TEKNOSAVO

GREEN, GREENER, GREENISH

Teknosavo's customer magazine no. 5

THE ADVANTAGES OF OPTIMIZATION IN THE ENERGY EFFICIENT PULP PRODUCTION

"Savings can be up to 30%, which means annual savings of tens of thousands of euros per production line."

The high price of energy makes pulp mills explore their production processes from a new perspective. By optimizing the processes, the energy efficiency of production can be highly improved at the same when the quality of the process can be increased and the carbon footprint be reduced. Where do these advantages come from?

OPTIMIZED DEBARKING

Optimizing barking with WoodSmart™ not only saves raw materials, but also saves energy. For example, the energy consumption of drum motors per produced cubic meter of chips can be reduced by more than 30%. On an annual basis, this means saving tens of thousands of euros per line. In addition, energy consumption can be reduced by using YardSmart management solution to use wood of uniform quality for production.

DEICING ENERGY SAVINGS

The WoodSmart™ optimization system also includes the facility to optimize the amount of deicing energy needed. This means that the temperature of the water is automatically adjusted according to the amount of wood and the temperature of the return water. Savings can be up to 30%, which means annual savings of tens of thousands of euros per production line. Other savings are achieved in the processing of process waters.

BENEFITS OF UNIFORM CHIP QUALITY IN FURTHER PROCESSES

Optimized debarking produces uniform quality of chips. Thanks to this, more savings are achieved in further processes, such as cooking and bleaching. All advantages described above have significant economical and environmental effects. When the quality of the production and the price obtained from pulp increases as the quantity of the lower-quality final product decreases, the energy consumption of the production is directed to the production with a high market value. At the same time, the total energy used by the mill decreases and the energy balance gets the best benefit from the pulp production. This ensures the continuity of production even during higher energy price peaks.

OPTIMIZATION OF FUEL COSTS IN WOOD LOGISTICS

Optimization also affects the energy efficiency of operations outside the pulp process itself. Fuel costs are significant in raw material chain transportation. It is essential that wood suitable for the production of the plant in question arrives at the factory, and that it can be used in production with the help of effective identification information in a timely manner without unnecessary transfers in the wood yard.

Optimizing pulp production minimizes the amount of woodloss. Correspondingly, the number of transfers on the field decreases. With this, the need to transport the wood used in production and the related fuel costs and carbon footprint will be reduced.

NET-ZERO EMISSIONS 2050

ACHIEVING PULP INDUSTRY'S SUSTAINABILITY TARGETS REQUIRES QUICK ADOPTION OF NEW TECHNOLOGIES

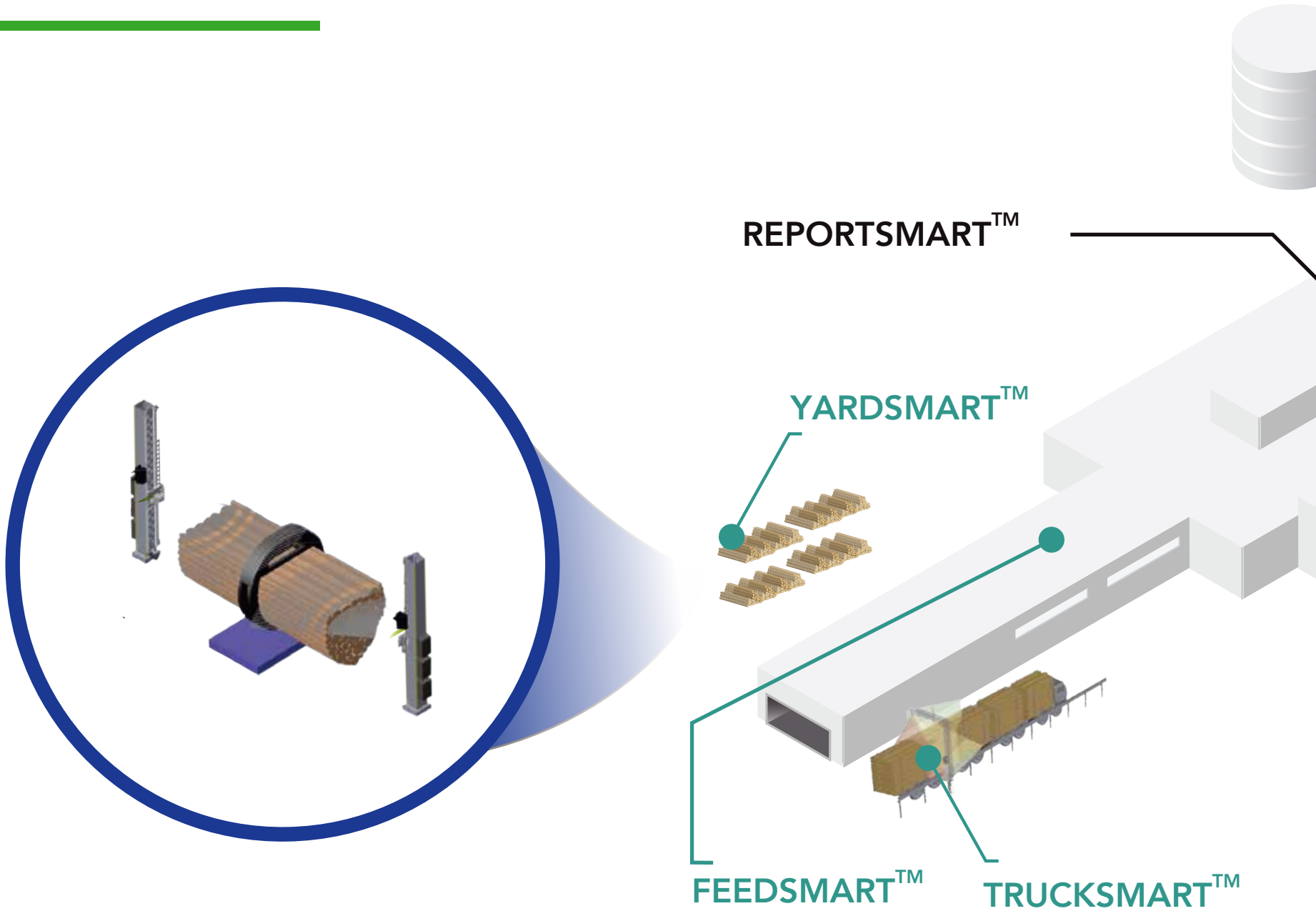
The pulp and paper sector were responsible for about 190 Mt of CO2 emissions in 2021, about 2% of all emissions from industry and a historic high. As paper production is projected to increase to 2030, significant efforts must be made to reduce the emissions intensity of production.

