

## POWER SYSTEM ENVIRONMENTAL PERFORMANCE C3

PS2: Biodiversity and the supply of electricity, renewables-based or not: risks, challenges, solutions and opportunities

10530\_2022

### Characteristics of mitigation measures in Japan for the impact of power transmission lines on biodiversity

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#### Motivation

- In Japan, the construction of transmission lines is not included in the Environmental Impact Assessment (EIA) Act.
- EIA and other environmental management procedures were conducted in accordance with local ordinances or requests from local governments.

#### Objects of investigation

- In this study, we conducted a survey on the latest cases of local ordinance EIA and voluntary EIAs implemented in Japan.
- Then, we discussed the differences between mitigation measures in EU countries to incorporate the better parts of other developed countries and seek more efficient mitigation measures.

#### Method/Approach

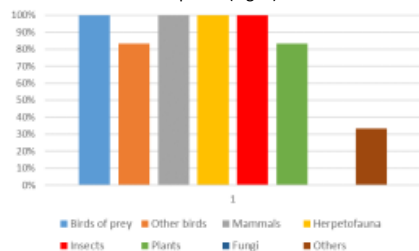
- The questionnaire survey for the TSO in Japan was conducted in both local ordinance EIA cases and voluntary EIA cases.
- The main questions were about the species to be surveyed and impact assessment, the duration of the survey, and the content of conservation measures requested by local governments.
- The answers to the questionnaire were summarized by the local ordinance EIA and voluntary EIA and were then compared. Subsequently, it was summarized for comparison with advanced cases in the EU.
- The advanced cases in foreign countries were compared with the cases in Japan by aggregating multiple cases in EU countries described in the article at T&D World.

#### Results

- There were six responses (per 11 TSOs) to the questionnaire for the local ordinance EIA and nine (per 11 TSOs) for the voluntary EIA.
- In some areas, no local ordinances were in place; therefore, only voluntary EIA was implemented. And two TSOs had replied no big project in these years to take place the EIA.

#### Local ordinance EIA in Japan

- Under the local ordinance EIA, insects and vertebrates such as birds of prey, mammals, amphibians, and reptiles were subject to investigation and impact assessment at all projects. In addition, there were five projects where surveys were conducted on plants (Fig. 1).



- Figure 1. Bar chart of the number of projects surveyed for each taxon under the local ordinance environmental impact assessment (Six projects).

- Furthermore, it was found that additional mitigation measures requested by local governments at the time of EIA included greening base land of the tower by native species, conservation of rare plants, and understanding and reporting of the actual nesting of rare birds (Fig. 2).

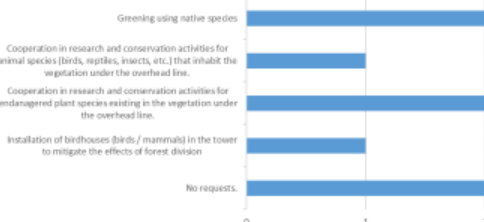


Figure 2. Types of requests for vegetation management and conservation measures from local governments in ordinance EIA.

- In most cases, during the process from planning to completion of the impact assessment, we found that Japanese TSOs found it difficult to determine the magnitude of the impact and mitigation measures. (Fig. 3).

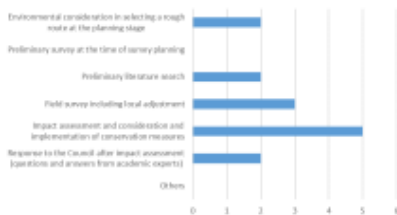


Figure 3. Difficult steps from the preparatory stage of the local ordinance environmental impact assessment.

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#### Results

##### Voluntary EIA in Japan

- Regarding the voluntary EIA, we asked about the reasons for implementing it, and three main answers were obtained.
- The most common reason was that “Lack of voluntary EIA could lead to intolerance from residents and professionals during and after construction.” Other reasons were “Although it is not related to licensing, it was strongly requested by the local government and experts at the planned site” and “Because it is the company’s responsibility to mitigate the natural impact of facilities” (Fig. 4).



Figure 4. Reasons for conducting a voluntary environmental impact assessment.

- In the voluntary EIA, birds of prey were surveyed at all projects, but no other taxa were commonly surveyed at all projects. Other than birds of prey, amphibians, reptiles, insects, and plants were investigated at many projects (Fig 5).
- Unlike local ordinance EIA, there was no prescribed guideline for field surveys. Therefore, surveying and assessing the impact of birds of prey, which were of the greatest concern, were major requirements for voluntary EIA by the local government.

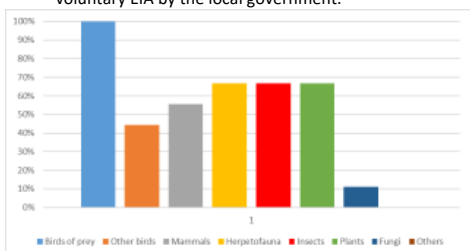


Figure 5. Bar chart displaying the number of projects surveyed for each taxon under the voluntary environmental impact assessment

- As in the case of the local ordinance EIA, it was found that additional mitigation measures requested by local governments during voluntary EIA included greening base land of the tower by native species and conservation actions such as transplantation of endangered plants (Fig. 6).

