

# Connectivity to be trusted.

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Annual Report 2018



**Bittium**



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# Overview 2018

## Tactical Communications

Bittium specializes in military radio and communication solutions by providing advanced products and services for wireless and wire line tactical communications.

## Secure Communications & Connectivity

Bittium provides highly secure communications and connectivity solutions for public safety & security, defense, healthcare and utility markets.

## Medical Technologies

Bittium offers medical technology for monitoring biosignals in the areas of cardiology, neurophysiology, rehabilitation and occupational health.

## R&D Services

Bittium offers professional R&D engineering services and technology expertise in the areas of wireless devices, network infrastructure, and IoT solutions.



Personnel

**674**

TOTAL





Net Sales

**62.8**

MEUR



Products

**30.8**

MEUR



Services

**32.1**

MEUR

Operating Profit

**2.8**

MEUR

Cash & Other Liquid Assets

**30.9**

MEUR

Net Gearing

**-26.7**

%

Earnings per Share

**0.113**

EUR

Dividend per Share

**0.15**

EUR (proposal)



# CEO's Review

The year 2018 was a great year to Bittium. The net sales in 2018 grew by 21.7 percent from previous year and was EUR 62.8 million. The share of the product-based net sales grew significantly and was EUR 30.8 million which was EUR 14.5 million more than in the corresponding period last year. The product-based net sales resulted mainly from the product deliveries of tactical communication systems, the deliveries of biosignal measuring and monitoring devices, deliveries of Bittium Tough Mobile™ smartphones and Mexasat phones, and their related security software deliveries.

The net sales of service business decreased from previous year and was EUR 32.1 million being EUR 2.8 million less than in the last year. The decrease in the services business net sales was mainly caused by the variation of the timing of R&D projects' starts and ends which is typical for the nature of the business, as well as the company's own significant large R&D projects that tie experts into internal product development.

Resulting from the growth of the net sales the company's operating result was EUR 2.8 million. The growth of the operating profit was affected especially by the growth of the product based net sales.

During 2018, the cooperation with Finnish Defence Forces strengthened further. In the spring they ordered products related to the Software Defined Radio based Bittium Tactical Wireless IP Network™ (TAC WIN) system, which is meant for tactical communications. The value of the order was EUR 14.3 million (excl. VAT). The order is based on the framework agreement signed earlier by Bittium and the Finnish Defence Forces. In the fall, we signed a framework agreement with

the Finnish Defence Forces on the purchase of Bittium Tough Comnode™ terminals and related accessories. The maximum value of the purchase for the framework agreement is EUR 8.3 million (excl. VAT). At the end of the year we signed a significant agreement with the Finnish Defence Forces on the purchase of the new Bittium Tough SDR™ handheld and vehicle radios, and their related accessories. The value of the Purchase Agreement is approximately EUR 10.5 million (excl. VAT) at the maximum. The purchase agreement includes terms for optional additional purchase, according to which, the Finnish Defence Forces have an option to purchase additional tactical radios and their related accessories, training and system management based on the prices agreed in the Purchase Agreement. If these optional additional purchase amounts would materialize in full, the total value of the purchase would be approximately EUR 207 million (excl. VAT) at the maximum.

The year 2018 was significant year for Bittium's tactical communication product portfolio also from international point of view. We received the first big international tactical communication deal, as our Austrian cooperation partner Kapsch Business AG won the competitive bidding of Austrian Defence Administration on the new tactical communication system for Austrian Armed Forces. The core for the new communication system will be Software Defined Radio based Bittium Tactical Wireless IP Network™ (TAC WIN) system and their related Bittium Tough Comnode™ and Bittium Tough VoIP™ terminal products. When materialized in full, Bittium's share of the total offering is approximately EUR 30 million.

Bittium has made several international tactical communication pilot deliveries. In 2018, most significant pilot delivery was to Spain, where we delivered new tactical Bittium Tough SDR Vehicular™ radios for the Spanish Army's vehicle pilot program.

In the beginning of the year we made important international breakthrough with our ECG measuring devices as we signed a three-year supply agreement with a major US remote monitoring provider under which Bittium will supply the Bittium Faros™ 360 and customized Bittium Faros™ 360 cardiac ECG signal measuring and monitoring devices. When materialized in full, the total value of the agreement is USD 21 million.

In line with our strategy, we continued investments into our product business. The R&D investments in own products and product platforms were high, 34.4 percent of net sales. The investments focused mainly on extending the tactical communication product offering targeted for defense industry as well as on different terminal products and their related software development targeted for Mobile Security and Public Safety markets. We also continued further developing our products for measuring and monitoring of biosignals. We will continue investing significantly in our product development also in 2019 in order to finalize the ongoing R&D projects.

Significant part of Bittium's strategy includes strengthening company's position in the international markets. In regards to this, the year 2018 was remarkable year for us. Bittium is in a good position to continue growing also in the future.

As a part of the product development we have respect for sustainability in our products. Sustainability is proven in the business operations, as well as in our products and services. It is proven in the way we create value for the environment surrounding us, and for all stakeholders. Last year, for the first time, we calculated our carbon footprint and we will refine our calculations in the future.

I want to thank our personnel and partners for all the significant efforts made to reach our targets during last year. I also want to thank our customers for their loyalty and trust, as well as our shareholders for the support to reach our long term targets.



**Hannu Huttunen**  
CEO



# Business and Operating Environment

## Bittium in Brief

Bittium specializes in the development of reliable, secure communications and connectivity solutions, leveraging its 30-year legacy of expertise in advanced radio communication technologies. Bittium provides innovative products and services, customized solutions based on its product platforms and R&D services. Complementing its communications and connectivity solutions, Bittium offers proven information security solutions for mobile devices and portable computers. Bittium also provides healthcare technology products and services for biosignal measurement in the areas of cardiology, neurology, rehabilitation, and occupational health.

**Bittium's purpose** is to adapt our deep knowledge to deliver superior technology innovations to enhance connectivity, bring safety and improve health in the society.

**Bittium's vision** is to become a global enabler of secure and reliable connectivity for people and things.

Bittium, formerly known as Elektrobit Corporation, was established in 1985. It changed its name to Bittium after selling its Automotive business and giving up the rights to brand name Elektrobit on July 1, 2015. Bittium is a publicly listed company on Nasdaq Helsinki as BITTI.

Bittium operates in Finland, Germany, the United States, Mexico, Singapore and Great Britain. Bittium headquarters is located in Oulu, and the company's other Finnish offices are in Espoo, Kajaani, Kuopio and Tampere.

At the end of 2018, Bittium had 674 employees, the majority of which were R&D engineers. In 2018, the Company did not undergo any significant changes in relation to its size, structure, operating areas, ownership, distribution of shares, income formation or the maintenance of operations.

Bittium operates globally, but most of its net sales originate from domestic customers. With regard to sustainable business, Bittium's products and services comply with the statutory requirements, directives, general standards and frameworks, such as SA 8000 (social responsibility), ISO 14001 (environmental systems), ROHS2 and ROHS3 (hazardous substances), REACH (chemicals regulations), WEEE (recyclability of waste electrical and electronic equipment) and ETJ+ / ISO 50001 (energy efficiency). As a global enterprise, the Company also takes the special requirements of its international customers into account.

# Business Model

## Megatrends and Their Phenomenons

Connectivity as an enabler of digitalization, Internet of Things (IoT) and digitalization, aging population, information security



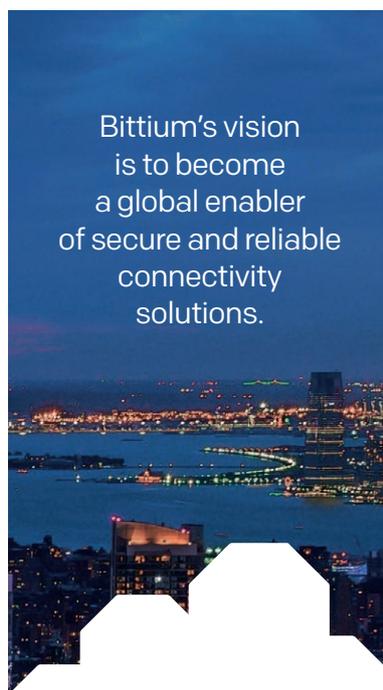
## Customer Groups

Companies of different sizes, OEMs, system integrators; Defense and governments; Hospitals and hospital districts; Other public administration and organizations; Research institutes; Universities



### Effects on the Customer

- Reliable Finnish partner
- Products and solutions that represent the latest technology
- High product performance and long lifecycle
- Scalable product platforms
- Short customization times and fast market entry of solutions
- Lower costs and risks in customer's own R&D projects



### Effects on Bittium

- Long-term projects and customer relationships build stability
- Service projects enable applying new technologies that strengthen the expertise of both the company and its customers
- Extensive understanding of commercial technologies and the customized communications systems used by authorities
- Integrated expertise in mobile and online technologies
- Good growth opportunities



### Products, Services and Solutions

- Products and services in tactical communications
- Secure phones and the related software and systems
- Information security software
- Design services for wireless communications
- IoT and digitalization services
- Biosignal measuring and monitoring equipment in the areas of cardiology and neurology



### Income Streams

- Products and product platforms, systems and the services related to these
- R&D services
- Maintenance fees
- Licenses



## Enablers

### Key Resources

- Experts
- Own products
- IPR
- Partners
- Strong balance sheet
- Efficient processes
- Quality and environment systems

### Key Focus Areas

- Personnel
- R&D
- Sales and marketing
- Way of working
- Digitalization

### Expertise

- Wireless technologies
- Software
- Mechanics and software solution integrations, testing and verification
- Extensive expertise in systems and specialist areas
- Information security
- Measurement of biosignals
- Way of working

### Channels

- Own sales
- Retailers
- System sales
- Integrators
- Web shop

## Bittium's Mission

is to adapt our deep knowledge to deliver superior technology innovations to enhance connectivity, bring safety and improve health in the society.

# Bittium in 2018

## Financial Performance in 2018

Bittium's net sales in January–December 2018 grew by 21.7 percent year-on-year to EUR 62.8 million (EUR 51.6 million, in 2017).

The share of the product-based net sales increased significantly to 49.0 percent and was EUR 30.8 million (EUR 16.3 million, in 2017), which resulted mainly from the product deliveries of the tactical communication system, deliveries of products for measuring and monitoring biosignals, and product deliveries of Bittium Tough Mobile smartphones and Mexsat phones and their related security software.

The share of the services-based net sales decreased to 51.0 percent and was EUR 32.1 million (EUR 34.9 million, in 2017). The de-

crease in the services business net sales was caused by the typical variation of timing of R&D project's beginning and ending, as well as the company's own significant large R&D projects that tie experts into internal product development.

Operating profit was EUR 2.8 million (operating loss of EUR -6.2 million, in 2017).

Cash flow from operating activities was EUR -0.5 million (EUR -0.0 million, in 2017). Net cash flow during the period was EUR -32.0 million. As the most significant item the net cash flow includes EUR 15.1 million investments made into own product development and the EUR 10.7 million dividend payment (EUR -32.0 million, in 2017, including EUR 5.8 million investments in own R&D and EUR 10.7 million dividend payment as well as investments into the new premises in Oulu, as the most significant item).

Equity ratio was 84.7 percent (85.6 percent, December 31, 2017). Net gearing was -26.7 percent (-52.9 percent, December 31, 2017).

## Research and Development

Bittium continued R&D investments in its own products and product platforms and the amount of R&D investments increased significantly during 2018. R&D investments in 2018 were EUR 21.6 million (EUR 15.0 million in 2017) which was 34.4 percent of net sales (29.1 percent of net sales in 2017). EUR 15.1 million were capitalized (EUR 5.8 million in 2017). The amount of capitalized R&D investments in the balance sheet at the end of 2018 were EUR 26.6 million (EUR 11.9 million in 2017).

## Consolidated Financial Statements

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME, MEUR	2018 12 months	2017 12 months
Net sales	62.8	51.6
Operating profit / loss	2.8	-6.2
Financial income and expenses	-0.1	0.4
Result before tax	2.7	-5.8
Result for the period from continuing operations	4.0	-4.8
Result for the period from discontinuing operations		1.7
<b>Result for the period</b>	<b>4.0</b>	<b>-3.1</b>
<b>Total comprehensive income for the period</b>	<b>4.1</b>	<b>-3.2</b>
Result for the period attributable to:		
Equity holders of the parent	4.0	-3.1
Total comprehensive income for the period attributable to:		
Equity holders of the parent	4.1	-3.2
Earnings per share from continuing operations, EUR	0.113	-0.133



## Bittium's Products and Services

Bittium is specialized in the development of reliable and secure connectivity and communication solutions and mobile information security solutions leveraging its 30 years legacy of expertise in advanced radio communication technologies.

Bittium offers its customers also health-care technology products and services in biosignal measuring in the areas of cardiology, neurology, rehabilitation, occupational health and sports medicine based on its over 30 years of expertise in measurement technologies.

Bittium's business operations are divided into three product and service areas: Defense & Security, Connectivity Solutions and Medical Technologies.

### Defense & Security

In the Defense & Security product and service area Bittium offers globally leading products and services for its customers in the defense, security and public safety markets. Bittium's competitiveness in these markets is based on trust and reliability, high quality products and services, as well as on advanced technology and security know-how developed within the company during more than 30 years.

**Bittium Tough Mobile™** is a secure and durable Android-based LTE smartphone combining the latest information security and commercial device technologies. Bittium Tough Mobile incorporates a hardware-based security platform, which enables strong device security as well as deep integration of both customers' own and

third-party software security solutions. This dedicated hardware is essential for building layered mobile security solutions. In addition, Bittium Tough Mobile's features include for example a programmable Push-to-Talk button (PTT), glove-usable 5" full HD display, IP67 level water and dust protection, and MIL-STD-810G level shock resistance. Bittium Tough Mobile and related management system and VPN encryption solution have received official Confidential level encryption product classification in Finland from the Finnish Communications Regulatory Authority where material can be transferred between a smartphone and connected back end solutions on top of creating and processing of classified information.

**Bittium Secure Suite™** is a device management and encryption software product that complements Bittium Tough Mobile smartphone with a scalable set of new software services for remote management, remote attestation and securing the network connections of the device. Bittium Tough Mobile smartphone and Bittium Secure Suite form a unique, complete, reliable system for processing and transferring sensitive and classified material and securing critical communication.

**Bittium Tough Mobile HybridX™** extension is a solution meant for authority use, where Bittium Tough Mobile smartphone is coupled with a functional accessory that is integrated to a PMR device (TETRA/P25). The solution also includes a holder with a wide angle lens, which enables authorities to share real-time situational awareness over the LTE network. Bittium Tough Mobile HybridX extension can

be used to operate both the secure Bittium Tough Mobile smartphone and PMR device, and communicate with both LTE and PMR network users.

**Bittium Specialized Device Platform™** is a versatile device platform leveraging latest mass market mobile device hardware and software technologies. The platform enables companies to roll-out fully customized mobile devices in various form factors (incl. module, smartphone, tablet and smart watch) faster and with lower development risks. The platform has been productized to public safety, security, industrial and smart watch markets. One of the major products based on this platform is the secure Bittium Tough Mobile smartphone.

**Bittium SafeMove® Mobile VPN** software enables the use of all IP based applications and networks by securing the connections between the mobile device and corporate services immediately upon device startup. SafeMove delivers highly secure and seamless connectivity to mobile workers regardless of time, place or network.

**Bittium SafeMove® Analytics** is an advanced monitoring and reporting module that helps organizations to monitor network connectivity and performance to improve productivity and user experience. The analytics tool continuously gathers connectivity data such as connectivity status, speed, throughput and bytes transferred, network type and Wi-Fi network informa-



Bittium  
Tough Mobile  
HybridX™

Bittium Tough  
SDR Handheld™  
and Bittium  
Tough SDR  
Vehicular™



tion. It is also easy to enhance the tool with positioning information if GPS data is available. In addition the new security features enable immediate report of possible security deviations in the mobile phones used by the employees. This enables reacting to the cyber threats without any delay, for example by disconnecting device that reported the deviation, from the company network for the time of clearance of the situation.

**Bittium Tactical Wireless IP Network™** (TAC WIN) is a Software-Defined Radio based wireless broadband network system intended for military and public safety use. With the system MANET (mobile ad hoc network), link, and connection networks can be formed into one logical IP network quickly, no matter where location is. Bittium TAC WIN is compatible with existing fixed and wireless network infrastructures. The core of the system is a tactical router that enables users to freely form both wired and wireless broadband data transfer IP connections. Tactical router enables also connections to different types of terminals and other communication systems connecting them into one communication network. In addition to the router, the system comprises of three types of radio heads, and each radio head covers its own frequency band area and can be used for flexible formation of optimized network topologies for different communication needs. All the products of the system are designed for harsh conditions, and thanks to the system's automated functions the implementation of the system can be done quickly. Due to the software-based functionality of the Bittium TAC WIN system, it can be easily updated with additional performance cost-efficiently during the whole lifespan of the system.

**Bittium Tough VoIP™** product family's products enable tactical IP calls and broadband data transfer even in demanding conditions. Products are easily integrated to existing IP infrastructure. The product family consists of a range of tactical IP-based communication products, including distributed VoIP service network for tactical environment, Bittium Tough VoIP Service; Voice over IP clients, Bittium Tough VoIP Field Phone and Bittium Tough VoIP Terminal; a network extension unit, Bittium Tough VoIP Network Extender; and Bittium Tough VoIP Service and Bittium Tough VoIP Softphone software products.

**Bittium Tough VoIP Field Phone™** is a SIP (Session Initiation Protocol) compliant client that provides interoperability with other SIP clients and server implementations available in the market, and incorporates functionality that enables introduction of VoIP services in dynamic self-forming networks independent from server.

**Bittium Tough VoIP Terminal™** is a wireline VoIP phone that can be operated either as an part of Bittium Tough VoIP solution or as an IP terminal together with a third-party equipment.

With the **Bittium Tough VoIP Network Extender™**'s SHDSL (Symmetric-High-Speed Digital Subscriber Line) connectivity, an IP network can be extended over long distances using conventional field wire. The Network Extender also features Ethernet and SHDSL connections to external networks and devices.

**Bittium Tough VoIP Service™** is a software product, which can be used to connect both fixed data network users and wireless tactical data network users to the same voice service network.

**Bittium Tough VoIP Softphone™** is a VoIP software product meant especially for tactical use. It can be used for VoIP calls, instant messaging, conference calls and screen sharing in the Bittium Tough VoIP Service network either with a PC or smartphone.

**Bittium Tactical LTE Access Point™** is a solution providing LTE access to the Bittium TAC WIN network. With the solution, different troops can benefit from cost-efficient and high-speed multimedia data and VoIP services by using commercial smartphones as well as special terminals intended for authority use.

**Bittium Tough Comnode™** fulfills the data transfer needs for mobile troops by functioning for example as a VoIP phone (Voice over IP), an IP router (Internet Protocol), and an SHDSL repeater (Symmetrical High-speed Digital Subscriber Line). Additionally, Bittium Tough Comnode also provides SIP (Session Initiation Protocol) server functionalities of the tactical voice network for commercial VoIP terminals and enables using also legacy Combat Net Radios (CNR) as part of the IP-based tactical communication system (Radio over IP, RoIP).

**The Bittium Tough SDR™ product family** of tactical radios consists of Bittium Tough SDR Handheld™, handheld radio for individual soldiers, and Bittium Tough SDR Vehicular™, tactical radio for vehicle installations. Bittium Tough SDR products help to produce and share real time situational awareness (location, image, voice, video, and sensor data) to all levels of the organization. Together with the SDR based Bittium TAC WIN system, it is possible to bring broadband data and voice to all mobile troops starting from brigade level and all the way across the battlefield.

## Connectivity Solutions

In the Connectivity Solutions product and service area Bittium provides professional design services and technology expertise in the areas of wireless devices, network infrastructure, and IoT solutions. Bittium also conducts R&D in the technology areas of 5G, Artificial Intelligence (AI), Robotic Process Automation (RPA), and Cloud Solutions. Bittium has long experience in system design, technology integration, wireless radio and antenna technologies, and power optimized, small form-factor device development. The understanding of industry-specific requirements, strong competence in R&D services, wireless devices, digitalization and information security along with the ISO 13485:2016 quality certificate, covering the devices, and equipment for health care enable Bittium to create solutions which bring clear added value to our customers and partners.

## Medical Technologies

In the Medical Technologies product and service area Bittium offers its customers healthcare technology products and solutions in biosignal measuring in the areas of cardiology, neurology, rehabilitation, occupational health and sports medicine. Combining healthcare technologies with Bittium's long-term experience and competence in wireless and security technologies gives Bittium good conditions to serve its customers in healthcare sector by offering them new kinds of products and services.

**Bittium Faros™** is a versatile waterproof ECG device that is used for early detection of cardiac abnormalities in everyday life. Bittium

Faros is ultra-small and lightweight, which enables precise long-term full disclosure ECG measurements for long-term Holter-ECG monitoring, cardiac event monitoring, mobile cardiac telemetry and assessing autonomic nervous system functions.

Bittium Faros outpatient monitoring solutions include several software options for cardiac monitoring. The built-in arrhythmia detection algorithms of Bittium Faros device are used for event recording and cardiac event monitoring. Bittium's solutions enable earlier repatriation of patients and better ability to react to potentially emerging arrhythmias faster.

**Bittium Faros Cardiac Rehabilitation System™** is a solution for cardiac rehabilitation real-time monitoring for up to 16 patients simultaneously. The system offers safety and efficiency for cardiac rehabilitation by showing each patient's heart rate changes in real-time during the exercise, ECG curve and changes in ST-segment. Utilization of the latest wireless technology allows complete freedom to choose different exercises in various training environments.



Bittium Cardiac Navigator™

**Bittium Cardiac Navigator™** is a completely new type of solution for the analysis of clinical Holter ECG recordings. Its user-friendly

and informative data presentation and intuitive analysis tools make the software efficient and easy to use when analyzing multiple days of ECG recordings. Bittium Cardiac Navigator is designed for scanning longer measurements efficiently in a shorter time and thus speeding up the final diagnosis.

**Bittium Cardiac Explorer™** offers a quick and flexible way of working with event-based ECG arrhythmia analysis. The biggest benefits of the software are having full disclosure ECG always available, full access to the events identified by the device, total control on the reporting content and the ability to analyze an unlimited amount of measurement data.

**Bittium NeurOne™** is one of the quickest and most accurate EEG measuring devices in the world designed for clinical and research use. Bittium NeurOne system enables fully synchronized group measuring of up to 30 persons simultaneously for example in different types of psychological studies. The solution is optimized for use with transcranial magnetic stimulators (TMS-EEG), with optional possibility to use it during magnetic resonance imaging procedures (fMRI-EEG).

**Bittium BrainStatus™** is a wireless compact EEG amplifier, which is used together with a disposable easy and quick to wear Bittium BrainStatus electrode headband, for example to diagnose epileptic seizures and brain stroke. Bittium BrainStatus enables quick measurement in field conditions as well as in hospitals, thus making the treatment process of the patient faster. Bittium BrainStatus can be used for wireless real-time remote EEG monitoring or data can be recorded in the device memory.



Bittium Faros™ 360  
and Bittium Faros™ 180

New Bittium Faros™ 360 and Bittium Faros™ 180 are water-proof ECG devices that enable precise and long-term ECG measurements in everyday life.



## Business Development in 2018

### The Product Deliveries to Mexico Started

Bittium received the first orders from Mexican government authorities for mobile devices developed for a satellite communication system. The mobile devices have been developed in a product development project that started in the year 2015. The product development phase has been successfully concluded and the devices are now in volume production. The total value of the first orders was approximately EUR 2.0 million and the devices were delivered to the customers by the end of the first quarter of 2018. The mobile devices are manufactured in Finland.

### New Offices to Mexico and Germany

In the beginning of the year Bittium opened a branch office in Mexico to enable high quality customer support for the local customers, and to contribute to sales and marketing in Mexico and other Latin American countries. Mr. Fernando Castillo was appointed as the General Manager of the branch office in Mexico. Mr. Castillo has long experience from the Mexican authorities market.

After summer, Bittium expanded its operations in Central Europe by opening a new branch office in Munich, Germany. Bittium's local presence in Germany enables high quality customer support for the local customers, and helps in developing and supporting Bittium's international sales network. Mr. Thomas Zieger was appointed as the General Manager of the branch office. Mr. Zieger has over 20 years of experience on sales and business development in various international communications and telecommunications positions.

### Significant Supply Agreement to US

Bittium Biosignals Ltd, a subsidiary of Bittium Corporation, and a major US remote monitoring provider, concluded a three-year supply agreement under which Bittium will supply the Bittium Faros 360 and customized Bittium Faros 360 cardiac ECG signal measuring and monitoring devices. In addition, Bittium will supply disposable electrodes for attaching Bittium Faros ECG devices. When materialized in full, the total value of the agreement is USD 21 million with revenues recognized gradually during the years 2018, 2019, 2020 and 2021 depending on the progress of the product deliveries, with estimated emphasis on 2019 and 2020.

### Medical Device Approval for Bittium Cardiac Navigator™ in Europe

Bittium Cardiac Navigator meant for the analysis of clinical Holter ECG recordings received medical device approval in Europe. The approval allows cardiologists to use the Bittium Cardiac Navigator software solution for official analysis of Holter ECG recordings collected with Bittium Faros ECG monitoring devices.

The user-friendly and informative ECG data presentation and intuitive analysis tools of Bittium Cardiac Navigator software solutions make the software efficient and easy to use when analyzing multiple days of ECG recordings. Based on recordings, the software provides information about the electrical cardiac activity of the heart, typical of Holter ECG analysis, and in particular, about arrhythmia and other exceptional events. Bittium Cardiac Navigator is designed for scanning longer measurements efficiently in a shorter time and thus speeding up the final diagnosis.

### Acquiring a New Medical Remote Diagnostics Service Platform

Bittium Medanalytics Oy, a subsidiary of Bittium Corporation, and RemoteA Oy signed a business purchase agreement according to which Bittium Medanalytics Oy purchases RemoteA's medical remote diagnostic service platform and the product rights of the related medical measurement devices and their interfaces. With the business transaction Bittium's offering expands from measuring and monitoring the electrical activity of the heart and brain to measuring and monitoring sleep apnea. In addition, a third party blood pressure measurement device has been connected to the service platform, and in the future, it is possible to connect also other measurement devices to the system. Biosignal information collected from the patients via the remote diagnostics service platform enables the transfer of information over the internet and it serves as a platform for patient measurement data and specialists' diagnosis.

### Cooperation with Cerenion on Measuring the Brain Activity

Bittium BioSignals Ltd, a subsidiary of Bittium Corporation, and Cerenion Oy announced a collaboration project on bringing advanced brain monitoring into the array of vital signs monitoring available to intensive care staff. The collaboration aims on providing a comprehensive solution for brain electrical activity monitoring for intensive care patients, by combining Bittium BrainStatus a wireless EEG-monitoring device meant for real-time brain electrical activity to Cerenion's innovative C-Trend™ index that interprets EEG signal to a simple score facilitate and accelerate the work of nursing staff.



Bittium BrainStatus™ EEG amplifier and electrode headband enables high quality and fast EEG signal measurement.

European CE medical approved wireless Bittium BrainStatus EEG amplifier and electrode headband enables high quality and fast EEG signal measurement. Through the use of Cerenion C-Trend™ technology this signal data is turned into a simple score that reveals the status of the patient's brain at the bed-side and without requiring any changes to the care of the patient. The first line of C-Trend-enabled Bittium BrainStatus devices are expected to become available in 2019.

### Bittium Invests in Swiss Remote Diagnostics Company, evismo AG

Bittium expanded its medical remote diagnostics service offering to Switzerland by investing in evismo AG, a Swiss medical remote diagnostics service provider. Bittium and evismo will jointly provide customers with full-scale remote diagnostics service that at this stage includes remote diagnostics service platform, monitoring the electrical activity of the heart, wireless measurement data transfer, and analysis and diagnostics of measurements.

The investment will be carried out by subscribing new shares in evismo AG, the subscription will be carried out in two phases. After the share subscription on July 11th, Bittium's holding of evismo was 17.4 percent and, subject to certain commercial terms by March 31, 2019, Bittium's holding would be 25 percent.

### New Waterproof Bittium Faros™ Launched

Bittium launched the new waterproof Bittium Faros devices together with the Bittium FastFix™ patch electrodes. The new solution makes the patient's life easier during long-term (3–30 days) ECG recordings. Bittium Faros ECG device together with the Bittium FastFix patch electrode is meant for wireless ECG measurement. The chest-attachable patch electrode can be used for 3 to 7 days at a time, after which measurement can be continued by replacing the patch electrode with a new one. ECG recordings with the waterproof Bittium Faros ECG devices and Bittium FastFix patch electrodes enable the monitored person to be active, do sports and shower without having to remove the device and thus stop the recording.

### Bittium Faros™, Bittium Cardiac Navigator™ and Bittium Cardiac Explorer™ Received Medical Device Clearances in the US

The new waterproof Bittium Faros ECG devices, Bittium Cardiac Navigator and Bittium Cardiac Explorer analysis software received FDA 510(k) medical device clearances in United States. The FDA 510(k) clearance received by the Bittium Faros ECG device includes the built-in algorithms for detection of arrhythmias. The received FDA 510(k) clearance also allows the use of Bittium Faros ECG measuring devices for pediatric ECG measurements. In addition, the received clearance allows the use of Bittium Faros both in long-term ECG recording and in remote wireless cardiac monitoring.

The received FDA 510(k) clearance allows cardiologists to use the Bittium Cardiac Navigator and Bittium Cardiac Explorer software solutions for official analysis of ECG recordings collected with the Bittium Faros ECG monitoring devices.



## The New Bittium Tough Mobile Hybrid X™

Bittium launched the new Bittium Tough Mobile HybridX extension that gives Bittium Tough Mobile a new user interface and functionalities that are very useful in demanding Public Safety use. Bittium Tough Mobile HybridX extension combines the secure Bittium Tough Mobile smartphone with a functional HybridX accessory. The HybridX accessory is integrated to the Bittium Tough Mobile and is connected to a PMR (Private Mobile Radio) device, such as TETRA or P25.

## The New Bittium Tough VoIP Softphone™

Bittium launched the new Bittium Tough VoIP Softphone software product at the Eurosatory defense exhibition in Paris, France. The Bittium Tough VoIP Softphone software product launched at the event is a VoIP client (Voice over Internet Protocol) that can be used for VoIP calls, instant messaging, conference calls and screen sharing in the tactical Bittium Tough VoIP Service™ network either with a PC or smartphone. Especially useful for tactical use are also the

Push-To-Talk (PTT) feature as well as the remote control and sending instant messages to existing third party Combat Net Radios (CNR) through Bittium Tough VoIP Service network and Bittium Tough Comnode terminal or Bittium TAC WIN system's router (Radio over IP, RoIP).

## Cooperation with the Finnish Defense Forces Strengthened

In April, Bittium received a purchase order from the Finnish Defence Forces for products included in the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, which is meant for tactical communications. The value of the purchase order was EUR 14.3 million. The purchase order is based on the framework agreement signed by Bittium and the Finnish Defence Forces on August 9, 2017, according to which the Finnish Defence Forces will order products included in the Software Defined Radio based Bittium TAC WIN system during the years 2018–2020. According to the framework agreement, Finnish Defence Forces will issue separate purchase orders for the products each year. The products ordered now will be delivered to

the Finnish Defence Forces during the year 2018. If materialized in full, the total value of the framework agreement is EUR 30 million.

In May, Bittium received a purchase order from the Finnish Defence Forces for the maintenance and further development of systems and related products meant for tactical communications. The order refers to the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, the Bittium Tough VoIP system for tactical IP calls and data transfer, as well as the products related to the systems, which are used by the Finnish Defence Forces. The purchase order applies to the year 2018 and includes the technical support of the systems and the equipment, software support, upkeep of the system support, management of the system support, and development of new features. The value of the purchase order is EUR 2.3 million.

In November, Bittium Wireless Ltd, a subsidiary of Bittium Corporation, and Finnish Defence Forces signed a framework agreement on Bittium Tough Comnode terminals and related accessories. The framework agreement covers the years 2018–2022.

The maximum value of the framework agreement is EUR 8.3 million. The Finnish Defence Forces will issue separate purchase orders in several batches during the validity of the framework agreement.

In December, Bittium Wireless Ltd, a subsidiary of Bittium Corporation and Finnish Defence Forces Logistics Command signed an Agreement on the purchase of Bittium Tough SDR handheld and vehicle radios, and their related accessories. The value of the purchase agreement is approximately EUR 10.5 million at the maximum. The new software-defined-radio based tactical radios will be used at the first phase by the Army and the delivery will be completed at the latest by the end of the year 2020. The purchase agreement is based on the Letter of Intent for purchase of new tactical radios, signed by Bittium and Finnish Defence Forces on August 8, 2017.

The purchase agreement includes terms for optional additional purchase, according to which, the Finnish Defence Forces have an option to purchase additional tactical radios and their related accessories, training and system management for the use of Army, Air Force and Navy, based on the prices agreed in the purchase agreement. If these optional additional purchase amounts would materialize in full, the total value of the purchase would be approximately EUR 207 million at the maximum. As agreed in the Letter of Intent, the Finnish Defence Forces aim at making these additional purchases during the next ten years. The materialization of the purchase is affected by the yearly state budget allocations for the administrative of the Ministry of Defence. There will be separate purchase orders for these optional additional purchases.

### Bittium Tough SDR™ Vehicle Radios for Pilot Use of Spanish Army

Bittium supplied its tactical Bittium Tough SDR Vehicular radios together with the ESSOR High Data Rate Waveform (ESSOR

HDR WF) Programme to the pilot vehicles of the Spanish Army's VCR 8x8 vehicle programme (Vehículo de Combate sobre Ruedas). In the scope of the VCR 8x8 programme the Spanish Army will acquire new combat vehicles and related data transfer systems to replace their current, long-lived combat vehicles. Bittium Tough SDR Vehicular radios will be delivered to the temporary joint venture UTE 8x8 (Unión Temporal de Empresas) formed by the Spanish companies GDELS Santa Bárbara Sistemas, Indra and SAPA. After the pilot phase, the programme will continue with another phase during which a separate procurement decision will be made for the supply of vehicular radios to the combat vehicles that will be deployed by the Spanish Army. Participation in the pilot phase of the programme does not automatically guarantee participation in the following phase of the programme.

### Bittium's Tactical Backbone Network Selected by the Austrian Armed Forces

Bittium's cooperation partner, Austrian information technology company Kapsch BusinessCom AG, was informed by the Austrian defense administration (Bundesministerium für Landesverteidigung, BMLV) that it should be selected as the provider of the new IP-based tactical communication system for the Austrian Armed Forces. Bittium's products for tactical communications are a significant part of Kapsch BusinessCom's bid, including the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, which will be the core of the new communication system, as well as Bittium Tough Comnode and Bittium Tough VoIP products.

The signing of the contract was scheduled in December 2018. Bittium's share of the total value is around EUR 30 million. The product deliveries are expected to take place during the years 2019–2021 and the majority of the net sales is estimated to realize during the years 2020 and 2021. Prior to the signing of the contract, there was a 10-days appeal

period, during which, the losing parties of the competitive bidding could have made complaint of the ministry's decision to the court. This is a typical process in such public competitive bidding. No appeals were filed.

### ThingSpace IoT Reference Hardware Design Developed with Verizon

In the spring, Bittium presented for the first time the ThingSpace LTE CAT-M1 IoT Reference Hardware Design developed together with Verizon at IoT World 2018 exhibition in Santa Clara, California, US. It is designed to allow an OEM the building blocks to get up and running quickly on the Verizon network and ThingSpace platform. Bittium provides open source hardware design documents and offers design services to Verizon's ThingSpace development partners. Bittium's IoT Design Service offerings vary from technology consultation to commercial wireless designs.

# Press Releases and Significant Orders 2018

### January 18

Bittium received the first orders from Mexican government authorities for mobile devices developed for a satellite communication system. The mobile devices have been developed in a product development project that started in the year 2015.



### February 13

Bittium Biosignals Ltd and a major US remote monitoring provider concluded a three-year supply agreement under which Bittium will supply the Bittium Faros™ 360 and customized Bittium Faros™ 360 cardiac ECG signal measuring and monitoring devices.



### March 16

Bittium launched new innovative Bittium Tough Mobile HybridX™ extension, that gives Bittium Tough Mobile a new user interface and functionalities that are very useful in demanding public safety use.



### March 28

Bittium Medanalytics Oy and RemoteA Oy signed a business purchase agreement of RemoteA's medical remote diagnostic service platform and the product rights of the related medical measurement devices and their interfaces.



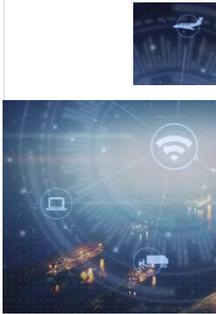
### March 9

Bittium Cardiac Navigator™ meant for the analysis of clinical Holter ECG recordings received medical device approval in Europe.



### January 18

Bittium opened a new office in Mexico.



### June 11-15

Bittium launched the new Bittium Tough VoIP Softphone™ software product at the Eurosatory defense exhibition in Paris, France.



### July 12

Bittium invested in a Swiss remote diagnostics service company, evismo AG. The companies will jointly provide customers with full-scale remote diagnostics service that at this stage includes remote diagnostics service platform, monitoring the electrical activity of the heart, wireless measurement data transfer, and analysis and diagnostics of measurements.

### August 9

Bittium expanded its operations in Central Europe by opening a new office in Munich, Germany.

### August 23

Bittium launched new waterproof Bittium Faros™ ECG 180 and 360 devices and Bittium FastFix™ patch electrode for ECG measurement at ESC Congress 2018 on August 25-29 in Munich, Germany.

### September 27

Bittium announced that it will supply its tactical Bittium Tough SDR Vehicular radios together with the ESSOR High Data Rate Waveform (ESSOR HDR WF) Program to the pilot vehicles of the Spanish Army's VCR 8x8 vehicle programme (Vehículo de Combate sobre Ruedas).

**April 13**

Bittium received a purchase order from the Finnish Defence Forces for products included in the Software Defined Radio based Bittium Tactical Wireless IP Network™ (TAC WIN) system.



**April 23**

Bittium's secure Bittium Tough Mobile™ smartphone was part of the Locked Shields 2018 cyber defense exercise organized by the NATO Cooperative Cyber Defence Centre of Excellence (CCD-COE), held in Tallinn, Estonia.



**May 14–17**

Bittium showcased the ThingSpace LTE CAT-M1 IoT Reference Hardware Design, which was developed with Verizon, at IoT World 2018 exhibition, held in California, the United States of America.



**May 15**

Bittium received a purchase order from the Finnish Defence Forces for the maintenance and further development of Software Defined Radio based Bittium Tactical Wireless IP Network™ (TAC WIN) system, the Bittium Tough VolP™ system for tactical IP calls and data transfer, as well as the products related to the systems.



**May 30**

Bittium BioSignals Ltd and Cerenion Oy announced a collaboration project that aims on providing a comprehensive solution for brain electrical activity monitoring for intensive care patients, by combining Bittium BrainStatus™ to Cerenion's innovative C-Trend™ index that interprets EEG signal to a simple score facilitate and accelerate the work of nursing staff.



**November 5**

Bittium Wireless Ltd and Finnish Defence Forces signed a framework agreement on Bittium Tough Comnode™ terminals and related accessories covering the years 2018–2022.

**November 23**

Bittium's tactical backbone network, Bittium Tactical Wireless IP Network, for the use of Austrian Armed Forces.



**December 10**

The new waterproof Bittium Faros™ ECG devices, Bittium Cardiac Navigator™ and Bittium Cardiac Explorer™ analysis software received FDA 510(k) medical device clearances in United States.



**December 13**

Bittium Wireless Ltd and Finnish Defence Forces signed an agreement on the purchase of Bittium Tough SDR™ handheld and vehicle radios, and their related accessories.



## Market Outlook

Bittium's customers operate in various industries, each of them having their own industry specific factors driving the demand. A common factor creating demand among the whole customer base is the growing need for higher quality and secure data transfer. Due to the technology competences accrued over time and long history in developing mobile communication solutions, Bittium is in a good position to offer customized solutions for its customers. Over thirty years of experience and extensive competence in measuring of biosignals also act as a basis for medical technology solutions.

