



Study of Zero Emission Bus Systems in Nordic Countries

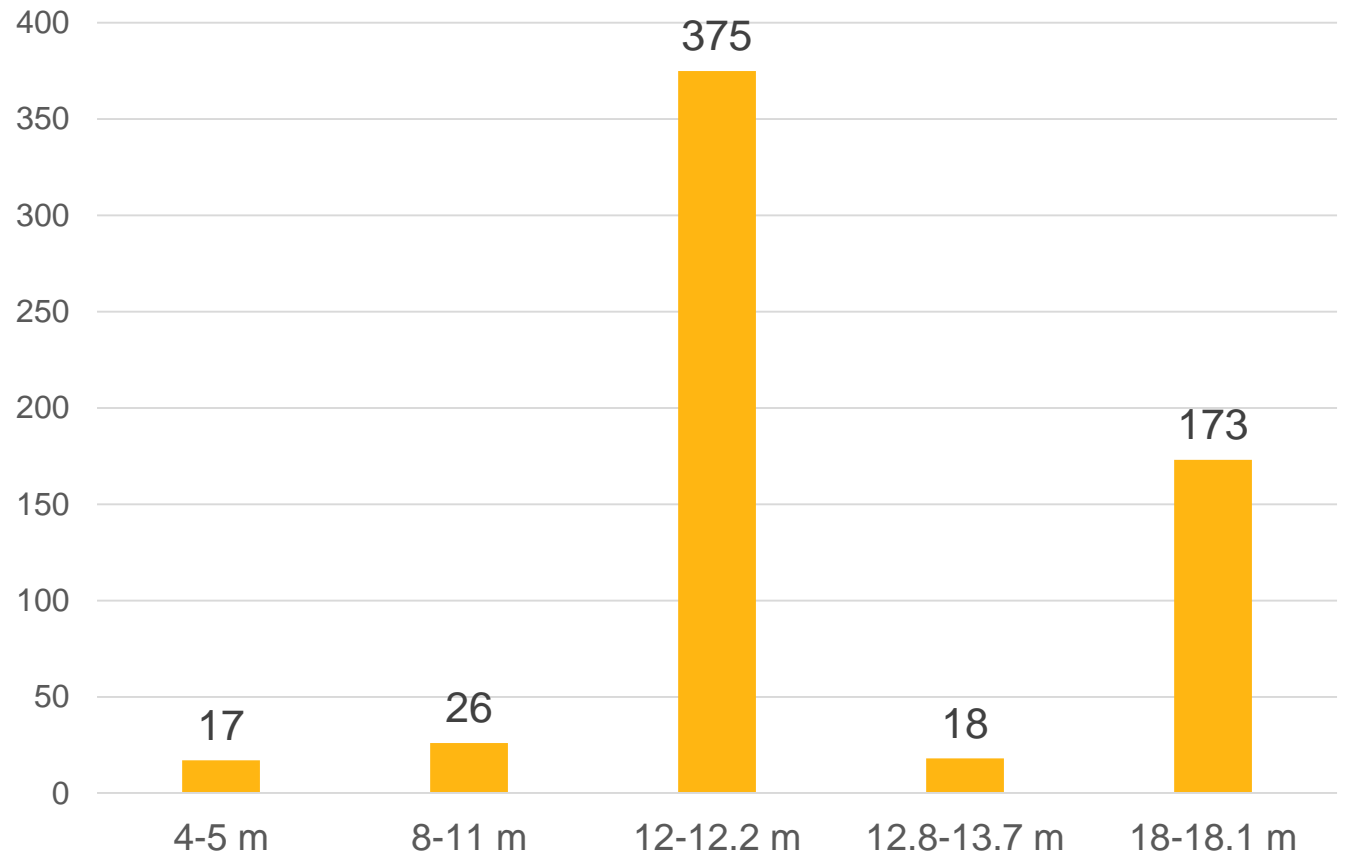
Victor Hug, Project Manager, Movia

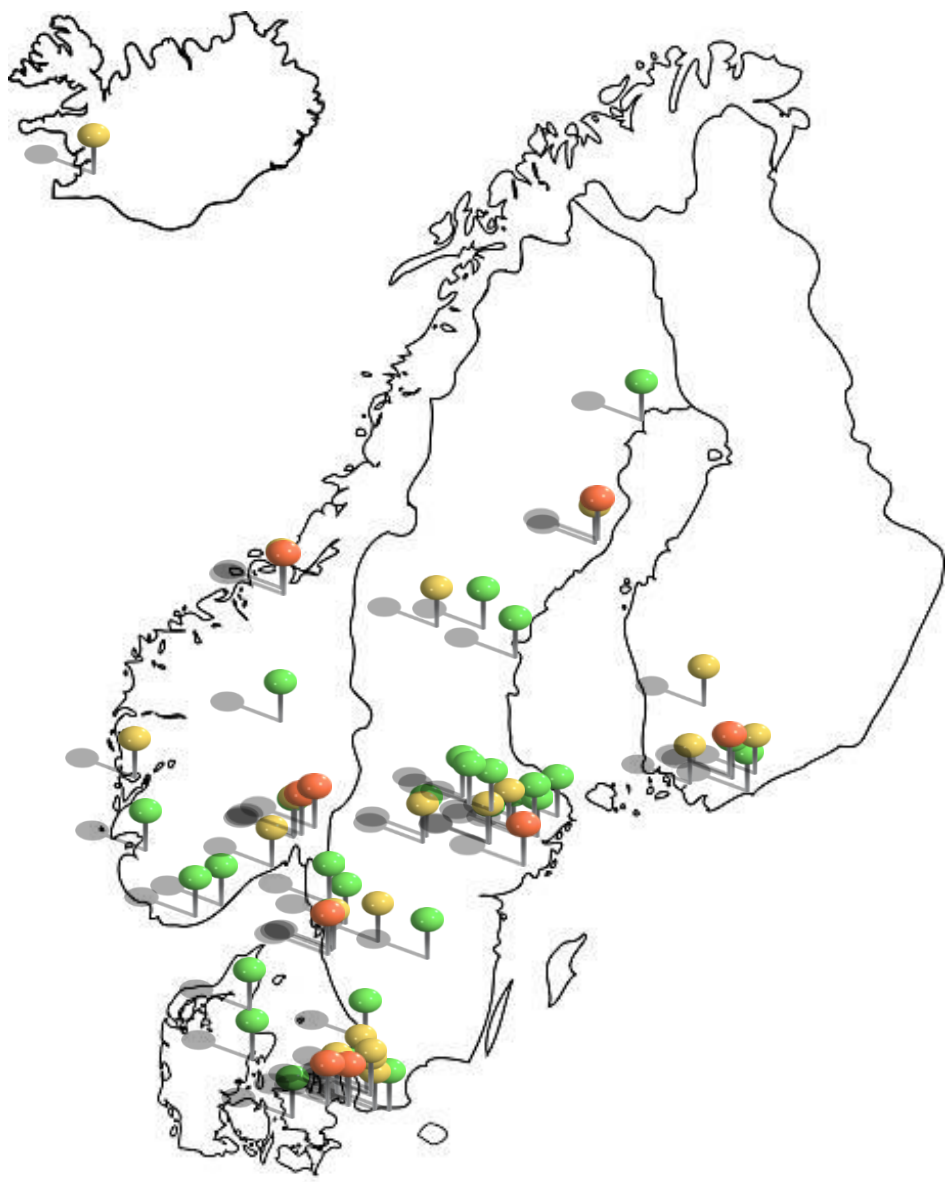
Co-funded by the Horizon 2020 Programme of the European Union



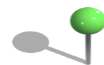
BUS TYPE	# BUSES
EBUS	590
FUEL CELL	8
TROLLEY	10
INMOTION CHARGING	1
TOTAL	609

BUSES ZERO EMISSION BUSES BY LENGTH

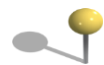




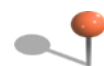
PROJECT SIZE:



