

# VAISALA

# 2016



Observations  
for a **Better World**

# Contents

Vaisala in Brief	3
A Year in Observations	4
Sustainable Technologies	6
Chairman's Message	7
CEO's Message	8
Our Values	10
Our Strategy	11
Strategy Implementation in 2016	12
Global Markets	14
World of Observations	16
Megatrends	18
Stakeholders	20
Value Creation for Employees	22
Value Creation for Customers	30
Value Creation for Society and Environment	36
Performance	46
GRI Content Index	70
Independent Assurance Report	74



## About This Report

Vaisala believes in a world where environmental observations improve the safety, efficiency, and quality of life in societies. This is why we named this year's sustainability report after our mission "Observations for a Better World 2016."

Vaisala has published sustainability reports since 2009, making this the ninth in the series and our first report to take definite steps towards Integrated Reporting.

We started by asking some of our key stakeholders what they expect of our integrated reporting. We laid the foundation by researching what megatrends affect Vaisala now and in the future, how we react to them, and what opportunities they may bring us. We then defined what types of value Vaisala creates and narrowed them down to the most important ones for each stakeholder. Finally, we wrapped it all together into a Value Creation Model, The World of Observations. The groundwork has now been laid for expanding integrated reporting further.

To satisfy the information need of those who gather data from GRI reports, we are glad to inform you that this report also caters to you. You can find a GRI cross-reference on page 70 and the Independent Assurance Report on page 74. We hope you enjoy learning more about Vaisala.

# Vaisala

in **Brief**

Vaisala is a global leader in environmental and industrial measurement. Building on 80 years of experience, Vaisala provides observations for a better world. We are a reliable partner for customers around the world, offering a comprehensive range of innovative observation and measurement products and services.

Headquartered in Finland, Vaisala employs nearly 1,600 professionals worldwide and is listed on the Nasdaq Helsinki stock exchange.

## Net Sales

 **319.1** M€

Operating result

**22.3** M€

## Personnel

 **1,569**

Offices

**30+**

Countries

**16**

# A Year in Observations

The anniversary year saw Vaisala's largest deals and the year ended with record net sales.

## Highlights for 2016

**JAN** PEC Energia, one of Brazil's foremost renewable energy developers, completed a 150 MW wind park in the northeastern state of Pernambuco, and, during the project development, relied on Vaisala's Triton remote sensing system for crucial wind measurement data.

**MAR** Vaisala humidity and pressure sensors headed for Mars again, incorporated in instrumentation built by the Finnish Meteorological Institute for the ExoMars spacecraft.

Vaisala introduced a new carbon dioxide meter, the Vaisala CARBOCAP® Carbon Dioxide Probe GMP251. The product is meant for applications with high CO<sub>2</sub> concentrations, such as life science incubators and cold storages.

Vaisala signed a three-year contract with Pattern Energy to provide access to historical and real-time lightning data for ten wind farms in North America. The data will be used by Pattern Energy to optimize blade inspection and repair programs and combat one of the most common causes of turbine downtime in the wind energy industry.

JAN

**FEB** Vaisala signed a EUR 20 million contract with the National Hydro-Meteorological Service of Vietnam to establish a high quality nationwide meteorological infrastructure in the country. The contract included weather radar and lightning detection networks, software toolkit for weather forecasting supplied by the Finnish Meteorological Institute, as well as training and spare parts.

Jarkko Sairanen started as Executive Vice President of Vaisala Weather Business Area.

MAR

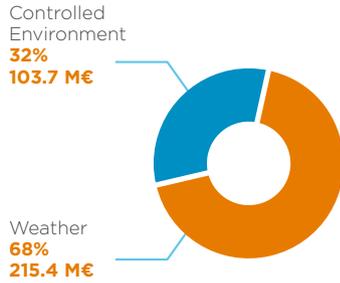


**APR** Vaisala celebrated its 80<sup>th</sup> anniversary with external stakeholders on April 14 – exactly 80 years after Vaisala received its first order from MIT.

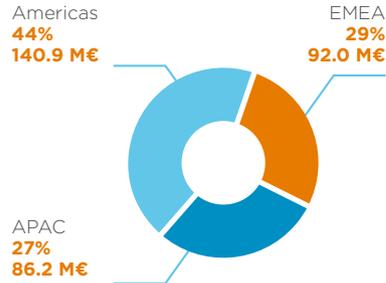
MAY

**MAY** Vaisala announced the launch of online Optimus DGA Monitor for transformer dissolved gas analysis. This game-changing product will solve many problems in transformer monitoring and maintenance.

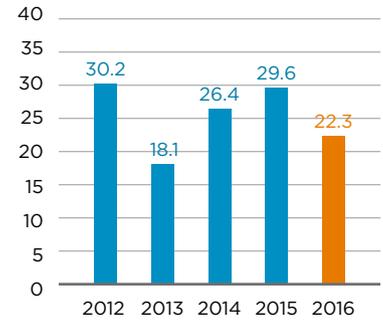
## Net Sales by Business Area 2016



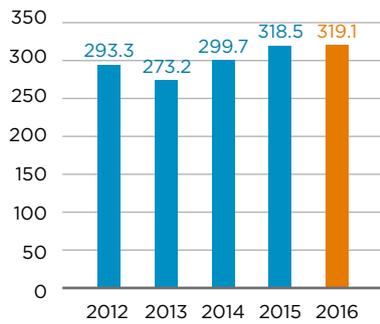
## Net Sales by Region 2016



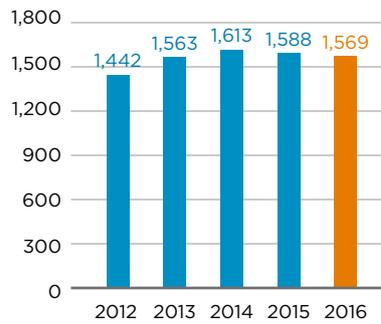
## Operating Result, M€



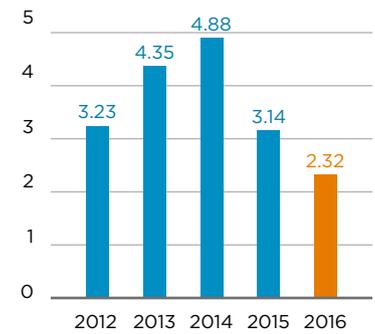
## Development of Net Sales



## Personnel, at Year-end



## Injuries per Million Working Hours (TRI)



**JUN** Vaisala produced its 11th million radiosonde.



**OCT** Vaisala signed a USD 18 million contract with the Ministry for Transport and Aviation of the Commonwealth of The Bahamas. The contract included weather radars, Automatic Weather Observation Systems (AWOS) for airports and Automatic Weather Stations (AWS) as well as civil works, installation services and a five years' service agreement.

**JUL**



**AUG** Vaisala made the decision to expand its offering into the growing air quality monitoring market by acquiring new products and technology. This move aligns perfectly with Vaisala's goal of making meaningful observations for a better world.

**SEP**

**NOV** American Airlines Safety Department partnered with Vaisala AviCast® Lightning Alert System for Real-Time Data and Alerts. The technology will be utilized at 51 airports in the U.S. and Puerto Rico, increasing safety and reducing lightning-related delays and costs.

Vaisala announced the reorganization of the Weather Business Area. The goal is to simplify its structure and operations and to better align with Vaisala's strategy.

**DEC**

# Sustainable

## Technologies

Ultimately, Vaisala's technology and solutions help safeguard life and property, while enabling critical decision-making that facilitates effective and efficient operations. Vaisala's products are inherently nonintrusive, require low energy input, need little servicing, and can be maintained remotely. The common denominator is that by measuring the environment accurately, the outcome is safer, more efficient, reliable, and sustainable operations in any application area.

Vaisala is in a unique position to promote sustainable development through the technologies it offers to its customers.

Through its **weather solutions**, Vaisala safeguards lives and property and reduces environmental impacts. **Industrial instruments** bring efficiencies and reduce energy and material consumption in customers' operations. **Renewable energy** solutions and services optimize site selection and power output for the renewable energy sector. **Air quality** observation networks warn citizens and authorities about dangerous levels of pollution in urban areas.

Every single flight around the world will at some point use weather observations produced by Vaisala equipment and/or forecasts driven by Vaisala sensor observations



Vaisala's emissions were reduced by **-81%** since 2014 (Scope 2).

Vaisala is forecasting for **150,000+** MW of wind generation capacity worldwide



**89%** of electricity consumed in 2016 was from renewable sources

Vaisala's Global Lightning Dataset GLD360<sup>®</sup> measured

**1,994,669,619** lightning strikes in 2016



**100,000+** installations of HUMICAP<sup>®</sup> Humidity and Temperature Transmitter Series HMT330 in industrial applications.

Water efficiency at manufacturing sites has improved by **+67%** in last 10 years



## Chairman's Message

# Solutions to Global Challenges



During Vaisala's 80th anniversary year, I met many Vaisala employees as well as customers and partners, who reminded me just how meaningful the company's work is.

Science is at the heart of all progress, and without accurate and reliable measurements to work on, science cannot find solutions to the global challenges affecting us all. Vaisala creates technologies to better understand how this globe of ours works. Vaisala furnishes societies with tools that help keep people safe in their everyday lives, from warning people in a hurricane or flood zone to keeping a premature baby protected and comfortable in the incubator.

That makes Vaisala's work purposeful. Vaisala's value added to the world is much greater than its size would suggest.

Vaisala is directly affected by and helps in addressing many of the megatrends reshaping the world now and in the future. In my opinion, the most disruptive trends are urbanization, digitalization, and, in a fundamental way, climate change.

Urbanization, as it is taking place now, is inherently unsustainable. We often envision smart cities with complex infrastructures in place, but where urbanization is most intense, they are distant luxuries. Acute challenges are related to air quality, lack of clean energy, and safe transportation. Vaisala's instruments help tackle these everyday issues.

As a new development, Vaisala is entering the market for air quality measurements in urban areas, where poor air quality is a health concern for millions of people. Dense and relatively inexpensive monitoring networks will improve the quality of life for people living in cities all over the world.

Digitalization leads to more and more things being measured. Vaisala sees opportunities from this development that will change how things and people interconnect and how things are done. Traffic, building automation, smart grids, and measurements in industrial processes will be just a few fields that will see an upsurge in demand for connected sensors.

Climate change fuels extreme weather and these events are becoming more prevalent and costly for societies. We must start bracing for effective mitigation techniques as the 1.5°C climate target is slipping further away. Vaisala helps national weather services to be prepared for dangerous weather events and on the other hand, support accurate climate research through long and reliable data series.

Vaisala's business has a sound foundation – all types of environments need to be measured to understand them and, when possible, control them. Vaisala's job is to provide the best possible tools to build this understanding, which aims at saving or securing resources and human lives.

Raimo Voipio  
Chairman of the Board of Directors

## CEO's Message

# Strong Together

In Vaisala, as in businesses everywhere, focus on sustainability is shifting from reducing negative impacts to creating sustained value over time and positive societal impacts. We are also looking for better ways to express our purpose and tangible impacts on society and our stakeholders.

### Towards a Net Positive Vaisala

This is why new business approaches like net positive approach, circular economy and integrated value creation are gaining ground among pioneering companies. They show that businesses see true value in sustainability and have hence adopted it into the core of their strategy and operations.

To us, striving to become net positive is a vision that means doing business in a way that puts back more into society, the environment and the global economy than it takes out – having a bigger handprint than footprint.

For the customers, it means that applying our technologies will improve their performance in a way that reduces negative impacts of operations, such as emissions, waste, material use or risks. Ultimately, this will have a net positive effect on the environment around the globe.

To succeed, becoming net positive requires determination and planning for long-term success, as well as strong financial performance and ability to attract the best talent and seeing the true big picture. Embracing the net positive idea is a challenging endeavor for any company, but we are driven by our strong value base and the passion to solve the most difficult challenges of our time.

Ultimately, we believe that the handprint of applying our technologies outweighs the footprint of manufacturing our sensors and hardware.

In more practical terms, Vaisala solutions help reduce energy consumption in buildings, and at the same time improve indoor air quality and hence the well-being of the people in the buildings. Our instruments help make industrial processes more efficient, optimizing the use of electricity and improving end product quality. Our weather observation systems provide data that makes it possible to provide residents advance warning of tropical storms or flash floods, saving lives. Vaisala services help pinpoint the most advantageous sites for solar and wind energy farms.

These are just a few examples of how Vaisala has an indirect positive impact on its customers and through them, the society as a whole. However, we do not have a perfect way to verify the extent of our impact yet; finding a reliable method for this is work in progress.

### Building Capacity for Better Informed Societies

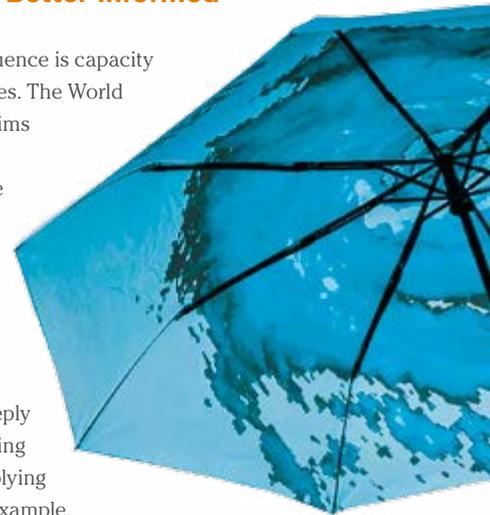
A growing area of positive influence is capacity building in developing countries. The World Meteorological Organization aims at improving meteorological capabilities in order to mitigate the impacts of extreme weather, but also to enable the use of weather information to eradicate poverty and achieve internationally agreed development goals.

In 2016, Vaisala has been deeply involved in these projects, helping nations get weather-ready, supplying them with weather radars, for example.

In February, we signed a contract with National Hydro-Meteorological Service of Vietnam over establishing a high quality nation-wide meteorological infrastructure in Vietnam, and in October, a contract was signed with the Ministry for Transport and Aviation of the Commonwealth of the Bahamas.

Both countries suffer from extreme weather phenomena every year, including tropical storms, floods and severe lightning. After building the meteorological infrastructure, the countries will be able to serve the whole nation with high quality meteorological data and weather forecasts, helping minimize loss of lives and damages to property.

Capacity building not only benefits the countries in question, but also the world as a whole. As the meteorological observation network expands to new areas and provides data in more detail, the basis for studying weather phenomena is on an even firmer footing and able to advance the science of forecasting further.



Of course, mitigating the effects of extreme weather is just as relevant to developed countries. The Atlantic hurricane season in 2016 was above average in activity. For instance, as Hurricane Matthew hit Florida, Georgia, South Carolina and North Carolina in the USA, it led to record-breaking flooding, with several lost lives.

Vaisala's solutions are used, for instance, in Hurricane Hunters' aircraft to determine the direction and strength of hurricanes at sea, and thunderstorm detection systems provide warnings for airports and lightning-sensitive operations.

### **Air Pollution the Single Biggest Environmental Health Risk**

In developed countries, air quality has improved over the years, but at the same time concern over its effects on health and well-being has grown considerable, as people have become better informed. In developing countries, poor air quality is a considerable health hazard, with millions of premature deaths attributable to it.

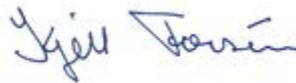
Effective and significantly more extensive measurement networks are required to understand and analyze the air pollution, and to build efficient systems for warning the public of hazardous levels of pollutants. Our new instruments make it possible to build dense but cost efficient

air quality measurement networks that increase the number of measurement points and improve the access to real-time air quality information for the authorities, decision-makers, businesses and citizens.

### **Strong Together**

One of Vaisala's fundamental values is Strong Together. Our success is not built in isolation, but in close cooperation between our experts from around the world and our customers, research partners and suppliers. We work with the top minds of our field and take part in networks across sectors – industry, academic, public, private or inter-governmental and UN organizations – to share and exchange knowledge.

Today, our motto 'observations for a better world' rings more true than ever. Essentially, we take refined sand, in the form of silicon wafers, and transform it into state-of-the-art sensors that safeguard pharmaceuticals, premature babies in incubators, indoor and outdoor air quality, and allows scientists to study incredible extremes, from Antarctica to Mars. Creating this value for our societies, we have intelligent, knowledgeable, and forward-looking people, who want to have a job that has meaning and impact. We can provide them with that. Observing our world closely takes us to a better understanding of its workings, and understanding helps us build a better and more sustainable future for us all.



Kjell Forsén  
President and CEO





# Our **Values** Guide Us

## **Customer Focus**

We strive for deep understanding of our customers' needs and aim at meeting them in everything we do.

## **Innovation and Renewal**

We embrace pioneering innovation and drive change through continuous improvement and learning.

## **Strong Together**

We excel by sharing, learning and working together with each other and our stakeholders.

## **Integrity**

We are honest, respectful and reliable. We promote sustainable and ethical behavior.

# Our Strategy

Observations for a **Better** World

## Weather



Growth through industry-leading offering and digital services

## Controlled Environment



Growth through product leadership

### Across Vaisala we build our excellence and leadership on

#### Reliability

We ensure highest reliability and customer delight. We offer reliable, high quality and high performance products, systems and services to our customers. We are a dependable partner for our customers and partners and a reliable employer.

#### Excellence in high-mix, low volume businesses

We have a wide product portfolio to serve our customers' needs in our chosen markets. It is in our core to master the complexity of our manufacturing, sourcing, delivery, and customer service, and to continue to improve their operational efficiency and flow.

#### Expertise in applications, science and technologies

We focus on understanding our customers' applications, needs and problems, having deep scientific understanding of physical phenomena and being the leader in the latest technologies to bring the best possible solutions to our customers.

Vaisala's goal of profitable growth will be achieved in the following strategic areas: business area-specific growth, reliability, and operational excellence.

Growth will be created in the Weather Business Area by building new business around decision support services that are offered to renewable energy, aviation and roads customers. The Controlled Environment Business Area will focus on enhancing its offering and developing the sales channel for life science and industrial customers to create value for customers' operations.

Reliability creates customer satisfaction and loyalty. High quality of products and services, well-functioning customer service, and accurate deliveries assure a reliable customer experience.

Operational efficiency focuses on optimized global networks, streamlined supply chains, common capabilities, and continual improvement in all functions to ensure increased efficiency of Vaisala's operations.

# Strategy

## Implementation in 2016

### Weather

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The Weather Business Area continued its efforts to create customer value and growth by building business around digital services that are offered to renewable energy, aviation and roads customers. Key product launches to enhance growth as well as to replace existing products included enhancements to Observation Network Manager NM10, new version of AviMet Airport Weather Observation System (AWOS) and new version of sounding system software.

In 2016, Vaisala entered the growing air quality monitoring market by acquiring products and technology which measure pollution gases and particles in the air. These products can be seamlessly combined with Vaisala's industry-leading weather sensors, enabling a compact and cost effective solution for measurement networks. This provides Vaisala a great opportunity to expand into the air quality monitoring market, which is supplementing traditional high cost reference measurement stations. Vaisala expects opportunities in particular in markets like China, India and the Middle East in the near future.

While the renewable energy market outlook has remained solid, development and adaptation of Vaisala's energy services has been slower than expected and commoditization of certain products has led to deterioration of market prices. Therefore, expected return on Vaisala's Energy business investment weakened, and Vaisala recorded a EUR 10.5 million write-down of intangible assets, such as technology and customer relationships, to Weather Business Area's

operating results in 2016. Vaisala has decided to focus its Energy business unit to areas of more sustainable long-term competitive differentiation. Going forward, Energy business unit's offering is based on industry-leading renewable energy measurement systems, resource assessment and asset management solutions.

In February, Vaisala made the decision to reshape its Transportation business unit within Weather Business Area to simplify structure, and improve profitability and partly divested the related business in the U.S. Going forward, Transportation business unit will focus on product leadership, delivery capability and expansion of information services in order to drive growth, profitability and customer focus. Vaisala aims to improve Transportation business profitability by focusing on Vaisala platform products providing high value customer support and expanding information services.

At the end of the year, Vaisala decided to reorganize its Weather Business Area in order to simplify structure and operations and to better align with the strategy. From January 1, 2017 onwards, Weather Business Area has organized its business under four regions (Americas; Europe; Asia-Pacific, Middle East and Africa; China), which have profit and loss responsibility. Additionally, Weather Business Area separates its product and service offering into two business lines (Offering and Information Services), which are responsible for product management, application expertise and R&D.

### Controlled Environment

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The Controlled Environment Business Area's product leadership strategy provided a strong platform for further growth during 2016. Controlled Environment Business Area continued to grow through industrial measurement solutions in various industries across all geographical areas. Regional expansion continued by contracting new distributors in countries with high industrial potential. This had a positive impact on distributor sales, which achieved double-digit growth.

Controlled Environment Business Area continued investing in its growth markets, life science and power transmission. Continuous monitoring systems offered to life science and

other industrial customers had, as in previous year, double-digit growth with further improving profitability and contributing to Controlled Environment Business Area's operating profit even though investment phase still continues.

Vaisala made a new product entry to power transmission customers by launching a measurement device for transformer online monitoring. For life science and industrial domain customers Vaisala launched the viewLinc Environmental Monitoring System. Other key launches included a new probe for industrial CO<sub>2</sub> measurement applications and related host device.