This can be accomplished primarily by moving away from fossil fuels as an energy source and encouraging innovation on technologies that reduce the amount of heat needed for pulp production. Following the Net-Zero Emissions by 2050 scenario requires the industry to reduce its emission intensity by 4 percent annually between 2021 and 2030.

According to the IEA, one of the significant prerequisites for reaching the goal is the improvement of factories' data collection, monitoring and classification systems alongside new types of energy systems. The advantages of information-based production development and benchmarking create new practices that drive the renewal of the industry also on an international level.

The International Energy Agency (IEA) works with countries around the world to shape energy policies for a secure and sustainable future.

TEKNOSAVO'S SOLUTIONS FOR OPTIMIZING INCOMING WOOD FLOW ARE A BIG DIGITAL STEP



The pulp industry has been developing more environmentally friendly production technology for decades. Responsibility has played an important role in the technological development of the industry. Digitization has taken this even further?

Teknosavo has been part of this development for three decades with the aim of 1) reducing the amount of wood loss and 2) reducing the energy used in production. The carbon footprint per a ton of pulp produced with these has already decreased in several factories. At the same time, with the help of mechanical optimization, it has been possible to reduce the impact of human work on product and process quality.

RELIABILITY BY DIGITIZING

Digitization is already well underway at several factories, but at the same time there are still many factories where a large part of the processes is practically carried out by labor. In manual steps, the margin of error is large, and maintaining work performance in different shifts requires the organization's attention in terms of right resourcing and continues internal training.

Machine vision and other smart technologies combined with functional process technology enable the benefits of a reliable and uniform process. Teknosavo's optimization solutions enable digital 1) measurement of the quantity and quality of incoming wood, 2) wood yard data monitoring, 3) optimization of raw wood and chips delivered into the process.

The optimization solutions that extend from the gate to the digester enhance the classification of the raw wood material coming to the factory (TruckSmart/BasinSmart), the collection (YardSmart), the control of production (WoodSmart™) all the way to the quality control of the chips sent to the digester (ChipSmart).