The following factors are expected to create demand for Bittium's products and services in 2019 and beyond:

- In the mobile telecommunications, development of 5G technology has decreased significantly and the implementation is accelerating in pace. Investments in developing new features continue and the importance of software development in the 5G network development expands. This creates demand for Bittium's R&D services. There is a wide range of frequencies allocated for the 5G technology thus creating the need to develop multiple products to cover the market and creating demand for R&D services for development of product variants. Also the development of new devices utilizing 5G technology increases the demand for Bittium's services.
- As the digitalization evolves, the secure IoT (Internet of Things) has become a significant development area in many industries. The increasing need of companies to digitalize their operations, collect data wirelessly and transfer it to the internet and cloud services generate need for Bittium's services and customized solutions. For this, there is a need for secure connected devices for consumers' free-time applications and demanding industrial usage that collect information through their sensors and connect the devices securely to the internet and cloud services. New IoT radio systems are being used all over the world and the amount of digitalized devices continuously increases. The devices have new further developed features that generate demand for R&D services. Along with the 5G technology is being used, there will also be new features in the IoT that enable i.e. remote control of machines. Therefore the integration of different systems and technologies play an important role in enabling the complete digitalization service. To ease and speed up the processing of large data amounts there are different kinds of learning systems and devices under development that use different kinds of artificial intelligence (AI) technologies.
- The use of LTE technology, smartphones and applications continue to increase in special verticals, such as public safety creating demand for Bittium Tough Mobile secure LTE smartphone and other customized special terminals based on Bittium's own product platform. The awareness of mobile security risks is growing and the interest towards secure mobile devices is increasing. Also the interest towards LTE-SAT-hybrid devices with terrestrial and satellite connections has grown to further improve the functionality of authorities' critical connections. The implementation of LTE-based devices in Public Safety markets has been slower than expected due to the delay of the device functionalities required by the authorities and due to the slow progress of the market.



The sale of the secure terminal products is expected to develop moderately according to the nature of public safety markets.

- Using public network connections in portable devices is increasing also in demanding professional use, such as in the public sector. This creates requirements for network connections to be easy to use and secure. The products in the Bittium SafeMove product family enable the ease of use of the devices and security in demanding use.
- In the defense sector's tactical communication market the governments' defense forces and other authorities need networks that troops, who are more and more constantly on the move, can use for transferring growing amounts of data securely. This creates demand for Bittium Tactical Wireless IP Network (TAC WIN) broadband network and for other Bittium's IP-based (Internet Protocol) tactical communications solutions, as well as for Bittium's new tactical communication handheld and vehicle radios that fulfill the needs of data transfer of moving troops or individual soldiers. Bittium continues its efforts to bring its defense market targeted products and

services also to the international defense markets and aims to get new international customers for its tactical communication system in 2019. Due to the long sales cycles driven by purchasing programs of national governments, it takes time to receive significant purchase orders.

- The heart and brain failures are among the most frequent causes of serious complications and recognizing those symptoms early on, based on information gathered by measuring, enable the start of the effective treatment in time. Also the prevention of diseases and health problems are being increasingly invested in. In the healthcare technology market there is ongoing a significant change in the patient care both inside the hospitals as well as in home care. The repatriation of patients is being pursued earlier than before which may enable significant cost savings in the healthcare. A prerequisite for early repatriation is the enabling of accurate and precise follow-up and measurement in home conditions through remote monitoring. For this purpose Bittium offers its Bittium Faros product family for remote heart monitoring and Bittium BrainStatus for measuring

the electrical activity of the brain. One of the growing application areas in the wireless and remote systems is healthcare technology that enables implementing these changes for its part. Remote monitoring and remote diagnostics together with wireless and remote-controllable systems bring effectiveness to the healthcare performance and cut costs as the diagnosis from specialists are available regardless of time and place. This enables also new service providers to enter the chain of medical treatment services offering wider availability of medicine, without bargaining the quality of specialists i.e. cardiologists and neurologists.

## Purpose

We adapt our deep knowledge to deliver superior technology innovations to enhance connectivity, bring safety and improve health in the society.

## Vision

Bittium's vision is to become a global enabler of secure and reliable connectivity for people and things.

## Strategic Guidelines (as Published in 2016)

In November 2016, Bittium Corporation updated its strategy to strengthen its position in the global markets and to speed up its growth. During 2017 and 2018, Bittium made no updates or changes in its strategy and continued systematically on its path towards the Company's strategic goals.

### **Bittium's Strategic Guidelines, as Published in November 2016**

The Company plans to make significant investments in the future by increasing significantly the R&D investments in its own products and solutions in the year 2017. In line with the nature of the defense and public safety markets, the investments will pay back in a longer time period and therefore Bittium plans to activate the most of the R&D investments to its balance sheet. The Company has a strong balance sheet and financial position.

Bittium decided to establish a new product and service area around healthcare technology. Combining healthcare technologies with Bittium's long-term experience and know-how in wireless and security technologies give the Company good conditions to serve its customers in healthcare sector by offering them new kinds of products and services. As the first step to build the competencies in healthcare technology on November 10, 2016 Bittium acquired Mega Electronics Ltd, a company specialized in measuring and monitoring biosignals.

Bittium continues to search for inorganic growth opportunities in all its product and service areas and is prepared to invest in acquisitions that strengthen the Company's growth strategy.

According to its updated strategy the Company's business is divided into three product and service areas effective as of December 1, 2016: Defense & Security, Connectivity Solutions and Medical Technologies.

### **Defense & Security**

In the Defense & Security product and service area Bittium offers globally leading products and services for its customers in the defense, security and public safety markets. Bittium aims to significantly increase investments in various authority and special terminals as well as in related software development and extend its tactical communication product portfolio for defense industry. Growth in the net sales is sought especially from own products and product

platforms that Bittium offers for international defense and public safety markets.

Bittium's competitiveness in these markets is based on trust and reliability, high quality of the products and services, as well as on advanced technology and security know-how developed within the Company during the last 30 years. Bittium offers its customers in the defense market new kind of efficiency for their management systems with products that enable faster data transfer, better mobility, and superior compatibility with other communication systems.

In the public safety markets the transition towards LTE-based technology is expected to accelerate in the next few years. As the security threats are growing increasingly more security demands are set for the communication systems. Bittium increases investments in developing its product offering further for these markets. The Company also continues offering public safety markets R&D services to develop special terminals and related systems that use both terrestrial and satellite networks.

In the defense, security and public safety markets, there are signs of unification regarding technologies as well as in security demands. Also many customers, partners and supply chains are mostly the same and the trend towards this is strengthening. Bittium merged two separate product and service areas into one and with that synergy Bittium is able to better serve the customers in defense and security technology.

The defense, security and public safety markets are slowly evolving markets by their nature. They are characterized by long sales cycles driven by the national governments' long preparation periods of projects and purchase programs. The purchases of the selected products are typically executed over several years.

### Connectivity Solutions

The development of wireless technology continues and digitalization creates growing need for wireless connections. Bittium offers R&D services and wireless connectivity solutions for its customers, and the demand is expected to increase within the next few years. The competitiveness of the Company in these markets is based on the strong technology and security competence, as well as on trust, reliability and quality. The more critical the system is, the more significant role Bittium's strengths have.

The demand for developing 4G technology-based network equipment is decreasing as the technology and market reach their maturity. However, Bittium is already strongly involved in the development of 5G technology which in the long run gives the Company a good position to offer even more advanced connectivity solutions also for customers in other markets.

### Medical Technologies

In the healthcare sector, remote monitoring and home care markets are growing strongly. Patient monitoring in the hospital environment is also changing into wireless.

These trends create demand for the digitalization of services, wireless capability and secure connections. For these markets Bittium decided to establish a new product and service area around healthcare technology. As the first step to build the competencies in healthcare technology, on November 10, 2016 Bittium acquired Mega Electronics Ltd, a company specialized in measuring and monitoring biosignals.

Combining healthcare technologies with Bittium's long-term experience and competence in wireless and security technologies gives Bittium good conditions to serve its customers in healthcare sector by offering them new kinds of products and services.

Bittium plans to strengthen its product and service offering for these markets also by searching for acquisition targets that complements the whole.

### Financial Targets, as Published in November 2016

Bittium has announced earlier that it targets 10 percent annual growth in net sales and to reach EBIT level 10 percent of net sales in the year 2017 at the latest. The Company believes that in the coming years it is able to grow its net sales even more than the earlier announced target, and therefore sets up a target to exceed the annual 10 percent growth target of the net sales.

However, Bittium believes, that during the year 2017 it is not yet able to reach the targets set for the growth in the net sales and

EBIT level. The reason for this is the termination of significant customer cooperation with a global network equipment manufacturer, of which Bittium announced earlier in October, that is expected to materialize faster and more extensively than the Company estimated earlier. According to the information received by Bittium, the net sales from this customer cooperation will end completely in the beginning of the second quarter of the year 2017. To this extend this kind of extensive and rapid decrease in the services business net sales is most likely difficult to be replaced in a short term. In addition, the operating profit level of the year 2017 is also affected by the planned investments to enable the future growth.

Bittium targets further to increase the share of net sales generated from own products and product platforms. According to the targets Bittium announced earlier, in the year 2017 the share of net sales generated from own products and product platforms is clearly higher than in the year 2014, when the product based net sales was 26.7 percent of the net sales.

# Shares and Shareholders

## Shares

The shares of Bittium Corporation are quoted on the Nasdaq Helsinki. The Company has one series of shares. All shares entitle their holders to dividends of equal value. Each share has one vote. The share does not have a nominal value. The Company's shares have been entered into the Euroclear Finland Ltd.'s book entry system.

At the end of the financial period, the fully paid share capital of the Company entered into the Finnish Trade Register was EUR 12,941,269 and the total number of the shares was 35,693,166. The accounting par value of the Company's share is EUR 0.10. The Company does not have its own shares in its possession.

### Share Price and Trading Volumes in 2018

The closing price of Bittium Corporation's share was EUR 7.61 at the end of 2018; the share reached a high of EUR 8.10 and a low of EUR 4.71. During the year, a total of 12.6 million shares with the value of EUR 75.4 million changed hands on the Nasdaq Helsinki. This is 35.3 percent of the share capital. Bittium Corporation's market capitalization on December 31, 2018 was EUR 271.6 million.

### Dividend and Dividend Policy

Bittium Corporation follows a dividend policy that takes into account the group's net income, financial situation, need for capital and financing growth.

In 2018, Bittium Corporation paid EUR 0.05 per share as dividend based on the adopted balance sheet for the financial period January 1, 2017–December 31, 2017 and EUR 0.25 per share as additional dividend. The dividend was paid to the shareholders who were registered as shareholders in the Company's register of shareholders as maintained by Euroclear Finland Ltd on the dividend record date, April 13, 2018. The dividend was paid on April 29, 2018.

The Board of Directors of Bittium Corporation proposes that the Annual General Meeting to be held on April 10, 2019 resolve to pay EUR 0.05 per share as dividend based on the adopted balance sheet for the financial period of January 1, 2018–December 31, 2018, representing approximately half of the result of the financial period, and in addition, EUR 0.10 per share as additional dividend, totaling altogether to EUR 0.15 per share. The dividend will be paid to the shareholders who are registered as shareholders in the company's register of shareholders as maintained by Euroclear Finland Ltd on the dividend record date, April 12, 2019. The Board of Directors proposes that the dividend be paid on April 23, 2019.

### Trading Codes

Bittium Corporation has been listed on Nasdaq Helsinki since 1998. Bittium Corporation's company code and trading code in the Nasdaq Helsinki INET system is BITTI and the trading code BITTI.

### Trading codes are:

Nasdaq Helsinki	BITTI
Reuters	BITTI.HE
Bloomberg	BITTIFH

### Shareholders

At the end of 2018, Bittium Corporation had 22,007 shareholders. The ten largest shareholders owned 28.4 percent of the shares. Private ownership was 75.6 percent. The percentage of foreign and nominee-registered shareholders was 4.1 percent at the end of 2018.

### Shareholding of the Board of Directors and CEO

At the end of 2018, the shareholding of the Board of Directors, CEO and the companies controlled by them was 1,541,966 shares, corresponding to 4.3 percent of all shares.

## Information to Shareholders

Press releases, reports, earnings estimates, share price ticker, contact details of analysts and other current investor material are available on the Company's website at [www.bittium.com](http://www.bittium.com). An email-based subscription service for press releases and publications can be found from the Company's website as well.

## Financial Reports 2019

Bittium reports its financial development with financial reports that are published semi-annually. In 2019, Bittium will publish financial reports as follows:

- February 21, 2019  
Financial Statement Bulletin 2018
- August 8, 2019  
Half Year Financial Report, Jan.–Jun. 2019

Financial reports will be published simultaneously in Finnish and in English at 8.00 a.m. (CET+1) on Bittium’s website at [www.bittium.com/investors](http://www.bittium.com/investors). The Company will hold press conference regarding the reports on dates to be specified later.

## Silent Period

Bittium Corporation observes a Silent Period prior to announcing its results. The Silent Periods in 2019 are as follows:

- January 31–February 21, 2019; and
- July 18–August 8, 2019.

## Trading Volume and Average Share Price 2013–2018



## Share Price Development in Nasdaq Helsinki 2013–2018



## Bittium Corporation's Annual General Meeting 2019

The Annual General Meeting of Bittium Corporation will be held on Wednesday April 10, 2019 at 1.00 p.m. at the University of Oulu, Saalastinsali, at the address Pentti Kaiteran katu 1, 90570 Oulu, Finland.

### Shareholders Registered in the Shareholders' Register

Each shareholder, who is registered on March 29, 2019 in the shareholders' register of the company held by Euroclear Finland Ltd, has the right to participate in the General Meeting. A shareholder, whose shares are registered on his/her personal Finnish book-entry account, is registered in the shareholders' register of the company.

A shareholder, who is registered in the shareholders' register of the company and who wants to participate in the General Meeting, shall register for the meeting no later than on April 5, 2019 by 10.00 a.m. by giving a prior notice of participation. The notice has to be received by the company before the end of the registration period. Such notice can be given:

- a) on the company's website at [www.bittium.com](http://www.bittium.com), as from February 21, 2019 at 10.00 a.m.
- b) by telephone +358 40 344 3322 or +358 40 344 5425 on weekdays between 9.00 a.m. and 3.00 p.m. or
- c) by regular mail to the address Bittium Corporation, General Meeting, Ritaharjuntie 1, 90590 Oulu, Finland.

In connection with the registration, a shareholder shall notify his/her name, personal identification number or business identity code, address, telephone number and the name of a possible assistant or proxy representative and the personal identification number of a proxy representative. The personal data given to Bittium Corporation is used only in connection with the General Meeting and with the processing of related registrations.

The shareholder, his/her authorized representative or proxy representative shall, where necessary, be able to prove his/her identity and/or right of representation at the General Meeting.

### Holders of Nominee-registered Shares

A holder of nominee registered shares has the right to participate in the General Meeting by virtue of such shares, based on which he/she on March 29, 2019 would be entitled to be registered in the shareholders' register of the company held by Euroclear Finland Ltd. The right to participate in the General Meeting requires, in addition, that the shareholder on the basis of such shares has been registered into the temporary shareholders' register held by Euroclear Finland Ltd at the latest on April 5, 2019 by 10.00 a.m. As regards nominee registered shares this constitutes due registration for the General Meeting.

A holder of nominee registered shares is advised to request without delay the necessary instructions regarding registration in the temporary shareholder's register, the issuing of proxy documents and registration for the General Meeting from his/her custodian bank. The account management organization of the custodian bank has to register a holder of nominee registered shares, who wants to participate in the General Meeting, into the temporary shareholders' register of the company at the latest by the time stated above.

Further information on the General Meeting and participation in the General Meeting is available on the company's website at [www.bittium.com](http://www.bittium.com).

### Proxy Representative and Powers of Attorney

A shareholder may participate in the General Meeting and exercise his/her rights at the meeting by way of proxy representation. A proxy representative shall produce a dated proxy document or otherwise in a reliable

manner demonstrate his/her right to represent the shareholder. If a shareholder participates in the General Meeting by means of several proxy representatives representing the shareholder with shares at different securities accounts, the shares by which each proxy representative represents the shareholder shall be identified in connection with the registration for the General Meeting.

Possible proxy documents should be delivered in originals to the address Bittium Corporation, General Meeting, Ritaharjuntie 1, 90590 Oulu, Finland, before the end of the registration period.

### Other Information

Pursuant to chapter 5, section 25 of the Companies Act, a shareholder who is present at the General Meeting has the right to request information with respect to the matters to be considered at the meeting.

On the date of this notice to the General Meeting February 21, 2019, the total number of shares and votes in Bittium Corporation is 35,693,166.

### Documents of the General Meeting

The above-mentioned proposals for the decisions on the matters on the agenda of the General Meeting, as well as this notice are available on Bittium Corporation's website at [www.bittium.com](http://www.bittium.com).

This annual report, which includes the company's annual accounts, the report of the board of directors and the auditor's report, as well as the company's corporate governance statement, is available on said website no later than on March 20, 2019. The proposals for decisions and other documents mentioned above are also available at the General Meeting. Copies of these documents and of this notice will be sent to shareholders upon request. The minutes of the General Meeting will be available on the above-mentioned website as from April 24, 2019, at the latest.





# Corporate Governance

The governance of Bittium Corporation (hereinafter 'Company') is determined by the Company's Articles of Association, the laws of Finland (such as the Finnish Companies Act and Securities Market Act) and the Company's Corporate Governance Code. The Company follows the Finnish Corporate Governance Code 2015 prepared by the Finnish Securities Market Association. The Governance Code may be viewed, inter alia, at the Finnish Securities Market Association website at [www.cgfinland.fi](http://www.cgfinland.fi).

In the assembly meeting held on April 11, 2018, the new Board of Directors elected on the same day considered the continuation of the Audit Committee and concluded that the extent of the Company's business still requires that a group with a more compact composition than the Board of Directors deals with the preparation of matters

pertaining to financial reporting and control. The Governance Code recommends that a Committee shall have at least three members. In the assembly meeting held on April 11, 2018, the new Board of Directors resolved to elect Mr. Juha Putkiranta (Chairman of the Committee) and Ms. Riitta Tiuraniemi as members of the Audit Committee and to invite authorized public accountant Mr. Seppo Laine as external advisor of the Board of Directors. The composition of two members and an external advisor was considered to be in compliance with the recommendation as authorized public accountant Mr. Seppo Laine brings continuity and expertise needed in the Committee.

This Statement is made separately from the Report by the Board. The Board's Audit Committee and the Company's auditor have reviewed this Statement.

The statutory governing bodies of the Company are the Shareholders' meeting, Board of Directors, Chief Executive Officer and the Auditor. The Management Group supports the statutory governing bodies of the Company. The Company's domicile is Oulu.

This Statement may be viewed on the Company's website at [www.bittium.com](http://www.bittium.com).

## The Board of Directors

The Board of Directors is responsible for the Company's governance and proper organization of the operations. The Board of Directors comprises of three to seven (3–7) members and in addition it may have one to three (1–3) deputy members. The Annual General Meeting shall elect the members of the Board of Directors for a term which expires at the end of the following Annual General Meeting. The number of terms for the members of the Board of Directors is not limited. The Board of Directors selects a Chairman among its members.

The Board conducts an annual evaluation of the independence of its members in accordance with recommendation 10. A member of the Board is required to submit to the Company the information necessary to conduct the evaluation of independence. A Board member is also required to notify the Company of any changes in information relating to independence.

The Annual General Meeting held on April 11, 2018 decided that the Board of Directors shall comprise six (6) members. Mr. Seppo Mäkinen, Mr. Juha Putkiranta, Mr. Tero Ojanperä and Mr. Erkki Veikkolainen were re-elected as members of the Board of Directors for a term of office expiring at the end of the next Annual General Meeting. Fur-

ther, Ms. Riitta Tiuraniemi and Mr. Petri Toljamo were elected as the new members of the Board of Directors for a corresponding term of office. At its assembly meeting held on April 11, 2018, the Board of Directors has elected Mr. Erkki Veikkolainen Chairman of the Board. Further, the Board has resolved to keep the Audit Committee. Mr. Juha Putkiranta (Chairman of the committee) and Ms. Riitta Tiuraniemi were elected as members of the Audit Committee and authorized public accountant Mr. Seppo Laine was invited to the Audit Committee as external advisor of the Board of Directors.

## Description of Activities

The Board of Directors has defined a working order and evaluates its performance annually. The Board of Directors shall implement the decisions of the General Meeting. The Board of Directors supervises the operations and management. The Board of Directors makes decisions on the Company's guiding principles for operation, strategy and budget. The Board of Directors decides on mergers and acquisitions and other strategic alliances as well as significant investments and significant matters regarding organization and finance.

The Board of Directors supervises that the Group companies' accounting and financial management is duly organized. The Board of Directors appoints the CEO and possible Deputy for him or her as well as approves the Company's organizational structure.

The CEO, CFO and Chief Legal Officer (who acts as secretary of the Board of Directors) attend the meetings of the Board of Directors. Other management attends the meetings when necessary or upon invitation by the Board of Directors. The Chairman of the Board approves the agendas of the meetings of the Board of Directors. The agendas are prepared by the CEO and the Chief Legal Officer.

An annual clock, according to which the regular subjects to be handled are determined, is applied in the Board's work. In addition to the regular subjects of the annual clock, the most important subjects of the Board during the year were seeking for international growth and focusing R&D investments.

The Annual General Meeting decides on the compensation of the members of the Board of Directors and the compensations can be publicly reviewed on the Company's website at [www.bittium.com](http://www.bittium.com).

In 2018, the Board convened 12 times.

The Board members attended to the meetings as follows:

January 1–December 31, 2018	Board	Audit committee
Erkki Veikkolainen	12/12	
Juha Putkiranta	12/12	4/4
Seppo Mäkinen	12/12	
Tero Ojanperä	12/12	
Riitta Tiuraniemi	9/9	4/4
Petri Toljamo	9/9	
Kirsi Komi	3/3	2/2
Staffan Simberg	3/3	2/2
Seppo Laine (external advisor of the Board)		6/6

## Diversity Principles of the Board of Directors

In the Company, diversity is seen as an essential part of corporate responsibility and as a factor in success, that enables achievement of strategic targets and continuous improvement of customer intimacy.

In planning the composition of the Board of Directors, the requirements of the Company's business operations, the phase of development and the competence requirements of the Board committees are taken into account. In appointing members of the Board the target is to ensure that the Board as a whole supports the development of the Company's current and future business operations. Diversity plays a part in supporting this goal, so the Company aims to reach a situation where the facts supporting diversity are taken into account as significant criteria in planning the composition of the Board of Directors.

Diversity is considered from different perspectives. From the Company's point of

view it is important to have Board members with diverse backgrounds in terms of competence, training, and experience of differing business operations, of varying stages of business development, and of leadership as well as diverse personal characteristics. Experience of international business environments and different cultures in addition to consideration of age and gender will support the diversity of the Board. The objective is that both genders are represented in the Board and the Company aims to maintain a good and balanced distribution of genders.

To fulfill the diversity principles, the principles are taken into account in the process to find and assess member candidates and representatives of both genders are looked for to the process. The status of diversity and progress of the goal mentioned above is monitored in the self-assessment discussions of the Board. A person elected as a Board member of the Company must have the competence required for the position and be able to devote a sufficient amount of time for the duties required. In forming the composition of the Board long-term needs

and successor planning will be taken into account.

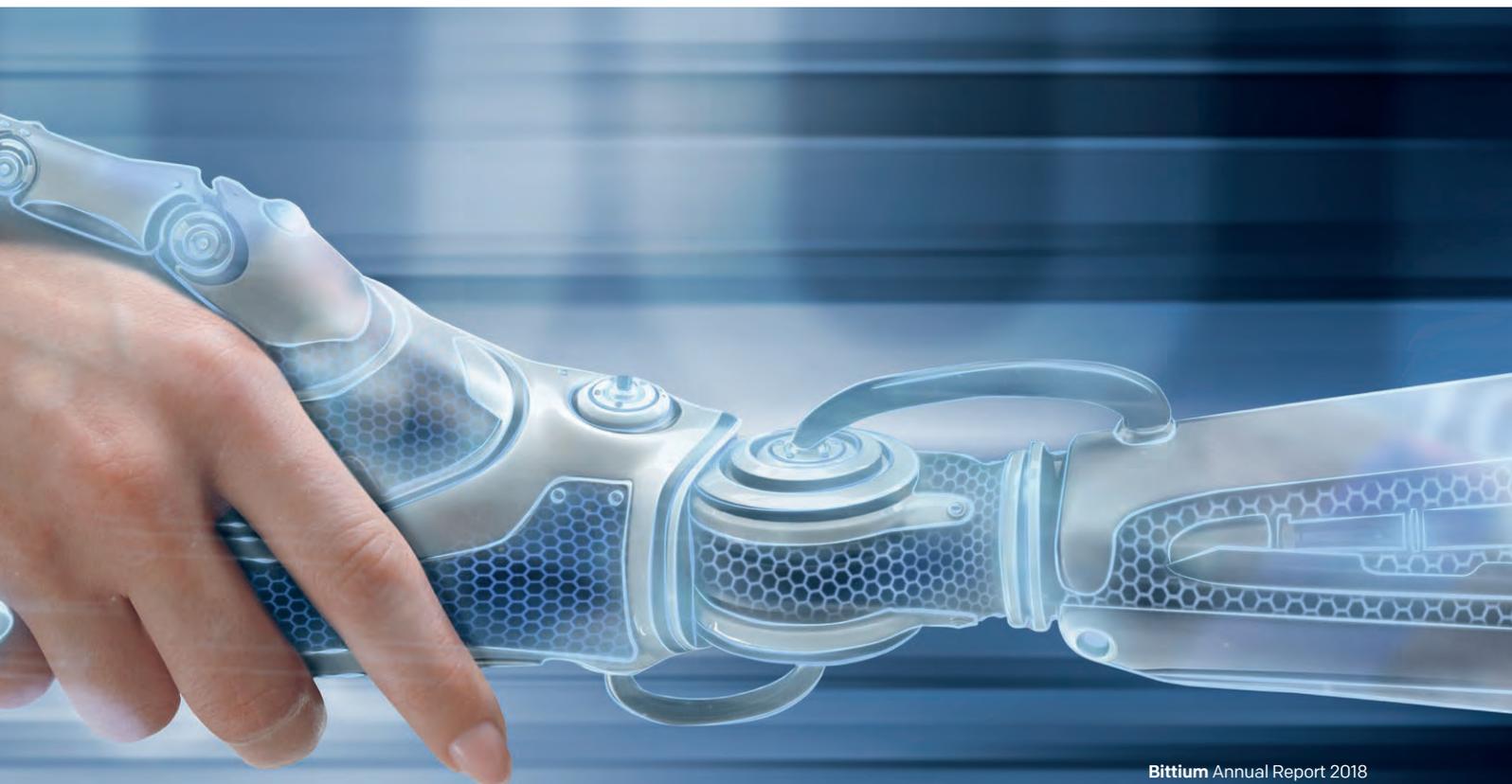
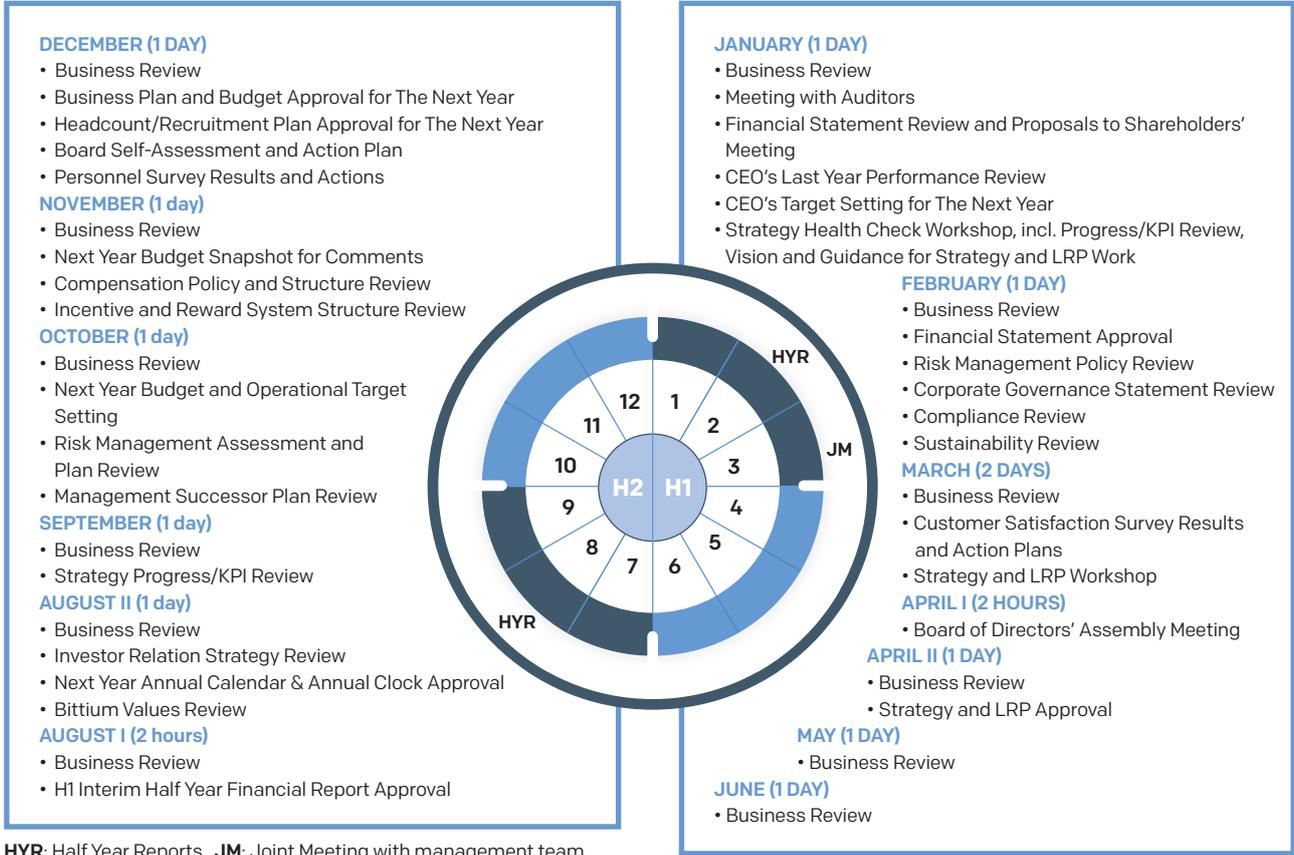
According to the Articles of Association, the Board of Directors comprises three to seven (3–7) members and in addition it may have one to three (1–3) deputy members. The composition of the Board and the number of members shall be such that they enable the Board to perform its duties efficiently. The members of the Board are appointed annually at the Company's Annual General Meeting.

During the financial period of January 1, 2018–December 31, 2018, the Board of Directors comprised six members. Five of the members have been male and one female. The self-assessment discussions of the Board have concluded that the members of the Board are so different in their special skills, backgrounds, age and gender that the Board as a whole has therefore been able to effectively support the business of the Company and its development.



# Board of Directors' Annual Clock 2018

Key topics to be covered during the year



# Bittium Corporation

## The Board of Directors



### Erkki Veikkolainen

b. 1952, M.Sc. (EE), eMBA  
Full-time occupation: Mevita Invest Oy, CEO

#### Positions of trust:

- Bittium Corporation (prev. Elektrobit Corporation), Member of the Board 2008–2015, Chairman of the Board 2015–.
- Elcoflex (Suzhou) Co. Ltd, Member of the Board 2007–.
- Elcoflex Oy, Member of the Board 2015–, Chairman of the Board 2006–2015.
- Maustaja Oy, Member of the Board 2006–.

#### Previous work history:

- Bittium Technologies Ltd. (prev. Elektrobit Technologies Ltd.), Member of the Board 2011–2015.
- Elektrobit Corporation, Executive Vice President, Contract R&D and Test Business Units 2002–2003.
- Elektrobit Technologies Ltd., Managing Director 2001–2003.
- Elektrobit Ltd., Vice President, Business Development 1998–2001.
- Nokia Mobile Phones, various positions 1985–1998, latest Vice President.

**Holdings Dec. 31, 2018:** Holds 1,507,539 shares in Bittium Corporation. Independent as regards to the Company and its significant shareholders.

### Seppo Mäkinen

b. 1952, M.Sc. Physical Chemistry  
Full-time occupation: Professional Board Member

#### Positions of trust:

- Bittium Corporation, Member of the Board 2015–.
- VideoVisit Oy, Member of the Board 2018–.
- Pathena S.A., partner 2017–.
- ValiRx Plc, Member of the Board 2013–2017, Advisor 2017–.
- Evondos Oy, Member of the Board 2016–.
- CBRA Genomics S.A., Member of the Board 2016–.
- Neurotar Oy, Member of the Board 2015–.

#### Previous work history:

- MedGroup Oy, Member of the Board 2013–2018.
- Ginolis Oy, Member of the Board 2011–2018, Chairman of the Board 2011–2014.
- Taikon Advisor, Managing Partner 2010–2016.
- Merieux Développement, Regional Partner, Nordics 2010–2016.
- Ventac Partners, Partner 2012–2016.
- Magnasense Technologies Oy, Member of the Board 2011–2015.
- Arcodia International Oy, Member of the Board 2011–2014.
- Balonco, Senior Advisor, owner 2012–2013.
- Mediracer Ltd., Chairman of the Board 2010–2013.
- RSP Systems, Member of the Board 2010–2011.
- Bio Fund Management Oy, Founding/Managing Partner 1997–2010.
- Sitra, Director in Life Science 1987–1997.
- Millipore/ Waters, Sales & Marketing 1983–1987.
- State Institute of Agricultural Chemistry, Chemist 1980–1983.
- Served as a Chairman or Member of the Board in Egalet A/S, SpinX Inc., Chempaq, Profos AG, Ilochip A/S, Exiqon A/S, KSH-Productor Oy, Merlin Diagnostika GmbH, Primex ASA, Rumen Oy, Millimed Inc., BioPorto A/S, Wallac, Kone Instruments, Rados Technologies, MAP Medical Technologies, Pharming NV, Bio-Orbit, Labmaster Oy, Viable Bioproducts, Fluilogic Oy.

**Holdings Dec. 31, 2018:** Holds 4,308 shares in Bittium Corporation. Independent as regards to the Company and its significant shareholders.

### Tero Ojanperä

b. 1966, Ph.D.  
Full-time occupation: Silo AI Oy, Managing Director and Co-Founder

#### Positions of trust:

- Bittium Corporation, Member of the Board, 2017–.
- Visionplus Oyj, Chairman of the Board, 2012–.
- DNA Oy, Member of the Board, 2014–.
- Tailorframe Oy, Chairman of the Board, 2013–.

#### Previous work history:

- Visionplus Oyj, Managing Director, 2012–2017.
- Tampere University of Technology, Chairman of the Board, 2012–2018.
- Nokia Oyj, Chief Technology Office, Head of the Nokia Research Center, Nokia Networks, Director and other Leading positions and Member of the Group Executive Board, 1990–2011.

**Holdings Dec. 31, 2018:** Holds 2,937 shares in Bittium Corporation. Independent as regards to the Company and its significant shareholders.



## Juha Putkiranta

b. 1957, M.Sc. Engineering  
Full-time occupation: Saafricon Oy, CEO

### Positions of trust:

- Bittium Corporation, Member of the Board 2015– and Chairman of the Audit Committee 2018–.
- Variantum Oy, Chairman of the Board 2016–.
- Aspocomp Oyj, Member of the Board 2016–.
- Nordcloud Oy, Member of the Board 2015–.

### Previous work history:

- Saafricon Oy, CEO and owner 2015–.
- Microsoft Corporation, Corporate Vice President, Company Integration, 2014.
- Nokia Oyj, Executive Vice President, Operations 2013–2014.
- Nokia Oyj, Senior Vice President, Head of Nokia Supply Chain 2008–2012.
- Nokia Oyj, Senior Vice President, Head of Multimedia, Product marketing and R&D 2006–2007.
- Nokia Oyj, Senior Vice President, Head of Imaging Business Unit 2003–2005.
- Nokia Oyj, Senior Vice President, Head of Cellular Telephones Unit 2000–2003.
- Symbian Ltd, Member of the Board 1998–2001.
- Nokia Oyj, Vice President, Corporate Planning and Business Development 1997–2000.
- Hewlett-Packard Corporation, Director of Marketing Europe and Africa, electronic measurement solutions 1992–1997.
- Siar Oy, consultant 1986–1987.
- Nokia Oyj, various project, sales and marketing management positions, information solutions unit 1979–1986.

**Holdings Dec. 31, 2018:** holds 14,308 Bittium Corporation shares. Independent as regards to the Company and its significant shareholders.



## Riitta Tiuraniemi

b. 1962, M.Sc. Electrical Engineering  
Full-time occupation: HealthOperator Ltd., CEO and Founder

### Positions of trust:

- Bittium Corporation, Member of the Board and Member of the Audit Committee 2018–.
- HealthOperator Ltd, Member of the Board, 2014–.
- Finnish Industry Investment Ltd, Member of the Board, 2014–.

### Previous work history:

- DNA Ltd, CEO, 2009–2013.
- DNA Finland Ltd, CEO, 2005–2008.
- DNA Networks Ltd, CEO, 2004–2005.
- DNA Networks Ltd, CTO, Chief technical officer, Member of management group, 1999–2005.
- Omnitele Oy, Department Head, Mobile Communications Consultancy, Member of management group, 1990–1999.
- Technology Development Centre, TEKES, Finland Senior Technical Adviser, Information Technology, 1996–1997.
- Nokia Telecommunications, Mobira Thesis, System Designer, Chief System Designer, 1986–1990.

**Holdings Dec. 31, 2018:** holds 1,437 Bittium Corporation shares. Independent as regards to the Company and its significant shareholders.



## Petri Toljamo

b. 1974, M.Sc., Radio Engineering, eMBA  
Full-time occupation: Keysight Technologies Inc., NEMO Wireless Network Testing, Vice President and Keysight Finland Oy, Managing Director

### Positions of trust:

- Bittium Corporation, Member of the Board, 2018–.
- Keysight Finland Oy, Chairman of the Board, 2017–.
- Manea Capital Oy, Chairman of the Board, 2016–.

### Previous work history:

- Anite Finland Oy, Managing Director and Anite Network Testing Business Unit, Managing Director, 2013–2017.
- Pulse Electronics, Mobile Division Director and Pulse Finland, Managing Director 2011–2013.
- Elektrobit Wireless Communications, Vice President, Device and Network Solutions Business Area, 2010.
- Elektrobit Wireless Communications, Vice President, Mobile Device Solutions Business Area, 2008–2009.
- Elektrobit Wireless Communications, Cellular Terminal Solutions Business Area, Director, 2007–2008.
- Elektrobit Wireless Communications, Platform R&D and Head of Terminal Programs, Director, 2005–2006.
- Elektrobit GmbH, Business Development, Director, 2004–2005.
- Elektrobit Oy, various product development, project management and business positions, 1996–2004.

**Holdings Dec. 31, 2018:** holds 1,437 Bittium Corporation shares. Independent as regards to the Company and its significant shareholders.

## The Board Committees

The proper function of the corporate governance of a company requires that Board work is organized as efficiently as possible. For this reason, the Company has established an Audit Committee.

The Directors on the Committee can concentrate on the matters delegated to the Committee more extensively than the entire Board of Directors. The purpose of the Committee is to enhance the efficient preparation of matters within the competence of the Board, increase transparency and ensure the quality and efficiency of the decision-making of the Board.

The Committee assists the Board by preparing matters falling within the competence of the Board. The Board remains responsible for the duties assigned to the Committee. The Committee has no autonomous decision-making power, and thus the Board makes the decisions within its competence collectively.

The Committee shall regularly report on its work to the Board. The reports shall include at least a summary of the matters, addresses and measures taken by the Committee.

The central duties and operating principles of the Audit Committee are described in the next chapter. The Annual General Meeting decides on the compensation of the members of the Board Committee and such compensations can be publicly viewed at [www.bittium.com](http://www.bittium.com).