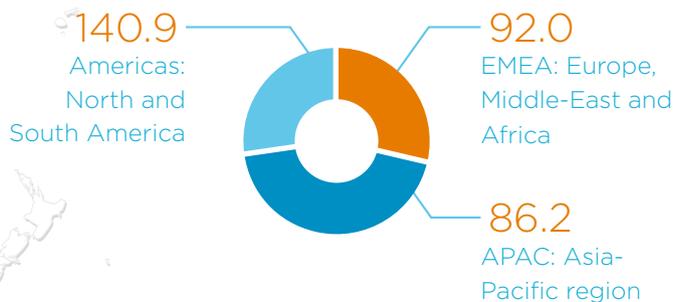


We have a strong market presence in all parts of the world with representatives in over 90 countries.

# Global Markets

- Office
- Manufacturing
- Service Center
- 100% renewable electricity
- Zero-waste to landfill
- Vaisala Green Offices
- Data Centers

## Net Sales 2016, M€



Customers in  
**150+**  
countries

## Weather



Meteorology  
Infrastructure



Transportation



Energy

## Controlled Environment



Instruments



Power  
Transmission



Life Science

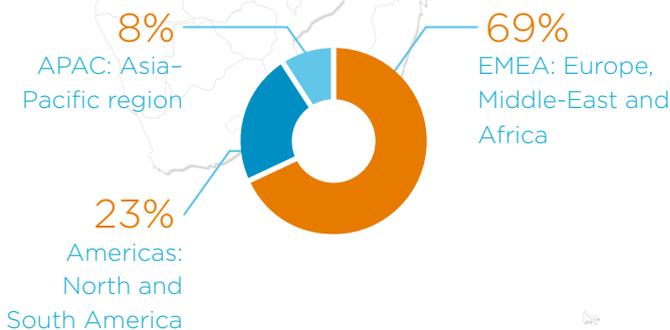
Market size in MEUR	450-500	300	300-350	400-450	150-200	250-300
Market growth p.a.	0%	0-5%	>10%	5%	15%	10%
Vaisala market share 2016*	HIGH	HIGH	LOW	MID	LOW	LOW
Market size total	EUR -2 Billion					

### Market share indication

LOW	<10%
MID	10-25%
HIGH	>25%

\* Vaisala's own estimate of the market sizes that are addressable currently or with organic development in roadmaps.

## Employees



## Vaisala locations

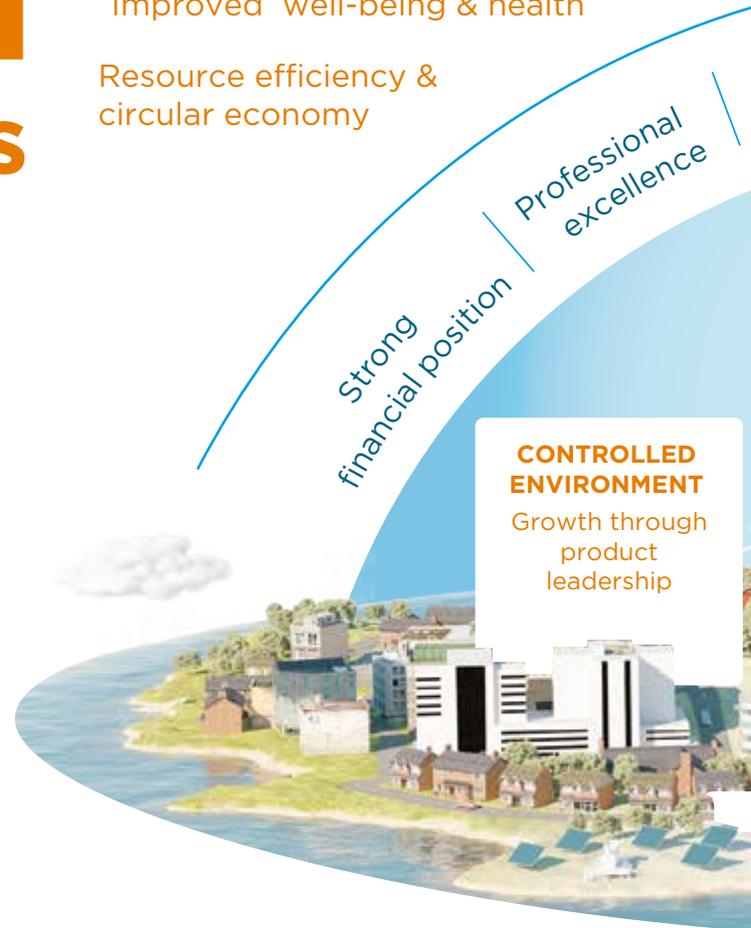
**30+**  
in 16 countries

# Vaisala's World of Observations

We believe in a world where environmental measurements and observations improve every aspect of daily life.

Vaisala's value creation model is a holistic representation of our impacts in the world and shows the values we create to our key stakeholders.

Energy efficiency  
Improved well-being & health  
Resource efficiency & circular economy



VALUE  
CREATED



**EMPLOYEES**

Purposeful work

Well-being

Learning

WHAT DRIVES OUR BUSINESS?

Urbanization Sustainability awareness

Climate change

WHAT DO WE NEED?

Technology leadership

Robust partnerships

Future of mobility

Renewable energy

Digitalization & big data

WHAT DO WE FOCUS ON?

Vaisala production system

Net positive

VAISALA

OBSERVATIONS FOR A BETTER WORLD

Customer focus

Integrity

Innovation and renewal

Strong together

WEATHER

Growth through industry-leading offering and digital services

Excellence in high mix, low volume businesses

FEEDBACK



CUSTOMERS

Reliable decisions

Productivity

Quality



SOCIETY & ENVIRONMENT

Better informed societies

Economic value

Safety

INVESTORS

RESPONSIBLE RETURNS

# Megatrends

# Drive our Business

## Needs Generated by the Megatrend:



### Climate Change

**Climate change increases** the likelihood of extreme weather and intensifies slow onset events. The importance of reliable observations and forecasts to protecting lives and property is constantly increasing due to the unpredictability brought on by the changing climate.



### Digitalization & Big Data

**Digitalization changes consumer** behavior, and the availability of big data disrupts business models, enabling creation and combination of data in completely new ways and creating new competition. Existing data can find innovative new applications, including developing new applications that benefit the society and business.



### Renewable Energy

**Growing global energy** demand is increasingly addressed through renewable energy sources due to their ability to improve energy security affordably and their potential to mitigate climate change. The scale and sophistication of today's renewable energy solutions are challenging traditional energy sources. The variable nature of wind and solar power highlights the importance of site selection and real-time forecasting capabilities as a way to ensure stable energy production in grids with a mix of energy sources.



### Future of Mobility

**Electrification, connectivity and autonomy** will change transportation, requiring more sophisticated safety and efficiency measures. Improving the overall safety and efficiency of transportation and maintaining the associated infrastructure require seamless data and information exchange between transportation system managers and end users.



### Sustainability Awareness

**Expectations on corporations** to take responsibility for their actions and to become a positive force in society have been steadily growing for several years. Innovative, diverse and entrepreneurial companies spearhead technological advancements in society. Companies are expected to solve environmental, societal and economic issues of our time, and at the same time, become leaner, more open and transparent, profitable, and sustainable. Increased regulation requires companies to work on issues that would not fall under their interests or sphere of influence otherwise.



### Urbanization

**As cities grow**, the number of people subjected to the special weather and environmental conditions in urban areas continues to grow. On the other hand, the population concentration brings on changes in the weather and environmental conditions, and in air quality in particular. Severe air pollution is induced in some big cities by increase in traffic and industrial processes. To find solutions to and control this problem, reliable tools and techniques for measuring air quality are necessary.



### Resource Efficiency & Circular Economy

**Resource efficiency** aims to do more with less, using raw materials in an economical and sustainable manner. Circular economy focuses on the reuse and reintroduction of materials back into the value chain instead of turning them into waste. Industrial measurements are becoming increasingly important in the process control of material circulation and in optimizing manufacturing processes and minimizing waste.



### Improved Well-being & Health

**Consumers are increasingly** interested in improving their health and conscious about the environments they spend time in. Access to medicine is also constantly improving around the world. To keep patients safe, authorities are tightening requirements on drug safety and traceability in the pharmaceutical supply chains.



### Energy Efficiency

**The increased demand** for energy globally is an inevitable result of an expanding population and the growth in computerization, electronics, and industrialization. To meet the future energy needs with current growth rates, efficiency gains need to be improved in the growing energy production. Regulation on the energy efficiency of products has been implemented on several markets and can be expected to increase.

■ Weather ■ Weather & Controlled Environment ■ Controlled Environment

## Vaisala's Response:

**Vaisala helps its customers** to establish weather observation networks and build up capabilities that improve their capacity to assess, predict, and prepare for extreme weather. In addition, we support the scientific community in its effort to increase knowledge of our changing climate and its impacts, by enabling them to observe our world as accurately as possible. Our aim is to help nations to better understand their vulnerabilities and risks and become more resilient to climate change through state-of-the-art environmental observations and forecasting.

**Data gathered** through Vaisala's weather observation platforms forms the basis for decision-making by governmental organizations, research organizations and the public. Vaisala delivers decision support by integrating observational data into applications via unified, connected services. We focus on meeting the expanding needs and requirements of users across multiple industries and disciplines. This is especially true in transportation, air quality, renewable energy, and the power industry at large.

**Renewable energy sites** must be selected based on verifiable local environmental conditions. Modeling future energy output from wind and solar production sites is a requirement for both investment decisions and to achieve maximum energy output from the deployed assets. Vaisala predictive models and measurement technologies provide comprehensive information that facilitates sound investment decisions for wind and solar sites. Vaisala's energy assessment methodology reduces performance risk with accurate estimates of long-term energy production at a site, while our measurements and real-time power forecasting capabilities aid in determining and predicting power generation, which can vary significantly in the short term.

**Vaisala provides solutions** that help transportation authorities and operators ensure the safety and efficiency of road, rail, sea, and air transport. Connected networks will collect and disseminate data and information between national and local observation and forecasting networks, to be delivered directly to vehicles. Connected services will integrate weather data seamlessly into decisions support systems and vehicle automation, increasing safety and efficiency of all modes of traffic.

**Our responsibility** does not stop at the factory door. We have been anticipating stronger requirements and commitments for sustainable business from customers, governments and the public for a long time, to be ready for them ahead of time. Increasingly, not just consumer-facing companies are scrutinized for their responsible and ethical behavior. In Vaisala's environmental observations business, trust, reliability, quality, respect, and sustainability are fundamental attributes that lay the foundation for our existence. We aim to be at the forefront in our industry, even from the sustainability point of view. Moreover, the positive effects on society occur through our customers when they apply our solutions, and therefore reach the sustainability targets of their own operations.

**Vaisala provides reliable** tools and technologies for measuring air quality, urban weather and micro-climates, and traffic, enabling authorities, businesses and the public to observe, react to, and mitigate the effects of weather. From the viewpoint of industrial growth, Vaisala offers diverse and advanced technologies needed in environments that need precise and constant monitoring, e.g. hospitals, subways, and large manufacturing facilities.

**The purpose of Vaisala's industrial** measurement solutions is to improve productivity, end product quality and yield, and resource efficiency in industrial processes. Vaisala's excellence in maintenance and calibration services ensures a very long lifetime for the instruments and guarantees their reliable operation in harsh environmental conditions. Optimization of manufacturing processes and process control for material circulation require robust and high-quality measurement solutions; this performance is intrinsic to Vaisala's instruments.

**Technological advances** make it possible to increase environmental monitoring of indoor conditions to secure people's health and well-being. Vaisala's solutions safeguard and optimize living and working conditions inside buildings, laboratories, hospitals, incubators, and other strictly controlled environments. They also help optimize the conditions in pharmaceutical manufacturing and supply chains, guaranteeing the safety of drugs we use. Vaisala's high-end monitoring solutions provide the accuracy and stability required to monitor these critical environments reliably and continuously.

**Vaisala's measurement technologies** improve energy efficiency by optimizing the control of many industrial processes. Vaisala helps customers in a multitude of energy intensive industries to reduce energy consumption as well as improve operations. Measuring parameters like humidity, carbon dioxide and temperature is important in many sectors, such as in Heating, Ventilation and Air-conditioning (HVAC) automation and in drying processes.

# Engaging Our Stakeholders

We want to have an open relationship with our stakeholders, as they are the ones who influence the future of our business. We are active in many corners of society and want to influence and convince people with our expertise. Working with environmental issues is a priority in our scope of societal affairs.

## Stakeholder Engagement

We identify and evaluate our stakeholders as part of our risk and sustainability management procedures. Both assessment methods are carried out internally and are part of corporate-wide processes. We determine the impact of various stakeholder groups on the company and analyze how our actions in turn affect them. We actively seek partnerships and joint opportunities with customers, suppliers, academia, research institutes, and other parties. We maintain a constant dialogue with our most important stakeholders.

The previous systematic stakeholder study was carried out in the fall 2016 with the intent of getting feedback from expert stakeholders on what a report like this should include to be valuable for Vaisala's stakeholders. The survey was carried out through in-depth interviews with investors, customers, employees, research partners, and Vaisala management, by

an external consultancy agency. The results provided insight into the future of reporting requirements, as well as into strategy, transparency and sustainability issue management. Some of the key takeaways were how Vaisala should present value creation of its operations to stakeholders, how to discuss it with them, and how sustainability should be integrated into strategy, processes, and operations. One of the results that came out of the discussion and interviews led us to consolidate our grouping of stakeholders and prioritize the four stakeholder groups that have the most influence on Vaisala.

# Stakeholders

## Description

## Main Activities

### Employees



Vaisala's 1,600 professionals in more than 30 locations in 16 countries

- Offering talented individuals work that has a higher purpose in society
- Learning programs and career development
- Monitoring of employee satisfaction and well-being

### Customers



Thousands of private, governmental, and public customers in more than 150 countries. Close to 100 distributors and representatives.

- Annual customer satisfaction survey across markets and regions
- Ongoing online surveys on customer training and field services operations
- Monthly online survey on technical support and services

### Society & Environment



Universities and research collaborators, manufacturing partners and suppliers, governments and regulators, local communities, the media, the public, and the environment.

- Partnerships and collaboration with academic and scientific institutions
- Scholarships and donations
- Close cooperation with our global supply chain
- Sharing expertise with external organizations and decision-makers
- Awareness raising of environmental issues for experts and the public

### Investors



Large shareholders include descendants of the founder Professor Vilho Väisälä, Novameter Oy, Finnish pension funds and other financial institutions, the Finnish Academy of Science and Letters, and private households. Foreign ownership amounted to 14.7% of shares in December 31, 2016.

- We arrange an interim results report and presentation and Q&A to investors, analysts and the media each quarter
- Annual General Meeting
- Stock exchange releases
- Roadshows, investors and analysts meetings and conference calls



## Space-proof Sensors

Our technology has a long history in space, from 1950's to today's missions to Mars

Nearly  
**100**  
representatives around  
the world

# How We Create Value to Our Employees

## Value created: **Purposeful Work**

Curious and capable employees are a cornerstone of Vaisala's success. Attracting creative and skilled people is not self-evident, and every member of our team is valued and respected. Although our employees stay with us for a decade on average, we do not take this for granted, and aim to offer them highly motivating career paths. This kind of long-term commitment has provided us with extremely competent professionals dedicated to developing superior technology and long-term customer relationships.

Vaisala offers meaningful challenges to curious and passionate professionals who value work with a purpose.

Integrity is one of our core values, meaning that we want to maintain an honest, respectful and reliable work environment. We promote sustainable and ethical behavior. We are proud that our employees find these values visible in their daily lives. Environmental observations that have a true purpose for societies, businesses and individuals are a key motivator for many of our employees. Being at the forefront of solving the most difficult challenges of our time is an exciting part of being with the Vaisala team.

### **Giant Leap Internship**

Challenging but also rewarding, Vaisala Giant Leap internship program targets university students with a variety of skills, qualities and educational backgrounds. Each year up to 20 students work with real-life projects that have genuine business relevance for a period of three months over the summer. The three-month project is filled with social events, engaging training sessions and it culminates in presenting the project outcomes to Vaisala's management group at the end of the summer. Many of the interns end up continuing with us in various positions, whether as thesis workers or specialists in their field and start building their careers in Vaisala.

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## Our people talking about the purpose of their work

“I’m proud to work at Vaisala because I can see that the company cares about the earth. I know I am contributing to something valuable. Our work even saves lives.”

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“The best quality of an employer is to provide a sense of meaning to our work – environmental measurements are more important than ever”

---

“Vaisala is filled with good people. The company trusts its employees to do their job, so employees in turn trust the company. That, in my opinion, is what makes Vaisala such a great company.”

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“We provide global solutions that can, and often will, make a positive difference. The best part of this is that we all have an important role in this effort.”

## Great Leadership

One of Vaisala’s key strengths is the competence of its middle management and team leaders. They regularly score above our peer companies in annual personnel surveys. We invest in good leadership by offering comprehensive training for our managers and supporting them in their work. Many of our development programs focus on generating great leadership, fostering a healthy workplace culture, and supporting a good work-life balance.

At Vaisala we see the value of great leadership and believe that investments in leadership development not only bring better results but also increase the well-being of both managers and team members. Good leaders help us attract and retain talented employees. When both managerial and professional expertise are highly valued, there are also more attractive development opportunities for employees in both areas.

For our managers in supervisory positions, we have a corporate wide learning program, LEAD. The program started in 2007 and has since then developed the leadership skills of our managers around the world. Along the way a spin-off called Expert LEAD has evolved. It is a program for employees who are not in supervisory role but need excellent leadership and communication skills.

## Awesome Place to Work

Vaisala’s Operations organization has systematically improved its manufacturing and delivery capabilities thus fulfilling the strategic objective of operational excellence. To support and further develop these capabilities, Vaisala Production System, an overarching method of ensuring operational excellence, was launched in 2016. By standardizing the ways of working and empowering the whole organization to systematically develop them together, the Production System will lead to ever smarter work and shared commitment to improvements. We are aiming for high performing, evolving teams, with a clear vision – we want to be an ‘Awesome Place to Work’.

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### Indicators:

Employee  
Engagement  
Index

4.08<sub>/5</sub>

I am proud that  
I work for Vaisala

4.14<sub>/5</sub>

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case

## Jukka-Pekka Took the Giant Leap

**Jukka-Pekka Piirainen** joined Vaisala in 2015 as a part of the Giant Leap program. Giant Leap is Vaisala's own internship program that gives interns the opportunity to make a true impact. Like many of the former Giant Leap interns, also Jukka-Pekka has stayed onboard.

At the start of the internship, Jukka-Pekka had just finished his fifth year of the Industrial Engineering and Management degree program at Tampere University of Technology: "As my studies were drawing to a close, I felt that it was time to look for a truly ambitious and interesting summer job to challenge myself and to develop professionally. Giant Leap offered me what I was looking for. It provided me with experience of managing a project of my own. It also offered a comprehensive view to cross-functional co-operation and collaboration between Vaisala and its suppliers," says Jukka-Pekka.

### A Great Experience

The summer at Vaisala lived up to Jukka-Pekka's expectations professionally, and even exceeded his expectations in terms of how much he enjoyed the experience: "Thanks to the other interns and Vaisala's welcoming people. It was incredibly rewarding to take up the challenge since the projects are genuinely considered important in the company. Vaisala has proven to be an employer whose values I can share, a workplace where my work is appreciated, and a company that can make a global difference through innovation." After his summer working as a part of Giant Leap, Jukka-Pekka was able to utilize his experiences in his thesis: "My thesis built on the lessons learned and included developing systematic practices for Early Supplier Involvement in Vaisala."

### Future with Vaisala

Nowadays Jukka-Pekka works as Sourcing Project Manager in Vaisala's Helsinki office. He participates in new product development projects as a sourcing representative and one of his key responsibilities is driving and facilitating Early Supplier Involvement in practice: "Both Giant Leap and my Master's thesis prepared me for the job well. Having participated in Vaisala's mentoring program and several trainings, I have been pleased with Vaisala's opportunities

for personal development. To summarize, Giant Leap took me to the core of strategic sourcing and offered me a truly rewarding chance to influence practices and ways of thinking. I got to carry out a full loop, from current state analysis and generating development ideas, to change management, practical implementation, and continuous improvement," says Jukka-Pekka.



# From Giant Leap to Boston



Technology company Vaisala may not be the most obvious choice that comes to the mind for a young marketing student close to graduation. Business student **Niina Reponen** however decided to apply, and was selected for Vaisala's Giant Leap internship program in 2011. "What really got my attention was the international aspect of the company, as well as the interesting Giant Leap projects. I'm glad I kept my mind open and joined the company - the Giant Leap summer exceeded all my expectations. I got to work with an interesting and meaningful project, which strengthened my skills in digital marketing, which is my field of specialization," Niina recalls.

## Best People Globally

After her Giant Leap summer Niina wrote her Master's thesis about Vaisala. Ever since, she has worked in several positions in marketing at the company. She is amazed by how much responsibility the company is willing to give to young professionals: "International projects have brought me to Boston, where I'm currently located. It's eye-opening to see the company's operations in another continent and from another perspective. Vaisala is truly a global company, which makes the business and everyday work exciting. However, even if it's a cliché, the people are the best part of Vaisala. I feel privileged to work with such an amazing, professional, fun and talented group of people," she says.

