

Transdev “eBus Living Lab”

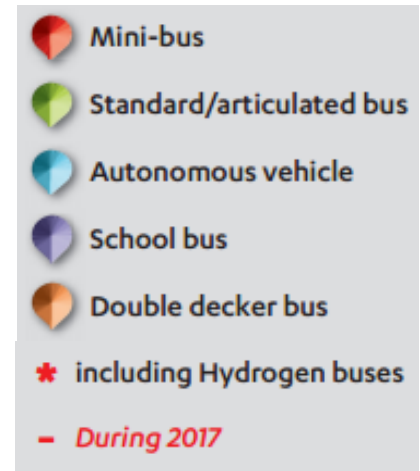
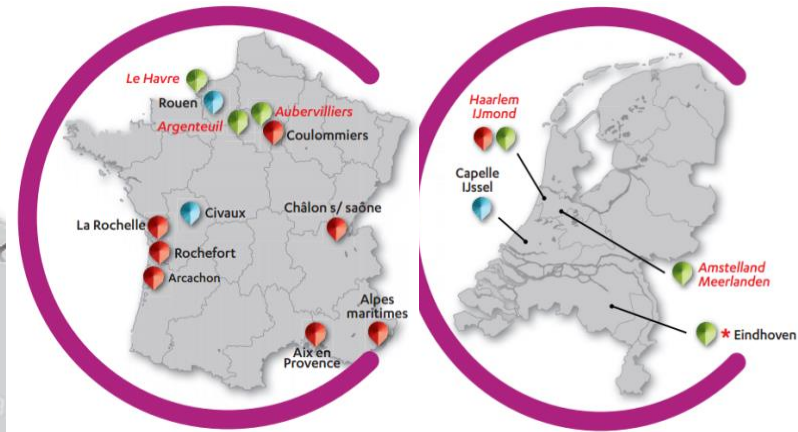
Francois REGEMBAL

