

DALIAN LUOBINSEN POWER EQUIPMENT CO., LTD

November 2020

RFI «Electric charging infrastructure for 168 articulated buses at Stubberud»



EV Fast Charging Solutions  
Since 2008

**Ruter#**





**We have wide experience at depot charging projects across the world.**

**Since 2008 Charging Infrastructure is our core competence**

- **10 000+ Charging units around the world**
- **36 Countries are using our chargers**
- **R&D team**
- **Two production facilities in China**

**Majority of Chinese bus manufacturers (BYD, YUTONG, Golden Dragon ...) are using Luobinsen Chargers for the overseas sales.**



0,4MW 1 unit \* 360kW charger, United Kingdom

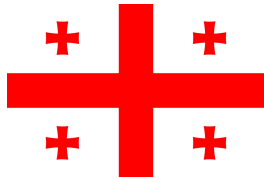
2,3MW. 13 units \* 180kW chargers, India

0,8MW. 4 units \* 200kW chargers, Sweden

1 MW. 3 units \* 360kW chargers, Georgia and Ukraine

29 MW. 73 units \* 400kW opportunity chargers for Moscow Public Transport Company

1,5 MW 21 units \* 75-150kW, Israel





Key idea of the project is creating least costly and effective overnight charging depot.

There are two suitable solutions

1. Pantograph charging
2. Plug-In CCS cable charging







1. Rectifiers location place at depot.
2. Massive metal structures and foundation for the charging domes.
3. Construction High COST
4. Extra DC cables and conduits
5. Operational issues (precise parking, connection issues)



1. All-In-One Charger (rectifier + charging point)
2. Simple Chargers Layout, Easy Relocation.
3. All power supply in the surface aisles conduits
4. Installation Time up to 1 hour
5. Second Floor Chargers. (additional option)



CCS chargers are more suitable for this specific project.

1. Less time and investment in construction works.  
Trouble-free, low cost relocation

2. Less Total Footprint 550x690mm

3. No DC Cables underground

4. Reliability. Each Charger Is Independent

ALL These factors will make positive impact  
on the project P&L.