Each year we handpick exciting real business challenges for our Giant Leapers to manage. Our unique approach allows these young talents to kickstart their careers and gain special insight into our mission of creating observations for a better world.

The 20 interns in 2016 gave an overall score of 4.8/5 for the Giant Leap program.

"Vaisala has a great working culture, I would definitely look forward to working here again" - Giant Leap Intern, 2016



# Value created: Learning

Our competitive strength originates in our highly capable personnel. We encourage our employees to take the initiative to improve their capabilities, promoting an active approach to career planning. Learning runs through every employee's whole career in Vaisala, both through structured programs and through learning on the job and getting valuable first-hand experience.

The tenth global Vaisala Business Learning Program is ongoing, extending leadership skills especially in strategy, customer focus, personal growth and financial performance. The program is about the future of Vaisala and it is a strategic investment in the development of talent within our organization, by broadening the perspectives of a selected group of managers and experts. Participants for the program are selected and approved by Vaisala Management Group. The participant list is put together on the basis of individual development discussions and strategic business aims. There are around 25 employees on each program, and they come from different units and locations around the company. The ninth program ended in March 2016, with very positive feedback from the participants.

Vaisala's approach to competence development combines internal and external learning programs, cooperation with universities and researchers, job rotation, international assignments, and mentoring and coaching processes. Vaisala also maintains a comprehensive e-learning platform to complement other learning methods. The online e-learning environment hosts more than 40 interactive modules, supporting our own employees learning and that of Vaisala's representatives and customers.

## Mentoring

Vaisala has a mentoring program to support the professional development of its employees. We use mentoring as a method of accelerating employee development and providing learning opportunities for both the mentor and the mentee.

The program is a structured, goal oriented 12–18-month process where mentees and mentors build a professional

relationship. It consists of a facilitated kick-off session, coaching activities during the program as well as a facilitated feedback session at the end of the program. The core of the program is built on regular meetings between the mentor and mentee.

Vaisala's fifth mentoring program was launched in April 2016. The purpose of the program is to support professional development, enhance Vaisala's leadership and coaching culture, and transfer tacit knowledge and best practices across business units and functions. Altogether 48 participants with diverse professional backgrounds and roles were selected from multiple locations.

## Indicators:

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**3.84**<sub>/5</sub>

I have opportunities to develop my skills and competencies at work

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**3.83**<sub>/5</sub>

My supervisor develops our skills and our operations

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“

## When asked

“What is your overall rating for Vaisala Business Learning Program”, the overall average score was

**5** /5 by the 25 participants in 2016.



“I started VBLP with Vaisala as an employer, I leave VBLP with Vaisala as a partner. I now view the relationship between myself and Vaisala as an investment.” - Participant from 9th Vaisala Business Learning Program

**Vaisala** e-learning platform offers

**40+**

advanced modules for employees.

# Value created: **Well-being**

We value work environments that support the well-being of our employees and smooth collaboration between teams. Our employees value the opportunities for good work-life balance as well as the meaningful challenges and outstanding supervisory work.

At Vaisala, well-being is regarded as comprising of following factors: meaningful work, team spirit, leadership, balanced work load, and safe working conditions. In addition, we encourage and support employees in the adoption of healthy and active lifestyle choices. We arrange and fund local activities to support the well-being and health of our people,

such as the Vaisala FIT program in the U.S. and sports and recreational clubs in Finland.

## **Keeping Track of Well-being**

Employee satisfaction and well-being are measured regularly at Vaisala to better understand the views of employees throughout the company and to keep abreast with possible changes and trends in our employees' attitudes. The survey is commissioned from a research company to guarantee the confidentiality of responses. The response rate was 85% in 2016 and more than 1,300 employees took part in the survey.

## **Engaging Careers**

The results showed that Vaisala employees are proud to work at Vaisala, find their own work meaningful, and feel professional in their own field of expertise. All survey areas developed positively compared to previous year. Supervisors' leadership showed strong positive development. Supervisors' support, fairness and objectivity, as well as positive attitude to new ideas were clearly above the benchmark data. Also team work results developed nicely. Engagement is a strength across Vaisala; however, cooperation between teams still requires further improvement.

In addition to the annual Staff Survey, a global Pulse Survey was conducted to further map out the level of employee well-being at Vaisala. Pulse is a focused follow-up study to the Staff Survey; it is conducted each fall. It provides complimentary feedback and development input to the Staff Survey.

Feedback from the surveys is used for continual development of our common ways of working and our work environment. The most important phase in the process is group meetings where the results are studied and development actions agreed. The reports and team discussions held each year provide valuable feedback to team leaders and support team development.



## Indicators:

Well-being index **3.95**<sub>/5</sub> in Staff Survey 2016

Proactive reporting of near misses increased

**+31%**

I feel that **my work is meaningful** **4.06**<sub>/5</sub>

Total Recordable Injury (TRI) rate 2016

**2.3**  
decrease by **-26%** from previous year. Target 2.5.

**6** ○○○○○○  
○○○○○

Injury free months in **2016**

## Firstbeat Well-being Analysis



At Vaisala, we believe that each individual has the most essential impact on his or her own well-being. The goal of our well-being activities is to support our professionals in managing their work, ensuring the sufficient recovery and leading healthy lifestyle in general.

We carried out a new experiment in 2016 and offered Firstbeat Well-being Analysis opportunity for professionals with irregular working hours. Firstbeat measurement allows individual to collect information on their stress and recovery levels during selected three days and provides reliable insights on the quality and quantity of sleep. Each participant received a personal feedback report after the measurement, with information on the balance between work and rest and recommended ways to improve their well-being. To help the participants understand their results and plan the necessary development activities to

daily routines, the experiment included feedback sessions in small groups.

Altogether 74 professionals from our manufacturing, finance and other group function teams participated in the pilot group. One of the participants, Sara Olkinuora, Financial & Control, recalls her experiences:

“Trying Firstbeat was an eye-opening experience for me. It was super interesting to see from the analysis which things can affect for example the quality of sleep or a running exercise. However the biggest benefit was that now I’m even more aware on how to balance activity and rest.”

As the feedback from Firstbeat pilot groups was encouraging, we will continue this work and offer the opportunity for well-being analysis to new employee groups in 2017.

# How We Create Value to Our Customers

## Value created: **Reliable Decisions**

We enable customers to make reliable decisions based on accurate environmental observations. Whether in transportation, the energy sector or various industrial applications, the information produced through our technologies help our customers make superior choices for the efficiency, safety, and sustainability of their operations.



Vaisala's equipment detects close to **100%** of the world's thunderstorms and **captures two billion lightning strikes** each year.

**3,700+** deployments of Triton Wind Profiler.

Winter road maintenance accounts for about

**20%** of the state DOT budgets. Each year, more than

**USD 2.3 billion** are spent on snow and ice control operations by state and local agencies. (FHWA, 2012)

Lightning causes around

**24,000** deaths and **240,000** injuries each year.

Vaisala is the **market leader** with around

**90%** of the world's non-invasive road surface sensing equipment.

## Smoke Gets in Your Eyes — Air Quality at Dangerous Levels

Poor air quality kills millions and costs a lot. Addressing the problem requires better understanding through observations, globally and locally.

Air quality is a matter of life or death. In 2014, the World Health Organization reported that an estimated seven million people died in 2012 as a result of air pollution exposure.

Even though developed countries are not immune to problems, developing countries fare much worse. According to "The Cost of Air Pollution" by the World Bank and Institute for Health Metrics and Evaluation (IHME) at the University of Washington, in 2013, about 93% of deaths and nonfatal illnesses attributed to air pollution occurred in them. The same study found that in 2013, premature deaths due to air pollution cost the global economy about USD 225 billion in lost labour income, or about USD 5.11 trillion in welfare losses worldwide.

### Decisions Based on Local Data

Today, air quality is monitored using stations that measure about 10-20 parameters, and cost a few hundred thousand dollars. A megacity may have a few dozens of these stations, scattered around its area; a smaller city might have two or three.

These stations are good at providing information on the long term, but they monitor far too few parameters to give a good picture of the atmosphere. Moreover, they are too far apart to provide information on local air quality. In addition, pollution in cities is highly local, made worse

by traffic, weather phenomena and buildings.

When the network of air quality observation stations is dense enough, the information it provides can be used in decision-making. Even today, air quality can be improved by e.g. redirecting traffic, or temporarily closing manufacturing plants.

### Understanding Through Observation

In the long term, observations help in achieving a more thorough understanding of the atmosphere and the interplay between the weather and air pollution. The observations could be used to start modelling the presence and spread of air pollutants in a way similar to weather modelling today. This understanding is essential, if we are to solve air quality problems and mitigate their impact.

The latest addition to Vaisala's offering are Air Quality Transmitters that are a cost-effective solution to monitoring conditions locally. The transmitters measure up to four most common gaseous pollutants, such as nitrogen oxides, sulphur dioxide, carbon monoxide, and ozone, as well as particles (PM2.5 and PM10).

case



# Value created: **Productivity**

Vaisala's solutions improve customers' cost-efficiency, yield and quality of operations, and end product. The high quality and long life-cycles of our products offer an superior total cost of ownership. Vaisala's solutions make maintenance and monitoring of crucial systems, such as high-voltage power transformers, efficient and cost-effective.

Monitoring conditions in warehouses, manufacturing processes or in supporting environments, such as insulation gas or oil, is most efficient done online. This eliminates the need for maintenance crews to visit facilities for on-site testing reduces error sources related to sampling and spot checking, and frees up resources. Reliable online monitoring enables a transition from reactive to preventive maintenance, with substantial economic returns in many industries.

Compressed air systems are one of the most important utilities in many industries, but also among the largest consumers of energy. High quality compressed air means dry, oil-free and dust-free air at a low cost. Energy accounts for 75% of the lifetime cost of a typical compressed air system. Leaks have been estimated to waste as much as 30% of a compressor system's output and energy usage, so significant cost savings can be made by improving energy efficiency. Vaisala's humidity measurement solutions help professionals maintain high-quality compressed air cost efficiently, and at the same time, detect any leaks in their systems early on.

## Indicators:

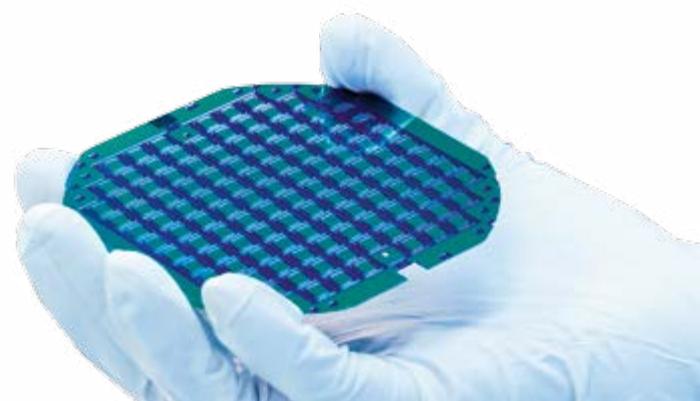
**8** of the **world's top 10 electric utility companies** rely on lightning data from Vaisala manufactured lightning detection networks

Data centers are energy intensive facilities, currently consuming

**1.3%**

of the world's total energy production. Vaisala helps data center operators to cool down their facilities as cost-efficiently and sustainably as possible through smart control systems and building automation solutions.

Continuous monitoring systems allow pharmaceutical manufacturers and distributors to monitor their facilities in a way that fulfill regulatory requirements from authorities, such as the FDA. The system optimizes indoor conditions and alerts facility managers of any unintended changes in conditions.



# Smarter Buildings Have Smaller Footprints

Smart buildings save energy and keep their users healthy. For good results, building automation must be based on reliable measurements.

Buildings are one of the biggest consumers of energy; in 2015, they accounted for about 40% of total U.S. energy use. People want to save energy, but at the same time they have higher expectations on their living and working environments.

To address both demands, buildings are becoming smarter, optimizing the conditions indoors as well as energy consumption.

McGraw Hill Construction published a SmartMarket Report stating that intelligent buildings use 20-40% less energy and result in 8-9% lower operating expenses with valuations 7.5% higher than those with legacy systems.

## Optimization for the Long Term

Optimizing indoor conditions requires integrated control systems, and they can only work properly when their operation is based on accurate and reliable measurements.

Even more important, however, is the stability of the sensors used to measure indoor conditions.

The instruments used are left to their own devices for years, so they need to be able to produce consistent and dependable results. However, the end users and owners

often have to rely on instruments the builders and system integrators have selected, and in today's cost-driven world, the main criterion is price.

This helps keep initial costs to a minimum, but in the long run, it can lead to higher maintenance costs and undermine the advantages of smart buildings.

## Taking the Outdoors into Account

Going forward, buildings can be made even smarter by using data from the outdoors.

Weather stations can provide information for optimizing air intake and cooling or heating, drying or humidifying it. In the future, forecasting could be used to change building automation settings in advance. Anticipating temperature peaks during the day, would allow systems to turn cooling up before the midday heat warms up the building.

Outdoor air quality measurements could be used by minimizing air intake when there is a lot of pollution or harmful particles in the outdoor air.



Improving yield and quality in customers' manufacturing processes through installing technology that help to improve operational efficiency. Vaisala's customer, a dairy manufacturer, managed to increase production volumes by more than

# 20%

with zero increase in energy consumption, through accurate humidity and temperature measurements in their milk powder manufacturing.

Automated ventilation in buildings can be energy intensive as outdoor conditions affect how much indoor air needs to be cooled down or warmed up. Vaisala's building automation solutions optimize indoor air and conserve energy by eliminating unnecessary ventilation through accurate measurement of humidity, temperature and carbon dioxide levels in buildings.

Vaisala CheckTime helps airlines reduce their consumption of de-icing chemicals in their winter operations by up to 30% through decision support for pilots based on real-time weather data.

# Value created: **Quality**

A shared appreciation for quality is something that our customers value when choosing their environmental measurement technology provider. High-quality products and services have always been the core of Vaisala, but most importantly, ensuring the quality of customers' end products or operations, is what makes all the difference.

Vaisala brings its technology and expertise to its customers' operations to improve quality and resource efficiency in various applications. At the customer, quality is improved by making processes more efficient and raising the quality of end products. Quality in operations typically entail ensuring stable environmental conditions and minimizing waste, such as reducing the need for treatment chemicals, saving energy in drying processes, optimizing indoor air in buildings, but also making the most out of an investment in wind parks or solar production plants.

The value created for customers through our reliable and sustainable technology is concrete and in many cases not only improves yield, quality, and resource use, but the

profitability and quality of their operations and end products, too. Coupled with unrivalled product quality and service, the strength of Vaisala's solutions is the proven, superior Total Cost of Ownership. The long-life cycles of our products, easy installation, low-maintenance needs, and exceptional customer service guarantee that choosing Vaisala is always the reliable and cost effective choice.

For example, metal industry customers performing heat treatment processes benefit from atmospheric control with Vaisala dewpoint transmitters. The metal surface ends up with an improved finish and the process generates less scrap, and higher yield.



# When Failure Is Not an Option



With continuous dissolved gas level monitoring, our customers can predict and reduce the maintenance costs of their transformers and greatly extend their investments' lifespan.

Hundreds of thousands of power transformers around the world are essential for providing electricity to communities. These transformers were designed for a lifespan of 40 years, while the average age is now already 42 years. The old age is now starting to show as gradual transformer faults. This means that in the near future, old transformers need to be either replaced or repaired before the break downs cause outages, or complete failures.

Replacing transformers with new ones is expensive, time-consuming and wasteful. Instead, timely maintenance provides a more economical solution. The challenge is to figure out which of the operators' transformers are at risk and when to repair them before they fail.

## Ensuring Long Life Cycles for Power Transformers

One indicator of a potential fault is a change in the levels of dissolved gas in the transformer oil. The traditional periodic monitoring of these levels has been inefficient and unreliable in the past. Through the expertise in monitoring moisture in oil,

Vaisala developed an innovative system that enables continuous online monitoring of the dissolved gas levels. This became the Vaisala OPT100 Optimus DGA Monitor.

The monitor provides operators with accurate real-time data remotely, to anywhere in the world. It measures and tracks levels of dissolved gas in the transformer oil, and sends an alarm when predetermined conditions are met. As a result, potential problems can be resolved before the equipment is damaged, and operators can optimize decision-making about when to service, upgrade, or refurbish their transformers. The technology in the maintenance-free DGA monitor eliminates false alarms reducing costs and freeing up resources.

Servicing the transformers on time instead of replacing them with new ones brings benefits to both the operators and the society in form of sustained economic value and stable power grids. Maximizing the lifespan of power transformers through this innovation is a great example of how Vaisala can help its customers be part of a more circular economy through technological advances.

case

## Indicators:

Vaisala's HUMICAP® Humidity and Temperature Transmitter Series HMT330 has surpassed

**100,000**  
installations world-wide

**20** years  
of CO<sub>2</sub> measurements in industrial applications

**75%** of  
of net sales come from products **that contain sensors manufactured in our in-house cleanroom**

On-time Delivery was

**98%** in 2016

**6,000+**  
different products

**1,000+**  
**shipments to customers weekly**, with a typical one week lead time from order to delivery globally.

**97.9%** of surveyed customers were **satisfied or very satisfied** with Vaisala's products.

# How We Create Value for **Society** & Environment

## Value created: **Better Informed Societies**

We bring value to societies through accurate and reliable environmental measurements, decision support for national and local authorities, businesses, and the renewable energy sector.

Vaisala works together with nearly all meteorological institutes in the world, supporting them to provide accurate, real-time information and forecasts on weather events all around the globe. Vaisala also collaborates with international funding agencies and weather experts, and together build capacity for weather observation networks in developing economies.

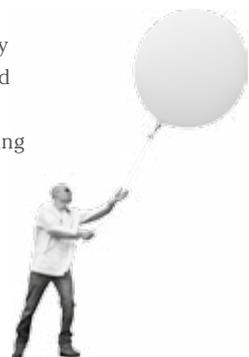
Extreme weather, such as hurricanes can have devastating consequences on local economies and livelihoods. Vaisala is the only manufacturer of hurricane tracking dropsondes that are used for in-situ measurements inside a hurricane, providing essential information when forecasting the hurricane's path and intensity.

Renewable energy is powered by weather and choosing optimal locations for wind and solar power production is vital for keeping the price of renewable energy low and investments profitable. Vaisala's solutions and services optimize site selection and power output for the renewable energy sector.

Air pollution is yet another threat to the health and well-being of people. The World Health Organization, WHO, has estimated that poor air quality causes seven million premature deaths annually, three million of which are directly linked to ambient air pollution. People living in low- and middle-income countries disproportionately experience the burden of outdoor air pollution with 87% occurring in low- and middle-income countries (WHO 2016).

Unicef reported in 2016 that 300 million children live in areas with extremely toxic levels of air pollution and an estimate of 2 billion children live in areas where pollution levels exceed the minimum air quality standards set by the WHO.

Vaisala's new venture into supplementary air quality monitoring networks will help authorities pinpoint and manage the problem areas especially in cities. With accurate and real-time air quality information becoming available, decision-makers as well as citizens, can adjust their activities according to the current air quality situation in their part of the city.





**Indicators:**

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**+20M**

hours of wind measurement data collected worldwide with the Triton Wind Profiler.

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**Capacity building**

projects involve building weather observation infrastructure for entire countries.

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**7** million premature deaths annually are linked to poor air quality.

(WHO, 2016)

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**92%** of the world population is living in areas where air quality guidelines are not met.

(WHO, 2014)

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Vaisala is the **only company producing dropsondes, an essential hurricane observation equipment.**

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# Making The Bahamas Stormproof

case



With a modern weather forecasting network, covering the whole expanse of the country, The Bahamas will be able to keep its citizens and numerous visitors safe from the ravages of extreme weather.

The Bahamas is a country that is in the path of hurricanes, and consisting of some 700 low and flat islands, it is prone to any rise in sea level. It is also a large country in area: the weather in the northern islands can be completely different from that in the southernmost islands.

In July 2015, Hurricane Joaquin caused widespread destruction in the Central and Southeast Bahamas. After this, the Government of The Bahamas decided to improve the weather forecasting capabilities of the country, in order to keep its citizens and visitors safe from extreme weather.

The Department of Meteorology of The Bahamas turned to Vaisala. After examining the status and needs of the Bahamian weather services, Vaisala created a package of equipment, software and training tailored to the needs of The Bahamas.

“We have over 40 years of history with Vaisala, and Vaisala has provided the most robust and reliable equipment. In this case, it was also important that Vaisala thought of the whole picture for The Bahamas – not just trying to make a deal. Training, for example, was an essential part of the contract for us,” Trevor Basden, Director of The Bahamas Department of Meteorology, points out.

## Building Better Informed Societies Together

In October 2016, the contract was signed with Vaisala, collaborating with the Finnish Meteorological Institute (FMI). The partnership makes it possible to provide Bahamians with the latest in meteorological technology to keep citizens and visitors safe.

Vaisala will provide hardware – weather radars and weather stations – and software, and train Bahamian meteorologists in their efficient use. FMI will provide meteorological software and training.

FMI is not only a weather service provider, but also develops its own software, so it knows the ins and outs of meteorological services. While training their Bahamian colleagues, the goal of FMI’s experts is not only to teach them how to use the software but also to build their meteorological capacity and hone their processes, organization and methods further.

