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How do High Voltage Overhead Transmission Lines impact the environment and how can this be evaluated?

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High Voltage Overhead Transmission Lines (HVOHL) impact the environment in six ways: a) Landscape, b) Biodiversity, c) Land use, d) Proximity effect, e) Indirect emissions and f) Resource depletion.

1. **Landscape** – HVOHL cause a visual deterioration of the skyline reducing its aesthetic appeal. In passing through populated areas this results in a loss of property values in the vicinity ; and in less populated areas, with a scenic, cultural or natural importance, this affects the tourism potential.
2. **Biodiversity** – The main impact is avian collisions which is particularly significant in high risk areas such as wooded regions and bird migration corridors. The impact on fauna and other animal species is usually temporary and reduces after the construction phase is over.
3. **Land use** – HVOHL passing through agricultural lands may permanently reduce the area under cultivation and cause physical damage during construction and maintenance.
4. **Proximity effect** – The "proximity effect" on human beings in the vicinity of HVOHL encompasses a fear of the adverse health effects of electromagnetic fields, annoyance and noise. While there is no definitive scientific study which establishes that 50 Hz electromagnetic fields within the recommended range of WHO present a danger for human health, many countries place restrictions on distance to human habitation as a precaution.
5. **Indirect emissions** – Energy losses during transmission cause indirect carbon emissions and air pollution in power generation plants which vary with the type of primary energy source.

It is important to integrate these environmental impacts into the cost-benefit evaluation of HVOHL projects in order to avoid decisions that may be biased towards less environment friendly solutions.

Efforts have been made, notably in the reference cited below, to compile methodologies and case studies for the economic quantification of these impacts of HVOHL on the environment, particularly those that remain after avoidance, mitigation and compensation, the so called ''residual effects''. Some methodologies connected with market prices are well developed, such as those for the loss of property values and land use, as well as transmission losses.

The methodologies for evaluating the impact on landscapes, visual effects and biodiversity are somewhat weaker, being more uncertain and time consuming. For biodiversity, there is no consensus on economic valuation methods and further research is needed.

Case studies from some European countries have shown that the evaluated costs of these environmental impacts can even add up to more than a million EUR per km per year in some cases.

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Ref : CIGRE Technical Brochure 616 "Externalities of Overhead High Voltage Power Lines'' Working Group C3.08, April 2015. (CIGRE report)

These also apply to UGC

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