



ERICSSON

CONNECTED VINEYARDS

How the Internet of Things is
enhancing the winemaking industry

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THE RISE OF THE IOT

Ericsson envisions that in the future, everyone and everything that can benefit from being connected will be connected – we call this the Networked Society. This vision will be made possible with the rise of new technologies and business ecosystems.

The Internet of Things (IoT) – where everyday objects are connected to the internet – will play an important role in this opportunity for growth, as it has the potential to transform every industry. Here we present an example of how the IoT is enabling the realization of the Networked Society, and highlight the ways that new technology can be used to benefit business.

Helping success to grow

The wine industry is one of many sectors investigating the potential of the IoT. In Germany, Ericsson is taking part in a trial to demonstrate how sensor data from a vineyard environment can be collected and processed in order to better inform wine producers about their grapes.



MyOmega's vision is to be the leading technology company for the IoT. It is the inventor of MYNXG, the IoT ecosystem that enables the Industry 4.0 and associated applications. MyOmega's solution is designed to support industrial customers by connecting any kind of machine, device and sensor to the cloud using the strongest security mechanisms in the industry.

As part of the trial we have partnered with MyOmega, an IoT startup company who offer products and services that connect devices efficiently and securely to business portals and cloud services.

The trial features Ericsson IoT Security Services, which are part of the Ericsson Device Connection Platform (DCP) providing SIM-based device authentication and secure, encrypted connectivity end-to-end. This is combined with MyOmega's gateway and radio sensors, as well as technology from Intel and connectivity provided by Telenor Conexion, to form a complete ecosystem for collecting and analyzing data from the vineyards.

Here we examine the benefits that this new technology is providing, and its potential to scale within the winemaking industry, as well as the impact it could have on other industries.



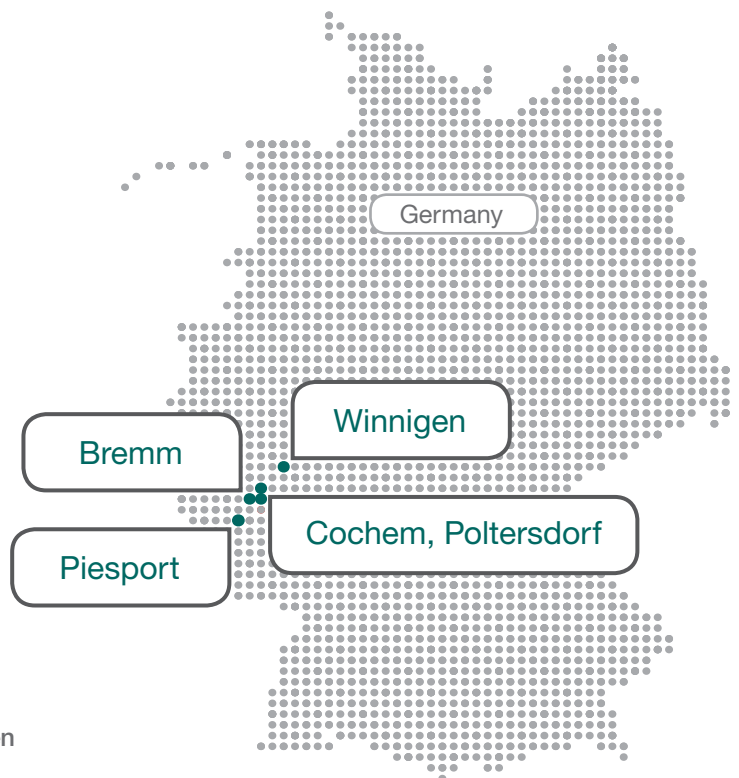
THE OLD AND THE NEW

In order to evaluate the IoT solution and its impact on agriculture, the innovative technology is being applied to several vineyards in the Moselle Valley, Germany to assess its performance. In conjunction with Ericsson and other partners, the trial is operated by MyOmega, a company that offers TracoVino, the IoT solution for vineyards and the automation of vinification.

The Moselle Valley has a long history of producing wine. The current generation of winemakers has brought back worldwide prestige to the Moselle Valley based on the outstanding quality of its Riesling wines. The TracoVino trial is verifying how data from the vineyard can be combined with the expertise of the winemakers to improve the quality of the grapes significantly.