Improved weather forecasting capabilities of the Bahamas Department of Meteorology, both through advanced instrumentation and increased expertise, will make it possible to provide advance warnings of approaching severe weather.

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Knowing a storm is coming allows time for getting prepared: making sure well in advance that there are extra supplies and sheltering available on the islands in the storm’s path. This decreases loss of life and property from the ravages of hurricanes, tropical storms, and tropical depressions.

# Value created: **Safety**

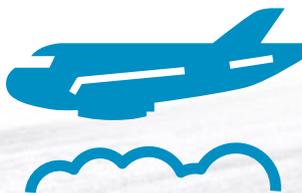
Vaisala's technologies help our customers maintain safe operating environments in many parts of the society.

Weather affects all transportation sectors, whether shipping goods or transporting people. The aviation industry is dependent on accurate weather information to minimize delays and ensure safe operations. Road authorities can mitigate accidents through roadside weather warnings and plan winter operations more efficiently with advance information about prevailing weather conditions. Railway operators, especially those of high-speed trains, benefit from wind warnings, so trains can slow down when wind conditions become dangerous. The maritime sector is depending on weather forecasts for safe transportation of people and goods, and harbor operations. Even missions to space need safe weather conditions during launches.

Using road weather information in winter maintenance operations, is an example where an investment's benefit to cost ratio is generally high, reaching up to 10:1. Vaisala's customers have reported that by applying our maintenance decision support systems in road winter maintenance, they have been able to reduce their de-icing costs by up to 40%, resulting in associated reductions in traffic accidents of as much as 50%.

## Indicators:

Vaisala has installed over  
**2,000**  
complete airport weather  
systems in over  
**100** countries  
around the world



According to National Highway Traffic Safety Administration, on average **1,511,000 vehicle crashes** — 24% of all vehicle crashes in the U.S. are weather-related each year, and **7,130 people are killed** and over 629,000 injured in these crashes each year.



It takes ten times more road salt to treat a road after freezing has set in than pre-treating the surface before it happens. **Vaisala's RoadDSS solution alerts road operators** when to apply chemicals on their road network for maximum effect.

**Every single flight around the world** will at some point use weather observations produced by Vaisala equipment and/or forecasts driven by Vaisala sensor observations



case

## Thunderstorms Cause More Air Travel Delays than Winter Weather

Accurate thunderstorm detection helps keeping ground crews and passengers safe.

Weather is the biggest cause for delayed flights; e.g. in the USA it accounts for 70% of all delays, according to the Federal Aviation Administration (FAA). It may be surprising that thunderstorms in the spring and summer are much more disruptive than snow and ice in the winter.

In April–September, over 40% of the delays to arrivals are caused by convective weather, i.e. rain or thunderstorms, according to the FAA.

Thunderstorms stop all traffic at an airport. In the air, lightnings can strike planes without problems, but they pose a danger to ground crews. In 1991–2011, at least 92 injuries and 1 death were caused by lightning at airports.

As all field operations as well as take-offs and landings come to a halt, flights are inevitably delayed, or even diverted. And this has a domino effect – delays in one place, even short ones, are felt throughout the aviation system.

### Forecasts Help Get Ready

Since lightning and thunderstorms will always be with us, airports and airlines have to do their best to manage operations in all weathers.

Winter storms develop and move slowly and are thus easier to forecast, giving airports and airlines more time to plan for them. Summer and spring thunderstorms can form quickly and affect large areas. They can be predicted, but their coverage and exact location cannot.

Many airports have their own meteorologists to monitor weather and provide local forecasts, but they also partner with private companies like Vaisala, to measure airfield conditions and track thunderstorms and lightning.

Vaisala is a leading authority on the monitoring and detection of lightning with its Global Lightning Dataset GLD360.

Vaisala invests heavily in lightning science research to improve the system's accuracy, as this translates directly into savings. Flight delays can cost as much as USD 35,000 per minute. For operators, accuracy equals reliability, eliminating any false alarms and unnecessary standstills. For travelers, accuracy means first and foremost safety.

[www.faa.gov/nextgen/programs/weather/faq/#faq3c](http://www.faa.gov/nextgen/programs/weather/faq/#faq3c)

# Value created: **Economic Value**

Vaisala's solutions help societies become more prepared and resilient against the negative effects of weather and the climate, and at the same time take advantage of favorable weather conditions.

Investments in new renewable energy capacity depend on reliable information on a potential site's future power output. Vaisala's clients use the forecasts we generate for wind or solar power plant sites to secure financing.

Vaisala as a company has a positive economic impact on local communities through employment and taxes, both directly and through its supply chain. Responsible business practices and use of local suppliers create indirect benefits to local communities.

Even without specific factoring in of natural disasters, United States economic activity varies by up to plus or minus 1.7% due to weather variability, resulting in impacts as large as USD 485 billion of the 2008 GDP of USD 14.4 trillion (Lazo, American Meteorological Society, 2011). Furthermore, "in 2011, about 206 million people were victims of natural disasters with an economic cost of USD 366 billion worldwide with the largest part of this due to disasters of meteorological and hydrological origin (WMO Report 1153, 2015)."

A nationwide survey by the National Weather Service (NWS) indicates that 96% of the U.S. public obtains, either actively or passively, 301 billion weather forecasts each year. Based on an average annual household value of USD 286 placed on weather information, the American public collectively receives USD 31.5 billion in benefits from forecasts each year. These benefits far exceed the USD 5.1 billion spent annually by both private and public weather bureaus on generating forecasts (Weather Ready Nation – NWS, 2011).

## Indicators:

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Upgrading meteorological and hydrological information and early warning capacity in all developing countries to developed country standards would save an average of

**20,000**

lives per year and

USD **300–2,000** million of avoided asset losses, according to a 2012 report by the World Bank.

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The UK Met Office will deliver a net economic value of GBD **29.5** billion to the UK over the next ten years with a benefit to cost ratio of 14:1.

(London Economics, 2015)

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Economic assessments set benefit to cost ratio for improved hydrometeorological capabilities from

**4:1 to 36:1**

for every invested dollar.

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Vaisala has helped secure project financing for **30 GW** of wind capacity and **42 GW** of solar capacity globally.

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**1,800+**

wind and solar energy project assessments to date.

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key  
note



# Integrated Weather Services Enhance Land Transportation

To mitigate the effects of adverse weather on transportation, we need integrated weather services that serve all modes of transportation. Reaching this state will require advanced technologies, new ways of working, and a cultural shift.

**Dr. Kevin R. Petty, Chief Science Officer**

Weather has a major impact on the safety, efficiency and continuity of aviation, marine and land transportation. However, there are substantial differences in how weather is taken into consideration within each mode. Land transport's vulnerability can be seen in accident statistics. In 2010 in the U.S., weather-related road accidents resulted in nearly 6,000 deaths per year and more than USD 40 billion in economic loss. Even though the economic impact of air traffic delays caused by weather is considerable, it is only 10% of that of weather-related highway losses. While land transport is more vulnerable to weather than aviation or marine sectors, its network is much less regulated and harmonized.

Land transport would clearly benefit from more efficient weather services. However, since the movement of people and goods is mostly multi-modal today, i.e. employing different modes of transport, an integrated meteorological service delivery, covering all transport, would have even greater value.

## Challenge: Distance, Time, and Modes of Transport

When transporting people or goods, weather has to be considered from the starting point to the destination, all along the route: at the departure terminal, along a rail line to a transit hub, at the hub, along a highway, and finally at the arrival terminal. Since this journey can take many hours and cover hundreds of miles, the weather impacts will need to be considered at different times and multiple locations. Along the route, the same weather conditions can have very different impacts at different points and for different users. For instance, freezing rain has less effect on trains than cars.

Impacts of extreme weather on transport are well understood for most modes of transport, but it is still a major

challenge to quantify and mitigate these impacts across multiple sectors. All in all, the process of considering the net effect of adverse weather is a very complex and complicated process.

## Integrated, but Tailored

Delivering relevant weather information to cover the whole transport transaction, from start to finish, will require addressing a number of considerations: identifying user-specific requirements, optimizing weather and traffic measurements, using and blending multiple observations and forecasting techniques, improving communications, and seamlessly integrating across different transport sectors.

The minimum requirements are a seamless suite of observations, forecasts and decision-support services. In integrated weather service delivery, many key attributes will often be common to multiple transport modes, but some information is unique to each mode or even to each user. Integrated services will have to be tailored to fit the needs of the different user groups, including transportation operators, such as trucking, airline, and shipping companies, airport operators, motorway maintenance organizations and emergency managers.

## Evolutionary Process to Integration

To attain a viable level of integrated service delivery, advances need to be made in meteorological observations and tools, and cultural changes have to take place in weather service providers and stakeholder organizations. These tools include, for instance, atmospheric and "surface-state" measurement systems, data assimilation methods and numerical weather prediction (NWP) models, and localized nowcasting methods.

An evolutionary process would probably be best, beginning by ensuring there is common situational awareness across the transport sectors during high-impact weather events. This should be followed by addressing the weather-related challenges that arise at and between the interconnections among transport modes and among stakeholders. This will be the most important challenge in the process.

In this, the first step could be to use a relatively mature and well-focused user group. This would facilitate the creation of a strategy for developing, testing and documenting best practices, which could be extended to other end user groups. This user group could be selected, for example, from among global logistics service providers, emergency management responders or multimodal hub operators – all groups already experienced with the impacts of weather.

### Keeping up with Technology

Integrated meteorological services will also have to keep abreast of changes in technology, culture and climate. Rapidly developing technologies in the transport system are opening new possibilities for weather services. For example, vehicle-to-vehicle (V2V) and vehicle-to-infrastructure

(V2I) capabilities, to be introduced over the next decade, will enable using the vehicles as weather sensing platforms.

The real-time mobile observations can enhance weather analysis and forecasting. Autonomous vehicles and automation in the form of e.g. vehicle platooning are also moving forward. The sensing technologies – radar, radio, and laser based detection methods to name a few – used in this transformation are sensitive to environmental conditions. This is why understanding and addressing the impacts of extreme weather on these technologies is crucial to ensure the safety of the traveling public.

The ultimate goal is service delivery that meets the needs of the transport operators and users, ensuring the safe, effective and efficient operation of the transport network, whether it is global, national, regional or local.

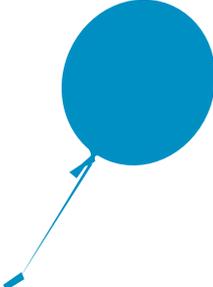
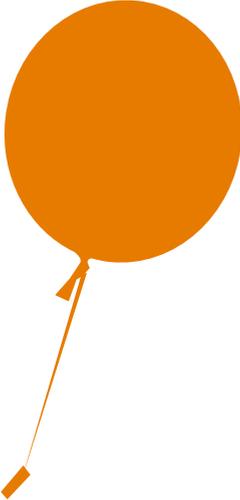
This is based on an article first published in the WMO Bulletin Vol 65 (2)-2016. The piece was authored by a WMO Expert Task Team, including Vaisala's **Kevin R. Petty, Paul Bridge, Walter F. Dabberdt**, and **WMO Secretariat**.

[Original article: https://public.wmo.int/en/resources/bulletin/integrating-meteorological-service-delivery-land-transportation](https://public.wmo.int/en/resources/bulletin/integrating-meteorological-service-delivery-land-transportation)



# Performance

## 2016



# Contents

Personnel	46
Occupational Health and Safety	49
Supply Chain Management	51
Environmental Sustainability	53
Community Outreach	58
Financial Performance	59
Risk Management	64
Responsible Business Conduct	66
Reporting Principles	68
UN Global Compact	69
GRI Content Index	70
Independent Assurance Report	74
Sustainability Contacts	75

# Performance

## Personnel

### Recruitment and Turnover

At the end of 2016, our personnel had decreased by 19 employees compared to the situation the previous year. The total number of employees at the end of the year was 1,569 (1,588). The average number of personnel employed in Vaisala during 2016 was 1,590 (1,611). The average age of personnel was 43 years. During 2016, 108 permanent employees were recruited and 160 left the company. Employees in research and development amounted to 19% of personnel and employees in manufacturing amounted to 14%.

### Major Changes during the Reporting Period

The decision to reshape Transportation business unit within Weather Business Area led to simplified organizational structure and profitability improvement. In total, these changes led to a reduction of 64 employees of which 11 employees were offered a new job in Vaisala. Most of the employees under the scope of the business transfer in the United States were employed by the acquiring company. In Weather Business Area, business development capability was strengthened by building a business development team and launching new agile business concept creation practices.

### Collective Agreements and Trade Unions

Vaisala recognizes the Federation of Finnish Technology Industries as its trade union. Vaisala's employees in Finland are covered by three collective agreements: the collective agreement for employees in technology industries, the collective agreement for salaried employees in technology industries, and the collective agreement for senior salaried employees in technology industries.

Salaries and wages paid by the company are based on local collective and individual agreements, individual performance and the demand level of each job. The base salaries are supplemented by performance-based bonus systems, which cover all Vaisala personnel.

Minimum notice periods are based on labor legislation in each country we operate. For Finland this means a minimum notice period from two weeks to six months depending on the length of employment.

### Diversity, Equality and Inclusiveness

We demonstrate equal employment opportunity in all recruitment, hiring, and working practices such as training and development. In North America, Vaisala Inc. is an Equal Opportunity Employer (EOE). Qualified applicants are considered for employment without regard to age, race, color, religion, gender, marital status, national origin, sexual orientation, disability, or veteran status. If an applicant needs assistance or an accommodation during the application process because of a disability, the company is pleased to provide it. No applicant will be penalized as a result of such a request.

According to the Finnish Non-Discrimination Act, section 4, an employer must create a plan to advance equality. The goal is that people at Vaisala work within a safe, caring, communal and accessible operating culture.

The equality plan is a plan on how Vaisala, as an employer, in the course of their operations, shall promote equality and prevent and address discrimination. The goal of our equality plan is that Vaisala's personnel, jobseekers and the subcontractors operating within Vaisala's guidance and offices, as well as leased personnel, will work and be treated equally, independently of their attributes.

Equality and fairness are also important elements of Vaisala's compensation policy. We do not distinguish between gender or other non-professional attributes in employee compensation or benefits plans.

Employees by employment contract type and gender	Permanent		Temporary	
	1,512		57	
	Male	Female	Male	Female
Full time	1,008	421	34	23
Part time	48	35		
<b>Total</b>	<b>1,090</b>	<b>479</b>		

Self-employed workers do not make up a significant part of the workforce

Personnel	2012	2013	2014	2015	2016
Employees at end of period	1,442	1,563	1,613	1,588	<b>1,569</b>
Finland	57.3%	55.7%	56.9%	58.5%	<b>61.9%</b>
Rest of Europe	7.7%	7.0%	7.2%	7.2%	<b>6.9%</b>
Americas	26.3%	29.2%	27.3%	25.7%	<b>22.6%</b>
Asia, Australia and Oceania	8.7%	8.1%	8.6%	8.6%	<b>8.6%</b>
Women	29.5%	30.3%	29.9%	30.0%	<b>30.5%</b>
Men	70.5%	69.7%	70.1%	70.0%	<b>69.5%</b>
Personnel in R&D	19.5%	19.8%	22.3%	21.4%	<b>19.2%</b>
Personnel in manufacturing	n/a	n/a	10.5%	11.9%	<b>13.9%</b>
Permanent	95.8%	96.6%	96.3%	96.0%	<b>96.4%</b>
Temporary	4.2%	3.4%	3.7%	4.0%	<b>3.6%</b>

Turnover 2016	Permanent	Temporary	Turnover rate	Turnover rate, permanent employees	Recruitment rate, permanent employees
Recruitment (+)	108	102			
Turnover (-)	160	72	14.7%*	10.6%**	7.1%

\* number of employees leaving the company in the reporting period divided by total number of employees at the end of the period

\*\* number of permanent employees leaving the company in the reporting period divided by total number of permanent employees at the end of the period

Turnover 2016, age	-19	20-29	30-39	40-49	50-59	60-	
Male	6	42	46	34	27	13	
Female	0	27	10	12	10	5	
<b>Total</b>	<b>6</b>	<b>69</b>	<b>56</b>	<b>46</b>	<b>37</b>	<b>18</b>	
%		2.6%	29.7%	24.1%	19.8%	15.9%	7.8%

Turnover 2016, region	Finland	Other Europe	Americas	Asia and Australia	Total
Permanent	55	10	83	12	160
Temporary	58	8	6	0	72
<b>Total</b>	<b>113</b>	<b>18</b>	<b>89</b>	<b>12</b>	<b>232</b>

Recruitments 2016, age	-19	20-29	30-39	40-49	50-59	60-	
Male	10	72	35	18	11	0	
Female	2	36	13	8	5	0	
<b>Total</b>	<b>12</b>	<b>108</b>	<b>48</b>	<b>26</b>	<b>16</b>	<b>0</b>	
%		5.7%	51.4%	22.9%	12.4%	7.6%	0.0%

Recruitments 2016, region	Finland	Other Europe	Americas	Asia and Australia	Total
Permanent	63	6	26	13	<b>108</b>
Temporary	86	7	7	2	<b>102</b>

Number of retired, Group	2014	2015	2016
Permanent	7	18	<b>8</b>

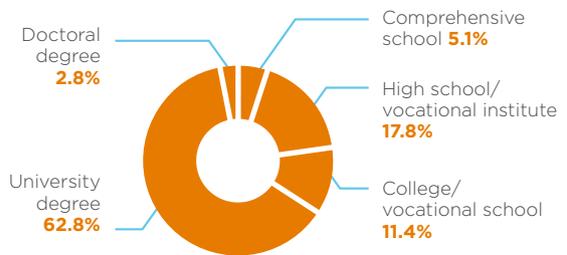
Average age	63.3	64.8	<b>64.0</b>
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Staff turnover 2012-2016	2012	2013	2014	2015	2016
Employees +/-	+234/-151	+230/-176	+257/-176	+204/-246	<b>+210/-232</b>
Turnover	10.5%	11.9%	10.9%	15.5%	<b>14.7%</b>
Turnover, permanent employees	6.2%	6.0%	6.4%	10.4%	<b>10.6%</b>

Development discussions	2012	2013	2014	2015	2016
Rate of personnel that has had a development discussion with their supervisor during the last 12 months (February 2017). Excludes long time absent and recently recruited employees.	92%	95%	98%	98%	<b>93%</b>

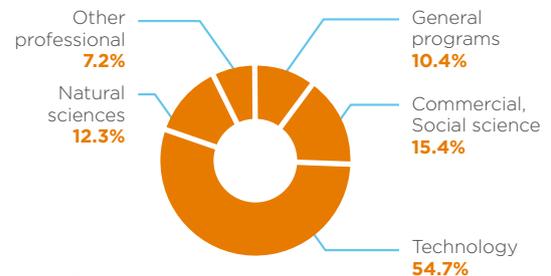
Training EUR 1,000	2012	2013	2015	2015	2016
Total employee training cost	1,271	1,318	1,270	1,052	<b>1,148</b>
Average training cost per employee	0.9	0.9	0.8	0.7	<b>0.7</b>

### Personnel by Level of Education



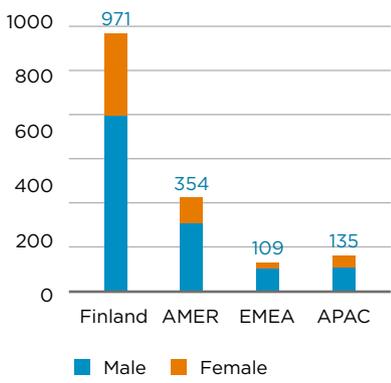
\* Covers 85% of employees

### Personnel by Area of Education

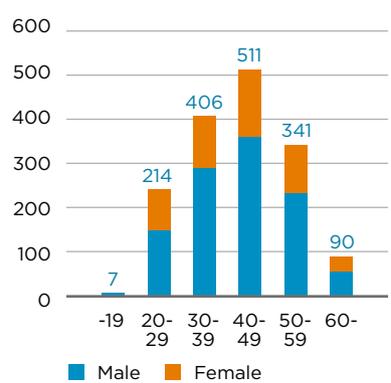


\* Covers 85% of employees

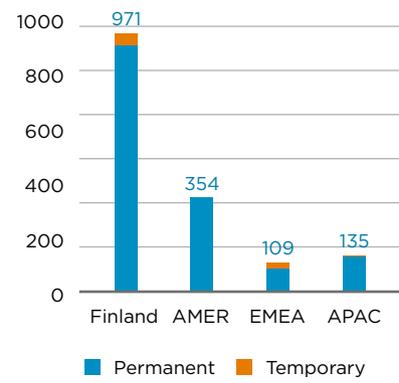
### Personnel by Region and Gender



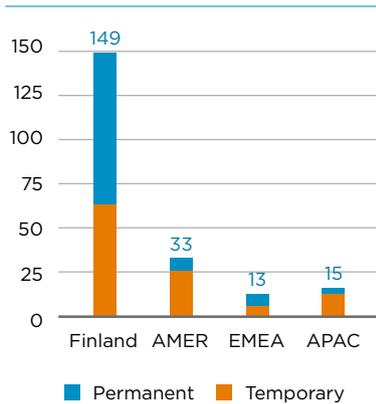
### Personnel by Age Group and Gender



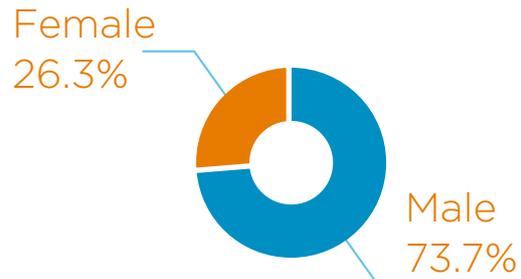
### Personnel by Region and Contract



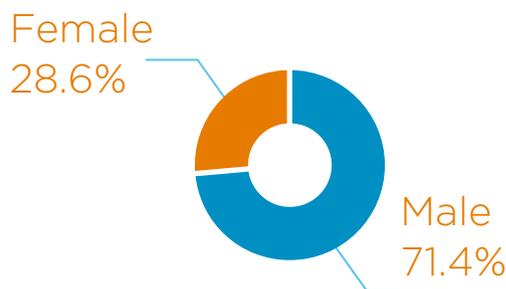
### Recruitments by Region and Contract



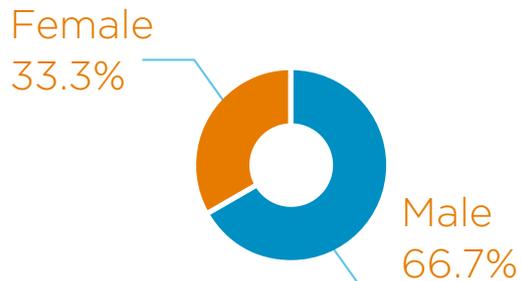
### Supervisor Gender Distribution



### Board of Directors Gender Distribution



### Management Group Gender Distribution



*\* After announcement dated Feb 9, 2017, Management Group gender distribution changed to 57% male, 43% female.*

# Occupational Health and Safety

Vaisala continues to strengthen its focus on safety at work. Global objectives, such as enhanced visibility of management commitment, mitigation of risks, and inclusion of third party employees in the scope of safety management, are set to guide the way to excellent safety performance. We believe that zero injury is achievable and we are committed to attaining that goal through continual improvement.

