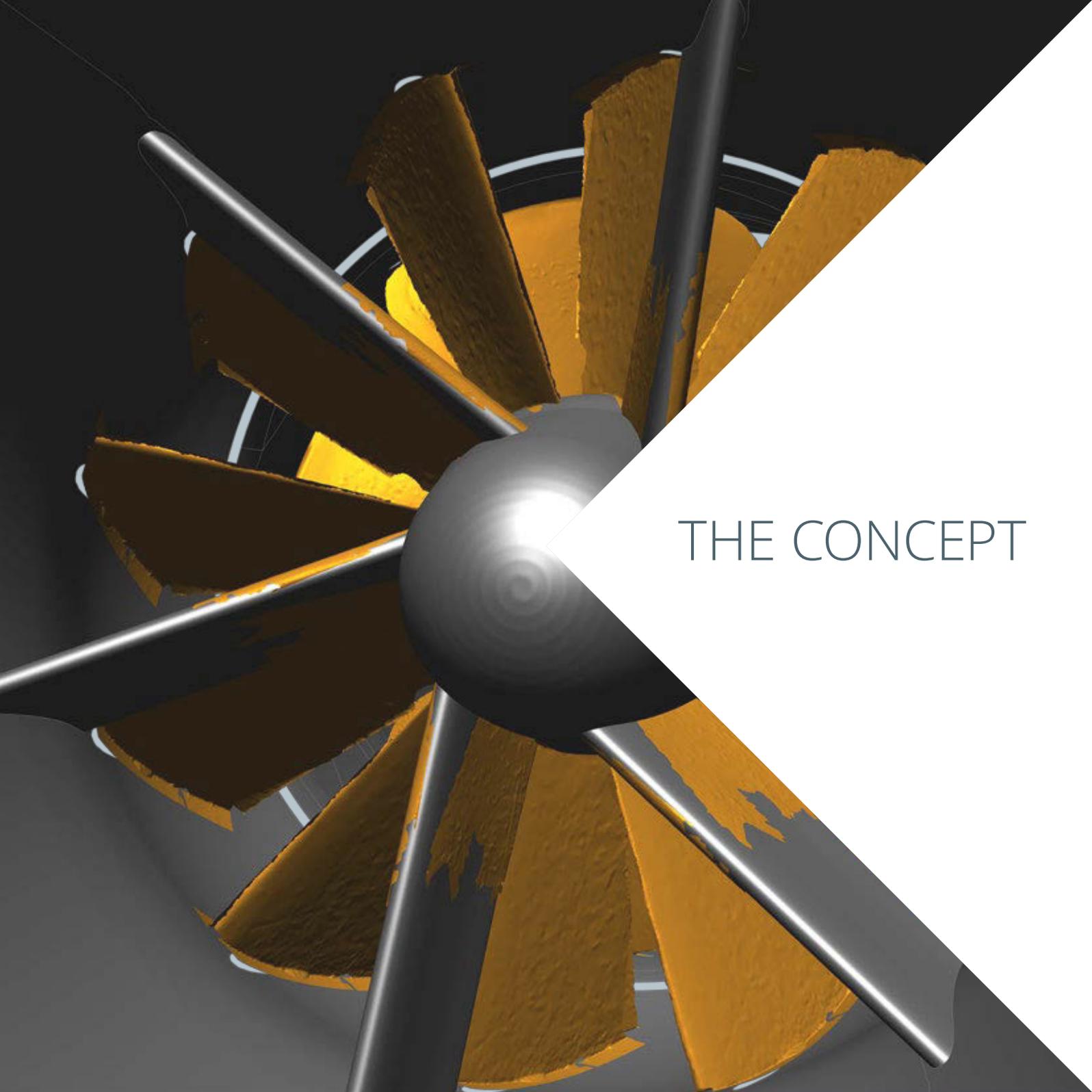




**Computational Cloud Services and
Workflows for Agile Engineering**



THE CONCEPT

WHAT'S THE IDEA?

The more products and product development integrate geometry, mechanics, electronics and software aspects, the more important workflows will become to development processes.