1-5 BUSES



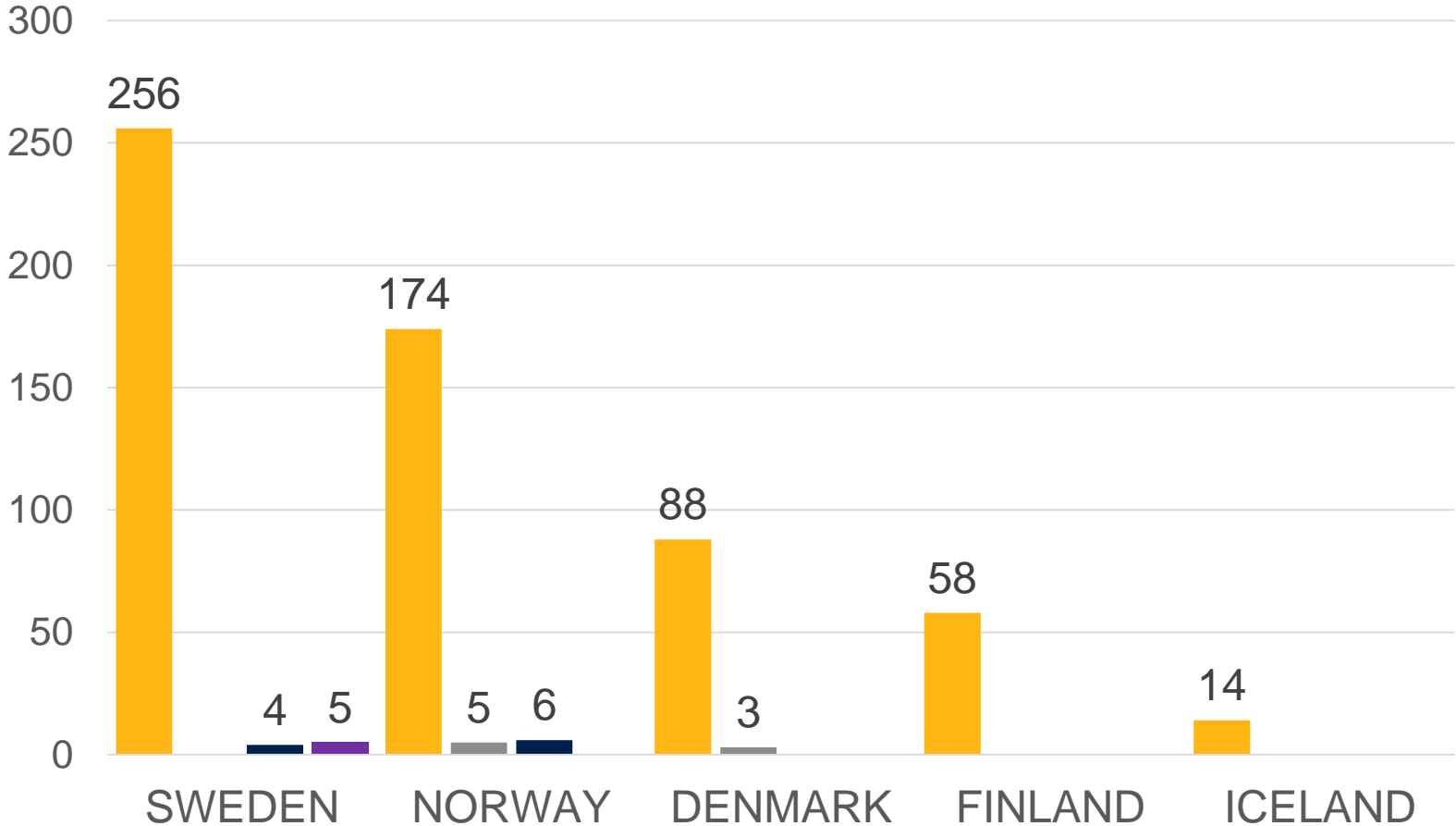
6-15 BUSES



16-30 BUSES

ZERO EMISSION BUSES PER COUNTRY

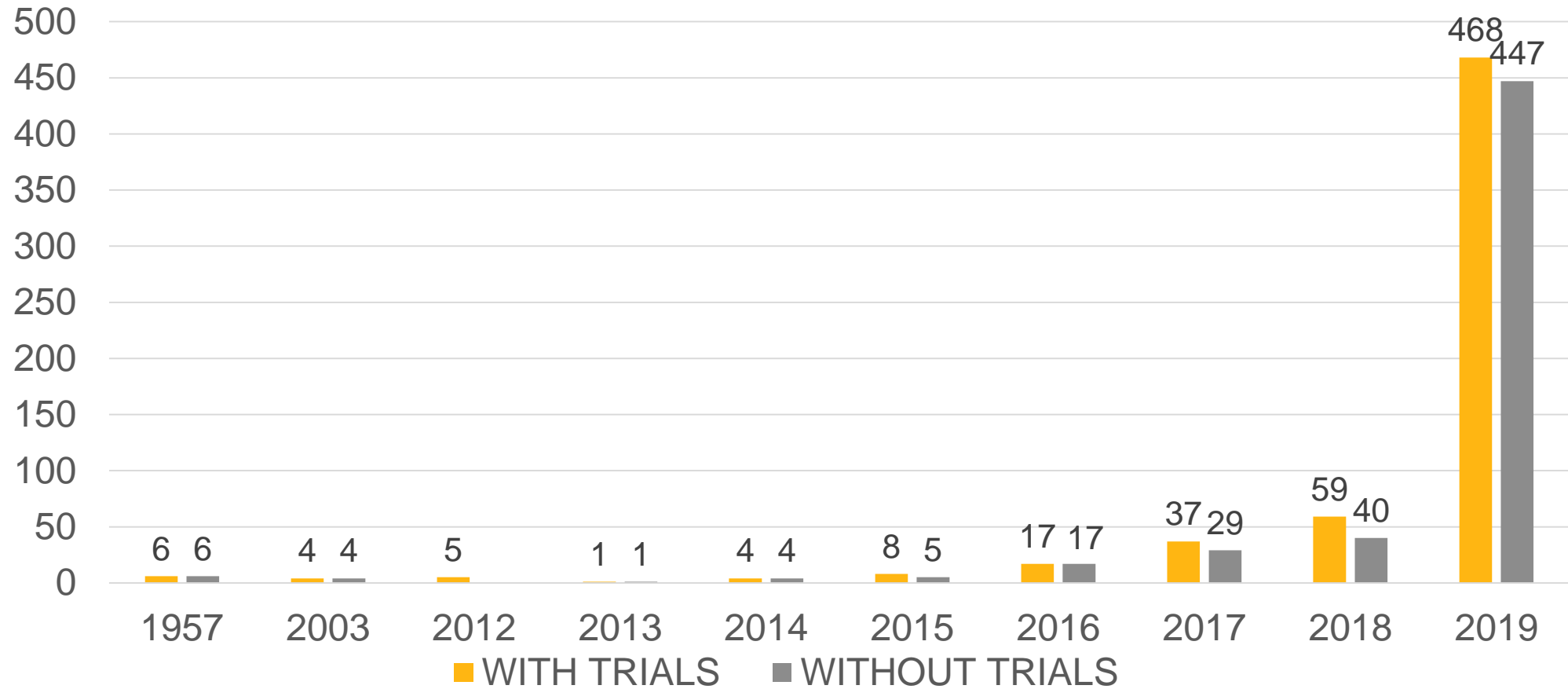
BUSES



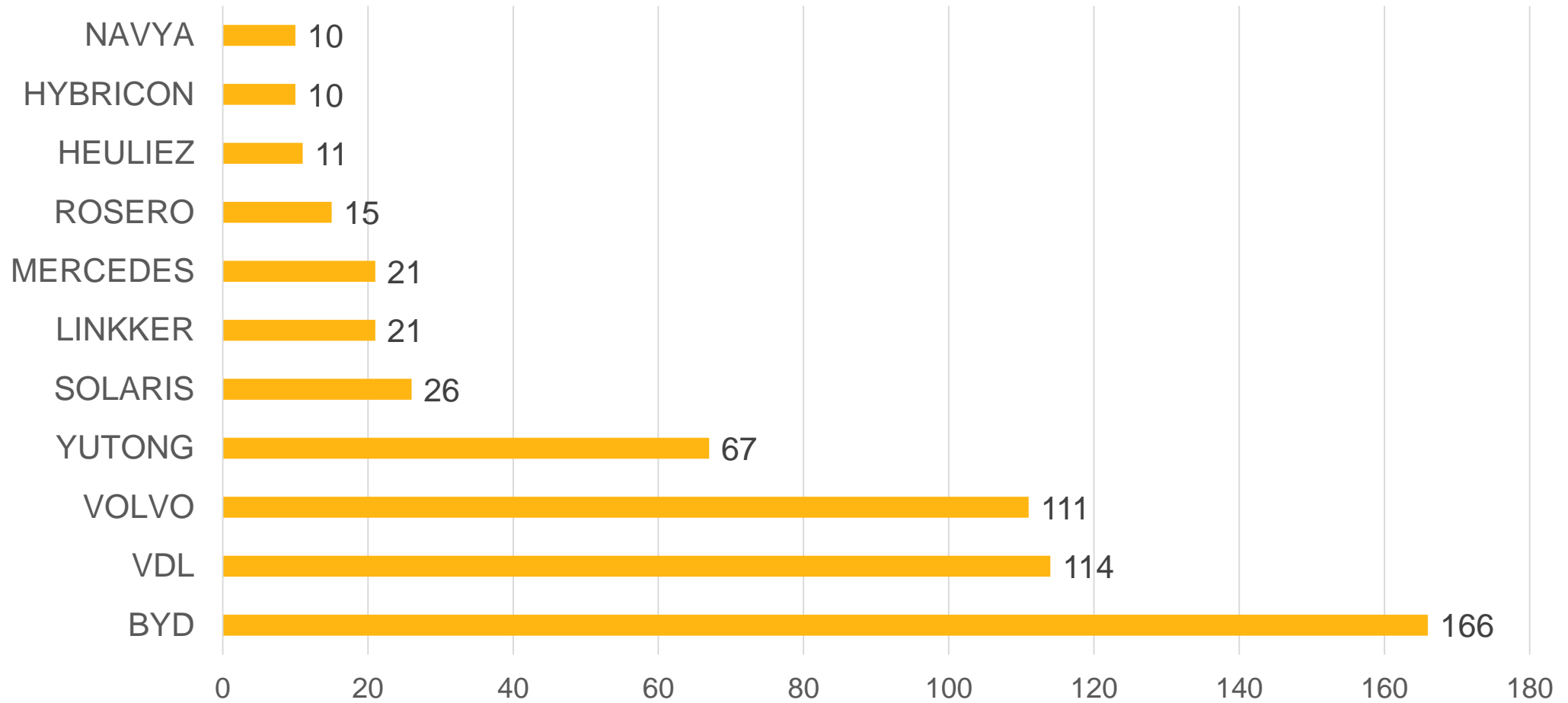
- EBUS