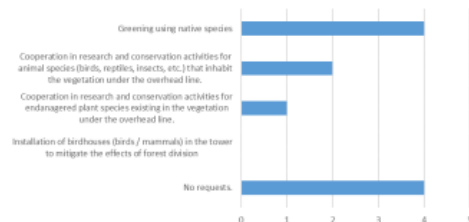


Figure 6. Types of requests for vegetation management and conservation measures from local governments in voluntary EIA.

- It was also found that local governments requested the installation of markers such as bird diverters and the investigation of the breeding status of rare species with regard to mitigation measures against bird collisions (Fig. 7).

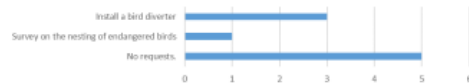


Figure 7. Types of requests for conservation measures from local governments with regard to mitigation measures against bird collisions

- In contrast, regarding the steps that were difficult to conduct, in addition to the stage of determining the magnitude of the impact and conservation measures, many respondents answered the questions on steps of the field survey (Fig. 8).



Figure 8. Difficult steps from the preparatory stage of the voluntary environmental impact assessment to the ex-post evaluation

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#### Features of EIA in Japan

- Thus, the EIA (including both local ordinance EIA and voluntary EIA) feature of transmission lines in Japan required the undertaking of possible mitigation measures based on detailed field surveys, instead of considering multiple routes, which was difficult in a small country.
- Since it often affects forests, mitigation measures are generally undertaken for species that live in forests and mountains, such as birds of prey. In addition, because the land use rights under the overhead line were restricted, greening was carried out only under the steel tower, and logging was often not done under the overhead line. This contributes to the conservation of biodiversity in forests, as it causes little habitat fragmentation due to clear-cutting of vegetation under transmission lines.
- Moreover, since the birds of prey that live in the forest often do not use the same nesting trees every year, their survey period tended to be longer. Figure 9 shows the number of years of response by combining the cases of local ordinance assessment and voluntary assessment. The overall average response time was 8.6 years which included preliminary survey to post construction monitoring. Field surveys have been carried out for many years, and by accumulating and aggregating these survey data, it is thought that basic information useful for raptor surveys and conservation measures can be obtained.

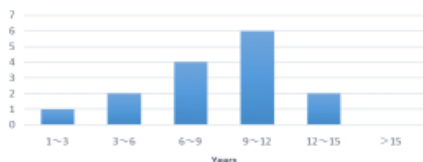


Figure 9. Investigation period of birds of prey (data form both local ordinance EIA and voluntary EIA questionnaires)

#### Conclusion

- Since the legal backgrounds of Japan and Europe are drastically different, the methods of implementing environmental impact mitigation measures are also different. However, the partial adoption of efficient European mitigation measures, such as the accumulation and use of wildlife distribution data, would enable the development and maintenance of more efficient transmission facilities while maintaining the positive aspects of Japanese mitigation measures.

#### Comparison of mitigation measures between Japan and EU countries

##### EIA and Database

- In EU countries, the Strategic Environmental Assessment (SEA) was required by EU directives; therefore, routes with less environmental impact were selected from multiple route proposals based on wildlife distribution data and information on nature-protected areas.
- In Japan, the importance of rerouting to avoid sensitive natural environments has also been recognized, but there are no guidelines or standards. The data accumulation of distribution of wildlife as referenceable data was not carried out enough.
- Therefore, we started to accumulate the existing wildlife data and past EIA data for construct the database to utilize on next EIA.

##### Vegetation Management

- In EU countries, vegetation management under overhead lines is generally managed as grassland after clear-cutting. In addition, some good practices have utilized these grasslands under power lines as biodiversity conservation areas.
- However, in Japan, for vegetation management under overhead lines, clear-cutting is often not done because of restrictions on land use rights by TSOs. This vegetation management in Japan works well in terms of forest ecosystem conservation.

##### Social Acceptance

- In EU countries, TSOs often have partnerships with local NGOs and local governments. Through these alliances, some TSOs have won external awards and succeeded in appealing to society as an environmentally friendly company. Japanese TSOs are not proactive in receiving such external awards, and the results of the questionnaire did not reveal any examples of such awards. Since Japanese TSOs have implemented sufficient mitigation measures, it is possible to receive an external award for mitigation measures if appropriate partnerships and strategic information disclosure can be implemented.

- In addition, in Europe, appropriate partnerships and strategic disclosure of information have led to external recognition of environmental mitigation measures, which in turn has led to greater social acceptance of TSO activities. If Japanese TSOs can also increase their social acceptance by establishing partnerships and receiving external awards, it will be possible to promote more efficient local ordinance EIAs and voluntary EIAs.