EURABUS
pure electric busses from ON‘S Industry Germany

diesel vs. electric!

84 t CO^2/year

0,5 €/km

heavy traffic noise

difficult in maintenance

diesel-bus

range:
Diesel > 500 km
Electro max. 350 km

0,15-0,2 €/km

0 t CO^2/year
(using renewable electricity)

very quiet

simple in maintanance

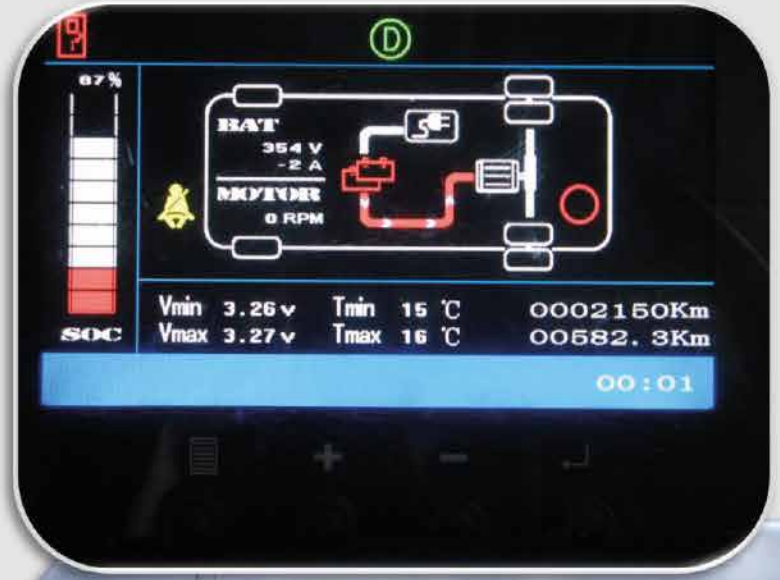
electric-bus

the EURABUS -principle:

- reliable, clean and affordable
- maximum efficiency (heat-pump-heating)
- fail safe LiFePO4 batteries, light weight construction
- economic, attractive ROI

12m class
EURABUS 1.0

Roll-Out of our first 12m e-bus with EU-type approval in early 2012



PURE E-MOTION EURABUS

Shuttle service in Berlin…
(between main station and German Federal President office)

EURABUS in Stockholm/Sweden

(now on duty on Swedish bus line)


HUMLEGÅRDEN
ONS
B EU 414


Ett tanklöst projekt, fullt av omtanke.
Här åker Humlegården Fastigheters kunder både kostnads- och avgasfritt.


HUMLEGÅRDEN
Solna C - Hagalund
utan buller eller utsläpp.
(Eller för den delen avgasrör.)
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12m class
Eurabus 2.0

red colour – made for Hamburg public transport system

EURABUS 2.0

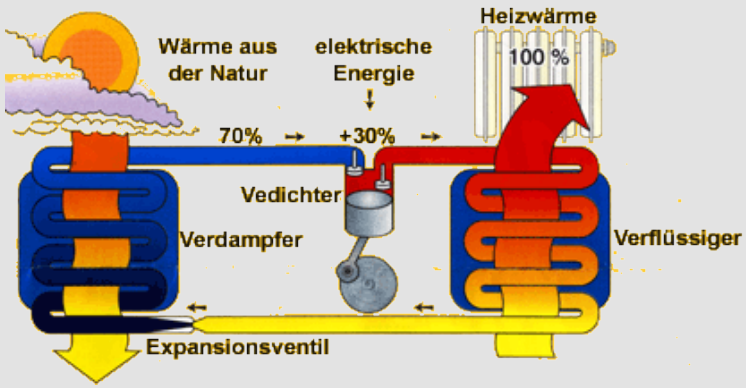
switch thinking!

Eurabus 2.0

in Switzerland

Dimensions	**11.980 x 2.500 x 3.140**
Net-weight with batteries	ca. 12.500 kg
Allowed total weight	18.500 kg (GER 18.000 kg)
Drivetrain	130 kW/2200 Nm asynchronous AC-engine, efficiency 93%, water-cooled incl. regeneration (kinetic) of brake-energy
Battery, range	214 kW Lithium iron phosphate batteries with single cell battery management system thermal containment, intrinsically safe, consumption approx. 1,1 kWh/km. (242 kW optionally)
Brakes	WABCO, dual-circuit pneumatic 4-discs-brakes + E-brake
Suspension	Pneumatic suspension WABCO/ECAS with kneeling-level-lowering
Air conditioning	Roof-top plant / electric, 22kw heat pump
Heating	Roof-top plant / electric, 25 kW heat pump
Doors, door-opening buttons	2 double doors, MTS door management (release by driver) Door-opening buttons on the inside and outside.
Windows	Tinted Windows: sides / rear
Other	VDV standard driver-seat (Continental) halogen headlights — Charger external or integrated Internal LED lightening — Manual wheelchair ramp IBIS Databus pre-installed — Space for wheelchair with belt
destination displays	Gorba, LAWO etc. (4)
seats	Seating according to customer's request. Design to be agreed