Group Technical and Operations Director
























Annual Meeting

Transdev Electric World

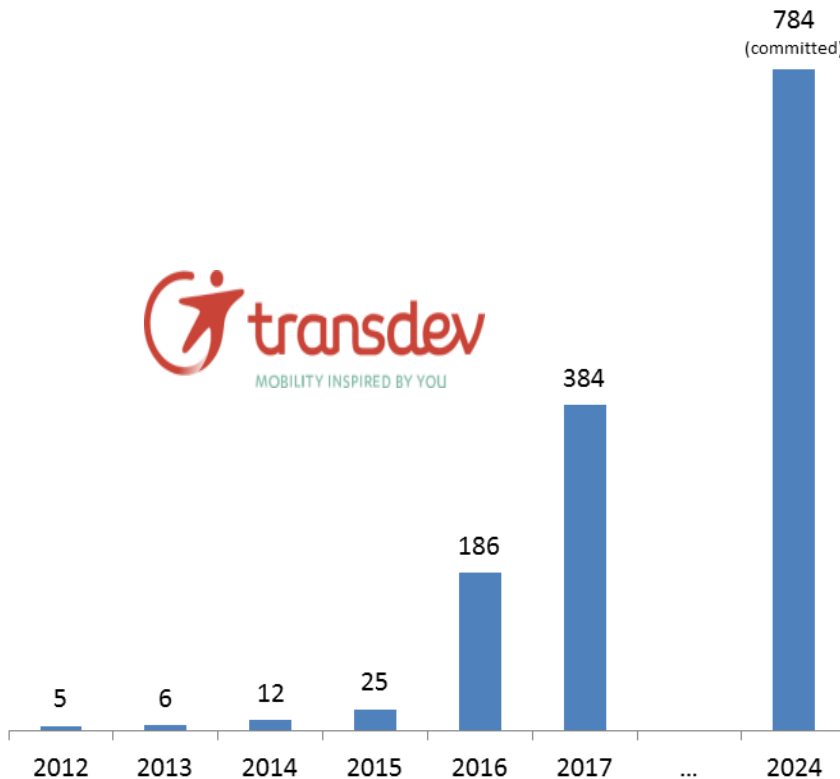


Electric Buses in Operation

	Model	Location	# Units		Model	Location	# Units		Model	Location	# Units
	BYD K9	Eskilstuna (Sweden)	12		VDL MidCity	Haarlem-IJmond (NL)	8		BYD/K7	Stanford University (USA)	11
	BYD K9	Haarlem-IJmond (NL)	8		Proterra Catalyst XR	Foothill (USA)	13		HYBRICON HCB	Umea (Sweden)	9
	BYD K9	Lancaster (USA)	22		EBUSCO YTP 1	Argenteuil (France)	9		VDL Phileas	Eindhoven (NL)	2
