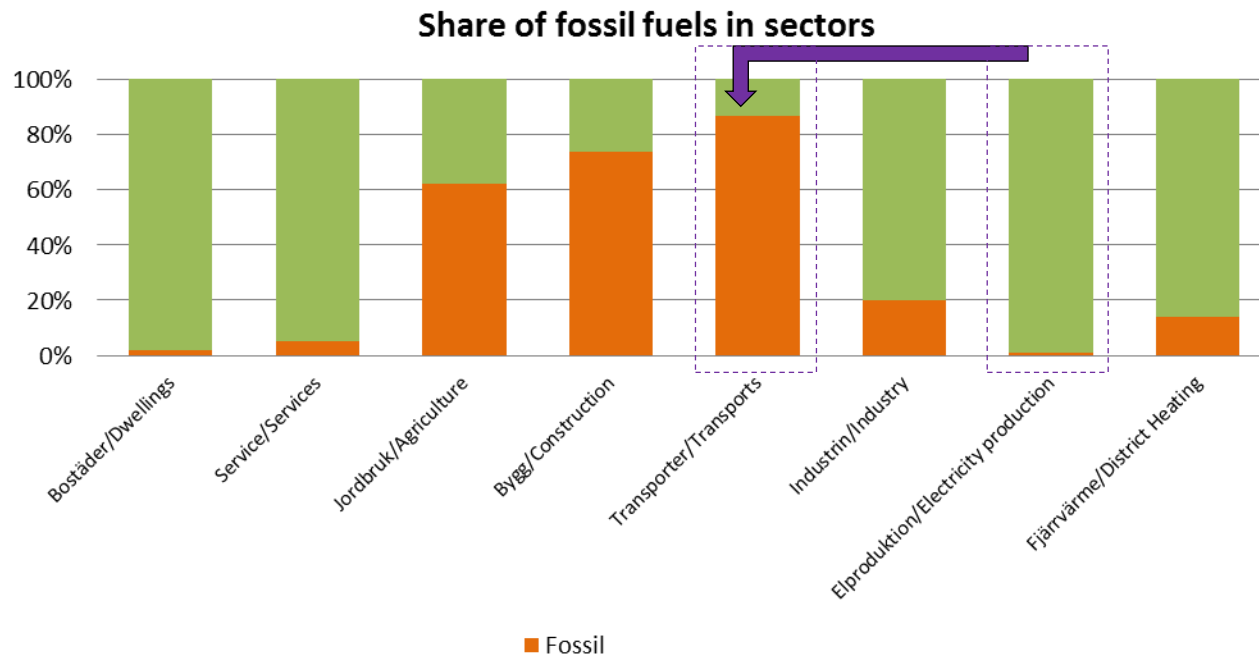


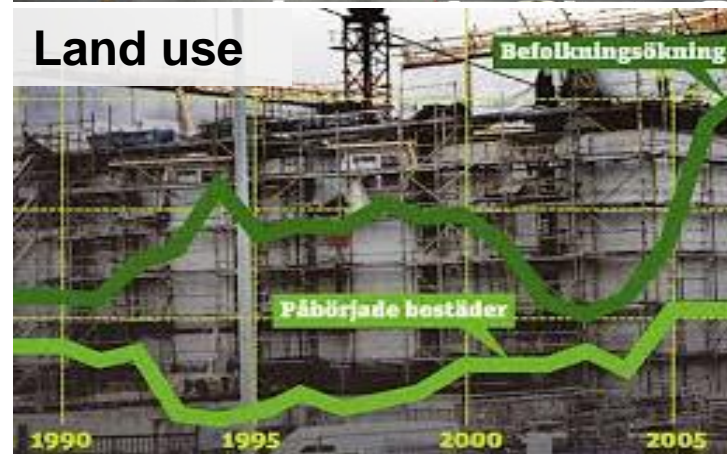
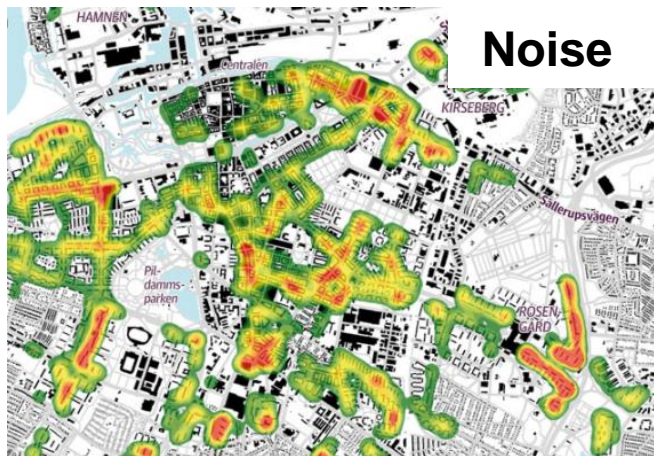
Electric bus charging