For the current Ruter's RFI we recommend to use

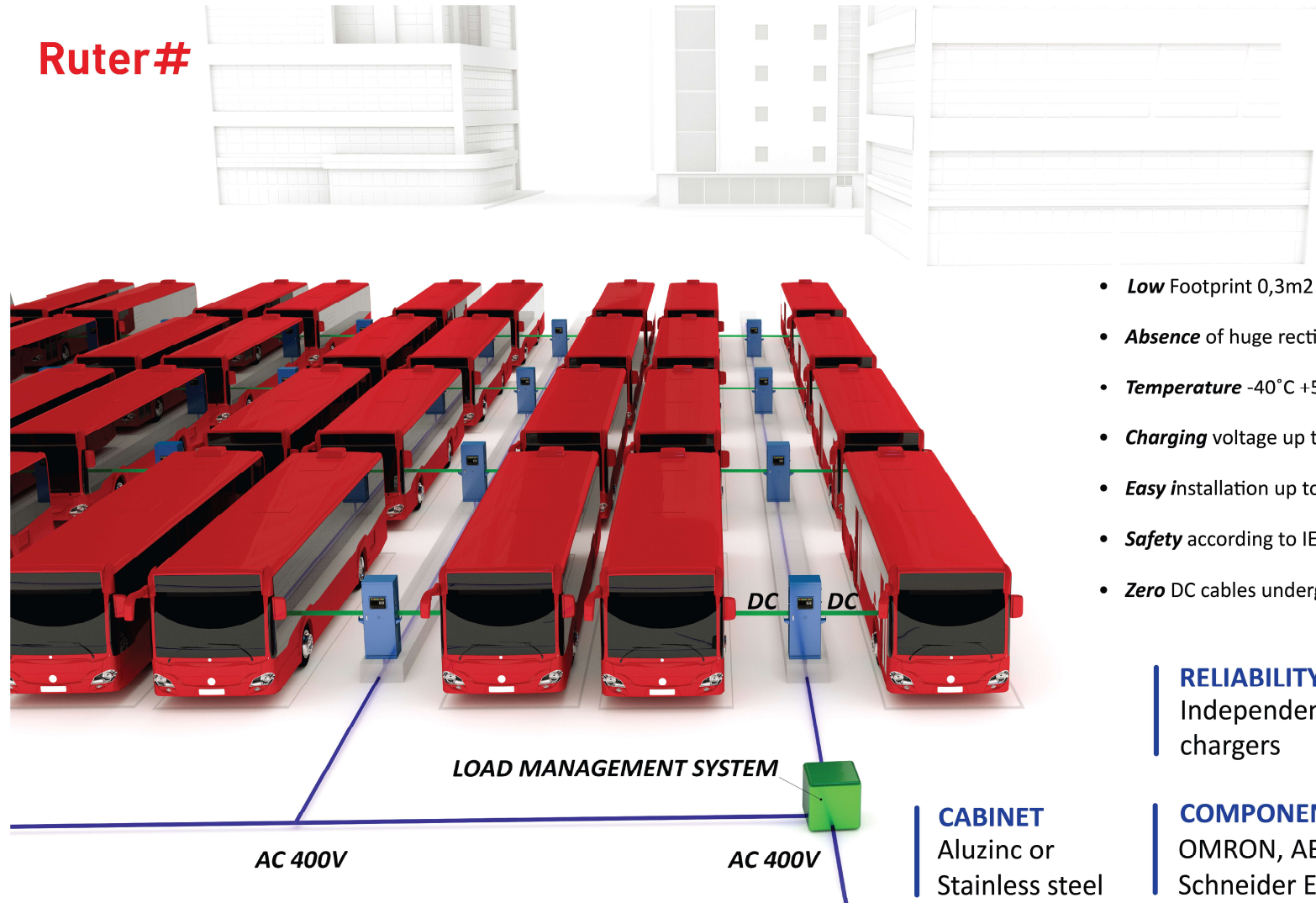
**All-In-One Dual Gun Charger.**  
With simultaneous 2 ebus charging option.

Our solution is flexible in Power Rates –  
it could be 60, 80 or 120 kW

Depending on battery capacity and charging voltage.



Ruter #

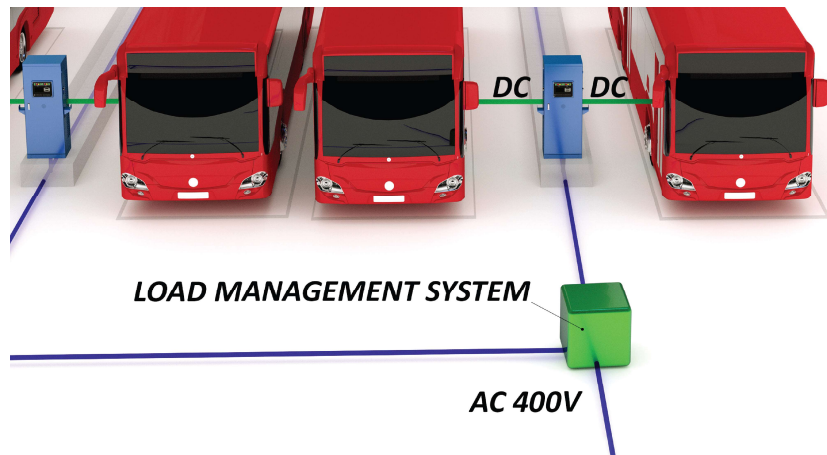
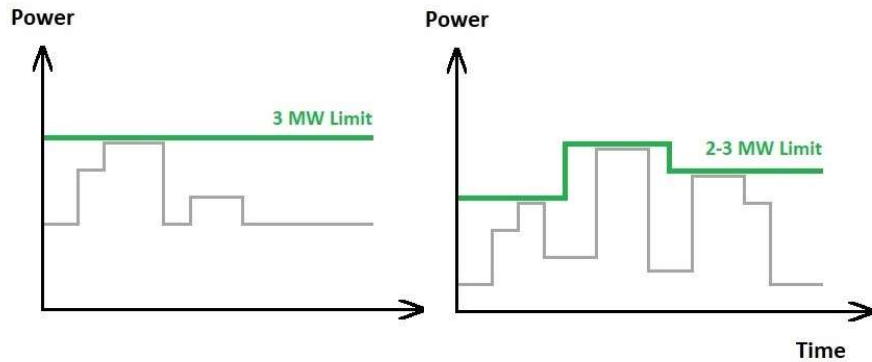


