

Zeynep YILDIZ¹
Research Associate

EVALUATION NOTE

STORKS, POWER LINES AND FIRE RISK

In August 2026, numerous dead and injured storks were found along a railway electrification line in Küçükçekmece, Istanbul (T24 Haber Merkezi, 2026). The incident raised questions about how bird safety should be addressed where migration routes intersect with electrified infrastructure. It also prompted concerns about whether contact with electrical infrastructure could have wider consequences in fire-prone areas.

The events in Küçükçekmece call for a reassessment of how we manage the risks that electrical infrastructure poses to birds and ecosystems.

This note does not treat the Küçükçekmece case solely as an isolated incident within the remit of Turkish State Railways (TCDD). Instead, it explores why risks differ across railway catenary systems, transmission lines operated by the Turkish Electricity Transmission Corporation (TEİAŞ), and electricity distribution networks. It also examines the distinction between collision and electrocution, the potential for fire, existing gaps, and feasible policy options.

1. Data and Methodological Limitations

The news reports, field accounts, institutional statements, scientific studies, and tender documents used in this study provide different levels of evidence. Death tolls reported on different dates may represent cumulative counts from the same incident and should therefore not be added together. Similarly, quantities specified in tenders or programs do not indicate the length of completed installations. Because publicly available records lack a shared dataset distinguishing bird contact from other faults involving electrical infrastructure, the proportion of fires caused by birds in Türkiye cannot be calculated.

The Center for Countering Disinformation under the Presidency's Directorate of Communications stated that electrical causes accounted for less than 5% of forest fires (Demirören Haber

¹ <https://www.tepav.org.tr/en/ekibimiz/s/1525>

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Ajansı [DHA], 2025). The Chamber of Electrical Engineers, however, claimed that the share reached 25% among fires with an identified cause (Elektrik Mühendisleri Odası [EMO], 2025). These two figures cannot be compared directly because the periods, datasets and denominators were not specified.

2. What Happened in Küçükçekmece?

According to field observers, storks perched on poles and catenary components along the railway line to rest and roost during migration. Some deaths reportedly occurred when the birds' wings came into contact with electrical wires (Hançerigüzel, 2026). In a statement dated 27 August, Minister of Transport and Infrastructure Abdulkadir Uraloğlu also noted that the birds arrived in the area particularly between 18:00 and 20:00, settling on catenary structures and nearby locations to roost (Oruç, 2026b). Although this statement confirms the storks' perching behavior, a detailed technical investigation report identifying the precise catenary components involved in the fatal contact has yet to be published.

The initial field account reported that 52 dead and 5 injured storks had been found on 6 August (Hançerigüzel, 2026). On 11 August, TCDD stated that storks had been harmed through contact with railway electrification infrastructure and announced an investigation, but did not disclose the number of dead birds (Oruç, 2026a). Drawing on social media posts, Hançerigüzel's article dated 13 August reported 81 deaths in only those areas that could be surveyed (Hançerigüzel, 2026). A T24 article published on the same date, citing Erdem Kuruca's field observations, reported at least 101 dead and 7 injured storks (T24 Haber Merkezi, 2026). Table 1 presents the changes in reported counts over time, their sources, and the limitations that should guide their interpretation.

Table 1. Timeline and evidence levels of reported counts in the Küçükçekmece incident

Date	Reported findings	Source and type of evidence	How should the findings be interpreted?
6 August 2026	52 dead, 5 injured	Field observations reported by Hançerigüzel (2026)	Initial field count, rather than an official institutional total.
11 August 2026	Death toll not disclosed	TCDD statement reported by Oruç (2026a)	TCDD confirmed that birds had been harmed by railway electrification infrastructure and that an investigation had been launched.
13 August 2026	81 dead	Field observations reported by Hançerigüzel (2026)	Updated cumulative field count for the same area.
13 August 2026	At least 101 dead, 7 injured	T24 Haber Merkezi (2026) report based on a field observer's findings	Higher cumulative count published on the same day. It is unofficial and limited to accessible areas.

Note: The figures are cumulative field counts reported on different dates for the same incident and should not be added together.

3. Are TCDD's Measures Sufficient?

TCDD teams reportedly identified high-risk locations, expanded the use of anti-perching devices and assessed potential safe perching sites (DHA, 2026). According to a field account

published in Sözcü, protective covers were fitted over energized components. During periods when storks congregated, a rail-mounted catenary maintenance vehicle was used in an attempt to guide the birds toward safe areas (Haber Merkezi, 2026).

Uraloğlu stated that existing anti-perching devices could be inadequate for large-bodied, long-legged storks, prompting the installation of taller, stork-specific anti-perching devices at selected locations (Oruç, 2026b). These are necessary emergency measures while migration continues. However, their effectiveness cannot yet be measured because the number of devices installed, the length of line protected, and changes in the death toll following installation have not been disclosed. Monitoring should also establish whether the deterrents redirect birds toward other hazardous locations (Martín Martín et al., 2022).

The issue, therefore, is not that TCDD has taken no action. The central need is to integrate emergency responses into a lasting system. To this end, a publicly available incident report should identify hazardous catenary components, specify the extent of insulation measures and set out an implementation timetable.

