

# **Description of the VTT operating system**

**beyond the obvious**



## VTT

VTT Group is a corporate group to which belong VTT Technical Research Centre of Finland Ltd (hereafter VTT) and VTT Ventures Ltd, VTT International Ltd and VTT Holding Oy, which operate under the management of VTT as subsidiaries.

VTT is a Finnish state-owned limited liability company and operates under the mandate of the Ministry of Economic Affairs and Employment. VTT's special task as an independent and impartial research institute is to promote the wide-ranging utilisation and commercialisation of research and technology in business and society. The company does not intend to make a profit.

VTT is a visionary research, development and innovation partner. We help society to develop and companies to grow through science-based innovation - In line with our brand promise, we promise to challenge ourselves and our partners. We have over 75 years of experience in cutting-edge research and science-based results. Carbon neutral solutions, sustainable products and materials and digital technologies are at the heart of our operations. We are guided by global challenges, from which we create opportunities for sustainable growth.

VTT's operating system is certified according to the ISO 9001, ISO 14001 and ISO 45001 standards. The certificates cover VTT, VTT MIKES and VTT Microelectronics Processes and Operations. VTT's information security management system is certified in accordance with the ISO 27001 standard, covering VTT's support services in the first phase including centrally produced data processing environments and facilities.

The ISO/IEC 17025 standard is applied in VTT's accredited activities.

## VTT MIKES

The National Metrology Institute and national standards laboratory MIKES is part of VTT. VTT MIKES maintains and develops national metrology system, measurement standards system, and calibration service. In addition, MIKES performs metrology research.

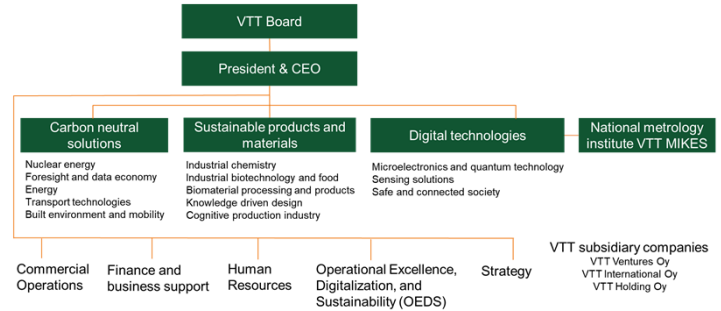
VTT MIKES participates in the international Mutual Recognition Agreement of measurements and calibrations of metrology (CIPM MRA), so VTT MIKES also complies with the ISO / IEC 17025 standard in these services. According to the agreement, the operating system of the VTT MIKES is approved in the European Association of National Metrology Institutes EURAMET's quality committee (TC-Quality).

The operating system of VTT MIKES, which is not described in this document, is covered by the VTT Group 9001, 14001 and 45001 certifications to the following extent: Maintenance and development of national measurement standards, establishment of internationally recognised traceability to the SI, metrology research and calibration services.

## VTT Microelectronics processes and operations

The operating system of VTT Microelectronics Processes and Operations, which is not described in this document, is covered by the VTT Group 9001, 14001 and 45001 certifications to the following extent: Manufacturing of devices for micro-, nano- and optoelectronic applications, wafer processing subcontracting services and facility maintenance. The function is a part of VTT's research area called Microelectronics and quantum technology.

## VTT's organisation 30.1.2025



## Our strategy is to lead a path of exponential hope with science-based innovation

Our ambition is to bring exponential hope to a world that needs to deal with the climate crisis, achieve resource sufficiency, drive industrial renewal, provide safety and security, and enable good life for all. We always aim for impact together with our customers.

### The five choices we make every day to make our strategy alive:

- Always aim for impact.
- Always create impact together with a customer.
- Always lead for excellence.
- Always drive sustainable business.
- Always build the world's most meaningful place to work.

### These choices are underpinned by our values:

- Respect
- Together
- Passion
- Forerunner

### Ethical norms:

- Impartiality
- Credibility
- Integrity
- Responsibility

## The principles guide our operations

Our business is based on our ethical norms and values. The Code of Conduct and the quality, environmental and safety and security policies adopted by the Board of Directors of VTT include the most important principles of action.

The Code of Conduct includes opinions concerning impartiality and research ethics, social responsibility and environmental issues, issues connected with customers and personnel, safety and information security issues, and IPR protection. In addition, principles of internal supervision, risk management, and internal audits are included in that document.

