RECP Best Practices Catalogue

Replacement of DC motors by induction motors

Developed within the framework of MED TEST II

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

switchmed

The SwitchMed Programme is funded by the European Union

Best Practice - Replacement of DC motors by induction motors

SECTOR:	**Metal, electrical and motor vehicle parts**
SUBSECTOR:	Manufacture of parts and accessories for motor vehicles
PRODUCTS	Cables and electrical wires, auto parts.
CATEGORY	Technology upgrade/Eco-innovation
APPLICABILITY	Utilities

COMPANY SIZE	305

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Description of the Problem (Base Scenario):	One roughing machine, and three drawing machines are equipped with DC motors with a total power of 1,155 kW (1 x 315 kW and 3 x 280 kW). These motors are less robust than induction motors and much more expensive, both in terms of material cost and maintenance cost, because they require regular maintenance of the collector and brushes. The critical element of a DC motor is the assembly (brushes - collector). This accounts for the abandonment of direct current in favour of alternating current. Also, DC motors have a lower efficiency than asynchronous motors
Description of the Solution	Since current DC motors are reaching the end of their service life, the company will have to replace such motors with induction motors that are used at high power to improve the efficiency of the installations. When they are associated with frequency converters with variable speed, the problems of torque and starting current are then perfectly solved.

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Economic Gain	The energy savings thus estimated for the replacement of DC motors by induction motors equipped with variable speed drives are at least € 14,000/year. The change from 83% to 95% efficiency means a consumption improvement of nearly 12%, whereas in several companies that have already made this type of change, the gains were more than 20%, not counting maintenance savings, estimated here at € 9,500/year. Which is a total of € 23,500/year
Environmental Gain	The reduction in energy consumption is estimated to be: 182,000 KWh/year, which should generate a reduction of GHG emissions in the area of: 133.9 tons of CO_2e/year
Health and Safety Impact	None

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Investment and Financial Indicators	The investment would be on the order of € 154,545 against an investment of about € 185,454 for the equivalent to direct current, a gain on the investment of € 30,909 The calculated simple return time is instantaneous if it is assumed that DC motors need to be replaced in the near future. By assuming their replacement as a new investment, the return time is 78 months
Suppliers	manufacturers of electric motors
Other aspects	None, these technologies are already proven
Implementation and new indicator	Under implementation