

# Traction and Energy

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Efacec offers a wide range of energy and traction power systems for Transportation, providing technologically advanced and energy-efficient solutions for Railways, Metros, Tramway & Light Rails, other segments.

With more than 30 years of working experience in the transportation market, Efacec assumes a strong compromise with technological developments and innovation, ensuring agility and flexibility on our offer, we provide expertise through every phase of project implementation including design, engineering, supply, project management, installation and testing, and maintenance of integrated systems.

## Competences

Efacec offers complete turnkey systems, including MV and LV installations, overhead contact line, primary substations, traction power substations, mobile traction substations for DC & AC applications, and Train charging Stations.

Power transformers, distribution transformers, MV switchgear, battery chargers, traction rectifiers and SCADA systems are manufactured in-house by Efacec and can be integrated in our solutions.



## Traction Substations

Over the past 30 years, Efacec has delivered an extensive portfolio of traction power projects to the rail industry. This portfolio includes traction power solutions and substations for railways, underground metros, light rail, and more. The provided solutions encompass indoor and outdoor systems, modular and mobile substations, as well as other custom-made solutions.

These systems are powered by local electrical networks by different incoming voltage levels (10kV, 11kV, 15kV, 20kV, 30kV, 60kV, 150kV, 220kV, and more) and delivering traction power at voltage levels such as:

- 750Vdc, 1500Vdc for Metro underground and tramway projects, interfacing with OCS or 3rd Rail systems
- 1x25kVac, 2x25kVac for Railway AC Systems, indoor and/or outdoor solutions.
- 1500Vdc, 3000Vdc for Railway DC Systems
- 700 Vdc for Trolleybus projects.

Efacec has in-house capabilities to develop the necessary design, studies and calculations, as well as expertise in design integration and coordination, enabling the delivery of turnkey solutions and ensuring well-integrated projects.

## MV/LV Substations

MV/LV substations are widely used in rail or roadway applications for the supply of electric power to stations/stops, tunnels, maintenance depots or other commercial installations.

Normally integrating equipment manufactured from Efacec (from transformers to switchgears and low voltage power supplies).





## Mobile Substations

Mobile Traction Substations are solutions specially developed for emergency and maintenance purposes, that can easily and fast replace a faulty substation, giving the infrastructure owner highly flexibility and redundancy.

For all these situations, Efacec has developed a compact substation solution, minimizing free space inside the building/shelter and providing different types of high resistance shelter encompassing all active equipment.

Mobile Substations are a variation of the compact substations, offered with different solutions for trailers, suitable for temporary installations.

## Overhead Contact Line

Efacec provides reliable overhead contact line systems for urban and suburban tramways and railways (operating speed up to 100 km/h), offering services from design to after-sales service, including power studies, supply, project management, commissioning and maintenance of the installed systems.

Efacec's overhead contact line solutions are suitable for AC and DC applications, for different voltages – 3000, 1500 or 750 Vdc and 25 kV AC.

## Medium and Low voltage installations

Associated to the solutions for traction and power supply systems, a full range of Medium /Low voltage installations can be supplied by Efacec, including:

- MV network
- Lineside power supply for Signalling and Telecommunications, including autonomous systems (solar panels or diesel generators) and power distribution systems along the line, feeded from public utilities or customer's installations;
- Station /Building electrification, including LV boards and power distribution;
- Lighting
- AC & DC Power Supply Systems



## ALGERIA

### Alger Light Rail System

- MV/LV Installations

### ANESRIF – BIRTOUTA SIDIABDELLAH – ZERALDA LINE

- Traction Substation 25KV

### Thenia – Tizi-Ouzou Line

- Traction Substation 25kV

### Siemens – Algiers Metro

- Traction Substations 750Vdc
- Distribution Substation
- ML/LV Installations

## BRAZIL

### Metro de S.Paulo

- Traction Substation
- Power Source System: 750 Vdc
- MV/LV Installations

## DENMARK

### Odense Light Rail

- Traction Substations 750Vdc
- Overhead Contact Line
- MV/LV Installation

### Banedanmark

- Traction Substation 1500Vdc
- Charging stations 2x 2.2 MVA

### Midtjyske Jerbaner

- Charging stations 2x 2.2 MVA

### Copenhagen Metro – Sydhaven Extension

- Traction Substation 750Vdc
- Distribution Substation 10KV/430V

## IRELAND

### Dublin Light Rail

- Traction Substation 750Vdc
- Overhead contact line
- MV/LV Installation

## ITALY

### Messina Light Rail

- Traction Substation 750Vdc
- Distribution Substation
- Overhead contact line
- MV/LV Installations

## MOROCCO

### ONCF

- Traction Substations 3000Vdc

## NORWAY

### Bergen Light Rail

- Traction Substation 750Vdc
- Overhead Contact Line

### Bergen TrolleyBus

- Modular Traction Substations 600Vdc
- Overhead Contact Line

## TUNISIA

### Tunis Light Rail

- Traction Substation 750Vdc
- Overhead contact line
- MV/LV Installations

## PORTUGAL

### IP – Infraestruturas de Portugal

- Traction Substations 25kV, 2x25kV, 1500Vdc
- Distribution Substations
- MV/LV Installations

### Lisbon Metro

- Power Substations 60/30KV
- Traction Substations 750Vdc
- Mobile Substation
- Distribution Substation 10KV/430V
- LV Installation

### Oporto Light Rail

- Traction Substations 750Vdc
- Mobile Substation
- Distribution Substations
- Overhead contact line
- MV/LV Installations

### STCP – Porto Heritage Tramway

- Traction Substations 600Vdc

## SPAIN

### Bahia de Cadiz Light Rail

- Traction Substations 750Vdc
- Distribution Substations
- Overhead Contact Line
- MV/LV Installations

### Tenerife Light Rail

- Power Substation 60/20KV
- Traction Substation 750Vdc
- Overhead contact line
- MV/LV Installation



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