### Independence and impartiality

VTT is independent of external parties in its activities and carries out its assignments confidentially, impartially and according to its agreements, taking into account, for example, the customer's confidentiality requirements.

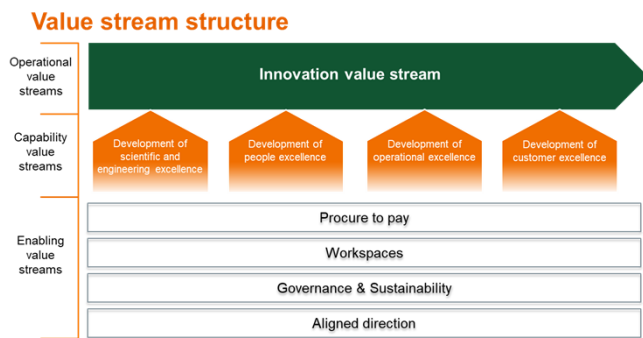
We pay attention also to the disqualification of an individual person if a statement is requested or independent research is ordered on a subject in which the person themselves has participated when an assignment has been carried out for another customer.

## Structure of the operating system

Quality, environmental, corporate responsibility and occupational safety and security management are integrated into VTT's operating system. The cornerstones of VTT's operating system are continuous improvement and value-added thinking.

## VTT's value stream map and processes

VTT's processes are connected to value streams. Value stream thinking helps us to develop our policies systematically and transparently to improve customer value.



### Operational value streams

Innovation value streams include our core function, i.e. research processes. Our research activities are carried out through self- and jointly-funded project activities. The services are produced as contract research projects.

The key outputs of the *Innovation value stream* are the creation of the new ideas and technologies and the development applications, as well as increased know-how and the creation of value directly for VTT's customers and partners. The objective is to create new expertise, technology and innovations that offer significant exploitation potential for our customers, now and in the future.

Our goal is to offer comprehensive solutions to the customer. We want to ensure that VTT's wide-ranging expertise is utilised and is available to the customer in accordance with current needs.

The key factors here are the management of VTT's research portfolio and the guidance and implementation of self- and jointly-funded research projects based on VTT's strategy.

### New business development and commercialisation of IPR

The objective of IPR processes is the transfer of VTT's technology to the business sector by protection and commercialisation of VTT's research results and business ideas.

The aim of the Spin Off Business for which *VTT Ventures Ltd* is responsible, is to utilise VTT's research results, technologies and business ideas in new companies.

VTT LaunchPad, on the other hand, is a deep-technology business incubator that helps to refine researchers' insights into new science-based companies. It connects our researchers, technology, business expertise and investors.

With the help of VTT LaunchPad, we also want to renew industries.

### Capability value streams

Capability value stream processes develop VTT's services and capabilities to continuously improve our operations. The development of scientific excellence and infrastructure as well as customer service and operational excellence in line with the strategy is at the core of Capability value streams.

Competent personnel is a critical success factor, and continuous development of management ensures, e.g. implementing strategic choices into practice.

### Enabling value streams

Enabling value streams are built on support processes as well as management-related processes that enable high-quality, responsible and safe operations. Management procedures include, e.g. strategy, annual planning and follow-up and assessment procedures of the operations.

## Development of operations

VTT collects and receives feedback on its operations through many channels, both from personnel and from customers and other stakeholders. If necessary, the feedback is processed at various organisational levels. Internal development projects are managed under the guidance of value stream owners.



Customer feedback is collected through customer satisfaction surveys and impact studies. Feedback received through other channels, such as complaints, is taken into account appropriately.

VTT's own activities are examined by means of internal audits, internal QEHS-audits, risk assessments and observations and development proposals made by the personnel. Feedback from the personnel is also obtained through annual surveys. An internal final evaluation is carried out on a project basis, in which the lessons learned are gathered for sharing.

Other feedback on VTT's activities is received both through external audits (ISO certificates, accreditations, customers) and, when necessary, separate assessments, such as assessments of research entities and brand studies.

The results of monitoring, measurement and evaluation are used to derive the annual objectives that support the strategy. The annual operating planning includes measures to achieve the objectives, regular monitoring and evaluation of effectiveness.

## Planning and reporting

VTT's annual management schedule involves the strategic planning for a five-year term, annual operative planning and follow-up and assessment on the realisation of plans. VTT is led by the VTT Board and the CEO. VTT reports its operation in annual financial statement and in the corporate responsibility reporting included in the annual review.

Strategic research based on government grant and research services sold by VTT to companies at market prices are separated using a practice based on internal project accounting. The establishing of companies within VTT Group supports also this target.

