
LUT
University
Report on
SUSTAIN-
ABILITY
2019

LUT University

Report on

SUSTAIN-ABILITY 2019

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LUT University

IN FIGURES 2019

50

LUT celebrated its 50th anniversary in 2019. LUT was founded in 1969, combining technology and business from the start.

919

scientific publications

5346

Bachelor's, Master's and doctoral students

393

Doctoral students

84

million euros in funding:
Ministry of Education and Culture € 46 million, supplementary funding € 38 million

944

staff members

80

nationalities on 2 campuses

23%

of new students are international

2

campuses:
Lappeenranta and Lahti

SUSTAINABILITY AT LUT UNIVERSITY

LUT is committed to considering its environmental, financial and social responsibility in all of its activities: scientific research, academic education, societal interaction and supporting functions at the LUT campuses in Lappeenranta and Lahti. This report presents the main goals and progress in these areas in the year 2019.

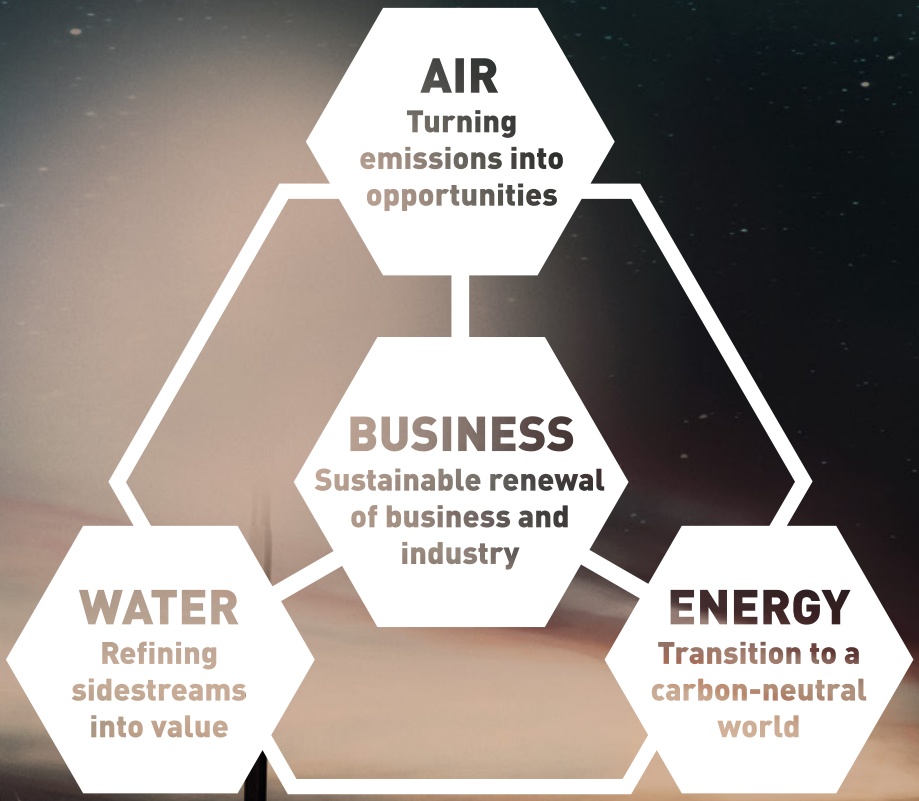
- In 2019, LUT revised its strategic path for the coming years. Strategy 2030: System Earth, solves vicious problems to save our planet.
- LUT is committed to making its campuses carbon negative by 2024. LUT is planning to reach this objective using its own research expertise. One approach is to influence the global energy system as a whole and to support a systemic change towards an emissions-free future.
- LUT's environmental policy establishes the framework for sustainability activities at the university. These activities are systematically managed, monitored and developed based on an environmental programme.
- LUT offers a sustainable, attractive working environment for researchers: the European Commission has granted LUT the HR Excellence in Research Award in accordance with its Human Resources Strategy for Researchers (HRS4R).
- LUT's WWF Green Office certificate has been renewed through an external assessment in 2019.
- LUT's sustainability policy and reports are all available to the public at lut.fi/sustainability.
- Through the expertise of its board of directors and advisory board, LUT also incorporates the business world's perspective in its sustainability promotion. The impacts of environmental actions are presented regularly to the university management.
- LUT requires sustainable operations and transparent reporting also from its partners.