- **Low** Footprint 0,3m2
- **Absence** of huge rectifiers
- **Temperature** -40°C +50°C
- **Charging** voltage up to 850V
- **Easy** installation up to 1 hour
- **Safety** according to IEC61851
- **Zero** DC cables underground

**RELIABILITY**  
Independent  
chargers

**CABINET**  
Aluzinc or  
Stainless steel

**COMPONENTS**  
OMRON, ABB  
Schneider Electric



To avoid peak tariffs, we recommend to install

## LUOBINSEN'S LOAD MANAGEMENT SYSTEM

### Static mode

The maximum power consumption for the depot charging infrastructure is a fixed value depending on the set power supply limit.

### Curve mode

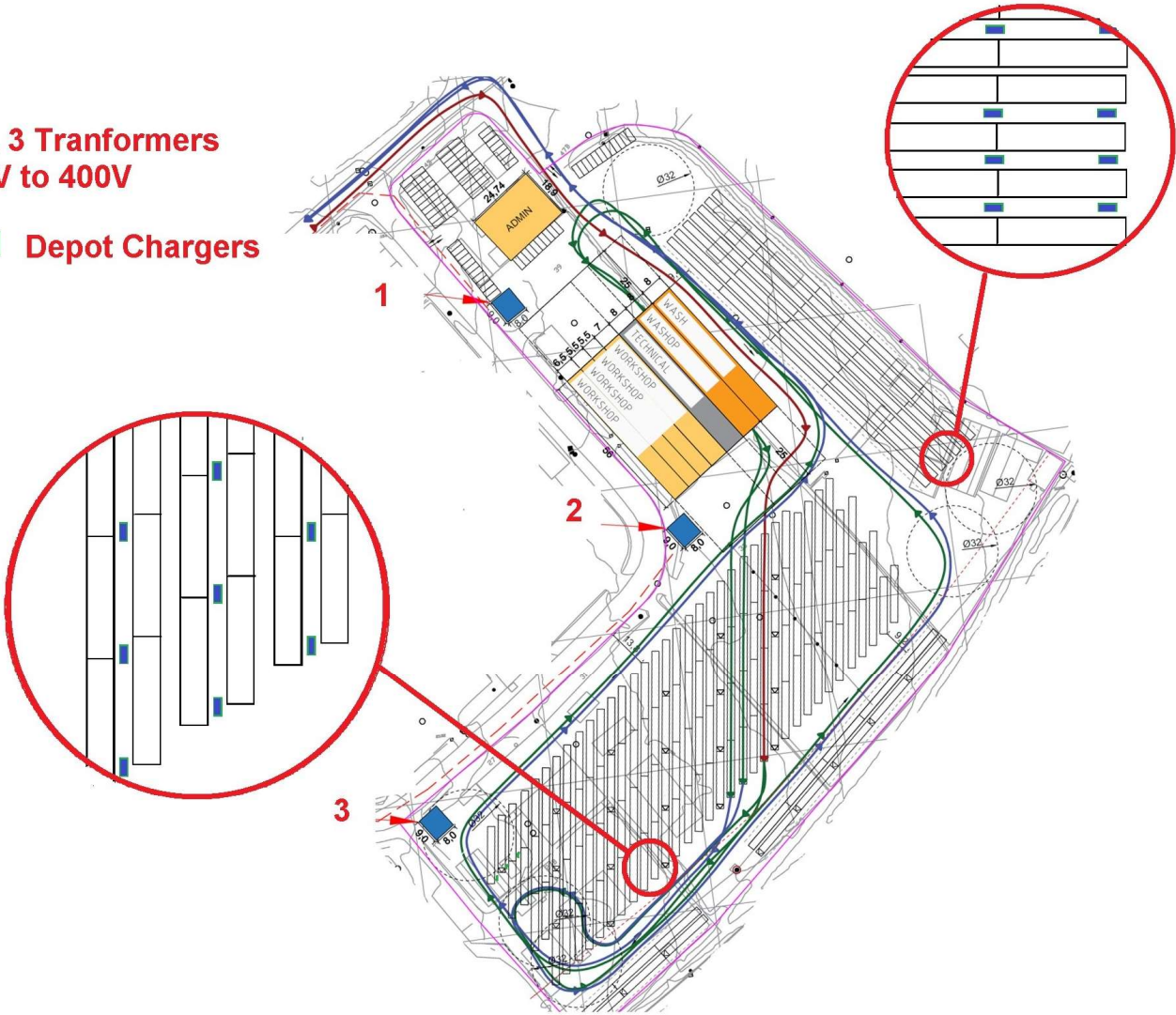
The maximum power consumption for the whole charging infrastructure changes according to the set tariff graph.