- FUEL CELL
- TROLLEY
- INMOTION CHARGING

BUSES

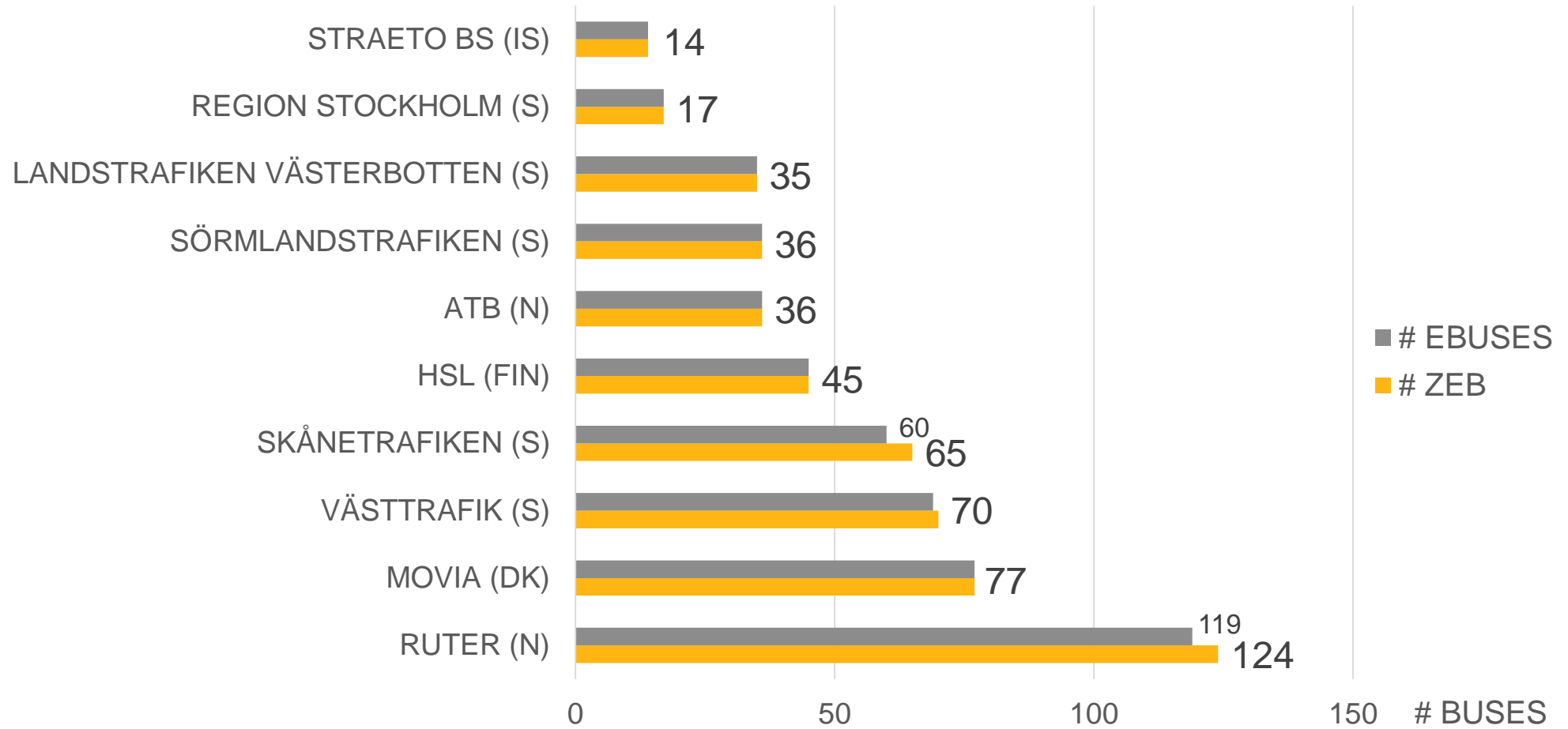
DEPOLYMENT OF ZERO EMISSION BUSES



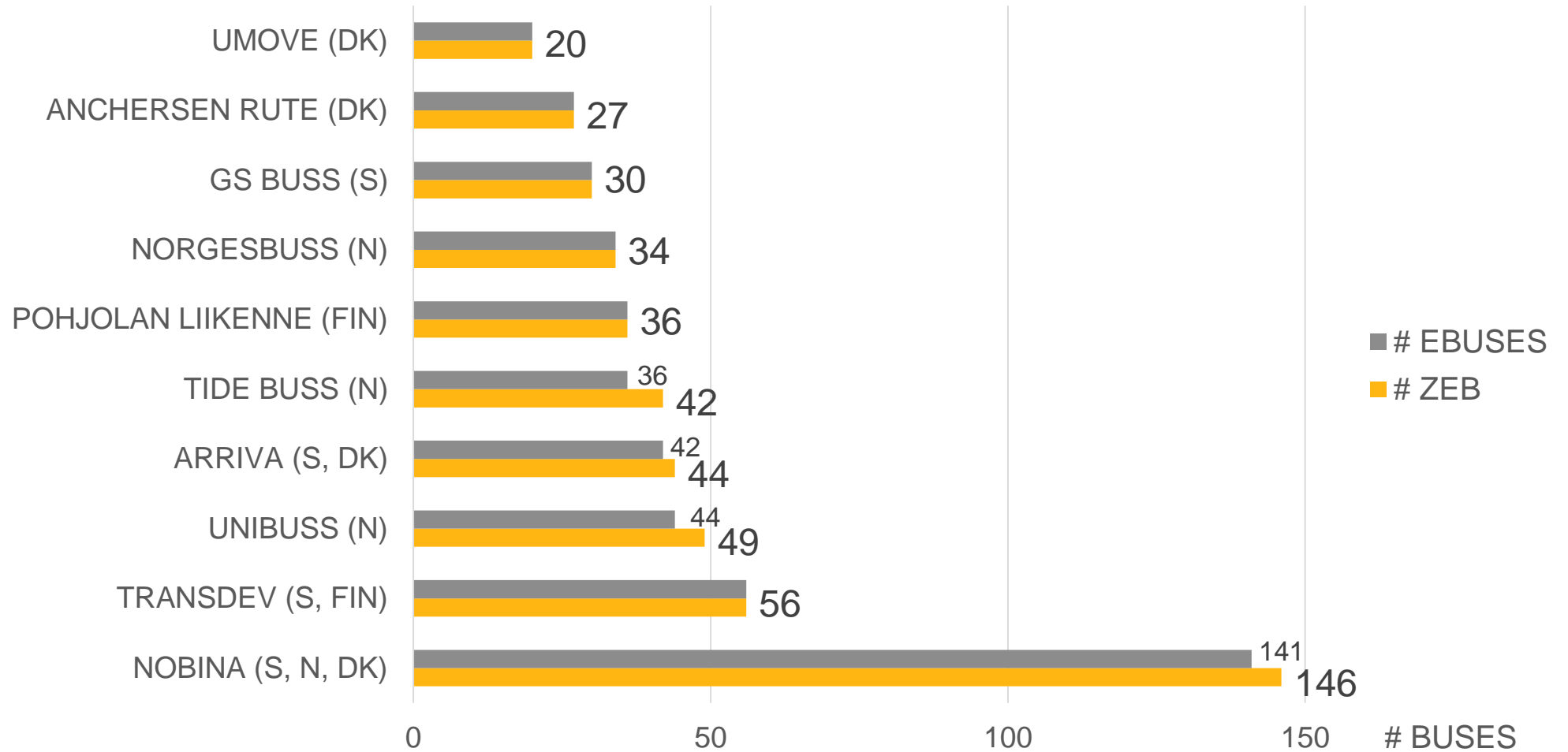
MANUFACTURES WITH MOST ZERO EMISSION BUSES