Through its Trailblazer 2030 strategy and research, LUT pursues particularly the following sustainable development goals of the UN:

LUT UNIVERSITY STRATEGY 2030

TRAILBLAZERS

Science with a Purpose



LUT UNIVERSITY

The Lappeenranta-Lahti University of Technology LUT is a pioneering science university in Finland, bringing together science and business since 1969.

We typically set very ambitious targets: we are interested in tasks that others may consider impossible. Because of our trailblazer spirit, we are often in the vanguard and address issues based on our ability for renewal and our visionary outlook.

Our international community is composed of approximately 6 500 students and experts engaged in scientific research and academic education. As a compact, agile, and highly focused university, we strive to build a financially, ecologically and socially sustainable world together with our partners in cooperation.

LUT opened a new campus in Lahti in August 2019.

We have the **courage** to succeed, **passion** for innovation through science and **will** to build well-being.

SUSTAINABILITY IN SCIENTIFIC RESEARCH

GOAL: LUT will conduct and publish high-level research which improves the state of the environment and is relevant to society and industries. LUT will contribute to an economically, ecologically and socially sustainable society in its research areas together with its partners and in its schools: the School of Energy Systems, the School of Engineering Science and the School of Business and Management.

- In 2019, the number of publications (Publication Forum rating 2-3) in high-quality journals increased by 23% compared to the previous year. The total number of these publications was 412.
- In total 264 of our Scopus publications dealt with at least one sustainable development goal.
- The Marjatta and Eino Kolli Foundation donated 1.8 million euros to LUT to establish three professorships in Lahti. The professorships will specialize in biopolymer production, process and plant design, and separation technology in biorefining.
- LUT commits to observe good scientific practices and principles of open science and research.
- In its guidelines on openness, LUT commits to observing good scientific practices and principles of open science and research.
- LUT schools conduct interdisciplinary research on research platforms:
  - REFLEX - Recycling carbon in a flexible competitive energy system
  - RED - Revealing emission discrepancies
  - RE-SOURCE - Resource efficient production processes and value chains
  - SAWE - Safe water for all
  - DIGI-USER - Smart services for digitalization
  - SIM - Sustainable product processes through simulation.
- Examples of LUT research promoting sustainability:
  - Food from air: emission-free food production with P2X-technologies.
  - Energy system based on 100% renewable energy
  - Production of carbon neutral fuels for transportation, based on P2X-technology
  - Computer vision and pattern recognition expertise utilised in plankton research
  - Better packaging solutions to mitigate plastic pollution
  - Personal carbon trading scheme for mobility

SUSTAINABILITY IN ACADEMIC EDUCATION

GOAL: LUT's graduates will become academic decision-makers with expertise in sustainable development. By using their knowledge, skills and competences, they will contribute to sustainable solutions and practices wherever they work.

- In 2019, a total of 780 students obtained their Master's degree in business or technology, which amounts to an increase of 22% from the preceding year.
- LUT degree programmes have solidified their commitment to develop their students' sustainability knowledge, skills and competences. In 2019, the share of degree programmes with sustainability-related intended learning outcomes was 72%.
- All new students undergo the Sustainability at LUT University orientation.
- Through a strong commitment to digitalization, LUT offers great possibilities to study and work online.
- The LUT School of Business and Management (LBM) is among the world's top 200 business schools (THE Rankings 2020 by subject). LBM focuses on sustainable business renewal in education and research. The school is committed to the UN's Principles for Responsible Management Education.
- According to the Master's graduate surveys 2019 both in technology and business administration the sustainability expertise developed in studies at LUT is above national average (sources: Finnish Business School Graduates, TEK Graduate Survey). Also Bachelor's graduate survey 2019 reveal that the sustainability competences have strengthened consistently both in engineering and business administration BSc degree studies.
- Examples of LUT's Master's programmes promoting sustainability:
  - Bioenergy Systems
  - Energy Conversion
  - Biorefineries
  - Chemical Engineering and Water Treatment
  - Sustainable Science and Solutions
  - Circular Economy
  - Global Management of Innovation and Technology
  - Supply Management
- Examples of LUT's open studies promoting sustainability:
  - LUT Open University: Sustainable water use, Energy scenarios
  - Massive open online course (MOOC): Circular Economy Now

SUSTAINABILITY IN SOCIETAL INTERACTION

GOAL: LUT will base its collaboration with companies on a strong international entrepreneurship ecosystem and an international process for the commercialization of innovations involving LUT's business accelerator, students, alumni, investors and enterprise networks.