Participating winemakers

Winemaker: Knebel	Winemaker: Franzen
Location: Winnigen	Location: Bremm
Vineyards: Hamm, Röttgen, Bruckstück	Vineyard: Calmont
Winemaker: Clemens	Winemaker: Haart
Location: Poltersdorf	Location: Piesport
Vineyard: Altarberg	Vineyard: Goldtröpfchen
Winemaker: Clemens	
Location: Cochem	
Vineyard: Schlossberg	



THROUGH THE GRAPEVINE

The solution used in the trial comprises 5 IoT gateways that connect to 20 solar-powered sensor platforms, which are placed throughout each vineyard. Part of the trial is to assess the best placement of the sensors, as this information will help winemakers in future industry applications of the technology.

The sensors are designed to measure a variety of environmental factors, including:

- > Air humidity and temperature
- > Soil humidity and temperature
- > Solar intensity



The trial tests how the data collected from the vineyards can be utilized in order to perform predictive analysis. The benefits of this include:

> **Maximized output and optimized management**

Predicting the optimum time for harvest can significantly improve quality and minimize risks for the grapes. Subsequently the yield of the wine is increased. The analysis performed by TracoVino helps staff to plan the allocation of resources and specify the precise necessary actions in advance.

> **Improved wine quality**

The data collected from the vineyards allows winemakers to assess vineyard conditions in order to define the optimal time and location for fertilization, irrigation and use of fungicides.

> **Remote monitoring of the vineyard**

The winemaker has real-time access to their vineyard data anytime and anywhere through the TracoVino app using the mobile network.

> **Eco-friendly operations**

The ability to predict how and when to use resources enables the producers to minimize impact on the environment.

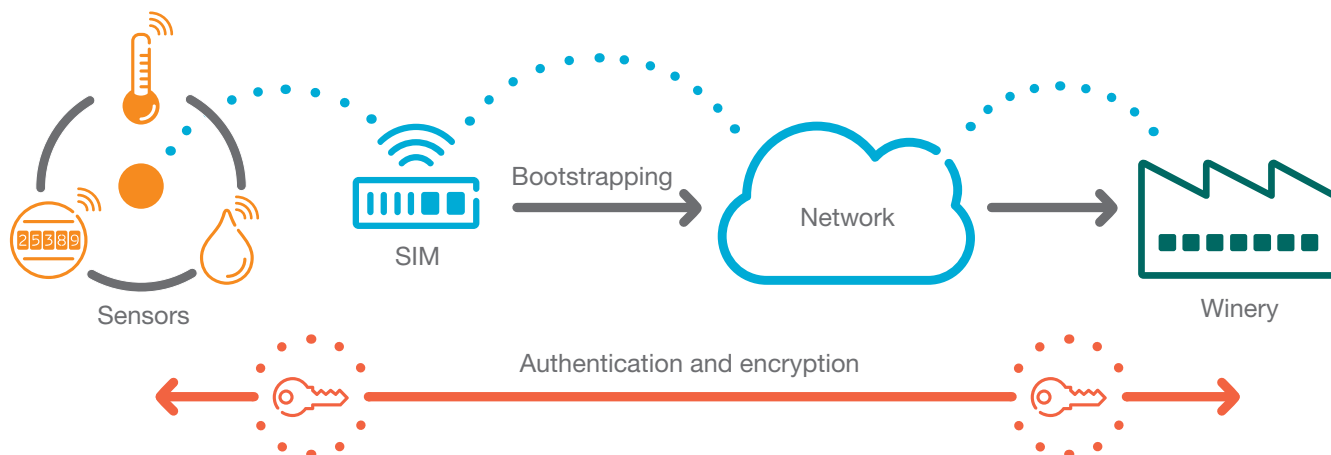


“TracoVino can definitely help us to work more exactly e.g. for working steps like vine defoliation, where hours and days matter.”

Winery: Franzen, Bremm

UTILIZING DATA

Generic Bootstrapping Architecture



The data collected from the sensor platforms is communicated to the IoT gateway via mid-range radio technology with coverage up to 3 km. The gateway aggregates the data and sends it via 3G network (provided by Telenor Connexion) to the MyOmega service layer hosted by a cloud server.

A unique security solution

As part of the trial, Telenor Connexion is providing global connectivity through SIM cards managed by the Ericsson DCP.