Competitive advantage heat pump: 1,1 kWh/km incl. Heating/cooling



energy for heating and cooling from ambient air, COP 3-3,3

Competitive advantage lightweight construction: load capacity as per a Diesel bus (12t/18t)

Every ton of weight saved = 5-6% less energy consumption

Energy storage: Lithium iron phosphate

Characteristics of different cathode materials

Quelle: Prof. Dr. Ralph Pütz, Leiter Labor Nutzfahrzeugtechnik,Hochschule Landshut.

	Energy density	Power density	safety	Stability	costs per Ah
Material	**Energie-dichte**	**Leistungs-dichte**	**Sicherheit**	**Stabilität**	**Kosten pro Ah**
LCO $LiCoO_2$					
NCA $LiNi_{0.80}Co_{0.15}Al_{0.05}O_2$					
NMC $LiNi_{0.33}Mn_{0.33}Co_{0.33}O_2$					
LMO $LiMn_2O_4$					
LFP $LiFePO_4$					

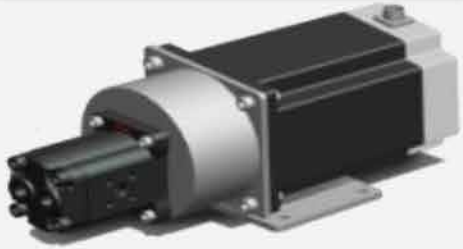
Sehr gut — Sehr schlecht

$LiFePO_4$ – Currently the safest and most attractive cell technology!

