

Low-loss solution for the Italian Energy Internet



Article Overview

Italy can achieve a low-loss, efficient Energy Internet through grid modernization, digitalization, renewable integration, and advanced transmission technologies.

Grid Modernization and Digitalization

Modernizing Italy's electricity distribution and transmission networks is central to reducing energy losses. Enel's ongoing investments focus on renewal of existing assets, development of new lines and substations, and implementation of innovative IT solutions for remote control and network management . Digitalization enables real-time monitoring, predictive maintenance, and optimized load management, which reduces technical losses and improves overall efficiency. Smart meters and encrypted data collectors allow operators to track energy flows accurately, supporting a bidirectional grid that integrates prosumers and distributed generation .

High-Efficiency Transmission and Distribution

Terna, Italy's national transmission operator, is investing €16.6 billion to expand and strengthen the national grid, including high-voltage lines and substations . Upgrading transmission infrastructure with low-resistance conductors, high-voltage direct current (HVDC) lines, and advanced transformers minimizes resistive losses over long distances. Reinforcing primary and secondary substations ensures stable voltage levels, reducing losses associated with voltage drops and improving energy delivery to end users

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How the electricity system works

Electricity production in Italy still largely takes place using non-renewable sources (natural gas, coal and oil), although the

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Net Zero by 2050 - Analysis

Net Zero by 2050 - Analysis and key findings. A report by the International Energy Agency.

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