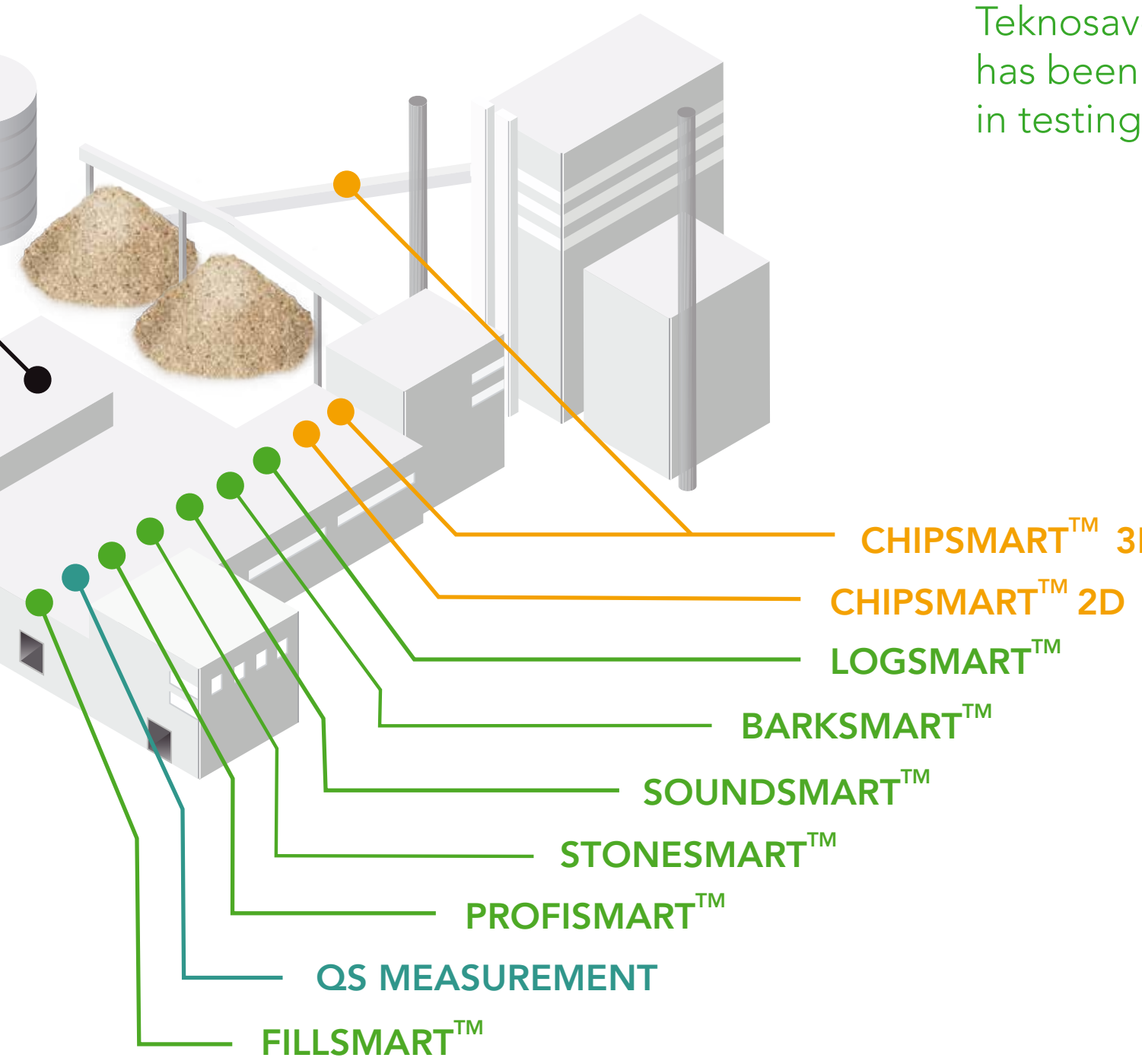
A NEW ERA OF INCOMING WOOD AND INSPECTION MEASUREMENTS

Teknosavo's TruckSmart digitizes the measurement of the raw wood used by the factory. It is suitable for receiving incoming wood. With the help of measurement technology, raw wood arriving on the station of a truck or train can be accurately and quickly documented. BasinSmart, which uses the same patented technology, does this for bundle-based measurement. BasinSmart is excellent for inspection measurements or for the needs of measurements in the wood yard.

TruckSmart and BasinSmart measure the volume of wood under the bark by calculating the cylinder volume of wood using imaging technology. The measurement accuracy of the solution follows the requirements of high Nordic standards. The accuracy requirement for incoming wood is 4% in Finland and 6% in Sweden. In inspection measurements, less than 2% accuracy is required. The measurement accuracy deviation of the system has been close to 0% in testing. In addition to the measured volume, the system tells you the volume and weight of the wood, as well as the fresh density based on these.

With the help of technology, reliable raw material data can be obtained from the wood driven to the machine vision station or lifted in bundles in 30 seconds. The technology speeds up the processing of incoming wood significantly. At the same time, it frees up the staff who did the measurement for other tasks at the reception. The digitization of the process not only

"The measurement accuracy deviation of Teknosavo's system has been close to 0% in testing."