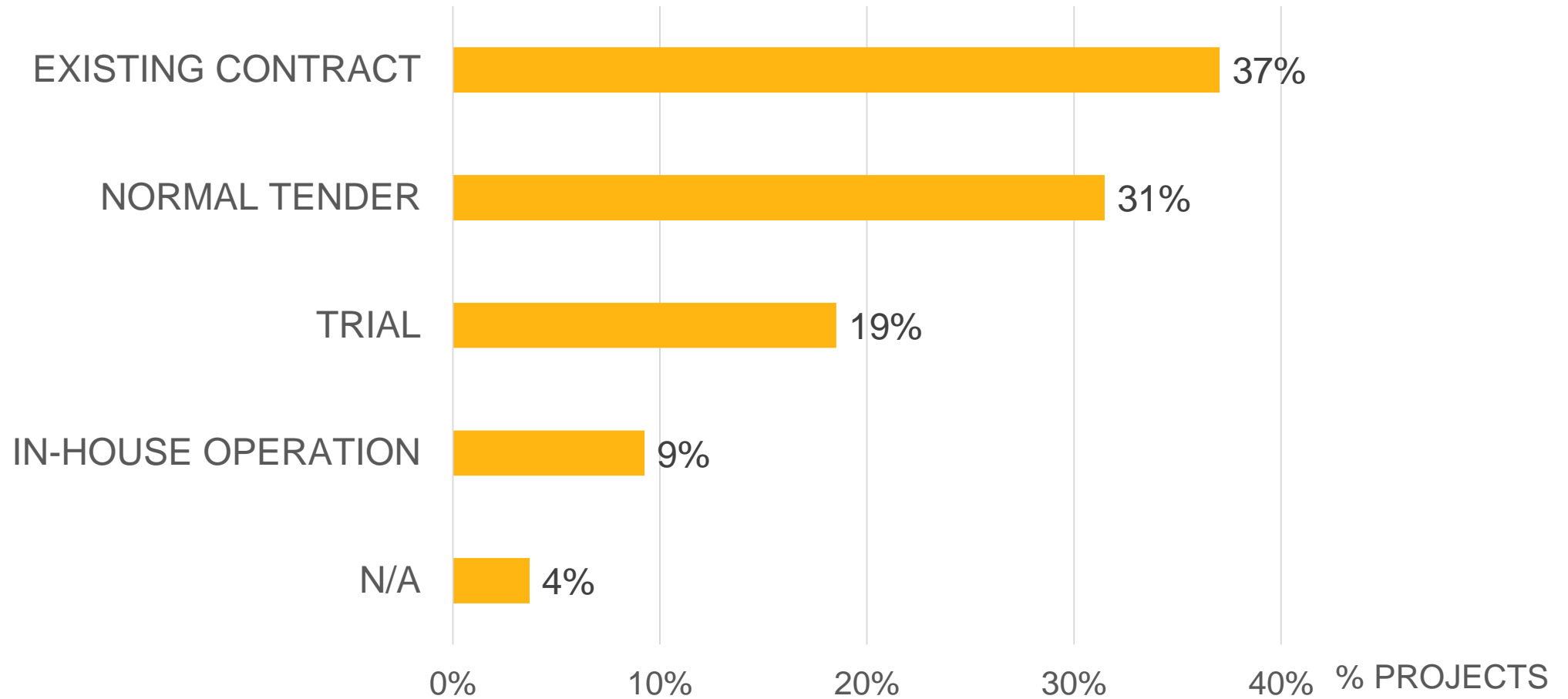
PTAs WITH MOST ZERO EMISSION BUSES



PTOs WITH MOST ZERO EMISSION BUSES

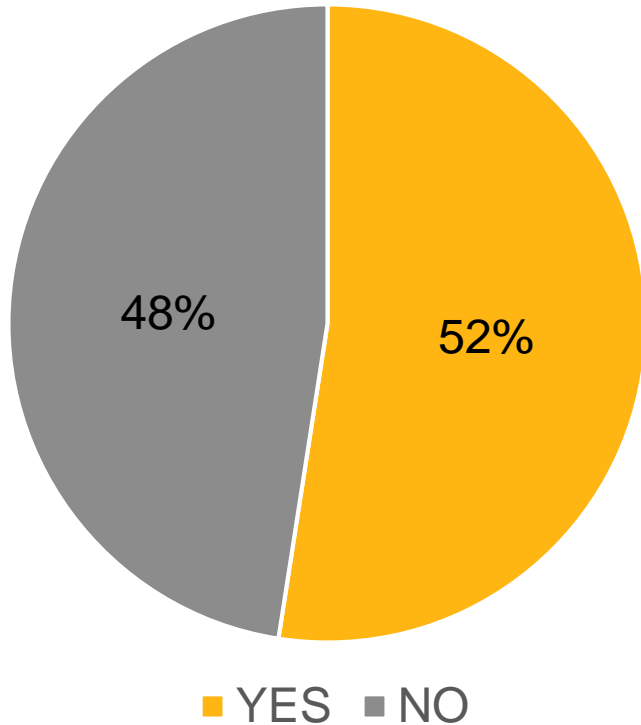


TYPE OF PROJECT

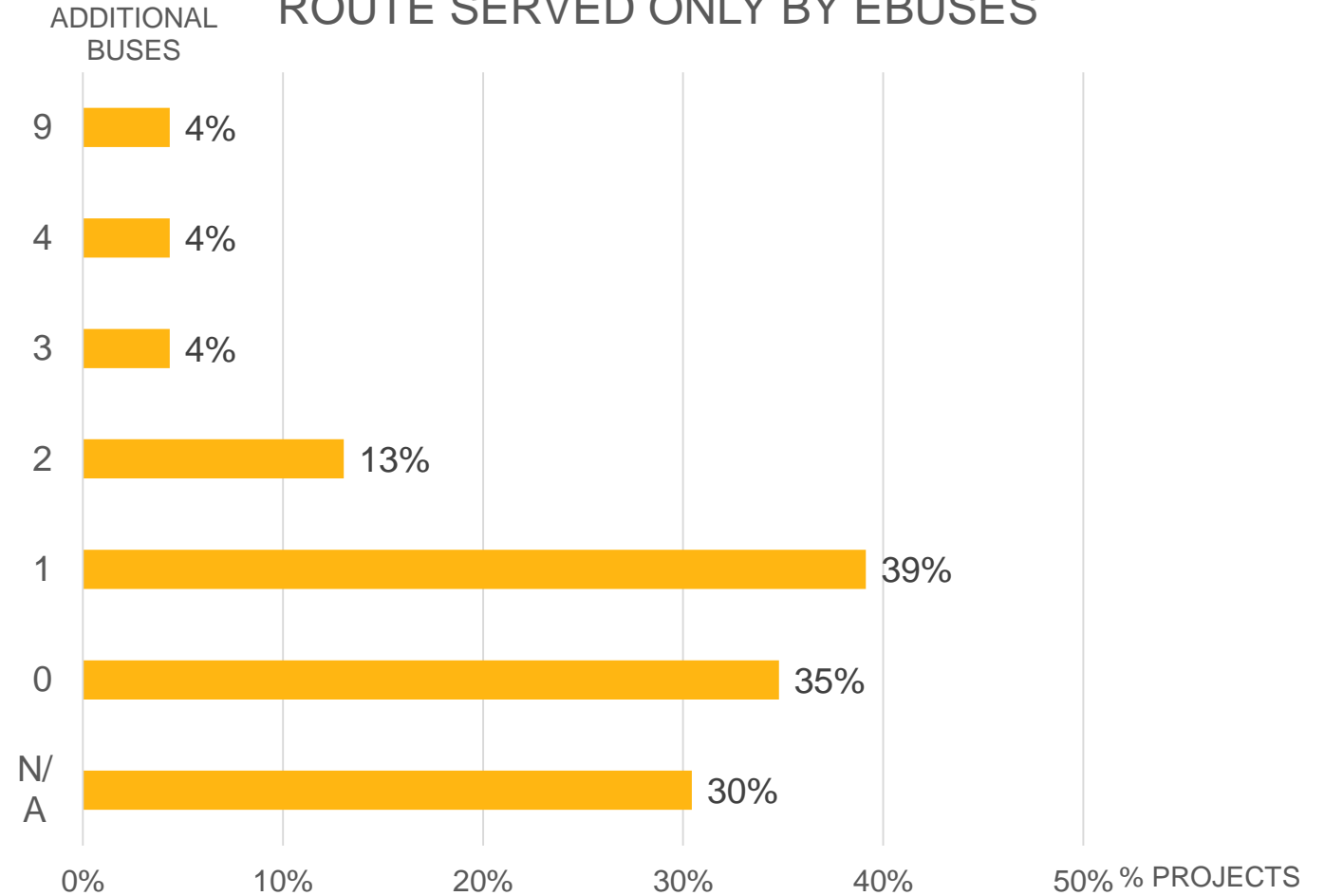


ONLY PROJECTS WITH 10-18 m BUSES

ROUTE(S) SERVED ONLY BY ZERO EMISSION BUSES