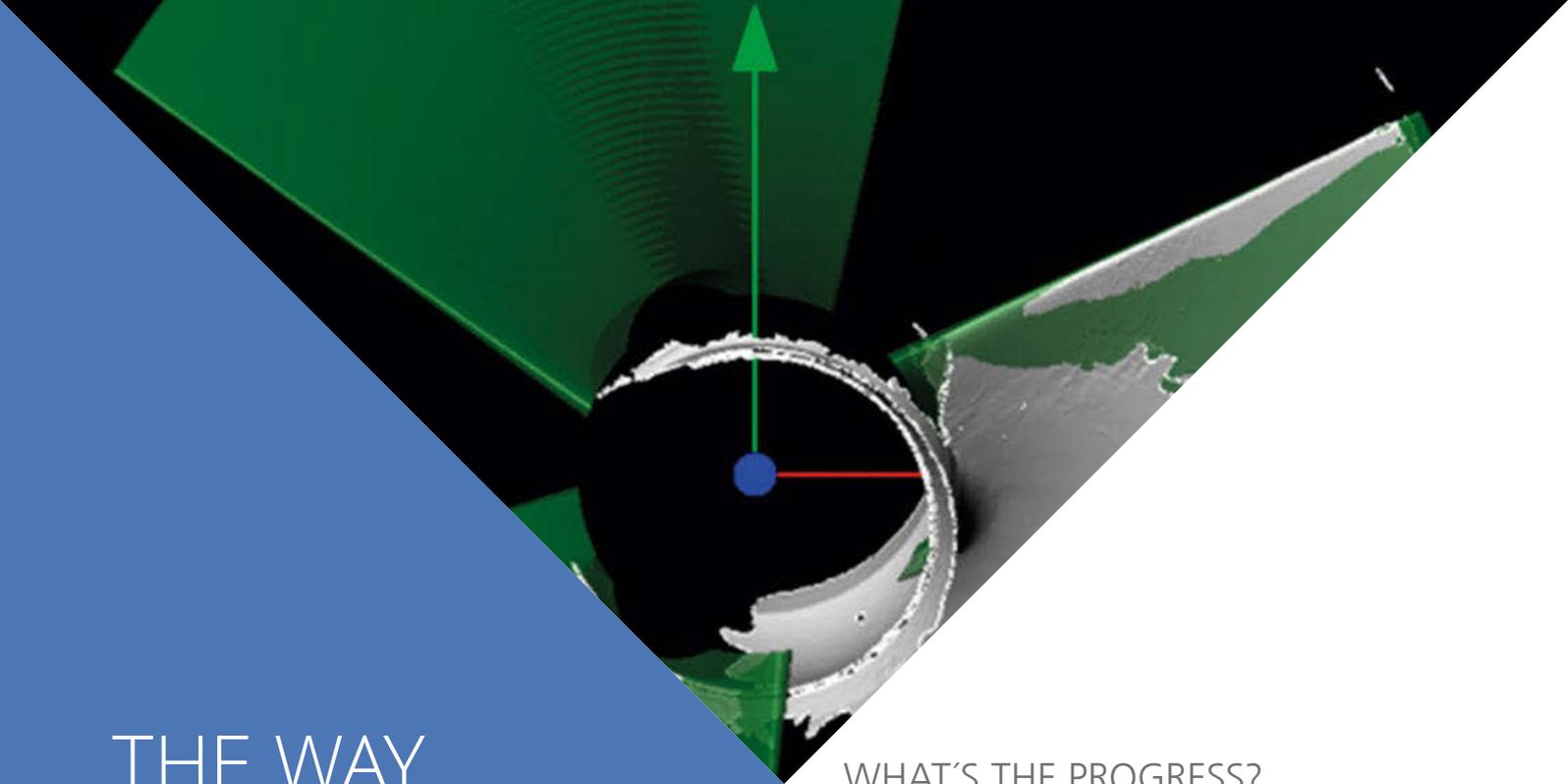
Such complex product development processes require multi-domain simulation, simulation-in-the-loop and synchronized workflows based on interoperability of data, services and workflows.