	BYD K9S	Los Angeles (USA)	4		Bolloré	Aubervilliers (France)	5		LINKKER (Proto)	Espoo (Finland)	1
	BYD K11	Lancaster (USA)	13		Irizar ie2	Le Havre (France)	3		BYD/K9A	Anaheim (USA)	4
	BYD K10	Lancaster (USA)	5		ADL/Magtec	York (UK)	6	<div>302 units + 82 mini/midi bus TOTAL: 384</div>			
	Autobus Lion	Quebec (Canada)	3		Volvo 9700-E	Harrogate (UK)	8				
	VDL-SLFA E 180 & 181	Amstelland Meerlanden (NL)	143		BYD/K9	Stanford University (USA)	13				

Electric Buses Outlook

EVER EXPANDING MARKET



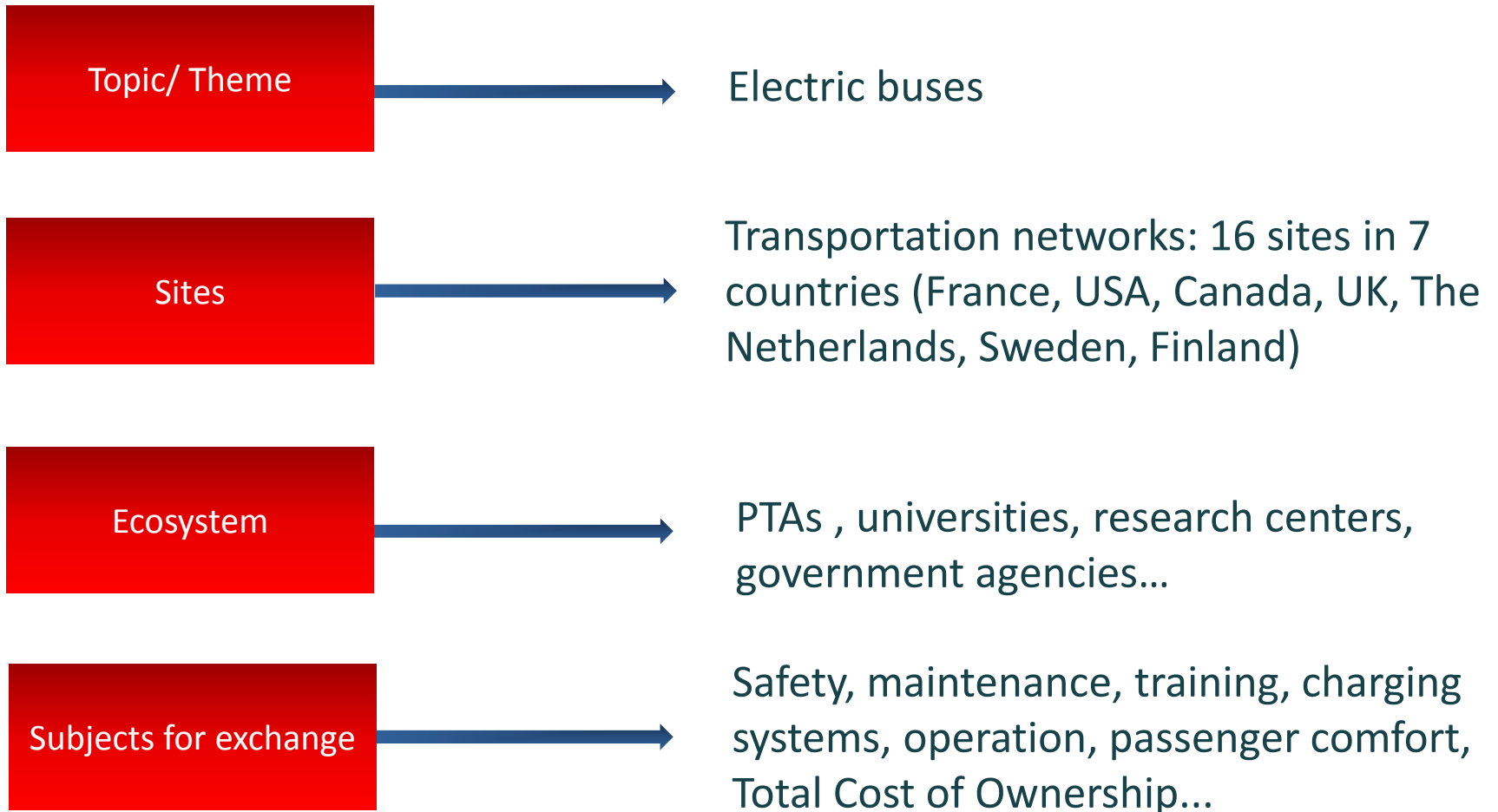
Global part of electric buses purchase:

IN 5 YEARS 40%

TODAY 18%

**10 YEARS AGO
< 1%**

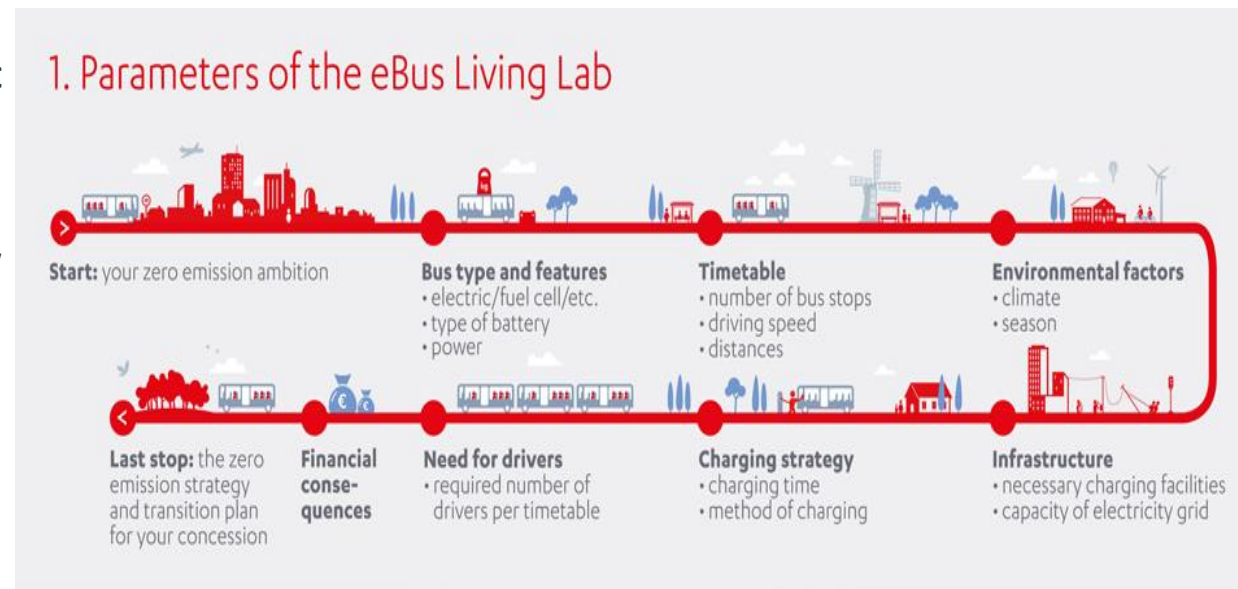
Transdev Living Lab



E-Bus toolbox

LIVING LAB OUTPUT #1

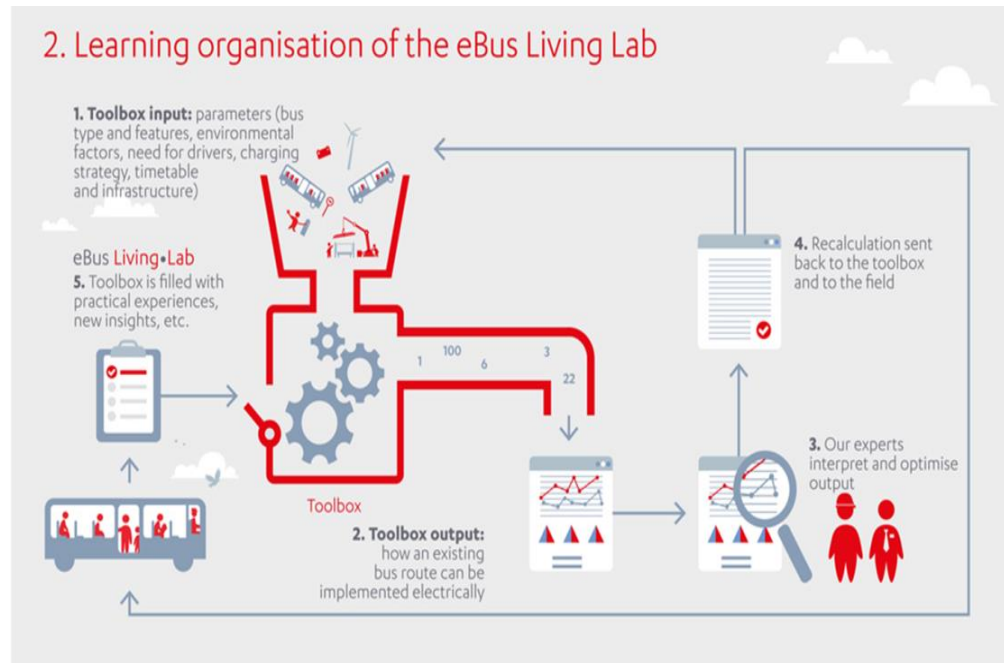
- Determine the best zero emission solution for specific network or line
- Modelling tool to assess new market developments
- Various parameters:
Charging infrastructure,
Rolling stock specifications,
Operational environment.



