

The challenge of sustainable production means a new opportunity for a better tomorrow

Jussi Soppela, PhD, Senior Lecturer, Lapland University of Applied Sciences

Together with the rest of the EU, Finland made a political commitment in 2020 to an ambitious and challenging goal in the European Green Development Growth Strategy for the new programme period, which aims to eliminate net greenhouse gas emissions by 2050. Finland has already set its own deadline to 2035.

The starting point for future goals was already set in the UN Rio Convention in 1992, when it was agreed to promote sustainable development in the world. The targets were made more specific in the Paris Climate Agreement in 2015, when measures to mitigate climate change were agreed on. The EU is now determined to show the rest of the world that it takes a real responsibility for translating the principles of sustainable development into practical action on a broad front.

How is the change brought about?

A key objective is a fair and competitive society, where modernisation of the economy and increased cost-effectiveness will lead to new sustainable growth and inclusion. The economies of the EU member states have the opportunity to work together to develop environmental issues and the well-being of their citizens, although the challenges especially in climate matters are great and require costly investment in technology and systems to achieve climate neutrality. At the same time, efforts are being made to involve other countries in a joint effort to reduce global carbon emissions.

Large-scale changes are needed in the energy production and construction sectors

A key production-related goal is to reduce carbon emissions in all activities, and there are several ways to do this. In the EU, 75% of greenhouse gas emissions come from the production

and use of energy, so it is worth to try to eliminate the use of carbon while investing in renewable energy sources. A smooth transition to new forms of energy production requires guidance on the shared use of renewable energy sources in order to ensure the supply of energy for industry and consumers. It is particularly important for production activities to move away from the use of carbon-based energy, especially in energy-intensive production such as steel, wood products, chemicals and cement, which are central to the various value chains of national economies.

The construction industry is everywhere using a lot of energy and mineral resources. In addition, buildings account for a large share of energy consumption, so it makes sense for EU member states to invest in the refurbishment of housing stock used for residency or work, which will effectively reduce energy consumption. Particular emphasis should be placed on the refurbishment of social housing, as many people living there have difficulty paying their energy bills.

Transitioning to a clean circular economy

With the increasing use of raw materials worldwide, around half of all greenhouse gas emissions and more than 90% of biodiversity loss and deteriorating water quality are due to increased use of natural resources or processing them into various materials. All too often, direct industrial production based on natural raw materials ends up mainly as waste and emissions. The large-scale introduction of the circular economy will provide not only new raw materials, but also more jobs and business based on new innovations. From the viewpoint of effectiveness, it is essential that industrial production be fully involved in activities and cooperation with other actors. The principles of the circular economy should be followed in all sectors, but especially in energy-intensive manufacturing. The transition to a large-scale circular economy has so far been slow, but good examples can be found in Lapland, e.g. in the Sea Lapland region, where the development of the circular economy in industry has been rapid recently. The Lapland University of Applied Sciences has also invested in promoting the circular economy in its educational and project activities. New investments in the forest industry in Finland also provide opportunities for a more extensive utilisation of the circular economy in production.

Ensuring a non-toxic living environment will lead to increasing industrial competitiveness

As a specific objective for the state of industrial production and, more generally, the living environment, the EU has set a requirement for a non-toxic environment and a zero-emission target to protect soil, air and water. This means monitoring the state of the environment and taking rectifying action to protect citizens and ecosystems. Attention will be paid to the effects that factors such as nutrients, plastic residues and various chemicals, as well as flood waters, have on the status of groundwater and surface water. Attention will be paid to air quality by surveying things such as the monitoring of local air status and purification. Emissions from large industrial plants will be assessed in relation to the environmental damage they cause, for instance from the viewpoint of the uniformity and application of legislation. In order to promote a non-toxic environment, a chemicals strategy will be prepared to protect citizens and the environment from dangerous chemicals. In implementing the strategy, industry must also be involved, together with society as a whole, in creating a culture where improving environmental protection and public health leads to development of industry and improved competitiveness.