### Audit Committee

The Audit Committee has the following duties:

- to monitor the reporting process of financial statements;
- to supervise the financial reporting process;
- to monitor the efficiency of the Company's internal control, internal audit, if applicable, and risk management systems;
- to review the description of the main features of the internal control and risk management systems pertaining to the financial reporting process, which is included in the Company's corporate governance statement;
- to monitor the statutory audit of the financial statements and consolidated financial statements;
- to evaluate the independence of the statutory auditor or audit firm and particularly the provision of related services; and
- to prepare the proposal for resolution on the election of the auditor.

The Chairman and the members of the Audit Committee are appointed by the Board of Directors of the Company. At least one Committee member must be a financial expert who has significant knowledge and experience in accounting and accounting principles applicable to the Company. The Board of Directors elected in the Annual General Meeting held on April 11, 2018 decided in its assembly meeting held on the same day to elect Mr. Juha Putkiranta (Chairman of the Committee) and Ms. Riitta Tiuraniemi as members of the Audit Committee. All members of the Committee are independent from immediate interest of both the Company and its significant shareholders and they have long term experience in business management. The Board of Directors decided further in its same meeting

to invite authorized public accountant Mr. Seppo Laine as external advisor of the Board of Directors.

In addition to Committee members, other regular participants to the committee meetings are CEO, CFO and CLO who acts as the Committee's secretary and optionally external auditors. Further, the Committee members may meet the external auditors without the operative management being present in such meetings. In 2018, the Audit Committee convened six (6) times to ordinary meetings. The Committee has evaluated, prepared and reviewed, inter alia, the following subject matters during the financial period of January 1, 2018–December 31, 2018:

- Financial Statements of 2017;
- Half Year Financial Report of 2018;
- Annual audit plan for 2018;
- Observations based on auditing during the financial period;
- Observation by the internal control;
- Cash flow monitoring and evaluation of sufficiency of financing;
- Budget target setting and budgeting process;
- M&A related issues and their effects on the result, balance sheet and financing status of the Group;
- Group legal structure related questions; and
- Impairment testing of the subsidiary shares and goodwill.

During 2019 the Committee's focus areas are:

- Controlling the valuation processes of inventory; and
- Review of the finance process, covering among other things offer calculating and agreement processes, cash flow, internal decision authorizations and compliance of the operations with instructions.



## Hannu Huttunen

Chief Executive Officer, 2015–  
b. 1966, M.Sc. (Econ.)

### Positions of trust:

- Technology Industries of Finland, Member of the Board, 2017–.

### Previous work history:

- Elektrobit Technologies Ltd., President, Wireless Business Segment 2010–2015.
- Tekniseri Oy, Member of the Board 2012–2016.
- EXFO Inc., Vice President, Wireless Division (previously NetHawk Oyj) 2010.
- NetHawk Oyj, CEO 2003–2010, NetHawk Oy, Executive Vice President 2002–2003.
- Nokia Mobile Phones Oy, Vice President, IP Convergence 2002, Vice President Special Products Business 1998–2002, NMT450 Business unit leader 1995–1998.

### Holdings Dec. 31, 2018:

Holds 10,000 shares in Bittium Corporation.

## Chief Executive Officer (CEO)

The CEO is in charge of the operative management of the Company in accordance with the Finnish Companies Act, the Articles of Association as well as the instructions and orders given by the Board of Directors. The CEO is responsible for the preparation of the Board meetings and implementation of any decisions made therein. Further, the CEO is responsible for ensuring that the Company's accounting methods comply with the applicable law and that the financial matters are being handled in a reliable

manner. The CEO prepares strategy, long-term planning, investments, mergers and acquisitions, financing and makes decisions thereof to the extent that such decisions are not tasks of the Board of the Directors. The CEO is responsible for financial planning, the Company's communications and investor relations.

The Board of Directors defines and approves the essential terms of the service of the CEO, including the CEO's remuneration, in

the form of a written agreement. The CEO's service contract is effective until further notice and can be terminated by the Company with twelve (12) and the CEO with six (6) months' written notice.

The pension security of CEO is statutory and he does not have supplementary pension. According to the pension legislation, the lowest limit of the pension age for CEO is 65 years and 3 months.

## Management Group

The management group supports the CEO in his tasks and consists of the CEO as the chairman, CFO, Chief Legal Officer, Director Corporate Communications and Marketing, as of October 1, 2018 Vice President, Sales, Directors responsible for product and service areas, Vice President responsible for Engineering and Senior Vice President responsible for Sales. The management group supports the CEO in operative management, implementation and follow-up of the CEO's competence area, in particular as regards the operative business, the management and development of the business portfolio, asset management and taxation, internal audit, Corporate Governance of the Company, investor and marketing communications and risk management.



### Karoliina Fyrstén

Director, Corporate Communications and Marketing, 2015–  
b. 1977, M.A. International Business Communications

#### Previous work history:

- Elektrobit Corporation, Corporate Communications Manager, 2015.
- Elektrobit Automotive GmbH, Corporate Communications Manager, 2013–2015.
- Elektrobit Corporation, Corporate Communications Manager, 2009–2013.
- Elektrobit Corporation, Internal Communications, 2006–2008.
- Elektrobit Group Plc, Communications, 2002–2006.
- JOT Automation Group Plc, Investor Relations and Communications, 2001–2002.

#### Holdings Dec. 31, 2018:

Holds 1,600 shares in Bittium Corporation.

### Jari-Pekka Innanen

Vice President, Engineering, 2015–  
b. 1968, M.Sc. (ME)

#### Previous work history:

- Elektrobit Wireless Communications Ltd., Vice President, Engineering, Wireless Business Segment, 2011–2015.
- Elektrobit, Senior Manager, WS Global Resourcing, 2007–2010.
- Elektrobit, Manager, Head of Global HW, 2006–2007.
- Elektrobit, Manager, Mobile Terminal Solutions, Head of HW Competence areas, 2006.
- Elektrobit, Manager, Mechanical Competence Center, 2003–2005.
- Elektrobit, Project Manager, 1999–2003.
- Elektrobit, Mechanical Designer, 1998–1999.
- Outokumpu Stainless Steel, Supervisor Cold Rolling Mills, 1994–1997.

#### Holdings Dec. 31, 2018:

Holds 7,000 shares in Bittium Corporation.



## Kari Jokela

Chief Legal Officer, 2014–.  
b. 1969, LL.M., trained on the bench,  
Mag.lur. (Saarbrücken)

### Previous work history:

- Elektrobit Technologies Ltd., Senior Legal Counsel, 2012–2014.
- Elektrobit Corporation, Senior Legal Counsel, 2010–2012.
- Elektrobit Automotive GmbH, Senior Legal Counsel, 2008–2010.
- Elektrobit Corporation, Senior Legal Counsel, 2008.
- Polar Electro Ltd., Group Legal Counsel, 2000–2007.
- Asianajotoimisto Gilbert, Segall and Young Oy, Attorneys at Law Helsinki, attorney, 1998–2000.

### Holdings Dec. 31, 2018:

Holds 1,100 shares in Bittium Corporation.



## Pekka Kunnari

Chief Financial Officer, 2015–.  
b. 1967, M.Sc. (Econ.), LL.M.

### Previous work history:

- Elektrobit Technologies Ltd., Vice President, Finance 2011–2015.
- Elektrobit Corporation, Director, Finance 2005–2011.
- Elektrobit Inc., Group Controller 2004–2005.
- Elektrobit Group Corporation, Group Controller 2003–2004.
- Elektrobit Ltd., Business Controller 2001–2003.
- RPC Rapid Prototyping Center Oy, Finance Manager 2000–2001.
- Tilintarkastajien Ltd. - Ernst & Young, Auditor 1998–2000.
- Tuottotieto Ltd., Business Consultant 1994–1998.

### Holdings Dec. 31, 2018:

Holds 3,000 shares in Bittium Corporation.



## Sammy Loitto

Senior Vice President, Sales, 2018–.  
b. 1980, MBA, M. Eng. (Industrial Management)

### Previous work history:

- Bittium Corporation, Director, Corporate Business Development, 2017–2018.
- Jolla Oy, Vice President, Sales & Business Development, 2016–2017.
- Gryphon Secure Oy, Vice President, Sales & Business Development, 2015–2016.
- Airbus DS Finland Oy, Senior Vice President, Sales, Solution & Product Management, 2009–2015.
- Telia Finland Oyj, Product Development Manager, 2004–2009.

### Holdings Dec. 31, 2018:

Holds 200 shares in Bittium Corporation.



## Klaus Mäntysaari

Senior Vice President, Connectivity Solutions & Head of Technology Development, 2016–. b. 1966, M.Sc.

### Positions of trust:

- Health Innovation Academy Oy, Deputy Member of the Board, 2014–.

### Previous work history:

- Bittium Wireless Ltd., Vice President, Telecom, 2015–2016.
- Elektrobit Wireless Communications Ltd., Vice President, Telecom, Wireless Business Segment, 2014–2015.
- Elektrobit, Vice President, Service Business Area, Wireless Segment, 2011–2014.
- Elektrobit, Director, Sales & Marketing Development, Wireless Solutions Business Unit, 2008–2011.
- Elektrobit, Director, Sales & Account Management & Marketing, Mobile Terminal Solutions Business Unit, 2008.
- Elektrobit, Director, Sales & Account Management, Mobile Terminal Solutions Business Unit, 2007–2008.
- Elektrobit, Head of Customer Operations, Contract R&D Business Unit, 2006–2007.
- Elektrobit, Director, Global Nokia Key Account Management, Contract R&D Business Unit, 2005–2006.
- Elektrobit, Key Account Manager, Nokia Terminals, Contract R&D Business Unit, 2004–2005.
- Nokia, Senior Manager, Vodafone Account, Nokia Multimedia, IP Convergence Business Program, 2004.
- Nokia, Senior Marketing Manager, Nokia Multimedia, IP Convergence Business Program, 2002–2004.
- Nokia, General Manager, Nokia Mobile Phones, Special Products, 2000–2002.
- Nokia, Marketing Manager, Nokia Mobile Phones, Special Products, 1998–2000.

### Holdings Dec. 31, 2018:

Holds 2,000 shares in Bittium Corporation.



## Arto Pietilä

Senior Vice President, Medical Technologies, 2016–. b. 1958, M.Sc. (Applied Electronics)

### Previous work history:

- Bittium Wireless Ltd., Senior Vice President, Operations, 2015–2016.
- Elektrobit Wireless Communications Ltd., Senior Vice President, Operations, Wireless Business Segment, 2010–2015.
- Elektrobit Wireless Communications Ltd., Senior Vice President, Operations, Wireless Solutions Business Unit, 2008–2010.
- Elektrobit Wireless Communications Ltd., Executive Vice President, Mobile Terminal Solutions Business Unit, 2006–2008.
- Elektrobit Wireless Communications Ltd., Executive Vice President, Contract R&D Business Unit, 2004–2006.
- Elektrobit Technologies Ltd., Managing Director, 2004–2006.
- Elektrobit Ltd., Managing Director, 2002–2004.
- Elektrobit Ltd., Vice President, Contract R&D, 2001–2002.
- Polar Electro Oy, President & CEO, 1999–2001.
- Polar Electro Oy, Executive Vice President, 1996–1999.
- Polar Electro Oy, Technical Director, 1992–1996.
- Polar Electro Oy, Product Development Manager, 1986–1992.
- Polar Electro Oy, SW/HW Design Engineer, 1980–1986.

### Holdings Dec. 31, 2018:

Holds 80,000 shares in Bittium Corporation.



## Jari Sankala

Senior Vice President, Defense & Security, 2016–. b. 1966, M.Sc. (Electrical Engineering, Digital Communications)

### Previous work history:

- Bittium Corporation, Senior Vice President, Sales, 2015–2016.
- Elektrobit Wireless Communications Ltd, Senior Vice President, Sales & Marketing, Wireless Business Segment, 2014–2015.
- Elektrobit Wireless Communications Ltd, Executive Vice President, Defence and Security, 2011–2014.
- NetHawk Group, Executive Vice President of Sales & Marketing, 2005–2011.
- NetHawk Germany, Managing Director, 2001–2005.
- Siemens AG, Sales Director Northern Europe, Mobile Networks, Germany, 1996–2001.

### Holdings Dec. 31, 2018:

Holds 27,500 shares in Bittium Corporation.

## Election and Remuneration of the Auditor

The Company shall have one (1) auditor that has qualified as Certified Public Accountant and if the auditor is not an auditing company as defined by the law, one (1) deputy auditor shall be elected. The term of office of the auditor expires at the end of the following Annual General Meeting.

The General Meeting 2018 re-elected Ernst & Young Oy, authorized public accountant firm, auditor of the company. Ernst & Young Oy has notified that Mr. Juhani Rönkkö, CPA, will act as the responsible auditor. The remuneration to the auditor shall be paid against the auditor's reasonable invoice.

The auditor's fees in 2018 amounted to EUR 112,000 (EUR 133,000 in 2017). Of the aggregate fees, EUR 90,000 was attributable to auditing (EUR 93,000 in 2017), EUR 16,000 to tax advice (EUR 29,000 in 2017) and EUR 6,000 to other services (EUR 11,000 in 2017).

## Main Features of Internal Control and Risk Management Processes Related to Financial Reporting Processes

### Risk Management

The purpose of risk management is to secure positive development of earnings of the Company and the continuation of the business by implementing risk management cost-effectively and systematically throughout the different businesses.

Risk management is part of the Company's strategic and operative planning, daily decision making process and internal control system. Business objectives, risks and risk management operations are combined through risk management as one chain of events.

### Main Principles of Organizing Risk Management

Company adheres to the risk management policy approved by the Board.

Risk management contains all actions, which are connected to setting up targets, identification of risks, measurement, review, handling, reporting, follow-up, monitoring and reacting to risks.

#### The Aim of Risk Management of the Company Is to:

- systematically and thoroughly identify and assess all major risks, which threaten the achievement of objectives, including risks related to business operations, property, agreements, competence, currencies, financing and strategy;
- optimize business opportunities and secure continuation of business;
- recognize and identify uncertainties and subsequently develop the prediction of risks and measures needed to manage risks;
- take only calculated and assessed risks with respect to e.g. expanding the business, increasing market share and creating new businesses;
- avoid or minimize liability risks;
- ensure the safety of products, solutions and services;
- establish a safe working environment for the employees;
- minimize possibilities for unhealthy occurrences, crimes or misconduct by operating procedures, control and supervision;
- inform interest groups of risks and risk management; and
- be cost-effective in risk management.

#### The Aim of Risk Management Is Not to:

- exclude all risks at their entirety;
- adopt unnecessary control and management procedures; or
- take bureaucratic processes and procedures into use.

### Main Principles of the Risk Management Process

In connection with the strategy process and annual planning the CEO reviews business risks which could endanger the achievement of strategic or financial targets. Risk assessment reports are produced to support the strategy process. Strategic and operative risks are monitored through monthly reporting by businesses in the Board of the Company. Businesses must produce assessments of risks in their designated areas of responsibilities and provide action plans to manage risks as well as to report on measures taken including the stage and effectiveness of such measures.

### General Description of Internal Control and Operational Procedures

Internal control is a process applied by the Board of Directors, management and all levels of personnel in the Company to ensure that management has reasonable assurance that:

1. operations are effective, efficient and aligned with strategy;
2. financial reporting and management information is reliable, complete and timely made; and
3. the Company is in compliance with applicable laws and regulations as well as the Company's internal policies and ethical values including sustainability.

The first category addresses the basic business objectives, including performance and profitability goals, strategy, implementation of objectives and actions and safeguarding resources. The second category relates to the preparation of reliable published financial statements, including half year financial reports and condensed financial statements and selected financial data derived from such statements, such as earnings releases, reported publicly. The third category deals with complying with those laws and regulations to which the Company is subject to.



## Internal Control Framework of the Company

Bittium's internal control framework consists of:

- the internal control, risk management and corporate governance policies and principles set by the Company's Board of Directors;
- management overseeing the implementation and application of the policies and principles;
- finance function and business controllers monitoring the efficiency and effectiveness of the operations and reliability of the financial and management reporting;
- enterprise risk management process identifying, assessing and mitigating risks threatening the realization of the Company's objectives;
- compliance procedures making sure that all applicable laws, regulations, internal policies and ethical values (including sustainability) are adhered to;
- effective control environment at all organizational levels including control activities tailored for defined processes and creating group minimum requirements for product and service areas as well as for geographical areas;

- shared ethical values and strong internal control culture among all employees; and
- internal audit assignments reviewing the effectiveness of the internal controls as needed.

## Risks and Controls in Core Business Processes

Risk management procedures are in place for business processes in the form of defined control points:

- relevant process risks are identified;
- common control points / Company's minimum requirement control points are identified;
- common control points are implemented in business processes; and
- additional control points can be determined as needed at business or functional levels.

Control activities are the policies and procedures that help ensure that management directives are carried out. They help ensure that necessary actions are taken to address risks to achievement of the Company's objectives. Control activities are set throughout the organization, at all levels and in all functions. They include various range of ac-

tivities including but not limited to approvals, authorizations, verifications, reviews of operating performance, securing of assets and segregation of duties.

## Internal Controls Over Financial Reporting

The Company's external financial reporting process, internal control and risk management systems are briefly described in this section. The main focus is on financial accounting and related controls.

### Financial Reporting Organization

The financial management of the Company is responsible for organizing the accounting, money transactions and other daily financial operations of the companies belonging to it as well as organizing the internal reporting that supports the business.

The tasks of the Company's financial administration consist of, inter alia, monthly consolidation of the Group entity, preparation of half-year financial reports and consolidated financial statements, management and investment of monetary assets of the Group, management of liabilities, protection against exchange risk, and transfer

pricing. The finance function of the Company implements operative supervision under the CFO who reports any supervisory findings to the Audit Committee. The tasks and responsibilities of the accounting function of the parent company and each subsidiary are included in the job descriptions of the teams and employees.

### Financial Reporting Systems

Consolidated financial statements are prepared by using the chosen consolidation tool. The accounting of the Group's subsidiaries is done by using the local accounting systems from which the actual figures are reported either manually or by automatic transfer to the group consolidation system. The accounting system in use includes general ledger accounting, accounts payables and accounts receivables. Current assets and payroll accounting is organized through various programs or purchased as an outsourced service. Purchase invoices are circulated through electronic invoice processing system. Global forecasts and budgets are prepared by using the forecast and reporting program.

### Internal Controls

The Company's internal control mechanisms are based on policies, instructions, limited process descriptions, authorization matrix, financial reporting review meetings, and segregation of key accounting duties.

### Compliance Procedures

Compliance processes are in place at all levels of the organization to ensure that that all applicable laws, regulations, internal policies and ethical values including sustainability are adhered to. The management and businesses are responsible for following up developments in legislation and regulations in their respective areas and communicating them to the organization. The members of the Management Group are responsible for setting up adequate compliance controls and compliance related training in their units. Chief Legal Officer of the Company coordinates the appropriateness and compliance of the compliance processes.

## Roles and Responsibilities Regarding Risk Management and Internal Control

The key roles and responsibilities regarding the Company's internal control and risk management are defined as follows:

### Board of Directors

The Board of Directors is ultimately responsible for the administration and the proper organization of the operations of the company. According to good corporate governance, the Board also ensures that the Company has duly endorsed the corporate values applied to its operations. The Board approves the internal control, risk management and corporate governance policies. The Board establishes the risk-taking level and risk bearing capacity of the Company and re-evaluates them on a regular basis as part of the strategy and goal setting of the Company. The Board reports to the shareholders of the Company.

### Audit Committee

Audit Committee is responsible for the following internal control related duties:

- to monitor the reporting process of financial statements;
- to supervise the financial reporting process;
- to monitor the efficiency of the company's internal control, internal audit, if applicable, and risk management systems;
- to review the description of the main features of the internal control and risk management systems pertaining to the financial reporting process, which is included in the company's corporate governance statement; and
- to monitor the statutory audit of the financial statements and consolidated financial statements.

More detailed descriptions how the Audit Committee is fulfilling its monitoring role are defined in the Committee's annual plan. The Audit Committee reports to the Board of Directors of the Company.

### Chief Executive Officer

CEO is in charge of the day-to-day management of the Company in accordance with the instructions and orders given by the Board. The CEO sets the ground for the internal control environment by providing leadership and direction to senior managers and reviewing the way they are controlling the business. The CEO is in charge of the risk management process of the Company and its continuous development, allocation of resources to the work, review of risk management policies as well as defining the principles of operation and overall process. The CEO reports to the Board on risk management as part of the monthly reporting. The CEO and the Management Group, which operates under the CEO, are responsible for the management of risks endangering the fulfillment of objectives set for the Company.

### Management Group

The members of the Management Group are responsible for internal control implementation in their responsibility areas. More specific internal control policies and procedures are established within the principles set by the Board and CEO. Additionally, the management of the subgroup and the Group Management are responsible for implementing risk management practices in planning cycle and daily operations, and ensure the adherence of:

- laws;
  - regulations;
  - internal policies; and
  - ethical values
- in their designated responsibility areas.

The CFO:

- ensures a setup of adequate control activities for product and service areas in cooperation with the business management;
- follows the adequacy and effectiveness of control activities; and
- ensures that external reporting is correct, timely and in compliance with regulations.

Finance function does not have a separate internal control function. CFO reports any supervisory findings to the Audit Committee.

Chief Legal Officer ensures that the Group's corporate governance practices comply with the law and that legal matters of the Group are handled appropriately, in particular the contractual risks relating to business operations.

#### **Internal Audit**

The Company has no specific internal audit organization. This is taken into account in the content and scope of the annual audit plan. On the one hand, external auditing focuses on specific areas in turn to be audited, and on the other hand, on separately agreed priority areas.

## Insider Guidelines

The Company adheres to the Insider Guidelines for Listed Companies prepared by Nasdaq Helsinki Ltd (previously NASDAQ OMX Helsinki Ltd, OMX Nordic Exchange Helsinki Ltd and Helsinki Stock Exchange), the Central Chamber of Commerce and the Confederation of Finnish Industries. The Company has complemented the Guidelines by its internal insider guidelines. The insider and trading guidelines approved by the Company include regulations on insiders, publication and postponement of publication of inside information, prohibited use of inside information, insider registers, duty of notification of managers' and their closely associated persons' transactions, and personnel's own trading with the Company's financial instruments. The purpose of the guideline is to explain the content of the guideline published by Nasdaq Helsinki Ltd and other regulations and restrictions relating to the matter, and to unify and coordinate the processing of insider and trading matters within Bittium.

The managers of the Company must comply with the EU Market Abuse Regulation's prohibition on dealing in the Company's financial instruments (closed period).

In accordance with the Company's Board of Directors' decision, the Company has in addition determined certain time periods during which persons taking part in the preparations of the Company's financial reporting, and other persons who have access to information pertaining to the Company's financial status, are prohibited to trade the Company's financial instruments. The purpose of the trade restrictions is to control trading of the Company's financial instruments, and thereby increase trust to the Company and the operation of the securities market. Trading with the Company's financial instruments is completely prohibited for the aforementioned persons for a period of 30 days before the publication of earnings information of the Company. The most common publications are the release of half year report and release of the Company's financial statements. The restriction is applicable also to any possible preliminary information regarding the financial statements and half year report.

Persons included in a project-specific insider register are prohibited from all trading and business transactions until the project has expired or has been publicly announced. If the project falls upon another listed company or may affect the price of the financial instruments of another listed company, the project-specific insiders have no right to trade with such company's financial instruments.

The Company voluntarily maintains on its website a list of the financial instruments owned by the Company's managers or by the institutions operating under the authority of the managers. The list is updated on the last day of each month.



# Sustainability at Bittium

Bittium is a global technology company and responsibility covers its products and services as well as its way of creating value for the surrounding society.

Our sustainability is based on the company's strategy and values. We pay actively attention to our focus areas that are important for us. These focus areas are:

- innovative and developing people;
- confidential customer relationships and secure products; and
- corporate citizenship and responsible business practices.

Our most important assets are our talented people, diverse and non-discriminatory working community as well as our personnel's well-being and competence.

We offer our employees challenging and motivating tasks. We are committed to support their development and invest in their well-being. We cherish open company culture and good working atmosphere.

We are reliable and trustworthy partner for all our stakeholders. Company's ethical principles and Code of Conduct guide our operations with all stakeholders. In customer relationships the responsibility is captured in the way we work and in the quality of our products, as well as in the confidentiality in the relationship. One of the key cornerstones of our company is trust.

Responsibility is the basis of our operations. It supports us in the risk management, and is an important value and competitive advantage for us. Sustainability follows us through long-term value creation.

**"VETOVOIMA-PALKINTO 2018"**  
 – the Successful ICT Company  
 Award was granted to Bittium by  
 Oulu Chamber of Commerce



**67%**

**THE RESPONSE RATE OF  
 THE PERSONNEL SURVEY**

**NPS**  
 Net Promoter Score  
 increased from 50 → 56

**↑ 56**



**AUTHORITATIVE  
 STAKEHOLDER VISIT**

The Federal President of the Federal Republic of Germany and his spouse visited Bittium in October 2018

**RECYCLING RATE**  
 increased from 66% → 99%

**↑ 99%**



**↓ 11%**

**WATER  
 CONSUMPTION**  
 decreased by 11%

**CARBON FOOTPRINT**  
 2,865 kg CO<sub>2</sub>e  
 / person / year

**2,865**  
 kg CO<sub>2</sub>e

**SHARE OF THE USE  
 OF THE SUN ENERGY**  
 reached over 12% / month  
 at the highest

**ISO 50001**  
 Energy Efficiency  
 System Certificate

**✓**  
**ISO 50001**



**5 SYSTEM  
 CERTIFICATES**  
 ISO 9001, AQAP 2110,  
 ISO 13485 quality  
 system certificates  
 and ISO 14001, ISO 50001  
 environmental certificates

## Our Value Creation Model

### Our Most Important Resources

#### People

- Almost 700 specialists
- Investments in personnel's wellbeing and competence development

#### Customer relationships

- Wide customer portfolio in public and private sector

#### R&D and materials

- Company culture supporting innovation
- Investments in product development
- IPR management
- Responsible sourcing

#### Profitable and responsible business

- Strong balance sheet
- Investments
- Responsible way of doing business
- Comprehensive quality, environment and safety systems
- Natural resources (energy and water)
- Compliance processes

#### Stakeholders

- Research and development cooperation
- Stakeholder and authority cooperation
- Trusted partnerships

### Our Mission

We adapt our deep knowledge to deliver superior innovations and reliable, secure communications and connectivity solutions.



Through these product and service areas we offer solutions for our customers in a way they can respond to the changes and opportunities in the environment brought by new technologies.



## Throughputs and Impacts

### Customers, products and services

- Customer relations built on trust
- Long-term partnerships
- Long-term and secure products using latest technologies
- Secure communication and connectivity solutions
- Reliable and advanced remote health monitoring solutions
- Minimizing the product life cycle impacts
- Quality, productivity and information security

### Society and environment

- Taxes, salaries and fees
- Active partner in the partner network
- Added value from the research and development
- High-end technology solutions for the growing need of society
- Optimizing energy and water consumption in own operations and products at all stages of their life cycle
- Enabling healthcare sector cost savings with technology solutions

### Innovative experts

- Prosperous and innovative experts
- Continuous competence development
- Meaningful work and supporting working environment

### Investors

- Profitable and capital investment

## Megatrends that Affect Our Operations

A megatrend that has a huge effect on our operations is digitalization, whose different manifestations create both business threats and business opportunities.

### Connectivity as an enabler of digitalization

The rise of merged software, complex system management and the fast development of the 5G technology create opportunities for us to provide added value to our customers. To maintain our competitive edge, we need to keep intensifying our own technological development.

### Internet of Things (IoT)

The growing importance of the IoT means that operational processes and the IoT need to be integrated to ensure efficiency. We utilize robotic process automation to develop our own operations. For our customers, we develop challenging IoT-related solutions that require specific data security.

### Digitalization and aging population

As the population is getting older and the global population is mushrooming, the digitalization of health care plays an important role for the ability to maintain the productivity and coverage of services. Remote monitoring, wireless solutions, new home care methods and faster and more efficient health data analyses are amongst the technological solutions we have developed to benefit our customers.

### Information security

As digitalization and technologies develop, the challenges of data security also become more prominent. This has made cyber security one of the major concerns. Tighter data security and regulatory requirements are reflected on the operations of our customers as well as Bittium. The requirements will also extend to new sectors and applications and, at the same time, the importance of data security certification will increase. We are familiar with these fast-increasing, sector-specific requirements and stay ahead of the curve in implementing them in our product development.

## Financial Influence

For Bittium, financial influence means securing the profitability of operations for the long term. This way, we will be able to add value to our different stakeholders as well as the society around us. Profitable operations benefit shareholders, employees, partners, subcontractors, retailers, customers, municipalities and the state alike.

Conforming with legal requirements is the basic premise of financial responsibility. However, in many regards, sustainability and influence exceed the legal requirements.

### Ensuring Added Value to Stakeholders

When it comes to Bittium’s financial influence, the local scope is the one that matters most. Local added value is generated especially via direct and indirect effects on employment. In addition to the local effects, our influence extends via tax payments, dividend payments and business effects from the national level to the countries in which we operate around the world.

Bittium operates in Europe, the Americas and Asia. Nonetheless, the majority of our employees work in Finland, more than half of them in the city of Oulu.

Still, ensuring added value means securing long-term growth and financial stability, comprehensive risk management and a long-standing commitment to the development of society and the local community. In addition to financial risks, risk management should take into consideration other risks concerning the valuation of the company, such as reputational risks.

Our business operations should react to the changes in the operating environment to maintain profitability and competitiveness in the future. The technological revolution and the resulting technological solutions create both opportunities and threats – changes that we should take into account already during the product development stage.

We already utilize robotics in-house, for instance, for financial administration tasks. As robotics and AI become more routine, they will have a greater effect on the development of our operations down the line. This also includes a change in job descriptions; what kind of skilled persons we will require and how we will recruit top talent in the future.

## Tax Footprint

In Bittium, taxes are part of our business process and tax management supports our company strategy. Bittium operates in six different countries. In line with this, our business profits and the resulting taxes occur locally.

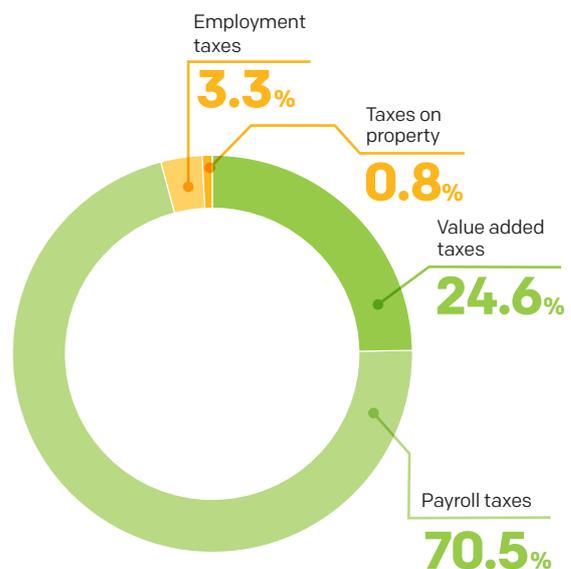
Bittium’s tax strategy is to support business decisions and ensure their proper implementation also from the point of view of taxation. Tax planning supports business efficiency and productivity creating added value to the owners and ensuring compliance with the established regulations. Our tax planning is not aggressive and it is not based on artificial arrangements. It is always based on our actual business needs.

Our tax strategy is aimed at making sure that we calculate, report and pay our taxes correctly to the authorities, conforming to the established regulations. Bittium is committed to complying with the laws of our operating countries as well as lesser regulations, such as the transfer price instructions of the OECD. Good corporate citizenship is part of Bittium’s values. Accordingly, the quality of our tax processes is an important cornerstone of Bittium’s tax strategy. Our philosophy is to be open and transparent towards the tax authorities in all of the

## Tax Footprint in 2018

MEUR

<b>Taxes collected</b>	
Value added taxes (VAT)	-3.0
Payroll taxes	-8.6
<b>Total</b>	<b>-11.7</b>
<b>Taxes borne</b>	
Employment taxes	-0.4
Taxes on property	-0.1
<b>Total</b>	<b>-0.5</b>
<b>Taxes total</b>	<b>-12.2</b>



countries in which we operate. For its part, Bittium seeks to influence the development of tax systems to make them clearer, fairer and more consistent.

In Finland, Bittium works in close cooperation with the Finnish Tax Administration.

### Investments in R&D

We operate in a sector that creates products and services for the future through continuous development, innovations and cross-sector cooperation. We are strongly involved as the spearhead of technological development, and active cooperation with academic researchers increases our understanding of significant new technologies and promotes the digitalization of society. Bittium has a long strong cooperation relationship with the University of Oulu.

In 2018, we took part in several national projects financed by Business Finland as investors and research partners. Europe-wide, our cooperation covered, for instance, the H2020, ITEA and EIT cooperation projects. The focus areas of these cooperation projects included technologies that are critical for Bittium's future product and service business, such as authoritative communications solutions, data security, machine learning and software design methods based on the LTE and 5G technologies.

Our product development investments continued to rise from the 2017 level to 34.4 per cent of our revenue. The R&D investments were mainly focused on extending the defence product portfolio in tactical communications and in the development of terminals and software for the authorities and special purposes. Furthermore, we continued to develop our secure smartphones and their related security software. We also continued our investments in the further development of health technology products.

### Stakeholders and the Economical Performance 2018



Average Share Price, 2017-2018



# Sustainability Management

## Sustainability Organization and Risk Management

The Board of Directors of Bittium Corporation discusses sustainability questions on the basis of the Management Group's proposals, and the Audit Committee discusses and prepares responsibility questions.

The Management Group discusses sustainability questions, monitors the effectiveness of sustainability measures and sets targets in the biannual management review. The Management Group is also responsible for implementing sustainability plans and measures in daily business.

Bittium also has a social sustainability working group that is responsible for monitoring and the impact assessment of responsibility measures, reporting, and risk management and assessment. The working group has six members: CEO, Chief Legal Officer, Director, Corporate Communications and Marketing, Director, Human Resources, CFO and Head of Quality, the Environment and Processes. The sustainability working group holds quarterly meetings and prepares the sustainability report. Bittium management and the Board of Directors review the sustainability report annually.

The sustainability report specifies the applicable methods that guarantee a sufficient level of diligence. The managing of risks related to operations and the operating environment as well as the processes are specified in the Bittium Corporate Governance Statement.

### We Will Continue Developing Our Sustainability Work in 2019

Bittium will improve its sustainability management in the coming years. In 2019 we will conduct a stakeholder survey based on which we will make a materiality analysis in order to better take account of the needs of our stakeholders. At the same time we will review our sustainability focus areas and define goals and indicators for each of them. We aim at releasing our sustainability program in 2020.



## Stakeholder Cooperation

Bittium's operations affect many different stakeholders. Understanding their views and expectations is important for our operations and success. Open dialogue with our stakeholders helps us to develop our operations, products and solutions as well as the way in which we, as a company, can seek goal-oriented solutions to social challenges.

Bittium works in cooperation with national as well as international stakeholders. Our stakeholders include our employees, customers, different actors and other third parties, partners, the authorities, shareholders and analysts as well as different communities. Our stakeholder-related activities are guided by good management practice as well as our ethical principles and Code of Conduct.

### Personnel

We arrange several different staff events each year where our employees get the opportunity to ask questions and give feedback. In addition to this, we receive feedback from our staff via the anonymous annual employee survey. Equal treatment and open interaction are important to our employees. What they want from us is interesting and meaningful tasks and the chance for professional growth.

### Customers

We get constant feedback from our customers, primarily by continuously staying in touch with them and via various annual surveys. The Scrum and Agile methods that we use support ongoing monitoring and open dialogue. This enables us to quickly tackle and react to potential problems. Our customers value competitive and reliable products and services as well as our sustainable way of working.

### Suppliers and Partners

When it comes to our suppliers and other partners, we have often worked with them in close cooperation for a long time following established rules and ways of working. Constant communication enables open dialogue. Our suppliers and partners expect from us fair and sustainable operations and long-time cooperation. As for us, we expect our suppliers and partners to work in a sustainable way, and we monitor this on a regular basis.

### Authorities

Bittium keeps a regular line of communication open towards the authorities, for example, with regard to export control and data security issues. We regularly monitor our compliance with the laws and regulations.

Applying them to our business operations requires open and ongoing interaction with the authorities.

### Local Cooperation

As part of our sustainable corporate citizenship, Bittium actively collaborates with different communities. We meet the expectations of different communities in a variety of ways. We regularly support educational institutions and schools to introduce young students to working life – and not forgetting the teachers. Thanks to this collaboration, we are also able to recruit new and enthusiastic graduates. Research and development cooperation with companies and research institutions extends our competencies and makes it possible to mutually promote development.

### Shareholders and Investors

Shareholders, investors and analysts expect Bittium to provide long-term value and act in a sustainable manner. We hold discussions with them at different events and the annual general meeting.

# Focus Areas of Sustainability



The Sustainable Development Goals of the United Nations, in which Bittium focuses in its operations.

We have identified the following areas of sustainability as fundamental to our business operations and defined them as our sustainability focus areas. We monitor the progress of each focus area using selected indicators and constantly develop our operations and performance.

**Innovative and developing people**

- We take care of the well-being of our employees
- We invest in the development of competencies and leadership skills
- We promote an open, equal and diverse working culture

**Confidential customer relationships and secure products**

- We meet the special sector-specific and technological requirements of our customers (quality and security)
- We invest in innovative and flexible product development
- We ensure the sustainability of our procurement chain

**Corporate citizenship and sustainable business practices**

- We engage in open dialogue with our stakeholders and support the local communities in which we operate
- We conform to sustainable business practices
- We create added value for our stakeholders through profitable, sustainable business operations

In addition to the prementioned focus areas, financial and environmental responsibility is a key part of our responsible and sustainable business operations. You can find more information on our financial influence in the 'Business and operating environment' section.

We have also reflected the themes of our focus areas on the UN Sustainable Development Goals (SDG) and identified the goals that are most important for the operations of our company:

- 3 Good health and well-being
- 9 Industry, innovation and infrastructure
- 13 Climate action
- 17 Partnerships for the goals

## Innovative and Developing People

Healthy and innovative professionals are key to our success. Ensuring the well-being and ability to work of our employees, developing professional skills and recruiting future professionals are our key focus areas.

At the end of 2018, Bittium had 674 employees in Finland, the United States, Mexico, the UK, Singapore and Germany. 99 percent of our employees are based in Finland. Most of the personnel work as R&D engineers.

### Company Culture and Innovation

Since its foundation, Bittium has been strongly based on its values, which are part of our everyday work and culture. Our corporate culture is defined by low organisation, low hierarchy, flexibility and transparency. Bittium's employees share a passion for technology and learning.

We believe in a culture of participation, discussion and debate, which leaves space for continuous development. This way, we can also lay the foundations of innovation, which is one of our values.

Supported by our encouraging and diverse corporate culture, operating methods and facility solutions, innovation is, to a large degree, an integral part of our operations. Ultimately, our innovative approach is reflected on our R&D and work with customers. As an example, Bittium has developed the world's first mobile phone that uses both terrestrial and satellite networks.

### Employee Survey and Experience

The prerequisites of innovation are motivated and happy employees, encouraging management and a sense of community. The annual Bittium Employee Survey (BES) is an important tool for developing well-being at work and job satisfaction and to reinforce the employee experience. The survey responses are discussed at all levels of the organisation, from the Board of Directors and Management Group to the individual teams.

67 percent of our employees took part in the employee survey completed at the end of 2018. Compared to the previous year the result was approximately at the same level, following several years of improvement. Our strengths, as revealed by the survey, include supervisory work, which showed improvement from the previous years measured by several indicators, as well as our open and respectful community spirit. On the other hand, the areas of development identified in the survey include competence development as well as the rush and situational changes evident in projects.

Competence development is one of the focus areas chosen for 2019. In addition, we continue developing our organization and way of working by using the principles of self-directing, agility and coaching leadership.