E-Bus toolbox

LIVING LAB OUTPUT #1

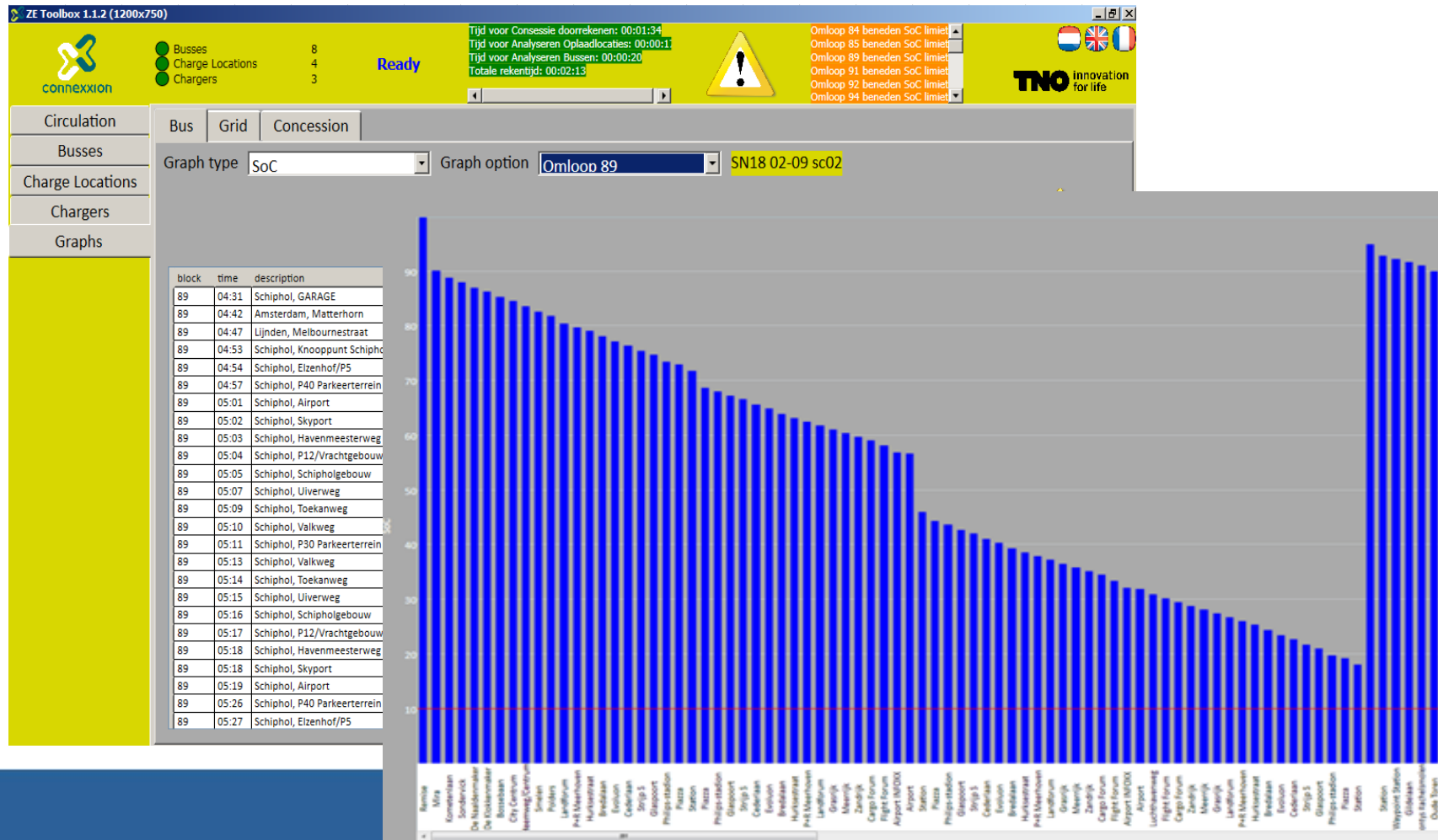
- Practical return on experiences feeds the toolbox for algorithm enhancement
- Partnership with research centers and state laboratories.