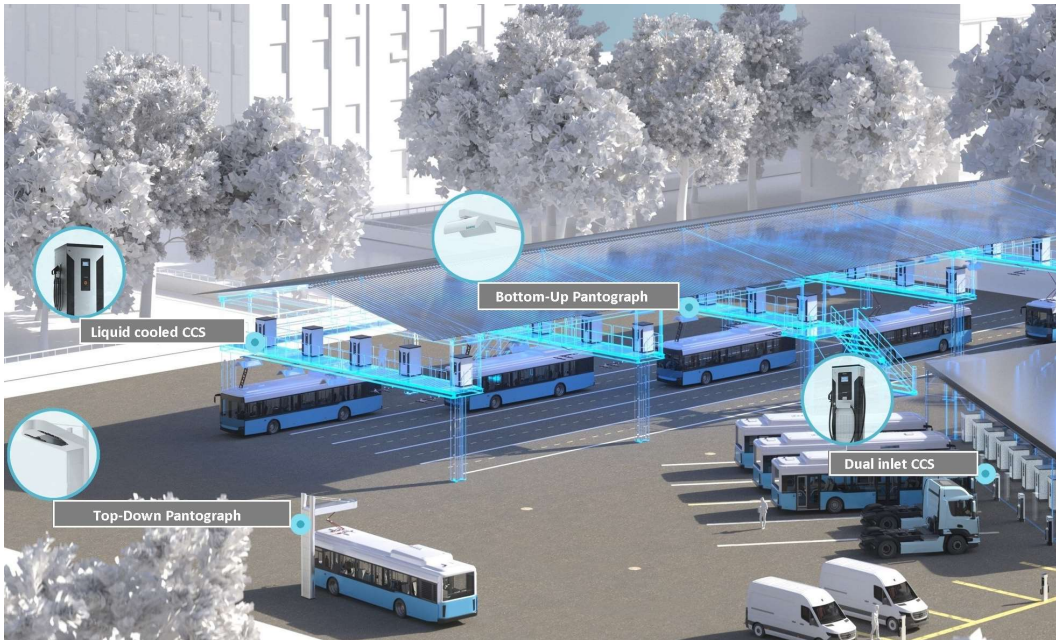
### Priority mode

Priority charging stations, that make it possible for any Ebus to get the maximum available power at any time on specific Priority charging stations.

1, 2, 3 Trnformers  
11kV to 400V

 Depot Chargers





Taking into account our experience we recommend to have some Fast Charging stations on site.

For this project we recommend to have at least 3 x 300kW Fast Charging stations.

There are four options:

- On-board Bottom-Up Pantograph \$\$\$\$\$
- Off-board Top-Down Pantograph \$\$\$
- Liquid cooled CCS2 \$\$
- Dual CCS charging \$

Luobinsen supports all 4 options.