CloudFlow **integrates** computational services in the Cloud into the engineering workflows of manufacturing companies (SMEs).

CloudFlow **aims** at enabling engineers to access services on the Cloud spanning domains such as

- ▶ CAD systems
- ▶ CAM system
- ▶ CAE (CFD) systems and
- ▶ PLM

Cloud Flow **combines** these domains to integrated workflows leveraging HPC resources.



THE WAY

WHAT'S THE PROGRESS?

Traditionally, the European manufacturing industry is characterized by innovative technology, quality processes and robust products which have leveraged Europe's industrialization.

However, globalization has exposed Europe's industry to new emerging and industrialized manufacturing markets. The current economic challenges have decelerated the internal boost and investment.

Hence, new ICT infrastructures across Europe need to be established to re-enforce global competitiveness.

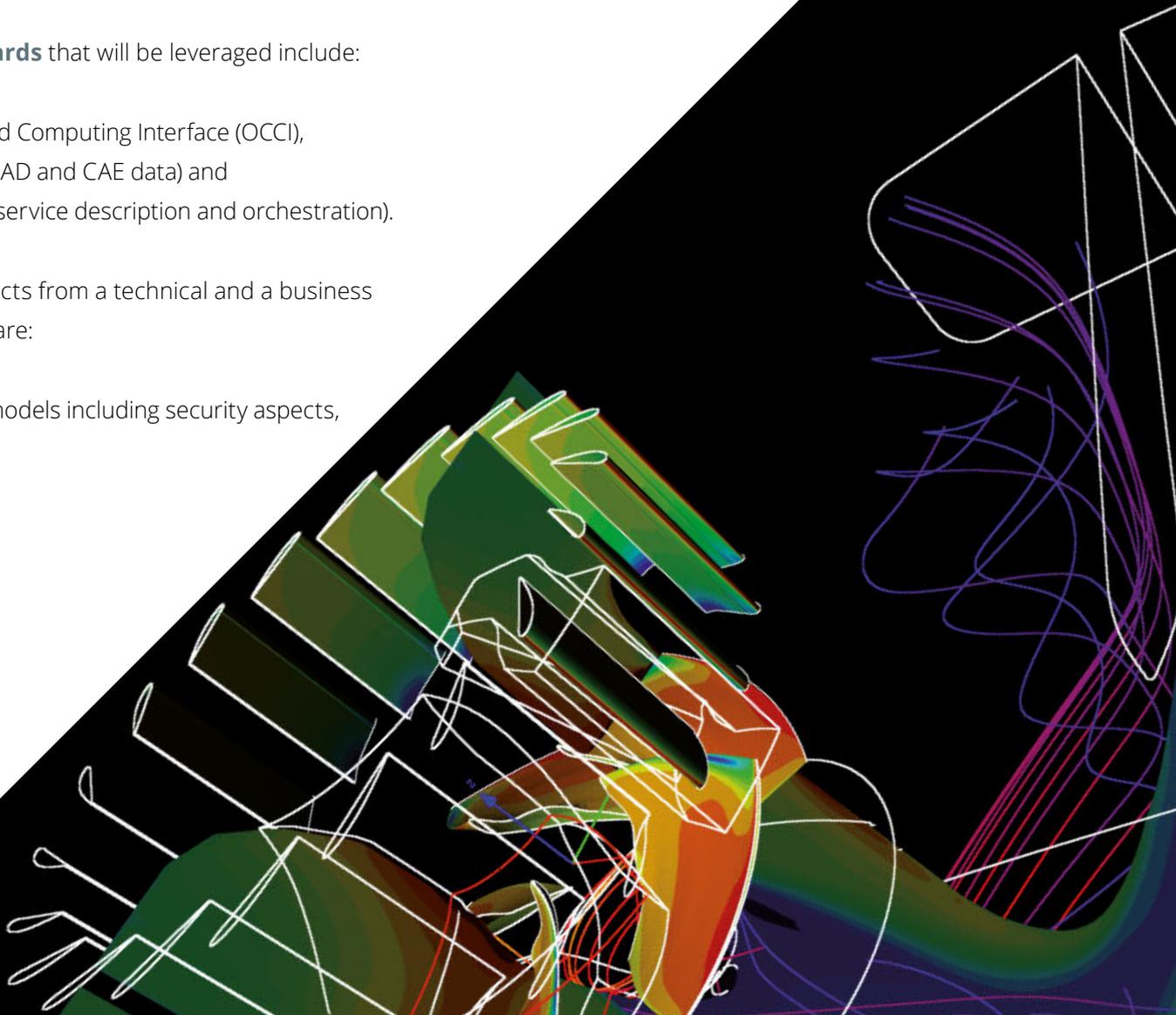
CloudFlow will build on existing standards and components to facilitate an as-vendor-independent-as-possible Cloud engineering workflows platform.