### Competence Development and Development Discussions

We revised our development discussion model back in 2016. According to the new model, subordinates and supervisors have an informal quarterly chat (Quarter Chat). In addition to this, the employees have the option to agree to have a separate longer conversation, especially with regard to a long-term competence development plan.

This actual development discussion is held when it is topical from the aspect of competence development.

A key objective of the switch to more frequent, regular discussions has been to take into consideration individuality and build trust in the relationships between supervisors and subordinates.

Coaching leadership is an important tool that promotes the development of individual skills. During 2019, we will be organising training sessions focused on improving the supervising and coaching skills of supervisors. The six-part coaching programme extensively covers the different areas of supervisor work, such as improving the employer image in recruitment, early-stage support, the management of different teams and individuals as well as self-management. The training is implemented in cooperation with the employee pension insurance company Varma.

In recent years, Bittium has focused its competence development measures on the development of flexible and efficient operating models, for example, software life-cycle processes and on the enhanced utilisation of open-source methods. Furthermore, Bittium takes an active part in the development of new technology skills, for example, in the areas of 5G, wireless communications technologies, machine learning and AI.

Various methods that enable learning are included in our daily operations, such as learning on the job, internal and external courses, the sharing of expertise and individual studying alongside work. In 2018, the average number of training days was 3.3 per employee. That figure comprises both internal and external training, including orientation and independent studies.



## Personnel in 2018



**674** end of year  
**660** average  
**586** engineers

### AVERAGE AGE

**42.3**

### BITTIUM YEARS

**8.2**

### RETIRED

**1**

### FEMALE

**11.7%**  
total

**11.1%**  
executive team

**16.7%**  
board

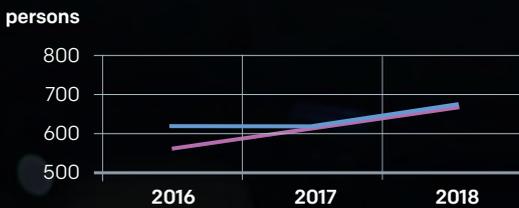
### EDUCATION

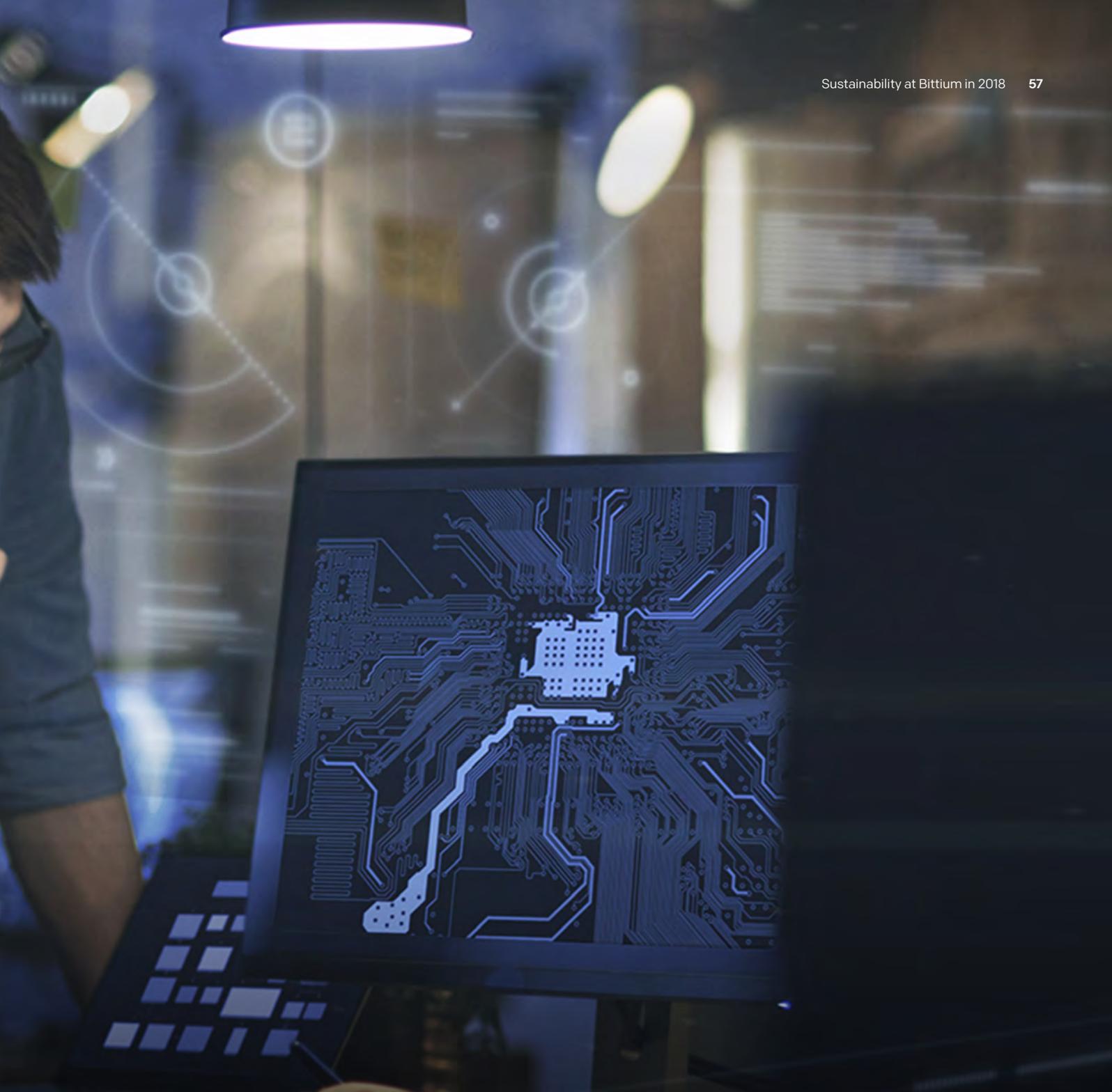
**87%**  
M.Sc / B.Sc

**2%**  
Lic. / Doc.

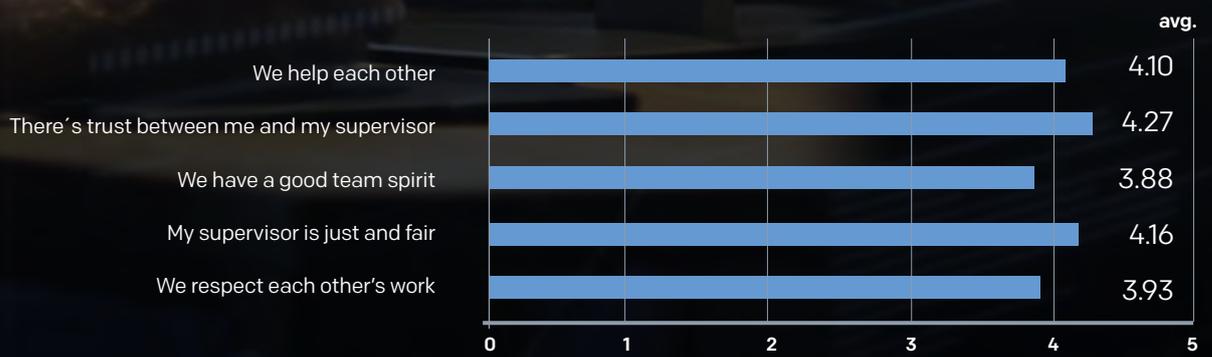
### TRAINING DAYS

**2,193** total  
**3.3** / person





**Bittium Employee Survey 2018: Sustainability Questions**



Response rate 67%. Scale 1 = poor, 5 = excellent

## Well-Being and Occupational Safety

The vast majority of work at a high-tech expert organisation is R&D, software development in particular, which means that the risks associated with manufacture and manual work are a relatively small concern. Hence, in our field, the most typical risks to an employee's ability to work include musculoskeletal diseases, coping at work and mental well-being. Project-based work is prevalent at Bittium, and the schedules and workload may vary greatly depending on the situation.

Our employees' well-being is widely supported by occupational healthcare services and other employee benefits. In the design of our facilities, we have placed a great emphasis on good ergonomics and a good working environment that encourages direct interaction and mutual innovation.

The Bittium OHS Committee holds regular meetings, and it has representatives from each of our offices in Finland. The operations are geared towards preserving the occupational health and ability to work of our employees and improving the quality of their working life.

All Bittium offices have appropriate safety plans in place. Some of our employees perform duties in which it is of particular importance to ensure electrical safety. The 'Close Call' reporting channel on our intranet enables our employees to report potential safety and 'Close Call' concerns.

Bittium's HR management and OHS function analyse occupational accidents at regular intervals and always in relation to any special risks that may occur. In 2018, there were ten incidents of occupational acci-

dents at Bittium's companies in Finland, the majority of which happened on the way to or from work. Only two of the incidents took place in the work place. None of the accidents resulted in incapacity to work.

## Human Rights, Equality and Diversity

We treat all of our employees and applicants equally regardless of their gender, age, ethnic background, political views or other similar background. Our equality plan is based on the Finnish Act on Equality Between Men and Women. We assess the implementation of equality at work from the point of view of employee surveys and studies, salaries, career development and recruitment.

From the aspect of managing and developing diversity, it is important to take into account different backgrounds and skills and to put them to good use. Participatory and coaching supervisor work plays an important role in this.

The principles regarding the diversity of the Board of Directors are defined in the Corporate Governance Statement.

The countries where Bittium's employees mainly work have advanced human rights laws. At Bittium, the monitoring of the implementation of human rights is mainly linked to the operations of subcontractors and suppliers, and Bittium has issued framework agreements and Supplier Requirements guidelines that serve as guidance in human rights questions. Bittium's main partners are assessed through self-assessments and audits in accordance with the annual plan. In 2018, no violations or significant deficiencies related to the use of child labour, forced labour, inappropriate disciplinary action, physical punishment

or health-related discriminatory practices were observed in Bittium's or its subcontractors' operations.

## Enhancing Employer Image

The competition for top talent in the technology sector is fierce, and Bittium is involved in the competition. Bittium's strengths as an employer include versatile tasks and development opportunities, working with different technologies, products and projects.

The meaningfulness of work is highlighted equally among our current and prospective employees, and we pay special attention to this by trying to be better at taking into consideration individual expectations and experiences regarding the factors that give work meaning.

In the future, we will concentrate even more on enhancing our image as an employer, improving the application experience and clarifying our employer promise to land the best people.

## Active Interaction

In addition to the development discussion and employee surveys, our internal interaction channels include conversational orientations and team meeting, events for the whole staff as well as our social intranet. We place a particular emphasis on our mutual staff events. We support our employees' community spirit and activities also outside working hours in the form of various clubs, physical exercise, activities, etc.

We engage in active collaboration with educational institutions. We are keen to showcase the fascinating opportunities that our sector provides for young people as early as possible. Collaboration with schools is

an important recruitment channel for future professionals. Visits to the company offer a good way for young people to get a concrete idea of the content and nature of the work. In 2018, we took part for the first time in the "Bring your kids to work" event. Our employees' children visited us in the morning to see where their parents work and explore things like our exciting test labs.

## Confidential Customer Relationships and Secure Products

Bittium specialises in the development of reliable, secure communications and connectivity solutions as well as mobile data security solutions. We also offer our customers healthcare technology products and services. Sustainability and responsibility are evident throughout the whole life-cycle of our products, from material choices to maintenance, confidentiality and data security.

Trust is one of our values and a cornerstone of our business. It refers equally to our customer relationships, products, services and operating methods. The continuous improvement of our operations, innovative and agile product development, meeting customer wishes and expectations as well as development in cooperation with our customers form the foundation of our sustainable business model and competitiveness.

### Confidential Customer Relationships

Taking into account our customers' specific requirements pertaining to our sector and technology is the cornerstone of a

confidential customer relationship. As our operating environment changes, we face new and exciting business requirements. We must be in the vanguard of meeting these requirements. For example, to be able to respond to material enquiries within a tight schedule we should develop product information management further. Our challenge and area of development is to get through the new requirements throughout the delivery chain.

Our operating methods especially take into account data security and keeping the confidential information of our customers secret. Our products are designed to be secure, always taking into account the needs of our customers. Described in more detail under 'Corporate citizenship and sustainable business practices', our ethical Code of Conduct is also an important element of our secure and responsible way of working with our customers and interest groups.

### Systems and Standards

Standards define the mutual ways of working that make the operations easier for the authorities as well as companies. Standardisation also makes it easier to promote global exports.

For us, certified integrated management systems are an important tool with which we can improve our efficiency and reliability, transparency and customer satisfaction. More and more, our customers also expect

our products and operating methods to be standardised and certified.

At the end of 2018, we were using five certified systems. All in all, we take into account approximately 400 different standards in our operations.

In June 2018, we also began an external information security system audit pursuant to ISO 27001. The process will be completed during the first half of 2019.

### Secure Products

The working lives of our products are long, and our products are designed to last throughout their life-cycle. In addition to the environmental effect of our products, we take into account the safety and security of our products, product materials and product components as well as compliance with product liability regulations in our target markets.

We utilize the relevant industry standards in the design of the electrical safety and performance features of our products. Customer, country and market-specific requirements are also taken into account in device development.

The products are tested, verified and approved as part of the R&D process, both by internal and external auditors. For example, in Europe our products are expected to display the CE label and the related Declaration of Conformity (DoC).

We also audit our product development projects in accordance with the PSSSL (Product Safety, Security and Liability) audit procedures as part of Bittium's End Product Process (EPP) requirements. Our employees receive PSSSL product liability

### NET PROMOTER SCORE

# 56

(2017: 50)

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#### CERTIFIED SYSTEMS

- Quality systems: ISO 9001, ISO 13485 and AQAP 2110
  - Environmental systems: ISO 14001, ISO 50001
  - Data security systems: ISO 27001, Katakri and different facility security approvals
- 

#### THE STANDARDS AND DIRECTIVES CONFORMED TO IN SUSTAINABILITY WORK

- OHSAS 18001, SA8000, GRI G4, Electronics Industry Citizenship Coalition (EICC), Ethical Trade Directive (ETI), Conflict Mineral (USA, EU)
  - EU ROHS(I,II,III), Reach, WEEE, Regulation on Waste, ErP (Energy-related Product), Battery Directive, Packaging Directives
- 

training. In addition, we systematically assess product and life-cycle risks as part of our R&D work.

### Sustainable Purchase

Bittium's products contain a range of electronic and mechanical components. We ensure the sustainability of our purchase chain, for instance, in the form of material and component supplier requirements and material assessments. We conform to a sustainable way of working and require the same of our suppliers. Our partners must comply with the principles of Bittium's Code

of Conduct and the Bittium Supplier Manual or Requirements instructions. We systematically develop our supplier relationship management and always review the CSR principles with our suppliers and partners.

We also audit our suppliers according to the specified criteria. The audit is carried out as a self-assessment compared to Bittium's supplier requirements or as an audit conducted by Bittium.

Employee training is also an important part of ensuring sustainable purchase. Sustainable procurement is part of the environmental training package which our employees are expected to study on their own.

#### Conflict Minerals Policy

The aim of conflict minerals laws and regulations is to stop funding conflicts through minerals trade and, ultimately, to address human rights violations and environmental destruction in conflict areas.

We require that our suppliers comply with the legislation on conflict minerals and recommended reporting practices. This way, we can ensure that the minerals used in Bittium products do not originate from conflict or risk zones.

In practice, the legislation requires responsible procurement and transparent supply chains in the case of certain minerals, such as tin, tantalum, wolfram and gold from conflict areas. These minerals are typically used in household goods, and they are particularly common in electronics such as mobile devices and computers.

In 2018, one of Bittium's suppliers reported that the components supplied by said supplier may have contained conflict minerals. Thanks to the early warning, these

suspected conflict minerals did not end up in Bittium products.

#### Avoiding Counterfeit Materials

Counterfeit materials are any materials with a falsely presented origin, age, consistency, configuration, certification status or other feature or with misleading markings on the material, package label or container.

We are aware of the risks associated with counterfeit materials, both when purchasing materials as ready components and using the reported raw materials. Bittium is committed to taking the necessary steps to avoid using counterfeit materials in its products. We have developed our supplier reporting methods to avoid the use of counterfeit materials. They address the different stages of the purchase process, all the way from the selection of suppliers. We also provide training on the detection of counterfeit materials for our employees.

No counterfeit materials were found in Bittium's products in 2018.



## Corporate Citizenship and Sustainable Business Practices

We operate as a responsible corporate citizen within the society around us. We are a reliable local partner and employer. We engage in active and open dialogue with our stakeholders, act in accordance with our mutual operating principles, create added value for our shareholders and seek operating methods and solutions that promote sustainability.

We monitor the effects of our operations and the added value we provide for different stakeholders on an ongoing basis. Our key stakeholders include our shareholders, customers, employees, partners and other suppliers as well as the public sector. You can find more information on the cooperation with our stakeholders in chapter 'Responsibility management'.

Since its establishment, Bittium has followed the values that were defined as guiding principles by its founders. We have revised our values with the passing years; the new values that guide our business were released in fall 2017. Bittium's revised values can be summarised into three keywords: trust, courage and innovation.

### Corporate Social Responsibility is Driven by Good Governance

The management of Bittium Corporation is governed by the Articles of Association, the Finnish law and the Bittium governance guidelines. Bittium conforms to the Finnish Corporate Governance Code (2015) that is prepared by the Securities Market Associa-

tion. Bittium's Corporate Governance Statement is available at [www.bittium.com](http://www.bittium.com).

GRC (governance, risk management and compliance) refers to the skills and abilities that enable an organisation to meet its targets, address uncertainties and operate with integrity. Bittium's GRC measures also include the framework for internal control, which begins with our corporate values and extends all the way to the principles set by our Board of Directors.

### Bittium's Ethical Principles and Code of Conduct

Our ethical principles comprise the following areas:

#### 1) Anti-corruption

Due to our market area and business sector, corruption is a significant risk in the areas of social responsibility and human rights. We do not condone any forms of bribery or corruption in our operations or the operations of our subcontractors. We use our internal and external anti-corruption guidelines that were updated in 2017. We provide our employees with training on the subject as part of our employee training programme, and we expect our partners to comply with the instructions.

We have available a tool for following up and recognizing potential corruption or other obscurities of our cooperation partners.

There is a channel available to both our external and internal stakeholders for reporting anti-corruption rule violations. There were no cases of corruption reported to Bittium in 2018.

#### 2) Information Security and Protection

Bittium's information security and privacy instructions specify the methods related to the classification, storage and disclosure of information.

#### 3) Fair Business, Advertising and Competition

We follow the rules on fair business, advertising and competition. We have access to different methods of securing our customers' information in accordance with information security procedures.

#### 4) Corporate Citizenship

The company supports community involvement in order to promote social and economic development.

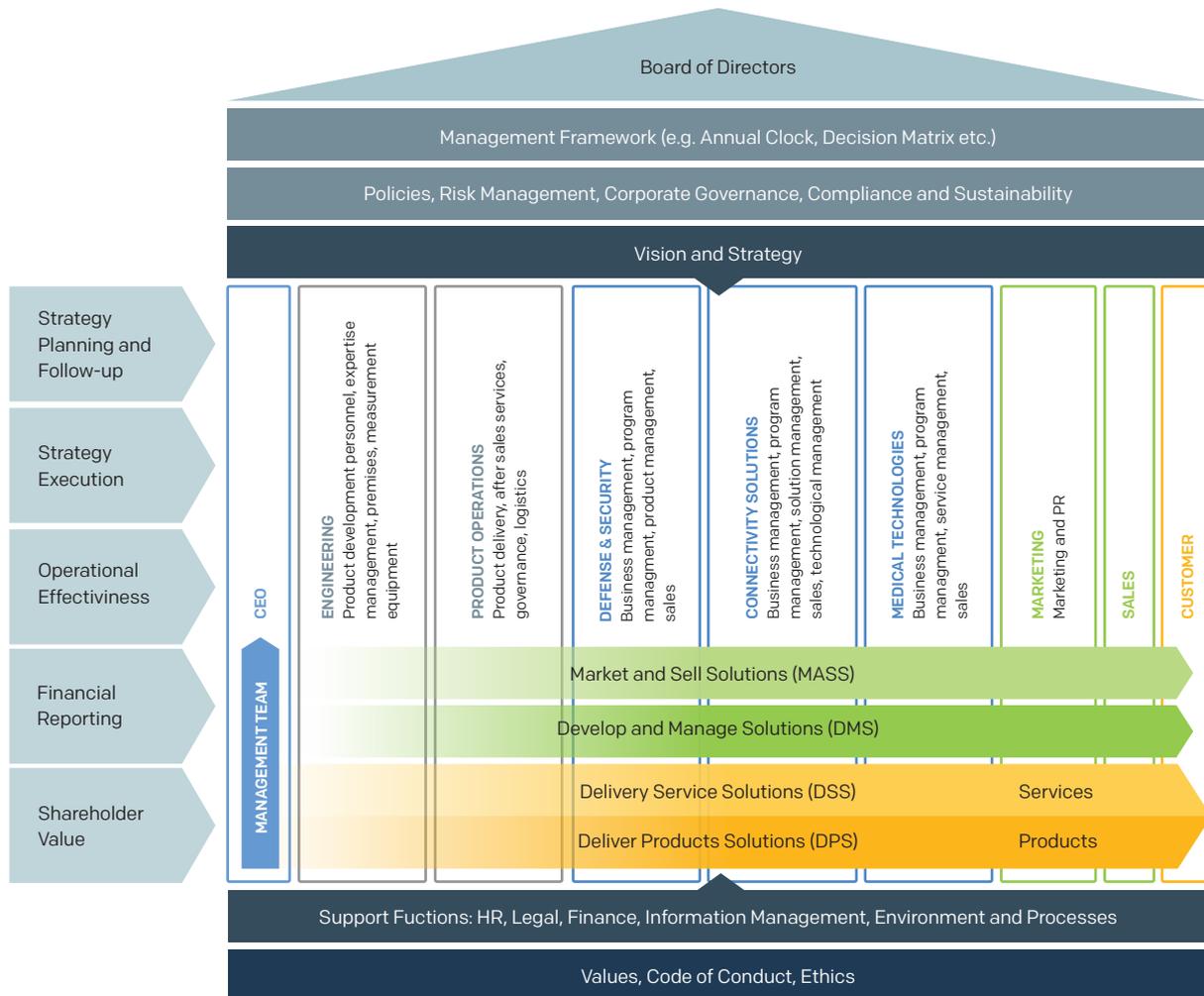
#### 5) Protection of Intellectual Property Rights

We respect intellectual property rights and apply our IPR strategy and guidelines to all of our operations.

Sustainable procurement is also an essential part of our sustainable business operations. The principles of sustainable procurement have been described in greater detail in chapter 'Confidential customer relationships and secure products'.

### Development of Export Control

In 2018, we also developed our export control system and the related policies strongly from the point of view of sustainability. In its operations, Bittium has always complied with the export control instructions and regulations, for instance, in the defense and data security sectors where the functionality of the export control system is a precondition for successful cooperation with



**Governance, risk management and compliance at Bittium**

the authorities as well as the customers. Parallel with the development of our export control system, we provided dozens of employees from the sales, marketing, product management and logistics functions with training on the principles of export control.

**Responsibility for the Environment**

Our business is mainly focused on product design, assembly by manufacturers, sales and marketing. These processes only account for a small share of the products' life-cycle effects. The greatest environmental impact occurs during the last stage of the product's life-cycle, i.e. recycling. Nonetheless, responsibility for the environment, fighting climate change and resource-efficient solutions are a key part of our operations and the development of our operations. By maximizing the service life and

recyclability of our products, we can affect the total life-cycle effect of the product.

**Environmental Liability Management and Environmental Programme**

In line with our environmental policy, we are committed to minimizing the environmental impact of the production, use and disposal of the products designed by us. We apply the ISO 14001 standard to our environmental management programme and implement sustainable development in accordance with the ISO 14001 standard, for example, at the following levels:

- Monitoring and complying with amendments to laws and regulations on environmental protection. This also covers to use of energy-efficient solutions in R&D (ecological design) and premises.
- Minimizing the environmental impacts of the production, use and disposal of products. The development of instructions and

practices related to ecological design supports these principles.

- Encouraging suppliers and partners to implement environmental management programmes. Compliance with the principles that limit the use of hazardous substances supports these goals.

We regularly monitor the environmental requirements that govern our products as well as the local regulations derived from these. The requirements also extend to our major suppliers. We have applied the provisions of the ROHS directives (I, II and III), the REACH regulation (on hazardous substances) as well as the WEEE (recycling of waste electronic and electrical equipment) directive in our design since 2002. Our ETJ+ energy-efficiency system was certified to comply with the ISO 50001 standard in 2018

Although the use of halogens is not yet forbidden in electronics, we strive to provide halogen-free products in order to meet the growing demand in the field and minimize the environmental impact of our products. Bittium's halogen-free statement conforms to the IEC's (International Electrochemical Commission) definition of halogen-free materials (IEC 61249-2-21).

**Achievements of 2018 Environmental Programme**

Our objective for the 2018 environmental programme was to manage environmental information in our Oulu facility, the certification of our ETJ+ energy-efficiency system to the international ISO50001 energy-efficiency system, as well as the piloting of the product's ECO design in two products.

We reached our environmental information goals we set for 2018.

- Up to 12 percent of the electricity used by our facility in Oulu was received from solar energy.
- We calculated our total carbon footprint for the first time.
- Our energy-efficiency system was certified to comply with ISO 50001.
- Our ECO design was also piloted, and the related viewpoints were added to our product development and project audit list.

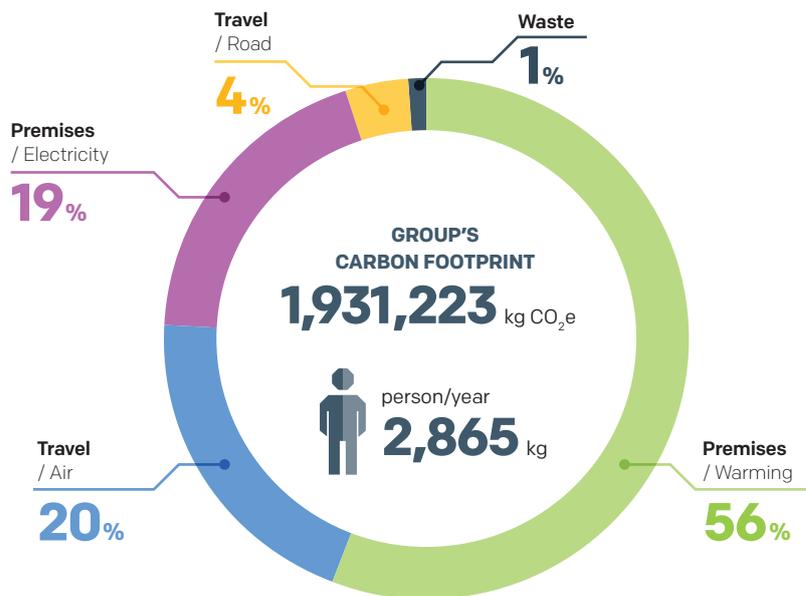
**Environmental Liability Indicators**

We keep a constant eye on the level of environmental protection. The following figures were selected as the key environmental liability indicators.

**Bittium Sustainability Metrics 2018**



In addition, we also keep an eye on the total carbon dioxide equivalent division within our group. 2,865 kg of CO<sub>2</sub>e in a year corresponds with approximately 27 percent of the annual carbon footprint of an average Finn (10,300 kg of CO<sub>2</sub>e/year) as stated by Sitra.



**Significant Improvement Achieved at Oulu Office**

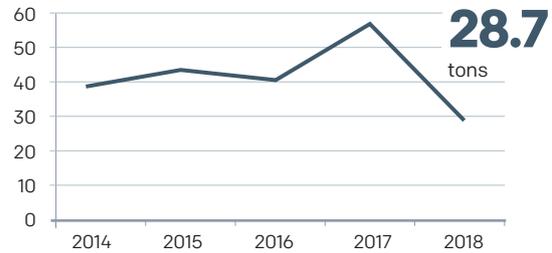
The starting point of the design of the new premises opened in Oulu late in 2017 was to concentrate different functions in order to improve efficiency and achieve savings. In 2018, we achieved significant improvements in energy-efficiency. For example, replacing office equipment and optimizing our lighting system – such as LEDs controlled by motion detectors – enabled us to significantly reduce our energy consumption. What’s more, we centralized our product testing and development laboratories and IT servers.

We were very successful in utilizing solar energy on our Oulu premises, where up to 12 percent of the used electricity comes from solar energy. We also optimized the electricity transmission costs by utilizing 20 kV medium voltage supply.

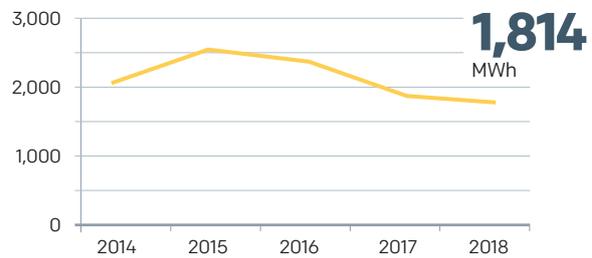
In addition, the move to our new facility in Oulu made a massive difference to our total water consumption: our total consumption dropped by 11 percent from the previous year. The level of recycling also rose from 66 to 99 percent, which resulted from significantly reduced amount of burned waste in 2018.

**Sustainability Metrics (trend) in Oulu 2014–2018**

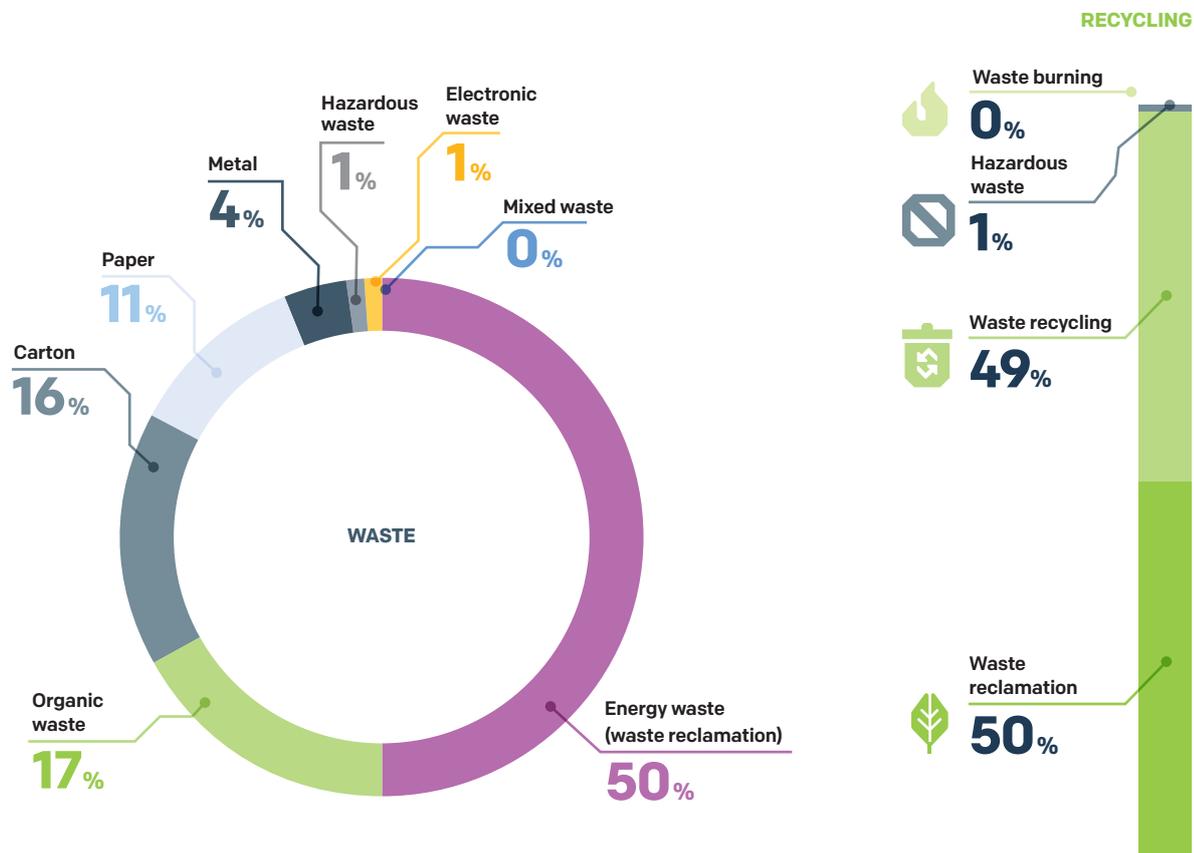
**AMOUNT OF WASTE**



**CONSUMPTION OF ELECTRICITY**



**Waste Treatment and Recycling (distribution), in Oulu 2018**



# Reporting

## Reporting Basics and Principles

### Scope of Reporting

This sustainability report, as part of the annual report, is the second extensive report on the management and implementation of sustainability at Bittium. We have developed our sustainability metrics, providing more information on impacts and expanding the scope of reporting. In order to enable comparability, Bittium's sustainability report is based on the Global Reporting Initiative (GRI) Standards framework. The table at the end of the report contains references to the relevant elements of the GRI Standards framework.

The report covers the three sustainability focus areas, a description of Bittium's environmental responsibility and financial effectiveness.

The financial data is collected from Bittium's financial information systems, and the majority of personnel data is from HR management systems. The reported financial figures are based on Bittium's audited financial statements from 2017 and 2018.

Bittium selected its reporting model on the basis of Bittium's sustainability principles, taking into account the GRI framework and the focus areas of the Company's business: wireless, secure communications in B2B operations. Bittium has customers both in Finland and in other countries. However, the majority of operations and most of the personnel are located in Finland.

This report will be published in electronic form in connection with the Group's annual report at [www.bittium.com](http://www.bittium.com) and <https://annualreport.bittium.com>.

### Scope of the Report

The period covered by the sustainability report is the same as the financial period, January 1–December 31, 2018. Environmental data is not reported from offices where the Company only uses a part of the office premises.

The report does not cover all suppliers or service providers. In other respects, the report covers all the operations of Bittium Corporation and its subsidiaries.

### Reporting Principles and Instructions

Financial reports are governed by the International Financial Reporting Standards (IFRS), and governance reports comply with the legislation on listed companies and the Finnish Corporate Governance Code that applies to listed companies.

The reported financial data is based on audited financial statements.

## Principles and Practices for External Verification

The 2018 sustainability report follows the core level of the GRI Standards guidelines. The sustainability report has not been verified by an independent third party. The fig-

ures presented in the “Financial effectiveness” section are based on the Group’s audited financial statements.

## Sustainability Contact at Bittium:

Karoliina Fyrstén,  
Director, Communications and Marketing  
karoliina.fyrsten@bittium.com

## GRI 102 GENERAL DISCLOSURES

G4	Title	Location	Additional info/comments
<b>Organization</b>			
102-1	Name of the organization	Bittium in Brief	page 8
102-2	Activities, brands, products, and services	Bittium in Brief; Bittium Products and Services	page 8 page 12
102-3	Location of headquarters	Bittium in Brief	page 8
102-4	Location of operations	Bittium in Brief	page 8
102-5	Ownership and legal form	Corporate Governance	page 29
102-6	Markets served	Bittium in Brief	page 8
102-7	Scale of the organization	Financial statement	page 71
102-8	Information on employees and other workers	Innovative and Developing People	page 55
102-9	Supply chain	Sustainable Purchase	page 53
102-10	Significant changes to the organization and its supply chain	GRI Standards Content List	No major changes page 67
102-11	Precautionary Principle or approach	Corporate Citizenship and Sustainable Business Practices Corporate Governance Statement	page 62 page 29
102-12	External initiatives		None
102-13	Membership of associations		Technology Industry Association

## GRI 102 GENERAL DISCLOSURES

G4	Title	Location	Additional info/comments
<b>Strategy</b>			
102-14	Statement from CEO	Statement from CEO	page 6
102-15	Key impacts, risks, and opportunities	Business and Operating Environment Main features of Internal Control and Risk Management Processes related to Financial Reporting Processes	page 8 page 41
<b>Ethics and Integrity</b>			
102-16	Values, principles, standards, and norms of behavior	Corporate Citizenship and Sustainable Business Practices	page 62
102-17	Mechanisms for advice and concerns about ethics	Corporate Citizenship and Sustainable Business Practices	page 62
<b>Governance</b>			
102-18	Governance structure	Corporate Governance	page 29
102-19	Delegating authority	Corporate Citizenship and Sustainable Business Practices	page 62
102-21	Consulting stakeholders on economic, environmental, and social topics	Stakeholder Cooperation Corporate Governance Statement	page 53 page 29
102-22	Composition of the Board	Corporate Governance	page 29
102-23	Chairman of the Board	Corporate Governance	page 29
102-24	Election of the Board	Corporate Governance	page 29
102-32	Highest governance body's role in sustainability reporting	Sustainability Organization	page 52
102-35	Remuneration policies	Corporate Governance Statement: Remuneration	page 29 <a href="http://www.bittium.com/investors/corporate-governance">www.bittium.com/investors/corporate-governance</a>
<b>Stakeholder Engagement</b>			
102-40	List of stakeholder groups	Stakeholder Cooperation	page 53
102-42	Identifying and selecting stakeholders	Stakeholder Cooperation	page 53
102-43	Approach to stakeholder engagement	Stakeholder Cooperation	page 53
102-44	Key topics and concerns raised	Stakeholder Cooperation	page 53
<b>Reporting Principles</b>			
102-45	Entities included in the consolidated financial statements	Entities included in the Consolidated Financial Statements; Notes to the Consolidated Financial Statements note 32: Related Party Disclosures	page 66 page 125
102-46	Defining report content and topic Boundaries	Defining report content and topic Boundaries	page 46 page 66
102-47	List of material topics	List of material topics	page 46 page 54
102-48	Restatements of information	Restatements of information	Enhancement of information
102-49	Changes in reporting	Changes in reporting	No major changes
102-50	Reporting period	Reporting period	page 66
102-51	Date of most recent report	GRI Standard Content Index	March 21, 2018
102-52	Reporting cycle	Reporting	Report is published annually, page 66
102-53	Contact point for questions regarding the report	Karoliina Fyrstén Director, communications and marketing <a href="mailto:karoliina.fyrsten@bittium.com">karoliina.fyrsten@bittium.com</a>	page 67

## GRI 102 GENERAL DISCLOSURES

G4	Title	Location	Additional info/comments
102-54	Claims of reporting in accordance with the GRI Standards	Reporting Basics and Principles	page 66
102-55	GRI content index	GRI content index	page 67
102-56	External assurance	Reporting Basics and Principles	page 67

## GRI 103 MANAGEMENT APPROACH

103-1	Entities included in the consolidated financial statements	Entities included in the Consolidated Financial Statements	Calculation boundary: Bittium Corporation
103-2	The management approach and its components	Sustainability Management; Focus Areas of Sustainability	page 52 page 54
103-3	Evaluation of the management approach	Sustainability Management	Management Review page 52

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201 Economic performance			
201-1	Direct economic value generated and distributed	Financial influence	page 50
201-4	Financial assistance received from government	Notes to the Consolidated Financial Statements note 4: Other Operating Income	page 99
205 Anticorruption			
205-3	Confirmed incidents of corruption and actions taken	Corporate Citizenship and Sustainable Business Practices	page 50 page 62

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302 Energy			
302-1	Energy consumption within the organization	Corporate Citizenship and Sustainable Business Practices	page 63
302-4	Reduction of energy consumption	Responsibility for the Environment	page 64
303 Water			
303-1	Water withdrawal by source	Responsibility for the Environment	page 64 Total consumption, page 64 Water usage / person, page 64
305 Emissions			
305-3	Direct (Scope 1) GHG emissions	Responsibility for the Environment	Reported carbon footprint page 64
306 Effluents and Waste			
306-2	Waste by type and disposal method	Responsibility for the Environment	page 65
307 Non-compliance with environmental laws and regulations			
307-1	Environmental compliance	Corporate Citizenship and Sustainable Business Practices	Database of applicable environmental laws and regulations page 63

## Social Impacts

G4	Title	Location	Additional info/comments
<b>401 Employment</b>			
401-1	Employment	New employee hires and employee turnover	Applicable only in Finland
<b>403 Occupational Health and Safety</b>			
403-2	Types of injury and rates of injury, occupational diseases, lost days and absenteeism, and number of work-related fatalities		Reported: Number of occupational incidents page 58
<b>404 Training and education</b>			
404-1	Average hours of training per year per employee	Innovative and Developing People	Average hours of training per year per employee page 55
404-2	Programs for upgrading employee skills and transition assistance programs	Innovative and Developing People	page 55
<b>405 Diversity and Equal Opportunity</b>			
405-1	Diversity of governance bodies and employees	Personnel year 2018	page 56
<b>419 Socioeconomic Compliance</b>			
419-1	Non-compliance with laws and regulations in the social and economic area	GRI Content Index	No violations <ul style="list-style-type: none"> <li>• Anticorruption, p. 62</li> <li>• Conflicting minerals, p. 60</li> <li>• Counterfeit materials, p. 60</li> </ul>

# Report by the Board of Directors and Financial Statements 2018

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# Report by the Board of Directors 2018

## Year 2018 in Brief

### Net Sales and Operating Result of 2018 Improved as Targeted

Bittium's net sales in January–December 2018 grew by 21.7 percent year-on-year to EUR 62.8 million (EUR 51.6 million, in 2017). The share of the product-based net sales increased significantly to 49.0 percent and was EUR 30.8 million (EUR 16.3 million, in 2017), which resulted mainly from the product deliveries of the tactical communication system, deliveries of products for measuring and monitoring biosignals, and product deliveries of Bittium Tough Mobile smartphones and Mexsat phones and their related security software.