The most effective and reliable option is

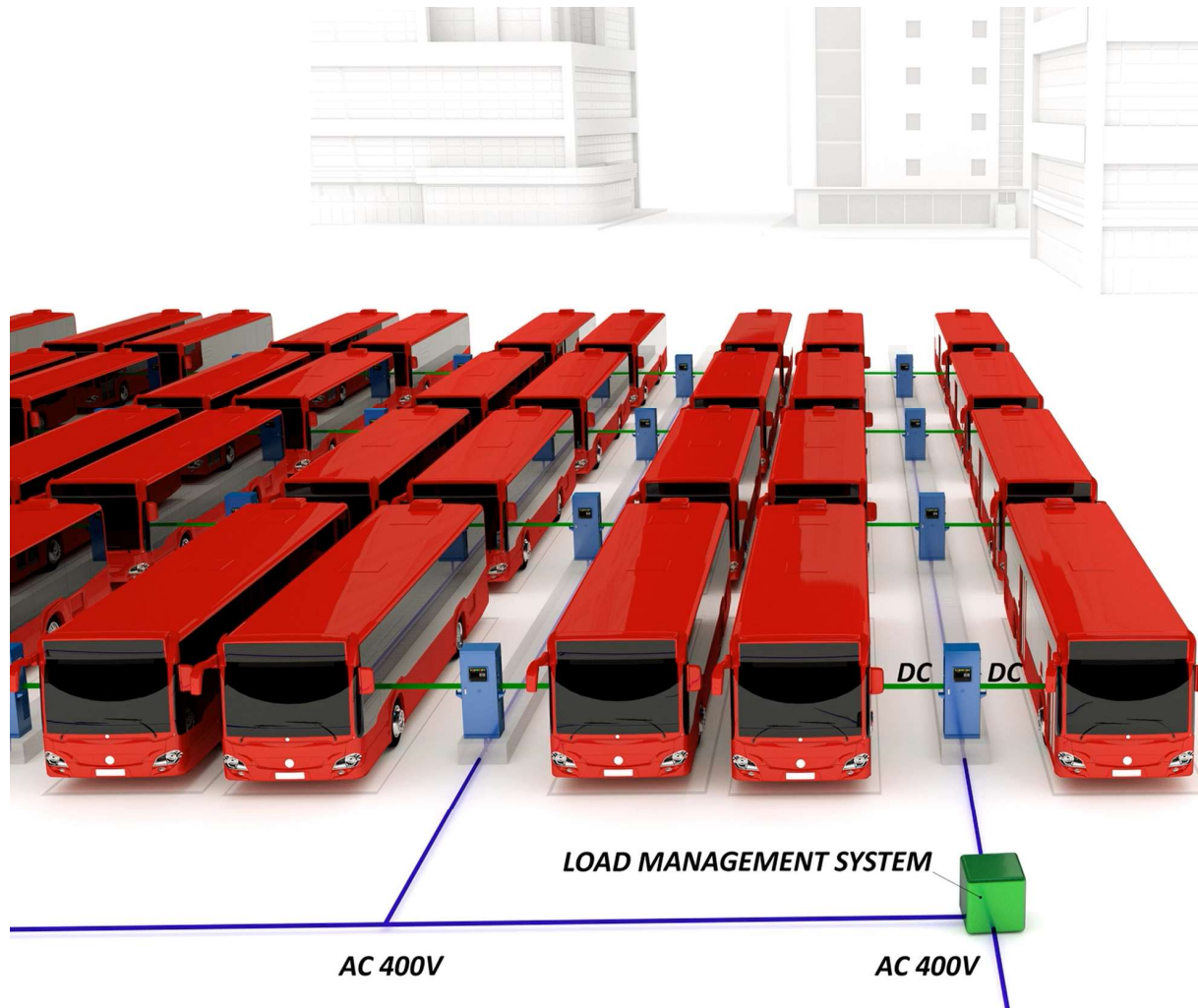
Dual CCS2 gun charging.

Least costly way to transfer up to 500Amps per Ebus.

Small retrofit needed on Ebus before placing the order. Just to add second CCS inlet.







- All-In-One unit
- Charging infrastructure lower cost
- Less footprint 550x690mm, Less weight 200kg
- No need in DC cables underground
- HMI Touch screen. Safety and Operational comfort
- Easy Accessible Emergency Stop Button
- High Reliability – each charger is independent unit

**We keep evaluating partner in Norway. It's just a matter of time.**



[www.luobinsen.org](http://www.luobinsen.org)