- The business ecosystem includes LUT's research and education units, LUT's business accelerator Green Campus Open (GCO), the J. Hyneman Center (JHC) for rapid prototyping, the LUT Entrepreneurship Society LUTES, and the cleantech seed investor Green Campus Innovations Ltd (GCI).

- We create sustainable solutions for society and industries: new business models, inventions and patents, new products and spin-off companies.

- In 2019, LUT was the Finnish university that received the most research funding from domestic companies in relation to the number of teaching and research staff. In total 113 of our projects involved companies.

- LUT research resulted 29 inventions in 2019. LUT applies for patents actively; its number of patents is the second highest of universities in Finland.

- Roughly 3–5 research-based spin-off companies are established each year. In 2019, there were 52 active spin-offs which had been established at least three years ago.

- Financing for 2019: core funding by the Ministry of Education € 46 million, supplementary funding € 38.2 million which amounts to over 45 % of the university's turnover. This demonstrates the high impact of LUT's research on the society.

- The Junior University incorporates LUT's sustainability contents into the curricula of local schools. The JU consolidates the knowledge of and skills in sustainable development among the region's children and youth. During the years 2018 – 2019 JU activities reached 10 810 people.

- Together with our campus cities Lappeenranta (European Green Leaf 2021) and Lahti (European Green Capital 2021), we promote a clean environment and sustainable society.

- LUT is a member of highly regarded sustainable development networks:
  - Climate University
  - Network for Business Sustainability
  - Greenreality Lappeenranta
  - Green Lahti
  - Principles for Responsible Management Education (PRME)
  - European Energy Research Alliance (EERA)
  - Sustainable Process Industry through Resource and Energy Efficiency (A.Spire)
  - The Water Europe
  - Finnish Climate Change Panel
  - The Nordic Sustainable Campus Network (NSCN)
  - The International Sustainable Campus Network (ISCN)

SUSTAINABLE ACTIONS ON LUT CAMPUSES

GOAL: LUT will aim to create a campus culture that increases responsibility and reduces our environmental load and carbon footprint. LUT monitors, measures and regularly reviews its impact on the environment.

- LUT is committed to making its campuses carbon negative by 2024. In 2019, LUT started planning for this objective by gathering a team of its sustainability research experts to prepare LUT's carbon negativity roadmap. LUT also started preparations for the recruitment of a sustainability manager.
- LUT has made a diverse range of environmental efforts: 100% of the energy LUT purchases is renewable, LED lamps light LUT's facilities, LUT enables remote work and distance learning and encourages its employees to bicycle to work.
- On the Lappeenranta campus, solar panels generates 508 kW and a wind turbine generates 20 kW of power, and there are also air-to-water heat pumps. In 2019, LUT's solar panels produced 5.4% of the electricity LUT consumed.
- LUT updated its waste policy and improved its waste separation instructions in 2019.
- LUT takes environmental responsibility into consideration in all procurements and in Travel Instructions.
- Campus restaurants have increased their sustainability e.g. by decreasing food waste with the ResQ mobile application. LUT arranges events sustainably and applies the principles of sustainable meeting arrangements published by the Finnish Ministry for Foreign Affairs and WWF.
- LUT began operating on the energy-efficient Lahti campus in August 2019. LUTs shares teaching facilities in Lappeenranta and Lahti with the LAB University of Applied Sciences, which is part of the LUT Group.
- Goals for energy efficiency are shared with the property operators, University Properties of Finland (SYK) and Isku Center. SYK's goal is for their campuses to be the most responsible campuses in Europe by 2030. In 2019 SYK developed the measurement of their carbon footprint.

LUT UNIVERSITY´S CARBON FOOTPRINT IN 2019

LUT is committed to making its campuses carbon negative by 2024. In 2019 LUT revised its strategy and its action plans to reach this goal. Strategy 2030: System Earth solves vicious problems to save our planet.

LUT has calculated its carbon footprint according to the Greenhouse Gas Protocol and has set targets for all three scopes of the protocol.

In 2019, LUT's total carbon footprint was 2054 t CO_2 ekv. This was the first time LUT employed the world's most widely used greenhouse gas accounting standard, the Greenhouse Gas (GHG) Protocol, to calculate its carbon footprint.

LUT does not have comparable GHG Protocol measurement data from previous years.