The share of the services-based net sales decreased to 51.0 percent and was EUR 32.1 million (EUR 34.9 million, in 2017). The decrease in the services business net sales was caused by the typical variation of timing of R&D projects' beginning and ending, as well as the company's own significant large R&D projects that tie experts into internal product development.

Operating profit was EUR 2.8 million (operating loss of EUR -6.2 million, in 2017).

### Significant Events during the Reporting Period

February 13, 2018 – Bittium Biosignals Ltd, a subsidiary of Bittium Corporation, and a major US remote monitoring provider, concluded a three-year supply agreement under which Bittium will supply the Bittium Faros 360 and customized Bittium Faros 360 car-

diac ECG signal measuring and monitoring devices. In addition, Bittium will supply disposable electrodes for attaching Bittium Faros ECG devices.

When materialized in full, the total value of the agreement was USD 21 million (approximately EUR 17.1 million based on an exchange rate of February 12, 2018) with revenues recognized gradually during the years 2018, 2019, 2020 and 2021 depending on the progress of the product deliveries, with estimated emphasis on 2019 and 2020. This agreement did not change the Company's long term financial outlook (published in the Half Year Financial Report January–June 2017 on August 8, 2018).

April 13, 2018 – Bittium Wireless Ltd, a subsidiary of Bittium Corporation received a purchase order from the Finnish Defence Forces for products included in the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, which is meant for tactical communications. The value of the purchase order was EUR 14.3 million (excl. VAT). The purchase order did not change Bittium's financial outlook for the year 2018 (published in the Financial Statement Bulletin 2017 on February 22, 2018). The purchase order is based on the framework agreement signed by Bittium and the Finnish Defence Forces on August 9, 2017, according to which the Finnish Defence Forces will order products included in the Software Defined Radio based Bittium TAC WIN system during the years 2018–2020. According to the framework agreement, Finnish Defence Forces will issue separate purchase orders for the products each year. The products ordered now will be delivered to the Finnish Defence Forces during the year 2018. If materialized in full, the total

value of the framework agreement is EUR 30 million (excl. VAT). Bittium announced the Frame Agreement on August 9, 2017.

September 11, 2018 – Mr. Sammy Loitto (MBA and Master of Engineering in Industrial Management) was appointed as Senior Vice President, Sales in Bittium Corporation as of October 1, 2018. Previously he has been responsible for sales and business development activities at Bittium. Prior to that, he has worked in several sales and management positions at Jolla, Gryphon Secure and Airbus. Mr. Loitto reports to Mr. Hannu Huttunen, CEO of Bittium Corporation. As of October 1, 2018 Bittium management group consists of following persons: Mr. Hannu Huttunen, CEO (chairman); Mr. Pekka Kunnari, CFO; Mr. Kari Jokela, CLO; Ms. Karoliina Fyrstén, Director, Corporate Communications and Marketing, Mr. Sammy Loitto, Senior Vice President Sales, and heads of product and service areas: Mr. Jari Sankala, Senior Vice President, Defense and Security; Mr. Klaus Mäntysaari, Senior Vice President, Connectivity Solutions; and Mr. Arto Pietilä, Senior Vice President, Medical Technologies; and Mr. Jari-Pekka Innanen, Vice President, Engineering.

October 3, 2018 – The Finnish Minister of Defence Jussi Niinistö has authorized the Finnish Defence Forces Logistics Command to enter into a framework agreement with Bittium Wireless Ltd on the purchase of Bittium Tough Comnode terminals and related accessories. The framework agreement was signed on November 11, 2018. It covers the years 2018-2020 and the maximum value of the purchase authorization for the framework agreement is EUR 8.3 million (excl. VAT). Based on the framework agreement, the Finnish Defence Forces will issue separate purchase orders in several batches during the validity of the framework agreement. The framework agreement did not change Bittium's financial outlook for the year 2018. Bittium Tough Comnode will

fulfill the data transfer needs of the Finnish Defence Forces' mobile troops by functioning for example as a VoIP phone (Voice over IP), an IP router (Internet Protocol), and an SHDSL repeater (Symmetrical High-speed Digital Subscriber Line). The terminals will be used by all three military branches.

November 23, 2018 – Bittium announced that its cooperation partner, Austrian information technology company Kapsch BusinessCom AG was informed by the Austrian defense administration (Bundesministerium für Landesverteidigung BMVL) that it should be selected as the provider of the new IP-based tactical communication system for the Austrian Armed Forces in case no appeals by the losing parties of the competitive bidding will be filed during the next 10-days appeal period. This is a typical process in such public competitive bidding. Bittium's products for tactical communications are a significant part of Kapsch BusinessCom's winning bid, including the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, which will be the core of the new communication system, as well as Bittium Tough Comnode and Bittium Tough VoIP products. On December 4, 2018 Bittium announced to have been informed that the 10-days appeal period has expired and no appeals have been filed. The signing of the contract was scheduled to December 2018. If materialized, Bittium's share of the total value of the winning bid will be around EUR 30 million (excl. VAT). The product deliveries are expected to take place during the years 2019-2021 and the majority of the net sales is estimated to realize during the years 2020 and 2021. This did not change Bittium's financial outlook for the year 2018.

December 11, 2018 – The Finnish Minister of Defence Jussi Niinistö authorized the Finnish Defence Forces Logistics Command to enter into an Agreement with Bittium Wireless Ltd on the purchase of Bittium Tough

SDR handheld and vehicle radios, and their related accessories. The Agreement was signed on December 12, 2018. The value of the Purchase Agreement is approximately EUR 10.5 million (excl. VAT) at the maximum. The new software-defined-radio based tactical radios will be used at the first phase by the Army and the delivery will be completed at the latest by the end of the year 2020. This purchase agreement did not change Bittium Corporation's financial outlook for the year 2018. The Purchase Agreement is based on the Letter of Intent for purchase of new tactical radios, signed by Bittium and Finnish Defence Forces on August 8, 2017. The Purchase Agreement is a natural continuum to the Letter of Intent. Bittium issued a stock exchange release on the Letter of Intent on August 8, 2017.

The purchase agreement includes terms for optional additional purchase, according to which, the Finnish Defence Forces have an option to purchase additional tactical radios and their related accessories, training and system management for the use of Army, Air Force and Navy, based on the prices agreed in the Purchase Agreement. If these optional additional purchase amounts would materialize in full, the total value of the purchase would be approximately EUR 207 million (excl. VAT) at the maximum. As agreed in the Letter of Intent, the Finnish Defence Forces aim at making these additional purchases during the next ten years. The materialization of the purchase is affected by the yearly state budget allocations for the administrative of the Ministry of Defence. There will be separate purchase orders for these optional additional purchases.

## Financial Performance in January–December 2018

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME, MEUR	2018	2017
	12 months	12 months
Net sales	62.8	51.6
Operating profit / loss	2.8	-6.2
Financial income and expenses	-0.1	0.4
Result before tax	2.7	-5.8
Result for the period from continuing operations	4.0	-4.8
Result for the period from discontinuing operations	0.0	1.7
<b>Result for the period</b>	<b>4.0</b>	<b>-3.1</b>
<b>Total comprehensive income for the period</b>	<b>4.1</b>	<b>-3.2</b>
Result for the period attributable to:		
Equity holders of the parent	4.0	-3.1
Total comprehensive income for the period attributable to:		
Equity holders of the parent	4.1	-3.2
Earnings per share from continuing operations, EUR	0.113	-0.133

- Cash flow from operating activities was EUR -0.5 million (EUR -0.0 million, in 2017).
- Net cash flow during the period was EUR -32.0 million. As the most significant item the net cash flow includes EUR 15.1 million investments made into own product development and the EUR 10.7 million dividend payment (EUR -32.0 million, in 2017, including EUR 5.8 million investments in own R&D and EUR 10.7 million dividend payment as well as investments into the new premises in Oulu, as the most significant item).
- Equity ratio was 84.7 percent (85.6 percent, December 31, 2017).
- Net gearing was -26.7 percent (-52.9 percent, December 31, 2017).

## Half Year Figures

GROUP'S NET SALES AND OPERATING RESULT, MEUR	2H/18	1H/18	2H/17	1H/17
Net sales	34.5	28.3	24.5	27.1
Operating profit (loss)	3.7	-0.8	-3.4	-2.8
Result before taxes	3.5	-0.8	-3.4	-2.4
Result for the period	4.8	-0.8	-2.4	-2.4

DISTRIBUTION OF NET SALES BY PRODUCT AND SERVICES, MEUR AND %	2H/18	1H/18	2H/17	1H/17
Product based net sales	19.0	11.8	9.1	7.2
	54.9%	41.8%	37.2%	26.5%
Services based net sales	15.6	16.5	15.2	19.7
	45.1%	58.2%	62.0%	72.7%
Other net sales			0.2	0.2
			0.8%	0.7%

DISTRIBUTION OF NET SALES BY MARKET AREAS, MEUR AND %	2H/18	1H/18	2H/17	1H/17
Asia	0.4	0.5	1.0	0.3
	1.1%	1.7%	4.2%	1.1%
Americas	5.0	3.0	1.4	4.5
	14.6%	10.6%	5.8%	16.4%
Europe	29.1	24.8	22.0	22.4
	84.3%	87.7%	90.0%	82.5%

## Research and Development

Bittium continued significant investments in its own products and product platforms. In January–December 2018 the investments were 34.4 percent of net sales.

The investments focused mainly on expanding the tactical communication product portfolio targeted to defense industry and on the development of different terminal products and their related software targeted for Mobile Security and Public Safety markets. In 2017, Bittium started to develop new software-defined radio based Bittium Tough SDR product family that includes tactical Bittium Tough SDR handheld and Bittium Tough SDR vehicle radios. In addition, Bittium continued to develop secure smartphones and the related security software. The investments were also continued into the further development of the products intended for measuring and monitoring of biosignals.

A significant part of the capitalized R&D investments is related to developing tactical communication handheld and vehicle radios and investments related to the further development of the secure smartphones and the related security software, as well as from the investments related to the further development of products intended for biosignal measuring and monitoring.

The depreciation plan of the capitalized R&D investments has been updated starting from November 2017 onwards. The depreciations are now made based on time. Previously part of the investments was depreciated based on the forecasted production amounts of the capitalized R&D asset. The update improves the allocation of the depreciations for the periods under review. The update of the depreciation plan has no effect on the evaluation of comparative periods.

<b>R&amp;D INVESTMENTS, MEUR</b>	<b>2018</b> <b>12 months</b>	<b>2017</b> <b>12 months</b>
Total R&D investments	21.6	15.0
Capitalized R&D investments	-15.1	-5.8
Depreciations and impairment of R&D investments	0.4	0.3
Cost impact on income statement	6.9	9.6
R&D investments, % of net sales	34.4%	29.1%

<b>CAPITALIZED R&amp;D INVESTMENTS IN BALANCE SHEET, MEUR</b>	<b>2018</b> <b>12 months</b>	<b>2017</b> <b>12 months</b>
Balance sheet value in the beginning of the period	11.9	6.4
Additions during the period	15.1	5.8
Acquisitions of the business		
Depreciations and impairment of R&D investments	-0.4	-0.3
Balance sheet value at the end of the period	26.6	11.9

## Statement of Financial Position and Financing

The figures presented in the statement of financial position of December 31, 2018, are compared with the statement of the financial position of December 31, 2017 (MEUR).

	Dec. 31, 2018	Dec. 31, 2017
Non-current assets	65.9	46.7
Current assets	66.5	91.6
Total assets	132.4	138.4
Share capital	12.9	12.9
Other capital	97.1	103.7
Total equity	110.0	116.7
Non-current liabilities	1.9	1.5
Current liabilities	20.5	20.2
Total equity and liabilities	132.4	138.4

	Jan.–Dec. 2018	Jan.–Dec. 2017
<b>CASH FLOW OF THE REVIEW PERIOD</b>		
+ profit of the period +/- adjustment of accrual basis items	7.9	-2.4
+/- change in net working capital	-8.4	2.0
- interest, taxes and dividends	0.0	0.3
= net cash from operating activities	-0.5	-0.0
- net cash from investing activities	-19.8	-18.5
- net cash from financing activities	-11.7	-13.4
= net change in cash and cash equivalents	-32.0	-32.0

Net cash from operating activities in 2017 includes operative cash flows from both continuing and discontinuing operations.

The amount of gross investments in the period under review was EUR 21.2 million. Net investments for the review period totaled to EUR 21.2 million. The total amount of depreciation during the period under review was EUR 4.6 million. The amount of interest-bearing debt, including finance lease liabilities, was at the end of the reporting period EUR 1.5 million (EUR 1.2 million on December 31, 2017). Bittium's equity ratio at the end of the period was 84.7 percent (85.6 percent on December 31, 2017).

Cash and other liquid assets at the end of the reporting period were EUR 30.9 million (EUR 62.9 million on December 31, 2017). Net cash flow during the period was EUR -32.0 million. The net cash flow resulted as the

most significant items from the EUR 15.1 million investments made into own product development and the EUR 10.7 million dividend payment (EUR -32.0 million, in 2017, including EUR 5.8 million investments made into own product development, EUR 10.7 million dividend payment and investments in the new premises in Oulu as the most significant items).

Bittium has a total of EUR 30.0 million committed credit facility agreements. In December 2018, Bittium renewed one EUR 10.0 million credit facility agreement so that the amount of the credit limit was raised to EUR 20.0 million. This new credit facility agreement is valid until December 31, 2021. The other EUR 10.0 million

credit facility agreement, signed in 2017, is valid until December 31, 2019. At the end of the review period, EUR 0.0 million of these facilities were in use.

Bittium follows a hedging strategy that has an objective to ensure the business margins in changing market circumstances by minimizing the influence of exchange rates. According to the hedging strategy principles, the net position in the currency is hedged when it exceeds the euro limit defined in the hedging strategy. The net position is determined on the basis of accounts receivable, accounts payable, order book and budgeted net currency cash flow.

## Business Development in January–December 2018

January 18, 2018 – Bittium announced to have received the first orders from Mexican government authorities for mobile devices developed for a satellite communication system. The mobile devices have been developed in a product development project that started in the year 2015. The product development phase has been successfully concluded and the devices are now in volume production. The total value of the first orders was approximately EUR 2.0 million and the devices were delivered to the customers by the end of the first quarter of 2018. The mobile devices are manufactured in Finland.

Bittium also announced to have opened a branch office in Mexico to enable high quality customer support for the local customers, and to contribute to sales and marketing in Mexico and other Latin American countries. Mr. Fernando Castillo was appointed as the General Manager of the branch office in Mexico. Mr. Castillo has a long experience in the Mexican authorities market.

February 13, 2018 – Bittium Biosignals Ltd, a subsidiary of Bittium Corporation, and a major US remote monitoring provider, concluded a three-year supply agreement under which Bittium will supply the Bittium Faros 360 and customized Bittium Faros 360 cardiac ECG signal measuring and monitoring devices. In addition, Bittium will supply disposable electrodes for attaching Bittium Faros ECG devices. When materialized in full, the total value of the agreement is USD 21 million (approximately EUR 17,1 million based on an exchange rate of February 12, 2018) with revenues recognized gradually during the years 2018, 2019, 2020 and 2021 depending on the progress of the product deliveries, with estimated emphasis on 2019

and 2020. This agreement did not change the Company's long term financial outlook.

March 9, 2018 – Bittium Cardiac Navigator meant for the analysis of clinical Holter ECG recordings received medical device approval in Europe. The approval allows cardiologists to use the Bittium Cardiac Navigator software solution for official analysis of Holter ECG recordings collected with Bittium Faros ECG monitoring devices. The user-friendly and informative ECG data presentation and intuitive analysis tools of Bittium Cardiac Navigator software solutions make the software efficient and easy to use when analyzing multiple days of ECG recordings. Based on recordings, the software provides information about the electrical cardiac activity of the heart, typical of Holter ECG analysis, and in particular, about arrhythmia and other exceptional events. Bittium Cardiac Navigator is designed for scanning longer measurements efficiently in a shorter time and thus speeding up the final diagnosis.

March 16, 2018 – Bittium launched new innovative Bittium Tough Mobile HybridX extension, that gives Bittium Tough Mobile a new user interface and functionalities that are very useful in demanding Public Safety use. Bittium Tough Mobile HybridX extension combines the secure Bittium Tough Mobile smartphone with a functional HybridX accessory. The HybridX accessory is integrated to the Bittium Tough Mobile and is connected to a PMR (Private Mobile Radio) device, such as TETRA or P25.

March 28, 2018 – Bittium Medanalytics Oy, a subsidiary of Bittium Corporation, and RemoteA Oy signed a business purchase agreement according to which Bittium Medanalytics Oy purchases RemoteA's medical remote diagnostic service platform and the product rights of the related medical measurement devices and their interfaces. With the business transaction Bittium's offering

expanded from measuring and monitoring the electrical activity of the heart and brain to measuring and monitoring sleep apnea. In addition, a third party blood pressure measurement device has been connected to the service platform, and in the future, it is possible to connect also other measurement devices to the system. Biosignal information collected from the patients via the remote diagnostics service platform enables the transfer of information over the internet and it serves as a platform for patient measurement data and specialists' diagnosis. The business transaction had no significant impact on Bittium Corporation's financial outlook for 2018. The parties agreed that the value of the transaction will not be published.

April 13, 2018 – Bittium announced to have received a purchase order from the Finnish Defence Forces for products included in the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, which is meant for tactical communications. The value of the purchase order is EUR 14.3 million (excl. VAT). The purchase order did not change Bittium's financial outlook for the year 2018. The purchase order is based on the framework agreement signed by Bittium and the Finnish Defence Forces on August 9, 2017, according to which the Finnish Defence Forces will order products included in the Software Defined Radio based Bittium TAC WIN system during the years 2018–2020. According to the framework agreement, Finnish Defence Forces will issue separate purchase orders for the products each year. The products ordered now will be delivered to the Finnish Defence Forces during the year 2018. If materialized in full, the total value of the framework agreement is EUR 30 million (excl. VAT). Bittium issued a stock exchange release about the framework agreement on August 9, 2017.

April 23–27, 2018 – Bittium’s secure Bittium Tough Mobile smartphone was part of the Locked Shields 2018 cyber defense exercise organized by the NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE), held in Tallinn, Estonia. It was the world’s largest and most complex international live-fire cyber defense exercise where more than 1 000 experts from 30 nations participated in total. The annual exercise is a unique opportunity for national representatives of cyber defense to practice protection of national information technology systems and critical infrastructure under the intense pressure of a severe cyber attack.

May 14–17, 2018 – Bittium showcased the ThingSpace LTE CAT-M1 IoT Reference Hardware Design, which was developed with Verizon, at IoT World 2018 exhibition, held in Santa Clara Convention Center, California, the United States of America. The IoT Reference Hardware Design was designed to allow an OEM the building blocks to get up and running quickly on the Verizon network and ThingSpace platform. Bittium provides open source hardware design documents and offers design services to Verizon’s ThingSpace development partners. Bittium’s IoT Design Service offerings vary from technology consultation to commercial wireless designs.

May 15, 2018 – Bittium received a purchase order from the Finnish Defence Forces for the maintenance and further development of systems and related products meant for tactical communications. The order refers to the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, the Bittium Tough VoIP system for tactical IP calls and data transfer, as well as the products related to the systems, which are used by the Finnish Defence Forces. The purchase order applies to the year 2018 and includes the technical support of the systems and the equipment, software support, upkeep of the system support, management of the system support, and development of new features. The value of the purchase order was EUR 2.3 million (excl. VAT). The purchase order did not change Bittium’s financial outlook for the year 2018.

May 30, 2018 – Bittium Corporation’s subsidiary, Bittium BioSignals Ltd and Cerenion Oy announced a collaboration project on bringing advanced brain monitoring into the array of vital signs monitoring available to intensive care staff. The collaboration aims on providing a comprehensive solution for brain electrical activity monitoring for intensive care patients, by combining Bittium BrainStatus a wireless EEG-monitoring device meant for real-time brain electrical activity to Cerenion’s innovative C-Trend index that interprets EEG signal to a simple score facilitate and accelerate the work of nursing staff.

Recently European CE medical approved wireless Bittium BrainStatus EEG amplifier and electrode headband enable high quality and fast EEG signal measurement. Through the use of Cerenion C-Trend technology this signal data is turned into a simple score that reveals the status of the patient’s brain at the bed-side and without requiring any changes to the care of the patient. The first line of C-Trend-enabled Bittium BrainStatus devices are expected to become available in 2019.

June 11–15, 2018 – Bittium launched the new Bittium Tough VoIP Softphone software product at the Eurosatory defense exhibition in Paris, France. The new Bittium Tough VoIP Softphone software product is a VoIP client (Voice over Internet Protocol) that can be used for VoIP calls, instant messaging, conference calls and screen sharing in the tactical Bittium Tough VoIP Service network either with a PC or smartphone. Especially useful for tactical use are also the Push-To-Talk (PTT) feature as well as the remote control and sending instant messages to existing third party Combat Net Radios (CNR) through Bittium Tough VoIP Service network and Bittium Tough Comnode terminal or Bittium TAC WIN system’s router (Radio over IP, RoIP).

July 12, 2018 – Bittium expanded its medical technology offering to Switzerland by investing in a Swiss remote diagnostics service company. Bittium and evismo will

jointly provide customers with full-scale remote diagnostics service that at this stage includes remote diagnostics service platform, monitoring the electrical activity of the heart, wireless measurement data transfer, and analysis and diagnostics of measurements. The investment was carried out by subscribing new shares in evismo AG, the subscription is carried out in two phases. After the share subscription on July 11th, Bittium’s holding of evismo was 17.4 percent and, subject to certain commercial terms by March 31, 2019, Bittium’s holding will be 25 percent. The investment did not change Bittium’s financial outlook for the year 2018.

August 9, 2018 – Bittium expanded its operations in Central Europe by opening a new office in Munich, Germany. Bittium’s local presence in Germany enables high quality customer support for the local customers, and helps in developing and supporting Bittium’s international sales network.

August 23, 2018 – Bittium launched new waterproof Bittium Faros ECG device and Bittium FastFix patch electrode for ECG measurement at ESC Congress 2018 on August 25–29 in Munich, Germany. The new waterproof Bittium Faros 180 and Bittium Faros 360 ECG devices together with the Bittium FastFix patch electrodes make the patient’s life easier during long-term (3–30 days) ECG recordings. Bittium Faros ECG device together with the Bittium FastFix patch electrode is meant for wireless ECG measurement. The chest-attachable patch electrode can be used for 3 to 7 days at a time, after which measurement can be continued by replacing the patch electrode with a new one. ECG recordings with the waterproof Bittium Faros ECG devices and Bittium FastFix patch electrodes enable the monitored person to be active, do sports and shower without having to remove the device and thus stop the recording.

September 27, 2018 – Bittium announced that it will supply its tactical Bittium Tough SDR Vehicular radios together with the ESSOR High Data Rate Waveform (ESSOR HDR WF) to the pilot vehicles of the Spanish Ar-

my's VCR 8x8 vehicle programme (Vehículo de Combate sobre Ruedas). In the scope of the VCR 8x8 programme the Spanish Army will acquire new combat vehicles and related data transfer systems to replace their current, long-lived combat vehicles. Bittium Tough SDR Vehicular radios will be delivered to the temporary joint venture UTE 8x8 (Unión Temporal de Empresas) formed by the Spanish companies GDELS Santa Bárbara Sistemas, Indra and SAPA. After the pilot phase, the programme will continue with another phase during which a separate procurement decision will be made for the supply of vehicular radios to the combat vehicles that will be deployed by the Spanish Army. Participation in the pilot phase of the programme does not automatically guarantee participation in the following phase of the programme.

November 5, 2018 – Bittium Wireless Ltd, a subsidiary of Bittium Corporation, and Finnish Defence Forces signed a framework agreement on Bittium Tough Comnode terminals and related accessories. The framework agreement covers the years 2018–2022. The maximum value of the framework agreement is EUR 8.3 million (excl. VAT). The Finnish Defence Forces will issue separate purchase orders in several batches during the validity of the framework agreement. The framework agreement did not change Bittium's financial outlook for the year 2018. Bittium announced on October 3, 2018 that the Finnish Minister of Defence Jussi Niinistö had authorized the Finnish Defence Forces Logistics Command to enter into a framework agreement with Bittium Wireless Ltd on the purchase of Bittium Tough Comnode terminals and related accessories.

November 23, 2018 – Bittium announced that its cooperation partner, Austrian information technology company Kapsch BusinessCom AG, was informed by the Austrian defense administration (Bundesministerium für Landesverteidigung, BMLV) today that it should be selected as the provider of the new IP-based tactical communication system for the Austrian Armed Forces, in case no appeals by the losing parties of

the competitive bidding will be filed during the next 10-days appeal period. This is a typical process in such public competitive bidding. Bittium's products for tactical communications are a significant part of Kapsch BusinessCom's bid, including the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, which will be the core of the new communication system, as well as Bittium Tough Comnode and Bittium Tough VoIP products. On December 4, 2018 Bittium was informed that the 10-day appeal period has expired and no appeals have been made. The signing of the contract was scheduled to December 2018. Bittium's share of the total value is around EUR 30 million (excl. VAT). The product deliveries are expected to take place during the years 2019–2021 and the majority of the net sales is estimated to realize during the years 2020 and 2021. This did not change Bittium's financial outlook for the year 2018.

December 10, 2018 – The new waterproof Bittium Faros ECG devices, Bittium Cardiac Navigator and Bittium Cardiac Explorer analysis software received FDA 510(k) medical device clearances in United States. The FDA 510(k) clearance received by the Bittium Faros ECG device includes the built-in algorithms for detection of arrhythmias. The algorithms can be used to automatically identify sequences in the heart measurement data that include atrial fibrillation, tachycardia, bradycardia, and pauses in the operation of the heart. The received FDA 510(k) clearance also allows the use of Bittium Faros ECG measuring devices for pediatric ECG measurements. The received clearance allows the use of Bittium Faros either in long-term ECG recording or in remote wireless cardiac monitoring. The received FDA 510(k) clearance allows cardiologists to use the Bittium Cardiac Navigator and Bittium Cardiac Explorer software solutions for official analysis of ECG recordings collected with the Bittium Faros ECG monitoring devices.

December 13, 2018 – Bittium Wireless Ltd, a subsidiary of Bittium Corporation and Finnish Defence Forces Logistics Command

signed an agreement on the purchase of Bittium Tough SDR handheld and vehicle radios, and their related accessories. The value of the purchase agreement is approximately EUR 10.5 million (excl. VAT) at the maximum. The new software-defined-radio based tactical radios will be used at the first phase by the Army and the delivery will be completed at the latest by the end of the year 2020. This purchase agreement did not change Bittium Corporation's financial outlook for the year 2018.

The purchase agreement is based on the Letter of Intent for purchase of new tactical radios, signed by Bittium and Finnish Defence Forces on August 8, 2017. The purchase agreement signed today is a natural continuum to the Letter of Intent. Bittium issued a stock exchange release on the Letter of Intent on August 8, 2017. The Finnish Minister of Defence Jussi Niinistö authorized the Finnish Defence Forces Logistics Command to enter into an agreement with Bittium Wireless Ltd on December 11, 2018. The purchase agreement includes terms for optional additional purchase, according to which, the Finnish Defence Forces have an option to purchase additional tactical radios and their related accessories, training and system management for the use of Army, Air Force and Navy, based on the prices agreed in the purchase agreement. If these optional additional purchase amounts would materialize in full, the total value of the purchase would be approximately EUR 207 million (excl. VAT) at the maximum. As agreed in the Letter of Intent, the Finnish Defence Forces aim at making these additional purchases during the next ten years. The materialization of the purchase is affected by the yearly state budget allocations for the administrative of the Ministry of Defence. There will be separate purchase orders for these optional additional purchases.

During 2018, Bittium showcased its products and services at several exhibitions around the world.

## Significant Events after the Reporting Period

February 14, 2019 – Bittium Wireless Ltd, a subsidiary of Bittium Corporation, received a purchase order from the Finnish Defence Forces for products included in the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system and Bittium Tough Comnode terminals, which are meant for tactical communications. The total value of the purchase order is EUR 11.5 million (excl. VAT) of which the share of the Bittium TAC WIN system's products is EUR 9.9 million and the share of the Bittium Tough Comnode terminals is EUR 1.6 million.

The share of the purchase order including Bittium TAC WIN system's products is based on the framework agreement signed by Bittium and the Finnish Defence Forces on August 9, 2017. According to the framework agreement, the Finnish Defence Forces will order products included in the Software Defined Radio based Bittium TAC WIN system during the years 2018–2020. If materialized in full, the total value of the framework agreement is EUR 30 million (excl. VAT). Finnish Defence Forces will issue separate purchase orders for the products each year. The products ordered now will be delivered to the Finnish Defence Forces during the year 2019.

The share of the purchase order including Bittium Tough Comnode terminals is based on the framework agreement signed by Bittium and the Finnish Defence Forces on November 5, 2018. According to the framework agreement, the Finnish Defence Forces will order Bittium Tough Comnode terminals and related accessories during the years 2018–2022. If materialized in full, the total value of the framework agreement is EUR 8.3 million (excl. VAT). Finnish Defence Forces will issue separate purchase orders in several batches during the validity of the framework agreement. The products ordered now will be delivered to the Finnish Defence Forces during the year 2019.

## Outlook for 2019

The amount of wireless broadband data transfer applications is expanding and diversifying. Also the amount of data transfer and the need for secure data transfer are growing. These all create demand for Bittium's leading edge technology products and solutions.

The digitalization of healthcare and remote care are becoming more common, enhancing the healthcare services and creating demand for Bittium's medical technology products and solutions. In order to enable strong international growth in a long term, Bittium invests significantly in developing its own products and solutions and aims at growing its net sales based on its products and product platforms.

Bittium expects that the net sales in 2019 will grow from previous year (EUR 62.8 million in 2018) and the operating profit to be better than in the previous year (2.8 million in 2018). Due to the product deliveries focusing on the second half of the year, the accumulation of the operating result is expected during the second half of the year, as in the previous year. In addition, the level of operating result in 2019 will be impacted by the investments in own products and product platforms started in 2017.

More information about Bittium's market outlook is presented in the section "Market outlook" in this Financial Statement Bulletin.

More information about other uncertainties regarding the outlook is presented in this Financial Statement Bulletin in the section "Risks and uncertainties" and on the company's internet pages at [www.bittium.com](http://www.bittium.com).

## Market Outlook

Bittium's customers operate in various industries, each of them having their own industry specific factors driving the demand. A common factor creating demand among the whole customer base is the growing need for higher quality and secure data transfer. Due to the technology competences accrued over time and long history in developing mobile communication solutions, Bittium is in a good position to offer customized solutions for its customers. Over thirty years of experience and extensive competence in measuring of biosignals also act as a basis for medical technology solutions.

The following factors are expected to create demand for Bittium's products and services in 2019 and beyond:

- In the mobile telecommunications, development of 5G technology has decreased significantly and the implementation is accelerating in pace. Investments in developing new features continue and the importance of software development in the 5G network development expands. This creates demand for Bittium's R&D services. There is a wide range of frequencies allocated for the 5G technology thus creating the need to develop multiple products to cover the market and creating demand for R&D services for development of product variants. Also the development of new devices utilizing 5G technology increases the demand for Bittium's services.
- As the digitalization evolves, the secure IoT (Internet of Things) has become a significant development area in many industries. The increasing need of companies to digitalize their operations, collect data wirelessly and transfer it to the internet and cloud services generate need for Bittium's services and customized solutions. For this there is a need for secure connected devices for consumers' free-time applications and demanding industrial usage that collect information through their sensors and connect the de-

vices securely to the internet and cloud services. New IoT radio systems are being used all over the world and the amount of digitalized devices continuously increases. The devices have new further developed features that generate demand for R&D services. Along with the 5G technology is being used, there will also be new features in the IoT that enable i.e. remote control of machines. Therefore the integration of different systems and technologies play an important role in enabling the complete digitalization service. To ease and speed up the processing of large data amounts there are different kinds of learning systems and devices under development that use different kinds of artificial intelligence (AI) technologies.

- The use of LTE technology, smartphones and applications continue to increase in special verticals, such as public safety, creating demand for Bittium Tough Mobile secure LTE smartphone and other customized special terminals based on Bittium's own product platform. The awareness of mobile security risks is growing and the interest towards secure mobile devices is increasing. Also the interest towards LTE-SAT-hybrid devices with terrestrial and satellite connections has grown to further improve the functionality of authorities' critical connections. The implementation of LTE-based devices in Public Safety markets has been slower than expected due to the delay of the device functionalities required by the authorities and due to the slow progress of the market. The sale of the secure terminal products is expected to develop moderately according to the nature of public safety markets.
- Using public network connections in portable devices is increasing also in demanding professional use, such as in the public sector. This creates requirements for network connections to be easy to use and secure. The products in the Bittium SafeMove product family enable the ease

of use of the devices and security in demanding use.

- In the defense sector's tactical communication market, the governments' defense forces and other authorities need networks that troops, who are more and more constantly on the move, can use for transferring growing amounts of data securely. This creates demand for Bittium Tactical Wireless IP Network (TAC WIN) broadband network and for other Bittium's IP-based (Internet Protocol) tactical communications solutions, as well as for Bittium's new tactical communication handheld and vehicle radios that fulfill the needs of data transfer of moving troops or individual soldiers. Bittium continues its efforts to bring its defense market targeted products and services also to the international defense markets and aims to get new international customers for its tactical communication system in 2019. Due to the long sales cycles driven by purchasing programs of national governments, it takes time to receive significant purchase orders.
- The heart and brain failures are among the most frequent causes of serious complications and recognizing those symptoms early on, based on information gathered by measuring, enables the start of the effective treatment in time. Also the prevention of diseases and health problems are being increasingly invested in. In the healthcare technology market there is ongoing a significant change in the patient care both inside the hospitals as well as in homecare. The repatriation of patients is being pursued earlier than before which may enable significant cost savings in the healthcare. A prerequisite for early repatriation is the enabling of accurate and precise follow-up and measurement in home conditions through remote monitoring. For this purpose Bittium offers its Bittium Faros product family for remote heart monitoring and Bittium BrainStatus for measuring the electrical activity of the brain. One

of the growing application areas in the wireless and remote systems is healthcare technology that enables implementing these changes for its part. Remote monitoring and remote diagnostics together with wireless and remote-controllable systems bring effectiveness to the healthcare performance and cut costs as the diagnosis from specialists are available regardless of time and place. This enables also new service providers to enter the chain of medical treatment services offering wider availability of medicine, without bargaining the quality of specialists i.e. cardiologists and neurologists.

## Risks and Uncertainties

Bittium has identified a number of business, market and finance related risk factors and uncertainties that can affect the level of sales and profits.

### Market Risks

The global economic uncertainty may affect the demand for Bittium's services, solutions and products and provide pressure on e.g. pricing. In the short term such uncertainty may affect, in particular, the utilization and chargeability levels and average hourly prices of R&D services. Growing political uncertainty may also affect the demand for Bittium's services, solutions and products and the price competitiveness in the different geographical areas. Bittium is also increasingly exposed to legal, economic, political and regulatory risks related to the countries in which its suppliers and other cooperation partners are located. Such risks may result in delays in deliveries, currency losses, elevated costs, or litigations and related costs.

Bittium's customer base includes, among others, companies operating in the field of telecommunication, defense and other au-

thorities, as well as companies delivering products to them, the company is exposed to market changes in these industries.

A significant part of Bittium's net sales accumulates from selling products and R&D services to defense and other authorities, as well as companies delivering products to them. Deviation in anticipated business development with such customer concentrations may translate as a significant deviation in Bittium's outlook, both in terms of net sales and operating result, during the ongoing financial period and thereafter.

Bittium seeks to expand its customer base on a longer term and reduce dependence on individual companies and hence the company would thereby be mainly affected by the general business climate in the industries of the companies belonging to Bittium's customer base instead of the development of individual customer relationships. The more specific market outlook has been presented in this Financial Statement Bulletin in the "Market outlook" section.

#### **Business Related Risks**

Bittium's operative business risks are mainly related to following items: uncertainties and short visibility on customers' product program decisions, their make or buy decisions and on the other hand, their decisions to continue, downsize or terminate current product programs, execution and management of large customer projects, ramping up and down project resources, availability of personnel in labor markets, accessibility on commercially acceptable terms and on the other hand successful utilization of the most important technologies and components, competitive situation and potential delays in the markets, timely closing of customer and supplier contracts with reasonable commercial terms, delays in R&D projects, realization of expected return on capitalized R&D investments, obsolescence of inventories and technolo-

gy risks in product development causing higher than planned R&D costs, and risks related to the ramp-up of product manufacturing. Revenues expected to come from either existing or new products and customers include normal timing risks. Bittium has certain significant customer projects and deviation in their expected continuation could result also significant deviations in the company's outlook. In addition, there are typical industry warranty and liability risks involved in selling Bittium's services, solutions and products.

Bittium's product delivery business model faces such risks as high dependency on actual product volumes, timing risks and potential delays in the markets. The above-mentioned risks may manifest themselves as lower amounts of products delivered or higher costs of production, and ultimately, as lower profit. Bringing Bittium's products to international defense and other authorities markets may take longer than anticipated because the projects are typically long and the purchasing programs are prepared in the lead of national governments and within the available financing. Once a supplier has been selected, product deliveries are typically executed over several years.

Some of Bittium's businesses operate in industries that are heavily reliant on patent protection and therefore face risks related to management of intellectual property rights, on the one hand related to accessibility on commercially acceptable terms of certain technologies in the Bittium's products and services, and on the other hand related to an ability to protect technologies that Bittium develops or licenses from others from claims that third parties' intellectual property rights are infringed. Additionally, parties outside of the industries operate actively in order to protect and commercialize their patents and therefore in their part increase the risks related to the management of in-

tellectual property rights. At worst, claims that third parties' intellectual property rights are infringed, could lead to substantial liabilities for damages. In addition, the progress of the customer projects and delivery capability may be also affected by potential challenges in global accessibility of key technologies and components on commercially acceptable terms, as well as by the acceptance of the necessary export licenses. The company changed its name to Bittium Corporation as of July 1, 2015 and started using the new trademark. The registration and the use of the new trademark can include customary risks involved in taking in use a new trademark.

#### **Financing Risks**

Global economic uncertainty may lead to payment delays, increase the risk for credit losses and weaken the availability and terms of financing. To fund its operations, Bittium relies mainly on income from its operative business and may from time to time seek additional financing from selected financial institutions. Currently Bittium has a committed overdraft credit facility agreement of EUR 30.0 million. From these agreements intended for general financing purposes, EUR 20.0 million are valid until December 31, 2021 and EUR 10.0 million until December 31, 2019.