The Global Health and Safety Team plays a key role in driving a global compliance program. The team provides expertise and support to Vaisala operations by issuing tools and corporate guidelines ensuring that the best practices are applied wherever we operate. In 2016, the focus was on job hazard analyses, especially working together with employees at all levels to identify probable risks specific for different assignments, in diverse locations, and functions. In 2017, more employees will be subjected to health and safety roles through committee work in new Vaisala locations and internal auditing of risk analyses will be carried out. We will focus on proactive measures like hazard identification and

building competencies around health and safety management and increasingly standardize methods and requirements in all Vaisala locations. Moreover, many employees work with special tasks that require specific safety training, such as working at height, in traffic or with chemicals, and gasses. Comprehensive training for these employees has been carried out and will continue in 2017.

### Injury Rate Record Low Second Year in a Row

Our goal of zero injuries is again a notch closer, but not where we aim to be. In 2016 we had seven injuries at work globally. This led to a remarkable 26% reduction from 2015 injury rate, being record low in Vaisala's history. Total recordable injuries per 1 million hours worked was 2.32 (3.14, 2015). Of the regions, Finland had four injuries, which was the lowest number in years. Rest of EMEA, North America and Asia-Pacific all had one. Although the overall good result in 2016, the work towards a safer workplace is never complete.

Last year we experienced a loss of life of one of our colleagues, taking place during a business trip. The other five injuries all required absence from work. In many injuries last year, the root cause was insufficient identification of risk exposures. Root cause analysis is done after each incident to prevent the same incident of recurring.

### Common Processes and Procedures

All employees are entitled to remain in good health at work, and well-being is a theme of great importance at Vaisala. We want to ensure that the working environment and methods are safe, regardless of the country of employment or employee status. This commitment extends to our contractors and service partners.

We develop common procedures and unified requirements in cooperation with our employees and ensure implementation through training and regular audits.

### Reporting and Investigation

We encourage an active approach in reporting. Employees are directed not only to report incidents and hazards, but also to suggest safety improvements to the workplace and working methods. In order to prevent injuries and a recurrence of incidents, reported non-conformities are investigated and corrective actions based on root causes are implemented promptly. As an example of increased awareness and sense of responsibility, our employees reported more near misses, hazards and health and safety improvements than ever before.

Reporting frequency of hazards and near misses increased by 31% compared to previous year. Our target of one reported near miss or hazard per ten employees, was still not met, as 0.4 reports per ten employees were reported. Nevertheless, these reports allowed us to interfere early with hazards and risks and gave us several opportunities to prevent injuries.

To increase the transparency of incident management and to share lessons learned, we have developed an Environment, Health & Safety (EHS) reporting system which covers all Vaisala operations. A globally harmonized reporting procedure and database allows for improved health and safety performance follow-up.

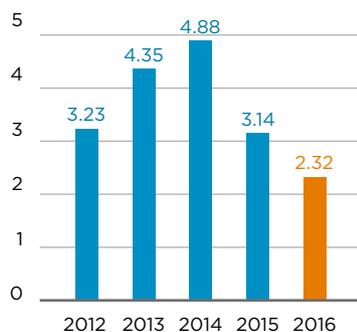
### Spreading Safety Culture

In Vaisala's locations in Finland, Canada and Seattle, USA, it is a statutory requirement for the employer and employees to meet in health and safety committees. In Finland, our Health and Safety Committee consists of eight employee representatives and two management representatives. Their objective is to improve safety culture throughout the site, follow-up on incident reporting and implement the global EHS strategy and action plan. This committee meets a minimum of four times annually, and in between meetings it organizes events and information sharing sessions for employees.

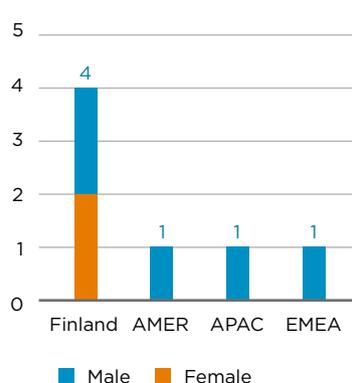
The Canadian committee is formed of four members, four of whom are non-management employee representatives. The committee meets on a monthly basis to e.g. conduct site inspections and talk about recent incidents or injuries at the workplace. Under legislation, committee members are entitled to eight hours of paid training per year. In our Seattle office the committee is made up of three non-managerial employees and three managers who meet on a monthly basis.

Currently the representatives in health and safety committees make up 1.2% of the total workforce, representing 66% of personnel. We intend to have at least one non-management employee representative on each site of more than ten employees. When this target is achieved, employee representation in health and safety matters will be doubled, helping us to raise awareness throughout the organization.

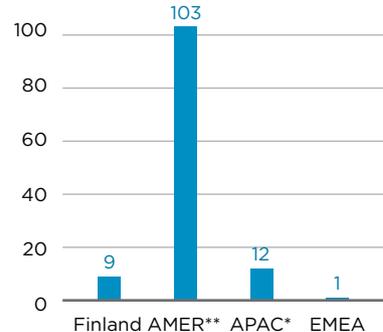
### Injuries per Million Working Hours (TRI)



### Total Recordable Injuries per Region



### Days of Absence due to Injury



\* Employee later perished to their injuries  
 \*\* Injury occurred 2015

# Supply Chain Management

Vaisala's excellence in a high-mix, low volume business model depends on effective management of hundreds of suppliers and numerous strategic sub-contractors. To live up to our customer promise and stakeholder expectations, a reliable and responsible supply chain is a necessity for Vaisala. We have thorough requirements for our suppliers and we work together with them so that mutual improvement can take place for both organizations.

## Typical Product Supply Chain

Vaisala's direct suppliers are located close to its manufacturing sites. The company sources components and mechanical parts primarily from Finland, Western-Europe, and the United States, and to a lesser extent from a few Asian countries. Raw materials used in Vaisala's own sensor factory are currently sourced exclusively from Europe. The upstream supply chains resemble those of other typical global electronic manufacturing industry supply chains.

In addition to the sensor factory in Helsinki, Finland, which produces sensors for all product families, Vaisala's manufacturing involves assembly, configuration, and calibration of electronic and mechanical equipment. Typically, our products are highly customized according to customer specifications, and therefore all products are made to order, thus keeping inventories of finished goods low. Final products are shipped directly to customers from the manufacturing sites in Helsinki and in Boulder, Colorado.

Product life cycles range typically from 1 to 20+ years, with scheduled recalibrations and maintenance during that time. Recalibration and maintenance are performed at one of Vaisala's four service centers or in many cases on site. At the end of the product life cycle, customers are instructed to follow the best available local practices for recycling electronic equipment, or to return products to Vaisala for recycling. Vaisala is required by the European Union Waste Electrical and Electronic Equipment (WEEE) Directive to finance the take-back, reuse, and recycling of products that are placed on the EU market.

## Strategic Sourcing

With the purpose of communicating our sustainability expectations better and ensuring a responsible supply chain from materials sourcing all the way to our distributors, Vaisala has integrated sustainable supply chain management into its sourcing strategy. The strategy emphasizes a long-term approach for better identifying and managing risks and opportunities, aligning our supply chain partners' sustainability efforts with our own, and encouraging continuous development and closer collaboration through a constructive dialogue. Tools and resources are part of

continuous supply chain management and ESG-topics are discussed and monitored regularly with key suppliers.

## Sustainability Metrics in Supplier Scorecard

Suppliers are very important to Vaisala, and a lot of effort is placed on managing supplier relationships. To do this, a key supplier scorecard is updated and reviewed annually for all key suppliers. Last year, the scorecard was improved by including three new sustainability metrics into it.

The indicators cover social, environmental and governance issues. The social indicators measure workplace safety and the environmental indicator measures waste recovery rate of the supplier.

It is important both for Vaisala and many of its customers that same supplier requirements are passed along the supply chain. A governance indicator measures how well the supplier manages these requirements in their own supply chain.

## Tools for managing a sustainable supply chain:

- Supplier Code of Conduct
- Supplier Sustainability Self-assessment Questionnaire (SAQ)
- Pre-assessment procedures
- Guidance for suppliers
- Audits and quarterly meetings with key suppliers, as part of supplier management

## Four Focus Areas of Vaisala's Sourcing Strategy



## Supplier Classification

Vaisala classifies its suppliers into four categories: potential, approved, preferred, and strategic suppliers. Vaisala applies a Supplier Sustainability Self-assessment Questionnaire (SAQ) as part of supplier scoring for all supplier categories. The SAQ rates the supplier by asking a series of questions relating to the governance of the supplier and its adherence to standards and labor and environmental regulation and best practices. The scoring categories are between the supplier exceeding expectations to being far below expectations. The SAQ forms a part of the supplier risk assessment and raises red flags for possible breaches in labor and human rights, and environmental issues. If a supplier scores in the lowest category, a corrective action plan must be put in place at once and business relations with the supplier may cease. New suppliers will not be approved, if they score below expectations. The SAQ-scoring is discussed bi-annually or when needed with each supplier.

At the end of 2016, Vaisala had 489 direct suppliers. Our 2016 target was that at least 80% of total euros spent on direct suppliers would be covered by SAQ-responses, the target was met at 86%. There were 16 new suppliers in 2016, eight of them had an SAQ-score before the end of the reporting period.

### Key figures of Vaisala's direct supply chain

- 489 suppliers
- 86% of suppliers rated on ESG-metrics (based on spend)
- Target 90% in 2017 (80%, 2016)
- 58% of suppliers have signed the Supplier Code of Conduct
- 16 new suppliers in 2017
- 50% of new suppliers scored on ESG-metrics, target is 100%
- The supplier base has been strategically consolidated down from 856 suppliers in 2013, a reduction of 43%.

## Sourcing Academy

Strategic sourcing emphasizes supplier relationship management, which aims to reduce supply chain risks and increase reliability. A strategic approach requires commitment and willingness to learn from everyone working with sourcing, from product development to supplier relationship management. To facilitate knowledge sharing across the organization, Vaisala Sourcing Academy, an internal learning program, was created.

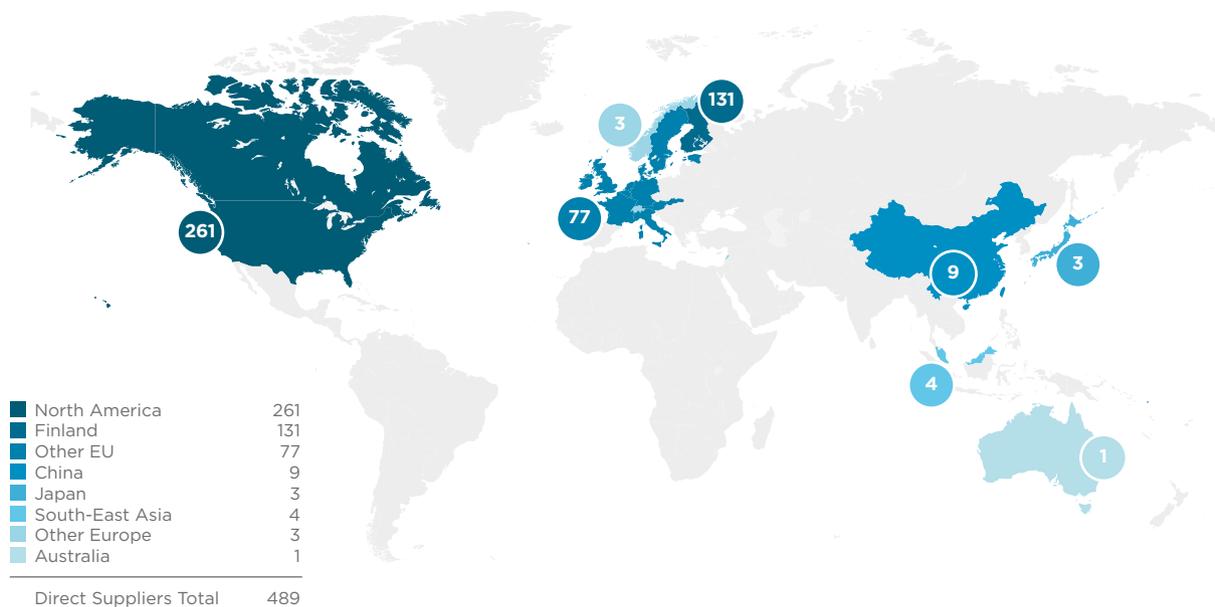
## Training Employees and Suppliers

The first Sourcing Academies were organized in 2016, and more are scheduled for 2017. In Sourcing Academies, employees are educated on different topics related to strategic sourcing. Topics have varied from supplier relationship management, financial analysis, to lean working ways, with special emphasis placed on sustainability training in 2016-2017.

In addition to internal training, we also offer some training to our suppliers in order to increase their expertise in topics that are important to Vaisala.

A more strategic approach to sourcing also means more emphasis on sustainable sourcing. Last year's development included emphasizing sustainability metrics in the annual scorecard for key suppliers, re-designing pre-assessment procedures and supplier audits with more thorough sustainability sections than previously. The development work continues and in 2017, Vaisala's Supplier Sustainability Self-Assessment will be updated and new procedures will be put in place.

Read more: Vaisala's Supplier Code of Conduct <http://bit.ly/1piC2R9>



# Environmental Sustainability

Vaisala wants to be involved in establishing a sound foundation for a better quality of the environment, safety of people and property, and productivity of its customers. Accordingly, the main purpose of many of our products is to contribute to these ends. Our industrial products and solutions provide our customers with means to improve their operational performance, and our weather measurement systems increase safety and predictability in weather critical operations.

## Excellence in Environmental Management

The Vaisala Environmental Management System (EMS) is an integral part of our global management system structure. The EMS has been ISO 14001 certified already since 2004. The certification covers not only all our manufacturing sites but many of our offices as well. In fact, as many as 94% of our employees work in ISO 14001 certified offices. All certified offices are audited by an independent third party and are a part of our internal audit program. The EMS helps us identify the most significant environmental impacts at each of our sites and set relevant corporate and local environmental objectives. Currently six offices, housing 86% of our staff, have made the commitment to take their environmental practices to the next level. They have formed green teams of voluntary employees to champion the improvement actions needed to accomplish this. Although the focus of this internal program has been on conserving energy and minimizing waste, the offices have come up with numerous other actions to protect the environment including nature clean up events, promoting green commuting and participation in programs to support wildlife and local natural habitats.

## Renewable Energy Gaining Ground

We believe in a future where societies are powered by renewable sources of energy. In order to minimize our own impacts on climate, we are committed to using 100% renewable electricity by 2020. After years of improving the energy efficiency of our operations, this commitment was the natural next step for us towards even more environmentally conscious operations. Although our manufacturing sites both in Finland and in the United States already produce clean energy by operating their own solar arrays, we still need to purchase most of our electricity from local energy companies. In 2016, 89% of the electricity we consumed originated from

renewable energy sources, mostly wind power. We are also a member of RE100, a global initiative that encourages the world's most influential companies to make a 100% renewable energy commitment with a clear timeframe for reaching that goal.

## Significant Reduction in Emissions

Managing our own operations and activities in an environmentally sustainable manner is the cornerstone of our commitment to the protection of the environment. Over the past years, we have implemented a series of measures improving the energy efficiency of our factories and offices ranging from LED lighting installations to more efficient HVAC equipment. These measures have helped us improve our energy efficiency by 1,800 MWh (6,480 GJ) and reduced our energy related CO<sub>2</sub>-e emissions by 2,375 metric tons. Actions towards the 100% renewable electricity goal have already reduced our electricity consumption related Scope 2 emissions by more than 80% or 5,279 metric tons of CO<sub>2</sub>-e compared to the 2014 baseline.

## Responsible Waste and Water Management

In 2016, we were able to maintain our waste recovery rate at a solid 98% in our manufacturing sites. This means that only 2% of the total waste ended up in landfills and the rest was recovered as material or energy. In our main manufacturing site in Finland, for example, the waste is sorted into 14 different subcategories in order to ensure the best possibilities for further treatment. The total amount of waste increased from the previous year's 329 tons to 359 tons mostly due to major layout changes in our manufacturing and warehouse areas.

Our manufacturing processes are not water intensive as such, but especially our sensor manufacturing process does require significant amounts of water. We have a state-of-the-art water cleaning facility on site that purifies municipal water to be used in our in-house cleanroom. The water is also treated before draining and closed loop processes are used whenever possible. Water consumption in 2016 remained on the previous year's level despite of the increased headcount in our manufacturing sites.

## Continuously Improved Logistics

We are continuously working with our logistic partners in order to minimize the environmental impact of transporting components and raw materials from suppliers to us and delivering products to our customers. These improvement actions include more efficient consolidation of shipments, optimization of packaging and increased use of electronic export documentation instead of paper.

## Scope of Environmental Reporting

Vaisala's carbon footprint comprises various components from the corporate value chain. The carbon footprint is divided into three scopes according to The Greenhouse Gas Protocol Account and Reporting Standard. Data collection and reporting scope for the carbon footprint is more extensive than for group Environmental Key Performance Indicators (EKPIs). Data is collected from offices with more than 15 employees. In 2016, Paris and Melbourne offices were dropped from the reporting scope after their headcount had decreased below 15 employees. Scope 1 includes field service and other vehicles owned by Vaisala. Scope 2 includes purchased electricity and heat. Scope 3 consists of business flights, rental cars, inbound and outbound logistics, energy consumption of installed base of weather radars, employee commuting, and waste treatment (from Finland only which accounts for 85% of group total waste). Business travel includes flights, as well as travel by rail and rental cars. This data comes from our global travel agency and covers over 90% of business flights in terms of costs.

Our EKPIs include energy consumption, water consumption and waste generation. The scope of our externally reported EKPIs include the manufacturing sites in Helsinki, Finland and Boulder, CO, U.S. The manufacturing sites are estimated to account for 83% of total energy consumption, 89% of total water consumption and 91% of total waste of all Vaisala offices globally. Intensity indicators are calculated by comparing the previously mentioned key performance indicators to company revenue and/or headcount of the two manufacturing sites. We frequently evaluate the comprehensiveness of the scope of reporting EKPIs and are ready to extend the scope if seen necessary. As the two manufacturing sites clearly account for most of our environmental impacts regarding EKPIs, reporting is also conducted on this basis. The rest of our sites have small individual impacts on the overall environmental performance.

## Methodologies and Assumptions

Energy, water and waste data are collected from various sources. If on-site monitoring is not available, service providers' invoices are used. Electricity and heating invoices are used for the reference documents for energy consumption. Solar energy generation as well as water consumption are measured with on-site meters. Waste data is obtained from bills and waste operator customer portals when available.

All energy efficiency improvement actions have been calculated individually using the best available information from for instance equipment manufacturers and applying the financial control method outlined in "The GHG Protocol: A Corporate Accounting and Reporting Standard".

## Emission Factors

Greenhouse gas emissions are calculated by using the best available conversion factors. These factors come from various reliable sources including DEFRA emission factor database and GHG Protocol calculation tools. Some emission factors are from more specific sources such as logistics partners and local energy utility companies, and emission factors of our fleet from vehicle manufacturers. Emission factors are updated regularly. We report our energy footprint mainly according to market-based emission factors. Sites using 100% renewable energy sources use 0,0 g CO<sub>2</sub>-e/kWh market-based emission factors.