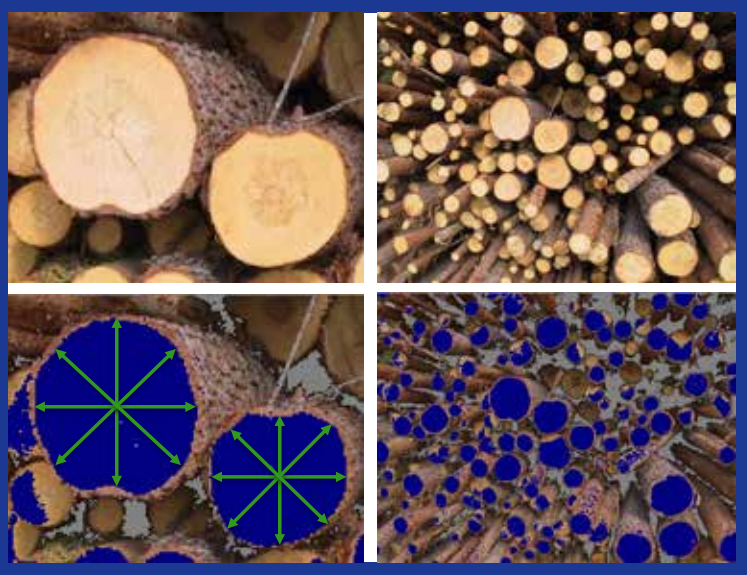
improves the reception, but also the subsequent processing of wood data in the factory's production, as well as in various administrative processes. On the other hand, the bundle measurement performed by BasinSmart in the process is easy to implement efficiently as part of the wood transfer process.

ACCURATE WOODYARD BOOKKEEPING SPEEDS YARD LOGISTICS

With the help of , the identification information of the raw wood bundles sent to the wood yard can be easily managed. The quality and location information of each bundle can be easily determined in the field coordinate system. With YardSmart, wood yard accounting is real-time, accurate and easy to use. The driver's system interface screen guides him directly to the correct stack, reducing unnecessary traffic in the woodyard.

In YardSmart, it is possible to take advantage of either the product information created by Teknosavo's TruckSmart or the corresponding data entered through another system.

TruckSmart and BasinSmart measure the volume of wood under the bark by calculating the cylinder volume of wood using imaging technology. The measurement accuracy of the solution follows the requirements of high Nordic standards.



TEKNOSAVO

METSÄ FIBER CHOSE WOODSMART™ AS A PART OF KEMI'S INVESTMENTS


Photo:Metsä Fiber

Metsä Group's bioproduct factory in Kemi will be the most efficient wood processing plant in Europe. The new production facility has decided to invest in Teknosavo's technology by choosing the WoodSmart™ measurement system for its factory.

The solution enables precise monitoring of the wood debarking process, high-class cleaning degree of the material used in the process, and minimal raw wood loss.

These factors are important for the customer because the investment has focused especially on material efficiency. WoodSmart™ increases the capacity of the debarking line, reduces quality differences between work shifts and improves the work ergonomics of the line.

The Metsä Fiber factory coming to Kemi is the largest investment in the history of the Finnish forest industry. The factory operates completely without fossil fuels.

Teknosavo's WoodSmart™ brings significant energy savings to the factory, which strives for maximum energy efficiency. The modern bioproduct factory will be completed in the third quarter of 2023. It produces 1.5 million tons of pine and birch pulp per year.

HOLMEN – A SATISFIED CUSTOMER IS THE BEST RE-COMMENDER


Photo: Holmen

In 2018, the Mill from Holmen Paper Hallstavik adopted Teknosavo's WoodSmart™ technology. With it, it was possible to better optimize the quality of the debarked wood that goes into the factory's process. At the same time, wood loss decreased, the need for the necessary wood decreased and the quality of production improved. These results accelerated the company's decision to adopt the technology in the company's other factories as well.

Holmen Braviken's WoodSmart™ has been installed and commissioned in October 2021. This was the company's second site where Teknosavo's technology was introduced. The delivery of the WoodSmart™ installed in the factory's line took place at the beginning of November. The implementation of the solution aims to have effects on the amount of wood needed by the factory, as well as on the quality and efficiency of production. The investment is based on the good experiences gained from the line installed in Hallstavik before the corona virus:

"The loss of wood has decreased significantly as the bark content of the wood chips remains low, and the energy consumption of the drum motors per ton of chips has decreased." Said process engineer Lars-Håkan Jansson from Holmen's Hallstavik factory shortly after installing WoodSmart™ in 2019. Also in Braviken, there has been many benefits after WoodSmart™was taken into use.

Holmen's experiences match those of dozens of other factories. WoodSmat™, like Teknosavo's other optimization solutions, offers its customers significant raw material savings and production efficiency. With these, the factory's carbon footprint also decreases.

As the importance of environmental values and challenges related to wood availability increases, the importance of optimization becomes even more important. Teknosavo's solutions are a way to enter a more sustainable era of pulp production.

TEKNOSAVO

TEKNOSAVO OY
Vipusenkatu 15
57200 Savonlinna, Finland

Tel. +358 15 477 0700

CONTACT SALES:
smart@teknosavo.fi

www.teknosavo.fi