These agreements include customary covenants related to, among other things, equity ratio, transferring property and pledging. There is no assurance that additional financing will not be needed in case of investments, networking capital needs or clearly weaker than expected development of Bittium's businesses. Customer dependency in some parts of Bittium's business may translate as an accumulation of risk with respect to outstanding receivables and ultimately with respect to credit losses.

## Environmental Factors

Bittium's business operations focus mostly on the design, assembly provided by the manufacturing partners and marketing of products. This represents only a minor part of the environmental impacts over the entire life cycle of the products. Products of the Company have only minor general environmental impacts.

Bittium Corporation renewed its global environmental management system certification according to ISO 14001:2015 standard in June 2016. Company is monitoring globally the environmental requirements for products and derived national regulations to the extent that they are related to the company operations. Bittium has also observed and applied the requirements of the ROHS (use of hazardous substances) and WEEE (recycling of electrical and electronic equipment) directives in design since 2002. In addition, Company has monitoring impacts of forthcoming REACH III directives.

The applied environmental standards and regulations in company operations have been consolidated as uniform Bittium substance list, applicable also to Bittium's significant suppliers. The biannually updated substance list includes, in addition to the compliance of ROHS (I, II and III) and REACH directives, the substance requirements applicable in different market areas against which identification of materials is made if needed. Further, materials declaration list observes certain customer specific requirements. Company has further updated the requirements mainly on a biannual basis and applied the proper environmental requirements to the products or solutions, in which Bittium has partial or total responsibility depending on the application scope. The imposed requirements will be observed in business operations on a country-specific basis.

During 2018 Bittium's EES+-based energy efficiency system was certified to cover also

ISO 50001 energy efficiency standard requirements. During 2019 company aims to renew its energy efficiency system certification according to ISO 50001:2018 standard. Bittium has also official energy efficiency review responsible person in its service authorized by Finnish Energy Office.

Bittium has further developed company environmental reporting, based on which the 2018 environmental objectives have been followed. Company has observed the sustainability reporting requirements and published the environmental information as part of its sustainability report. The energy efficiency of Bittium's Oulu facilities has been clearly improved due to new site opened in October 2017. As an example of the energy efficiency actions the energy powered by solar cells was reaching over thirteen percent of the whole energy consumption during the best times. In the other Bittium facilities no major changes was observed during 2018.

## Personnel

The Bittium group employed an average of 660 people in between January and December 2018. At the end of December 2018, the company had 674 employees (619 employees at the end of 2017). A significant part of Bittium's personnel are R&D engineers.

## Changes in the Company's Management

September 9, 2018 – Mr. Sammy Loitto (MBA and Master of Engineering in Industrial Management) was appointed as Senior Vice President, Sales in Bittium Corporation as of October 1, 2018. Previously he has been

responsible for sales and business development activities at Bittium. Prior to that, he has worked in several sales and management positions at Jolla, Gryphon Secure and Airbus. Mr. Loitto reports to Mr. Hannu Huttunen, CEO of Bittium Corporation.

As of October 1, 2018 Bittium management group consists of following persons: Mr. Hannu Huttunen, CEO (chairman); Mr. Pekka Kunnari, CFO; Mr. Kari Jokela, CLO; Ms. Karoliina Fyrstén, Director, Corporate Communications and Marketing, Mr. Sammy Loitto, Senior Vice President Sales, and heads of product and service areas: Mr. Jari Sankala, Senior Vice President, Defense and Security; Mr. Klaus Mäntysaari, Senior Vice President, Connectivity Solutions; Mr. Arto Pietilä, Senior Vice President, Medical Technologies; and Mr. Jari-Pekka Innanen, Vice President, Engineering.

## Incentive Systems

### Variable Pay System

Variable pay is paid based on the achievement of the set targets. In 2018, earning period for the variable pay was the calendar year. The targets are determined separately for each earning period. The setting of targets and the review of their achievement is decided on a one-over-one basis. The criteria for the short-term merit pay are the financial and strategic targets of the Company. In 2018, gross margin and cash flow formed the financial targets. In addition, part of the targets may be other Company objectives or personal targets. Personal targets vary between duties.

### Directed Share Issue without Consideration (2016)

Based on the authorization granted by Bittium Corporation's Annual General Meeting of Shareholders held on April 15, 2015, the Board of Directors of Bittium Corporation decided on March 22, 2016 on a direct-

ed share issue without consideration as reward payments to the key persons of the Company and its subsidiaries. In the share issue, 37,500 new shares were issued without consideration to the key persons entitled to the share bonus. The share bonus was issued to 8 key persons of the Company defined by the Board of Directors, with the condition that they must be employed by Bittium Corporation or its subsidiaries at the time of payment of the share bonus. The shares issued in the directed share issue without consideration are subject to restrictions on the right of disposal until December 31, 2018. However, the Board of Directors may grant permission to dispose or use the shares prior to the given date. The shares were registered to the trade register and on the book-entry accounts of the recipients on March 24, 2016, and became subjects to trading on the trading list of Nasdaq Helsinki on March 29, 2016. The CEO received 10,000 shares of Bittium Corporation, and the rest of the members of the Management Group received in total 27,500 shares of Bittium Corporation.

## Authorizations of the Board of Directors at the End of the Reporting Period

### Authorizing the Board of Directors to Decide on the Repurchase of the Company's own Shares

The General Meeting held on April 11, 2018 authorized the Board of Directors to decide on the repurchase of the Company's own shares as follows.

The amount of own shares to be repurchased shall not exceed 3,500,000 shares, which corresponds to approximately 9.81 percent of all of the shares in the company.

Only the unrestricted equity of the company can be used to repurchase own shares on the basis of the authorization.

Own shares can be repurchased at a price formed in public trading on the date of the repurchase or otherwise at a price formed on the market.

The Board of Directors decides how own shares will be repurchased. Own shares can be repurchased using, inter alia, derivatives. Own shares can be repurchased otherwise than in proportion to the shareholdings of the shareholders (directed repurchase).

The authorization canceled the authorization given by the General Meeting on April 12, 2017 to decide on the repurchase of the company's own shares. The authorization is effective until June 30, 2019.

### Authorizing the Board of Directors to Decide on the Issuance of Shares as well as the Issuance of Special Rights Entitling to Shares

The General Meeting held on April 11, 2018 authorized the Board of Directors to decide on the issuance of shares and special rights entitling to shares referred to in Chapter 10 Section 1 of the Companies Act as follows.

The amount of shares to be issued shall not exceed 7,000,000 shares, which corresponds to approximately 19.61 percent of all of the shares in the company.

The Board of Directors decides on all the conditions of the issuance of shares and of special rights entitling to shares. The authorization concerns both the issuance of new shares as well as the transfer of treasury shares. The issuance of shares and of special rights entitling to shares may be carried out in deviation from the shareholders' pre-emptive rights (directed issue).

The authorization canceled the authorization given by the General Meeting on April 12, 2017 to decide on the issuance of shares as well as the issuance of special rights entitling to shares referred to in Chapter 10 Section 1 of the Companies Act. The authorization is effective until June 30, 2019.

## Shares and Shareholders

The shares of Bittium Corporation are quoted on Nasdaq Helsinki. The Company has one series of shares. All shares entitle their holders to dividends of equal value. Each share has one vote. The share does not have a nominal value. The Company's shares have been entered into the Euroclear Finland Ltd's book-entry securities system.

At the end of the financial period, the fully paid share capital of the Company entered into the Finnish Trade Register was EUR 12,941,269.00 and the total number of the shares was 35,693,166. The accounting par value of the Company's share is EUR 0.10. The Company does not have its own shares in its possession.

Shareholding and control related information is presented in section 36 of the notes to the Financial Statement.

## Flagging notifications

There were no changes in the ownership during the period under review that would have caused flagging notifications which are obligations for disclosure in accordance with Chapter 2, section 9 of the Securities Market Act.

## Notifications of Managers' Transactions

November 30, 2018: Name of the person subject to the notification requirement: Erkki Veikkolainen, chairman of the Board of Directors. Notification type: initial notification. Nature of transaction: receipt of a share-based incentive. Transaction date: November 28, 2018. Aggregated transactions: volume 2,514 shares, volume weighted average price: EUR 6.68000.

November 30, 2018: Name of the person subject to the notification requirement: Petri Toljamo, member of the Board of Directors. Notification type: initial notification. Nature of transaction: receipt of a share-based incentive. Transaction date: November 28, 2018. Aggregated transactions: volume 1,437 shares, volume weighted average price: EUR 6.68000.

November 30, 2018: Name of the person subject to the notification requirement: Riitta Tiuraniemi, member of the Board of Directors. Notification type: initial notification. Nature of transaction: receipt of a share-based incentive. Transaction date: November 28, 2018. Aggregated transactions: volume 1,437 shares, volume weighted average price: EUR 6.68000.

November 30, 2018: Name of the person subject to the notification requirement: Juha Putkiranta, member of the Board of Directors. Notification type: initial notification. Nature of transaction: receipt of a share-based incentive. Transaction date: November 28, 2018. Aggregated transactions: volume 1,437 shares, volume weighted average price: EUR 6.68000.

November 30, 2018: Name of the person subject to the notification requirement: Tero Ojanperä, member of the Board of Di-

rectors. Notification type: initial notification. Nature of transaction: receipt of a share-based incentive. Transaction date: November 28, 2018. Aggregated transactions: volume 1,437 shares, volume weighted average price: EUR 6.68000.

November 30, 2018: Name of the person subject to the notification requirement: Seppo Mäkinen, member of the Board of Directors. Notification type: initial notification. Nature of transaction: receipt of a share-based incentive. Transaction date: November 28, 2018. Aggregated transactions: volume 1,437 shares, volume weighted average price: EUR 6.68000.

## The Board of Directors, Board Committees and the Auditor

The Annual General Meeting held on April 11, 2018, decided that the Board of Directors shall comprise six (6) members. Mr. Seppo Mäkinen, Mr. Juha Putkiranta, Mr. Tero Ojanperä and Mr. Erkki Veikkolainen were re-elected as members of the Board of Directors for a term of office expiring at the end of the next Annual General Meeting. Further, Mr. Petri Toljamo and Ms. Riitta Tiuraniemi were elected as new members of the Board of Directors for a corresponding term of office.

At its assembly meeting held on April 11, 2018, the Board of Directors elected Mr. Erkki Veikkolainen Chairman of the Board. Further, the Board resolved to keep the Audit Committee. Juha Putkiranta (Chairman of the Committee) and Riitta Tiuraniemi were elected as members of the Audit Committee and authorized public accountant Seppo Laine was invited to the Audit Committee as external advisor of the Board of Directors.

The Annual General Meeting held on April 11, 2018 re-elected Ernst & Young Oy, authorized public accountants as auditor of the Company for a term of office ending at the end of the next Annual General Meeting. Ernst & Young Oy notified that Mr. Juhani Rönkkö, authorized public accountant, will act as responsible auditor. It was decided that the remuneration to the auditor shall be paid against the auditor's reasonable invoice.

## Corporate Governance Statement

The Board of Directors has issued the corporate governance statement separate from this report.

## Dividend from 2017

The Annual General Meeting held on April 11, 2018 decided in accordance with the proposal of the Board of Directors to pay EUR 0.30 per share as dividend based on the adopted balance sheet for the financial period January 1, 2017–December 31, 2017. The dividend was paid to the shareholders who are registered as shareholders in the Company's register of shareholders as maintained by Euroclear Finland Ltd on the dividend record date Friday, April 13, 2018. The dividend was paid on Friday, April 20, 2018.

# Consolidated Statement of Comprehensive Income

Continuing operations, 1000 EUR	Notes	Jan. 1– Dec. 31, 2018	Jan. 1– Dec. 31, 2017
<b>NET SALES</b>	1, 3	<b>62,840</b>	<b>51,637</b>
Other operating income	4	1,263	2,109
Change in work in progress and finished goods			
Work performed by the undertaking for its own purpose and capitalized		337	681
Raw materials		-10,214	-5,940
Personnel expenses	7	-29,717	-33,044
Depreciation	6	-4,646	-3,902
Other operating expenses	5	-17,124	-17,784
Share of results of the associated companies	15	105	39
<b>OPERATING PROFIT</b>		<b>2,845</b>	<b>-6,203</b>
Financial income and expenses	9	-136	378
<b>PROFIT BEFORE TAX</b>		<b>2,709</b>	<b>-5,825</b>
Income tax	10	1,315	1,065
<b>PROFIT FOR THE YEAR FROM CONTINUING OPERATIONS</b>		<b>4,024</b>	<b>-4,760</b>
Profit for the year from discontinued operations	2		1,653
<b>PROFIT FOR THE YEAR</b>		<b>4,024</b>	<b>-3,108</b>
<b>Other comprehensive income:</b>			
Items that may be reclassified subsequently to the statement of income			
Exchange differences on translating foreign operations		46	-122
<b>TOTAL COMPREHENSIVE INCOME FOR THE YEAR</b>		<b>4,070</b>	<b>-3,229</b>
<b>Profit for the year attributable to</b>			
Equity holders of the parent		4,024	-3,108
<b>Total</b>		<b>4,024</b>	<b>-3,108</b>
<b>Total comprehensive income for the year attributable to</b>			
Equity holders of the parent		4,070	-3,229
<b>Total</b>		<b>4,070</b>	<b>-3,229</b>
<b>Earnings per share for profit attributable to the shareholders of the parent company:</b>	11		
<b>Earnings per share from continuing operations, EUR</b>			
Basic earnings per share		0.113	-0.133
Diluted earnings per share		0.113	-0.133
<b>Earnings per share from discontinued operations, EUR</b>			
Basic earnings per share			0.046
Diluted earnings per share			0.046
<b>Earnings per share from continuing and discontinued operations, EUR</b>			
Basic earnings per share		0.113	-0.087
Diluted earnings per share		0.113	-0.087
Average number of shares, 1000 pcs		35,693	35,693
Average number of shares, diluted, 1000 pcs		35,693	35,693

# Consolidated Statement of Financial Position

1000 EUR	Notes	Dec. 31, 2018	Dec. 31, 2017
<b>Non-current assets</b>			
Property, plant and equipment	12	23,448	21,946
Goodwill	13	5,821	5,820
Intangible assets	13	29,691	14,951
Investments in associated companies	15	1,480	1,242
Other financial assets	16	112	112
Non-current receivables	18	1,578	210
Deferred tax assets	17	3,747	2,463
<b>Total</b>		<b>65,877</b>	<b>46,744</b>
<b>Current assets</b>			
Inventories	18	14,585	10,574
Trade and other receivables	19	21,061	18,151
Financial assets at fair value through profit or loss	20	21,576	56,401
Cash and short-term deposits	21	9,305	6,518
<b>Total</b>		<b>66,527</b>	<b>91,644</b>
<b>Total assets</b>		<b>132,404</b>	<b>138,387</b>
<b>Equity and liabilities</b>			
Equity attributable to equity holders of the parent	22		
Share capital		12,941	12,941
Translation differences		1,083	1,030
Invested non-restricted equity fund		25,953	25,953
Retained earnings		70,058	76,753
<b>Total</b>		<b>110,035</b>	<b>116,678</b>
<b>Total equity</b>		<b>110,035</b>	<b>116,678</b>
<b>Non-current liabilities</b>			
Deferred tax liabilities	17	405	377
Interest-bearing loans and borrowings (non-current)	25	769	484
Other non-current liabilities, non-interest bearing	26	685	678
<b>Total</b>		<b>1,859</b>	<b>1,540</b>
<b>Current liabilities</b>			
Trade and other payables	26	18,121	18,302
Provisions	24	1,643	1,143
Interest-bearing loans and borrowings (current)	25	747	725
<b>Total</b>		<b>20,510</b>	<b>20,170</b>
<b>Total liabilities</b>		<b>22,369</b>	<b>21,710</b>
<b>Total equity and liabilities</b>		<b>132,404</b>	<b>138,387</b>

# Consolidated Statement of Cash Flows

1000 EUR	Notes	Jan. 1– Dec. 31, 2018	Jan. 1– Dec. 31, 2017
<b>Cash flow from operating activities</b>			
<b>Profit for the year from continuing operations</b>		<b>4,024</b>	<b>-4,760</b>
<b>Profit for the year from discontinued operations</b>			<b>1,653</b>
Adjustments			
Effects of non-cash business activities	28	5,018	2,189
Finance costs	9	1,412	448
Finance income	9	-1,276	-826
Income tax	10	-1,315	-1,065
Change in net working capital			
Change in short-term receivables	19	-4,284	5,598
Change in inventories	18	-3,909	-6,363
Change in interest-free short-term liabilities	26	-175	2,773
Interest paid on operating activities		-1,412	-451
Interest and dividend received from operating activities		1,276	825
Income taxes paid		92	-67
<b>Net cash from operating activities</b>		<b>-548</b>	<b>-45</b>
<b>Cash flow from investing activities</b>			
Acquisition of business unit, net cash acquired	14		
Purchase of property, plant and equipment	12	-3,697	-11,408
Purchase of intangible assets	13	-15,958	-6,677
Sale of property, plant and equipment	12		116
Sale of intangible assets	13	31	149
Purchase of investments/associated companies	15	-208	-728
<b>Net cash from investing activities</b>		<b>-19,832</b>	<b>-18,549</b>
<b>Cash flows from financing activities</b>			
Share option plans exercised	23		
Repayment of borrowing	25	-5	-1,692
Payment of finance lease liabilities	25	-944	-1,010
Dividend paid and capital repayment		-10,708	-10,708
<b>Net cash from financing activities</b>		<b>-11,657</b>	<b>-13,410</b>
<b>Net change in cash and cash equivalents</b>	21	<b>-32,038</b>	<b>-32,004</b>
Cash and cash equivalents at 1 January		62,919	94,922
Change in fair value of investments			
<b>Cash and cash equivalents at the end of the year</b>		<b>30,881</b>	<b>62,919</b>

Cash and cash equivalents include liquid and low risk financing securities.

# Consolidated Statement of Changes in Equity

## Equity attributable to equity holders of the parent

1000 EUR	Share capital	Invested non- restricted equity fund	Translation difference	Retained earnings	Non- controlling interests	Total
<b>Shareholders' equity Jan. 1, 2018</b>	12,941	25,953	1,036	70,747	0	116,678
<b>Comprehensive income for the period</b>						
Profit for the period				4,024		4,024
Exchange differences on translating foreign operations			46			46
<b>Total comprehensive income for the period</b>	0	0	46	4,024	0	4,070
<b>Transactions between the shareholders</b>						
Dividend distribution				-10,708		-10,708
<b>Other changes</b>				-5		-5
<b>Shareholders' equity Dec. 31, 2018</b>	12,941	25,953	1,083	70,058	0	110,035
<b>Shareholders' equity Jan. 1, 2017</b>	12,941	25,953	1,158	90,562	0	130,615
<b>Comprehensive income for the period</b>						
Profit for the period				-3,108		-3,108
Exchange differences on translating foreign operations			-122			-122
<b>Total comprehensive income for the period</b>	0	0	-122	-3,108	0	-3,229
<b>Transactions between the shareholders</b>						
Dividend distribution				-10,708		-10,708
<b>Other changes</b>						0
<b>Shareholders' equity Dec. 31, 2017</b>	12,941	25,953	1,036	76,747	0	116,678

# Notes to the Consolidated Financial Statements

## Corporate Information

The company's field of activities is the development, production and selling of software, equipment and other products for the automotive and electronics industry, the production of R&D services and other services as well as other industrial operations. The company may administer product and other rights and conduct research and development operations, hold and trade securities and real-estate and conduct other investment activities.

The parent company of the Group is Bittium Corporation, which is a Finnish public company. The parent company is domiciled in Oulu and its registered address is Ritaharjuntie 1, 90590 Oulu.

## Accounting Principles for the Consolidated Accounts

### Basis of Preparation

The consolidated financial statements have been prepared in accordance with International Financial Reporting Standards (IFRS) as well as the SIC and IFRIC interpretations in force at December 31, 2018. The financial statements are presented in thousands of euro. The consolidated financial statements have been prepared on a historical cost basis unless otherwise indicated.

## Consolidation Principles

The consolidated financial statements of Bittium include the financial statements of the parent company Bittium Corporation and its subsidiaries.

## Subsidiaries

The consolidated financial statements include Bittium Corporation and its subsidiaries financial statements. Subsidiaries are companies in which the Bittium Corporation has a controlling interest. A controlling interest arises when the Group holds more than half of the voting rights or it otherwise has the power to govern the financial and operating policies of the entity. The existence of potential voting rights is taken into account in assessing the conditions under which control arises whenever instruments conferring potential voting rights can be exercised at the review date.

## Associated Companies

An associated company is a company in which the Group has a significant influence. A significant influence exists, when the Group has a right to participate in the decision making in regards of financing or operative business of the associated company but has no sole or common control of such decisions. In the consolidated financial statements the investments in the associated companies are accounted for using the equity method according to the IFRS 11: Joint Arrangements standard. The investment in associated companies is recorded using the acquisition price, adjusted for the Groups' share of changes in the associated companies' equity after the date of acquisition. If the Groups' share of associated companies' losses exceeds the carrying amount of the investment, the investment in the associated company in the balance sheet shall be written off. The losses exceeding the carrying amount are consolidated only if the Group has a binding obligation of covering the associated companies' liabilities. Investments in the associated companies include the goodwill emerging upon the acquisition. The unrealized profits or losses between the Group and the associated

companies are eliminated according to the share of Groups' ownership.

The Groups' share of results in the associated companies is recorded as an item above the operating result if the result arises from the operative business. The Groups' share of associated companies' other comprehensive income is recorded in the other items of comprehensive income in the consolidated statement of profit and loss.

The carrying value of investments in the associated companies is tested by comparing the carrying amount and the recoverable amount of the associated companies. An impairment loss is recognized if the carrying amount of the investment in associated companies exceeds the recoverable amount. An impairment loss is recognized in the income statement.

## Elimination of Intra-Group Transactions

Intra-Group share ownership has been eliminated by means of the purchase method. Acquired subsidiaries are included in the consolidated financial statements from the time when the Group has obtained control, and divested subsidiaries up to the time when control ceases. The excess of the acquisition cost of the subsidiary shares over fair value of the net assets acquired is allocated partly to the identifiable assets and liabilities. Any excess is recorded as goodwill. Business combinations that occurred before the implementation of IFRS, in 2004, the carrying amount of the goodwill has been treated according to the Finnish GAAP in accordance with the exemption under IFRS 1. According to IFRS goodwill is not amortized but tested annually for impairment.

Intra-Group transactions, receivables, liabilities and margins are eliminated in prepara-

ration of the consolidated financial statements.

## Foreign Currency Transactions

Figures relating to the financial statements of Group entities are measured in the currency that is the currency of each entity's main operating environment ("functional currency"). The consolidated financial statements are presented in euros, which is the functional currency of the Group's parent company.

Transactions denominated in foreign currency are recorded in euros using the exchange rate on the date of the transaction. Monetary items denominated in foreign currency are translated to euros using the European Central Bank exchange rates at the balance sheet date. Gains and losses arising from transactions denominated in foreign currency and the translation of monetary items are recorded in the income statement.

Income statements and cash flows of subsidiaries, whose functional and reporting currency is not the euro, are translated into euros at the average exchange rates during the financial period. Their balance sheets are translated at the exchange rates prevailing at the balance sheet date. Translating the profit for the period using different rates in the income statement and the balance sheet leads to a translation difference that is recorded in equity. The translation differences arising from the elimination of the cost of foreign subsidiaries are recorded in equity. When a subsidiary is sold, the cumulative translation differences are entered in the income statement as part of the capital gain or loss.

Cumulative exchange differences arising from the translation of internal long term loans, which are in actual terms net investments in foreign operations, are taken directly to a separate component of equity.

The goodwill arising from the acquisition of foreign operations as well as fair value adjustments made to the carrying amounts of the assets and liabilities of said foreign

operations in connection with an acquisition are treated as the assets and liabilities of said foreign operations and translated to euros using the exchange rates at the balance sheet date.

## Property, Plant and Equipment

Property, plant and equipment are measured at historical cost less depreciation and impairment losses. Assets of acquired companies are stated at their fair values at the date of acquisition. Assets are depreciated using the straight-line or reducing balance method over their useful life.

The residual value of assets and their useful life are reviewed periodically in connection with each set of financial statements and the interim report and, if necessary, they are adjusted to reflect changes that have occurred in the expectations for the asset's useful life. Ordinary repair and maintenance costs are charged to the income statement during the financial year in which they incurred. Gains and losses on sales and disposals are determined by comparing the received proceeds with the carrying amount and are included in operating profit.

## Intangible Assets

### Goodwill

After January 1st, 2004 the cost of goodwill is the excess of the cost of the business combination over the acquirer's interest in the net fair value of the identifiable assets. The goodwill arising from the business combinations prior to this represents the amount recorded under previous GAAP, which has been used as the deemed cost. The classification and accounting treatment of these business combinations has not been adjusted when the Group's opening IFRS balance sheet has been prepared.

Goodwill is tested annually or, if necessary, more frequently to determine any impairment. For this purpose, goodwill has been allocated to cash-generating units. The recoverable amount of a cash generating unit is compared to its carrying amount and an impairment loss is recognized if the carrying amount of the assets exceeds the recover-

able amount. An impairment loss is recognized in the income statement.

### Research and Development Expenditure

Research expenditures are recorded as an expense as they are incurred. Expenditure on development activities is capitalized if they meet the criteria defined in IAS 38 Intangible Asset. Capitalized development expenses include mainly materials, supplies and direct labor costs. They are amortized on a systematic basis over their expected useful lives.

Capitalized development expenses are reviewed for potential impairment regularly by comparing the carrying amount to their recoverable amount. Significant changes in the technological environment are taken into account. If the carrying amount of the development expenses is greater than the recoverable amount, an impairment loss is recognized immediately.

### Other Intangible Assets

Patents, trademarks, licenses and other intangible assets having a finite useful life are entered in the balance sheet and the amortized expense is recorded in the income statement over their useful life. If indications on possible impairment exist, the recoverable amount is determined and an impairment loss is recognized if necessary. Intangible assets with an indefinite useful life are not amortized but tested annually or, if necessary, more frequently to determine any impairment.

## Inventories

Inventories are stated at the lower of initial cost or net realizable value. Net realizable value is the estimated selling price in the normal course of business less the estimated costs of sale. The value of raw material inventory is determined using a weighted average cost formula. The initial cost of finished and semi-finished products comprises of raw material, direct labor and other direct expenses as well as an appropriate share of fixed and variable production overheads, based on the normal capacity of the production facilities.

## Borrowing Costs

Borrowing costs are recognized in the income statement as they accrue.

## Government Grants

Government grants are recognized when there is reasonable assurance that Group will comply with the conditions attaching to them and the grant will be received. Government grants received from public corporations are presented as other income in the income statement.

## Leases

When the Group is a lessee, all lease contracts of property, plant and equipment, in which the Group has substantially all the risks and rewards of ownership, are classified as finance leases. A finance lease agreement is recognized in the balance sheet at an amount equal at the inception of the lease to the fair value of the leased property or, if lower, at the present value of the minimum lease payments. An asset obtained on a finance lease is depreciated over the useful life of the asset or, if shorter, the lease term. Lease obligations are included in interest-bearing liabilities.

Lease agreements in which the risks and benefits attached to ownership remain with the lessor are classified as operating leases. Lease payments under an operating lease are recognized as an expense in the income statement on a straight line basis over the lease term.

## Impairment of Assets

At each balance sheet date the Group estimates whether there is any indication that an asset may be impaired. If any such indication exists, the recoverable amount of the asset is estimated. The recoverable amount is estimated annually regardless of any indication of impairment to the following assets: investments, goodwill, intangible assets with an indefinite useful life and for intangible assets which are not yet ready for use. The recoverable amount is based on

the future discounted net cash flows, which are equivalent with the expected cash flows generated by the asset.

An impairment loss is recognized whenever the carrying amount of an asset exceeds its recoverable value. The loss is booked to the income statement. A previously recognized impairment loss is reversed only if there has been a change in the estimates used to determine the recoverable amount. However, the reversal must not cause that the adjusted value is higher than the carrying amount that would have been determined if no impairment loss had been recognized in prior years. Impairment losses recognized for goodwill will under no circumstances be reversed.

## Employee Benefits

### Pension Liabilities

Group companies in different countries have pension plans in accordance with local conditions and practices. The plans are classified as either defined contribution plans or defined benefit plans.

In Finland, the Group has organized pension coverage for its staff through independent pension insurance companies.

The Finnish system under the Employees' Pensions Act and the disability portion are treated as a defined contribution plan. The contributions to defined contribution plans are charged to the income statement in the year to which they relate. After this the Group has no other obligations for additional payment. Also the pension arrangements of the foreign subsidiaries are classified as defined contribution plans.

### Share-Based Payment

The Group has applied IFRS 2: Share-Based Payment standard. The Group has an incentive plans in which part of the remuneration for the Board of Directors is paid in shares of Bittium. Share-based incentives are measured at fair value at the time they are granted and entered as an expense in the income statement when right is granted.

## Provisions

A provision is recognized when the Group has a legal or constructive obligation as a result of a past event, it is probable that a payment obligation will be realized or cause a financial loss and the amount of the obligation can be estimated reliably. Provisions can arise from restructuring plans, onerous contracts, warranty repairs and allowances and from environmental, litigation or tax risks.

The amount recognized as a provision is the best estimate of the expenditure required to settle the present obligation at the balance sheet date. If the time value of money is material, provisions will be discounted.

If a reimbursement can be obtained from a third party for part of the obligation, the reimbursement is treated as a separate asset when it is virtually certain that the reimbursement will be received.

## Taxes

Tax expense in the Group's income statement comprises the current tax and change in deferred taxes of each group company. Current tax is calculated based on the taxable income using the tax rate that is enacted in each country at the balance sheet date.

Deferred tax liability is calculated on the temporary differences between the carrying amounts and the amounts used for taxation purposes. Deferred tax assets are recognized for deductible temporary differences and tax losses to the extent that it is probable that taxable profit will be available against which tax credits and deductible temporary differences can be utilized. In calculating deferred tax liabilities and assets, the tax base which is in force at the time of preparing the financial statements or which has been enacted by the balance sheet date for the following period, has been applied.

## Revenue Recognition

IFRS 15 standard came in force on January 1st, 2018. Bittium identified and reviewed

the customer contracts and the revenue recognition principles for the different contract elements using the five step method presented in IFRS 15. During the process of reviewing the customer contracts Bittium stated that majority of the revenue recognition principles were already in line with the IFRS 15. Therefore the new standard did not have a material effect on the financial statements of the year 2018.

According to Bittium principles the signed contracts and purchase orders are customer contracts in accordance with IFRS 15. Frame contracts and Letters of intent can be classified as customer contracts only when the conditions of the contract are otherwise fully in accordance with the IFRS 15.

Bittium has recognized following IFRS 15 contract elements: product and license sales, sales of R&D services, maintenance and support services of products and extended warranties of the products. Bittium has listed prices for the products and their

maintenance and support services as well as for their extended warranties. If the contract does not define a single price of a contract element, the price can be estimated using the market price method or using a cost base method. The prices for the sales of services are defined in each service contract. Bittium has not activated any costs of gaining a contract nor has it allocated them for the projects or products as part of the revenue to be recognized. These additional costs have been minor and the possible assets borne as a result would have a depreciable lifetime of less than one year.

The revenue of the services is recognized as the service has been performed. In this case the contract element is delivered over time. Revenue from long-term construction contracts is recognized based on the stage of completion when the outcome of the project can be reliably measured. The stage of completion is measured by using the cost-to-cost method under which the percentage of completion is defined as the ratio

of costs incurred to total estimated costs. This requires an accurate forecasting of future sales and costs during the lifetime of the contract. The forecasts are a basis for the revenue recognized and they contain the latest estimates of the contract sales, costs, and the risks related to the contract. The forecasts are also subject to remarkable changes due to possible changes in contract scope, cost estimate changes and change in customers' plans as well as other factors affecting the forecast.

The revenue of product sales is recognized when the significant risks and rewards normally connected with ownership, have been transferred to the buyer. Neither the Group retains a continuing managerial involvement to the degree usually associated with ownership, nor effective control of these goods. In this case the contract element is transferred in a point in time. Sales are presented net of indirect sales taxes and discounts.

The following matrix states the different aspects of estimating and classifying the revenue recognition of different contract elements:

Type of contract	Contract element	The principle for revenue recognition and possible estimates
Sales of services	Customer contract, fixed price	Percentage of completion defined as the ratio of costs incurred to total estimated costs.
Sales of services	Customer contract based on time, price per hours	Revenue based on the work performed, recognition based on regular invoicing.
Product/licence sales	Product, off shelf	The revenue based on product delivery as the customer has achieved the control of the goods delivered.
Product/licence sales	Product, customized	The revenue based on product delivery as the customer has achieved the control of the goods delivered. The customization work is accrued over time according to the percentage of completion or based on the time as mentioned above in the sales of services.
Product/licence sales	Product + maintenance	The revenue based on product delivery as the customer has achieved the control of the goods delivered. Maintenance accrued over the maintenance period.
Product/licence sales	Product support services	Over time, based on the work done.
Other contracts	Rental agreements	During the rental period, according to the rental agreement.

In case Bittium receives prepayments from customers, the income related to them is recognized according to above mentioned principles. For the product warranties Bittium makes warranty provisions that are reversed over time during the warranty periods. The extended warranties paid separately are accrued as income over time during the warranty period.

### Assets Held for Sale and Discontinued Operations

The Group classifies a non-current asset or disposal as held for sale if its carrying amount will be recovered principally through a sale transaction rather than through continuing use. Non-current assets and asset items related to discontinued operations, which are classified as held for sale, are measured at the lower of their carrying amount and fair value less costs to sell. Depreciation and amortization on these asset items is discontinued at the time of classification.

## Financial Assets, Financial Liabilities and Derivative Contracts

IFRS 9: Financial Instruments standard has come into force on 1st of January 2018. The new standard did not have significant impact on the classification of the financial assets or liabilities in Bittium. The hedge accounting according to the IFRS 9: Financial Instruments standard has not been applied for the financial statement period or for the comparative period.

As presented in IFRS 9, Bittium has three classes of financial assets and liabilities: those measured at amortized cost, financial assets and liabilities at fair value through other comprehensive income and financial assets and liabilities at fair value through statement of income. The classification is made based on the business models and based on the analysis of cash flows. The financial assets and liabilities are classified

as they are initially recorded. After this no reclassifications are made unless the business model of asset management changes. At the financial statement date Bittium had a marginal amount of financial assets other than those measured at amortized cost. As an exception to this, the cash and short-term deposits include a low risk short-term investment portfolio that is assessed at fair value through statement of income.

The financial assets are written off when:

- The agreement based right for the cash flows of the financial asset is terminated or;
- The group has either transferred all the relevant risks and rewards related to the financial assets or it has transferred their control outside the group.

### The Impairment of Financial Assets

IFRS 9 had a small effect on assessment of group financial assets. Based on the simplified approach allowed by IFRS 9 standard the group assesses and writes off the amount of expected credit losses from accounts receivables. There are no significant financing components contained into Bittium's accounts receivables.

For assessing the expected credit losses, Bittium applies a provision matrix that is based on historical realized loss rates adjusted by forward looking estimates of lifetime of accounts receivables. All the components of the provision matrix are updated for each reporting date. The expected credit losses are presented in the group of provisions in the balance sheet. The changes in the expected credit losses are presented in the profit and loss statement.

### Cash and Short-term Deposits

Cash comprises cash on hand, bank deposits and other highly liquid investments with low risk. Assets classified as cash and short-term deposits have a maximum maturity of three months from the date of acquisition. Cash and bank deposits are mea-

sured at amortized cost, the short-term investment portfolio is assessed at fair value through statement of income.

### Financial Liabilities

Financial liabilities include trade and other payables, loans and other financial liabilities. All financial liabilities are measured at amortized cost. The loans are initially recognized at fair value. Transaction costs are entered in the profit and loss. Subsequently the loans are measured at the amortized cost by using the effective interest rate.

Financial liabilities are not reclassified after the initial recognition. Non-current financial liabilities are due after one year whereas the current financial liabilities are due within one year.

Financial liabilities are disposed as the liability related to the contract is declared void, cancelled or due. As the terms of the financial liability are substantially changed or when a new contract with the existing creditor is made, the change is entered as disposal of the old liability and as an entry of a new liability. The changes in the balance sheet values are entered through profit and loss.

### Significant Accounting Estimates and Judgments

The preparation of financial statements requires management to make estimates and assumptions about the future that affects the reported amounts. Used estimates and assumptions are based on prior experience and presumptions, which reflect the circumstances and expectations prevailing at the time of the preparation of the financial statements. Materiality and judgment in assessing the effect of uncertainties and the application of accounting principles have been observed in the preparation of the financial statements.

The management has exercised judgment during the financial year in applying e.g. in assessing the future cost forecasts in the

percentage of completion projects, assessing the value of intangible assets in business acquisitions and also when assessing the future prospects of Group companies in conjunction with standards IAS 12: Income Taxes and IAS 36: Impairment of Assets. Based on the management judgment, the majority of the capitalized R&D investments are depreciated over their expected useful lives. Part of the capitalized R&D investments is depreciated based on production amounts of the goods.

Financial statements may include non-recurring income or expenses that are not related to normal operative business or that occur only infrequently. Such items are among others sales profits or losses, substantial changes in asset values, like impairment or reversal of impairment, substantial restructuring costs or other substantial items that are considered as non-recurring by the management. Substantiality of the item is based on the item's euro amount and the relative share of total value of the asset.

## The Application of New and Revised IFRS Regulations

The consolidated financial statements are prepared in accordance with International Financial Reporting Standards (IFRS) effective at the end of the period. The new, revised or amended IFRS regulations did not have significant impact on the consolidated financial statements during the period.

### **The Application of IFRS 15: Revenue from Contracts with Customers Standard**

IFRS 15: Revenue from Contracts with Customers, came into force on 1st of January 2018. Bittium adopted the standard using the modified retrospective approach. The standard did not have effect on the opening balance of year 2018.

### **The Application of IFRS 9: Financial Instruments Standard**

IFRS 9: Financial Instruments standard has come into force on 1st of January 2018. It replaces the former IAS 39 Financial Instru-

ments: Recognition and Measurement standard. The objective of the new standard is to clarify the classification and assessment of the financial assets and liabilities and to create a new model for impairment and for the hedge accounting. In Bittium the new standard did not have significant impact on the classification of the financial assets or liabilities, nor to the assessments or processes of managing the currency risks. The model for impairment leads to earlier recognition of impairment losses but its effect on Bittium financial reporting has not been material. The new standard has specifying impact on the notes to the financial reporting with respect to financial instruments.

### **The Preparations for Application of IFRS 16: Leases Standard**

The impacts of the IFRS 16: Leases standard, coming into force in 2019 have been analyzed during the year 2018. According to the standard, basically all the Group lease agreements are presented in the assets and liabilities in the balance sheet. The adoption of the standard will increase the value of assets and liabilities in the consolidated opening balance sheet by EUR 1.5 million on January 1, 2019. Bittium will adopt the standard using the retrospective approach. The retrospective effect of adopting the new standard will not be restated for the comparative periods.

The other forthcoming revisions or amendments of the standards are not expected to have significant impact on the consolidated financial statements.

# Notes to the Consolidated Financial Statements

## 1. OPERATING SEGMENTS

Bittium has one reporting business segment, the Wireless business, that includes three product and service areas supporting each other. These areas are as follows: Defence & Security, Connectivity Solutions and Medical Technologies.

Wireless business is focused on creating reliable and secure communication and connectivity solutions, as well as on developing healthcare technology solutions for biosignal measuring. For its customers Bit-

tium offers innovative products and solutions based on its product platforms, and R&D services. Bittium also offers high quality information security solutions for mobile devices and portable computers. For customers in biosignal measuring in the areas of cardiology, neurology, rehabilitation, occupational health and sports medicine Bittium offers healthcare technology products and services.

The highest operative decision-making body of the company is the Board of Di-

rectors of Bittium which is responsible for allocating resources to and evaluating the results of Bittium's operating segment. Income statement and balance sheet information of the Wireless business are equivalent to corresponding information of the Bittium group.

**Wireless****Geographical areas**

Bittium operates in three geographical areas which are Europe, Americas and Asia. In presenting the geographical information, the revenue is based on the geographical location of customers. Geographical assets are based on the geographical location of the assets.