VTT as a whole is a not-for-profit organisation. The profit from commercial project work is reinvested into its own research activities, competence development, and dissemination of research results.

## High-quality research and services

The VTT operating system is certified under quality management system standard ISO 9001:2015. The certificate covers research, new technology development, technology transfer and commercialisation at VTT. Research activities are carried out in projects, so project procedures are a key tool for quality assurance. They support agile and flexible customer collaboration.

We follow the responsible conduct of research in all research and reporting of results. The quality and quantity of peer-reviewed scientific publications are an important measure of the effectiveness of our operations.

### *Our Quality Policy:*

The cornerstones of our business are

- reliable and clear methods and practices in research and client work
- results which are reliable and easy to understand and implement
- the impact of our operations for customers and for the rest of society.

We commit ourselves to

- developing competence and leadership
- the acquisition and maintenance of modern research infrastructure and
- evaluating and continually improving our quality management system and operational processes
- fulfil requirements represented by our interest parties.

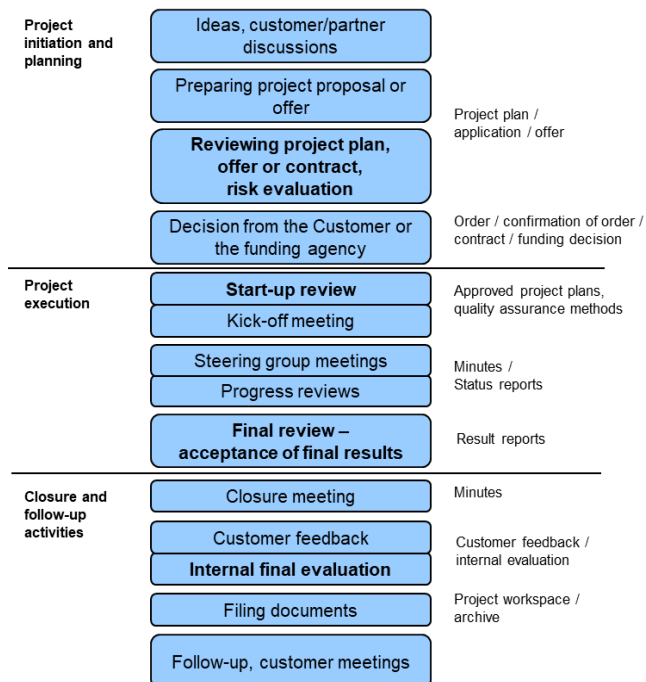
Everyone is responsible for the quality of their work. We, together - VTT's management and staff - are implementing these principles.

## Project activities at VTT

The Project manager has overall responsibility for project implementation within the framework of its targets, schedule and budget. A project owner is also appointed for each project. Persons appointed for the project team work under the project manager. A steering group is also appointed for each project. At a minimum, it consists of the customer and a VTT representative. Project contracts are made in accordance with the general contract made with the customer or the VTT contract guidelines.

It is possible to deviate from project practices laid down in the operating system according to the customer's needs if this is not in conflict with our other principles. Any practices that deviate from our operating system are documented in the project contracts or plans.

## Description of the VTT operating system



Cornerstones of project activities are:

- Charting of customer needs and the review of the project plan or offer, risk evaluation if necessary, together with the customer, in order to establish the starting points
- Start-up review, when the order or financing decision has been received, which ensures the available resources, budget and schedule.
- A sufficient number of documented monitoring meetings to achieve the planned project results.
- Following the responsible conduct of research in all research and reporting of results.
- Reliable end-results for the customer (quality assurance in experimental research work, review of research report)
- Active collection of customer feedback and internal final review and project assessment that allow us to continuously improve our operations.

If necessary, more detailed quality assurance plans are described in the project plan.

## Responsibility

VTT's most significant responsibility action is to develop sustainable solutions for customers and society. Together with our customers and partners, we create sustainable solutions to major societal challenges. We take the principles of sustainable development into account in our research and service activities, reporting and internal operations.

## Environmental management system

The VTT operating system is certified under environmental management system standard ISO 14001:2015.

*Our Environmental Policy:*

- We create sustainable solutions for major societal challenges in our research projects.
- We support our customers in innovations that enhance environmental performance.
- We encourage our personnel towards sustainable choices.
- We comply with the statutory requirements and other binding obligations of our operations.
- We continuously improve our management system to enhance environmental performance.

**Corporate responsibility**

To create sustainable growth, we, together with our customers, focus on the following systemic and technological challenges.

