

# Reducing flood risk for energy companies

## Helping energy companies to monitor environmental risks and reduce downtime across networks

### The specific challenge for energy companies

Energy assets such as towers and substations are integral in supplying consumers with power. Although they have been designed to withstand a variety of environmental conditions, the increasing number of extreme weather events is exposing them to increased risk. There is a need for energy companies to monitor the ever-growing complexity of environmental risks, in order to provide an uninterrupted service to their customers.

Surface water flooding represents a pervasive peril, occurring when drainage systems are overwhelmed – typically due to intense rainfall in urban areas. It can have detrimental implications for critical energy infrastructures, such as primary and secondary substations. Solutions are urgently needed to predict the timing, persistence and magnitude of surface water flooding, in order to inform management and understand the effects on energy network performance.



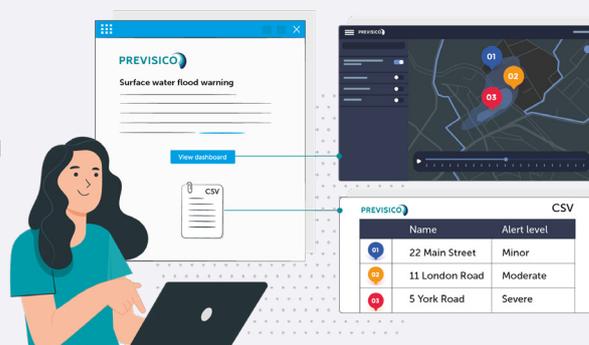
### Solutions for energy companies

Previsico delivers a warning and forecast service for surface water and ordinary water course flooding at 25m resolution using its proprietary live hydrodynamic modelling software.

- **Flood dashboard:** Displays predicted time and depth of flooding up to 48 hours in advance. Scroll and zoom to see predictions at street and property level anywhere in the US.
- **Automated warnings:** Automated email warnings when districts and critical infrastructure are at risk.
- **Sensors:** Complimentary to Previsico's forecasting technology and used as a high-uncertainty-avoidance solution to monitor water depth and flow above ground (e.g. streams, lakes, screened culverts) and below ground (e.g. inspection chambers).
- **APIs:** Technologies integrate seamlessly with existing systems.

### Benefits for energy companies

- Provides timely information on surface water flood risk to inform event response, mitigating impacts and losses.
- Insights can support actioning of requests for help from customers during and/or after events (front-end triage).
- Sensors support accurate and effective monitoring of water levels and conveyance (above and below ground) across significant geographical scales in near-real-time to inform understanding of risks to networks and infrastructure.



## The growing flood problem

If climate change brings significant sea-level rise (as many models predict), that raises new vulnerabilities for power plants in the U.S.

- Nine nuclear-power plants are located within two miles of the ocean.\*
- 8,625 power plants are sited near shorelines to have access to water.\*
- According to the Department of Energy, 44 power plants were in flooded areas during Hurricane Irene and 69 during Hurricane Sandy.\*
- During these hurricanes, eight nuclear power plants had to shut down or reduce service.\*
- When Hurricane Harvey hit Houston in 2017, wind and catastrophic flooding knocked down or damaged more than 6,200 distribution poles and 850 transmission structures. 21.4 gigawatts of generation were affected.\*

\* References: [Mckinsey.com/why-and-how-utilities-should-start-to-manage-climate-change-risk](https://www.mckinsey.com/why-and-how-utilities-should-start-to-manage-climate-change-risk)

“ The expected increase in flooding means that energy companies need to assess their exposure and develop strategies to mitigate risks. Early warnings can help them to prepare for flood events and potentially prevent network outages. ”

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