Can you introduce yourselves and your roles in the Finnish Environment Institute (SYKE)?

LK: I am Director General of SYKE and have extensive experience in working on science-policy interfaces related to various environmental issues. I have been actively involved in the development of Finnish research and innovation policy as a member of the various Finnish environmental research councils and as a member of the National Science and Technology Policy Council. Since 2008, I have also been a member of the International Resource Panel of the United Nations Environment Programme.

JS: I am Director of the Centre for Sustainable Consumption and Production (CSCP) at SYKE, and have been managing several extensive R&D projects on sustainable consumption and production as well as sustainable use of natural resources. Additionally, I have participated in different working groups and committees on sustainability issues and am a member of the national climate change panel.

What are the primary goals of the Institute? What is the role of the CSCP?

LK: SYKE is the R&D centre of the Finnish environmental administration, comprising 700 highly qualified employees. The organisation’s main activities include R&D-related to changes in the environment, cause and effect relationships, means of resolving environmental problems and policy measures. SYKE’s research themes and programmes assess environmental problems from a multi-disciplinary perspective, by integrating socioeconomic considerations with natural and technical sciences.

JS: CSCP is one of six centres at SYKE. Its main research focus is on the sustainable use of resources (materials, energy, land use and water) and reduction of harmful emissions. Other major issues the Centre works on include waste prevention and waste treatment, contaminated soils and industrial emissions. CSCP’s core activities include life cycle assessments of products and services, and the development of tools for ecological product design.

At present, where does Finland’s environmental R&D focus lie?

LK&JS: It is increasingly focusing on the transition to a carbon neutral and resource efficient economy, where wealth and wellbeing are created by using significantly smaller amounts of natural resources, causing less waste and emissions and safeguarding our ecosystem services. In this process, solutions to mitigate greenhouse gas emissions play an important role.

This November, the Intergovernmental Panel on Climate Change (IPCC) published a report warning that, unless immediate action is taken...
taken, climate change will cause irreversible damage to humans and ecosystems. How is SYKE responding to this issue?

LK&JS: Climate change mitigation and adaptation are embedded in almost all research themes. The general objective is to find solutions that reduce the dependency on fossil fuels, ensure sustainable use of natural resources and increase the resilience of society to climate change. In particular, urban planning and smart cities with new consumer-based solutions for energy efficiency and renewable energy production are important R&D areas – and to generate new solutions, it is important to cooperate internationally.

Finland is the most heavily forested country in Europe, with nearly 75 percent of its land considered boreal forest. How does the country ensure that the forests are managed effectively and that their biological diversity is protected?

LK&JS: The Finnish Government has decided that Finland should be a global forerunner in bioeconomy, meaning that the forest sector will continue to be of high importance in our country. The demand for forest biomass will evidently increase because significant investments have been made into the development of new wood-based products. A critical question is how to determine sustainable levels of forest harvesting, while also taking into account biodiversity concerns.

The Finnish forest inventory system, maintained by the Finnish Forest Institute, is highly valued worldwide. Thanks to reliable inventories, annual changes in the biomass and carbon balance of forests can be estimated. According to recent estimates, both the biomass and carbon sink will increase in the next decade even when assuming an increase in harvesting. Attention has to be paid to the conservation of biodiversity, because the majority of endangered species in Finland live in forest ecosystems and many are dependent on decaying wood. In principle, the new guidelines for forestry practices take into account biodiversity aspects, but their implementation is critical – the local forest extension services play a crucial role in this, while the Finnish Forest Research Institute and SYKE jointly monitor and assess the development of biodiversity.

The Carbon Neutral Municipalities Project

SINCE OCTOBER 2008, SYKE has coordinated the Carbon Neutral Municipalities (HINKU) project, in which all stakeholders – municipality, citizens and local businesses – are involved in the effort to reduce local greenhouse gas emissions.

The aim is to create ‘win-win-win’ situations, where efforts to mitigate climate change give full consideration to economic, environmental and social factors. The municipalities have committed themselves to reducing emissions in their territory by 80 per cent by 2030, when compared with 2007. The HINKU project has expanded from five small municipalities to 22, now covering over 370,000 citizens in Finland.
What activities are underway to manage and maintain water resources in the region?

**LK&JS:** Finland has plenty of good-quality water resources compared with almost any other country. As a member of the EU, Finland has implemented the European Directives on water protection and management in national legislation and practices – with cooperation between the authorities, stakeholders and citizens, management plans in accordance with the EU Water Framework Directive have been prepared for all river basins in the country. Moreover, the Environmental Protection Act and the Water Act specify strict permit procedures according to which environmental and water permits are necessary even for small projects and production facilities.

Can you discuss the mining industry’s presence in Finland? Is SYKE working with the industry to move it towards environmentally friendly practices?

**LK&JS:** From the viewpoint of Europe, Finland is rich in metal mineral resources; the growing demand for and increasing prices of metals make the opening of new mines attractive. However, recent experiences with serious environmental pollution from the Talvivaara mine have caused intensive debates on the level of environmental management. In response, the authorities, mining industry and research institutes have initiated several joint projects to improve the sustainability of the industry. SYKE’s experts have been actively involved in this process by producing data and information on environmental protection aspects for working groups’ needs.

Are there major challenges Finland needs to confront to become a fully sustainable country? How do you envision the country progressing within the next five to 10 years?

**LK&JS:** Finland’s major challenges are related to our high material consumption and energy use resulting in high greenhouse gas emissions. Our consumption-based material flows and greenhouse gas emissions per capita are very high. We have the same problem as other industrial countries: we import a lot of goods and raw materials, and thus have partly shifted our emissions abroad.

Finland has already invested significantly in cleantech and eco-innovations. Our politicians, administration and many companies also understand that it is necessary to improve our own environmental performance for credibility and competitiveness in the fast-growing global cleantech markets. One of the most important new initiatives in the field of sustainable consumption and production is the transition to a carbon neutral, circular economy. During the next five to 10 years, we have to move towards low carbon electricity production and to increase our energy efficiency. In addition, we can expect improvements in our material efficiency in construction and urban planning. However, for the transition of society, we need improvements in resource efficiency of all activities, optimisation of production processes, new business models, better logistics and changing consumption patterns.

---

**Green cities**

**SMART AND SUSTAINABLE** urbanisation is one of SYKE’s key focus areas. The Institute assesses cost-effective solutions for renewable energy production and energy efficiency, as well as urban planning, while taking into account the needs of different target groups. Recently, SYKE has begun to study the possibilities of adapting distributed energy systems and smart grid solutions.

On a mission to make cities more sustainable, the Institute explores the following themes:

- Attractive, resource-efficient and low-carbon urban structures
- Relationships between urban areas and regional and global material flows
- Digital economy, smart services and urban structure