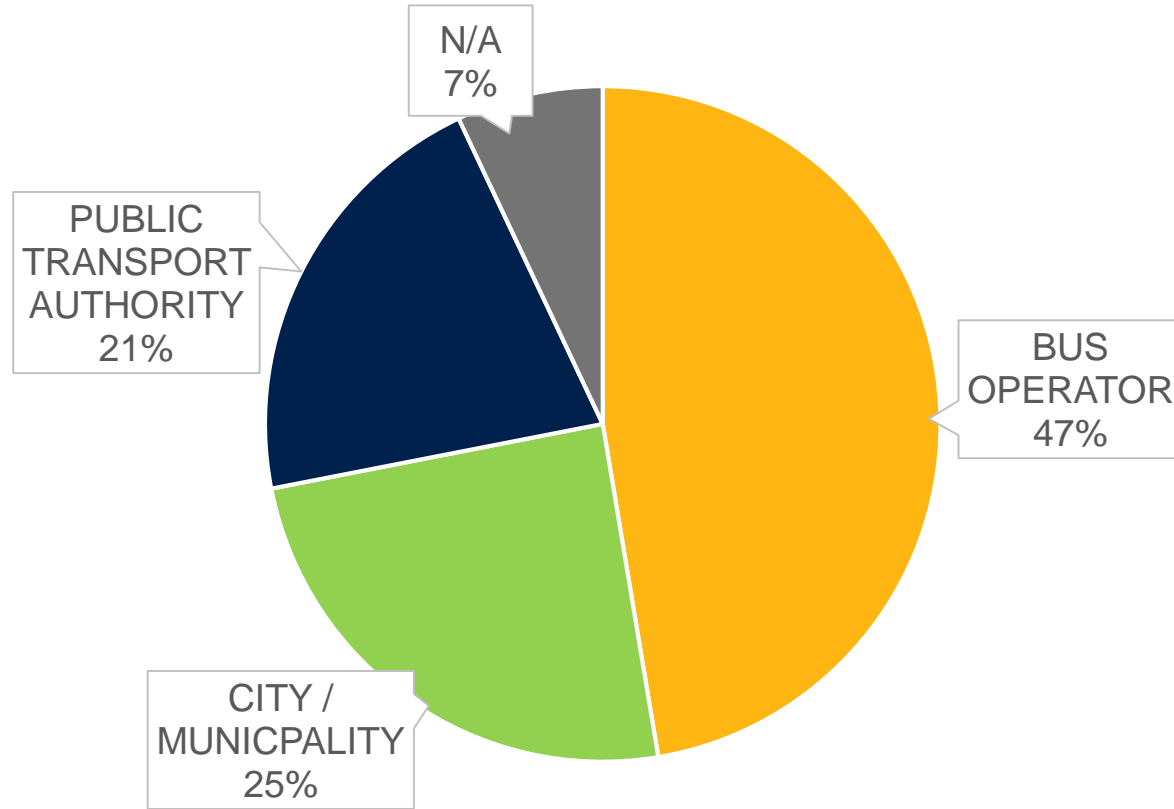


ADDITIONAL BUSES COMPARED TO DIESEL ROUTE SERVED ONLY BY EBUSES

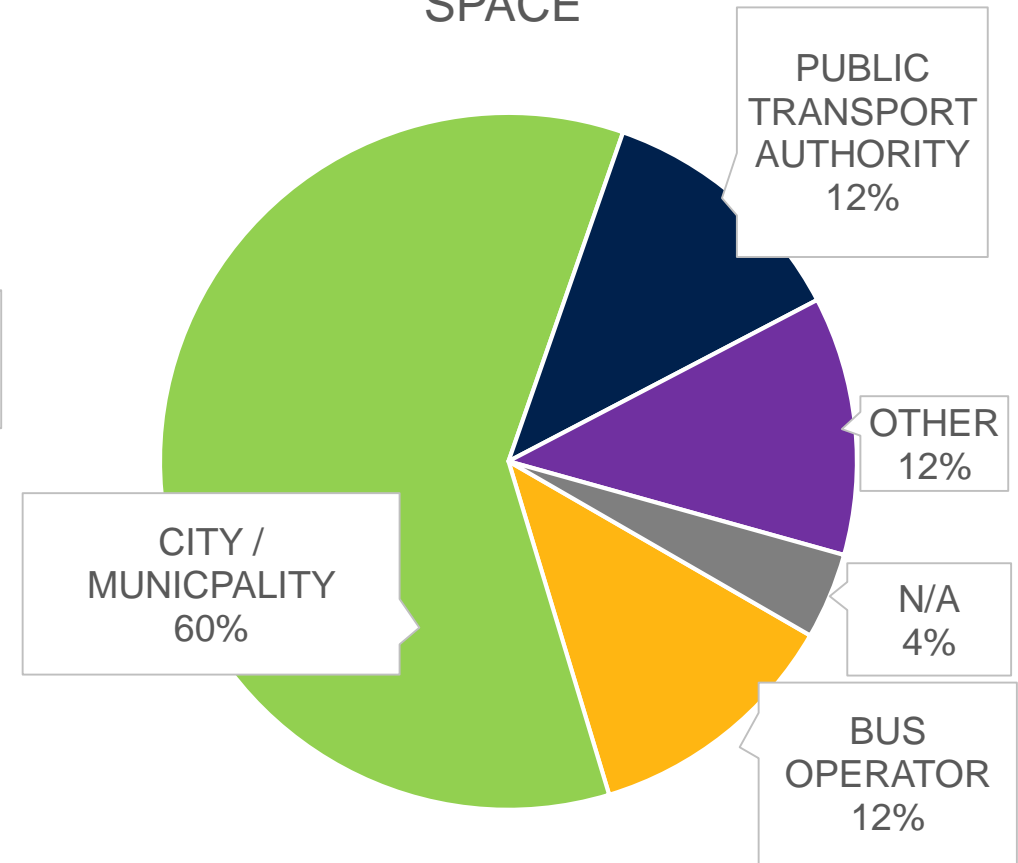


AUTONOMOUS BUSES (4-5 m) ARE NOT INCLUDED

STAKEHOLDER DECIDING THE USE OF CHARGING INFRASTRUCTURE IN PUBLIC SPACE