Ericsson is also providing an associated IoT security service end-to-end based on 3GPP standard Generic Bootstrapping Architecture (GBA). This enables the reuse of the SIM card credentials and generates security keys to set-up secure end-to-end authentication and encryption from the sensors towards the application in the MyOmega service layer.

During the bootstrapping procedure, the security keys are generated on the MYNXG IoT Gateway and in the Ericsson IoT Security Solution in DCP. The keys can be time-limited and generated on demand, thereby enhancing security even further.

Value for winemakers

> Access to the IoT

Winemakers have technology that is easy to install, maintenance-free, and secure. The sensors are designed for usage in the vineyards, and are robust, highly-reliable and machinery-friendly.

Value for operators

> Monetization of their key asset – connectivity (through SIM cards)

Adding security features such as device authentication and encryption on the application layer increases the value delivered by the operator.

> Expanded business opportunities

With IoT connectivity solutions, operators can address new markets by offering services to customers with devices connected to a mobile gateway.

> Short time-to-market

The IoT security solution offered as a cloud service through Ericsson DCP avoids the need for operators to make upfront investments and time-consuming deployments.

Value for the enterprise

> End-to-end security based on a secure physical identity (the SIM card)

SIM-based authentication is a standardized, trusted and worldwide deployed technology.

> Full control of security

The enterprise is in full control of its security policy through management of key distribution, key validity and the ability to allow/block device connectivity to enterprise data.

> New partnerships

Enterprises can improve their operations and target adjacent business areas through the use of internet connectivity.

THE VALUE CHAIN



The TracoVino value chain

In order to truly realize the Networked Society, new partnerships will need to be formed between technology providers and industries so as to create the ecosystems necessary to enable the IoT.

It is these new value chains that will create opportunities for all stakeholders involved, allowing them to expand their revenue streams and connect with alternative business areas.

The TracoVino solution is one example of a new value chain, as it involves many parties, each providing different products and services.

Ericsson

- > Connectivity management as-a-Service through the Device Connection Platform
- > End-to-end security service (based on SIM)

Intel

- > Chipset in the MyOmega gateway
- > 3GPP modem with security function

Telenor Connexion

- > Global connectivity using SIM

MyOmega

- > MYNXG IoT Gateway
- > MYNXG service and cloud
- > MYNXG analytical tools

TracoVino by MyOmega

- > Connectivity management
- > Security based on SIM
- > Sensor solutions and platforms
- > Data quality and predictive applications
- > Local support



Winery

EXPANDING TO OTHER INDUSTRIES

As technology begins to open new business models, companies around the world are making the move away from selling machines and products, and are increasingly selling services instead.

In line with this, there are several ways to utilize the IoT technology and solution used in the TracoVino trial in order to generate additional business for DCP on-boarded operators.

For example, with agricultural use cases, the TracoVino solution could be replicated with few customizations.

The unique scale and security of the technology are particularly important when it comes to expanding applications in other industries, such as transportation, health, construction and manufacturing. These sectors also benefit from devices and objects that are securely connected to an internet network, allowing data to be analyzed with a view to improving day-to-day operations.

In these instances, the solution used in the TracoVino trial could be reused. The sensor technology could be customized depending on the use case.

Ericsson's IoT security service in particular is a component that can be reused for large-scale IoT, Machine-to-Machine and industry use cases, without any adaptations. We can supply the software to the relevant IoT device and gateway developer community to shorten the time-to-market and increase uptake of the service.

Not only does Ericsson provide a global connectivity solution for emerging business models, but we also ensure safe transfer of data and complete security.



Leading transformation through mobility

We are a world leader in the rapidly changing environment of communications technology – providing equipment, software and services to enable transformation through mobility.

Some 40 percent of global mobile traffic runs through networks we have supplied. More than 1 billion subscribers around the world rely every day on networks that we manage. With more than 37,000 granted patents, we have one of the industry's strongest intellectual property rights portfolios.

Our leadership in technology and services has been a driving force behind the expansion and improvement of connectivity worldwide. We believe that through mobility, our society can be transformed for the better. New innovations and forms of expression are finding a greater audience, industries and hierarchies are being revolutionized, and we are seeing a fundamental change in the way we communicate, socialize and make decisions together.

These exciting changes represent the realization of our vision: a Networked Society, where every person and every industry is empowered to reach their full potential.

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