

Improving Public Acceptance of High Voltage Substations

As electricity networks expand to support the global energy transition, the construction and upgrading of high voltage substations is unavoidable. While these assets are essential for maintaining reliability and enabling renewable energy, public acceptance has emerged as one of the most significant challenges facing grid operators worldwide. Working Group (WG) C3.15, “Best environmental and socio-economic practices for improving public acceptance of high voltage substations” has addressed this issue and produced Technical Brochure (TB) 965. The Australian member of this WG was James Hart.

The significant rollout of electrical infrastructure to meet the challenges of the global energy transition relies on rapid installation which, in turn, requires community support. The TB examines how environmental, spatial and socio-economic practices can improve community acceptance of new and existing substations. The study draws on international research, a global survey spanning more than 20 countries, and 59 real world case studies. Importantly, it shows that opposition is rarely based on a single issue. Communities most often raise concerns about visual impact, land use, noise, electromagnetic fields, safety, ecological effects and perceived impacts on property values.

The report identifies three overarching strategies for increasing acceptance. These are hiding, integration and showing. Hiding techniques include green buffers, architectural screening and underground or semi sunken substations, particularly effective in rural or environmentally sensitive areas. Integration focuses on making substations a natural part of their surroundings through camouflage, ecological enhancements or the inclusion of shared public functions such as parks, walking paths or educational spaces. In some urban renewal areas, deliberately showing a substation as a well-designed landmark has also succeeded when supported by strong community engagement.

Across all countries studied, early and transparent stakeholder engagement consistently emerges as a critical factor. Projects that involve communities early, clearly explain trade-offs and respond to local concerns are more likely to secure planning approval, reduce objections and shorten delivery timeframes. The brochure also highlights that meaningful acceptance can often be achieved with relatively modest investment compared to overall project costs.

A key conclusion is that there is no single best solution. Successful approaches depend on context including location, voltage level, land use and cultural expectations. Through thoughtful design, environmental stewardship and ongoing engagement, substations can move from being contested infrastructure to becoming accepted and sometimes valued parts of the local landscape.

The TB is free for members and €200 for non-members.