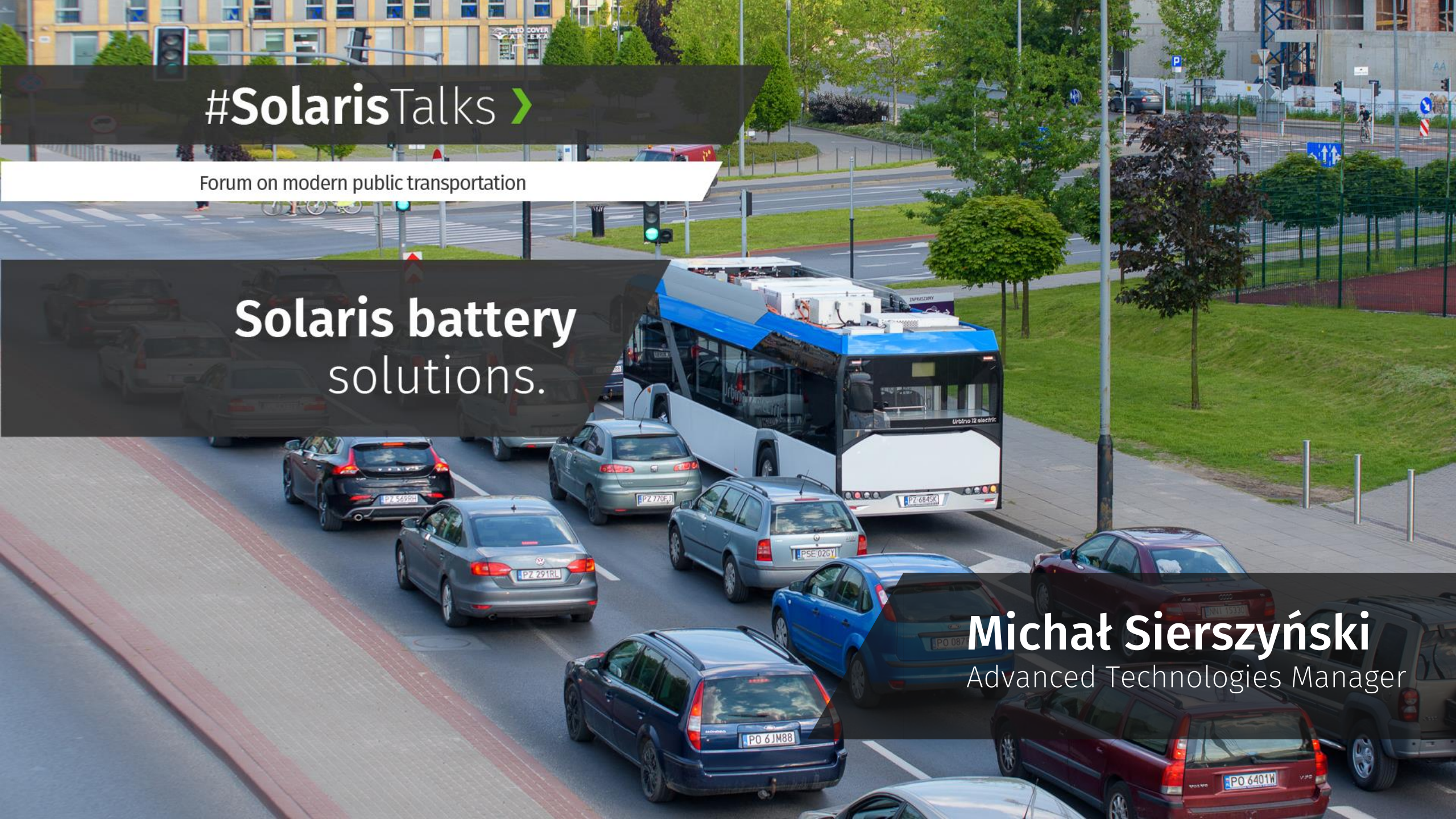


#SolarisTalks

Forum on modern public transportation

Solaris battery solutions.