4. Historical and Ecological Context

4.1. The Historical and Cultural Significance of Storks in Türkiye

This note's focus on storks does not imply that other species or ecosystems are less important. The mass deaths in Küçükçekmece brought the broader impacts of electrical infrastructure on wildlife into focus through the case of storks. The stork is therefore treated here as an indicator species for monitoring biodiversity risks.

In Türkiye, the stork is a cultural symbol associated with spring, abundance, kindness, and family ties. Altier (2022) notes that storks are known as “Hacı Baba” and that killing them or damaging their nests is considered a sin (pp. 125, 129–130). This cultural significance was also reflected in historical conservation practices. Examples include Bursa's Gurabahane-i Laklakan and funds allocated by a charitable endowment to feed storks (Altier, 2022, p. 130; Özcan, 2016).

Today, pairing nests with “foster families” and establishing local arrangements to care for injured birds in Eskikaraağaç, on the shores of Lake Uluabat, demonstrate the continuation of this tradition (Numanoğlu, 2025). In the same area, regular monitoring of Yaren the stork and the fitting of satellite transmitters to its chicks have brought cultural interest together with scientific monitoring and local participation (Doğa Koruma ve Millî Parklar Genel Müdürlüğü, 2025; Karacabey Belediyesi, 2026).

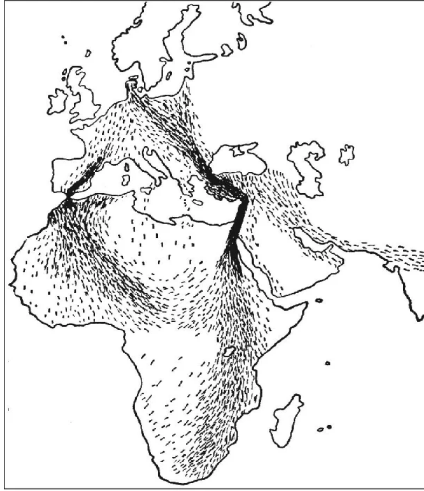
4.2. Migration Routes and Türkiye's Ecological Position

The risks that electrified infrastructure poses to birds are not evenly distributed across Türkiye. The broader literature on bird migration shows that geographical barriers and landscape features that guide migration can concentrate bird movements at particular locations and times, creating migration bottlenecks (Busse et al., 2014). During long-distance migration, white storks rely heavily on thermal updraughts that form over land to gain altitude and conserve energy. The limited availability of these air currents over large bodies of water channels storks toward overland routes and narrow crossings (Blas et al., 2020). Consequently, the western branch of white stork migration between Europe and Africa is concentrated at the Strait of Gibraltar, while the eastern branch converges at the Bosphorus (Blas et al., 2020). Türkiye encompasses a substantial part of the eastern migration route, which enters Anatolia via the Bosphorus and continues to Africa through the Eastern

Mediterranean. The Belen Pass is also one of the principal crossing points used by soaring birds (Belen Kaymakamlığı, n.d.).

Figure 1 shows the main migration routes of white storks between Europe and Africa. This historical schematic does not, on its own, constitute a current risk map. Infrastructure decisions should consider recent bird observations, incident records, telemetry findings and the location of electrified infrastructure together.

Figure 1. Schematic representation of the main migration routes of white storks between Europe and Africa



Source: Map by Dorst (1962), reproduced in Busse et al. (2014, Figure 1, p. 5). The figure caption states that the original schematic was based on Rüppell (1942) and adapted by Verheyen (1950).

5. Why Does the Issue Extend beyond TCDD?

During the same migration period, people reportedly saw dead storks beneath electricity poles in Silivri and Bursa (Hançerigüzel, 2026). In Mersin, three of five storks that perched on a pole reportedly died from electrocution (İhlas Haber Ajansı, 2026). In Tekirdağ, approximately 30 dead storks were reportedly found along a high-voltage line (Taşoyar, 2026).

These records differ in their sources and levels of evidence. No publicly available technical report identifies the mechanism of death or the hazardous component in any of these cases. The records should therefore be treated as field reports warranting investigation rather than combined into a national total. Table 2 summarizes the details.

Table 2. Selected reports of stork deaths associated with electrical infrastructure in Türkiye appearing in news and social media, August 2026