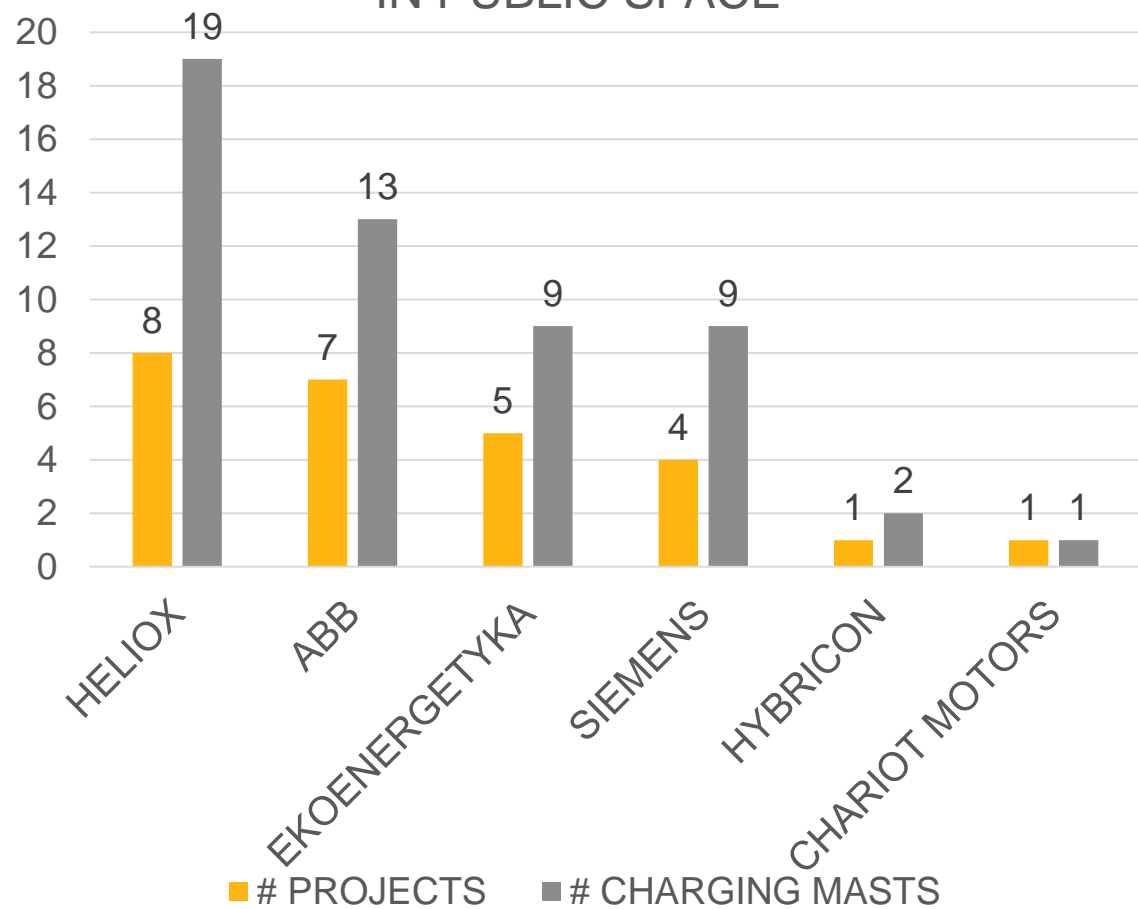


OWNERSHIP TO CHARGING INFRASTRUCTURE IN PUBLIC SPACE

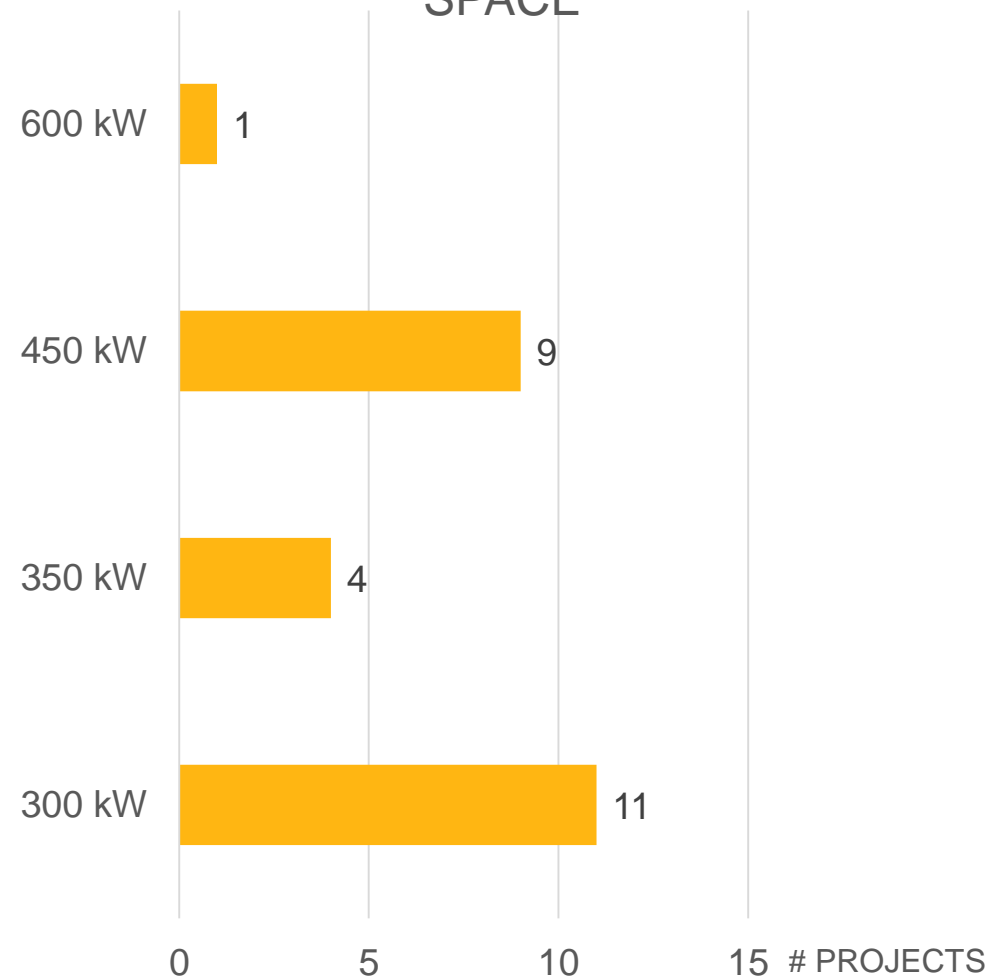


ONLY PROJECTS WITH 10-18 m BUSES

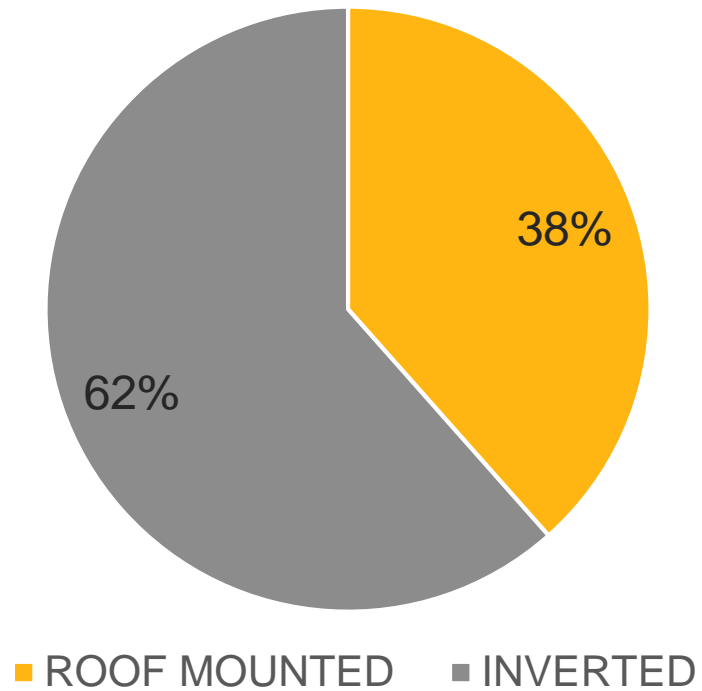
PROVIDERS OF CHARGING STATION IN PUBLIC SPACE



