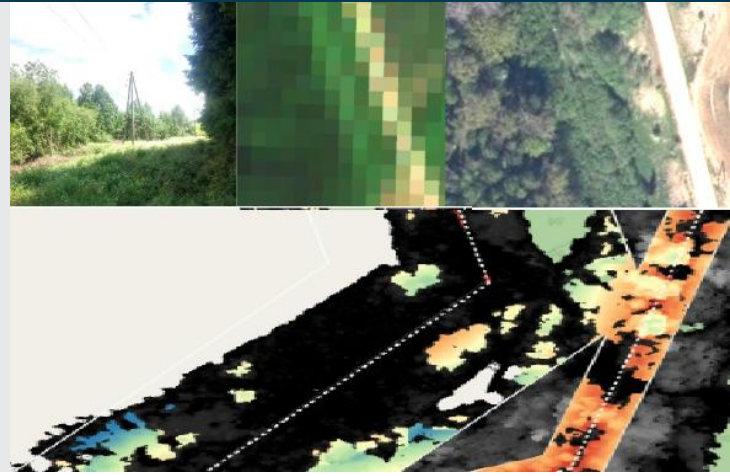


## SUCCESS CASE 11.2026 Satellite-based Vegetation Control System

FULLY AUTOMATED OVERHEAD  
POWER LINES VEGETATION  
MANAGEMENT SERVICE FOR  
DSO "SADALES TIKLS"



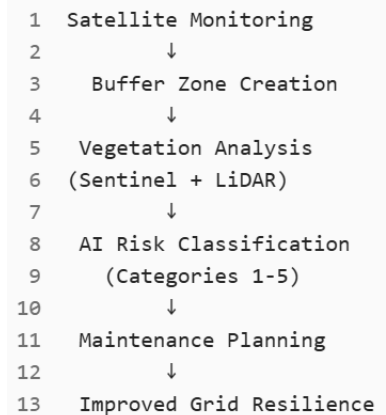
### THE CHALLENGE

Vegetation growing near overhead power lines is a major operational and safety risk for electricity distribution networks. Trees and branches coming into contact with power lines can cause outages, service interruptions, and infrastructure damage. Traditional vegetation management, based on field surveys and helicopter inspections, is costly, resource-intensive, and often reactive rather than predictive. The challenge is particularly significant in Latvia, where approximately **50% of the territory is covered by forests** and **around 10 major storm events occur each year**. These conditions increase the likelihood of vegetation-related outages and create a need for more efficient monitoring across large and remote network areas. To improve network resilience and optimize maintenance activities, system operators require proactive, scalable, and data-driven solutions that enable early identification and mitigation of vegetation-related risks.

### THE SOLUTION

DSO «Sadales tīkls» has developed an automated Satellite-based Vegetation Control System that integrates Sentinel satellite imagery, LiDAR data, and AI-powered analytics within a high-performance web application. The solution automatically creates protection buffer zones around overhead power lines, with corridor widths determined by line voltage and surrounding land cover. Vegetation within these zones is continuously assessed by combining LiDAR-based 3D information on tree height and structure with frequently updated Sentinel observations of current tree cover conditions.

The platform provides a comprehensive view of the distribution network, enabling users to analyse vegetation risks, filter and update data, and generate operational reports. Based on current conditions and predicted vegetation growth, the system automatically prioritizes maintenance activities through a five-level risk classification framework, supporting efficient work order planning for contractors.



By combining satellite and LiDAR data, the solution reduces dependence on repeated large-scale field inspections and LiDAR acquisitions while maintaining high monitoring accuracy. The system enhances situational awareness, enables predictive vegetation management, optimizes maintenance investments, and strengthens the resilience and reliability of the electricity distribution network.

For more information about the project, please contact:

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| MAIN ACHIEVEMENTS                 | BENEFITS                                 |
|-----------------------------------|------------------------------------------|
| AI-driven vegetation management   | Fewer vegetation-related outages         |
| Automated risk zone detection     | Lower inspection costs                   |
| Automated work order generation   | More efficient maintenance planning      |
| Contractor performance monitoring | Improved grid reliability and resilience |
| Reduced need for LiDAR surveys    | Predictive maintenance approach          |

## RESULTS

| Accuracy Class                                                | MV network       | LV network        |
|---------------------------------------------------------------|------------------|-------------------|
| Field inspections for algorithm validation                    | 61 objects       | 366 objects       |
| Clearing works scheduled for 2026-2027, as the first priority | 52 objects (85%) | 288 objects (79%) |
| Clearing works scheduled for 2028, as the second priority     | 6 objects (10%)  | 56 objects (15%)  |
| No clearing works should be performed in this case            | 3 objects (5%)   | 22 objects (5%)   |

- Field inspections confirmed solution accuracy of 85% in MV network and 79% in LV network.

## MAIN SUCCESS FACTORS

- High-quality GIS and asset data.
- Advanced AI models for vegetation growth prediction and risk scoring.
- Effective integration with GIS and maintenance management systems.
- Strong operational adoption supported by clear workflows and user-friendly dashboards.
- Robust business case and continuous validation of results.

## WAY FORWARD

- Scale the solution across the entire distribution network.
- Further enhance AI models for improved tree species identification and growth prediction.
- Integrate real-time weather and climate data to strengthen forecasting capabilities.
- Increase automation of maintenance workflows, including automated work order generation.
- Explore advanced technologies such as drone integration and edge analytics to further improve monitoring efficiency and accuracy.

Validation of the data processing results: SAT vs LIDAR data