**Geographical areas****Jan. 1–Dec. 31, 2018**

1000 EUR	Finland	Other Europe	Americas	Asia	Eliminations	Group total
<b>Net sales</b>						
Sales to external customers	48,637	5,311	8,041	851		62,840
Non-current assets	60,250		303			60,553
<b>Total non-current assets *)</b>						<b>60,553</b>
*) does not include deferred tax assets						
<b>Capital expenditure</b>						
Tangible assets	1,509		-7			1,503
Intangible assets	14,742					14,742
Investments	27	210				237
Goodwill	-8		9			1

**Geographical areas****Jan. 1–Dec. 31, 2017**

1000 EUR	Finland	Other Europe	Americas	Asia	Eliminations	Group total
<b>Net sales</b>						
Sales to external customers	39,060	5,361	5,888	1,328		51,637
Non-current assets	43,770	2	299			44,071
<b>Total non-current assets *)</b>						<b>44,071</b>
*) does not include deferred tax assets						
<b>Capital expenditure</b>						
Tangible assets	9,252		103			9,355
Intangible assets	5,673					5,673
Investments	1,220	2				1,223
Goodwill	-890		-27			-917

**Information of primary customers**

Group's revenues from the 10 largest customers in period Jan. 1–Dec. 31 2018 were EUR 51.9 million (EUR 41.1 million in 2017) representing 82.6 percent of the net sales (79.6 percent in 2017).

# Notes to the Consolidated Financial Statements

## 2. DISCONTINUED OPERATIONS

1000 EUR	2018	2017
Other operating income	0	1,653
<b>Profit for the year from discontinued operations</b>	<b>0</b>	<b>1,653</b>
<p>The other operating income 2017 includes the reversal of provisions related to the sale of Automotive-segment (2015) as well as VAT returns related to sale of shares which have been returned due to changes in legal interpretation.</p>		
Cash received	221	432
<b>Cash flow impact</b>	<b>221</b>	<b>432</b>

## 3. NET SALES

1000 EUR	2018	2017
Services	32,068	34,919
Products	30,772	16,314
Other		403
<b>Total</b>	<b>62,840</b>	<b>51,637</b>

The services include the project sales with fixed prices and with hourly rates.

The product sales includes all the sales affected by products:

the sales of products, the product maintenance, extends warranties and licence sales.

### Construction contracts

The contract revenue is recognized in the income statement in proportion to the stage of completion of the contract. The stage of completion is defined as the ratio of costs incurred to total estimated costs. The turnover of construction contracts is, depending on the contract elements, recognized over time or at point in time. The principles of revenue recognition based on IFRS 15 are presented in detail in the accounting principles of the consolidated financial statements.

Income recognized from construction contracts	12,293	13,472
Net sales other	50,547	38,165
<b>Total</b>	<b>62,840</b>	<b>51,637</b>
Income recognized over time based on the stage of completion of long-term construction contracts	12,293	13,472
Revenue recognized from long-term construction contracts in progress amounted to	5,511	8,443
Advances received from long-term construction contracts recognized in the balance sheet amounted to	100	475
Receivables recognized from long-term construction contracts amounted to	1,909	1,289

The net sales by geographical areas is presented in the note 1.

**4. OTHER OPERATING INCOME**

1000 EUR	2018	2017
Government grants	1 193	1 944
Other income	69	165
<b>Total</b>	<b>1 263</b>	<b>2 109</b>

**5. OTHER OPERATING EXPENSES**

External services	2,779	4,313
Voluntary staff expenses	984	1,045
Premises expenses	1,386	2,886
Travel expenses	1,318	1,163
IT expenses	3,080	2,625
Other expenses	7,572	5,752
<b>Total</b>	<b>17,120</b>	<b>17,784</b>
<b>Auditor's charges</b>		
<b>Ernst &amp; Young</b>		
Auditing	66	68
Tax advice	9	17
Other services	5	11
<b>Total</b>	<b>81</b>	<b>96</b>
<b>Others</b>		
Auditing	24	25
Tax advice	7	12
Other services	1	
<b>Total</b>	<b>31</b>	<b>37</b>

# Notes to the Consolidated Financial Statements

1000 EUR	2018	2017
<b>6. DEPRECIATIONS AND IMPAIRMENTS</b>		
<b>Depreciations</b>		
Intangible assets		
Capitalized development expenditure	371	339
Intangible rights	432	604
Customer relations and technology	221	241
Other intangible assets	169	75
Tangible assets		
Buildings and constructions	439	379
Machinery and equipment	3,022	2,263
<b>Total</b>	<b>4,654</b>	<b>3,902</b>
<b>7. EMPLOYEE BENEFIT EXPENSES AND NUMBER OF PERSONNEL</b>		
<b>Number of personnel</b>		
Average number of personnel during the fiscal period		
Continuing operations	660	614
<b>Personnel expenses 1000 EUR</b>		
Personnel expenses		
Managing Director's salaries	333	214
Board of Directors *	169	165
Other salaries and wages	22,305	25,861
<b>Total</b>	<b>22,808</b>	<b>26,239</b>
Pension expenses, defined contribution plans	5,781	5,528
Other personnel expenses	1,128	1,276
<b>Total</b>	<b>29,717</b>	<b>33,044</b>

\*Including the share-based incentives. Further information in the note 32.

1000 EUR	2018	2017
<b>8. RESEARCH AND DEVELOPMENT EXPENSES</b>		
The research and development expenses total	21,596	15,045
Capitalized to the balance sheet	-15,105	-5,766
Depreciations	371	339
The expensed research and development expenses recognized in the income statement amounted to	6,862	9,618
<b>9. FINANCIAL EXPENSES (NET)</b>		
Interest expenses	-98	-87
Interest income	2	2
Dividend income	0	1
Exchange gains and losses	-120	47
Change of financial assets and liabilities at fair value through profit or loss	1,257	394
Other financial expenses	-1,193	-408
Other financial income	17	428
<b>Total</b>	<b>-136</b>	<b>378</b>
<b>10. INCOME TAXES</b>		
Income taxes, current year	-58	
Other taxes		
Income taxes, previous years	-2	-7
Deferred taxes	1,376	1,072
<b>Total</b>	<b>1,315</b>	<b>1,065</b>
A reconciliation between the effective tax rate and domestic tax rate (20.0 percent) of the Group:		
<b>Profit before taxes</b>	<b>2,709</b>	<b>-5,825</b>
Tax at the domestic tax rate	-544	1,177
Effect of tax rates of foreign subsidiaries	-1	6
Taxes for prior years	-2	-7
Tax free income	50	268
Non-deductible expenses	-2,088	-2,267
Utilization of deferred tax assets from previous years	2,622	1,112
Reassessment of deferred tax assets	1,374	1,072
The deferred tax assets from tax losses	-96	-297
Others		
<b>Income taxes in the consolidated income statement</b>	<b>1,315</b>	<b>1,065</b>

# Notes to the Consolidated Financial Statements

1000 EUR	2018	2017
<b>11. EARNINGS PER SHARE</b>		
<b>Basic</b>		
Basic earnings per share amounts are calculated by dividing net profit for the year attributable to ordinary equity holders of the parent by the weighted average number of ordinary shares outstanding during the year.		
Profit attributable to the equity holders of the parent, continuing operations	4,024	-4,760
Profit attributable to the equity holders of the parent, discontinued operations	0	1,653
Profit attributable to the equity holders of the parent, continuing and discontinued operations	4,024	-3,108
Weighted average number of ordinary shares during the financial year (1000 PCS)	35,693	35,693
<b>Basic earnings per share, continuing operations, €</b>	<b>0.113</b>	<b>-0.133</b>
<b>Basic earnings per share, discontinued operations, €</b>	<b>0.000</b>	<b>0.046</b>
<b>Basic earnings per share, continuing and discontinued operations, €</b>	<b>0.113</b>	<b>-0.087</b>
<b>Diluted</b>		
Diluted earnings per share is calculated by dividing the net profit attributable to ordinary equity holders of the parent by the weighted average number of ordinary shares outstanding during the year plus the weighted average number of ordinary shares that would be issued on the conversion of all the dilutive potential ordinary shares into ordinary shares. The Group had no share-based payment schemes which would have a diluting effect on the number of shares.		
Profit attributable to the equity holders of the parent, continuing operations	4,024	-4,760
Profit attributable to the equity holders of the parent, discontinued operations	0	1,653
Profit attributable to the equity holders of the parent, continuing and discontinued operations	4,024	-3,108
Weighted average number of ordinary shares during the financial year (1000 PCS)	35,693	35,693
Effect of dilution (1000 PCS)		
Weighted average number of ordinary shares during the financial year (1000 PCS)	35,693	35,693
<b>Diluted earnings per share, continuing operations, EUR</b>	<b>0.113</b>	<b>-0.133</b>
<b>Diluted earnings per share, discontinued operations, EUR</b>	<b>0.000</b>	<b>0.046</b>
<b>Diluted earnings per share, continuing and discontinued operations, EUR</b>	<b>0.113</b>	<b>-0.087</b>

## 12. PROPERTY, PLANT AND EQUIPMENT

The Group has not revalued property, plant and equipment, hence the Group has not recognized any impairment losses directly to equity or recorded any reversals of those.

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>Land and water</b>		
Acquisition cost Jan. 1	1,091	1,091
Additions during the period		
Acquisition cost at the end of the period	1,091	1,091
Carrying amount at the end of the period	1,091	1,091
<b>Buildings and constructsures</b>		
Acquisition cost Jan. 1	17,284	10,145
Translation differences	3	
Additions during the period	159	7,193
Disposals during the period		-55
Acquisition cost at the end of the period	17,445	17,284
Accumulated depreciations Jan. 1	-2,878	-2,551
Translation differences	0	0
Depreciation for the period	-439	-379
Depreciations on disposals		51
Carrying amount at the end of the period	14,128	14,406
No revaluations or capitalizations of interest costs have been done.		
<b>Machinery and equipment</b>		
Acquisition cost Jan. 1	49,813	44,921
Translation differences	-9	34
Additions during the period	4,800	5,003
Acquisition of business unit		
Disposals during the period		-144
Acquisition cost at the end of the period	54,603	49,814
Accumulated depreciations Jan. 1	-43,452	-41,105
Translation differences	11	-34
Depreciation for the period	-3,022	-2,347
Depreciations on disposals		32
Carrying amount at the end of the period	8,141	6,361
<b>Other tangible assets</b>		
Acquisition cost Jan. 1	88	88
Acquisition cost at the end of the period	88	88
Carrying amount at the end of the period	88	88

## Notes to the Consolidated Financial Statements

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>Property, plant and equipment total</b>		
Acquisition cost Jan. 1	68,097	56,066
Translation differences	-6	34
Additions during the period	5,008	12,196
Acquisition of business unit	0	0
Disposals during the period	0	-199
Transfer to assets	0	0
Acquisition cost at the end of the period	73,099	68,097
Accumulated depreciations Jan. 1	-46,201	-43,476
Translation differences	11	-34
Depreciation for the period	-3,461	-2,726
Depreciations on disposals	0	84
Carrying amount at the end of the period	23,448	21,946
<b>Finance leases</b>		
The Group had the following amounts of property, plant and equipment acquired by finance leases:		
<b>Machinery and equipment</b>		
Acquisition cost	7,807	6,551
Accumulated depreciations	-6,317	-5,376
Carrying amount at the end of the period	1,490	1,175

Additions of property, plant and equipment include assets acquired by finance leases of EUR 0.9 million in 1.1.–31.12.2018 (EUR 0.8 million in 2017).

## 13. INTANGIBLE ASSETS

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>Capitalized development expenses</b>		
Acquisition cost Jan. 1	16,619	10,855
Additions during the period	15,105	5,764
Acquisition cost at the end of the period	31,724	16,619
Accumulated depreciations Jan. 1	-4,751	-4,412
Depreciation for the period	-371	-339
Carrying amount at the end of the period	26,602	11,868
<b>Intangible rights</b>		
Acquisition cost Jan. 1	4,244	3,889
Additions during the period	649	388
Disposals during the period	-5	
Transfer to assets		-33
Acquisition cost at the end of the period	4,888	4,244
Accumulated depreciations Jan. 1	-3,005	-2,652
Depreciation for the period	-432	-352
Carrying amount at the end of the period	1,452	1,239
<b>Customer relations and technology</b>		
Acquisition cost Jan. 1	1,688	1,688
Acquisition of business unit	92	
Acquisition cost at the end of the period	1,780	1,688
Accumulated depreciations Jan. 1	-414	-173
Depreciation for the period	-221	-241
Carrying amount at the end of the period	1,145	1,274

# Notes to the Consolidated Financial Statements

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>Other intangible assets</b>		
Acquisition cost Jan. 1	3,955	3,406
Translation differences	5	-13
Additions during the period	91	528
Transfer to assets		33
Acquisition cost at the end of the period	4,050	3,955
Accumulated depreciations Jan. 1	-3,385	-3,323
Translation differences	-5	13
Depreciation for the period	-169	-75
Carrying amount at the end of the period	492	570
<b>Intangible assets total</b>		
Acquisition cost Jan. 1	26,506	19,838
Translation differences	5	-13
Additions during the period	15,845	6,680
Acquisition of business unit	92	0
Disposals during the period	-5	0
Transfer to assets	0	0
Acquisition cost at the end of the period	42,443	26,506
Accumulated depreciations Jan. 1	-11,555	-10,560
Translation differences	-5	13
Depreciation for the period	-1,193	-1,008
Carrying amount at the end of the period	29,691	14,951
<b>Goodwill</b>		
Acquisition cost Jan. 1	5,820	6,737
Translation differences	9	-27
Disposals during the period	-8	-890
Carrying amount at the end of the period	5,821	5,820

### Impairment Test

The cash flow forecasts employed in impairment test calculations are based on the budgets for 2019 and the Long Range Plans (LRP) for 2020–2021 approved by management for the strategical period and management estimations for 2022–2023. Cash flows beyond five-year period are calculated by using the terminal value method. Future cash flows are exposed to the risks that are discussed in section “Risks and uncertainties” in the Report by the Board of Directors.

The used discount rate in impairment testing is Weighted Average Cost of Capital (WACC) before tax defined for Bittium. WACC defines average costs of equity and debt by noticing the risks belonging to the each component. The components of WACC are risk-free interest rate, market risk premium, beta, cost of debt, corporate income tax rate and target capital struc-

ture. WACC calculated according to these parameters amounted to 9.8 percent (9.8 percent in 2017).

In 2018, Wireless business did not reach the cash flow forecasted in the impairment test calculation in 2017. This was mainly because of slower than expected growth in the product business and increase in working capital. There were no fundamental changes in the business environment that would make an impact to the cash flow expectations compared to the previous financial year.

The impairment test is done when needed, but at least once a year. Impairment tests made in December 2018 did not indicate need for impairment bookings. Recoverable amounts exceed significantly the book value of goodwill and other assets. The terminal value represents 79 percent of business value. Product business grew slower

than expected and also investments to the development of a new products move focus of forecasted net present value based cash flows from the near future to further in the future.

Sensitivity analysis was also carried out during the impairment test. Cash flow forecast was either decreased by 20 or the discount factor was increased by 5 percentage units. It was noticed that cash flows are relatively sensitive to increase in discount factor. However, there are no expectations for impairment losses in the future.

# Notes to the Consolidated Financial Statements

## 14. ACQUISITIONS

### Acquisitions in 2018

In 2018, or in the comparative period 2017, the Group did not have acquisitions to be reported according to the IFRS standards.

## 15. SHARES IN ASSOCIATED COMPANIES

On June 16, 2017 Bittium Medanalytics Oy, part of Bittium group, and Coronaria Hoitoketju's subsidiary Coronaria Analyysipalvelut Oy, signed agreements according to which Bittium Medanalytics Oy sells its remote diagnostic service business to Coronaria Asiakaspalvelut Oy. According to the agreement Bittium supplies its web-based service kardiolog.fi used in monitoring cardiac abnormalities to Coronaria's use. Kardiolog.fi service is used by more than 70 Finnish health centers and private medical centers.

Further, Bittium Technologies Ltd, part of Bittium group, acquired 25 percent of the shares in Coronaria Analyysipalvelut Oy. Through this joint ownership Bittium and Coronaria aim at gaining synergies from Bittium's device and system development and the interfaces formed by Coronaria's clinical medicine and services.

Coronaria Analyysipalvelut Oy has been consolidated using the equity method using the information that was available for the Bittium financial statements. The domicile of the company is Oulu and Bittium group has 25 percent of the shares of the company in the end of 2018.

1000 EUR	2018	2017
<b>Shares in associated companies</b>		
Coronaria Analyysipalvelut Oy	1,271	1,220
Other associated companies	209	22
<b>Assets total</b>	<b>1,480</b>	<b>1,242</b>
<b>Coronaria Analyysipalvelut Oy</b>		
Current assets	1,597	1,050
Non-current assets	1,385	1,188
Non-current liabilities	217	63
Turnover	5,003	4,364
Net profit	936	834
<b>Reconciliation of financial information of the associated company to asset value of the group</b>		
Net assets of associated company	1,092	457
Share % of ownership	25%	25%
Share of net assets	273	114
Goodwill	839	839
Other intangible assets	224	289
Other items	-65	-22
Carrying value of the associated company	1,271	1,220

# Notes to the Consolidated Financial Statements

## 16. OTHER FINANCIAL ASSETS

1000 EUR	2018	2017
At 1 January	112	132
Disposals		-20
<b>At the closing date</b>	<b>112</b>	<b>112</b>

## 17. DEFERRED TAX LIABILITIES AND ASSETS

1000 EUR	Jan. 1, 2018	Recognized in the income statement	Acquisitions and disposals of subsidiaries	Dec. 31, 2018
<b>Deferred tax assets</b>				
Unutilized losses in taxation	523	0		523
Other items	1,940	1,284		3,224
<b>Total</b>	<b>2,463</b>	<b>1,284</b>	<b>0</b>	<b>3,747</b>

On December 31, 2018 the Group had 79.8 million euros tax losses and non-depreciated depreciations of which it had not booked deferred tax receivables in full amount due to the uncertainty of the future profits, their timing, taxation or location. The amount of these non-booked deferred tax receivables is approximately 16.0 million euros. The aging of these tax losses begins from year 2019.

1000 EUR	Jan. 1, 2018	Recognized in the income statement	Acquisitions and disposals of subsidiaries	Dec. 31, 2018
<b>Deferred tax liabilities</b>				
Customer and technology assets	377	-57	85	405
<b>Total</b>	<b>377</b>	<b>-57</b>	<b>85</b>	<b>405</b>

1000 EUR	Jan. 1, 2017	Recognized in the income statement	Acquisitions and disposals of subsidiaries	Dec. 31, 2017
<b>Deferred tax assets</b>				
Unutilized losses in taxation	360	162		523
Other items	1,156	784		1,940
<b>Total</b>	<b>1,516</b>	<b>947</b>	<b>0</b>	<b>2,463</b>

On December 31, 2017 the Group had 78.0 million euros tax losses and non-depreciated depreciations of which it had not booked deferred tax receivables due to the uncertainty of the future profits, their timing, taxation or location. The amount of these non booked deferred tax receivables is approximately 15.6 million euros. The aging of these tax losses begins from year 2018.

1000 EUR	Jan. 1, 2017	Recognized in the income statement	Acquisitions and disposals of subsidiaries	Dec. 31, 2017
<b>Deferred tax liabilities</b>				
Customer and technology assets	461	-83		377
<b>Total</b>	<b>461</b>	<b>-83</b>	<b>0</b>	<b>377</b>

# Notes to the Consolidated Financial Statements

## 18. INVENTORIES

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
Raw materials and supplies	8,635	5,797
Work in progress	4,188	3,193
Finished products	1,132	742
Other inventories	631	843
<b>Total</b>	<b>14,585</b>	<b>10,574</b>

## 19. TRADE AND OTHER RECEIVABLES (CURRENT)

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
Non-current receivables	1,578	210
<b>Non-current receivables total</b>	<b>1,578</b>	<b>210</b>
Current receivables:		
Trade receivables	16,125	13,891
Receivables from construction contracts	1,909	1,289
Prepaid expenses and accrued income	2,213	2,285
Other receivables	814	684
<b>Current receivables total</b>	<b>21,061</b>	<b>18,151</b>

Receivables are valued at nominal value or probable current value, whichever is lower.

During the financial year, Group has booked impairment losses from accounts receivable EUR 0.1 million (EUR 0.0 million 2017)

Age distribution of accounts receivable		
Current	11,894	10,012
Aged Overdue Amounts		
0-3 months	3,454	2,897
4-6 months	291	297
7-12 months	485	667
> 12 months	1	18
<b>Total</b>	<b>16,125</b>	<b>13,891</b>

**20. FINANCIAL ASSETS AT FAIR VALUE THROUGH PROFIT OR LOSS**

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>Interest rate funds</b>		
Balance sheet value on Jan. 1	56,401	66,935
Disposals	-34,952	-11,000
Changes in fair value	127	466
<b>Balance sheet value at the end of the period</b>	<b>21,576</b>	<b>56,401</b>
<b>Financial assets at fair value through profit or loss total</b>		
Balance sheet value on Jan. 1	56,401	66,935
Disposals	-34,952	-11,000
Changes in fair value	127	466
<b>Balance sheet value at the end of the period</b>	<b>21,576</b>	<b>56,401</b>
<b>21. CASH AND SHORT-TERM DEPOSITS</b>		
Cash and short-term deposits	9,305	6,518
<b>Total</b>	<b>9,305</b>	<b>6,518</b>
<b>Cash and cash equivalents at consolidated cash flow statement consist of:</b>		
Interest rate funds	21,576	56,401
Cash and short-term deposits	9,305	6,518
<b>Total</b>	<b>30,881</b>	<b>62,919</b>

Fair value of cash and cash equivalents does not significantly differ from the carrying amount.

# Notes to the Consolidated Financial Statements

## 22. ISSUED CAPITAL AND RESERVES

	Shares 1000 PCS	Share premium 1000 EUR	Premium fund 1000 EUR	Invested non- restricted equity fund 1000 EUR	Total 1000 EUR
On December 31, 2017	35,693	12,941	0	25,953	38,894
On December 31, 2018	35,693	12,941	0	25,953	38,894

### Shares and the Share Capital

The shares of Bittium Corporation are listed on the NASDAQ OMX Helsinki Ltd. The Corporation has one series of shares. All the shares entitle their holders to dividends of equal value. Each share has one vote. The share does not have a nominal value. The company's shares have been entered into the Finnish Central Securities Depository Ltd's book-entry securities system.

At the end of the financial period, the fully paid share capital of the company entered into the Finnish Trade Register was EUR 12,941,269.00 and the total number of the shares was 35,693,166. The accounting per value of the company's share is EUR 0.10. The company is not in the possession of its own shares.

### Translation Differences

The translation reserve comprises all foreign exchange differences arising from the transition of the financial statements of foreign subsidiaries.

### Dividends

The Board of Directors proposes that the Annual General Meeting resolve to pay EUR 0.15 of dividend per share based on the adopted balance sheet for the financial period of January 1, 2018–December 31, 2018.

### 23. SHARE-BASED PAYMENT PLANS

During the financial year 2018 the Group has paid 40 percent of total remuneration of the Board of Directors of Bittium Plc. by the shares of Bittium. The shares were acquired from the stock exchange. The main terms of the remuneration arrangement are presented in the table below.

#### Share-based remuneration of the Board of Directors

Form of the reward	Shares
Grant date	Nov. 28, 2018
Total amount of the executed shares	9,699
Share price at the grant date, EUR	6.68
Total expenses of the reward, EUR million	0.1
Vesting conditions	Ownership of the shares was transferred to the recipients at once but the recipients have agreed the lock-up undertaking until the membership in the board have ceased.
Execution	In shares

During the financial year 2017 the Group has paid 40 percent of total remuneration of the Board of Directors of Bittium Plc. by the shares of Bittium. The shares were acquired from the stock exchange. The main terms of the remuneration arrangement are presented in the table below.

#### Share-based remuneration of the Board of Directors

Form of the reward	Shares
Grant date	May 5, 2017
Total amount of the executed shares	10,125
Share price at the grant date, EUR	6.39
Total expenses of the reward, EUR million	0.1
Vesting conditions	Ownership of the shares was transferred to the recipients at once but the recipients have agreed the lock-up undertaking until the membership in the board have ceased.
Execution	In shares

### 24. PROVISIONS

1000 EUR	Guarantee provisions	Expected credit losses	Others	Total
December 31, 2017	1,077	0	66	1,143
Increase in provisions	402	158		559
Utilized provisions			-59	-59
Reversal of utilized provisions				0
<b>Dec. 31, 2018</b>	<b>1,479</b>	<b>158</b>	<b>6</b>	<b>1,643</b>
Current provisions	1,479	158	6	1,643
<b>Total</b>	<b>1,479</b>	<b>158</b>	<b>6</b>	<b>1,643</b>

# Notes to the Consolidated Financial Statements

## 25. FINANCIAL LIABILITIES

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>Non-current loans</b>		
Finance lease liabilities	769	484
<b>Total</b>	<b>769</b>	<b>484</b>
<b>Current loans</b>		
Finance lease liabilities	747	720
Repayments of non-current bank loans		5
<b>Total</b>	<b>747</b>	<b>725</b>
Repayment schedule of long-term loans:		
2019		363
2020	467	104
2021	171	14
2022	109	3
Later	23	
<b>Total</b>	<b>769</b>	<b>484</b>

The interest-bearing non-current loans are distributed by currency as follows:

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
EUR	769	484
<b>Total</b>	<b>769</b>	<b>484</b>

The interest-bearing current loans are distributed by currency as follows:

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
EUR	747	725
<b>Total</b>	<b>747</b>	<b>725</b>

Maturities of the finance lease liabilities:

<b>1000 EUR</b>	<b>Dec. 31, 2018</b>	<b>Dec. 31, 2017</b>
Finance lease liabilities - minimum lease payments		1,236
Within one year	780	743
After one year but no more than five years	793	493
After five years	0	0
Finance lease liabilities - Present value of minimum lease payments	1,516	1,204
Within one year	747	720
After one year but no more than five years	769	484
After five years	0	0
Future finance charges	58	32
<b>Total amount of finance lease liabilities</b>	<b>1,573</b>	<b>1,236</b>

# Notes to the Consolidated Financial Statements

## 26. CHANGES IN LIABILITIES ARISING FROM FINANCING ACTIVITIES

1000 EUR	Jan. 1, 2018	Cash flows	New leases	Dec 31, 2018
Obligations under finance leases and hire purchase contracts	1,204	-944	1,256	1,516
<b>Total</b>	<b>1,204</b>	<b>-944</b>	<b>1,256</b>	<b>1,516</b>

## 27. TRADE AND OTHER PAYABLES

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>Non-current liabilities</b>		
<b>Other non-current liabilities, non-interest bearing</b>		
Non-current advances received	155	190
Other non-current liabilities, non-interest bearing	530	488
<b>Total</b>	<b>685</b>	<b>678</b>
<b>Current liabilities</b>		
<b>Trade and other payables</b>		
Trade liabilities	5,707	9,162
Accrued liabilities, deferred income	7,450	6,023
Other liabilities	4,964	3,116
<b>Total</b>	<b>18,121</b>	<b>18,302</b>
Material of accrued expenses and deferred income consist of personnel expenses and other accruals.		
Fair value of the other liabilities than derivatives doesn't significantly differ from the initial carrying value, because the impact on discounting is not significant when taking into account the maturities of the loans.		
<b>Financial liabilities at fair value through profit or loss</b>		
Liabilities based on derivatives		
Balance sheet value on Jan. 1		6
Changes in fair value		-6
<b>Balance sheet value at the end of the period</b>	<b>0</b>	<b>0</b>

## 28. FINANCIAL RISK MANAGEMENT

Under its normal business activities, Bittium Corporation is exposed to several financial risks. The primary financial risks are foreign exchange rate risk, interest rate risk, investment risk and default risk. The goal of the Group's financial risk management function is to reduce adverse effects of price fluctuations and other uncertainties on earnings, balance sheet and cash flows as well as to ensure sufficient liquidity. In its risk management, the Group uses financial instruments such as forward exchange agreements and interest rate swaps. External professional portfolio managers are employed for investing activities.

The Group's general risk management principles are approved by the Board of Directors. The responsibility for their implementation lies with the group finance department together with operational units. The group finance department identifies and assesses risks and obtains relevant financial instruments for hedging them in close co-operation with the operative units. Management evaluates risk concentrations from the viewpoint of business activities, taking into consideration shared factors between underlying variables such as those arising from changes in economic conditions or other variables. Operations and funding programs executed in the financial markets are mainly concentrated into the parent company. Subsidiaries are mainly funded through intra-company loans and group account overdraft credit limits.

The Group's financial risks are divided into market, default and liquidity risks.

### Market Risks

Market risks are caused by changes in foreign exchange rates, interest rates and the price of securities. Fluctuations in these may have an impact on the Group's income statement, cash flow or balance sheet.

### Foreign Exchange Rate Risk

The Group operates globally and is exposed to transaction risk from foreign exchange positions as well as to risks due to the translation of investments in different currencies to the functional currency of the parent company. The most relevant currencies for the Group are the Euro and the US dollar. Foreign exchange rate risk is caused by commercial activities, monetary items on the balance sheet and net investments in foreign subsidiaries. A business unit's functional currency or generally used currencies (EUR, USD) are used as invoicing currency. Additional information on functional currency and foreign currency conversion is available in the accounting principles section of the consolidated financial statements.

The Group follows a currency strategy that aims at securing the margin of business activities in changing market conditions by minimizing the effect of fluctuations in foreign exchange rates. According to the principles of the currency strategy, surely

considered and the most probable net cash flow in a particular currency is hedged as net position. The cash flow is defined based on the net position of the trade receivables, trade payables, order intake and forecasted net currency cash flow. According to the currency strategy the degree of hedging can vary from approximately 50 to 100 percent of the forecasted net position when net position exceeds EUR 1 million. The Group could also apply hedge accounting as defined in the IFRS 9 standard. Hedge accounting was not applied during 2018. At the end of the financial period the counter value of the hedged net position was EUR 0.0 million. During the financial year the amount of the hedged position has been changing between EUR 0.0–2.5 million.

The Group has hedged the transaction risk related to its income statement and the translation risk related to equity on the balance sheet or economic risk has not hedged. Foreign currencies denominated equities of foreign subsidiaries on December 31, 2018 was EUR 2.2 million (EUR 2.0 million in 2017) from which dollar denominated equities of foreign subsidiaries was EUR 1.2 million (EUR 1.0 million in 2017).

## Notes to the Consolidated Financial Statements

On the closing date, the Group had the following foreign exchange derivative contract nominal amounts outstanding (the nominal amounts do not represent the amounts exchanged by the parties):

1000 EUR	2018	2017
Forward contracts		
Market value	0	0
Nominal value	0	0

Dollar denominated assets and liabilities translated to euros using the closing date's value:

1000 EUR	2018	2017
Long-term assets	0	0
Long-term liabilities	0	0
Current assets	4,004	1,809
Current liabilities	2,789	848

The table below describes the 10 percent appreciation or depreciation of the Euro against the US dollar, other variables remaining constant. The sensitivity analysis is based on foreign currency denominated assets and liabilities as of the closing date. The change in dollar denominated trade receivables and debt would primarily have been due to fluctuations in the foreign exchange rate.

1000 EUR	Changes in income statement before tax		Changes in equity before tax	
	2018	2017	2018	2017
EUR appreciates	-100	-100	-100	-100
EUR depreciates	100	100	100	100

### Interest Rate Risk

Part of the Group's debt is tied to fixed interest rates.

At the closing date, the Group had the following fixed interest rate debts outstanding:

1000 EUR	2018	2017
Fixed interest rate debts	1,516	1,209

The table below describes the interest rate risk of debts should there have been a  $\pm 1$  percent change in interest rates of short term reference interest rate debts, other variables remaining constant. The figures presented indicate the change in yearly interest expense calculated using the average amount of debt during the financial period.

1000 EUR	Changes in income statement before tax		Changes in equity before tax	
	2018	2017	2018	2017
Loan stock January, 1	1,200	3,200		
Loan stock December, 31	1,500	1,200		
Average loan stock	1,400	2,200		
Change in interest	+/- 0	+/- 0	+/- 0	+/- 0

### Market Risk of Investment Activities

The Group's interest investments result in interest rate exposure, but their effect is not considered significant. The Group's revenue and operative cash flows are mainly independent of market rate fluctuations.

The Group invests in low-risk interest rate funds and therefore it has not been exposed to security price risk of fluctuations in the stock markets. According to the Group's principles, investments related to cash management are made in liquid and low-risk money market or bond instruments

and thus have not been hedged using derivatives.

The table below describes the distribution of investments in securities at the closing date.

	2018	2017
Stock shares	0.0%	0.0%
Bonds	66.9%	64.1%
Money market investments	33.1%	35.9%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

## Notes to the Consolidated Financial Statements

The combined value of the above instruments during the financial period has ranged from approximately EUR 21.6 to EUR 56.4 million. At closing date their value was approximately EUR 21.6 million. This risk concentration has been managed by investing in well-spread and low-risk money market funds.

The table below describes the price risk of the investments if they had exhibited a  $\pm 1$  percent change in a market rate of interest, other variables remaining constant. Financial assets that are recognized at market value in the income statement affect net income. Changes in the value of for-sale financial assets affect equity. In the cal-

culations it is presumed that the Group's investments change with the interest rate level in question. The sensitivity analysis describes the total market risk of investment activity because all investments are in the interest rate instruments.

1000 EUR	Changes in income statement before tax		Changes in equity before tax	
	2018	2017	2018	2017
Interest investments	+/- 100	+/- 400	+/- 100	+/- 400

### Default Risk

Group's credit risks are mainly related to accounts receivable, cash, financial investments and derivatives used in hedging. In its deposit, financial investment and hedging activities Bittium operates only with well-known partners who have good credit rating.

About 87 percent of the Group's trade receivables are from ten customers. The other trade receivables are distributed among a wide customer base and across several geographical areas. Credit risk is mitigated for example by documentary credits or bank guarantees when needed. Default risk concentration is mainly assessed as a single customer's share of total trade receivables but also according to the receivable's date of maturity.

Bittium's significant default risk concentration is EUR 0.5 million which represents approximately 3.1 percent of the total accounts receivable.

During the past financial year the amount of recognized credit losses was approximately EUR 0.1 million (EUR 0.0 million in 2017). The amount of loans granted to affiliated companies were EUR 0.0 million at the end

of 2018 (EUR 0.1 million in 2017). Group did not have capital loans granted outside of the Group at the end of 2018 (EUR 0.0 million in 2017).

The amount of the Group's counterparty default risk is consistent with the book value of financial assets at the closing date. For the maturity distribution of trade receivables, see note 19.

### Liquidity Risk

The Group and business segments strive to continuously evaluate and monitor the amount of liquid funds needed for business operations and loan repayments. The Group strives to guarantee the availability and flexibility of financing by its strong financial position and liquid investments. The Group has also EUR 20.0 million credit facility agreement with Nordea Bank Plc. and EUR 10.0 million credit facility agreement with OP Corporate Bank Plc. From these agreements, intended for general financing purposes, EUR 10.0 million are valid until December 31, 2019 and EUR 20.0 million until December 31, 2021. The agreements include conventional covenants that are, among others, related to equity ratio, interest bearing debt to EBITDA, and transfer and pledge of the assets. These credit

facilities were in use EUR 0.0 million at the end of the reporting period. For the maturity distribution of the Group's debt, see note 25.

### Capital Structure Management

The Group strives to optimize its capital structure and thus support business activities by ensuring normal operating conditions under all circumstances. An optimal capital structure also ensures that the cost of capital is minimized.

The capital structure is affected by dividend policy and share issuance. The Group can alter and adjust dividends paid to shareholders as well as share repurchases. The Group can also alter and adjust the amount of shares issued, or make decisions on the sale of assets.

The management has continuously monitored the development of the Group's net gearing and solvency ratio. The Group's interest bearing net debt at the end of 2018 was EUR -29.4 million (EUR -61.7 million in 2017) and net gearing was -26.7 percent (-52.9 percent in 2017). The Group's solvency ratio at the end of 2018 was 84.7 percent (85.6 percent in 2017).

## Fair Values of Financial Assets and Liabilities

This section presents the Group's fair valuing principles for all financial instruments. The table below presents book values for each item in detail. Their fair values are not considered to materially differ from the book values presented in the consolidated balance sheets.

1000 EUR	Note	Book value 2018	Fair value 2018	Book value 2017	Fair value 2017
<b>Financial assets</b>					
Other financial assets	16	112	112	112	112
Deferred tax assets	17	3,747	3,747	2,463	2,463
Non-current receivables	19	1,578	1,578	210	210
Trade receivables and other receivables	19	21,061	21,061	18,151	18,151
<b>Financial assets at fair value</b>					
through profit or loss	20	21,576	21,576	56,401	56,401
Cash and cash equivalents	21	9,305	9,305	6,518	6,518
Currency forwards	20	0	0	0	0
<b>Financial liabilities</b>					
Bank loans	25			5	5
Finance lease liabilities	25	1,516	1,516	1,204	1,204
Trade payables and other debts	17,24,26	20,854	20,854	20,500	20,500
Currency forwards	27	0	0	0	0

### Investments in Shares and Funds and Other Investments

For-sale financial assets consist mainly of money market investments that fair values are based on the quotes of the closing day (IFRS 7: fair value hierarchy level 1; quoted prices (unadjusted) in active markets for identical assets or liabilities).

### Derivatives

The fair values of forward contracts are defined based on publicly quoted currency and interest rate information and using commonly accepted valuation methods (IFRS 7 fair value hierarchy level 2; instruments

whose fair value is observable either directly (i.e. as prices) or indirectly (i.e. derived from prices)). These calculations have been carried out by an outside professional party.

### Bank Loans

Book values are considered to closely approximate fair values.

### Finance Lease Liabilities

Book values are considered to closely approximate fair values.

### Trade Receivables and Other Receivables

The original book value of receivables is considered to equal their fair values, since the effect of discounting is non-significant considering the maturities of the receivables.

### Trade Payables and Other Debts

The original book value of payables and other debts is considered to equal their fair values, since the effect of discounting is non-significant considering the maturities of the receivables.

# Notes to the Consolidated Financial Statements

## 29. ADJUSTMENTS TO NET CASH FROM OPERATING ACTIVITIES

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
Business transactions without payments		
Depreciations	4,646	3,902
Share of profits in associated companies	-105	-39
Other adjustments	477	-1,673
<b>Total</b>	<b>5,018</b>	<b>2,189</b>

## 30. OPERATING LEASE AGREEMENTS

### The Group as Lessee

The total of future minimum lease payments under non-cancellable operating leases for each of the following periods:

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
Not later than one year	554	516
Later than one year and not later than five years	748	914
After five years	128	63

The Group owns its facilities in Oulu and Kuopio. The facilities in other locations are rented. In average the maturities of the lease agreements are from 1 month to 5 years and normally they include an option to extend the rental period from originally agreed end date.

### The Group as Lessor

The Group has leased the excess office and production facilities with lease agreements valid until further notice. These agreements have been released at the end of year 2017.

**31. SECURITIES AND CONTINGENT LIABILITIES**

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
Against own liabilities		
Floating charges	1,000	1,000
Guarantee limits at the maximum	135	1,201
Other contractual liabilities		
Falling due in the next year	2,414	1,884
Falling due after one year	2,132	995
Mortgages are pledged for liabilities totaled		
Other liabilities (guarantees issued)	135	1,201
Material purchase commitments	12,605	9,882

**32. RELATED PARTY DISCLOSURES**

The Group has the following structure:

	Country of incorporation	Owned by Parent %	Owned by Group %
<b>Parent</b>			
Bittium Oyj	Finland		
<b>Subsidiaries</b>			
Bittium Technologies Oy	Finland	100.00	100.00
Bittium Wireless Oy	Finland	0.00	100.00
Bittium Safemove Oy	Finland	0.00	100.00
Bittium Biosignals Oy	Finland	0.00	100.00
Bittium Medanalytics Oy	Finland	0.00	100.00
Kiinteistöosakeyhtiö Oulun Ritaharjuntie 1	Finland	0.00	100.00
Bittium Germany GmbH i.G.	Germany	0.00	100.00
Bittium Mexico S.A. de C.V.	Mexico	0.00	100.00
Bittium USA, Inc.	USA	0.00	100.00
Bittium Technology (Beijing) Co. Ltd.	China	0.00	100.00
Bittium Singapore Pte. Ltd.	Singapore	0.00	100.00

Information on the associated companies is presented in the note 15.