Location	Reported findings	Infrastructure information	Source and evidence status
Silivri, Istanbul	Dead storks were reportedly found beneath electricity poles described as newly installed. No count was disclosed.	Electricity network poles are shown, but the voltage level, operator, and relevant technical components have not been verified.	Haçerigüzel (2026) reported social media footage and accounts from local residents. No institutional statement or technical investigation report has been published.
Dereçavuş, Bursa	More than five dead storks were reportedly seen beneath an electricity pole.	An electricity pole is shown, but the voltage level, operator, and relevant technical components have not been verified.	Based on a nature observer's social media account (Haçerigüzel, 2026). No institutional statement or technical investigation report has been published.
Resulköy, Toroslar/Mersin	Three of five storks that perched on a pole reportedly died from electrocution.	An electricity pole is shown, but the source does not specify the voltage level or operator.	Based on a video news report by İhlas Haber Ajansı (2026). Although the footage provides evidence of the incident, the count of three deaths relies on the agency's reporting. No institutional technical investigation report has been published.
Marmaraereğlisi, Tekirdağ	Approximately 30 dead storks were reportedly found along a high-voltage line, with electrocution suspected as the cause of death.	The news report describes the infrastructure as a high-voltage line. Officials from Trakya Elektrik Dağıtım A.Ş. (TREDAS) stated that a detailed inspection and maintenance work would be carried out.	Based on DHA's field reporting and an account from a representative of a local environmental association (Taşoyar, 2026). The findings of the technical investigation have yet to be published.

Note: The table summarizes selected media reports available as of 2 September 2026 according to their sources and evidence status. Each record was treated as an indication of a potential incident requiring technical investigation at the relevant location.

6. How Do Birds Die on Electrified Infrastructure?

6.1. Collision and Electrocution Are Distinct Mechanisms

Collision and electrocution are two distinct mechanisms of death and injury. Collision occurs when a bird in flight physically strikes a conductor, a shield wire, or another overhead line component. Electrocution occurs when a bird's body forms a conductive connection between two points at different electrical potentials, exposing it to an electric current (Martín Martín et al., 2022). A bird can therefore suffer electrocution without colliding with a line, while striking a conductor does not necessarily expose it to an electric current.

Large-bodied birds with wide wingspans are particularly vulnerable to electrocution when they simultaneously touch an energized conductor and an grounded metal component, or two conductors of different phases. Accessible energized components associated with bare jumper wires, pin-type insulators, fuse cutouts and pole-mounted transformers can increase this risk

(International Finance Corporation [IFC] & European Bank for Reconstruction and Development [EBRD], 2026). In a local intervention in Iran, 75 pin-type insulators identified as hazardous were replaced with an equal number of suspension insulators, further illustrating the importance of pole geometry and insulator arrangement for bird safety (Kolnegari et al., 2024, p. 284).

Railway catenary systems and electricity distribution poles differ in their technical configurations. A catenary system is an overhead electrical system that supplies traction power to electric trains and comprises poles, messenger wires, a contact wire, insulators and fittings (Kuşdoğan & Doğruer, 2021, pp. 131–132). Catenary systems and distribution lines differ in their component arrangements, voltage levels, grounding arrangements and operating conditions. Devices or insulation solutions developed for distribution lines should therefore not be applied directly to catenary systems without verifying their electrical and mechanical suitability. In both types of infrastructure, however, the fundamental aim is to prevent birds from forming a conductive connection between components at different electrical potentials. Select solutions separately for each infrastructure type based on its design and operating conditions.

6.2. A Single Device Cannot Eliminate All Risks

Deterrent devices intended to keep birds away from hazardous components may shift the risk elsewhere rather than eliminate it if safe perching or nesting alternatives are not provided. Bird safety should therefore not rely solely on anti-perching devices.

Solutions for catenary systems must also be designed to suit the electrical, mechanical and operating conditions specific to railways. Since anti-perching devices may redirect birds toward other, more hazardous parts of the same structure, their safety and effectiveness should be monitored after installation (Martín Martín et al., 2022, pp. 113, 116–119). Table 3 presents the risk types, the technical measures available to address them and the limitations of each measure.

Table 3. Technical measures by risk type in bird interactions with electrified infrastructure

Risk type	Measure	Primary function	Limitations and conditions for use
Collision	Installation of line markers such as spirals, reflective rings, flappers or, at suitable locations, warning spheres.	Helps birds in flight detect conductors earlier.	Does not directly prevent electrocution. Placement should take migration corridors, wetlands, flight height and visibility conditions into account (Martín Martín et al., 2022).
Electrocution	Provision of safe electrical clearances and insulation of bare jumper wires, areas around insulators, and other accessible energized components.	Prevents birds from forming a conductive connection between phases or between phase and ground.	Materials should be suitable for the voltage class and tested for dielectric strength and resistance to ultraviolet radiation, temperature and mechanical stresses (IFC & EBRD, 2026).
Perching and nesting	Installation of safe perches or nesting platforms and, where necessary, controlled relocation of nests in hazardous locations.	Provides birds with a safe alternative away from hazardous electrical components (Moreira et al., 2018).	Deterrent devices should not be used alone. Monitoring after installation should establish whether birds are redirected toward other hazardous components (Martín Martín et al., 2022).