In the GHG Protocol, greenhouse gas emissions are classified into three scopes. Scope 1 and 2 are mandatory to report, and scope 3 is voluntary and the most challenging to monitor. In 2019, LUT included all these three scopes in its carbon footprint calculations.

LUT's Total Carbon footprint 2054 t CO_2 ekv

SCOPE 1: 18.8 t CO_2 ekv
Direct emissions from LUT-owned and controlled resources including emissions from four owned cars.

SCOPE 3: 2035.2 t CO_2 ekv
Emissions are all indirect emission – not included in scope 2 – and emissions that are linked to the value chain and operations of LUT, e.g. business travel via CWT, food at LUT Buffet, construction, maintenance.

SCOPE 2: 0 t CO_2 ekv
Indirect emissions from the generation of purchased energy. LUT´s electricity comes 100 % from renewables and therefore it is considered that emissions at the generation are zero. The GHG Protocol says that the company does not account for GHG emissions from operations in which it owns an interest but has no control. The owner of the buildings and the buyer of the district heating, SYK Oy, has included district heating in its own calculations and already compensated all the emissions. That's why the district heating is excluded from the calculations.

Water consumption per year

2017: 16 731 m^3

2018: 15 674 m^3

2019: 14 114 m^3

Consumption per person is 3.18 m^3/person

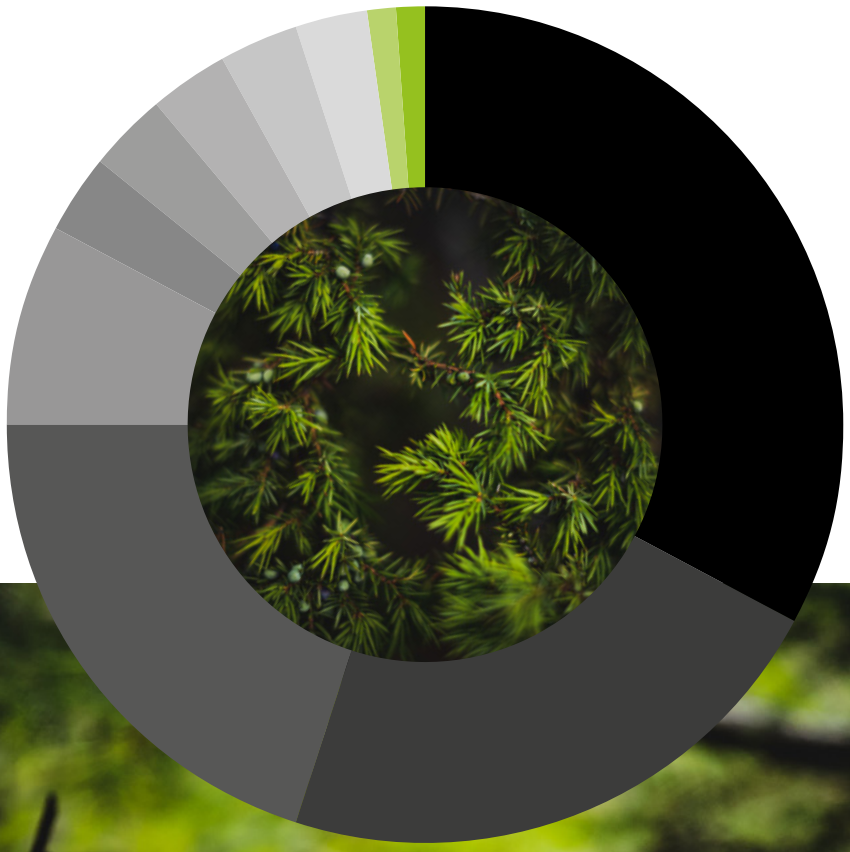
Amount of waste 181 tons, from which:

91 t of waste recycled (50,3 %)

90 t of waste to energy production (49,7%)

0 t of waste sent to landfill – 0 (0%)

LUT UNIVERSITY'S CARBON FOOTPRINT IN 2019



- Food 33%
- Commuting 22%
- Business travel 20%
- Publishing 8%
- Waste 3%
- Construction 3%
- Research 3%
- Education 3%
- Advertising 3%
- Maintenance 1%
- LUT fleet 1%

LUT & SUSTAINABLE DEVELOPMENT GOALS

SDG 1 | NO POVERTY

- The employment rate of our graduates is 97%.
- LUT organizes an annual Projects & Part-time jobs event, where companies recruit our students.
- In 2019, we awarded a scholarship 83% of persons who are required to pay a tuition fee and who accepted a study place.