E-Bus toolbox

PRACTICAL DEMO: CALCULATION RESULTS AT BUS LEVEL

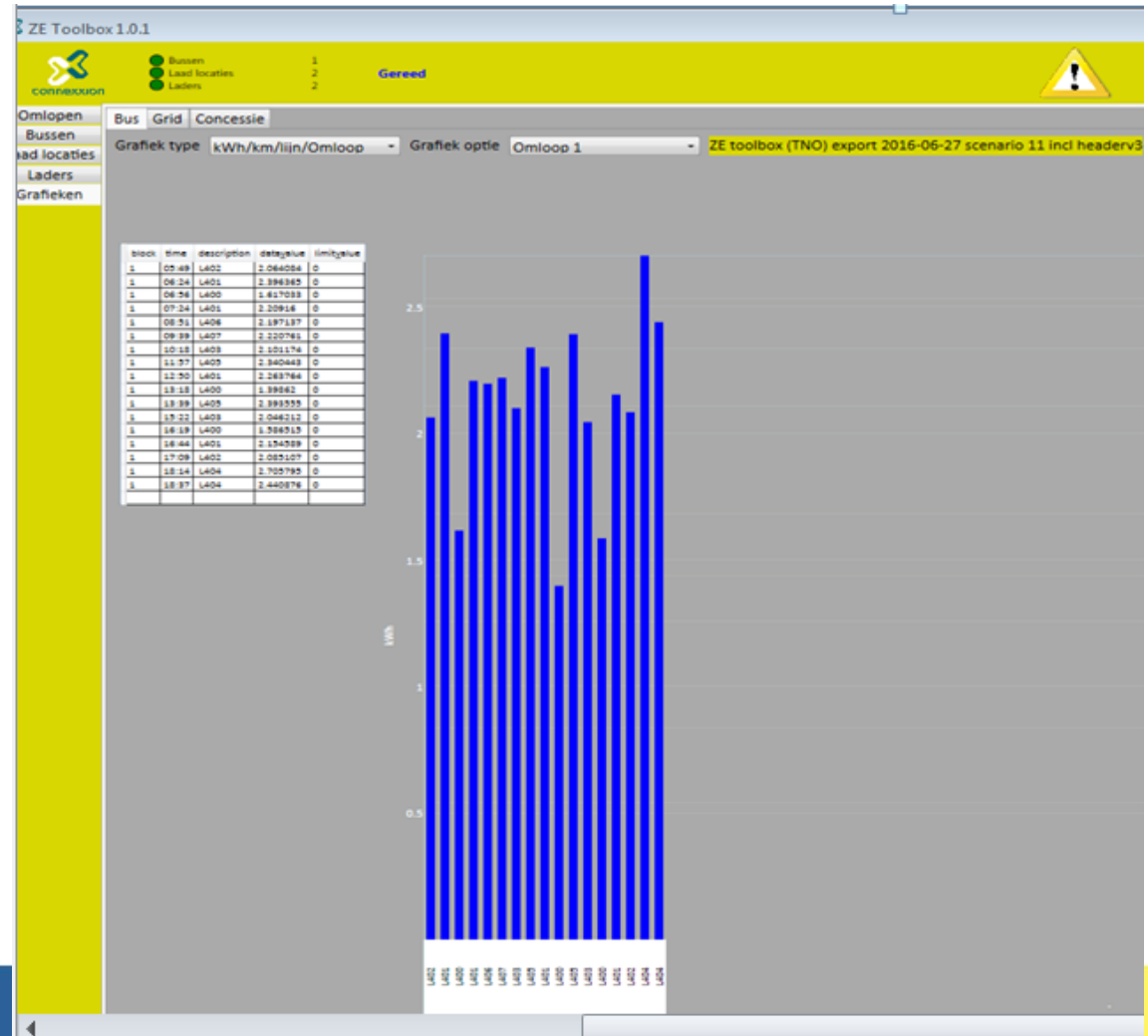
Evolution of the state of charge of the buses batteries during daily operation. (in