**Related party transactions and balances:**

1000 EUR	2018	2017
Associated companies		
Net sales	319	172
Receivables	2,101	336
Debts	413	475

# Notes to the Consolidated Financial Statements

1000 EUR	2018	2017
<b>Employee benefits for key management</b>		
Salaries and remuneration		
Managing director of the parent		
Hannu Huttunen 1.1.–31.12.2017, 1.1.–31.12.2018	333	214
<b>Total</b>	<b>333</b>	<b>214</b>
Remuneration of the members of the board of the parent and the financial committee		
Staffan Simberg 1.1.–31.12.2017, 1.1.–31.12.2018	5	18
Erkki Veikkolainen 1.1.–31.12.2017, 1.1.–31.12.2018	25	25
Kirsi Komi 1.1.–31.12.2017, 1.1.–11.4.2018	5	17
Riitta Tiuraniemi 11.4.–31.12.2018	12	
Petri Toljamo 11.4.–31.12.2018	10	
Juha Putkiranta 1.1.–31.12.2017, 1.1.–31.12.2018	17	14
Seppo Mäkinen 1.1.–31.12.2017, 1.1.–31.12.2018	14	14
Tero Ojanperä 1.4.–31.12.2017, 1.1.–31.12.2018	14	10
<b>Total</b>	<b>103</b>	<b>99</b>
<b>Share-based incentives</b>		
Board of Directors	66	66
<b>Total</b>	<b>66</b>	<b>66</b>
<b>Members of the group executive board</b>	<b>1,038</b>	<b>804</b>

There have not been any business transactions or open balances between the related parties.

#### Loans and guarantees to related party

There are no loans or guarantees granted between the related parties.

### 33. SIGNIFICANT EVENTS DURING THE REPORTING PERIOD

February 13, 2018 – Bittium Biosignals Ltd, a subsidiary of Bittium Corporation, and a major US remote monitoring provider, concluded a three-year supply agreement under which Bittium will supply the Bittium Faros 360 and customized Bittium Faros 360 cardiac ECG signal measuring and monitoring devices. In addition, Bittium will supply disposable electrodes for attaching Bittium Faros ECG devices.

When materialized in full, the total value of the agreement was USD 21 million (approximately EUR 17.1 million based on an exchange rate of February 12, 2018) with revenues recognized gradually during the years 2018, 2019, 2020 and 2021 depending on the progress of the product deliveries, with estimated emphasis on 2019 and 2020. This agreement did not change the Company's long term financial outlook (published in the Half Year Financial Report January–June 2017 on August 8, 2018).

April 13, 2018 – Bittium Wireless Ltd, a subsidiary of Bittium Corporation received a purchase order from the Finnish Defence Forces for products included in the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, which is meant for tactical communications. The value of the purchase order was EUR 14.3 million (excl. VAT). The purchase order did not change Bittium's financial outlook for the year 2018 (published in the Financial Statement Bulletin 2017 on February 22, 2018).

The purchase order is based on the framework agreement signed by Bittium and the Finnish Defence Forces on August 9, 2017, according to which the Finnish Defence Forces will order products included in the Software Defined Radio based Bittium TAC WIN system during the years 2018–2020. According to the framework agreement, Finnish Defence Forces will issue separate purchase orders for the products each year. The products ordered now will be delivered to the Finnish Defence Forces during the year 2018. If materialized in full, the total value of the framework agreement is EUR 30 million (excl. VAT). Bittium announced the Frame Agreement on August 8, 2018.

September 11, 2018 – Mr. Sammy Loitto (MBA and Master of Engineering in Industrial Management) was appointed as Senior Vice President, Sales in Bittium Corporation as of October 1, 2018. Previously he has been responsible for sales and business development activities at Bittium. Prior to that, he has worked in several sales and management positions at Jolla, Gryphon Secure and Airbus. Mr. Loitto reports to Mr. Hannu Huttunen, CEO of Bittium Corporation. As of October 1, 2018 Bittium management group consists of following persons: Mr. Hannu Huttunen, CEO (chairman); Mr. Pekka Kunnari, CFO; Mr. Kari Jokela, CLO; Ms. Karoliina Fyrstén, Director, Corporate Communications and Marketing, Mr. Sammy Loitto, Senior Vice President Sales, and heads of product and service areas: Mr. Jari Sankala, Senior Vice President, Defense and Security; Mr. Klaus Mäntysaari, Senior Vice President, Connectivity Solutions; and Mr. Arto Pietilä, Senior Vice President, Medical Technologies; and Mr. Jari-Pekka Innanen, Vice President, Engineering.

October 3, 2018 – the Finnish Minister of Defence Jussi Niinistö has authorized the Finnish Defence Forces Logistics Command to enter into a framework agreement with Bittium Wireless Ltd on the purchase of Bittium Tough Comnode terminals and related accessories. The framework agree-

ment was signed on November 11, 2018. It covers the years 2018–2020 and the maximum value of the purchase authorization for the framework agreement is EUR 8.3 million (excl. VAT). Based on the framework agreement, the Finnish Defence Forces will issue separate purchase orders in several batches during the validity of the framework agreement. The framework agreement did not change Bittium's financial outlook for the year 2018. Bittium Tough Comnode will fulfill the data transfer needs of the Finnish Defence Forces' mobile troops by functioning for example as a VoIP phone (Voice over IP), an IP router (Internet Protocol), and an SHDSL repeater (Symmetrical High-speed Digital Subscriber Line). The terminals will be used by all three military branches.

November 23, 2018 – Bittium announced that its cooperation partner, Austrian information technology company Kapsch BusinessCom AG was informed by the Austrian defense administration (Bundesministerium für Landesverteidigung BMVL) that it should be selected as the provider of the new IP-based tactical communication system for the Austrian Armed Forces in case no appeals by the losing parties of the competitive bidding will be filed during the next 10-days appeal period. This is a typical process in such public competitive bidding. Bittium's products for tactical communications are a significant part of Kapsch BusinessCom's winning bid, including the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system, which will be the core of the new communication system, as well as Bittium Tough Comnode and Bittium Tough VoIP products. On December 4, 2018 Bittium announced to have been informed that the 10-days appeal period has expired and no appeals have been filed. The signing of the contract was scheduled to December 2018. If materialized, Bittium's share of the total value of the winning bid will be around EUR 30 million (excl. VAT). The product deliveries are expected to take place during the years 2019–2021 and the majority of the net sales

is estimated to realize during the years 2020 and 2021. This did not change Bittium's financial outlook for the year 2018.

December 11, 2018 – The Finnish Minister of Defence Jussi Niinistö authorized the Finnish Defence Forces Logistics Command to enter into an Agreement with Bittium Wireless Ltd on the purchase of Bittium Tough SDR handheld and vehicle radios, and their related accessories. The Agreement was signed on December 12, 2018. The value of the Purchase Agreement is approximately EUR 10.5 million (excl. VAT) at the maximum. The new software-defined-radio based tactical radios will be used at the first phase by the Army and the delivery will be completed at the latest by the end of the year 2020. This purchase agreement did not change Bittium Corporation's financial outlook for the year 2018. The Purchase Agreement is based on the Letter of Intent for purchase of new tactical radios, signed by Bittium and Finnish Defence Forces on August 8, 2017. The Purchase Agreement is a natural continuum to the Letter of Intent. Bittium issued a stock exchange release on the Letter of Intent on August 8, 2017.

The purchase agreement includes terms for optional additional purchase, according to which, the Finnish Defence Forces have an option to purchase additional tactical radios and their related accessories, training and system management for the use of Army, Air Force and Navy, based on the prices agreed in the Purchase Agreement. If these optional additional purchase amounts would materialize in full, the total value of the purchase would be approximately EUR 207 million (excl. VAT) at the maximum. As agreed in the Letter of Intent, the Finnish Defence Forces aim at making these additional purchases during the next ten years. The materialization of the purchase is affected by the yearly state budget allocations for the administrative of the Ministry of Defence. There will be separate purchase orders for these optional additional purchases.

# Notes to the Consolidated Financial Statements

## 34. SIGNIFICANT EVENTS AFTER THE REPORTING PERIOD

February 14, 2019 – Bittium Wireless Ltd, a subsidiary of Bittium Corporation, received a purchase order from the Finnish Defence Forces for products included in the Software Defined Radio based Bittium Tactical Wireless IP Network (TAC WIN) system and Bittium Tough Comnode terminals, which are meant for tactical communications. The total value of the purchase order is EUR 11.5 million (excl. VAT) of which the share of the Bittium TAC WIN system's products is EUR 9.9 million and the share of the Bittium Tough Comnode terminals is EUR 1.6 million.

The share of the purchase order including Bittium TAC WIN system's products is based on the framework agreement signed by Bittium and the Finnish Defence Forces on August 9, 2017. According to the framework agreement, the Finnish Defence Forces will order products included in the Software Defined Radio based Bittium TAC WIN system during the years 2018–2020. If materialized in full, the total value of the framework agreement is EUR 30 million (excl. VAT). Finnish Defence Forces will issue separate purchase orders for the products each year. The products ordered now will be delivered to the Finnish Defence Forces during the year 2019.

The share of the purchase order including Bittium Tough Comnode terminals is based on the framework agreement signed by Bittium and the Finnish Defence Forces on November 5, 2018. According to the framework agreement, the Finnish Defence Forces will order Bittium Tough Comnode terminals and related accessories during the years 2018–2022. If materialized in full, the total value of the framework agreement is EUR 8.3 million (excl. VAT). Finnish Defence Forces will issue separate purchase orders in several batches during the validity of the framework agreement. The products ordered now will be delivered to the Finnish Defence Forces during the year 2019.

## 35. KEY RATIOS

	IFRS 2018	IFRS 2017	IFRS 2016	IFRS 2015	IFRS 2014
<b>INCOME STATEMENT, MEUR</b>					
Net sales, MEUR *)	62.8	51.6	64.2	56.8	52.7
Net sales change, %	21.7	-19.6	13.0	7.8	
Operating profit/loss, MEUR *)	2.8	-6.2	2.5	2.3	0.8
% of net sales	4.5	-12.0	4.0	4.1	1.5
Profit/loss for continuing operations before taxes, MEUR	2.7	-5.8	3.1	2.1	0.6
% of net sales	4.3	-11.3	4.9	3.7	1.2
Profit for the year from continuing operations, MEUR	4.0	-4.8	3.5	2.3	1.3
% of net sales	6.4	-9.2	5.5	4.1	2.4
Profit after tax for the year from discontinued operations, MEUR	0.0	1.7	0.0	539.0	11.2
% of net sales	0.0	3.2	0.0	948.7	21.3
Profit for the year attributable to equity holders of the parent, MEUR	4.0	-3.1	3.5	541.3	12.5
% of net sales	6.4	-6.0	5.5	952.8	23.7
<b>BALANCE SHEET, MEUR</b>					
Non-current assets	65.9	46.7	30.3	14.4	48.8
Inventories	14.6	10.6	4.1	2.2	2.2
Current assets	51.9	81.1	118.9	142.8	115.8
Shareholders' equity	110.0	116.7	130.6	137.6	93.4
Non-current liabilities	1.9	1.5	3.1	2.0	7.6
Current liabilities	20.5	20.2	19.6	19.8	65.8
Balance sheet total	132.4	138.4	153.3	159.4	166.8

	IFRS 2018	IFRS 2017	IFRS 2016	IFRS 2015	IFRS 2014
<b>PROFITABILITY AND OTHER KEY FIGURES</b>					
Return on equity % (ROE) **)	3.6	-3.9	2.6	2.0	
Return on investment % (ROI) **)	3.7	-4.5	2.6	2.5	
Interest-bearing net liabilities, (MEUR)	-29.4	-61.7	-91.8	-121.4	-35.0
Net gearing, %	-26.7	-52.9	-70.3	-88.2	-37.4
Equity ratio, %	84.7	85.6	87.0	90.5	62.3
Gross investments, (MEUR) *)	21.2	20.1	18.5	7.4	4.5
Gross investments, % of net sales	33.8	38.8	28.8	13.1	8.5
R&D costs, (MEUR) *)	21.6	15.0	6.9	7.3	6.9
R&D costs, % of net sales	34.4	29.1	10.8	12.9	13.0
Average personnel during the period, parent and subsidiaries *)	660	614	569	511	486
<b>STOCK-RELATED FINANCIAL RATIOS</b>					
Earnings per share from continuing operations, EUR					
Basic earnings per share	0.113	-0.133	0.098	0.020	0.010
Diluted earnings per share	0.113	-0.133	0.098	0.020	0.010
Earnings per share from discontinued operations, EUR					
Basic earnings per share		0.046	0.000	4.687	0.086
Diluted earnings per share		0.046	0.000	4.685	0.085
Earnings per share from continuing and discontinued operations, EUR					
Basic earnings per share	0.113	-0.087	0.098	4.708	0.096
Diluted earnings per share	0.113	-0.087	0.098	4.706	0.095
Equity per share, EUR	3.08	3.27	3.66	3.86	0.71
Dividend per share EUR ***)	0.15	0.3	0.3	0.3	0.04
Dividend per earnings, %	132.7	-344.6	305.3	6.4	42.7
P/E ratio	53.0	-64.9	57.7	344.3	35.9
Effective dividend yield, %	2.5	5.3	5.3	4.3	1.2
Market values of shares (EUR)					
Highest	8.10	7.88	7.40	7.80	3.83
Lowest	4.71	5.55	5.15	3.27	2.30
Average	5.98	6.55	6.05	4.92	2.85
At the end of period	7.61	5.65	5.67	7.01	3.36
Market value of the stock, (MEUR)	271.6	201.7	202.4	249.6	441.8
Trading value of shares					
MEUR	75.4	83.1	126.4	837.1	188.0
1000 PCS	12,608	12,684	20,888	169,993	66,019
Related to average number of shares %	35.3	35.5	58.6	147.8	50.4
Adjusted number of the shares at the end of the period (1000 PCS)	35,693	35,693	35,693	35,600	131,493
Adjusted number of the shares average for the period (1000 PCS)	35,693	35,693	35,670	114,983	130,975
Adjusted number of the shares average for the period diluted with stock options (1000 PCS)	35,693	35,693	35,670	115,037	131,663

\*) Continuing operations. Excluding Automotive business income statements from periods Jan. 1–July 1 2015 and 2014.

\*\*) comparable key figures for 2014 N/A.

\*\*\*) Proposal of the BoD for 2018.

# Notes to the Consolidated Financial Statements

## CALCULATION OF KEY RATIOS

<b>Return on equity % (ROE)</b>	=	$\frac{\text{Profit for the year} \times 100}{\text{Total equity (average for the accounting period)}}$
<b>Return on investment % (ROI)</b>	=	$\frac{\text{Profit before tax} + \text{interest and other financial expenses} \times 100}{\text{Balance sheet total} - \text{interest-free liabilities (average for the accounting period)}}$
<b>Net gearing, %</b>	=	$\frac{\text{Interest-bearing liabilities} - \text{cash and cash equivalents} \times 100}{\text{Total equity}}$
<b>Equity ratio, %</b>	=	$\frac{\text{Total equity} \times 100}{\text{Balance sheet total} - \text{advances received}}$
<b>Earnings per share</b>	=	$\frac{\text{Profit attributable to equity holders of the parent}}{\text{Share issue adjusted number of the shares average for the period}}$
<b>Equity per share</b>	=	$\frac{\text{Equity attributable to equity holders of the parent}}{\text{Share issue adjusted number of the shares at the end of the period}}$
<b>Dividend per share</b>	=	$\frac{\text{Dividend for the period (Board's proposal) per share}}{\text{Adjustment coefficient of post-fiscal share issues}}$
<b>Dividend per earnings, %</b>	=	$\frac{\text{Dividend per share} \times 100}{\text{Earnings per share}}$
<b>P/E ratio</b>	=	$\frac{\text{Share issue adjusted share price at the end of the period}}{\text{Earnings per share}}$
<b>Effective dividend yield, %</b>	=	$\frac{\text{Dividend per share} \times 100}{\text{Share issue adjusted share price at the end of the period}}$

### 36. SHAREHOLDINGS AND SHARES

#### Breakdown of Shares by Shareholding, December 31, 2018

Number of shares	Number of shareholders	Percentage of shareholders	Number of shares	Percentage of shares and votes
1 - 100	9,408	42.8	443,579	1.2
101 - 500	7,009	31.8	1,854,824	5.2
501 - 1000	2,283	10.4	1,787,427	5.0
1001 - 5000	2,485	11.3	5,659,491	15.9
5001 - 10000	416	1.9	3,035,921	8.5
10001 - 50000	345	1.6	7,018,772	19.7
50001 - 100000	34	0.2	2,367,238	6.6
100001 - 500000	20	0.1	4,754,675	13.3
500001 - 999999999999	7	0.0	8,771,239	24.6
<b>Total</b>	<b>22,007</b>	<b>100.0</b>	<b>35,693,166</b>	<b>100.0</b>
Nominee-registered	10		1,370,086	3.8

#### Breakdown of Shareholders by Shareholder Type, December 31, 2018

Shareholders by shareholder type	Number of shareholders	Percentage of shareholders	Number of shares	Percentage of shares and votes
Corporations	497	2.3	3,009,602	8.4%
Financial sector	10	0.0	851,553	2.4%
Public sector	5	0.0	3,162,817	8.9%
Non-profit organizations	30	0.1	200,124	0.6%
Households	21,375	97.1	26,997,249	75.6%
Foreign owners	80	0.4	101,735	0.3%
Nominee-registered shares	10	0.0	1,370,086	3.8%
<b>Total</b>	<b>22,007</b>	<b>100.0</b>	<b>35,693,166</b>	<b>100.0%</b>

# Notes to the Consolidated Financial Statements

## Largest Shareholders, December 31, 2018

	Number of shares	Percentage of shares and votes
<b>Number of shares total</b>	<b>35,693,166</b>	<b>100.0</b>
1. Veikkolainen Erkki, Chairman of the Board	1,507,539	4.2
2. Hulkko Juha	1,506,870	4.2
3. Ponato Oy	1,501,300	4.2
4. Varma Mutual Pension Insurance Company	1,365,934	3.8
5. Ilmarinen Mutual Pension Insurance Company	1,296,529	3.6
6. Nordea Bank ABP	935,067	2.6
7. Hilden Kai	658,000	1.8
8. Elo Mutual Pension Insurance	500,000	1.4
9. Fondita Nordic Micro Cap Placeringsfund	465,000	1.3
10. Hirvilammi Hannu Esa	394,821	1.1
<b>Total</b>	<b>10,131,060</b>	<b>28.4</b>
Others (incl. nominee-registered shares)	25,562,106	71.6

## The Board and CEO

Veikkolainen Erkki, Chairman of the Board	1,507,539	4.2
Mäkinen Seppo, Member of the Board	4,308	0.0
Ojanperä Tero, Member of the Board	2,937	0.0
Putkiranta Juha, Member of the Board	14,308	0.0
Tiuraniemi Riitta, Member of the Board	1,437	0.0
Toljamo Petri, Member of the Board	1,437	0.0
Huttunen Hannu, CEO	10,000	0.0
<b>Total</b>	<b>1,541,966</b>	<b>4.3</b>

# Income Statement, Parent

1000 EUR	Notes	2018	2017
<b>NET SALES</b>	1, 2	<b>704</b>	<b>764</b>
Other operating income	3	0	1,379
Personnel expenses	4	-1,157	-926
Depreciation and reduction in value	5	-11	-9
Other operating expenses	6	-745	-910
<b>OPERATING PROFIT</b>		<b>-1,208</b>	<b>297</b>
Financial income and expenses	7	1,129	813
<b>PROFIT (LOSS) BEFORE APPROPRIATIONS AND TAXES</b>		<b>-79</b>	<b>1,110</b>
<b>APPROPRIATIONS</b>	8	<b>6,300</b>	<b>540</b>
<b>PROFIT (LOSS) BEFORE APPROPRIATIONS AND TAXES</b>		<b>6,221</b>	<b>1,650</b>
<b>NET PROFIT FOR THE FINANCIAL YEAR</b>		<b>6,221</b>	<b>1,650</b>

## Balance Sheet, Parent

1000 EUR	Notes	Dec. 31, 2018	Dec. 31, 2017
<b>ASSETS</b>			
Non-current assets			
Intangible assets	9	71	68
Tangible assets	10	72	73
Investments	11	39,750	39,750
Non-current assets total		39,893	39,890
Current assets			
Receivables			
Current receivables	12	63,842	37,430
Receivables total		63,842	37,430
Financing securities	13	21,576	56,401
Cash and bank deposits		6,958	3,643
Current assets total		92,376	97,474
<b>TOTAL ASSETS</b>		<b>132,268</b>	<b>137,364</b>
<b>SHAREHOLDERS' EQUITY AND LIABILITIES</b>			
Shareholders' equity			
Share capital	14	12,941	12,941
Invested non-restricted equity fund		25,953	25,953
Retained earnings		85,179	94,237
Net profit/loss for the year		6,221	1,650
Shareholders' equity total		130,294	134,782
Provisions			
Provisions, non-current	15		
Provisions, current			37
Liabilities			
Current liabilities	16	1,974	2,546
Liabilities total		1,974	2,546
<b>SHAREHOLDERS' EQUITY AND LIABILITIES TOTAL</b>		<b>132,268</b>	<b>137,364</b>

# Cash Flow, Parent

1000 EUR	2018	2017
<b>CASH FLOW FROM OPERATING ACTIVITIES</b>		
Profit (loss) before taxes +/-	6,221	1,650
Adjustments:		
Depreciation according to plan +	11	9
Effects of non-cash business activities	-6,507	-1,559
Financial income and expenses +/-	-1,129	-813
Cash flow before change in net working capital	-1,404	-713
Change in net working capital		
Change in interest-free short-term receivables	-13	-189
Change in interest-free short-term payables	-28	241
Cash flow before financing activities	-1,446	-661
Interest paid -	-1,331	-864
Dividends received +	0	1
Interest received +	2,459	1,677
<b>Net cash from operating activities</b>	<b>-317</b>	<b>152</b>
<b>CASH FLOW FROM INVESTING ACTIVITIES</b>		
Purchase of tangible and intangible assets -	-13	-30
<b>Net cash used in investing activities</b>	<b>-13</b>	<b>-30</b>
<b>CASH FLOW FROM FINANCIAL ACTIVITIES</b>		
Change in interest-free short-term financial receivables in Group	-21,019	-21,550
Change in interest-free short-term financial payables in Group	7	410
Received Group contributions	540	4,000
Dividend paid and capital repayment	-10,708	-10,708
<b>Net cash used in financial activities</b>	<b>-31,180</b>	<b>-27,848</b>
<b>NET CHANGE IN CASH AND CASH EQUIVALENTS</b>	<b>-31,510</b>	<b>-27,725</b>
Cash and cash equivalents at beginning of period	60,044	87,769
Cash and cash equivalents at end of period	28,534	60,044
Change in cash and cash equivalents in balance sheet	-31,510	-27,725

Cash and cash equivalents include liquid and low risk financing securities.

# Accounting Principles for the Preparation of Financial Statements

The financial statements have been prepared in accordance with the Finnish Accounting Act.

## Valuation Principles

### Valuation of Non-current Assets

Non-current assets are capitalized in the balance sheet at the original acquisition cost deducted by accumulated depreciation. Depreciations according to the plan is calculated either using the straight-line method or the reducing balance method, taking into consideration of the useful life of assets. The depreciation periods are:

Intangible assets	3–10 years
Tangible assets	3–5 years

### Valuation of Financial Securities

Financial securities are valued at fair value. The fair value of forward exchange are defined based on forward exchange prices on balance sheet date and option contracts are defined based on market prices on balance sheet date.

### Pensions

The Company has organized pension coverage for its personnel through independent pension insurance companies. The pension insurance expenditures are included into personnel expenses.

### Leasing Agreements

Leasing agreements and fixed-term rental agreements are reported as contingent liabilities off the balance sheet.

### Income Tax

Taxes of the financial year have been reported in the income statement as income taxes. Deferred tax or liabilities or receivables has not been recorded on the financial statement.

### Foreign Currency Items

The transactions in the income statement have been converted into euro using the exchange rate of the transaction date. Receivables and payables denominated in foreign currency have been converted into Euro by using the exchange rate of the European Central Bank at the balance sheet date.

### Net Sales

Sales of goods is recorded when goods have been handed over to the customer or the services have been rendered. Sales are shown net of indirect sales taxes and discounts.

# Notes to the Financial Statements of the Parent Company

1000 EUR	2018	2017
<b>1. NET SALES BY SEGMENTS</b>		
Other functions	704	764
<b>Total</b>	<b>704</b>	<b>764</b>
<b>2. NET SALES BY MARKET AREAS</b>		
Europe	671	751
America	33	13
Asia		0
<b>Total</b>	<b>704</b>	<b>764</b>
<b>3. OTHER OPERATING INCOME</b>		
Other operating income	0	1,379
<b>Total</b>	<b>0</b>	<b>1,379</b>
<p>The other operating income in 2107 includes the reversal of provisions related to the sale of Automotive segment as well as VAT returns related to sale of shares which have been returned due to changes in legal interpretation.</p>		
<b>4. NUMBER OF PERSONNEL AND PERSONNEL EXPENSES</b>		
Average number of personnel during the period		
Other functions	7	7
<b>Total</b>	<b>7</b>	<b>7</b>
Number of personnel at the end of the year		
	7	7
Personnel expenses *		
Management salaries	333	214
Board of Directors	169	165
Other salaries and wages	531	398
<b>Total</b>	<b>1,034</b>	<b>776</b>
Pension expenses	113	136
Other social expenses	11	14
<b>Total</b>	<b>1,157</b>	<b>926</b>
* The Board of Directors salaries include the share-based compensation.		
<b>5. DEPRECIATION AND REDUCTION IN VALUE</b>		
Intangible rights	8	6
Other capitalized long-term expenditures	2	2
Machinery and equipment	1	1
<b>Total</b>	<b>11</b>	<b>9</b>

# Notes to the Financial Statements of the Parent Company

1000 EUR	2018	2017
<b>6. OTHER OPERATING CHARGES</b>		
IT equipment and SW expenses	84	82
Premises expenses	15	41
Administrative services	265	488
Travel expenses	63	62
Voluntary staff expenses	21	29
Other business expenses	297	208
<b>Total</b>	<b>745</b>	<b>910</b>
Auditor's charges		
Auditing	23	21
Tax advice	9	7
Other services	5	6
<b>Total</b>	<b>37</b>	<b>33</b>
<b>7. FINANCIAL INCOME AND EXPENSES</b>		
Income of investments		
From others	1,269	811
<b>Total</b>	<b>1,269</b>	<b>811</b>
Other interest and financial income		
From Group companies	1,084	432
From others	106	428
<b>Total</b>	<b>1,190</b>	<b>861</b>
Other interest and financial expenses		
To Group companies	2	1
To others	1,329	857
<b>Total</b>	<b>1,331</b>	<b>858</b>
Reduction in value of investment	0	0
Net financial income and expenses	1,129	813
Net financial income and expenses including exchange gains and losses	0	3
<b>8. APPROPRIATIONS</b>		
Received Group contributions	6,300	540

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>9. INTANGIBLE ASSETS</b>		
<b>Intangible rights</b>		
Acquisition cost Jan. 1	275	246
Investments during the period	13	29
Acquisition cost at the end of the period	288	275
Accumulated depreciations Jan. 1	-211	-204
Depreciation for the period	-8	-6
Book value at the end of the period	70	64
<b>Other capitalized long-term expenditures</b>		
Acquisition cost Jan. 1	6	6
Investments during the period		
Acquisition cost at the end of the period	6	6
Accumulated depreciations Jan. 1	-3	-1
Depreciation for the period	-2	-2
Book value at the end of the period	1	4
<b>Intangible assets total</b>		
Acquisition cost Jan. 1	281	253
Investments during the period	13	29
Acquisition cost at the end of the period	295	281
Accumulated depreciations Jan. 1	-213	-205
Depreciation for the period	-10	-8
Book value at the end of the period	71	68

# Notes to the Financial Statements of the Parent Company

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>10. TANGIBLE ASSETS</b>		
<b>Machinery and equipment</b>		
Acquisition cost Jan. 1	5	4
Investments during the period		1
Acquisition cost at the end of the period	5	5
Accumulated depreciations Jan. 1	-4	-3
Depreciation for the period	-1	-1
Book value at the end of the period	1	2
<b>Other tangible assets</b>		
Acquisition cost Jan. 1	71	71
Acquisition cost Dec. 31	71	71
Book value at the end of the period	71	71
<b>Tangible assets total</b>		
Acquisition cost Jan. 1	76	75
Investments during the period		1
Acquisition cost at the end of the period	76	76
Accumulated depreciations Jan. 1	-4	-3
Depreciation for the period	-1	-1
Book value at the end of the period	72	73
<b>11. INVESTMENTS</b>		
<b>Investments in subsidiaries</b>		
Acquisition cost Jan. 1	39,749	39,749
Book value at the end of the period	39,749	39,749
<b>Investments in other shares</b>		
Acquisition cost Jan. 1	1	1
Book value at the end of the period	1	1
<b>Investments total</b>		
Acquisition cost Jan. 1	39,750	39,750
Book value at the end of the period	39,750	39,750

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>12. CURRENT RECEIVABLES</b>		
Accounts receivable		
From Group companies	23	92
<b>Total</b>	<b>23</b>	<b>92</b>
Other receivables		
From Group companies	57,458	36,439
From others	46	133
<b>Total</b>	<b>57,504</b>	<b>36,572</b>
Prepaid expenses and accrued income		
From Group companies	6,300	540
From others	14	226
<b>Total</b>	<b>6,314</b>	<b>766</b>
<b>Current receivables total</b>	<b>63,842</b>	<b>37,430</b>
<b>13. FINANCING SECURITIES</b>		
Cash and cash equivalents include liquid and low risk financing securities		
Financial assets at fair value through profit or loss	21,576	56,401
<b>14. SHAREHOLDERS' EQUITY</b>		
Share capital at the beginning of the period	12,941	12,941
<b>Share capital at the end of the period</b>	<b>12,941</b>	<b>12,941</b>
Invested unrestricted equity fund at the beginning of the period	25,953	25,953
Share issue		
<b>Invested unrestricted equity fund at the end of the period</b>	<b>25,953</b>	<b>25,953</b>
Retained earnings at the beginning of the period	95,887	104,945
Dividend distribution	-10,708	-10,708
Net profit for the period	6,221	1,650
<b>Retained earnings at the end of the period</b>	<b>91,400</b>	<b>95,887</b>
Distributable earnings at the end of the period	117,353	121,840
<b>Shareholders' equity total</b>	<b>130,294</b>	<b>134,782</b>

# Notes to the Financial Statements of the Parent Company

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>15. PROVISIONS</b>		
Provisions		
Provisions, current		37
<b>Total</b>		<b>37</b>
<b>16. LIABILITIES</b>		
<b>Current liabilities</b>		
Accounts payable		
To Group companies	128	482
To others	93	110
<b>Total</b>	<b>221</b>	<b>593</b>
Other short-term liabilities		
To Group companies	1,379	1,816
To others	68	29
<b>Total</b>	<b>1,447</b>	<b>1,845</b>
Accrued expenses and deferred income		
To others	306	108
<b>Total</b>	<b>306</b>	<b>108</b>
<b>Current liabilities total</b>	<b>1,974</b>	<b>2,546</b>

1000 EUR	Dec. 31, 2018	Dec. 31, 2017
<b>17. SECURITIES AND CONTINGENT LIABILITIES</b>		
On behalf of Group companies		
Guarantee limits	86	1,155
of which guarantees in use total	86	1,155
Leasing liabilities		
Falling due in the next year	1,107	1,053
Falling due after one year	1,244	909
Rental liabilities		
Falling due in the next year	6	5
Contractual liabilities		
Falling due in the next year	73	42
Falling due in 1-5 years	0	0

	Owned by Parent, %	Owned by Group, %	Book value 1000 EUR
<b>18. SHARES AND HOLDINGS</b>			
Subsidiaries			
Bittium Technologies Oy	100.00	100.00	39,749
Other holdings by Parent			
Partnera Oy			1

## Proposal by the Board of Directors on the Use of the Profit Shown on the Balance Sheet and the Payment of the Dividend

According to the parent company's balance sheet at December 31, 2018, the distributable assets of the parent company are EUR 117,353,042.28 of which the profit of the financial year is EUR 6,220,716.85. The Board of Directors proposes that the Annual General Meeting to be held on April 10, 2019 resolve to pay EUR 0.05 per share as dividend based on the adopted balance sheet for the financial period of January 1, 2018–December 31, 2018, representing approxi-

mately half of the result of the financial period, and in addition, EUR 0.10 per share as additional dividend, totaling altogether to EUR 0.15 per share.

The dividend will be paid to the shareholders who are registered as shareholders in the company's register of shareholders as maintained by Euroclear Finland Ltd. on the dividend record date, April 12, 2019. The Board of Directors proposes that the dividend be paid on April 23, 2019.

Bittium Corporation follows a dividend policy that takes into account the Corporation's net income, financial situation, need for capital and financing of growth. There have not been any substantial changes in the company's financial position after the financial year. Company has good liquidity and according to the Board of Directors, the proposed distribution of profits does not danger the company's solvency.

In Oulu, February 20, 2019



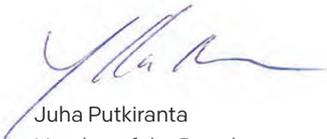
Erkki Veikkolainen  
Chairman of the Board



Seppo Mäkinen  
Member of the Board



Tero Ojanperä  
Member of the Board



Juha Putkiranta  
Member of the Board



Riitta Tiuraniemi  
Member of the Board



Petri Toljamo  
Member of the Board



Hannu Huttunen  
CEO

## Auditor's Note

Auditor's Report has been issued today.

In Oulu, February 20, 2019

Ernst & Young Oy  
Authorized Public Accountant Firm



Juhani Rönkkö, Authorized Public Accountant

# Auditor's Report

(Translation of the Finnish original)

## To the Annual General Meeting of Bittium Corporation

### Report on the Audit of Financial Statements

#### Opinion

We have audited the financial statements of Bittium Oyj (business identity code 1004129-5) for the year ended 31 December, 2018. The financial statements comprise the consolidated balance sheet, statement of comprehensive income, statement of changes in equity, statement of cash flows and notes, including a summary of significant accounting policies, as well as the parent company's balance sheet, income statement, statement of cash flows and notes.

In our opinion

- the consolidated financial statements give a true and fair view of the group's financial position as well as its financial performance and its cash flows in accordance with International Financial Reporting Standards (IFRS) as adopted by the EU.
- the financial statements give a true and fair view of the parent company's financial performance and financial position in accordance with the laws and regulations governing the preparation of financial statements in Finland and comply with statutory requirements.

Our opinion is consistent with the additional report submitted to the Audit Committee.

#### Basis for Opinion

We conducted our audit in accordance with good auditing practice in Finland. Our responsibilities under good auditing practice are further described in the *Auditors Responsibilities for the Audit of Financial Statements* section of our report.

We are independent of the parent company and of the group companies in accordance with the ethical requirements that are applicable in Finland and are relevant to our audit, and we have fulfilled our other ethical responsibilities in accordance with these requirements.

In our best knowledge and understanding, the non-audit services that we have provided to the parent company and group companies are in compliance with laws and regulations applicable in Finland regarding these services, and we have not provided any prohibited non-audit services referred to in Article 5(1) of regulation (EU) 537/2014. The non-audit services that we have provided have been disclosed in note 5 to the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

#### Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

We have fulfilled the responsibilities described in the *Auditor's responsibilities for*

*the audit of the financial statements* section of our report, including in relation to these matters. Accordingly, our audit included the performance of procedures designed to respond to our assessment of the risks of material misstatement of the financial statements. The results of our audit procedures, including the procedures performed to address the matters below, provide the basis for our audit opinion on the accompanying financial statements.

We have also addressed the risk of management override of internal controls. This includes consideration of whether there was evidence of management bias that represented a risk of material misstatement due to fraud.

#### Responsibilities of the Board of Directors and the Managing Director for the Financial Statements

The Board of Directors and the Managing Director are responsible for the preparation of consolidated financial statements that give a true and fair view in accordance with International Financial Reporting Standards (IFRS) as adopted by the EU, and of financial statements that give a true and fair view in accordance with the laws and regulations governing the preparation of financial statements in Finland and comply with statutory requirements. The Board of Directors and the Managing Director are also responsible for such internal control as they determine is necessary to enable the preparation of fi-

**KEY AUDIT MATTER****Revenue Recognition**

*We refer to the Group's accounting policies and to the note 3*

Fixed price contracts in long-term construction contracts are part of the Group's business practice. These projects constitute a significant portion of the consolidated net sales. In the financial statements 2018 the revenue recognized from these projects was 12.3 million euro, which is 20 percentage of the total net sales. The group applies the percentage of completion method for recognizing revenue from long-term construction contracts, which involves the use of significant management estimates. E.g. the following estimates include significant management judgement for each project: stage of completion, total contract costs and the project margin. During the performance phase, the financial outcome of a project is based on the estimates made by the management and will come more accurate when the project advances.

In the group net sales is a key performance indicator, which might generate an incentive to prematurely recognition of revenue. Revenue recognition was determined to be a key audit matter and a significant risk of material misstatement referred to in EU Regulation No 537/2014, point (c) of Article 10(2), because of the risk related to correct timing of revenue.

**HOW OUR AUDIT ADDRESSED THE KEY AUDIT MATTER**

Our audit procedures in which risk of material misstatement on revenue recognition has been taken into account included, among other:

- assessment of the accounting principles of the group on revenue recognition and comparing them with the applied accounting standards;
- examination of the nature of revenue, stage of completion and financial contract terms behind the revenue recognized in the long-term projects;
- tests of revenue recognition, which included testing of the calculations and the estimates used in the revenue recognition;
- analytical procedures on revenue and
- tests of the notes of revenue recognized.

financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board of Directors and the Managing Director are responsible for assessing the parent company's and the group's ability to continue as going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting. The financial statements are prepared using the going concern basis of accounting unless there is an intention to liquidate the parent company or the group or cease operations, or there is no realistic alternative but to do so.

### Auditor's Responsibilities for the Audit of Financial Statements

Our objectives are to obtain reasonable assurance on whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that

includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with good auditing practice will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

As part of an audit in accordance with good auditing practice, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions,

misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the parent company's or the group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of the Board of Directors' and the Managing Director's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the parent company's or the group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to mod-

ify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the company to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events so that the financial statements give a true and fair view.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected

to outweigh the public interest benefits of such communication.

## Other Reporting Requirements

### Information on Our Audit Engagement

We were first appointed as auditors by the Annual General Meeting on April 12, 2002, and our appointment represents a total period of uninterrupted engagement of 17 years.

### Other Information

The Board of Directors and the Managing Director are responsible for the other information. The other information comprises information included in the report of the Board of Directors and in the Annual Report, but does not include the financial statements and our report thereon. We obtained the report of the Board of Directors prior to the date of the auditor's report, and the Annual Report is expected to be made available to us after the date of the auditor's report.

Our opinion on the financial statements does not cover the other information.

In connection with our audit of the financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. With respect to report of the Board of Directors, our responsibility also includes considering whether the report of the Board of Directors has been prepared in accordance with the applicable laws and regulations.

In our opinion, the information in the report of the Board of Directors is consistent with the information in the financial statements and the report of the Board of Directors has

been prepared in accordance with the applicable laws and regulations.

If, based on the work we have performed, we conclude that there is a material misstatement in the information included in the report of the Board of Directors, we are required to report this fact. We have nothing to report in this regard.

Oulu, February 20, 2019  
Ernst & Young Oy  
Authorized Public Accountant Firm

Juhani Rönkkö  
Authorized Public Accountant

# Bittium

Connectivity to be trusted.  
[www.bittium.com](http://www.bittium.com)

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