Michał Sierszyński

Advanced Technologies Manager

SOLARIS
A CAF GROUP COMPANY

COMMON DIRECTION›

#SolarisTalks ›

Batteries
offered by Solaris

NEW

SOLARIS HIGH POWER

- High power density
- Perfect solution for fast charging
- Can be fitted in electric buses, trolleybuses, hydrogen vehicles

SOLARIS HIGH ENERGY

- High energy density
- Solution which is able to provide long range on a single charge

SOLARIS HIGH ENERGY+

- Latest Solaris battery solution
- Very high energy density
- A vehicle with HE+ batteries is able to cover distances up to 200 km* on a single charge

*Example for the bus equipped with a hybrid heating

New !

5 x battery Pack **HE+**

Solaris Urbino 12 electric

Range on a single charge: **200 km***
Number of passengers: **69**

6 x battery Pack **HE**

Solaris Urbino 12 electric

Range on a single charge: **150 km***
Number of passengers : **64**

With **Solaris High Energy+** battery it is possible to obtain both
a larger range of the vehicle and a higher passenger capacity

*Example by energy consumption of 1,39 kWh/km (hybrid heating)

SOLARIS
A CAF GROUP COMPANY

COMMON DIRECTION›

#SolarisTalks ›

Solaris High Energy+ in Urbino 18 electric

7 x battery pack

Solaris High Energy +

200 km range

on a single charge*

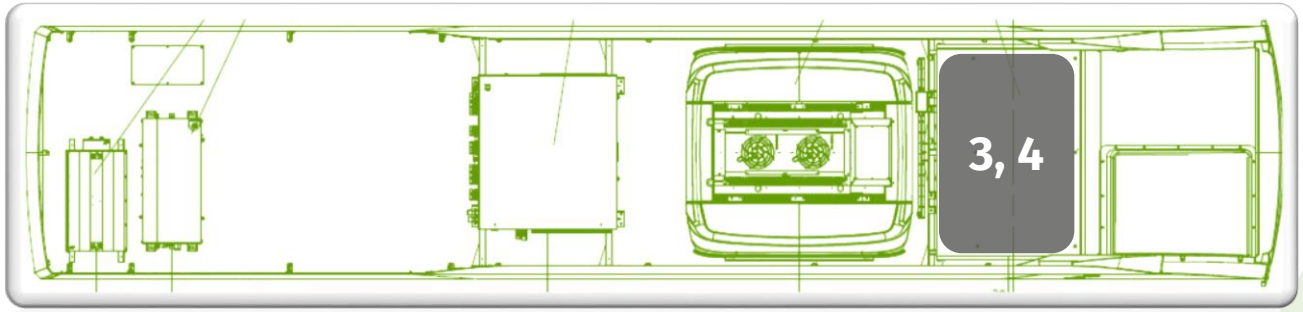
4 x roof

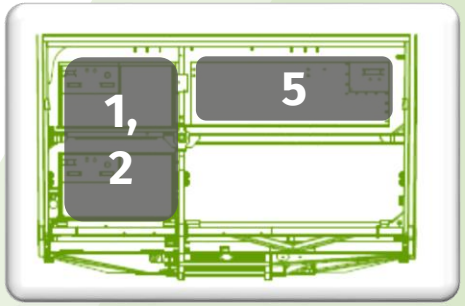
3 x rear

*Example by energy consumption of 1,94 kWh/km (hybrid heating)