Core standards that will be leveraged include:

- ▶ Open Cloud Computing Interface (OCCI),
- ▶ STEP (for CAD and CAE data) and
- ▶ WSDL (for service description and orchestration).

The key aspects from a technical and a business perspective are:

- ▶ business models including security aspects,
- ▶ workflows,
- ▶ services,
- ▶ data and
- ▶ users.

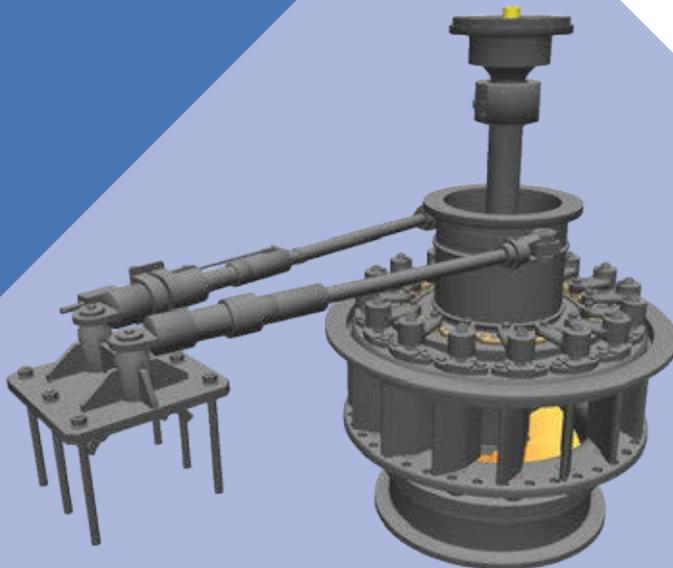


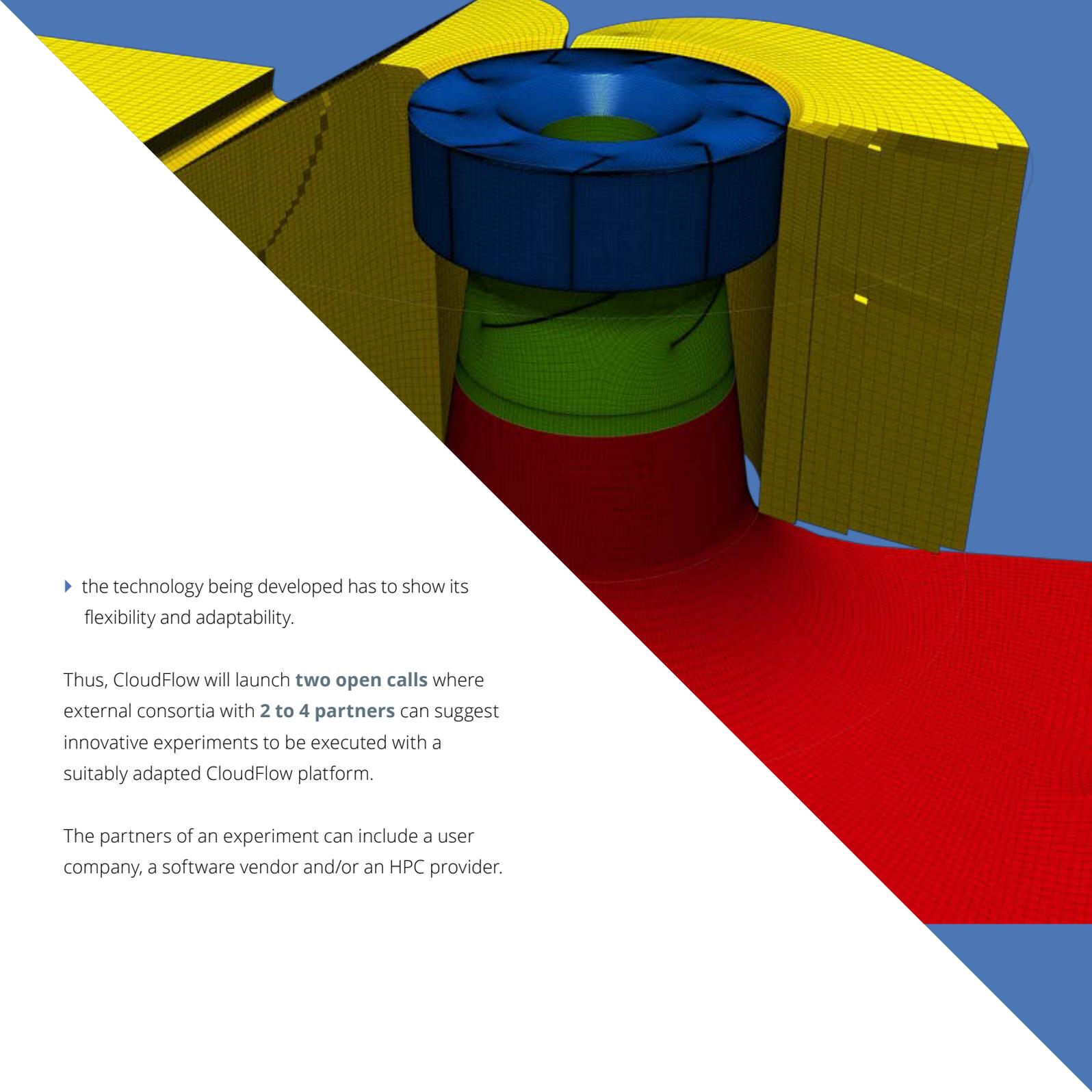
OPEN CALLS

HOW CAN YOU PARTICIPATE?

CloudFlow is devised as an **open project**. It is open to new “experiments” carried out by new partners. The open scheme brings different advantages and challenges, like:

- ▶ new technology and market trends can be incorporated much better than with a consortium already fully fixed at the project start,



- 
- ▶ the technology being developed has to show its flexibility and adaptability.

Thus, CloudFlow will launch **two open calls** where external consortia with **2 to 4 partners** can suggest innovative experiments to be executed with a suitably adapted CloudFlow platform.

The partners of an experiment can include a user company, a software vendor and/or an HPC provider.

WHAT ARE THE EXPERIMENTS ABOUT?

