

In order to improve the recyclability of the cable systems, reduce the environmental impact, and promote carbon neutrality target, below considerations in cable design are of importance:

1. Improve cable qualification requirement definition to better represent the actual operational conditions. Via this way the cable system weak points in the installation and operation stages can be revealed and cable should be redesigned to tackle these points.
2. Optimize the material use in the cable design:
 - a. Increase designed electrical stress thus reduce insulation volume, less colored PE sheath to ease recycling process later. Higher requirement of insulation material will be needed
 - b. Introducing less different metals and proper separable materials in a cable to ease recycling process
 - c. Remove bonding between the metal sheath and cable/core outer sheath to make the separation of the materials easier in cable recycling process
 - d. Use recyclable insulation material other than XLPE
 - e. Replace the commonly used lead sheath in HV and EHV cable systems to reduce the environmental impact
 - f. Use environmentally friendly material in cable components and cable packaging & transportation processes: recyclable plastics, tapes, and transportation materials in the cable.
3. Optimize cable production processes to reduce the scrap rate, therefore, to reduce the amount the waste material. High Quality Assurance and Quality Control (QA/QC) requirements can help increase the cable reliability therefore reduce the footprint of cable repairing activity.
4. Prolong the designed service lifetime of the cable. Or in the systems that the cables need to be retrieved/replaced before the end of their service lifetime, via quality control and sufficient testing, the retrieved cables might be able to use for other (lower voltage, less server) applications.

Considerations in cable installation practice to increase the recyclability and reduce the environmental impact include:

1. Minimize the disturbance on the environment during the installation, repairing, and retrieving process of the cable system;
2. Better cable protection system design and implementation to mitigate third-party damages therefore increase reliability. Attention should be paid to better planning of cable routes, cable route risk assessment, cable non-burial protection, shipping guidance, and sufficient cable distance separation in multiple circuits.
3. Standardize installation procedures and apply more monitoring system in cable handling process. Cable monitoring system can help preventive warnings and reduce environmental impact of cable repairing/scraping due to damage during handling, transportation, and installation processes.

Cable end of life strategy should be considered at the early stage of the cable project as a standard procedure:

1. Cable recycling strategy should be considered at the early stage of the cable project as a standard procedure: separation and recycling of cable components or reuse of cable systems are retrieving.
2. Cable retrieving method should consider the cable installation situation and minimize environmental impact during the retrieving processes.
3. Choose best recycling methods of the cable system considering the cable design and cable installation practice:
 - Mechanical stripping or crushing
 - chemical,
 - energy recovery,
 - open burning.