E-Bus toolbox

PRACTICAL DEMO: CALCULATION RESULTS AT BUS LEVEL

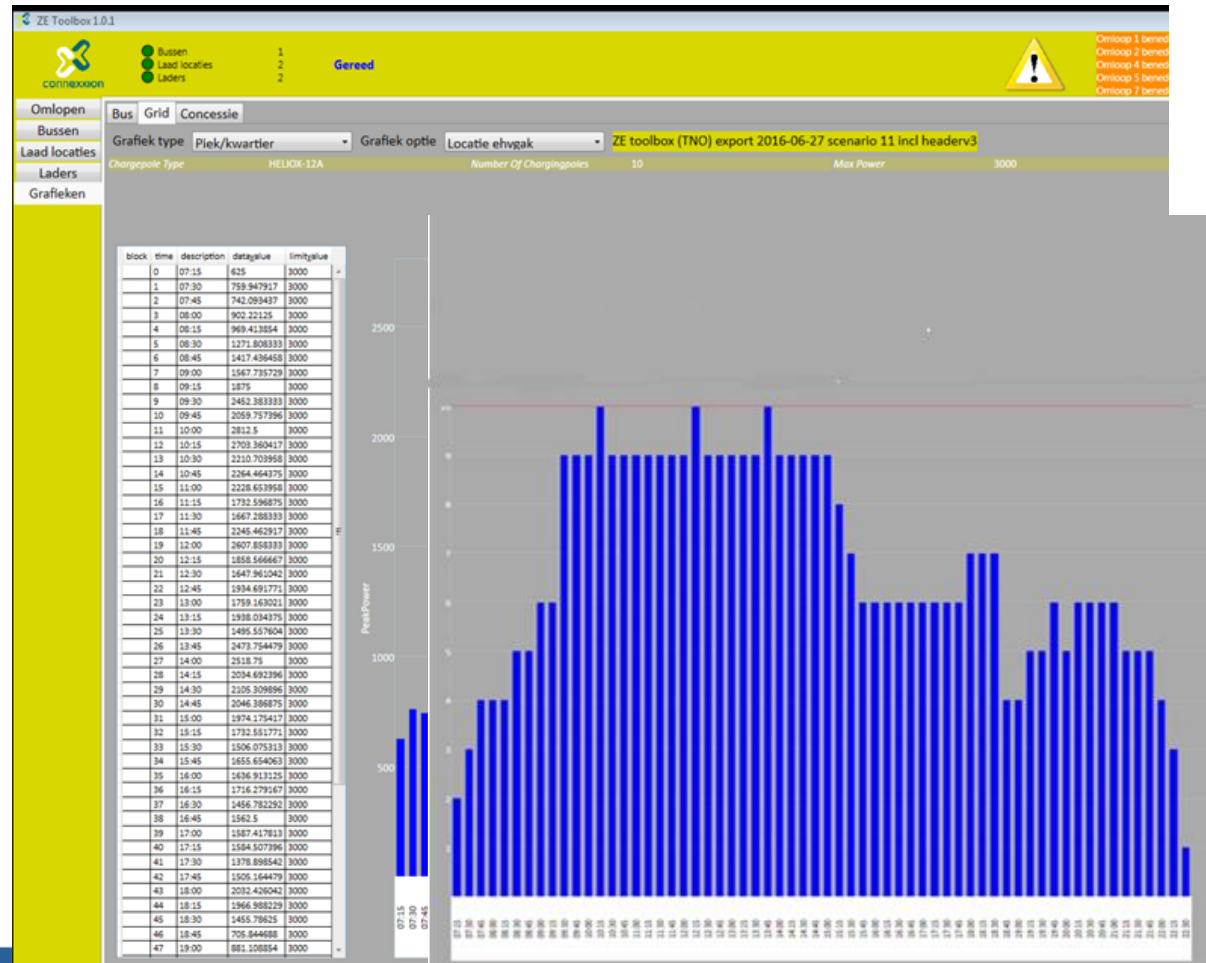
- Total energy consumed per bus in kWh/km/loop



E-Bus toolbox

PRACTICAL DEMO: CALCULATION RESULTS AT GRID LEVEL

- Peak power demand (total power/15 minutes)



New Technologies

LIVING LAB OUTPUT #2

Fuel Cell

Testing Hydrogen buses in operation (2017)



Electric Coach

Running long range coach on commuter routes (2018)



Trolley 2.0

Trolley operation in dual mode: catenaries and batteries (2017)



Smart Charging

Optimized overnight charging system (2017)



LIVING LAB OUTPUT #3

- 
- Sharon Dijksma -
State Secretary of the Ministry of Infrastructure and Environment -
Netherlands