STIF
41 rue de Châteaudun
75009 Paris
www.stif.info

ZeEUS is co-funded by the European Commission under the 7th Research and Technological Development Framework Programme, Mobility & Transport Directorate General under grant agreement n°605485. The ZeEUS project has been launched by the European Commission in the frame of the European Green Car and Smart Cities & Communities Initiatives.

Sennse • Mai 2016 - 11859

ZeEUS:
INNOVATION
FOR
THE ENERGY
TRANSITION

STIF, committed to **the energy transition**

**As the authority for sustainable transport,
STIF is boosting the energy transition in the Paris region.**

INVEST AND INNOVATE

STIF designs, finances and organizes one of the largest public transport networks in Europe and conceives ideas to improve the way people will travel tomorrow. As a leading player in the energy transition, STIF has modernized its infrastructure and developed innovative solutions which make travel simpler and faster and which respect the environment and improve city living.

WORKING TOWARDS A CLEAN BUS FLEET

On 11 December 2013, the STIF management board adopted an ambitious investment programme for the renewal of the bus fleet in the Paris region introducing electric and Biogas vehicles from 2018. The Regional Sustainable Urban Mobility Plan (PDUIF), approved in 2014, set a goal of reducing greenhouse gases by 20 % by 2020.

To meet these commitments, STIF is accelerating energy transition for transport by piloting a series of tests on new solutions. A standard 12 metre, 100 % electric vehicle co-financed by STIF and RATP, was selected as part of the European project ZeEUS (Zero Emission Urban Bus System).

At the end of 2016, about 970 hybrid buses, combining CNG (Compressed Natural Gas) and electrical power will already be operating on the Paris network, representing 10 % of the Paris region fleet.

Energy transition for buses : an exemplary approach

The Paris region transport network has over 1,500 bus routes with wide-ranging complexity. This flexible mode of transport, currently undergoing a technical evolution, is everywhere : from the heart of major cities to the towns and villages that make up the Paris region. One more reason to strengthen both its appeal and its environmental performance.

The 10 pilot sites in Europe

ZeEUS - Key figures

As part of the ZeEUS project, STIF oversees the testing of 100% electric buses on route 341.

40 European partners (public transport authorities, public transport operators, manufacturers, energy suppliers, ...)

9 countries

10 pilot sites

22.5 million (13.5 million financed by the European Commission and 9 million by other partners)

55% of travel by public transport within the European Union is by bus, nearly 32 billion trips

ZeEUS, a European project for the electric bus

Zero Emission Urban Bus System

Launched in 2013 under the auspices of the International Association of Public Transport (UITP), the Zero Emission Urban Bus System project (ZeEUS) is preparing the introduction of electric buses in European cities.

A FULLSCALE TEST ACROSS EUROPE

The ZeEUS project stems from the desire of the European Commission to encourage modes of transport that are more competitive in environmental terms. This project aims to promote the development of electric buses :

- reduce emissions of greenhouse gases;
- improve air quality;
- limit noise pollution in urban areas.

Deployed in 10 pilot sites across 9 countries of the EU, the ZeEUS trials are designed to test a wide range of innovative technologies in real-life conditions on different models of bus and electricity charging infrastructure solutions. The goal is to anticipate the rollout of electric buses and encourage manufacturers to offer proven solutions. The trials should also help validate different bus operating models from an economic, environmental and societal perspective.

THE CHALLENGE OF INNOVATION

If the share of electric buses in European cities is less than 1.5 % today, the significant progress made by manufacturers means that it is certain there will be a significant increase in demand between 2020 and 2025. That is why the ZeEUS project wants to test today the technologies and products of tomorrow.

For all the stakeholders involved in the project, the solutions to be found are based on 5 key points :

- economic feasibility;
- performance (availability and reliability);
- the vehicles available and the scope of contracts (maintenance, support, training, ...)
- interoperability and charging standards;
- electricity resources (stability of production, location of charging points, energy prices).

For more information : www.zeeus.eu and info@zeeus.eu

100 % electric buses
on route 341

The BlueBus 100 % electric vehicles, unveiled at the COP 21, will be introduced progressively on route 341 between Charles de Gaulle-Etoile and Porte de Clignancourt.

This trial is co-financed by STIF and RATP, their contribution is

10 *million euros.*

Charging system for the Bluebus vehicle.

TRIALS IN REAL-LIFE CONDITIONS

Route 341 will be the first bus route in Ile-de-France to be fully equipped with 100 % standard sized (12 metre) electric buses with the same passenger capacity as a conventional bus. The "clean" Bluebus (Bolloré Group) and its overnight charging system are being tested at the Belliard RATP depot. Eventually, a standardized system will be deployed across the Paris region bus fleet.

TWENTY-THREE 100% ELECTRIC BUSES TESTED

Route 341 was chosen because its operating conditions are representative of routes across the network. It also benefits from existing electrical equipment at the Belliard depot.

23 Bluebus vehicles, assembled in Ergué-Gabéric, near Quimper in Brittany, will be tested progressively. With powerful 240 KWh, LMP batteries (Lithium Metal Polymer) the operating range of these standard (12 metre) vehicles is expected to reach 180 kilometres without need for intermediate recharging. Their passenger capacity is identical to that of a conventional bus.

The lifetime of the batteries, the reliability of the transmission system, as well as maintenance conditions, will be closely monitored. Noise levels inside and outside the bus will also be measured.

SERVING PASSENGERS

The 100 % electric buses are not only environmentally efficient: they also offer better travel conditions. A smoother ride, zero vibration, larger glazed areas, central sliding doors which make it easier to move around inside the vehicle and quieter operation are some of the advances from which passengers will benefit. The selected buses have a floor at pavement level and ramps for those with disabilities.