**Systemic challenges**

1. Carbon neutrality: To reach a carbon neutral economy in the coming decades.
2. Productivity leap: To achieve a 10-fold productivity leap from resources.
3. Societal resilience: To secure society's functions, fiscal sustainability and wellbeing while demographics shift.

**Technological challenges**

4. Quantum leap: To bring about the quantum leap in computing.
5. Super-performing materials: To create superior-performing materials and shorten design cycle by 50%.
6. Superior digital systems: To unleash superior performance and sustainability in digital systems.
7. Synthetic biology: To match nature's engineering skills through synthetic biology and bioinspired production.

In addition, we constantly explore emerging topics and continue to support the public sector.

Our research agenda is based on a challenge-driven (outside-in) approach: the research is steered by external factors and we do not rely on our existing expertise. The challenges facing our customers and their growth opportunities have a strong impact on our research agenda and the development of our competences.

Studies show that the utilisation rate of our research findings is extremely high. Therefore, VTT's impact on promoting sustainable development is very significant. Our professionals and the results of our research are used extensively in public decision-making on the journey towards a more sustainable society. We are a member of FIBS, a network of corporate responsibility experts, and are committed to the UN Global Compact.

We report on social responsibility issues in accordance with GRI Standards 2016, as applicable. The key part of our corporate social responsibility is the annual report with a GRI table presenting the table of contents, some indicator values, and references to further information on the matter.

In our research operations, we follow national and international guidelines for good scientific principles (RCR, Responsible conduct of research).

**Safety and security**

We take safety and security issues seriously and want to invest in the development of comprehensive security in order to serve our customers in the best possible way. Everyone has a responsibility to follow the safe and secure procedures, as well as report and address detected anomalies, threats and dangerous activities. The focus is on the continuous improvement of comprehensive safety and security.

Our investment in comprehensive safety and security gives us an even better ability to carry out confidential projects with our partners.

*The core of our Safety and Security Policy:*

- We protect our people, data, property, reputation and the environment from accidents, damage and crime.
- Safety and Security is an essential part of our activities that concerns all of us.
- We secure confidential information.
- We constantly strengthen our safety and security culture.

**Occupational health and safety**

The personnel is the core of VTT. VTT's operating system is certified under occupational health and safety management system standard ISO 45001:2018. Scope of VTT's occupational health and safety management system covers:

- Research, new technology development, technology transfer and commercialisation.
- Maintenance and development of national measurement standards, establishment of internationally recognised traceability to the SI, metrology research and calibration services.
- Manufacturing of devices for micro-, nano- and optoelectronic applications, wafer processing subcontracting services and facility maintenance.

In accordance with our occupational safety programme, a good level of safety is the minimum requirement in all our activities. Our safety objective is to ensure that all VTTers come to work healthy, and leave work healthy.

1. VTT offers meaningful work that factors in the capabilities, resources and weaknesses of individuals (physical, psychological and social stress).
2. VTT provides a healthy and safe working environment.
3. Taking risks, deviating from safe procedures and ignoring instructions is forbidden.

VTT is a member of the Zero Accident Forum. We have a **Zero Accident goal** that goes beyond mere accidents, such as:

- Zero occupational diseases
- Zero tolerance for bullying
- Zero work-related sick leave
- Zero untreated cases of violence or harassment
- Zero cases of burnout
- Zero supervisor and employee unaware of occupational safety.

**Physical security and cyber security**

VTT's information security management system is certified in accordance with the ISO 27001:2022 standard, covering VTT's support services in the first phase including centrally produced data processing environments and facilities. With our support services, we have laid the foundation for conducting secure research at VTT. We are constantly



developing our information security, and we are looking into extending the certificate to our research environments as well.

The leadership and management principles for information security and security arrangements complement our Safety and Security policy including the following objectives:

- Our security is at an excellent level.
- Cybersecurity is an enabler of business and research. It must not be an obstacle.
- We ensure secure research environments in Finland in normal circumstances and exceptional situations.
- Getting the entire organisation to operate securely.
- We meet the requirements set by VTT's stakeholders.
- We comply with legislative requirements.

VTT has a corporate security certificate issued by an authority and a Facility Security Clearance (FSC) that enables the processing of international classified information. In addition, VTT has a corporate security certificate in accordance with the requirements of the National Security Auditing Criteria KATAKRI 2020, on the basis of which VTT's reliability, administrative safety and security procedures, and level of facility and information security have been assessed to the highest level of protection ST II.