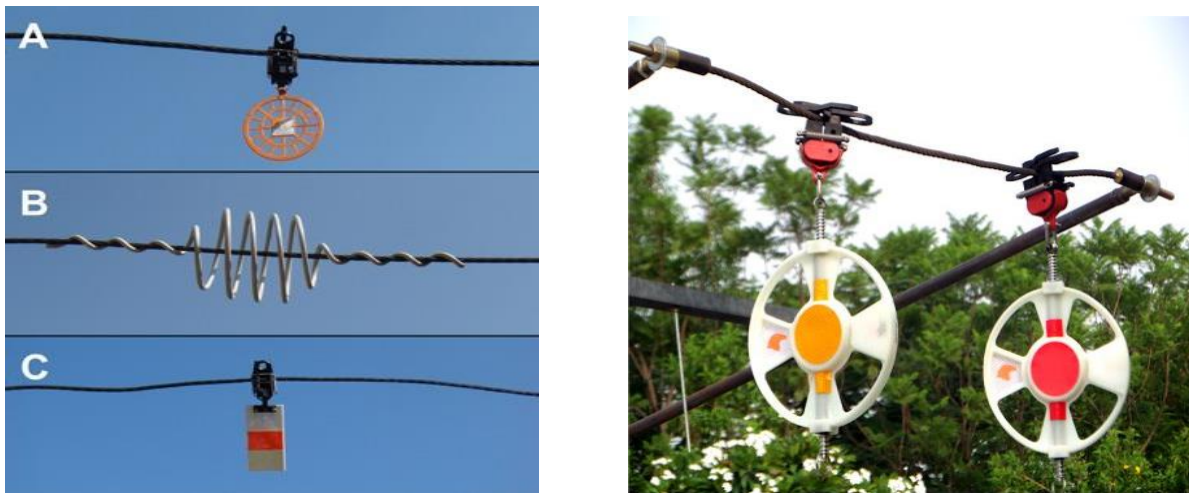
Note: The table outlines the main categories of measures by risk type. It does not recommend a specific product, implementation project or standard design drawing.

6.3. Measures Should Be Selected by Risk Type and Monitored

The measures summarized in Table 3 are not interchangeable. The large warning spheres covered by the International Civil Aviation Organization's (ICAO, 2013) rules on marking overhead lines are primarily aviation markers intended to make lines visible to aircraft and helicopters. To reduce bird collision risk, spirals, reflective flappers or similar bird flight diverters can be installed on hazardous wires, taking migration corridors, flight height, bird species and conductor geometry into account. Their effectiveness varies by species, design and site conditions and should therefore be monitored after installation (Martín Martín et al., 2022, pp. 73–79). These visibility-enhancing markers do not directly prevent electrocution. Reducing electrocution risk requires safe electrical clearances, insulation of accessible energized components, changes to pole geometry where necessary, and safe perching or nesting alternatives (IFC & EBRD, 2026).

Figure 2 shows line markers used to reduce collision risk, while Figure 3 presents examples of insulation measures and a safe nesting platform used to address electrocution risk.

Figure 2. Spiral, hanging, and circular line markers for reducing collision risk



Source: Compiled by the author using Keçeci et al. (2022, Figures 10 and 12).

Note: These devices are intended to reduce collision risk by increasing conductor visibility. They do not directly prevent electrocution.

Figure 3. Insulation measures and a safe nesting platform to reduce electrocution risk

Source: Compiled by the author using photographs of installations presented in Keçeci et al. (2022, Figure 14).

Note: The image on the left illustrates the insulation of accessible energized components. The image on the right shows a nest positioned on a platform at a safe distance from conductors. These images do not constitute a standard design for a specific line or a post-installation impact assessment.

Several institutional announcements document insulation measures and safe nesting platforms in Türkiye. In Sinop, artificial platforms were reportedly installed on poles for storks (Güçüklüoğlu, 2025). Toroslar Elektrik Dağıtım A.Ş. (Toroslar EDAŞ) announced that it had carried out insulation work on power lines (Toroslar Elektrik Dağıtım A.Ş., 2023). TREDAS also announced the installation of safe nesting platforms for storks (Trakya Elektrik Dağıtım A.Ş., 2024).

7. Distribution Network Upgrades Have Begun, but Remain Insufficient

Distribution companies' tender documents, annual reports and field announcements show that bare conductors have begun to be replaced with AER/Alpek cables in various regions. AER is an aerial bundled cable with insulated aluminum conductors and a supporting messenger wire. It is also marketed as Alpek (Türkiye Elektrik Dağıtım A.Ş. [TEDAŞ], 2022).

Publicly available documents cover completed installations, future program targets, and material purchases. The 678 kilometers announced for Toroslar EDAŞ is a program target (Anadolu Ajansı, 2026). The 35.85 kilometers reported by Kayseri ve Civarı Elektrik Türk A.Ş. (KCETAŞ) represents completed installations (Kayseri ve Civarı Elektrik Türk A.Ş., 2023). The record of Vangölü Elektrik Dağıtım A.Ş. (VEDAŞ) of approximately 25 kilometers in Gevaş likewise refers to completed installation work (Vangölü Elektrik Dağıtım A.Ş., 2022). These figures should therefore not be compared directly.

The findings of the review covering Türkiye's 21 distribution companies are presented in Appendix Table 1. Cable quantities specified in tenders should not be interpreted as installed line lengths. Although these records show that conversion to insulated conductors is taking place in different regions, comparable outcome data demonstrating the extent to which these measures have reduced bird deaths are not yet available.