The carbon footprint includes all greenhouse gases converted into CO<sub>2</sub> using Global Warming Potential GWP-100. As our GHG accounting has improved and expanded, we have calculated the carbon footprint retroactively in order to maintain comparability over the reporting periods. Comparability from year to year is, however, still imperfect.

Reduced Carbon Emissions by

**-81%**

from 2014 baseline (Scope 2)

Water Efficiency has Improved

**+67%**

in last 10 years

Renewable Electricity

**89.2%**

Waste Recovery Rate, Manufacturing sites

**98%**

Employees Working in ISO 14001 Certified Locations

**94%**

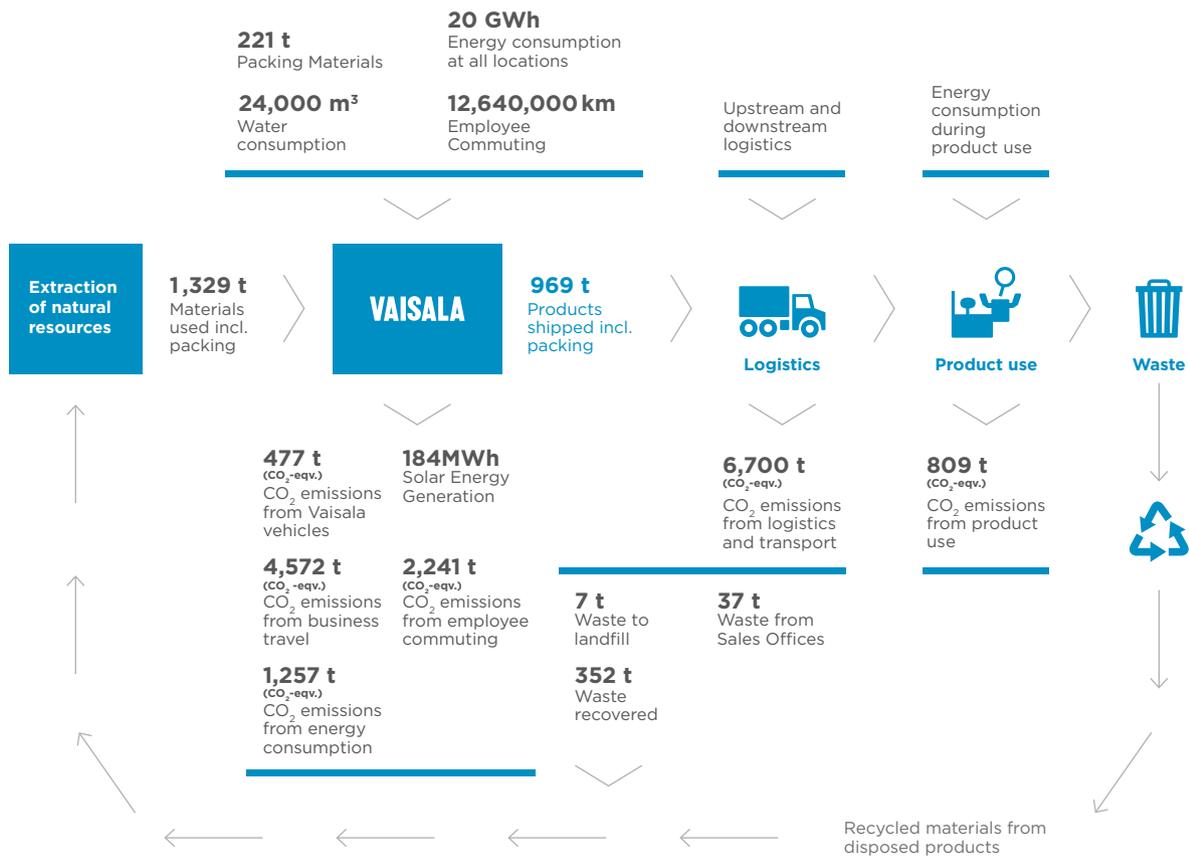
Employees Working at Green Office Locations

**86%**

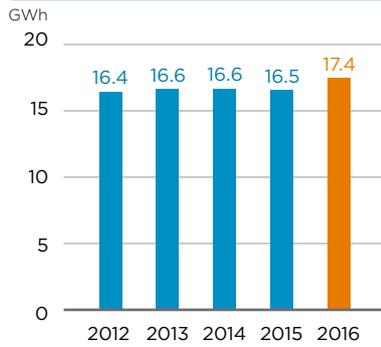
## Environment Indicators

Waste, Manufacturing Sites	2012	2013	2014	2015	2016
<b>Recoverable waste</b>					
Hazardous waste (tons)	18.1	20.3	19.6	22.6	<b>19.9</b>
WEEE (tons)	3.6	5.4	11.0	10.4	<b>6.6</b>
Biowaste (tons)	42.7	33.9	41.3	42.0	<b>61.6</b>
Energy Waste (tons)	38.1	43.7	45.4	47.6	<b>51.3</b>
Other (tons), Wood, paper, combustible waste, metal etc.	131.5	181.1	256.2	199.7	<b>213.0</b>
<b>Total recoverable waste (tons)</b>	<b>234.1</b>	<b>284.4</b>	<b>373.4</b>	<b>322.3</b>	<b>352.4</b>
<b>Non-recoverable waste</b>					
Waste to landfill (tons)	43.0	31.7	9.1	7.1	<b>6.9</b>
<b>Total waste (tons)</b>	<b>277.0</b>	<b>316.1</b>	<b>382.6</b>	<b>329.4</b>	<b>359.4</b>
Waste recovery rate, %	84	90	98	98	<b>98</b>

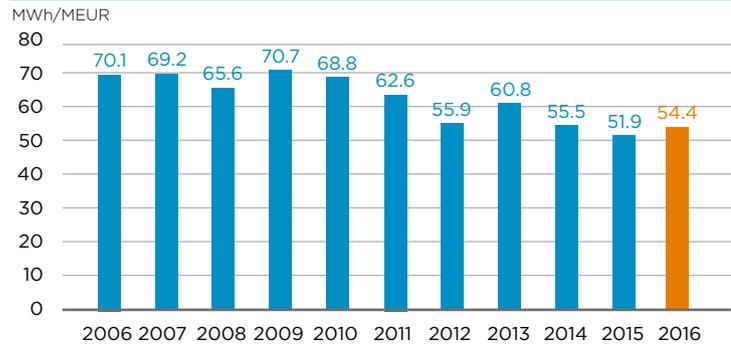
## Vaisala's Environmental Impacts



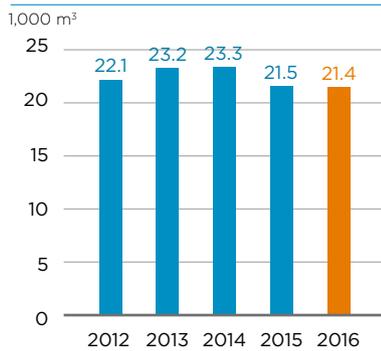
### Energy, Manufacturing Sites



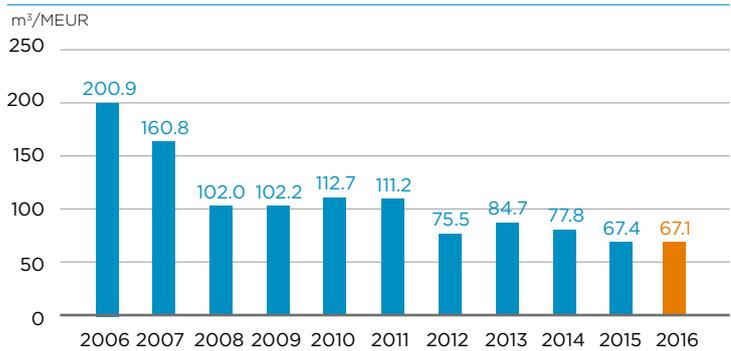
### Energy Consumption per Sales (MWh/M€)



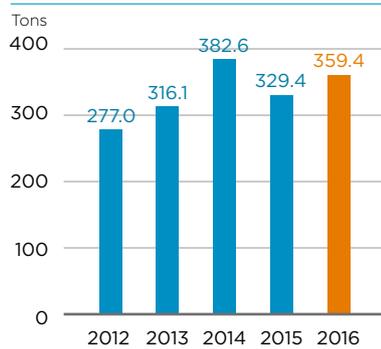
### Water, Manufacturing Sites



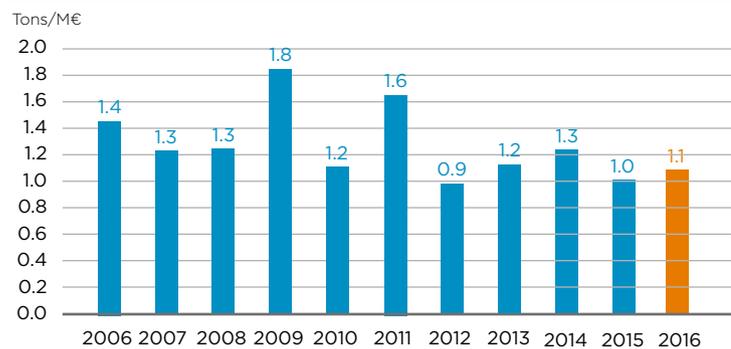
### Water Consumption per Sales (m³/M€)



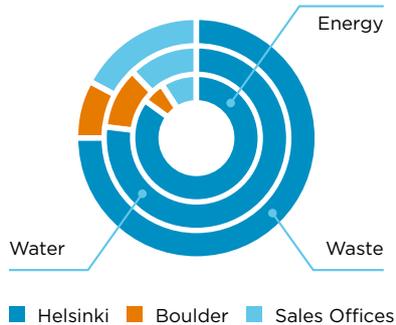
### Waste, Manufacturing Sites



### Waste Generation per Sales (Tons/M€)



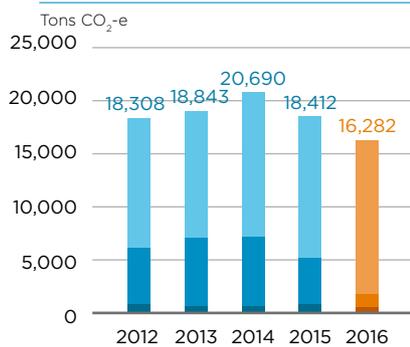
## Environmental Impacts Manufacturing vs. Offices



## Water, Waste, and Energy on Manufacturing Sites

Manufacturing	2012	2013	2014	2015	2016
Water Consumption, 1,000 m <sup>3</sup>	22.1	23.2	23.3	21.5	<b>21.4</b>
Waste Generation, Tons	277.0	316.1	382.6	329.4	<b>359.4</b>
Energy Consumption, GWh	16.4	16.6	16.6	16.5	<b>17.4</b>

## Carbon Footprint



## Renewable electricity

Renewable Electricity Target	Baseline year 2014	2016
Electricity consumption, GWh	19.5	<b>20.4</b>
Scope 2 emissions CO <sub>2</sub> -e tons	6,536	<b>1,257</b>
Reduction from the baseline		<b>-5,279t</b> <b>-80.8%</b>
Renewable electricity	17.6%	<b>89.2%</b>

Carbon Footprint	2012	2013	2014	2015	2016	Difference
Scope 1 Service fleet	792	601	626	816	<b>477</b>	<b>-42%</b>
Scope 2 Purchased electricity and heat						
Market Based	5,318	6,462	6,536	4,366	<b>1,257</b>	<b>-71%</b>
Location Based					<b>4,778</b>	<b>n/a</b>
Scope 3 Business travel, rental cars, upstream and downstream logistics, waste, commuting, products	12,198	11,780	13,528	13,231	<b>14,548</b>	<b>+10%</b>
<b>Total emissions with Market Based factors</b>	<b>18,308</b>	<b>18,843</b>	<b>20,690</b>	<b>18,412</b>	<b>16,282</b>	<b>-12%</b>

# Community Outreach

Vaisala believes in a world where environmental observations improve daily life. As the global leader in environmental measurement and an active member of society, we acknowledge that the company has a responsibility to support its stakeholders in society and the research community.

Vaisala may provide charitable donations of products, funding, or services to non-profit organizations through its Community Outreach Program. The Program's overall objective is to support organizations and projects that advance environmental awareness and science education. All our outreach activities should be in line with Vaisala's values and resonate well with environmental issues such as climate, weather, environmental measurement, and environmental sciences.

In 2016, donations were EUR 672,000 globally. Our objective is to focus our donations and continuously correlate them with the community outreach policy. Vaisala does not donate funds to political parties, causes, or campaigns.

## Focus Areas

Within science education, we focus on students and their teachers, in contexts that promote natural sciences, innovation, and environmental awareness. We also support universities, scientists and researchers who help increase the understanding of environmental observations and their implications. Scholarships paid in the form of salary are outside the scope of this program.

The second focus area is non-profit organizations working for environmental disaster prevention and recovery, particularly in connection with the prevention of environmental hazards. Also, impartial and neutral humanitarian organizations that provide protection and assistance to people affected by disasters are in the scope of this program.

## Current Sponsorships

Following the guidelines set by Vaisala's Community Outreach Program, we sponsor a variety of different causes.

### Professor Vilho Väisälä Award

Vaisala funds the biennial Professor Vilho Väisälä Award. The award was established in 1985 to encourage and stimulate interest in research in the field of environmental measurement instruments and methods of observation. It is administrated by the World Meteorological Organization, which selects the winners on a biennial basis. The award consists of a medal, diploma and a cash prize of USD 10,000.

In 2004, the WMO Executive Council decided to establish a second Professor Vilho Väisälä Award. The main focus of this award is meteorological instrument work in developing countries and countries with economies in transition. At

the same time, the WMO Executive Council adopted new guidelines for granting the Professor Vilho Väisälä Awards. Both awards are granted biannually in connection with the WMO TECO/METEOREX conference and carry a cash prize of USD 10,000. More information about the awards: [www.wmo.int](http://www.wmo.int)

### The 2016 Award Winners:

#### 25th Award for An Outstanding Research Paper on Instruments and Methods of Observation:

R.J. Dirksen, M. Sommer, F.J. Immler, D.F. Hurst, R. Kivi and H. Vomel

*Reference quality upper-air measurements: GRUAN data processing for the Vaisala RS92 radiosonde*, Atmospheric Measurement Techniques, 7, pp 4463-4490, 2014.

#### 5th Award for Development and Implementation of Instruments and Methods of Observation in Developing Countries:

Ms Amudha Bakthavathsalu and Dr Rabia Merrouchi  
*Survey on alternatives for dangerous and obsolete instruments: evaluation of the questionnaire and recommendations for alternatives*, WMO, IOM Report No. 117, 2014.

### Millennium Technology Prize

Vaisala's success is based on a constant stream of world-class innovations. It is only natural that we are a proud supporter of the Finnish tribute for better life, The Millennium Technology Prize. The biennial prize is awarded to groundbreaking technological innovations that enhance the quality of people's lives in a sustainable manner.

<http://taf.fi/en/millennium-technology-prize/>

### New Children's Hospital

Vaisala is an honorary in-kind donator for the new children's hospital being built in Helsinki, Finland in 2017. Vaisala will be contributing humidity, temperature, and carbon dioxide measurement instruments to the hospital. The equipment is valued at an estimated EUR 225,000 and will be integrated into the hospital's building automation solution.

### Donations to Universities

In 2016, the Board of Directors decided to donate a total of EUR 310,000 in support of the following universities: Aalto University, University of Helsinki, Lappeenranta University of Technology, University of Oulu, and Tampere University of Technology. Moreover, a donation of USD 25,000 was made to Colorado State University, CSU. The weather radar donated in 2015 was delivered to CSU at the end of 2016.

### Vilho, Yrjö and Kalle Väisälä Fund

In the 1960's, Professor Vilho Väisälä, the company's founder, donated Vaisala shares to the Finnish Academy of Science and

Letters. These shares were used to establish the Vilho, Yrjö and Kalle Väisälä Fund. The Fund provides grants annually for research in mathematics, physics, geophysics, meteorology and astronomy.

In 2016, the Fund granted a total of EUR 1.4 million to 75 researchers. The Fund's available grants are dependent on Vaisala's profits, so the company has an economic responsibility towards the Fund.

#### **Raising Awareness**

Vaisala partners with Heureka Science Centre in Finland in order to increase awareness of atmospheric sciences among children and adolescents. As an example, Vaisala sponsors the Science on a Sphere exhibition at Heureka. In 2017, Vaisala is also sponsoring The Museum of Technology in Helsinki as part of Finland's centenary celebrations.

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The Vilho, Yrjö and  
Kalle Väisälä Fund  
granted  
donations to

**75** researchers  
in 2016

## Financial Performance

### **Market situation in 2016**

In 2016, market environment for Vaisala was characterized by differences between geographic areas and customer groups. Weather observation market conditions weakened in 2016 compared to rather good previous two years. Industrial measurement market was favorable overall.

In EMEA, weather observation market was weak. In North America, weather observation market was stable, and Vaisala's deliveries increased as a result of good order intake in 2015.

In Latin America, weather observation market was affected by weak macroeconomic conditions especially in Brazil. In APAC, weather observation market was stable, and as a result of a few large projects, Vaisala's performance improved.

Vaisala's industrial measurement solution orders received increased in all regions. This was a result of favorable market conditions, and Vaisala also grew faster than the addressable market. The growth was strong especially in APAC and in life science market.

### **Market Outlook for 2017**

Global economy accelerated towards the end of 2016, and latest forecasts refer to moderate outlook. Increase in commodity prices, especially in crude oil, is expected to improve outlook of several emerging economies. Vaisala is expecting stable market in 2017 both for weather observation and industrial measurement.

Weather observation market outlook is overall stable.

However, development of Vaisala's orders and deliveries are still expected to remain dependent on timing and progress of individual projects. In EMEA, weather observation market is expected to improve after weak 2016. In North America, weather observation market outlook is stable and Vaisala's orders are expected to increase from 2016, whereas deliveries are expected to decrease as a result of fewer large orders in 2016. In Latin America, stabilizing economic outlook is expected to support weather observation market conditions. In APAC, weather observation market customer activity for orders is expected to improve from 2016, whereas deliveries are expected to decrease slightly as a result of fewer large weather infrastructure projects. In China, weather observation market is expected to remain stable, although market conditions are currently difficult to project. Market outlook for renewable energy solutions is overall positive, even though growth of renewable power capacity has decelerated.

Market outlook for industrial measurement solutions is stable globally, and Vaisala is expecting increase in annual deliveries. Life science market growth is expected to continue, as a result of tightening requirements for monitoring and reporting of environmental conditions. Utility companies are increasingly adopting transformer online condition monitoring, what is expected to accelerate demand for power transmission solutions.

## Business Outlook for 2017

Vaisala estimates its full-year 2017 net sales to be in the range of EUR 310–340 million and its operating result (EBIT) to be in the range of EUR 32–42 million.

## Shares

Vaisala's share capital totaled EUR 7,660,808 on December 31, 2016. On December 31, 2016, Vaisala had 18,218,364 shares, of which 3,389,351 were K shares and 14,829,013 were A shares. The K shares and A shares are differentiated by the fact that each K share entitles its owner to 20 votes at a General Meeting of Shareholders while each A share entitles its owner to 1 vote. On December 31, 2016, the total number of votes attached to all shares was 82,616,033. The A shares represent 81.4% of the total number of shares and 17.9% of the total votes. The K shares represent 18.6% of the total number of shares and 82.1% of the total votes.

In January–December 2016, a total of 2,031,136 (2,507,672) Vaisala shares with a value totaling EUR 57.7 (60.9) million were traded on the Nasdaq Helsinki Ltd. Vaisala's share price

increased by 41% (9%) during the year while OMX Helsinki Mid Cap index increased by 8% (12%). The closing price of the Vaisala Corporation share on the Nasdaq Helsinki Ltd stock exchange in December 2016 was EUR 33.70 (23.94). Shares registered a high of EUR 36.96 (27.02) and a low of EUR 21.81 (21.55). The volume-weighted average share price was EUR 28.27 (24.33).

The market value of Vaisala's A shares on December 31, 2016 was EUR 487.4 (350.4) million, excluding the Company's treasury shares. Valuing the K shares – which are not traded on the stock market – at the rate of the A share's closing price on the last day of December, the total market value of all the A and K shares together was EUR 601.6 (431.6) million, excluding the Company's treasury shares.

Vaisala is included in the OMX GES Sustainability Finland index. The index is a benchmark index comprising of Finnish listed companies, all leaders in terms of sustainability. The index criteria are based upon international guidelines for environmental, social and governance (ESG) issues and support investor considerations to the UN Principles for Responsible Investment (PRI).