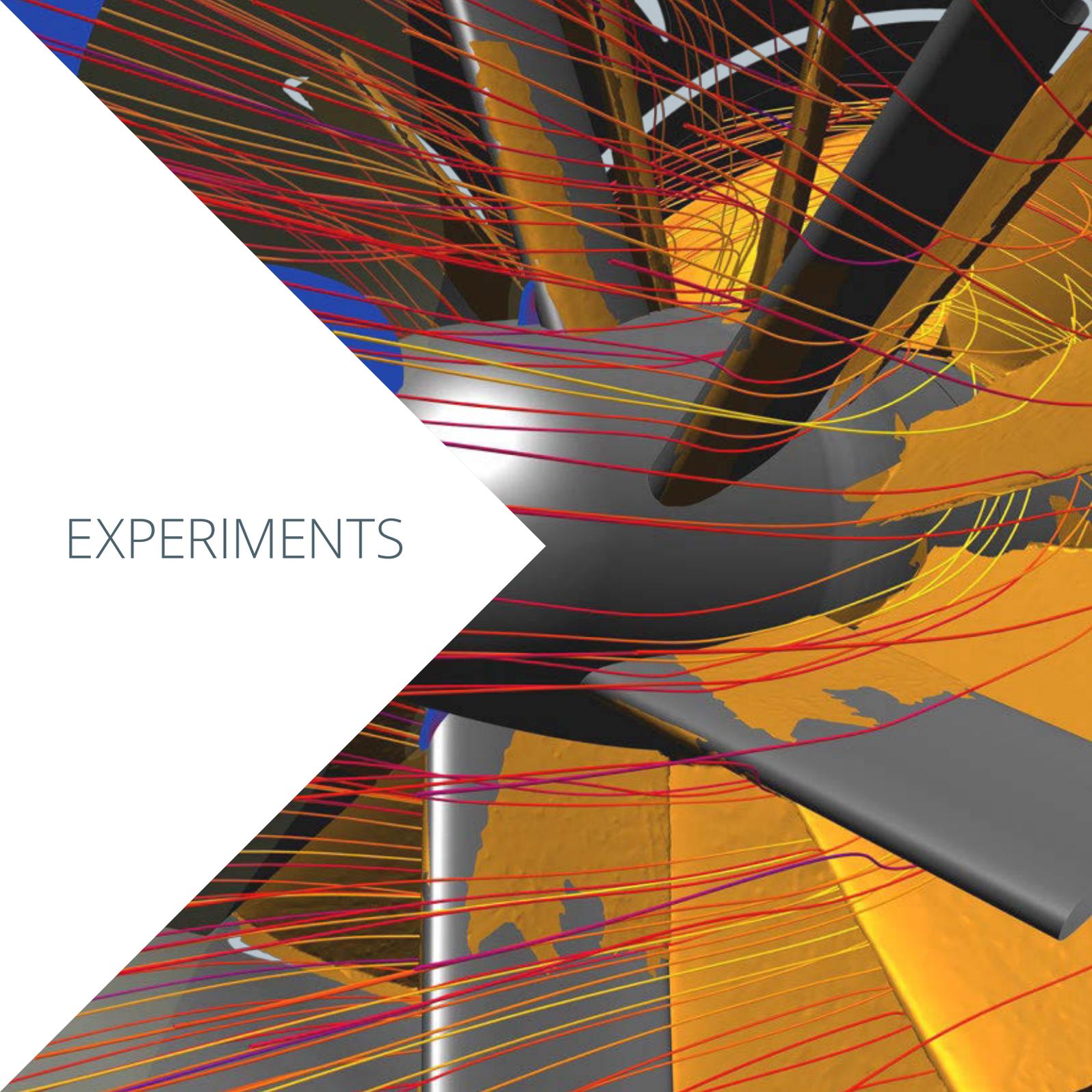
Experiments are an **integral concept** of the project. They are SME-driven use cases for the CloudFlow platform that is being developed.

CloudFlow is designed to execute application experiments in waves, generating a total number of **twenty experiments**. The experiments will be conducted in **three waves**.