SDG 2 | ZERO HUNGER

- The campus restaurant constantly monitors the amount of biowaste and sells food out shortly before closing time to minimize line loss.
- Research with VTT created a new emission-free process to produce protein from air with emission-free electricity and without land use.
- Sustainability Science Group investigated the response diversity of wheat. Because of climate change, food security requires more crop cultivars that exhibit different responses to climatic conditions.

SDG 3 | GOOD HEALTH AND WELL-BEING

- Employees are offered the occupational health services and Happiness through Health activities with the aim of increasing social, mental and physical well-being and job satisfaction. Occupational safety aims to reduce hazards at work.
- The aim of the well-being committee is to promote students' well-being on the campuses. It annually organizes a Well-being Week for all campus students and staff.
- Research in the field of software programming examined factors influencing the use of quantified self-tracking wearable devices among older adults and in organisational use.

SDG 4 | QUALITY EDUCATION

- Lifelong learning is supported through the LUT Junior University, open university instruction, Educational Services for Companies and The Finnish Institute of Technology.
- The sustainability skills of graduates have developed in recent years. The contents of sustainable development are integrated into degree programmes and all new students receive an introduction to sustainability at LUT.
- Several of degree programmes have passed international accreditation, which is a guarantee of high quality.

SDG 5 | GENDER EQUALITY

- LUT hosted the event Shaking Up Tech, which encourages young women to enter the world of technology.
- The objective of the equality plan is to promote equality and prevent and eliminate discrimination. The human resources committee follows and evaluates the realization of equality.
- At the end of 2019, the share of female employees was 45%. A total of 27% of undergraduate students and 37% of postgraduate students were women.

SDG 6 | CLEAN WATER AND SANITATION

- LUT regularly monitors its water consumption. In 2019, the consumption was 3.18 m^3 per person. LUT minimizes its water use with automatically closing water taps and campus vegetation which does not require irrigation. Drinking water is provided free of charge.
- Research into water responds to complex water treatment needs and resource recovery from wastewater.
  The research also benefits local water systems: a pumping station improves water quality in Lake Saimaa, and mud balls clean local waters in Lake Nukkajärvi.
- Water-related education is provided e.g. in the Master's Programme in Water Technology, in the Junior University, and through the scientific platform SAWE – Safe water for all.

SDG 7 | AFFORDABLE AND CLEAN ENERGY

- LUT's solar panels produce almost 5.4% of the electricity LUT consumes, and 100% of the energy LUT purchases is renewable. Goals for energy efficiency are shared with the property operators.
- LUT's research shows an economically viable pathway to a global carbon neutral electricity system by 2050.
- The LUT School of Energy Systems offers education in energy engineering, electrical engineering, sustainability science and mechanical engineering. Energy education is provided also through the research platform REFLEX.

SDG 8 | DECENT WORK AND ECONOMIC GROWTH

- LUT has committed to the European Charter for Researchers, the European Commission's principles of good human resources policy and the Society's Commitment to Sustainable Development. LUT's Code of Conduct assures that every member of our academic community has equal opportunities.
- LUT's business ecosystem includes research and education units, LUT's business accelerator Green Campus Open (GCO), the J. Hyneman Center (JHC) for rapid prototyping, the LUT Entrepreneurship Society LUTES, and the cleantech seed investor Green Campus Innovations Ltd (GCI).
- LUT promotes entrepreneurial skills e.g. in schools and in the Master's Programme in International Business and Entrepreneurship.

SDG 9 | INDUSTRY, INNOVATION AND INFRASTRUCTURE

- LUT promotes society's transition to carbon neutrality through electrification and power-to-x technologies. P2X is applicable to the production of synthetic fuels, chemicals and edible proteins. Raw materials for these products include carbon dioxide captured from the air.
- Green Campus Open supports turning LUT's research into business. LUT's research resulted in 29 inventions in 2019, and there were 52 active spin-offs which had been established at least three years ago.
- Clean energy, water and air are life-giving resources for which we seek new solutions with our study programmes in technology and business.