Sustainable and smart mobility changes production

The majority of freight transport in the EU (75%) is by road, which is a worse option in terms of greenhouse gas emissions than a mode of transport which makes a more versatile use of rail and water transport options. In addition, the EU intends to explore fossil fuel support practices in shipping and air transport and relate them to the environmental and health impacts of transportation. Emissions from mobility can also be affected by increasing the production of sustainable alternative transport fuels. One of the factors affecting freight transport emissions is restricting the movement of the most polluting seagoing vessels in EU ports and obliging vessels at berth to use shore-side electricity. In mobility, the shift is on from fossil fuels to renewable and new technologies, which require large investments in production infrastructure and which will enable the uptake of new technologies in transport and other mobility in the future. During the transition phase, large-scale changes in energy use will create new demand and growth for industry and national economies.

The food system as part of a sustainable food supply

Food production also consumes nature and pollutes the climate. At the same time as natural resources are used extensively, much of the food ends up as waste, which further increases the carbon footprint of the product used. In the spring of 2020, the EU launched the From Farm to Fork strategy, which aims to communicate new innovations and technologies in the sector that can increase the skills of farmers, stockbreeders and fishers and help with the introduction of new practices and technologies. New methods aim to reduce greenhouse gas emissions and take better account of the environmental impact of agribusiness. At the same time, efforts are being made to ensure a fair livelihood for traders. New methods for reducing carbon emissions from agriculture include precision farming, organic farming and agroforestry. In fisheries, the aim is to develop solutions such as aquaculture of sustainably produced fish and shellfish. The sustainable blue economy will therefore aim to reduce future pressures on protein production in terrestrial ecosystems and thus reduce the carbon burden on the climate. In addition, the seas offer the opportunity for clean energy production on the high seas or on the coast.

There are plans to improve quality by reducing the use of chemical pesticides and fertilisers, as well as antibiotics, while maintaining the volume of food production. This will be made possible by investing more strongly in organic production and the use of new pesticide methods and technologies. In addition, the use of chemical fertilisers can be reduced through the circular economy. The effects are also reflected in a reduction of adverse environmental impacts in production, distribution and storage. Emission reductions and encouraging results have been achieved in food production in Finnish Lapland, for instance by developing the production, marketing and distribution of local food, especially in tourism, but also in the municipal sector, for example in the municipalities of Sodankylä and Ii.

Finland has both a lot to offer and a lot to learn in the use of natural resources.

The European Green Growth Strategy underlines the objectives of conserving biodiversity and natural ecosystems. This needs to be taken into account, especially in production directly oriented towards the use of natural resources, such as forestry, agriculture and fisheries. The EU's Biodiversity Strategy identifies actions to restore degraded ecosystems to a better ecological state. In forestry, the restoration of bogs is one example of possible measures that apply in particular to Finland and its northern and eastern parts, which are known for their bog landscapes. The management of forest ecosystems is under increasing pressure to mitigate

climate change, but also to preserve and increase biodiversity. The EU is therefore now developing a new forestry strategy, the previous version of which was published in 2013. Finland is strongly involved in drawing up the strategy and seeks to influence its content, taking into account the conditions in our country. A key aim of the new forest strategy is to invest in afforestation and the conservation and restoration of Europe's forests. Here Finland has strong know-how and traditions to offer, which have secured the growth of our forests and the building of the forest industry since the end of the 19th century, when the first Forest Act was enacted.

Sustainable production challenges technology and develops through innovation

Production activity is usually thought to be linked to the manufacture of physical products, with a general focus on production costs, product quality and competitiveness in the market. Of course these are still important, but in addition, more attention must be paid in sustainable production to the requirements of sustainable development throughout the history of the product, from manufacturing to the end of the product's life cycle. The topic has been examined by Jari Sarja and Matias Ristimella, using the manufacture of intelligent lighting solutions in Kempele as an example. The same idea is referred to in the article by Elisa Maljamäki and Sini Turpeenniemi, "Kestävää lunta" (Sustainable snow), which considers making snow from the perspective of sustainability, taking into account the special features of the production.