8. When Does Bird Contact Lead to a Fire?

Electrocution does not always cause a fire. However, heat generated by an electrical arc or short circuit can ignite a bird's feathers or dry nesting material. A burning bird, nest debris or hot particles falling onto dry vegetation can also start a fire (Guil et al., 2018, p. 461).

The publicly available tables of the General Directorate of Forestry (OGM) do not distinguish the underlying technical causes of fires associated with energy infrastructure. Broken lines, equipment failures, conductor contact, transformer faults, and contact involving birds or other wildlife are not recorded separately. Consequently, the share of energy-related fires attributable to bird contact cannot be calculated (Atmış et al., 2023, pp. 39–40). Table 4 presents the relevant data.

Table 4. Distribution of forest fires in Türkiye by ignition cause, 2012–2021

Ignition cause	Share of total fires	Share of total area burned	How should the figures be interpreted?
Negligence and carelessness	29.49%	16.95%	Includes various subcategories associated with human activities.
Deliberate ignition	5.25%	23.00%	The share of area burned was particularly influenced by the extensive area burned under the “other” subcategory in 2021.
Accidents, total	5.12%	22.05%	Includes energy-related, traffic-related and other accidental causes.
Energy infrastructure (subcategory of accidents)	3.38%	20.44%	Includes energy infrastructure such as high-voltage lines, power plants and transformers. This row is included in the accidents total.
Unknown cause	48.22%	37.08%	Indicates that the ignition cause could not be established for a substantial proportion of recorded fires.
Lightning	11.92%	0.92%	Accounts for a relatively high share of fires but a small share of the area burned.

Note: “Energy infrastructure” is a subcategory within “accidents”. The percentages in these two rows should therefore not be added together.

Source: Compiled by the author using OGM data reported in Atmış et al. (2023, pp. 39–40).

8.1. Key Regulatory and Institutional Gaps

The availability of technical solutions does not ensure that they will be applied systematically or in the right locations. The Küçükçekmece case shows that bird safety cannot be managed solely through measures taken after an incident or within a single institution's remit. As used in this section, “gap” refers to the insufficient integration of known risks into planning, maintenance, inspection, interinstitutional coordination and data collection processes, rather than to fault established through judicial or administrative proceedings.

Planning and design gaps: When migration bottlenecks, wetlands, roosting and feeding sites, and the location of electrified infrastructure are not assessed within a shared risk model, bird safety cannot be incorporated into infrastructure projects at an early stage. Consequently, measures such as safe electrical clearances, insulation, line visibility and alternative perching sites are often considered only after an incident, rather than treated as requirements from the outset of project design.

Inadequate maintenance and technical inspection: Loose connections, damaged or contaminated insulators, unsuitable fuses, inadequate grounding and poor coordination between protection systems can increase the risk of electrical arcing and short circuits. These

risks require specific attention in routine maintenance programs and inspections before the migration season.

Insufficient interinstitutional coordination: TCDD, TEİAŞ, electricity distribution companies, the Turkish Electricity Distribution Corporation (TEDAŞ), the Energy Market Regulatory Authority (EPDK), the General Directorate of Nature Conservation and National Parks (DKMP), and OGM have responsibilities and powers relating to different aspects of the risk. This study could not identify a publicly available shared risk map, response protocol or performance monitoring system integrating these institutions' data and response procedures. Activities confined to individual institutional remits are insufficient to assess the full chain of risks arising from interactions between infrastructure and wildlife.

Data and monitoring gaps: Bird deaths and fires are not recorded in a shared system covering incident coordinates, infrastructure type and component, bird species, the mechanism of death or injury, network fault records, measures implemented, and technical investigation findings. This gap makes it difficult to measure both the true scale of the risk and the effectiveness of interventions using publicly available data.

9. What Does International Practice Show?

Germany has required new medium-voltage poles to be designed to protect birds from electrocution and existing high-risk poles to be retrofitted within a specified timeframe. The fact that railway overhead lines are subject to separate provisions demonstrates the need for standards tailored to each infrastructure type (Bundesnaturschutzgesetz [BNatSchG] § 41, 2009).

In Portugal, stork nests in hazardous locations were relocated, safe nesting platforms and deterrents were installed, and hazardous components were replaced. Records of Redes Energéticas Nacionais (REN), Portugal's transmission system operator, show that outages associated with stork nests fell from 739 per 1,000 nests in 1993 to 9 in 2015. This decline cannot be attributed to a single device, but it illustrates the importance of long-term monitoring and combined measures (Moreira et al., 2018, pp. 2264–2265). In the intervention in Iran, 75 pin-type insulators were replaced with suspension insulators and 24 safe platforms were installed. No electrocution incidents were recorded during the two-year monitoring period (Kolnegari et al., 2024, p. 284).

IFC and EBRD recommend bird-safe design for new distribution lines, alongside risk-based retrofitting, regular inspections and long-term maintenance for existing networks (IFC & EBRD, 2026). The shared lesson is clear: lasting results depend on accurate risk mapping, appropriate technical solutions, safe nesting sites, and regular monitoring working together, rather than on a single bird-protection device.