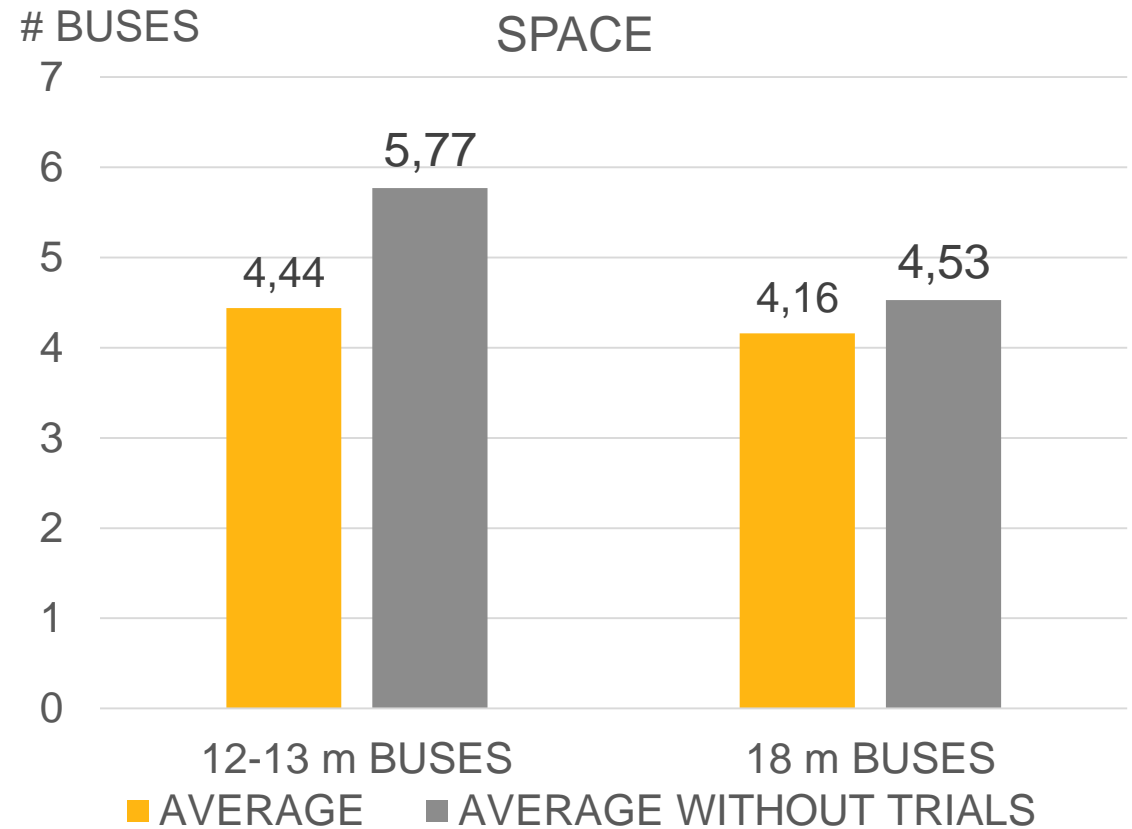
CHARGING POWER IN PUBLIC SPACE



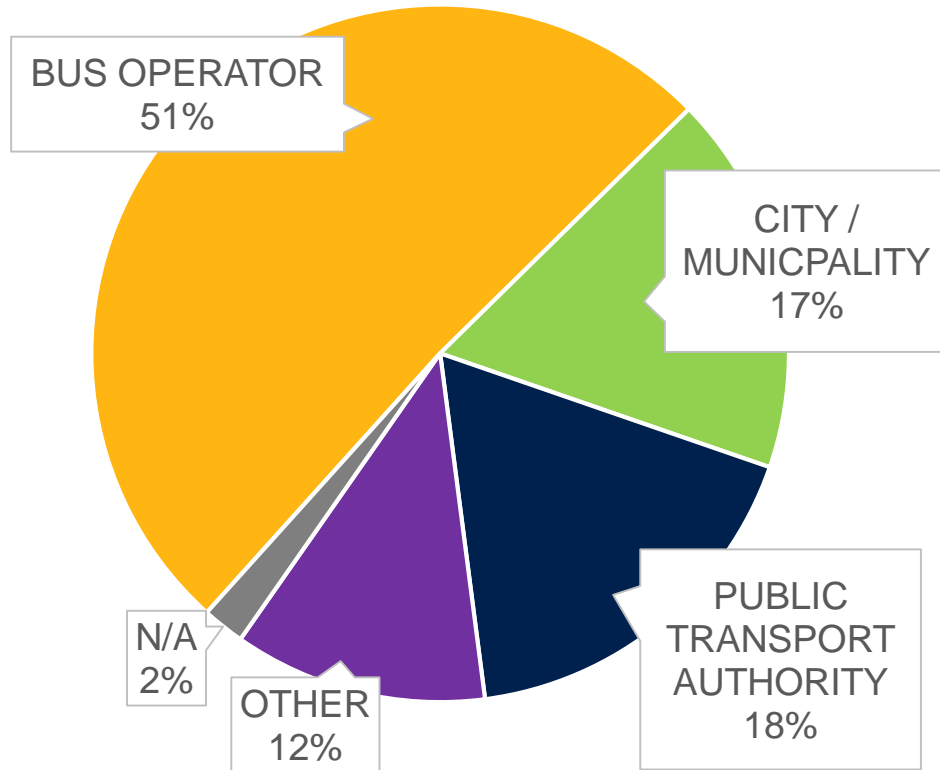
CHARGING INTERFACE IN PUBLIC SPACE PCT OF PROJECTS



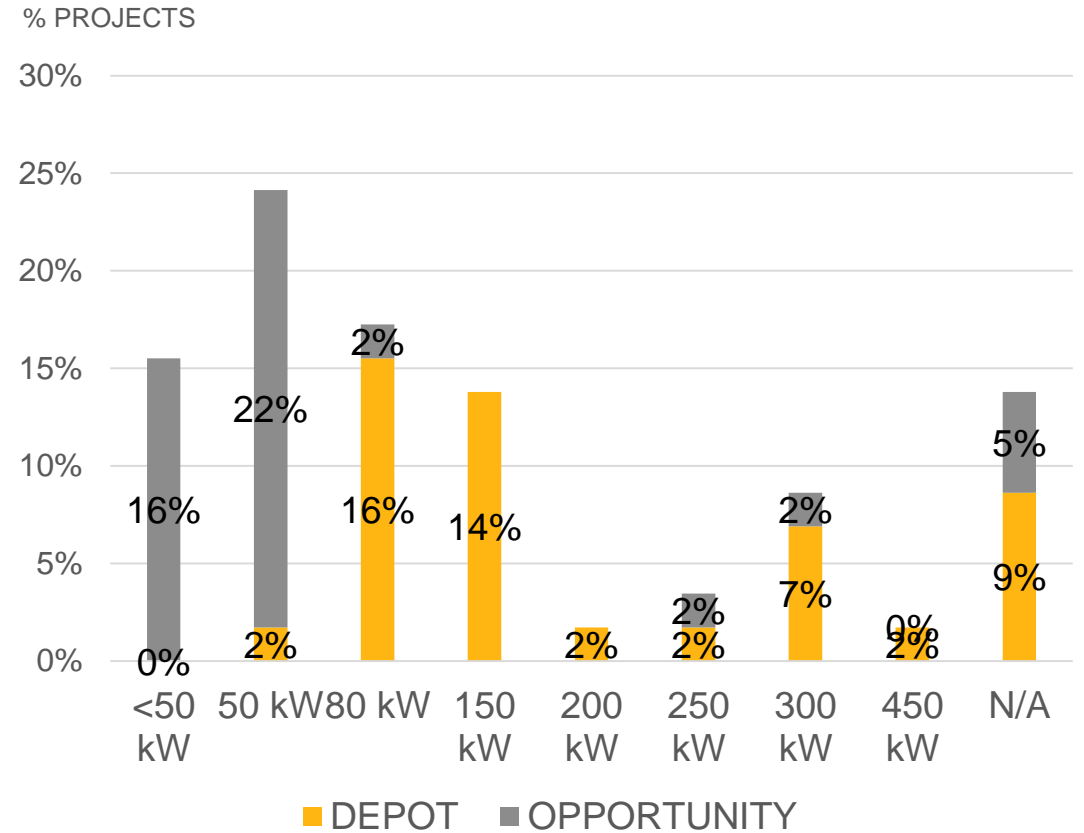
EBUSES PER CHARGING HEAD OPPORTUNITY CHARGING IN PUBLIC SPACE



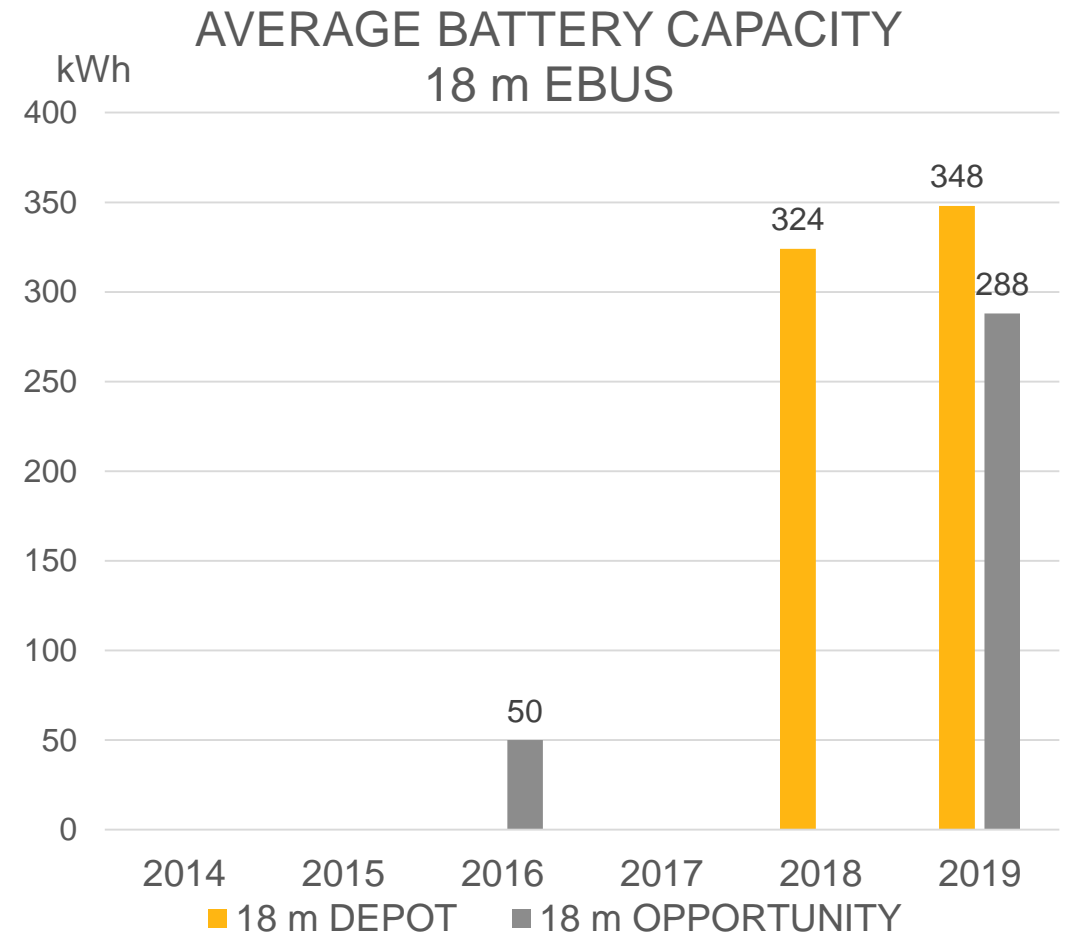
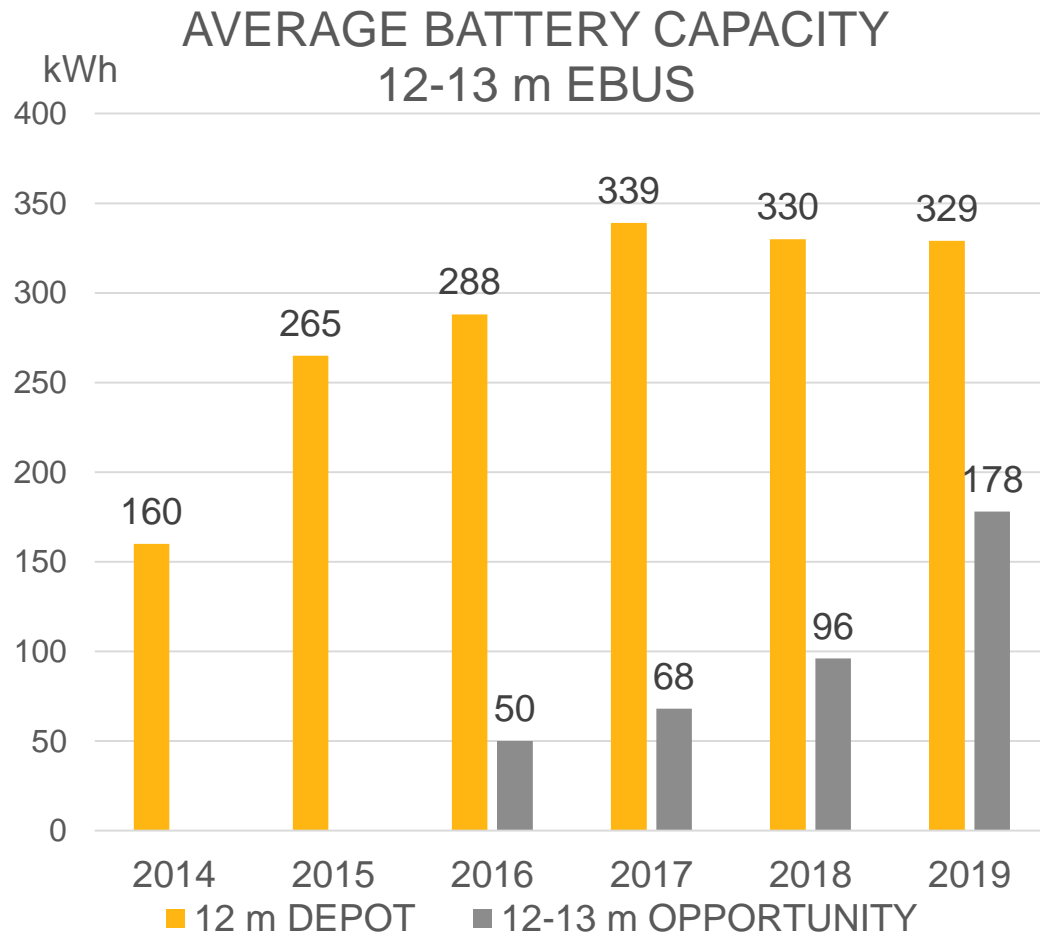
OWNERSHIP TO BUS DEPOT



MAX CHARGING POWER AT DEPOT



ONLY PROJECTS WITH 10-18 m BUSES

