

## MOBILITY

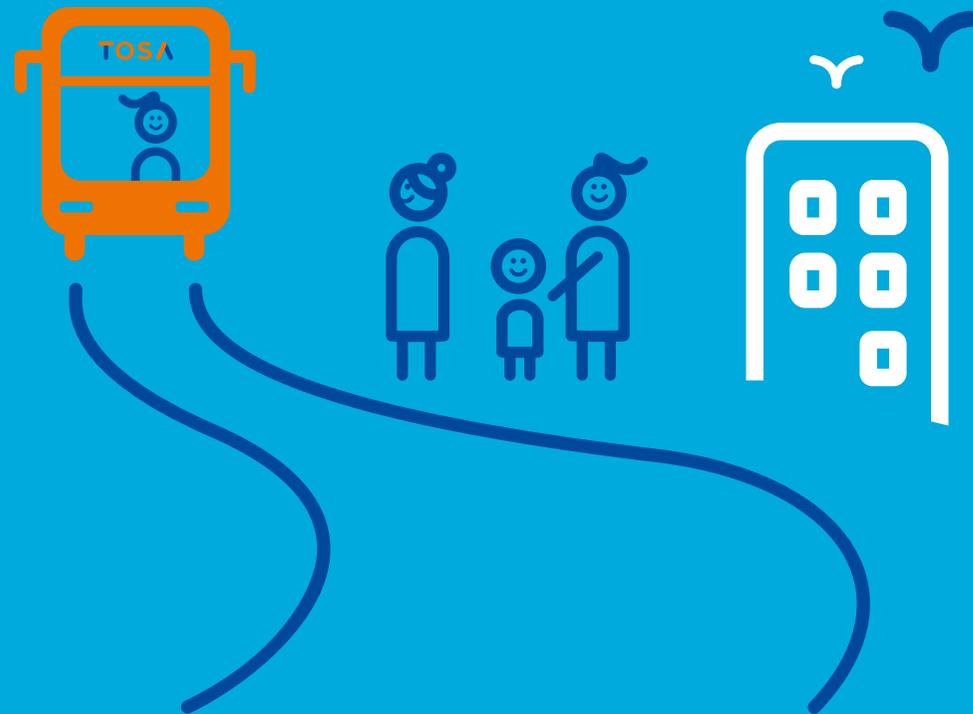
### Better flexibility, better performance

Thanks to the technological innovations developed by the TOSA buses, overhead wires are no longer necessary, which improves the flexibility of the vehicles and the performance of the lines.

### For the passengers' comfort

Heating, air conditioning and information displays, the TOSA buses do not compromise on the comfort of passengers. The TOSA vehicles also offer USB sockets near the front seats, allowing users to recharge their devices.

### More room for passengers



tosa.ge.ch

# TOSA

### A perfect public-private partnership model

The TOSA 100% electric bus was born in 2011 as a result of exchanges between the Transports publics genevois (TPG), the Office de Promotion des Industries et des Technologies (OPI), the Services Industriels Genevois (SIG) and ABB Sécheron (ABB). In 2013, the State of Geneva and the Swiss Federal Office of Energy (SFOE) joined the group, both eager to bring this technology to the public and the benefit of users. This project is also supported by leading Swiss universities of applied sciences and arts (EPFL, HE-Arc, HEPIA).

### Roll-out in 2018

After a successful test phase with an articulated bus, the first fleet of TOSA buses will run, from 2018, on the 12 km of line 23, linking Palexpo to Carouge at a rate of 10 minutes during peak hours.



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Smart mobility, happy city  
with the TOSA electric bus



REPUBLIQUE  
ET CANTON  
DE GENEVE

POST-TERMINAS LUX



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Federal Office of Energy SFOE

stpg

opi»»