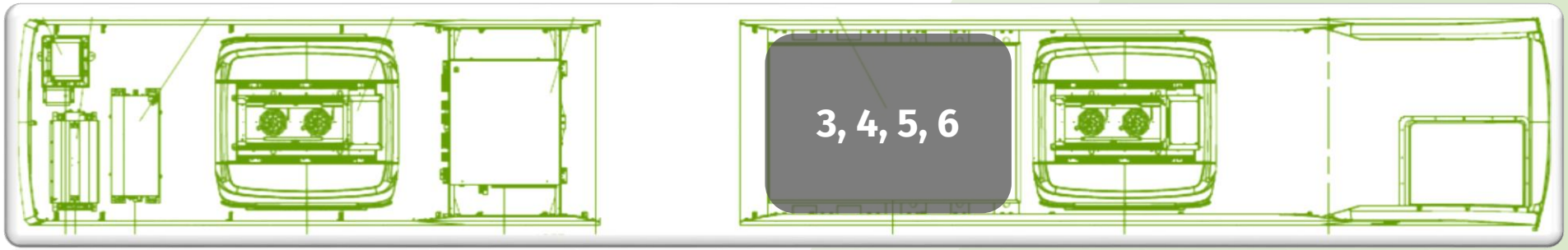
Battery **placement**

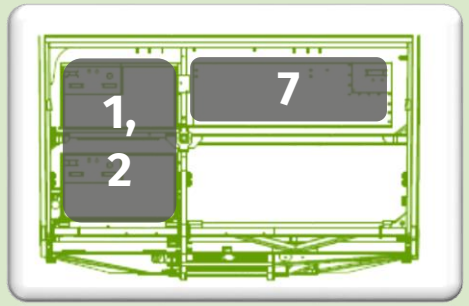
Solaris Urbino **12 electric**





Solaris Urbino **18 electric**





SOLARIS
A CAF GROUP COMPANY

COMMON DIRECTION›

#SolarisTalks ›

Let’s talk about **the details**

COMMON DIRECTION›

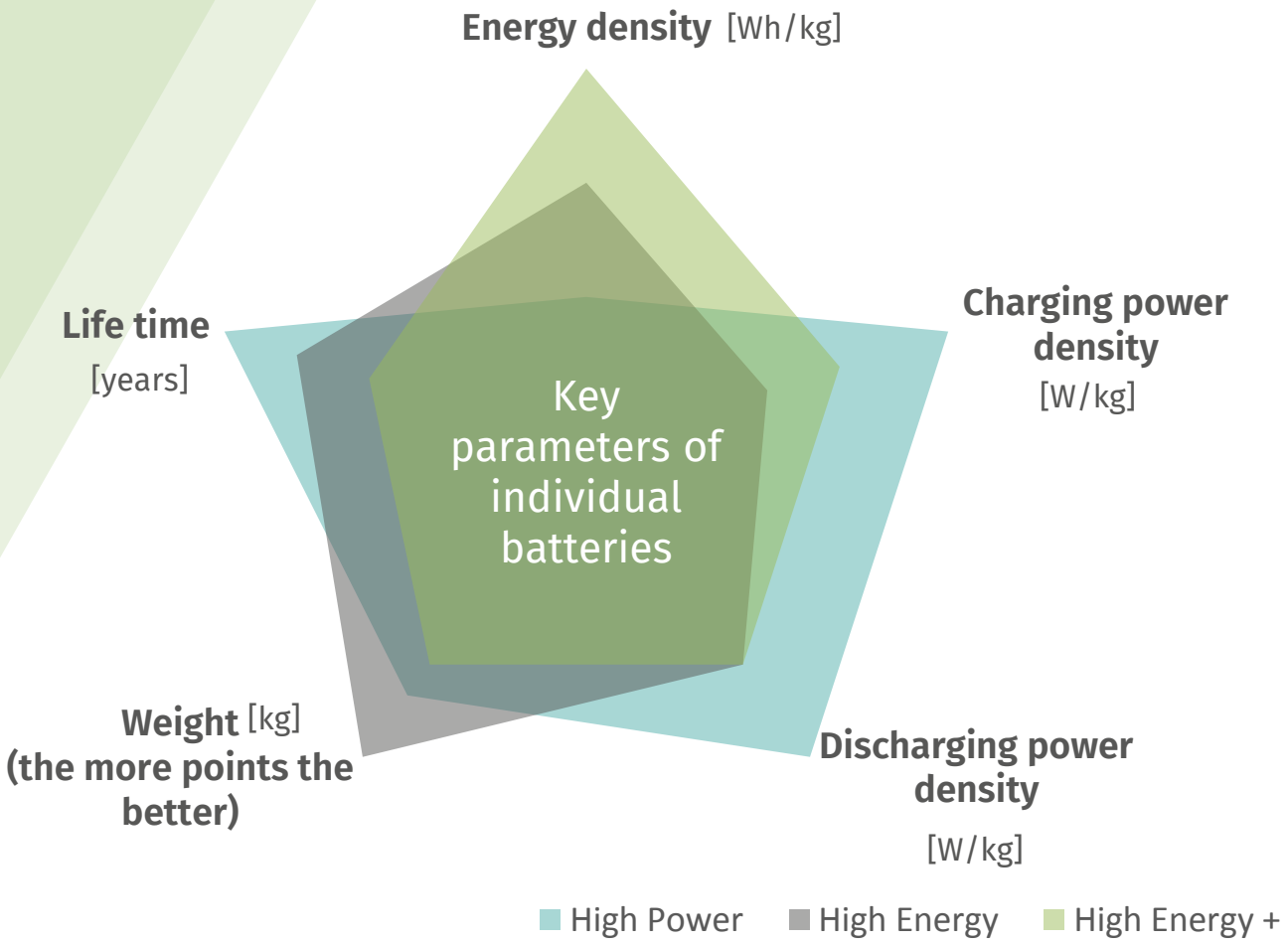
#SolarisTalks ›

Battery technology comparison

Wide range of **traction batteries**

Innovative technologies

Batteries **perfectly** suited to the **customer needs**



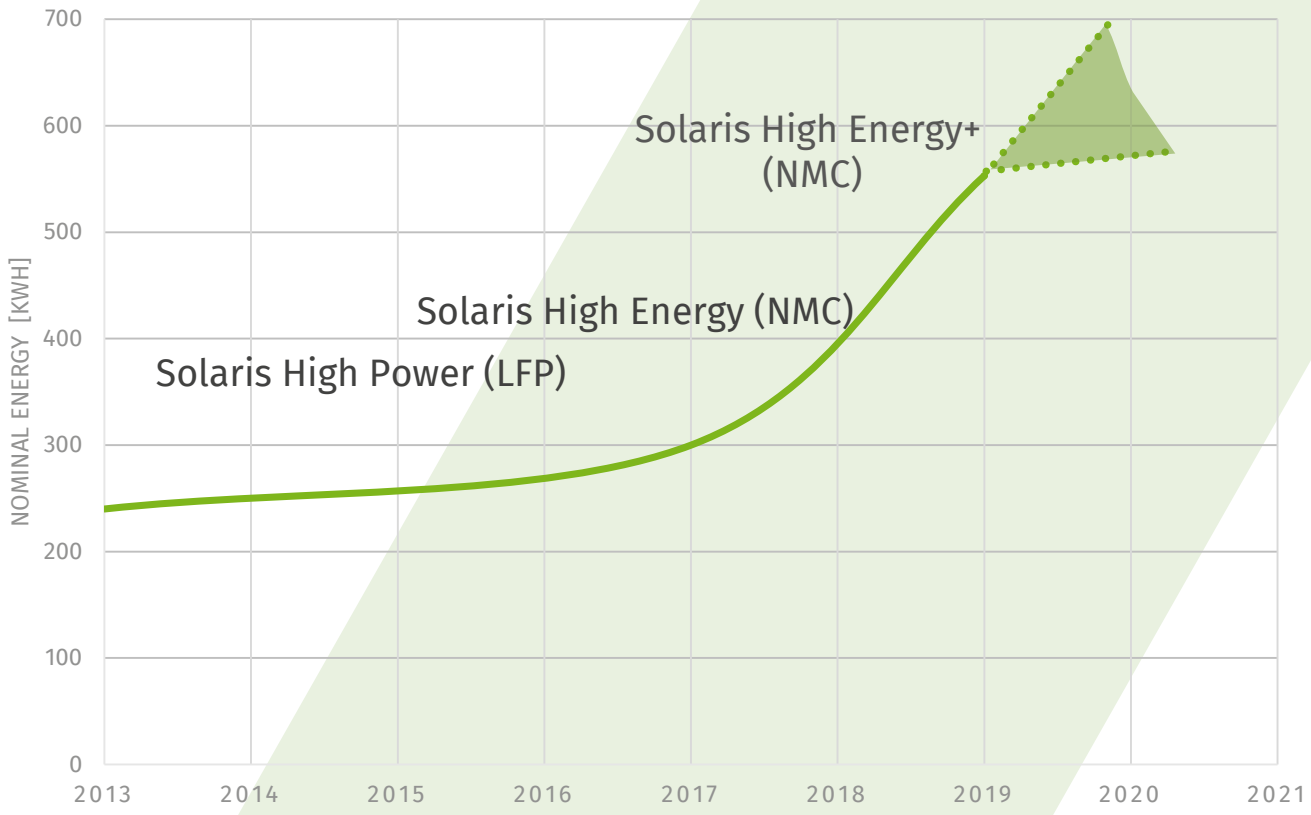
COMMON DIRECTION›

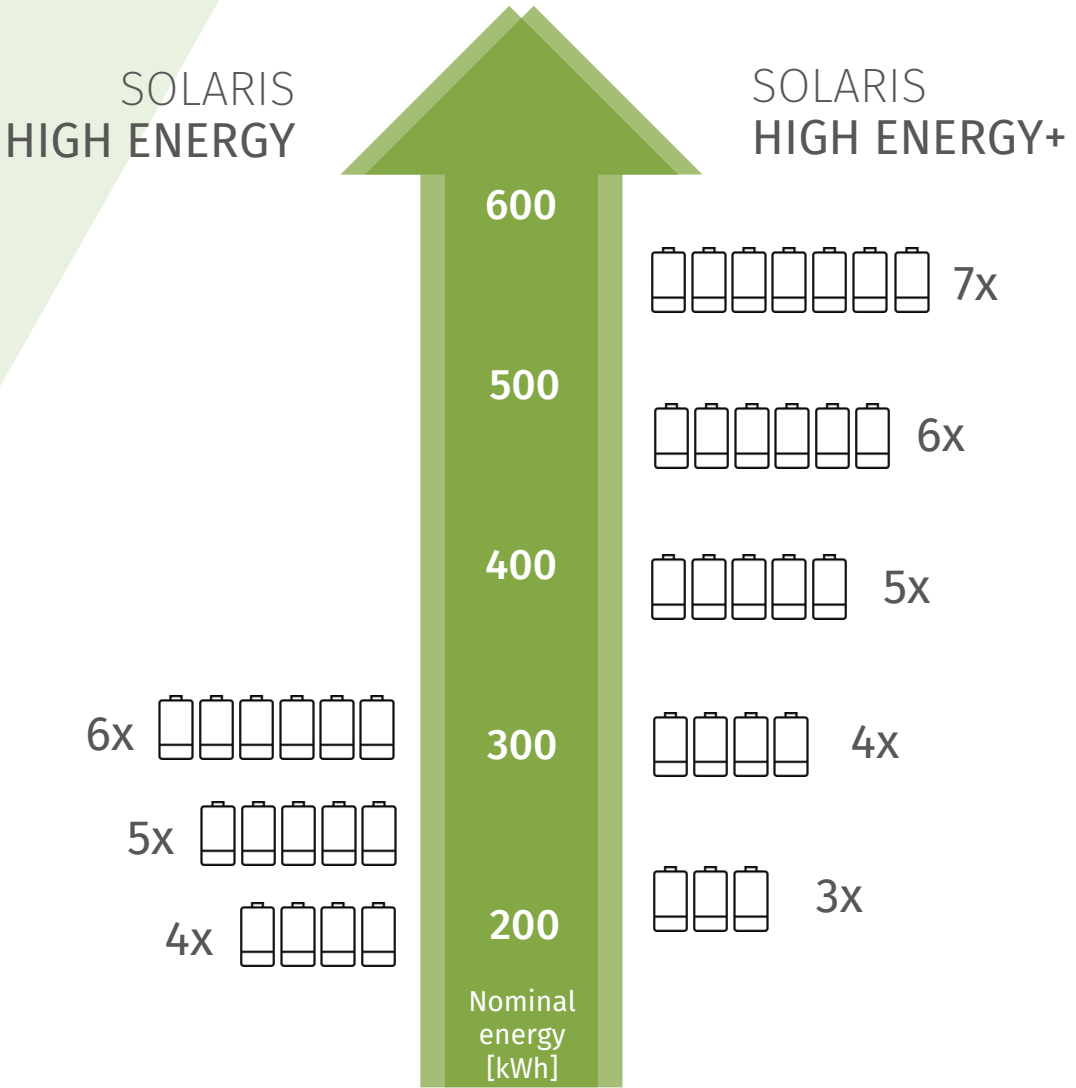
#SolarisTalks ›

Battery technology comparison