-700 W/h

-48 kW/day

-0,4 kW/h



Regeneration

-0,6 kW/h

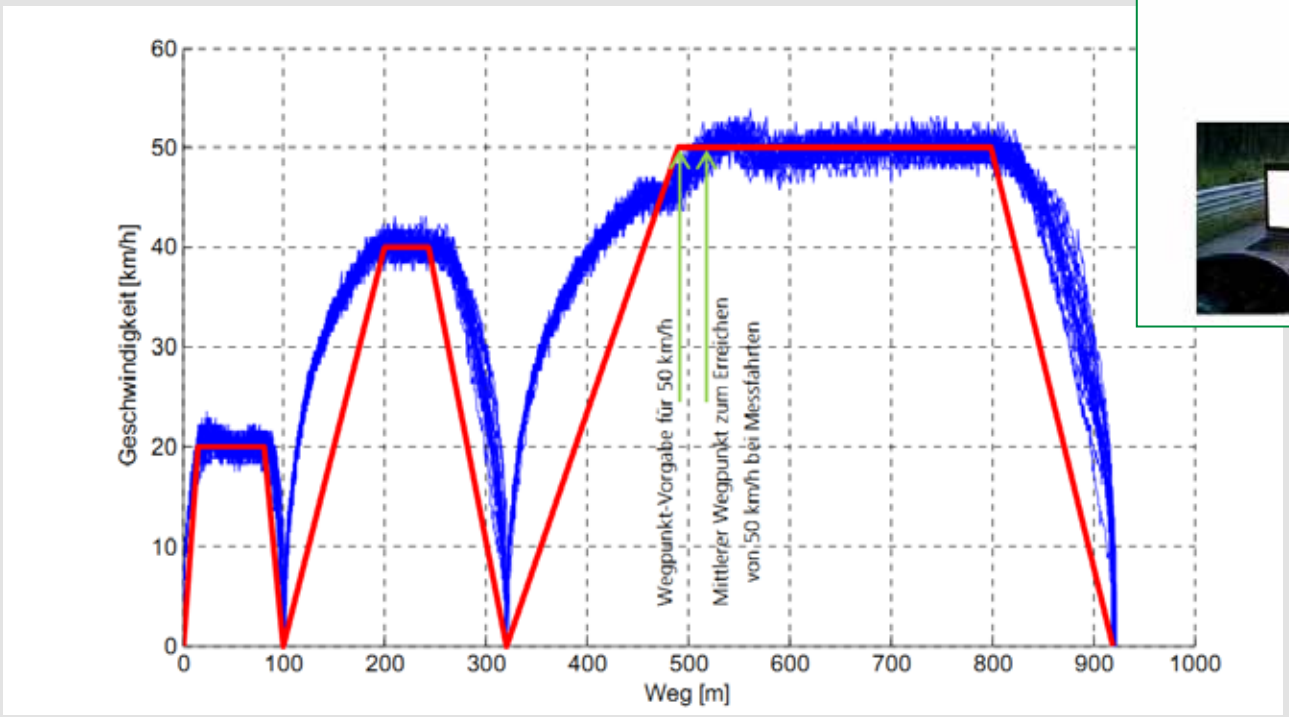
lightweight construction

EURABUS 2.0

1,2 kWh/km
Incl. heating

Energy measurement acc. SORT1/2/3
result: approx. 1,2 kWh/km

Energy consumption in real public transport use:
ca. 1,1- 1,3 kWh/km



Fraunhofer
IVI

FRAUNHOFER-INSTITUT FÜR VERKEHRS- UND INFRASTRUKTURSYSTEME IVI

ENERGIEVERBRAUCHSMESSUNGEN

Prüfbericht zum Energieverbrauch eines
12 m-Elektrobusses der Fa. Euracom GmbH

Matthias Breitkopf, IVI
Sven Boden, IVI

Im Auftrag der Fa. Euracom GmbH

Dresden, 17.10.2013

Fraunhofer
IVI

How does electricity get into the bus?
-range versus charging infrastructure-

application scenario range
up to 350 km/day

„overnight charging +
standard battery pack

application scenario range
>350 km/day

intermediate charging

larger battery

conductive

inductive

„Overnight“ (slow charge)
e.g. 100 A (40 kW/h) = 5h

„fast charge“
e.g. 200 A (80 kW/h) – 2,5 h

„boost-charge “ (ultra fast ch.)
e.g. 500 A (200 kW/h) – ca. 1 h

2015:

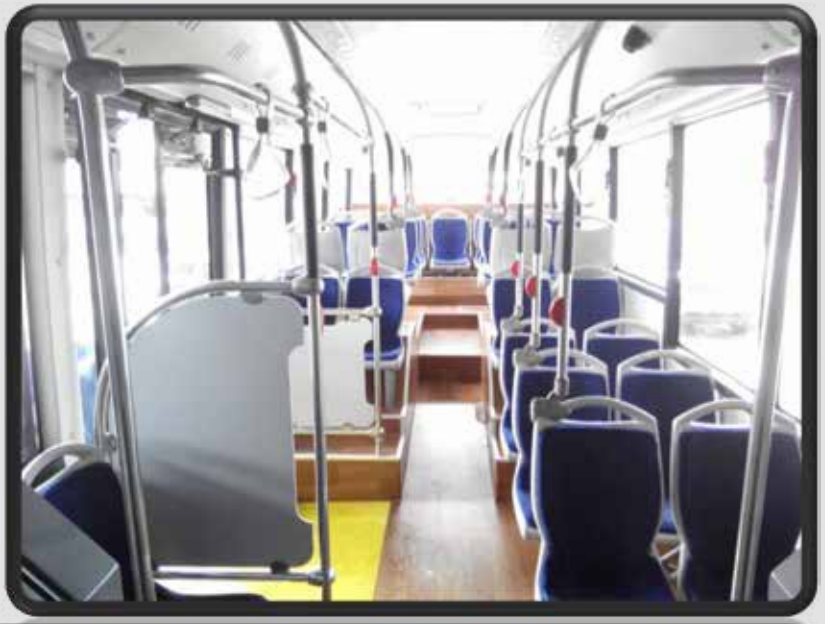
all-new 18m-articulated e-bus


ONS
ONS

18m articulated bus

(up to 135 passengers)

- ✓silent
- ✓enviromentally friendly
- ✓Reasonable ROI



564 kWh Lithium-iron-phosphate-battery system
$LiFePO_4$

Range approx. 350 km
Double-charging system 2x 200A/400V (max. 160kW)

PURE E-MOTION

EURABUS

PURE E-MOTION

EURABUS

switch thinking!

ON‘S Industry Germany

Flughafenstrasse 52a · Building C · D-22335 Hamburg

Phone: +49 40-53 29 91 72 · Fax: +49 40-53 29 91 00

info@ons-industry.com · www.ons-industry.com