As digitalisation develops and its use increases, there is an increasing emphasis on responsibility and other obligations to sustainable development in its production and use. This has been examined in a thematic article by Maarit Tihinen, Leila Saari and Jukka Kääriäinen on the need to use digital tools in small and medium-sized enterprises. Tuomas Valtanen also writes about the effects of digitalisation in his article on the importance of collaboration platforms in international communication and work.

The introduction of the circular economy in Sea Lapland in relation to technological know-how and the results of related project activities are presented in Katri Hendriksson's thematic article on resource wisdom through pilot projects in Sea Lapland. The circular economy is also the subject of a thematic article by Sanna Tyni, Selina Kantanen and Katri Hendriksson on the implementation and results of the Circular School project.

The challenges of a practical circular economy are discussed in two presentations on the further use of horse manure. In her thematic article, Sanna Vinblad comprehensively examines the availability, utilisation, business opportunities and new innovations of horse manure in the light

of good examples. An innovative approach can be found in Otto Pesonen's detailed contribution, which sheds light on practical aspects of horse manure utilisation based on personal experiments. Nutrient recycling related to the theme of manure has also been studied in the Learn About Nutrients project, the main results of which have been compiled by Eija Raimovaara and Kalle Santala in their article "Ravinteiden pitää kiertää" (Nutrients must circulate).

Networking cooperation for sustainable use in forestry production is examined in an article describing the operation of the large, international Rosewood project. The main aim of the project is to disseminate forestry innovations and good practices between the participating countries. Its results provide the reader with solutions or policies that support different dimensions of sustainability and contribute to the objectives of the Green Development Strategy.

In their contribution, Kalle Santala and Anna Suomalainen shed light on the possibilities of sustainable mobility and adaptation to changing mobility practices in a Lapland characterised by long distances.

In Lapland, the importance of local food is emphasised in the tourism industry

An essential part of the success of tourism services is based on the provision of good food of high quality during the trip. This has been recognised in Lapland, and especially tourist destinations offer a variety of traditional dishes based on local ingredients or other dining options that make use of local food. The topic is addressed in more detail in Minna Sippola's article "Onko lähiruoka luksusta?" (Is local food a luxury?). Correspondingly, the article by Sini Yli-Suvanto and Hanna-Mari Romakkaniemi examined the theme of local food based on ideas born in the Vihreä Lappi maailmankartalle – yhteisvoimin! (Putting Green Lapland on the world map – as a joint effort!) webinar, bringing the topic closer to the EU's From Farm to Fork strategy. In their thematic article "Näkökulmia lähituotannon kestävyteen" (Perspectives on the sustainability of local production), Pasi Satokangas, Sini Turpeenniemi and Mika Uitto emphasise the importance of sustainable food production, where local procurement can have an impact on the regional economy and employment. Alongside the carbon footprint of local production, the importance of the carbon handprint in improving the carbon balance is discussed.

In her article, Petra Paloniemi treats industrial tourism as a special theme of tourism, while Mervi Angeria and Seija Tuulentie wrote about the features of sustainable nature tourism in their thematic article. There is still a lot to explore in Lapland, where on the other hand, the themes of green growth may well have been considered long before the EU's new growth strategy. News of reindeer farm tourism and the opinions of entrepreneurs in the field, as well as development ideas in the middle of the corona, can be read in an article by Sini Kestilä and Anni Kauppila, which was compiled on the basis of three workshops held in August.

Climate neutrality and clean energy from Lapland's point of view

The European Green Development Programme seeks to establish guidelines for Europe and the world to tackle climate change through a plan of packages of measures linked to time epochs. As a regional event on the theme of the EU Green Week, a joint Lapland Green Week was organised, on the results of which Sini Yli-Suvanto and Reetta Sipola compiled the thematic article "Ilmastoneutraali EU 2050, Suomi ja Lappi jo 2035" (Climate-neutral EU by 2050, Finland and Lapland already by 2035). The article examines the content of Lapland's own Green Deal, the Lapland Agreement, and the issues raised at the thematic event, based mainly on the opinions of the keynote speakers.