Increase of nominal energy of the battery

on the example of Solaris Urbino 18 electric





Warranty ≠ life time

WARRANTY = guaranteed performance

*e.g. we guarantee that the battery in a period of 5 years or a mileage of no more than **500,000 km will work properly** and the energy capacity available to the user will **not drop to around 80%** of the capacity available to the user with a new battery.*

LIFE TIME = technical durability of components

*Information used to plan the **battery replacement period**.*
*Battery life designed for a given period of time. There is **no guarantee** that the technical parameters will be preserved, including the capacity.*

Example: Bus lifetime is equal to 15 years but the warranty is provided up to 3 years

SOLARIS
A CAF GROUP COMPANY

COMMON DIRECTION›

#SolarisTalks ›

Batteries
offered by Solaris

NEW

HP

SOLARIS HIGH POWER

no limits

up to 7 years*

HE

SOLARIS HIGH ENERGY

up to 500 000 km*

up to 5 years*

HE+

SOLARIS HIGH ENERGY+

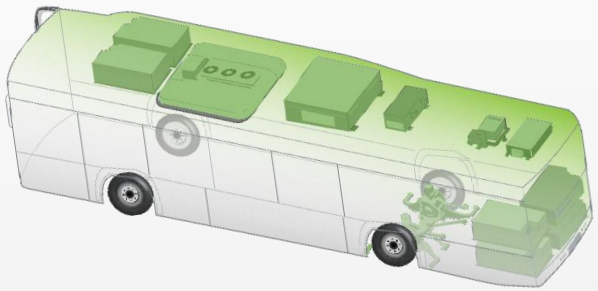
up to 500 000 km*

up to 5 years*

*The restrictions depend on working conditions. The warranty time is calculated for each case.

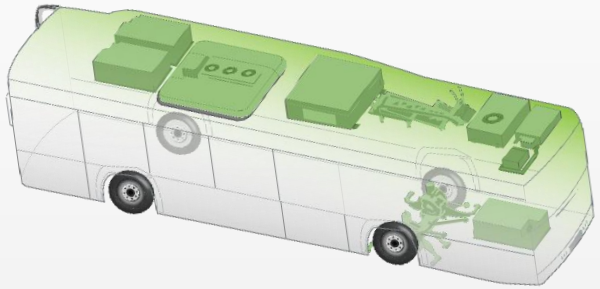
Charging possibilities

BATTERY BUS (PLUG-IN CHARGING)



- **High energy density storage system**
- Batteries charged **at the depot**
- **Long distance** covered on one charge (200 km*)

BATTERY BUS (PANTOGRAPH CHARGING)



- **High power density storage system**
- Charging the battery **at bus stops - even in 7 minutes**
- **Shorter distance,** more frequent charging

HYRDROGEN BUS

- **High power density storage system**
- Single refueling: **~10 min.**
- **350 km range** on one refueling

SOLARIS
A CAF GROUP COMPANY

COMMON DIRECTION›

#SolarisTalks ›

How to choose **the optimal battery?**

SOLARIS
A CAF GROUP COMPANY

COMMON DIRECTION›

#SolarisTalks ›

? How to optimally **manage the battery bus fleet**?

