

E.ON Danmark

Purpose of the conference

Ruter wants to invite operators, manufacturers of buses and charging equipment, power suppliers and other relevant stakeholders to dialogue on what are the most important measures to lay the foundations for a good transition to electric bus operation in Oslo in 2020.

Questions which Ruter wants to discuss at the dialogue conference include:

- What are the key learning points in a system test? What are the major uncertainties and risks related to the phasing-in of approximately 100 battery electric articulated buses in the city center in 2020?

Opportunity charging

Roof-mounted / Oppcharge

- What is needed to ensure that the startup and operation of around 100 electrically articulated buses in 2020 will deliver an equally good service to customers, as what we have today?

Clear system specification from PTA

Sufficient training period before start of operation

Experienced and local maintenance setup for busses and chargers

Choosing the right partners – experience, organizational setup, capital

- o or are these buses / charging systems now so well proven / tested that Ruter can already ask for electric buses in ordinary tenders?

Yes. E-busses and chargers have been proven in commercial operation – e.g. Eindhoven, Gothenborg, London

- Which business model should be applied in the test - ie who should own / operate / maintain the various elements of electric bus ecosystem? This will also help to ensure:

E.ON would like the role of CPO (Charge Point Operator). The services we would like to provide include:

Service and repair of charging equipment

Backend operator – monitoring and remote handling of the chargers

Energy provider

Investor in the charging equipment

Reporting of charger performance

Invoicing to bus operator and/or PTA

E.ON can be CPO regardless which PTO, busses or chargers Ruter chooses for the test period.

- o a test that provides the most relevant learning for many of the involved parties

- o sufficient flexibility to take into account the rapid technological development (e.g duration and structure of contracts)

● Who should procure buses and infrastructure for a system test?

Procurement of one element is dependent on the procurement of another. There are 3 options:

Clear system design and specification from PTA (eg. Roof-mounted / Oppcharge, bus type, battery type and size, depot / opportunity charge, location of chargers – grid connection possibilities)

Procurement of either busses or chargers first, then specify 2nd tender accordingly.

1 tender for both busses and chargers – the supplier designs the system

o Should Ruter conduct separate procurement of electric buses, infrastructure and bus services, or

o should any / all three procurements be merged together into one tender?

E.ON recommends separate procurement. The advantages for the PTA are:

Better control of charger specification

Use of chargers for other purposes

Better communication between CPO and PTA

Contract length on chargers to correspond to lifetime of chargers

● How big size/scope should the test operation have, to provide value as a system test?

o how many electric buses, the number of charging points, the number of driven km or hours per year, duration of contract, etc, is needed for generating 'good enough' experience to follow up with full scale deployment?

Test of charger utilization would be interesting – how many busses per charger.

Test of a full route

● How is the market's expected delivery capability and lead times in 2018-20?

o Total time from award of contract to the startup of commercial passenger service with electric opportunity charge buses

9-12 months