Susanna Hurtig, Business development
Nordic Electric Bus Initiative
Gothenburg, 2015 09 02

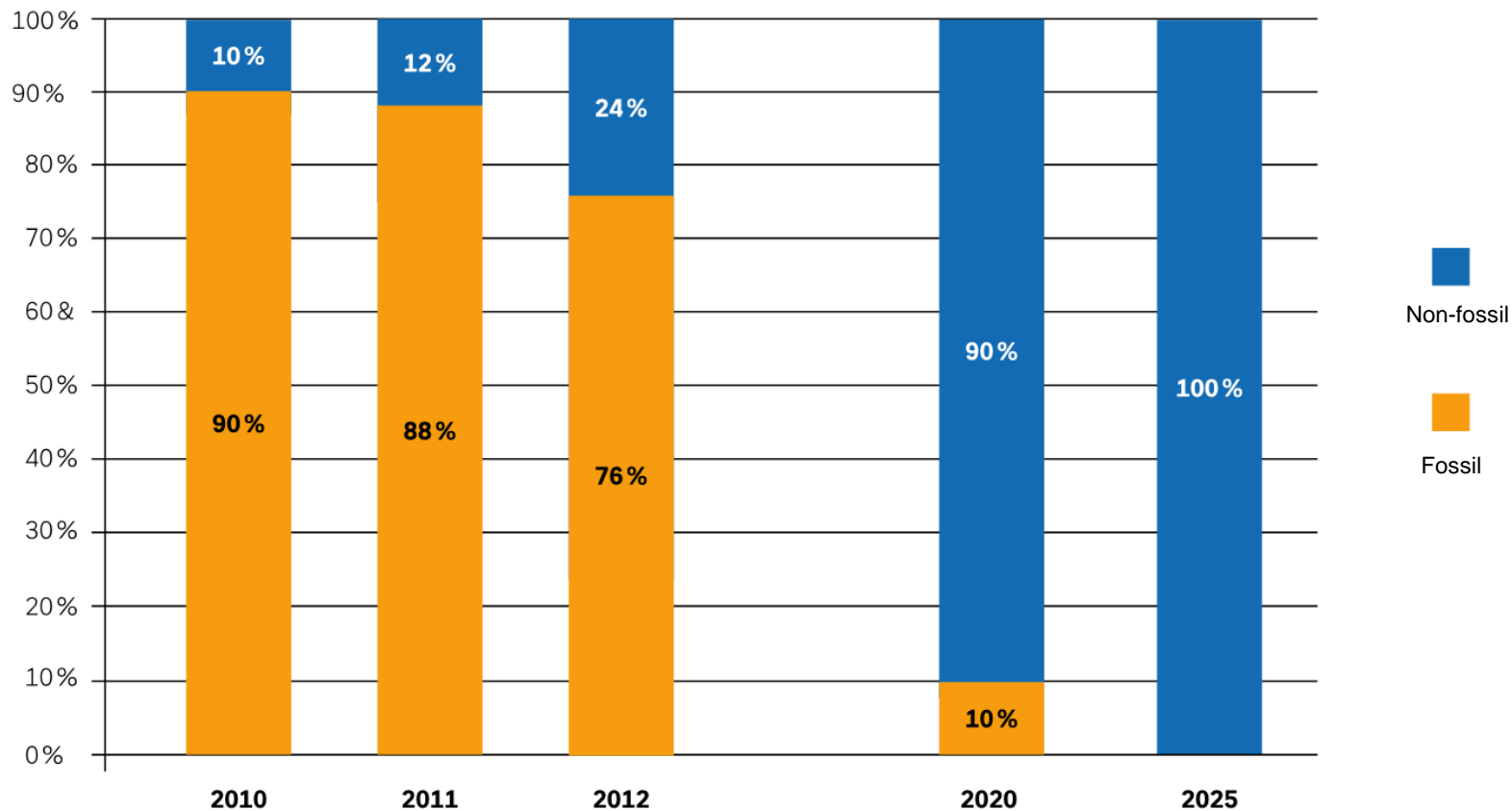