9.1. Synergies among the Rio Conventions Provide a Complementary Framework

The three Rio Conventions are the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), and the United Nations Convention to Combat Desertification (UNCCD) (UNFCCC, n.d.). The Paris Agreement does not prescribe technical rules for power lines, but provides a policy foundation for the low-carbon transition (United Nations, 2015). The United Nations Environment Programme (UNEP) emphasizes that investments supporting one environmental objective should not undermine others (UNEP, 2025). In this note, synergies among the Rio Conventions provide a complementary framework for considering electrification alongside its effects on birds, migration routes and land within the same investment decision.

10. What Should Türkiye Do?

The stork deaths reported in Küçükçekmece and other locations show that isolated interventions are insufficient. Türkiye needs a national bird safety program that incorporates migration routes into planning, selects solutions according to line type and measures outcomes.

1. Establish a Shared Incident Data Standard across Institutions

TCDD, TEİAŞ, distribution companies, DKMP and OGM should use common data fields. Each incident record should include the date, location, infrastructure component, bird species and number, mechanism of death, information on faults or fires, and technical investigation findings. The reporting source, survey method, and level of evidence should also be specified. Publish results on a publicly accessible dashboard while protecting sensitive species location data.

2. Develop a Seasonal, Multilayered Risk Map

The map should jointly assess infrastructure geometry and the migration bottlenecks, wetlands, feeding sites, and roosting sites where storks and other migratory birds congregate. Represent the risk of bird contact and the risk of that contact leading to ignition and subsequent fire spread in separate layers.

3. Develop Separate Technical Standards for Each Infrastructure Type

Develop separate bird safety standards for distribution lines, transmission lines, and railway catenary systems. Determine criteria for using collision mitigation measures based on bird species and site conditions (Martín Martín et al., 2022). Define requirements for electrical clearances, insulation, pole geometry, and safe perching to reduce electrocution risk (IFC & EBRD, 2026). TCDD should incorporate binding provisions for catenary systems and traction power lines into its specifications, and test solutions under railway-specific conditions.

4. Retrofit Existing Infrastructure According to Risk and a Defined Timetable

Each retrofitting program should specify the risk level, timetable, budget, and responsible unit. On TEİAŞ lines, priority should be given to migration bottlenecks, wetlands and locations with recurring collisions. For distribution networks, options should include placing suitable lines underground, replacing bare conductors with AER/Alpek cables, and insulating accessible energized components. AER/Alpek should not be presented as a directly applicable solution for TEİAŞ transmission lines or TCDD catenary systems.

5. Use Deterrents alongside Safe Alternatives

Where appropriate, use deterrents in combination with safe perches or nesting platforms. Post-installation monitoring should determine whether storks are redirected to other hazardous components and whether deaths decline (Martín Martín et al., 2022).

6. Implement a Response Protocol for Migration Periods

Establish a mechanism integrated with existing reporting systems and accessible around the clock for high-risk corridors. The protocol should cover response teams, transferring injured birds to rehabilitation centers, a same-day preliminary inspection, and a deadline for the technical report. Record scheduled maintenance, fire response, bird contact, and other faults under separate codes.

7. Record the Underlying Technical Causes of Fires Separately

OGM records should include separate fields for infrastructure type, technical mechanism, the involvement of birds or other external factors, and the level of evidence. Distinguish conductor breakage, insulator or transformer faults, vegetation contact, and animal contact. Incidents should be classified as “preliminary assessment”, “confirmed by technical investigation” or “undetermined”.

8. Establish Clear Rules on Funding and Financial Liability

Track bird safety investments through dedicated budgets and performance indicators in distribution plans and TEİAŞ and TCDD programs. Alongside expenditure and equipment counts, operators should publish changes in bird deaths, faults, outages and fires. Financial liability should be determined in each case based on technical investigation findings, causation, and the relevant legal provisions. The provisions of the Forest Law should not be presented as an automatic recourse mechanism (Orman Kanunu, 1956, arts. 76, 110, 112, 114).

11. Conclusion

The mass stork deaths in Küçükçekmece highlighted the need to incorporate bird safety into planning, design, operation and monitoring from the outset wherever electrified infrastructure intersects with migration routes and ecosystems. As the precise technical cause of the incident has yet to be established in an official investigation report, the deaths cannot be directly attributed to a single catenary component, a specific maintenance deficiency or electrification accelerated by climate policies.

Nevertheless, as investment in electrical infrastructure expands as part of the low-carbon transition, it becomes increasingly important to assess these investments alongside their effects on biodiversity and land. In this note, synergies among the Rio Conventions serve as a planning framework that brings climate, biodiversity and land objectives into the same investment decision, rather than prescribing technical rules for power lines. Storks are not the only species requiring protection, but serve here as an indicator species that makes the accumulation of infrastructure risks along migration corridors visible.

In Türkiye, fires associated with energy infrastructure accounted for 3.38% of all forest fires and 20.44% of the total area burned during 2012–2021 (Atmış et al., 2023, pp. 40–43). However, because existing records do not distinguish bird contact from other faults involving energy infrastructure, the share of energy-related forest fires attributable to birds cannot be calculated. This data gap should not be filled with assumptions. The technical subcategories under which incidents will be recorded, the institution responsible, and the recording method should be clearly defined.