? How to **speed up the diagnosis** and prepare the appropriate service action?

? How to check the battery usage during its lifetime to be able to use it in the appropriate **second life app**?

SOLARIS
A CAF GROUP COMPANY

COMMON DIRECTION›

#SolarisTalks ›

Feasibility studies

01. DATA **COLLECTING**

02. DATA **ANALYSIS**

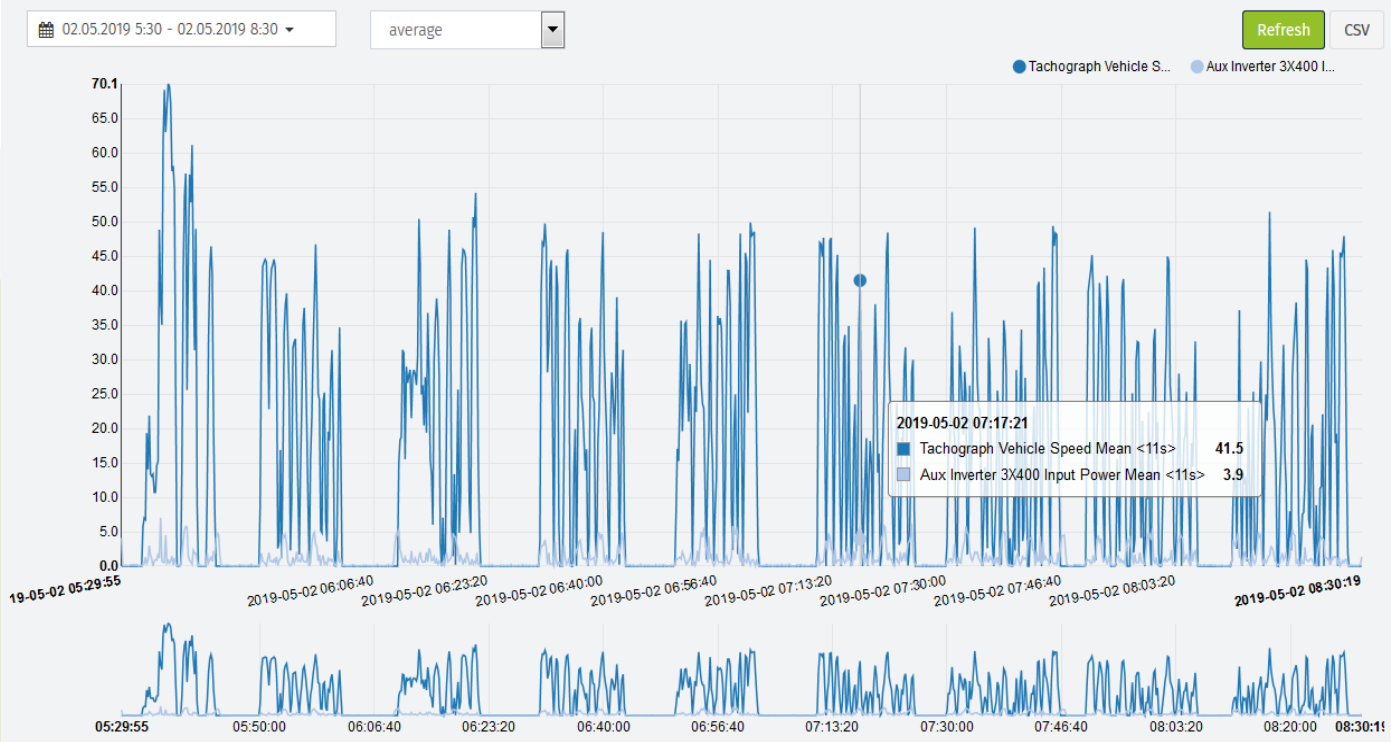