SDG 13 | CLIMATE ACTION

- LUT is committed to carbon negativity by 2024. Our carbon footprint is calculated in accordance with the Greenhouse Gas Protocol and it includes each of the three related scopes.
- Combating climate change and securing clean air are key questions that humanity needs to solve. LUT uses applied mathematics and climate modelling to promote these issues.
- According to the 2019 Master's graduate surveys in both technology and business administration, the sustainability expertise developed in studies at LUT is above the national average.

SDG 10 | REDUCED INEQUALITIES

- The goal of the Fusion Grid project is to provide network connections and electricity in developing countries to enable better opportunities for education, work and business activities.
- By supporting the sustainable renewal of business, the LUT School of Business and Management helps to eradicate inequality in the working world.
- LUT has signed the Erasmus Charter for Higher Education. In 2019, there were 205 outgoing and 268 incoming exchange students at LUT. In addition to academic staff, the mobility of other staff is supported through the Erasmus and FIRST programmes.

SDG 14 | LIFE BELOW WATER

- AI is taught to recognise marine plankton and used to gather information on the state of the Baltic Sea, the global ecosystem and the impacts of eutrophication and climate change on water quality.
- Computer vision identifies the endangered Saimaa ringed seal, enables protection of the species and helps to see how it adapts to climate change.
- Oil spill prevention in the Arctic can be improved with biowaste.

SDG 11 | SUSTAINABLE CITIES AND COMMUNITIES

- The mobile application CitiCAP for personal carbon trading was invented to help the city of Lahti to encourage its citizens towards more ecological mobility and to reduce emissions from transport.
- Master's students around Europe analyse genuine industrial cases in the e-CirP project, where the circular economy is embedded into product design and optimization.
- The LUT Junior University raises responsible urban citizens from preschool to upper secondary school, encouraging them to contribute to the sustainable development of the city through their own activities.

SDG 15 | LIFE ON LAND

- Ultrasound helps to recover valuable natural ingredients ecologically and has the potential to reduce losses in food chains.
- Biotrail – a forest trail next to the campus, where you can learn how nature has inspired innovations.
- Metsä360 – a new award to accelerate forest processing and support the growth of a responsible bioeconomy.

SDG 12 | RESPONSIBLE CONSUMPTION AND PRODUCTION

- LUT has updated its waste policy and waste separation instructions: 0% of LUT's 181 tons of waste will be landfilled. Our campus restaurants have biowaste scales to monitor biowaste volumes. LUT takes environmental responsibility into consideration in all procurements.
- A total of 59% of the EU's plastic waste comes from food packaging. We are saving the world by better packaging solutions with our partners in the project PackageHeroes.
- The LUT School of Business is committed to the Principles for Responsible Management Education, which aim to implement sustainable values in education and research. The Master's Programme in Supply Management offers competencies for managing global supply networks to increase sustainability.

SDG 16 | PEACE, JUSTICE AND STRONG INSTITUTIONS

- LUT´s organizational structure, board of directors, advisory board and university collegium are transparent. LUT's student union is consulted in decision-making.
- The aim of LUT's equality plan is to help LUT develop into a work community where all members of the community are treated with respect. Equal treatment is actualised in interactive situations, personnel management, recruitment, working conditions, salaries, and career development. A total of 80 nationalities are represented in the staff, and 20% of new students are international.
- LUT's accessibility statement assesses the accessibility of the LUT website in the light of Web Content Accessibility Guidelines (WCAG) 2.1, levels A and AA.

SDG 17 | PARTNERSHIPS FOR THE GOALS

» Local partnerships for sustainable development:

- A feasibility study for a pilot production plant for local synthetic fuels is started with a group of companies. The target is to produce carbon neutral fuels for transportation.
- A member of the Greenreality, a network of the energy and environment sector's companies operating in South Karelia.
- Members in the cooperation group of the project "Carbon Neutral South Karelia".

» National partnerships for sustainable development:

- Professor Christian Breyer is a member of the Finnish IPCC Working Group.
- LUT and Wärtsilä join forces to model a future based on 100% renewable energy.
- A member in the Sustainability and Responsibility Working Group of Unifi.

» Global partnerships for sustainable development:

- Partner in an international competence centre (under the auspices of UNESCO) in mining.
- Professor Jari Hämäläinen re-elected as COST Scientific Committee Chair
- Member of many international networks promoting sustainable development, such as the ISCN and the NSCN.

17 PARTNERSHIPS FOR THE GOALS

SUSTAINABLE DEVELOPMENT GOALS

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