## Financial Indicators

Key figures (EUR million)	2012	2013	2014	2015	2016
Net sales	293.3	273.2	299.7	318.5	<b>319.1</b>
Operating costs	248.0	237.8	258.6	274.3	<b>273.9</b>
Operating profit	30.2	18.1	26.4	29.6	<b>22.3</b>
R&D expenditure % of net sales	9.5	10.6	11.3	11.3	<b>11.9</b>
Income taxes	6.4	6.6	6.1	7.2	<b>7.9</b>

Personnel expenses (EUR million)	2012	2013	2014	2015	2016
Total payroll & benefits	87.0	84.7	94.9	105.5	<b>102.8</b>
Share-based remunerations	0.4	0.6	1.0	1.0	<b>2.3</b>
Social costs	7.6	8.8	9.8	11.7	<b>11.3</b>
Pension expenses, net	9.4	10.6	10.6	11.7	<b>11.9</b>
<b>Total</b>	<b>104.5</b>	<b>104.7</b>	<b>116.3</b>	<b>130.0</b>	<b>128.4</b>

Gross taxes by geographical area EUR 1,000	2012	2013	2014	2015	2016
EMEA	4,430	4,397	5,472	7,037	<b>7,195</b>
of which Finland	4,067	4,089	5,199	6,601	<b>6,751</b>
Americas	1,523	1,563	82	-384	<b>404</b>
of which United States	1,526	1,319	69	-400	<b>366</b>
APAC	416	684	539	588	<b>343</b>
<b>Total</b>	<b>6,369</b>	<b>6,644</b>	<b>6,093</b>	<b>7,241</b>	<b>7,941</b>

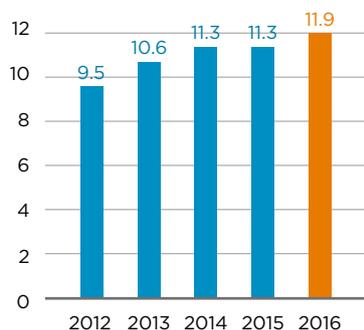
Financial ratios	2012	2013	2014	2015	2016
Return on equity (ROE) (%)	11.7	6.3	14.3	15.7	<b>10.5</b>
Solvency ratio (%)	75	72	71	70	<b>71</b>
Earnings per share (EUR)	1.20	0.60	1.30	1.52	<b>1.05</b>
Dividend per share (EUR)	0.90	0.90	0.90	0.95	<b>1.00*</b>

\* Board's proposal to the Annual General Meeting

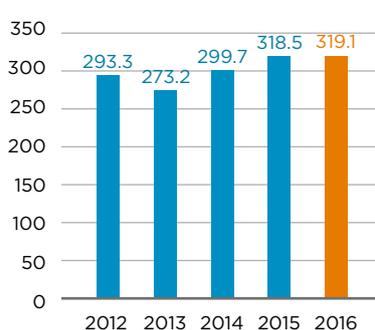
Financial assistance from governments by country EUR 1,000	2012	2013	2014	2015	2016
Investment grants, R&D Grants, or other grants					
Finland	873	568	355	1,314	<b>595</b>
Canada		48			
United Kingdom					<b>24</b>
<b>Total</b>	<b>873</b>	<b>616</b>	<b>355</b>	<b>1,314</b>	<b>619</b>

Donations EUR 1,000	2012	2013	2014	2015	2016
<b>Total</b>	<b>59</b>	<b>75</b>	<b>310</b>	<b>466</b>	<b>672</b>

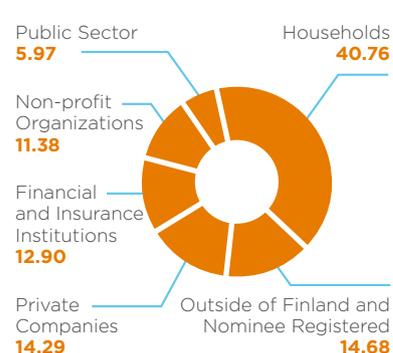
### R&D Expenditure % of Net Sales



### Development of Net Sales



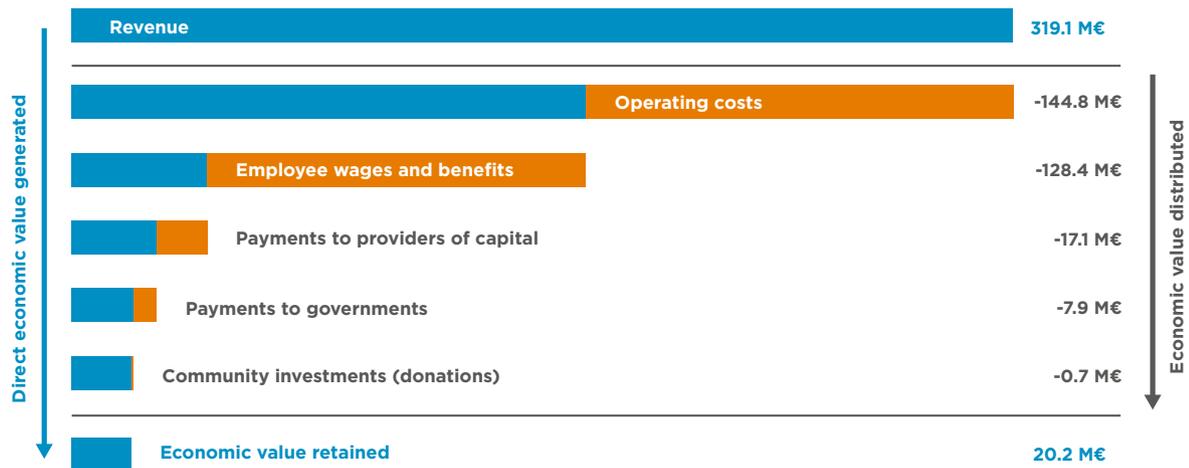
### Shareholders by Sector %



Direct economic value generated * (EUR million)	2012	2013	2014	2015	2016
Revenues	293.3	273.2	299.7	318.5	<b>319.1</b>
Operating costs	-143.5	-133.1	-142.3	-143.9	<b>-144.8</b>
Employee wages and benefits	-104.5	-104.7	-116.3	-130.0	<b>-128.4</b>
Payments to providers of capital	-11.8	-16.2	-16.3	-16.4	<b>-17.1</b>
Payments to government	-6.4	-6.6	-6.1	-7.2	<b>-7.9</b>
Community investments (donations)	-0.3	-0.1	-0.3	-0.5	<b>-0.7</b>
<b>Economic value retained</b>	<b>26.8</b>	<b>12.5</b>	<b>18.4</b>	<b>20.5</b>	<b>20.2</b>

\* As defined in GRI G4 EC1 indicator, please see <http://bit.ly/1AanTEv> for reference

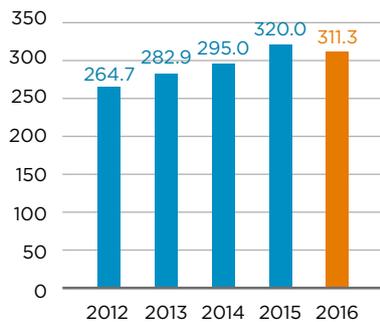
## Direct Economic Value Generated



## Structure of Parent Company and Subsidiaries

Company	Country	Group ownership %
Parent company Vaisala Corporation	Finland	100
Vaisala Holding Oy	Finland	100
Vaisala Limited	United Kingdom	100
Vaisala Pty Ltd.	Australia	100
Vaisala GmbH	Germany	100
Vaisala KK	Japan	100
Vaisala Inc.	United States	100
Tycho Technology Inc.	United States	100
Vaisala China Ltd	China	100
Vaisala Canada Inc.	Canada	100
Vaisala S.A.	Argentina	100
Vaisala SAS	France	100
Vaisala Sdn Bhd	Malaysia	100
Vaisala Servicos De Marketing Ltda	Brazil	100
3TIER R&D India Pvt Ltd	India	100
Vaisala East Africa Ltd.	Kenya	100
Meteorage SA	France	35

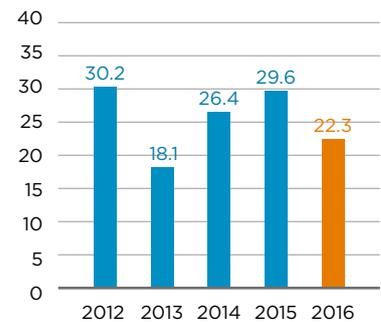
### Orders Received, M€



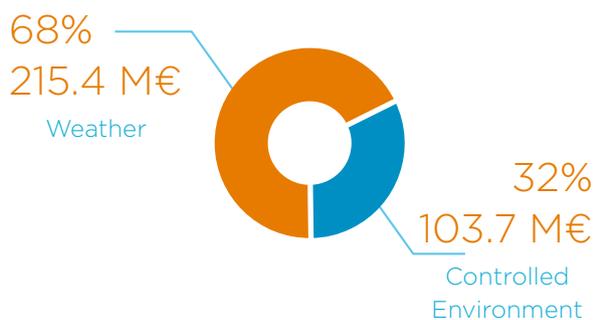
### Order Book, M€



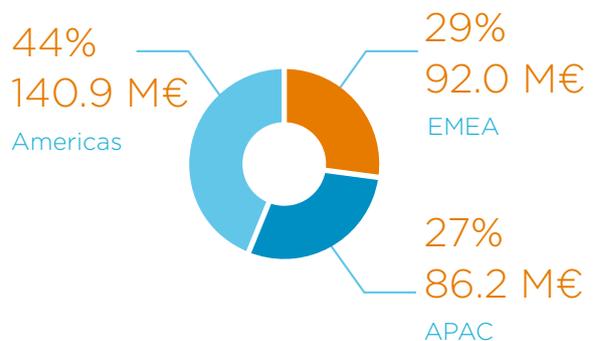
### Operating Result, M€



### Net Sales by Business Area 2016



### Net Sales by Region 2016



# Risk Management

The objective of Vaisala's risk management is to identify and manage material risks related to strategy implementation and business operations. Vaisala has a risk management policy which has been approved by the Board of Directors, and which covers the Company's strategy, operational, hazard and financial risks. The policy aims at ensuring the safety of the Company's personnel, operations and products, as well as the continuity and compliance of business operations. The Board of Directors defines and approves risk management principles and policies, and assesses the effectiveness of risk management. The Audit Committee reviews compliance with risk management policy and processes.

Vaisala's Risk Management Steering Group comprises key internal stakeholders. The Steering Group is responsible for the operational oversight of the risk management process and assuring that all significant risks are identified and reported, and risks are acted upon on all necessary organizational levels and geographical locations.

Risk management is integrated into key business processes and operations. This is accomplished by incorporating applicable risk identification, assessment, management and risk reporting actions into the core processes. The most significant risks are reported to the Vaisala Management Group and the Audit Committee annually.

Vaisala's business operations are subject to various risks which may have an adverse effect on the company. The list below is not complete but it explains some of the risks with their potential impacts and how Vaisala manages those risks today.

## Near-term Risks and Uncertainties

Uncertainties in world economic and political situation as well as changes in customer behavior may cause demand

slowdown or delays in customer projects. In the US, political decisions may have both positive and negative effects on the demand for Vaisala's products and services for the public sector.

Weather Business Area offers its meteorological customers large infrastructure projects. The closing of such contracts is characterized by budgetary constraints, long-term negotiations concerning scope, project timing and financing. Thus, Vaisala's financial performance may vary significantly over time. Also increasing competition, changes in price levels and exchange rates may impact Vaisala's net sales and profitability.

The ongoing business expansion in renewable energy and information services market may be delayed due to long authorization and approval processes, evolving business models and customers' postponing decision making. Delays in new product ramp-ups and market acceptance of new offering, such as power transformer monitoring products and continuous monitoring systems, may postpone the realization of Vaisala's growth plans.

Suppliers' and subcontractors' delivery capability or operating environment as well as product quality may impact Vaisala's net sales and profitability. Cyber risk and availability of IT systems may impact operations, delivery of information services or Internet-based services or cause financial loss.

Vaisala's capability to successfully complete investments, acquisitions, divestments and restructurings on a timely basis and to achieve related financial and operational targets represent a risk, which may impact net sales and profitability.

Further information about risk management and risks are available on the company website at [www.vaisala.com/](http://www.vaisala.com/) investors, Corporate Governance and [www.vaisala.com/](http://www.vaisala.com/) investors, Vaisala as an Investment.

## Vaisala's Risk Map

Strategic Risks Risk	Impact	Management
Global lowering of price level and gradual loss of price premium	Lower gross margin	Continued focus on product leadership Strive for outstanding customer experience and superior product quality Cost reduction
Customer budget cuts in developed countries and political unrest in developing economies	Reduced revenue	Regional sales capabilities Sales model for upgrades
Success of growth in information service businesses not meeting targets	Reduced return on investments	Strong engagement with target industries Frequent business follow-ups Efficient sales execution
New product introduction and/or entry to new markets slower than planned	Delayed return on investment, cost overruns due to engineering of legacy products	Sales organization and channel development Early product piloting and concepting R&D support for production ramp-up

Operational Risks Risk	Impact	Management
Availability of IT systems	Interruptions to operations, especially manufacturing	<ul style="list-style-type: none"> <li>Stabilization of operational IT environment, shortening of resolution time of critical incidents</li> <li>Change management process with impact analysis and formal approvals</li> </ul>
Business continuity risks related to suppliers	Delays in deliveries, and consequent loss of customers	<ul style="list-style-type: none"> <li>Active supplier risk assessment</li> <li>Supplier base optimization</li> <li>Long-term supplier development plans</li> <li>Strategic supplier continuity audits</li> </ul>
Cyber risks	Delays in deliveries, and consequent loss of customers Financial loss Loss of trade secrets or personal data	<ul style="list-style-type: none"> <li>Information Security Management System (ISMS) creation and deployment</li> <li>Cyber insurance</li> </ul>
Change management performance	Reduced revenue or profitability caused by failed or delayed investment, acquisition, divestment or restructuring projects	<ul style="list-style-type: none"> <li>Continuous progress follow-up</li> <li>Resource allocation for critical projects</li> </ul>
Project delivery performance and interdependencies	Uncertainty of revenue forecasting, lower profitability	<ul style="list-style-type: none"> <li>Continuous sales and delivery process follow-up and improvement</li> </ul>
Political, legislative or regulatory changes	Loss of market potential, or increased cost of accessing a market	<ul style="list-style-type: none"> <li>Geographic and market diversity of business</li> <li>Market and regulatory foresight</li> </ul>
Inventory risk	Reduced profitability due to write-down	<ul style="list-style-type: none"> <li>Development of product ramp-down and material management and inventory processes</li> </ul>
<b>Hazard Risks Risk</b>	<b>Impact</b>	<b>Management</b>
Fire, contamination, or other major disruption in the cleanroom operation	Reduced revenue Loss of customers	<ul style="list-style-type: none"> <li>Emergency stock of sensor components, risk based management of production equipment and spare parts, safety of facilities</li> <li>Business continuity planning</li> </ul>
Field service health and safety risks related to working conditions	Harm to health or safety of personnel	<ul style="list-style-type: none"> <li>Continuous development of occupational health and safety system, emergency procedures</li> <li>Traveler tracking system</li> </ul>
Failure of infrastructure supporting information service businesses	Reduced availability of information services	<ul style="list-style-type: none"> <li>Geographic system redundancy across four server sites</li> </ul>
Natural disaster, epidemic, civil unrest, terrorism	Impaired business environment leading to cancellation of orders, or delays in deliveries and revenue	<ul style="list-style-type: none"> <li>Geographic business diversity</li> <li>Monitoring of the business environment</li> <li>Risk assessment of business opportunities</li> </ul>
<b>Financial Risks Risk</b>	<b>Impact</b>	<b>Management</b>
Credit risk	Credit loss	<ul style="list-style-type: none"> <li>Secured terms of payment, business credit checks, diversification of customer pool</li> </ul>
Liquidity and refinancing risk	Unavailability of credit facilities	<ul style="list-style-type: none"> <li>Sustainable capital structure</li> </ul>
Financial credit and interest rate risk	Financial credit loss, lower finance income	<ul style="list-style-type: none"> <li>High credit rating of financial counter parties, low risk cash investment</li> </ul>
Currency risk	Lower net profit due to foreign exchange rate movements	<ul style="list-style-type: none"> <li>Currency hedging</li> </ul>

# Responsible Business Conduct

To ensure and further promote responsible business practices, Vaisala has a Code of Conduct which is to be followed by all employees. The Code embodies our rules for behavior in conducting business at or with Vaisala, and translates our values and responsibility into actions taken by our employees every day. The Code highlights important issues such as regulatory compliance and integrity, human rights, workplace behavior and safety, anti-corruption, healthy competition and environmental aspects of our operations.

The first Code of Conduct was introduced to the organization in 2008. Since then, all employees have been required to complete an online training module which is also part of the orientation program for new employees.

In 2015, a revised Code of Conduct was put in place, together with a new training module. At the time of reporting in February 2017, 90% (94%) of current Vaisala employees had completed the new Code of Conduct training module either online or in separate training sessions. In 2017, a new e-learning tool will be taken into use for improved staff training on the Code of Conduct. When the training is launched, all staff will be required to complete the training and retake the course periodically.

During 2016, Vaisala renewed its longstanding International Anti-corruption Policy. The new policy brings more clarity and details to what is expected of Vaisala personnel, distributors and agents, customers and suppliers. Training on the policy was arranged for key employee groups, such as sales and sourcing personnel, during 2016 and continues in 2017.

## Vaisala's Code of Conduct

Vaisala Group is a global leader in environmental and industrial measurement. Our goal is to provide reliable environmental observations for better decision making, safety, and efficiency. We aim at growing and conducting long-term profitable business in an ethical and responsible manner. We endorse the United Nations Global Compact strategic initiative for sustainable business practices and support the Global Compact's Ten Principles which are derived from the areas of human rights, labor, environment and anti-corruption.

This Code of Conduct ("Code") sets forth the most important principles and practices guiding Vaisala and its employees in all of their actions. As Vaisala's reputation is reliant on the conduct of its employees, each Vaisala employee is expected to comply with the requirements set forth in this Code without exception.

Vaisala's business partners are required to endorse the principles of this Code as part of their contractual relationship with Vaisala. We have a separate Supplier Code of Conduct in which we require that our suppliers and subcontractors meet

the standards and requirements set forth in the Supplier Code of Conduct.

### 1. Compliance with Laws

We comply with all applicable laws and regulations in the countries in which we operate. Where differences exist between local laws, regulations, customs or norms and this Code, Vaisala strives to apply which ever sets the highest standard. In addition to following formal legal norms, we make no compromise in acting in an ethical manner. Our ambition is to be a good corporate citizen and let our commitment to integrity show through in all our actions.

### 2. Human Rights

We respect human rights as defined in the United Nations' Universal Declaration of Human Rights and we seek to promote them in our conduct and practices. In particular, we refrain from using any form of forced or child labor and insist on the same from our business partners. We endorse the International Labour Organization's Declaration of Fundamental Principles and Rights at Work, which entail, inter alia, respecting our employees' right to peaceful assembly, freedom of association and collective bargaining.

### 3. Employees

We value innovation and curiosity and encourage the professional and personal growth of our employees. We recognize the value of diversity and do not accept any form of discrimination, harassment or other offensive or inappropriate behavior from or towards our employees. We are committed to providing a safe working environment and require the same from our business partners.

### 4. Anti-Corruption

We maintain a zero tolerance approach towards all forms of corruption and abide by the anti-corruption laws applicable in the countries in which we operate. Our reputation as an honest and reliable company is of paramount importance to us, and each employee is expected to safeguard this reputation. The monetary value of any gifts, entertainment or other types of hospitality offered to clients or business partners, or received by Vaisala's employees, must be reasonable and appropriate under the circumstances. Making any offers to public officials or other business partners with an intent to improperly influence their decisions is strictly prohibited.

### 5. Use of Vaisala's Funds and Assets

Vaisala's funds and assets are to be used for the benefit of Vaisala only, and they may not be used for any unlawful or improper purpose. Employees must avoid and report events or

circumstances where their personal interests may be in direct or indirect conflict with the interests of Vaisala. Such scenarios could include a situation where a Vaisala employee holds a financial interest in a competing entity or in a business partner.

## 6. Competition

We recognize the importance of healthy competition in the marketplace and encourage fair competition worldwide. We comply with all laws and regulations concerning competition and expect the same from our competitors and business partners. Business practices we renounce include participating in cartels, abusing one's dominant position in the market place and fixing prices with competitors.

## 7. Environment

Our investment in and commitment to sustainable business practices demonstrates our ambition to be a good corporate citizen. The environment is a key stakeholder for us, and we comply with all generally accepted international environmental standards and often seek to exceed those standards. In addition, we constantly seek to include a sustainability element in our products and services.

## 8. Implementation and Monitoring

We implement this Code by training our employees and requiring periodical acknowledgements of their compliance with this Code. Further, compliance with this Code is continuously monitored by regional/business unit heads and immediate supervisors and is also subject to internal audit. If any Vaisala employee becomes aware of or suspects a violation of this Code, they are required to report their concerns through the internal communication channel which provides anonymity. Violating this Code will lead to appropriate corrective action, up to and including the termination of employment or business relationship.

### Supplier Code of Conduct

The Supplier Code of Conduct reflects Vaisala's values and the Vaisala Code of Conduct, and is based on principles created by the International Labor Organization (ILO), the United Nations Global Compact initiative, and the Electronic Industry Citizenship Coalition (EICC). The Code of Conduct contains language from standards and policies formulated by the above-mentioned organizations, as well as those of the Business Social Compliance Initiative (BSCI) and Social Accountability International (SAI).

### Regulatory Compliance

We believe that responsible business conduct is based on fairness and integrity. Vaisala complies with all national laws and regulations, and does not respond to suspicious business proposals. We continuously follow changes in legislation and

keep our staff informed through internal communication, such as the company intranet, and training for key employees.