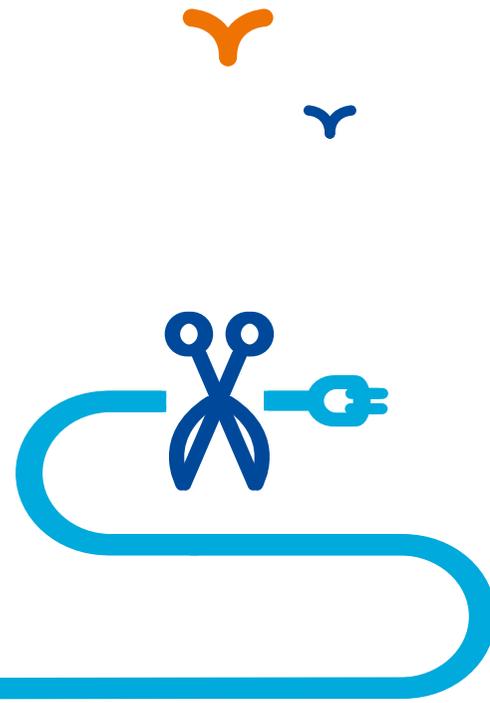
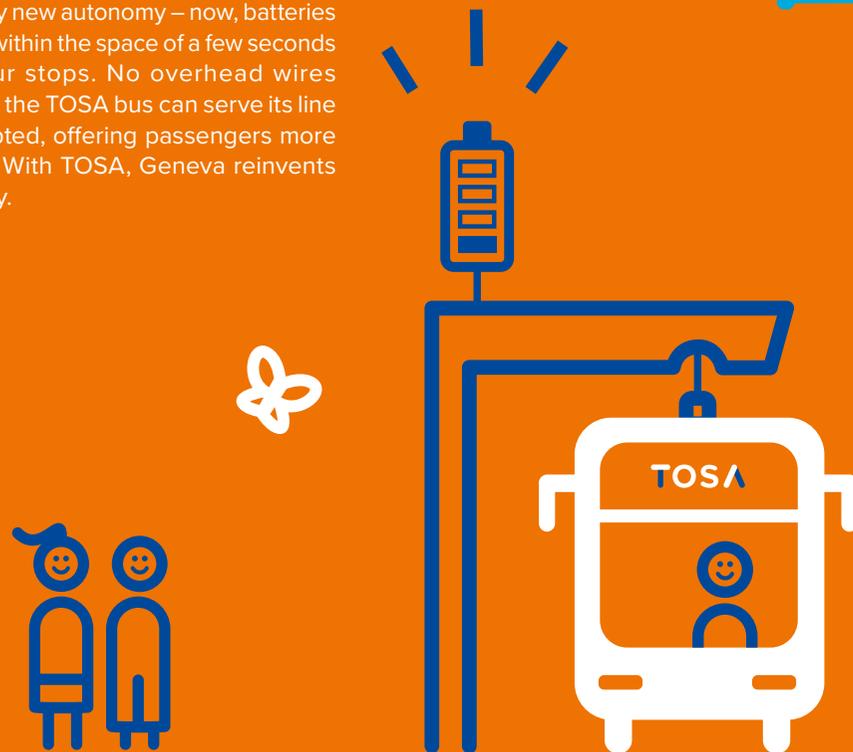
SIG

ABB

## So, what is TOSA?

Geneva welcomes a new era of mobility with an entirely local innovation: the TOSA electric bus, equipped with ultra-fast charging (flash) technology and high-performance batteries. With the removal of charging time, this electric bus enjoys a completely new autonomy – now, batteries recharge within the space of a few seconds every four stops. No overhead wires mean that the TOSA bus can serve its line uninterrupted, offering passengers more flexibility. With TOSA, Geneva reinvents its mobility.

**TOSA is the first 100% articulated electric bus that combines high-capacity, eco-friendliness and total autonomy**



## INNOVATION



**Clever consumption management**  
The TOSA technology is also a major innovation in energy savings thanks to the high-efficiency of the electric motor, roughly twice that of a diesel engine. For a 12 km line, the annual saving in energy equals the annual consumption of 10,000 refrigerators. Moreover, the TOSA buses benefit from a device which stores the braking energy in the batteries. This way, losses are kept to a minimum!

**Ultra-fast charging and optimised energy consumption**

**Fully charged in 20 seconds**  
Developed by ABB Sécheron (ABB), the TOSA technology gives the electric bus the same flexibility as a diesel bus while being 100% eco-friendly. Thanks to the “biberonnage” technique, which relies on the transfer of energy between the vehicle and the charging stations via a moving arm, the TOSA bus recharges quickly at the stop (20 seconds) and at the terminus (full reload in about 4 to 5 minutes).

The staggered charging stations along the network allows the bus to regularly recharge its batteries to travel long distances and increase its range of action, offering an almost unlimited autonomy.

## ENVIRONMENT

**Cleaner air**  
Like all electric vehicles, the TOSA bus respects the environment as it produces zero emissions and zero fine particles. On a 12-km journey, it saves roughly 400,000 litres of diesel (more than 1,000 tons of CO<sub>2</sub>) annually. In addition, the TOSA bus produces half as much noise as a diesel bus and allows the use of renewable energy since 100% of the electricity used is of hydraulic origin.

**An urban landscape free of overhead wires**  
Good for one’s health (lungs and ears!), the TOSA bus is also easy on the eyes. By recharging its batteries only at certain stations, this new bus, unlike trolleybuses, gets rid of overhead wires. No more cables, pylons and spider webs – TOSA gives the walls and the sky their complete freedom.

**Good for your health and good for the landscape!**