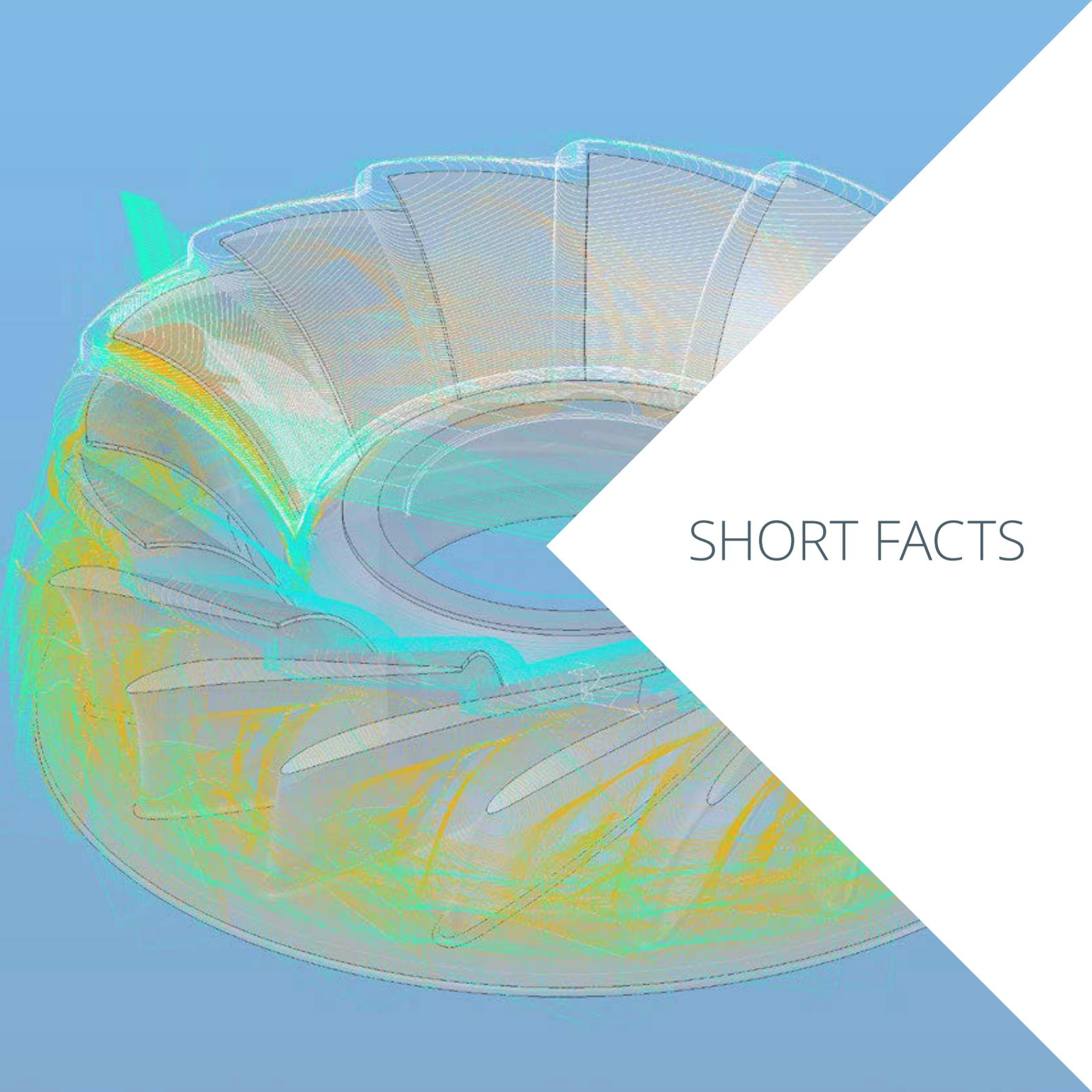
In the first project phase the CloudFlow platform will be evaluated by implementing, executing and validating the **six “internal” experiments**:

- ▶ CAD on the Cloud,
- ▶ CAM on the Cloud,
- ▶ CFD on the Cloud,
- ▶ PLM on the Cloud,
- ▶ Systems simulation on the Cloud and
- ▶ Point cloud vs. CAD comparison on the Cloud.

The **infrastructure** will be maturing over the duration of the project so that experiments in the later waves can be more demanding with respect to workflow support and services than the first wave.



EXPERIMENTS



SHORT FACTS

WHERE DOES CLOUDFLOW COME FROM?

CloudFlow is a project of the European Commission. It is a part of the “**ICT Challenge 7**: ICT for the Enterprise and Manufacturing” and a part of the initiative “ICT for Manufacturing SMEs,” short I4MS: www.i4ms.eu.

With this project and innovation initiative for the manufacturing sector the European Commission will enable high-tech SMEs to exploit the potential of ICT to help grow their businesses.

The **project duration** of CloudFlow is 42 months. It started on July 1, 2013 and ends on December 31, 2016.

WHO ARE THE PARTNERS?

CloudFlow is an SME-driven IP incorporating **seven SMEs**: Missler (CAD/CAM), JOTNE (PLM), Numeca (CAE/CFD), ITI (Systems), Arctur (HPC), StellbaHydro (turbine MRO for water energy plants) and CARSA (business models and security). **Four** renowned **research institutions** complement the consortium: DFKI, SINTEF, University of Nottingham and Fraunhofer.



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