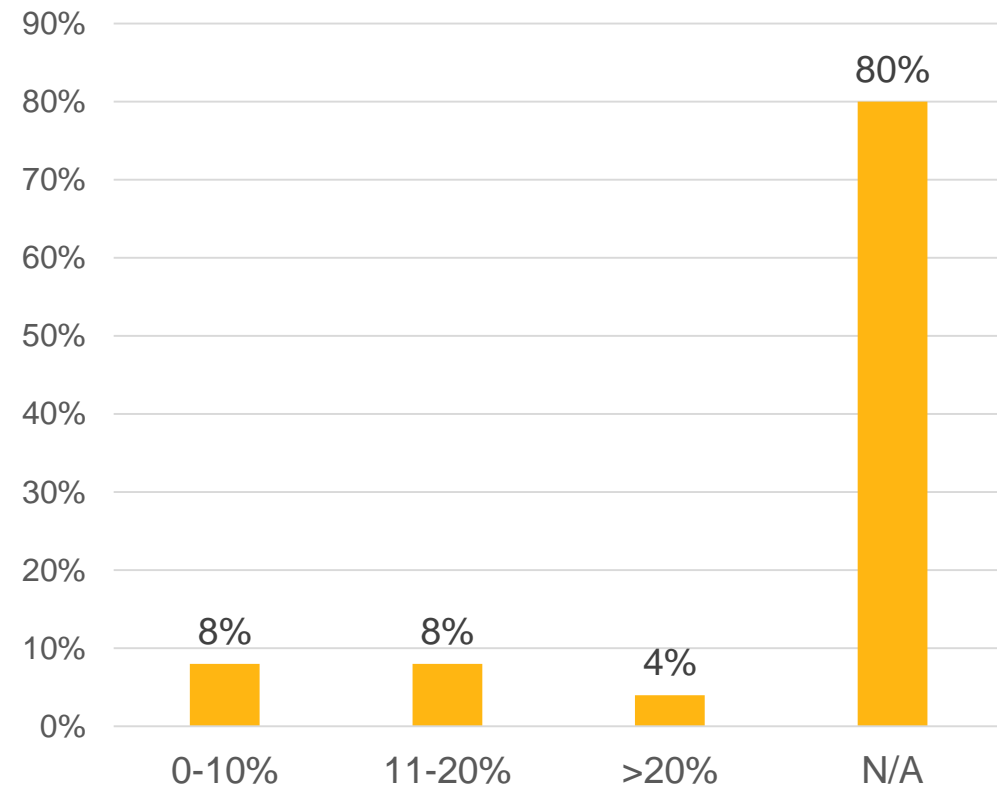


CONCLUSIONS

- Strong market penetration of e buses in 2019
- Additional cost are difficult to assess
- An array of different business models are used with respect to:
 - ✓ Contracting
 - ✓ Decision of the use of charging infrastructure in public space
 - ✓ Ownership to infrastructure in public space
 - ✓ Ownership to bus depot

ESTIMATED ADDITIONAL COST TO DIESEL

% PROJECTS



ONLY EBUS PROJECTS