

Sure, let's break down the process of how transformers are used in the national grid system to transmit power over long distances with minimal losses in 8 steps:

1. By following these steps and utilizing transformers effectively, the national grid system can transmit power over long distances with minimal power losses, ensuring reliable electricity supply to consumers. These transformers reduce the voltage to levels suitable for distribution and consumer use, typically in the range of tens of kilovolts (kV) to hundreds of volts. The high-voltage transmission reduces resistive losses, while the step-down transformers ensure that the electricity is delivered safely and effectively to consumers.
2. **Consumer Use**: Finally, the electricity reaches consumers, where it powers various devices, appliances, lighting, and machinery.
3. **Minimal Losses**: By transmitting electricity at high voltages, the current flowing through the transmission lines is reduced. According to Ohm's Law ($V = IR$), where V is voltage, I is current, and R is resistance, reducing the current results in lower resistive losses (I^2R losses) in the transmission lines.
- 4.
- 5.
- 6.
- 7.
- 8.