Route 341 : a route representative of the Paris bus network

In service since 2008, bus route 341 stretches for 10 kilometres. It includes 26 stops and 9 interchange points.

Service is provided from 7:00 to 20:30, at intervals of 7 minutes in rush hour. The average speed is 10.5 kph. The route is used daily by 8,800 passengers, that is 2 million passengers per year.

The benefits of the trials

FACILITATING DECISIONS AT A EUROPEAN LEVEL

The test conducted on route 341 will enable STIF and operators to learn valuable lessons in preparation for bus fleet renewal in Paris from 2018. Trials will also feed the database of the ZeEUS Observatory. This will allow for and inspire the exchange of best practices at a European level.

A 100 % electric bus on route 341.

COLLECTING DATA

If we are to reduce the carbon footprint, the use of "clean" buses must become ever more attractive. Performance, comfort and availability will logically result in an increase in ridership. As part of the trial on route 341, passenger surveys will be conducted to evaluate the influence of new technology on behaviour.

The evaluation of the economic model of the 100 % electric bus is part of the experience. In effect, the vehicle is part of an overall system including charging facilities and the various services offered by the manufacturer in terms of maintenance, management and replacement of equipment. After the various trials, ZeEUS will provide a guide to European cities and tools to encourage the energy transition of urban buses.

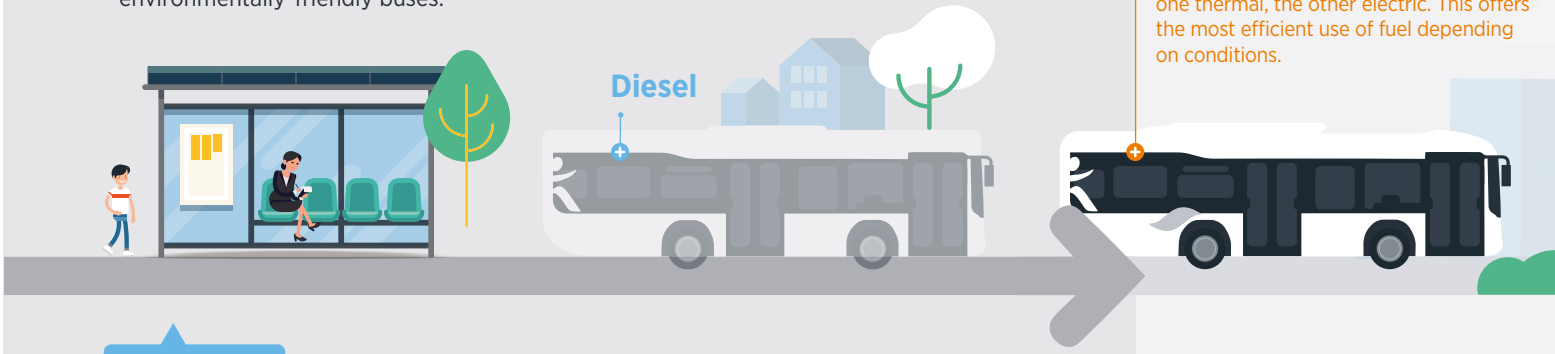
The results of the ZeEUS project will be presented in spring 2017 to support the strategic choices of the leading players in public transport across Europe.

Transport leaders and passengers, take up the challenge!

The bus, leading the way to **energy transition in the Paris region**

The energy transition will take place progressively:

- Replacement of the most polluting buses by more environmentally-friendly buses.
- Trials such as that testing 100% electric buses on route 341.



Today

9.500 buses, of which **970** clean vehicles

1.500 routes

3.5 million bus trips per day

The bus: a flexible mode of transport that is adaptable and available across the Paris region.

...develop new skills

CNG

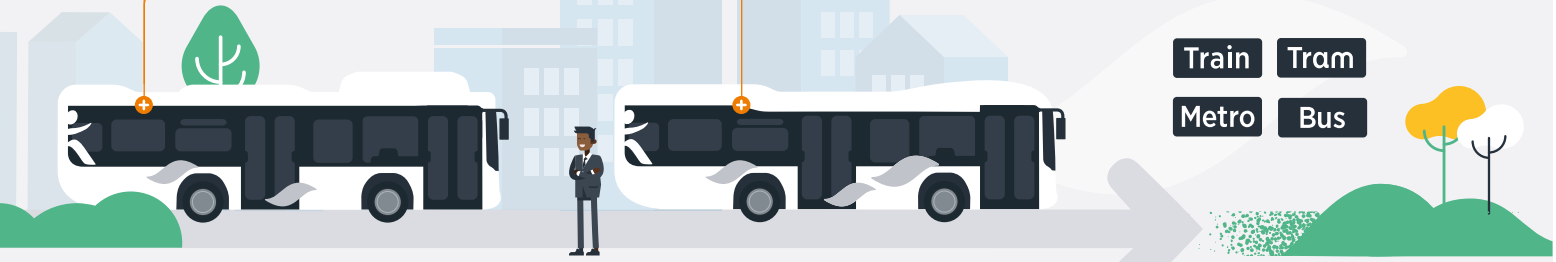
Compressed Natural Gas is the non-diesel derived fuel alternative that is the most common bus fuel after diesel.

Biogas

Biogas is the methane produced from biomass. It is a 100 % renewable energy produced from organic waste.

100 % electric

Has its own energy reserves in the form of on-board batteries.



Tomorrow

PDUIF* objective

- 20 % greenhouse gases in 2020

For ever cleaner transport and a better city environment.

Train · Tram · Metro · Bus

**Paris Ile-de-France Sustainable Urban Mobility Plan.*

The energy transition will...

...create new infrastructure

(maintenance and garage facilities, charging systems, etc.)

...make buses more attractive