03. **CALCULATIONS**

04. **SOLUTION**

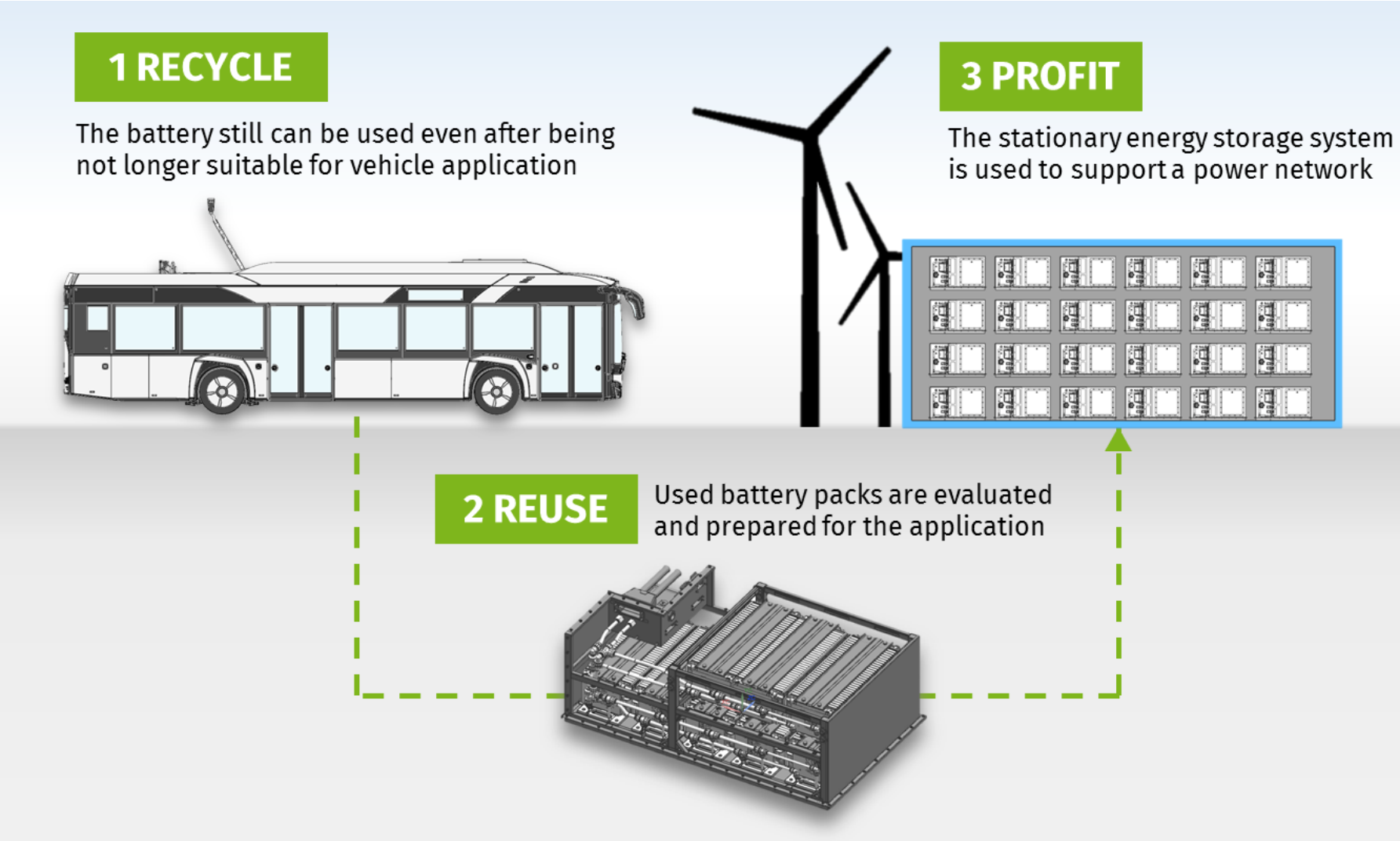
eSConnect
SOLARIS

Fleet management – Possibility of supervising the battery

- Charging Energy
- Energy of discharge
- Energy of recuperation
- Battery power
- Battery heating status
- Many other bus parameters…



Stationary energy **storage system**



Any questions?