The Green Deal is also the starting point for Satu Ervasti's and Reetta Sipola's thematic article, which examines the use of clean energy in Lapland. Clean energy is defined in the Green Development Programme as a carbon-free, energy-efficient way of producing energy, mainly based on renewable energy sources. In the Lapland Green Week webinar workshop, a summary was compiled on the topic, in which a more self-sufficient future for energy and food production is forecast for Lapland, among other things.

Arene, the Rectors' Conference of Finnish Universities of Applied Science, has drawn attention to the responsibility of higher education institutions for achieving sustainability goals. The Lapland University of Applied Sciences has also been awake, and a recent work plan for responsible development for 2020–22 has recently been published. The topic is discussed in more detail in Katri Hendriksson's and Saira Puukko's thematic article on the development of ecological sustainability at the Lapland University of Applied Sciences.

Socially and culturally sustainable activities in different contexts

Taking care of the well-being of employees is a key task for employers in today's work organisations – and why not older ones as well, but currently the subject just might be talked about more. The issue is also essential for sustainability, which affects many other things besides comfort, not least the results of the work. Employers therefore have good reason to seek to ensure the sustainable use of human resources by taking into account the many factors that affect matters such as cooperation in the work community. In her thematic article, Anne Puro has explored the promotion of well-being at work through sustainable work and resource wisdom. The article considers taking into account the characteristics of employees from the perspective of resource wisdom and how different measures can be used to promote well-being at work. In the end, the topic is largely related to management and the rational development of the work community, taking into account well-being at work.

One way to improve well-being is not in the workplace, but in nature. Maarit Timonen, Johanna Rintala, Panu Huczowski and Pia Rajaniemi have approached the topic through nature coaching based on experience of nature. An operating model linked to various nature-related or nature-related activities

has been developed in projects for different target groups, and it has yielded positive results in both Finland and Sweden.

Anitra Arkko-Saukkonen and Arja Jussila have produced an article on the work of the visual artist and the various forms it may take. Things such as continuous self-development, differences to paid work and networking are emphasised in the work. Obligations and guidelines are provided for training in terms of the effectiveness and continuity of cooperation.

Sisko Häikiö also writes about the importance of networking in her thematic article on the features of the Arctic Smartness operating model. The Lapland University of Applied Sciences is creating a strong network and international cooperation in Lapland, which has resulted in several projects and deepening cooperation between the members of the network.

The same themes – internationality, development activities and education – are also discussed in Esa Jauhola's article, which focuses especially on international activities and the importance of the formed partnerships for the continuity of cooperation. The article describes educational projects implemented over several years between universities in neighbouring countries, where

the network of universities has acted as a creator of cooperation involving businesses, other organisations and students.

The theme of education theme is also broached in Anzelika Krastina's article, which explores a teaching process that aimed at providing students with the skills to integrate a sustainable-development mindset into business in English-language entrepreneurship education. The increased use of digital technology during the corona pandemic even proved to be a positive thing, well suited to the pursuit of green values in studying.

In an article on the alumni activities of the Lapland University of Applied Sciences, Sanna Vinblad and Päivi Honka highlight the importance of alumni as role models and knowledge enhancers for students, and how better results overall can be achieved by making alumni activities more uniform.

The ethics of reindeer meat production was the subject of Karoliina Majuri and Kirsi Muuttoranta, who covered issues related to it with striking headings from many angles, eventually ending up at the event of slaughter. Ethics is primarily sought here based on an ethical operating principle that extends throughout the rearing period.

What is sustainable and open learning, and how can RDI activity be integrated into it? This is discussed in the article by Helena Kangastie and Riitta Alajärvi-Kauppi, which deals with the theme in the operating environment of the Lapland University of Applied Sciences. The text leaves the reader with the question: "Is the production of the skills needed in working life the only goal, or should we also aim at supporting the growth of students into independent, critically analysing, thinking citizens who can act responsibly, sustainably and openly?" To this question, answers are likely to be found in curricula – but how this actually happens will depend on the training of the teachers and their putting it into practice.