The first concrete step should be for TCDD, together with the relevant nature conservation authorities and specialist organizations, to publish a comprehensive incident report on the Küçükçekmece case. The report should disclose the scope of the field survey, the number of dead and injured birds, hazardous catenary components, fault and protection system records, measures implemented and planned, the units involved, and the implementation timetable. The shared incident-recording standard should then be extended to TCDD’s other electrified lines, the TEİAŞ transmission network, and Türkiye’s 21 electricity distribution regions (Ertılav & Aktel, 2015, pp. 103–105). Technical investigation and retrofitting criteria should be defined separately, based on the characteristics of each infrastructure type.

The program's success should be measured not merely by the number of devices installed, components insulated or poles retrofitted, but by changes in bird deaths, network faults, outages and fire indicators. What Türkiye needs is not a new list of technologies but a regulatory and inspection system that requires existing solutions to be applied at the appropriate risk locations, ensures their suitability for the infrastructure concerned and regularly monitors the results.

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Appendix 1. AER/Alpek Installation and Procurement Records of Distribution Companies

This table distinguishes completed installations, program targets and material purchases. Quantities specified in tenders or targets should not be interpreted as installed line lengths.

Appendix Table 1. Publicly available AER/Alpek records for Türkiye's 21 electricity distribution companies

Distribution company and service area	Publicly available findings	Evidence type and limitations of interpretation	Source links
ADM Elektrik Dağıtım Anonim Şirketi (ADM EDAŞ) - Aydın, Denizli, Muğla	ADM signed contracts worth USD 2,588,000 for AER cable procurement under the second-phase investment program in 2021 and USD 753,000 for AER cable procurement in 2022.	Official tender results. Cable quantities and installed line lengths were not disclosed.	2021 procurement ; 2022 procurement
Akdeniz Elektrik Dağıtım Anonim Şirketi (AEDAŞ) - Antalya, Burdur, Isparta	Alpek cable or conductor procurement contracts were signed in 2018 and 2021.	Official tender results disclose contract values but not cable quantities in meters or installed lengths.	Tender results ; Tender document
AKEDAŞ Elektrik Dağıtım Anonim Şirketi (AKEDAŞ) - Kahramanmaraş, Adıyaman	No dates or quantities specific to AER/Alpek could be verified on the company's public procurement page.	The absence of directly identifiable public evidence does not mean that the company does not use AER/Alpek.	Procurement page
Aras Elektrik Dağıtım Anonim Şirketi (Aras EDAŞ) - Erzurum, Erzincan, Ağrı, Kars, Ardahan, Bayburt, Iğdır	The eight AER/Alpek items in the schedule accompanying Tender Notice 2012/93454 total 90,000 meters.	Advertised quantities reproduced in a secondary tender archive. They do not establish that a contract was signed, materials were delivered or installation was completed.	Tender archive
Başkent Elektrik Dağıtım Anonim Şirketi (Başkent EDAŞ, Enerjisa) - Ankara, Bartın, Çankırı, Karabük, Kastamonu, Kırıkkale, Zonguldak	Tender notices covering AER were published in 2020, 2021, 2023 and 2025. According to a company statement, insulator replacement and insulation work on 23,150 poles, together with the construction of 650 fire-prevention installations, were completed in 2026.	The AER records are tender notices and do not specify quantities in meters or completed AER installations. The insulation work in 2026 is a separate intervention from conversion to AER.	Archive 1 ; Archive 2 ; Company statement reported by Anadolu Ajansı
Boğaziçi Elektrik Dağıtım Anonim Şirketi (BEDAŞ) - European side of Istanbul	A total of 22,500 meters of Alpek cable was procured in 2018. The contract value for Alpek cable procurement in 2021 was reported as TRY 1,139,960.	Official tender results. Purchased quantities cannot be interpreted directly as installed line lengths.	2018 result ; 2021 result
Çamlıbel Elektrik Dağıtım Anonim	Tenders for Alpek cable or conductor procurement	Official tender results. Contract values were	2020 result ; 2021 result