There were no confirmed complaints or sanctions by authorities during 2016. Specifically, no incidents of corruption, anti-competitive behavior, anti-trust or monopoly practices or any other breach of legislation or regulations were confirmed during 2016. Furthermore, there were no reported concerns or breaches of human rights, labor rights, or environmental legislation in the adjacent supply chain.

### Compliance Committee

Vaisala has a compliance committee whose task is to oversee that all parts of Vaisala's operations are in line with the Code of Conduct as well as all other legislation and regulation. The committee has members from the Legal Department, Finance & Control and Human Resources and is headed by Senior Vice President for Compliance and Risk Management.

### Grievance Mechanisms

Vaisala provides an internal grievance mechanism for its employees through a dedicated channel, the Vaisala Whistleblowing Channel. The channel operates by e-mail and regular mail and accepts both anonymous and signed messages. Responsibility for the channel and actions taken on cases put forward in the forum lies with the Compliance Committee. Cases are handled confidentially by the Committee.

The Whistleblowing Channel also acts as a medium for clarifying questions about our Code of Conduct or the Code of Conduct training. All Vaisala employees are required to take part in annual training covering the Code of Conduct. This channel also serves Vaisala's other stakeholders, such as suppliers, customers, or distributors.

### Compliance to Human Rights and Labor Laws

Vaisala does not condone infringement of human rights or breaches of labor laws in any part of its supply chain and takes appropriate measures to ensure that the risks of any violations of the company's Code of Conduct or its Supplier Code of Conduct are minimized in the adjacent supply chain. Moreover, due to the enforcement of Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, suppliers to Vaisala must ensure that proper precautions are taken in order not to source any materials that have their origin in conflict areas, including but not limited to the tin, tungsten, tantalum, and gold mined in the Democratic Republic of Congo (DRC) or in adjoining countries.

# Reporting Principles

Vaisala has published annual sustainability reports since 2009. This is the ninth in the series, and the first report that includes elements of Integrated Reporting. This year, we named our sustainability report according to our mission “Observations for a Better World 2016.”

## **Towards Integrated Reporting**

Vaisala has decided to take steps towards Integrated Reporting, as defined by the International Integrated Reporting Council (IIRC). The primary purpose of an Integrated Report is to describe how a company creates value over time. We started our work towards this goal through exploring the different types of value Vaisala creates for its stakeholders. In 2016, we initiated the process by engaging in dialogue with some of our key stakeholders and interviewed them to find out what they expect of Vaisala and our corporate reporting. We studied what megatrends affect Vaisala now and in the future, how we react to them, and what opportunities they may bring us. We then defined what types of value Vaisala creates and narrowed them down to the most relevant ones for each stakeholder. Finally, we wrapped it all together into a Value Creation Model, “The World of Observations.” The groundwork has now been laid for taking our integrated reporting further.

## **Implementing the GRI Guidelines**

To maintain transparency and consistency in its sustainability reporting, Vaisala applies the Global Reporting Initiative’s (GRI) G4 guidelines, and its report is in accordance with the guideline’s Core criteria. For some indicators, we also refer to Vaisala’s Financial Statements and the Corporate Governance Statement, both of which are available on our website.

The Performance chapter of this report discloses our key performance indicators as determined through a materiality analysis, which is based on the GRI G4 Guidelines.

Following the GRI boundary guidelines, our financial and human resource data is reported for the entire Group and in all locations. The scope of our environmental data is divided into Group Environmental Key Performance Indicators, which cover the manufacturing sites; Carbon Footprint, which covers manufacturing sites and offices with more than 15 employees; and indirect sources.

Vaisala’s management reviewed the material aspects and key stakeholders in 2016 as part of the integrated reporting process. The material aspects reflect Vaisala’s strategic priorities and concerns raised by stakeholders.

We also report sustainability information directly to selected organizations. We prioritize reporting to CDP, Global Compact, our customers, institutional investors and ESG rating agencies. You can find further information not incorporated in this report on our website. In particular, we encourage you to have a look at the sustainability section of the website ([www.vaisala.com/sustainability](http://www.vaisala.com/sustainability)).

## **Independent Assurance**

According to our reporting process, we seek assurance for the report from a third party assurance provider. Standard disclosures for 2016 with a reference to external assurance in the GRI content index have been externally assured by an independent third party, Ernst & Young Oy.

# UN Global Compact

Vaisala joined the UN Global Compact in 2008 and has committed itself to following the ten guiding principles of the initiative. Consequently, we report on our progress on annual basis. Vaisala is an active member in its local UNGC network, The Global Compact Nordic Network. Engaging in the local network gives us the possibility to influence the network's

activities and benchmark our efforts to other companies. Vaisala's sustainability reports has qualified for the Global Compact Advanced differentiation level since its introduction in 2010. Vaisala is also an active member according to the initiative's definition.

## Human Rights

Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights.	Embedded in Vaisala's Code of Conduct and Supplier Code of Conduct. Mandatory regular Code of Conduct training for entire personnel.
Principle 2: Make sure that they are not complicit in human rights abuses.	Mandatory regular Code of Conduct training for entire personnel.

## Labor Standards

Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.	Embedded in Code of Conduct and Supplier Code of Conduct. Employee representatives, according to local legislation.
Principle 4: The elimination of all forms of forced and compulsory labor.	Covered in Code of Conduct and Supplier Code of Conduct.
Principle 5: The effective abolition of child labor.	Covered in Code of Conduct and Supplier Code of Conduct.
Principle 6: The elimination of discrimination in respect of employment and occupation.	Covered in Code of Conduct and Supplier Code of Conduct.

## Environment

Principle 7: Businesses should support a precautionary approach to environmental challenges.	We systematically identify and evaluate our environmental impacts and hazards to mitigate any negative effects they might incur.
Principle 8: Undertake initiatives to promote greater environmental responsibility.	Signatory of The Federation of Technology Industries' Energy Conservation Agreement. Participates in WWF Finland's Green Office program and refurbishes facilities to meet green standards. Committed to 100% renewable energy by 2020.
Principle 9: Encourage the development and diffusion of environmentally friendly technologies.	We constantly develop Best Available Technology (BAT) products to meet the increasing demand for highly accurate measuring instruments, e.g. for climate change research.

## Anti-Corruption

Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.	Covered in Code of Conduct, Supplier Code of Conduct and Vaisala's International Anti-Corruption Policy. Vaisala's management enforces a strict zero-tolerance policy on any forms of bribery and corruption.
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## Local Network and National Cooperation

Vaisala is part of a Global Compact local network, The Nordic Network, which has Global Compact participants from Denmark, Finland, Greenland, Iceland, Norway and Sweden. The network provides a learning forum for its members, displaying best practices in corporate responsibility as well as in implementing the ten principles. The network convenes twice per year in a member country. Vaisala is also represented in the network's Steering Group.

In order to benchmark with other industrial companies, Vaisala also takes part in discussions between other Finnish signatory companies. A group of companies meets on a regular basis to exchange best practices with each other and to promote Global Compact for companies that are not yet Global Compact members.

Read more about The Nordic Network:  
[www.gcnordic.net](http://www.gcnordic.net)

# GRI Content Index

The Global Reporting Initiative content index is provided to assist the reader in navigating through the report and to compare it to the GRI G4 Guidelines. The report is in accordance with the core criteria of the guidelines. Standard disclosures for 2016, with a reference to external assurance

in the GRI content index, have been externally assured by an independent third party, Ernst & Young Oy. The independent assurance report is on page 74 of this report. For more information about the guidelines or the application levels, please see [www.globalreporting.org](http://www.globalreporting.org)

	Description	Reference	Reasons for omission	Assurance	Global Compact Principle
	<b>General Standard Disclosures</b>				
G4-1	Provide a statement from the most senior decision-maker of the organization (such as CEO, chair, or equivalent senior position) about the relevance of sustainability to the organization and the organization's strategy for addressing sustainability	7-9			

## Organizational Profile

G4-3	Name of the organization	3			
G4-4	Primary brands, products, and services	6			
G4-5	Location of the organization's headquarters	3			
G4-6	Number of countries where the organization operates	3, 15			
G4-7	Nature of ownership and legal form	3			
G4-8	Markets served	14-15			
G4-9	Scale of the organization	14-15			
G4-10	Workforce information	46-49		●	Principle 6
G4-11	Report the percentage of total employees covered by collective bargaining agreements	46		●	Principle 3
G4-12	Describe the organization's supply chain	51-52			
G4-13	Significant changes during the reporting period regarding the organization's size, structure, ownership, or its supply chain	46			
G4-14	Approach to the precautionary principle	64-67			
G4-15	Externally developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes or which it endorses.	69			
G4-16	List memberships of associations and national or international advocacy organizations	8-9, 21, 69			

## Identified Material Aspects and Boundaries

G4-17	Entities included in the organization's consolidated financial statements or equivalent documents. Report whether any entity included in the organization's consolidated financial statements or equivalent documents is not covered by the report.	The report's scope include all affiliates and wholly owned companies of the parent company Vaisala Oyj, pages 63.			
G4-18	Process for defining the report content and the Aspect Boundaries	2, 16-17, 68			
G4-19	List all the material Aspects identified in the process for defining report content	16-17			
G4-20	Reporting of Aspect Boundaries within the organization	16-17			
G4-21	Reporting of Aspect Boundaries outside the organization	16-17			
G4-22	Effect of any restatements of information provided in previous reports, and the reasons for such restatements	68, Re-statements are explained within the text were applicable.			
G4-23	Report significant changes from previous reporting periods in the Scope and Aspect Boundaries.	68			

## Stakeholder Engagement

G4-24	List of stakeholder groups engaged by the organization	21			
G4-25	Basis for identification and selection of stakeholders with whom to engage	20-21			
G4-26	Organization's approach to stakeholder engagement	20			
G4-27	Key topics and concerns that have been raised through stakeholder engagement	16-19, 20-21			

### Report Profile

G4-28	Reporting period for information provided	Calendar year 2016			
G4-29	Date of most recent previous report	22 March 2016			
G4-30	Reporting cycle	Annual			
G4-31	Contact point for questions regarding the report or its contents	75			
G4-32	The 'in accordance' option the organization has chosen.	In accordance with the GRI G4 Core option.			
G4-33	Organization's policy and current practice with regard to seeking external assurance for the report.	68			

### Governance

G4-34	Governance structure of the organization	Corporate Governance Statement			
	<b>Ethics and Integrity</b>				
G4-56	Organization's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics	10, 66–67			All principles
G4-57	Internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organizational integrity, such as helplines or advice lines	66			All principles
G4-58	Internal and external mechanisms for reporting concerns about unethical or unlawful behavior, and matters related to organizational integrity, such as escalation through line management, whistleblowing mechanisms or hotlines	66			All principles

	Description	Reference	Reasons for omission	Assurance	Global Compact Principle
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#### Disclosures on Management Approach (DMA)

G4-DMA	Materiality and impacts	11–12			
	<b>Indicators</b>				
	<b>Category: Economic</b>				
	Aspect: Economic Performance				
G4-EC1	Direct economic value generated and distributed	62	Figures reported on Group level. We consider the regional level reporting of these figures trade secrets.	●	
G4-EC3	Coverage of the organization's defined benefit plan obligations	Financial Statements, p. 32, 43, 54	There is no single Group policy, as practices differ between countries. Percentage of salary and participation level not reported.	●	
G4-EC4	Financial assistance received from government	61		●	
	<b>Category: Environmental</b>				
	Aspect: Energy				
G4-EN3	Energy consumption within the organization	56	Vaisala does not consume fuels or sell electricity in any significant quantities, therefore these are not considered material.	●	Principles 7, 8
G4-EN4	Energy consumption outside of the organization	53–54	The scope is the installed base of Vaisala's C-band Weather Radar, converted into Scope 2 emissions.	●	Principles 7, 8, 9
G4-EN5	Energy intensity	56		●	Principle 8
G4-EN6	Reduction of energy consumption	54–57		●	Principle 8
	Aspect: Water				
G4-EN8	Total water withdrawal by source	56		●	Principles 7, 8
	Aspect: Emissions				
G4-EN15	Direct greenhouse gas (ghg) emissions (scope 1)	57		●	Principles 7, 8
G4-EN16	Energy indirect greenhouse gas (ghg) emissions (scope 2)	57		●	Principles 7, 8
G4-EN17	Other indirect greenhouse gas (ghg) emissions (scope 3)	57	The data includes business travel and commuting for the Group; logistics and waste for Finland; and installed base of one product group, the C-band weather radar. Scope of reporting will be reviewed annually.	●	Principles 7, 8
G4-EN18	Greenhouse gas (ghg) emissions intensity	57		●	Principles 7, 8
G4-EN19	Reduction of greenhouse gas (ghg) emissions	57		●	Principle 8
	Aspect: Effluents and Waste				
G4-EN23	Total weight of waste by type and disposal method	55		●	Principles 7, 8

	Description	Reference	Reasons for omission	Assurance	Global Compact Principle
	Aspect: Compliance				
G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	67		●	Principle 7
	Aspect: Supplier Environmental Assessment				
G4-EN32	Percentage of new suppliers that were screened using environmental criteria	52		●	Principle 7
	Aspect: Environmental Grievance Mechanisms				
G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms	67		●	Principle 7
	<b>Category: Social</b>				
	<b>Sub-category: Labor Practices and Decent Work</b>				
	Aspect: Employment				
G4-LA1	Total number and rates of new employee hires and employee turnover by age group, gender and region	47-49		●	Principle 6
	Aspect: Labor/Management Relations				
G4-LA4	Minimum notice periods regarding operational changes, including whether these are specified in collective agreements	46		●	Principle 3
	Aspect: Occupational Health and Safety				
G4-LA5	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs	50		●	Principle 3
G4-LA6	Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender	49-50	Occupational disease rate, absentee rates, and lost day rate have been determined not to be material in Vaisala due to low frequency. Data for contractors is too limited for reporting.	●	
G4-LA7	Workers with high incidence or high risk of diseases related to their occupation	49-50			
	Aspect: Training and Education				
G4-LA10	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	46		●	Principle 6
G4-LA11	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	48	Performance reviews are a key indicator for Vaisala's human resources development. As 93% of staff had had a development discussion in the past 12 months, we determine region and gender not material for Vaisala.	●	
	Aspect: Diversity and Equal Opportunity				
G4-LA12	Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity	47-49	Vaisala does not register ethnicity or minority group status in most of its operating countries, except where it is a regulatory requirement. Minority status has also been determined as not material.	●	
	Aspect: Supplier Assessment for Labor Practices				
G4-LA14	Percentage of new suppliers that were screened using labor practices criteria	52		●	Principles 3, 4, 5
	Aspect: Labor Practices Grievance Mechanisms				
G4-LA16	Number of grievances about labor practices filed, addressed, and resolved	67		●	Principles 3, 4, 5
	<b>Sub-category: Human Rights</b>				
	Aspect: Investment				
G4-HR2	Total hours of employee training on human rights policies or procedures	66	The e-learning platform does not account for hours spent on training, but instead registered completion of the course.	●	Principles 1, 2
	Aspect: Non-discrimination				
G4-HR3	Total number of incidents of discrimination and corrective actions taken	67		●	Principle 2
	Aspect: Freedom of Association and Collective Bargaining				
G4-HR4	Operations and suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and measures taken to support these rights	52	Aspect was determined not material in Vaisala's own operations, only in specific areas of the supply chain. For details of supply chain risk mapping, the information is proprietary.	●	Principles 1, 2, 3

	Description	Reference	Reasons for omission	Assurance	Global Compact Principle
	Aspect: Child Labor				
G4-HR5	Operations and suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor	52	Aspect was determined not material in Vaisala's own operations, only in the supply chain.	●	Principle 5
	Aspect: Forced or Compulsory Labor				
G4-HR6	Operations and suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of all forms of forced or compulsory labor	52	Aspect was determined not material in Vaisala's own operations, only in the supply chain.	●	Principle 4
	Aspect: Supplier Human Rights Assessment				
G4-HR10	Percentage of new suppliers that were screened using human rights criteria	52		●	Principles 1, 2
	Aspect: Human Rights Grievance Mechanisms				
G4-HR12	Number of grievances about human rights impacts filed, addressed, and resolved through formal grievance mechanisms	67		●	Principles 1, 2
	<b>Sub-category: Society</b>				
	Aspect: Anti-corruption				
G4-SO4	Communication and training on anti-corruption policies and procedures	66-67	Every employee is in the scope for these policies and procedures. Therefore, the breakdown of staff has been deemed not material.	●	Principle 10
G4-SO5	Confirmed incidents of corruption and actions taken	67		●	Principle 10
	Aspect: Public Policy				
G4-SO6	Total value of political contributions by country and recipient/beneficiary	58, 61		●	Principle 10
	Aspect: Anti-competitive Behavior				
G4-SO7	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	67		●	Principle 10
	Aspect: Compliance				
G4-SO8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	67		●	Principle 10
	Aspect: Supplier Assessment for Impacts on Society				
G4-SO9	Percentage of new suppliers that were screened using criteria for impacts on society	52		●	Principle 10
	Aspect: Grievance Mechanisms for Impacts on Society				
G4-SO11	Number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms	67		●	Principle 10
	<b>Sub-category: Product Responsibility</b>				
	Aspect: Customer Health and Safety				
G4-PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning the health and safety impacts of products and services during their life cycle, by type of outcomes	67		●	
	Aspect: Product and Service Labeling				
G4-PR4	Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes	67		●	
	Aspect: Compliance				
G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	67		●	

References: Vaisala Annual Review 2016 and Corporate Governance Statement  
[www.vaisala.com/investors/](http://www.vaisala.com/investors/)

# Independent Assurance Report

## To the Management of Vaisala Oyj

At the request of the Management of Vaisala Oyj (hereafter Vaisala) we have performed a limited assurance engagement on certain economic, environmental, social, and compliance information in Vaisala's Observations for a Better World 2016 -report for the reporting period 1 January to 31 December 2016 (hereafter corporate responsibility information). Further information about the scope of the assurance engagement can be found in the GRI index on pages 70–73 of the report.

## Management's Responsibility

The Management of Vaisala is responsible for the preparation and presentation of the corporate responsibility information in accordance to Vaisala's internal reporting instructions and the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines G4 (hereafter the reporting principles).

## Assurance Provider's Responsibility

It is our responsibility to present an independent conclusion on the corporate responsibility information based on our work performed. We do not accept nor assume responsibility to anyone else except to Vaisala for our work, for the assurance report and for the conclusions that we have reached.

We have conducted the assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 'Assurance Engagements Other than Audits or Reviews of Historical Financial Information'. The ISAE 3000 standard requires compliance with ethical requirements as well as planning and performing the assurance engagement to obtain limited assurance on whether the corporate responsibility information has been prepared, in all material respects, in accordance with the reporting principles.

## Assurance Provider's Independence and Quality Assurance

We comply with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the IESBA (International Ethics Standards Board for Accountants). We apply ISQC 1 (International Standard on Quality Control) and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

## Limitations of the Engagement

Assurance is provided only on the information outlined in the GRI index on pages 70–73 of Vaisala's Observations for a Better World 2016 -report. We have not been engaged to provide assurance on amounts or disclosures relating to other topics or to prior reporting periods presented in the Annual Review 2016 and Observations for a Better World 2016 -reports.

In a limited assurance engagement the evidence gathering procedures are more limited than in a reasonable assurance

engagement, and therefore less assurance is obtained than in a reasonable assurance engagement. The procedures selected depend on the Assurance Provider's judgment, including an assessment of the risks that the corporate responsibility information would not, in all material respects, comply with the reporting principles. We have planned and performed our engagement to obtain sufficient appropriate evidence on which to base our conclusion.

We have performed, among others, the following procedures:

- a. An update of our knowledge and understanding of Vaisala's material sustainability reporting topics, organization and activities,
- b. An assessment of suitability and application of the reporting principles regarding the stakeholders' needs for information,
- c. Interviews with senior management to understand Vaisala's corporate responsibility leadership,
- d. Interviews with personnel responsible for gathering and consolidating the corporate responsibility information to understand systems, processes and controls related to gathering and consolidating the information,
- e. Visiting a site in United States and a site in Finland to obtain evidence of the data gathering and consolidation process,
- f. Reviewing evidence retrieved from internal and external data sources and checking the data to reporting information on a sample basis,
- g. Performing recalculation of information on a sample basis and reviewing the underlying data that is the basis of narrative disclosures related to the data.

Our assurance report should be read in conjunction with the inherent limitations of accuracy and completeness for corporate responsibility information. This independent assurance report should not be used on its own as a basis for interpreting Vaisala's performance in relation to its principles of corporate responsibility.

## Conclusion

Based on our work described in this report, nothing has come to our attention that causes us to believe that the corporate responsibility information has not been prepared, in all material respects, in accordance with the reporting principles, or that the Information is not reliable, in all material respects, based on the reporting principles.

Helsinki, 13 March 2017  
Ernst & Young Oy

Terhi Mäkinen  
Partner, Authorized  
Public Accountant

Jani Alenius  
Leader of Climate Change  
and Sustainability Services

## Sustainability Contacts in Vaisala

If you have questions or comments regarding the report or Vaisala's sustainability activities, please feel free to contact us.

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