Şirketi (ÇEDAŞ) - Sivas, Tokat, Yozgat	were concluded in 2020 and 2021.	disclosed, but cable lengths were not specified.	
Çoruh Elektrik Dağıtım Anonim Şirketi (Çoruh EDAŞ) - Artvin, Giresun, Gümüşhane, Rize, Trabzon	Bare conductors were removed, and 650 meters of Alpek cable and 20 low-voltage poles were installed in Genek neighborhood, Kocadal village, Torul district, Gümüşhane.	Installation work was reported as completed in the company's announcement dated 24 January 2023.	Company announcement
Dicle Elektrik Dağıtım Anonim Şirketi (Dicle EDAŞ) - Diyarbakır, Şanlıurfa, Mardin, Batman, Şırnak, Siirt	Nineteen kilometers of Alpek cable were reportedly installed in Yeşilli district, Mardin. In İkiköprü, Batman, 5 kilometers of bare cable were reportedly replaced with Alpek cable.	The Yeşilli figure comes from a company statement reported by Anadolu Ajansı, while the İkiköprü figure comes from local news coverage. Both describe installation work reported by secondary sources.	Yeşilli report; İkiköprü report
Fırat Elektrik Dağıtım Anonim Şirketi (Fırat EDAŞ) - Bingöl, Elazığ, Malatya, Tunceli	"Alpek (AER) Cables" was included as a product category in a 2016 supplier notice for investment materials.	A notice seeking suppliers, rather than a confirmed purchase or tender result. Quantities and outcomes were not disclosed.	Supplier notice
GDZ Elektrik Dağıtım Anonim Şirketi (GDZ Elektrik) - İzmir, Manisa	A contract worth USD 1,349,000 for AER cable procurement was signed in 2024. In 2025, contracts for two Alpek groups totaled USD 1,823,701.	Official tender results. Cable quantities, allocation by district, and installed lengths were not disclosed.	2024 procurement; 2025 procurement
İstanbul Anadolu Yakası Elektrik Dağıtım Anonim Şirketi (AYEDAŞ, Enerjisa) - Asian side of Istanbul	Completed tender records show AER procurement every year from 2019 to 2026. The 2026 contract for "AER Conductor Procurement" was worth USD 269,000.	Official tender results. Installed cable lengths were not disclosed. Links use year and "AER" search filters because page numbers may change.	2026 records; 2024 records; 2022 records
Kayseri ve Civarı Elektrik Türk Anonim Şirketi (KCETAŞ) - Kayseri	KCETAŞ's 2023 annual report states that 35,850 meters of Alpek cable were installed (p. 75).	Reported as completed installation work. However, the copy accessed is hosted on a third-party document platform rather than the company's website.	2023 annual report
Meram Elektrik Dağıtım Anonim Şirketi (MEDAŞ) - Konya, Karaman, Kırşehir, Nevşehir, Niğde, Aksaray	No publicly available direct record specifying quantities for AER/Alpek installation or procurement could be identified.	This finding indicates that the review did not locate a verifiable direct source, rather than establishing that the company does not use AER/Alpek.	No direct source identified.
Osmangazi Elektrik Dağıtım Anonim Şirketi (OEDAŞ) - Afyonkarahisar, Bilecik, Eskişehir, Kütahya, Uşak	Secondary records of scheduled outages in August 2026 refer to "Alpek cable installation" in Demirciören village and	Secondary records of planned work. They do not establish that the work was completed or that a particular length of cable was installed.	18 August notice; 24 August notice

	Fuatpaşa neighborhood, Kütahya.		
Sakarya Elektrik Dağıtım Anonim Şirketi (SEDAŞ) - Sakarya, Kocaeli, Bolu, Düzce	Documentation for an open tender for Alpek cable procurement was published in 2023.	An official tender document indicating an intention to procure. It does not contain quantities, tender results or installed line lengths.	Tender specifications
Toroslar Elektrik Dağıtım Anonim Şirketi (Toroslar EDAŞ, Enerjisa) - Adana, Gaziantep, Hatay, Kilis, Mersin, Osmaniye	The 2026 program targets the conversion of 678 kilometers of conductors to Alpek by the end of the year.	A program target based on a company statement, rather than a completed conversion figure.	Company statement reported by Anadolu Ajansı
Trakya Elektrik Dağıtım Anonim Şirketi (TREDAS) - Edirne, Kırklareli, Tekirdağ	A tender notice for AER cable and conductor procurement was published in 2019.	Official tender notice. Quantities, tender results, and installed line lengths could not be established from this source.	Tender notice
Uludağ Elektrik Dağıtım Anonim Şirketi (UEDAŞ) - Bursa, Balıkesir, Çanakkale, Yalova	The seven AER/Alpek items in the 2022 tender annex total 58,000 meters, while the six items in the 2023 schedule total 22,000 meters.	Quantities of materials intended for procurement. They do not indicate installed line lengths or completed installations.	2022 annex; 2023 schedule
Vangölü Elektrik Dağıtım Anonim Şirketi (VEDAŞ) - Van, Bitlis, Muş, Hakkâri	Alpek cable was installed along approximately 25 kilometers of overhead line in Gevaş. The 2025 tender schedule also included procurement of 72,000 meters of AER cable.	The approximately 25 kilometers refers to completed installation work, while 72,000 meters is a procurement schedule quantity. These figures should not be added together.	Gevaş installation; 2025 tender
Yeşilırmak Elektrik Dağıtım Anonim Şirketi (YEDAŞ) - Amasya, Çorum, Ordu, Samsun, Sinop	A tender for conductor and Alpek cable procurement was announced in 2020. A 2014 outage notice stated that Alpek cable installation was planned in Çengelli neighborhood, Çarşamba district.	The first record is a notice in a secondary tender directory, and the second is a scheduled work announcement. Quantities, tender results and completion status were not disclosed.	2020 tender; 2014 outage notice

Source: Distribution companies' tender notices and results, annual reports, field announcements and secondary news reports.