The Perspective



The Opportunity

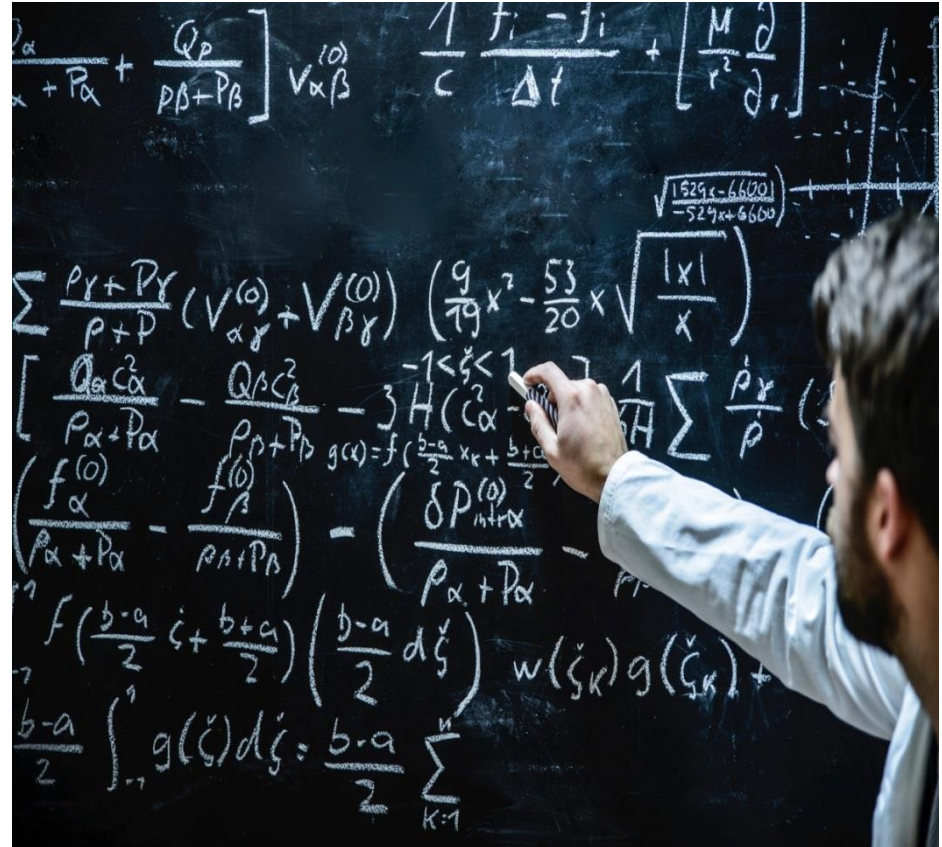


The Low-Hanging Fruit

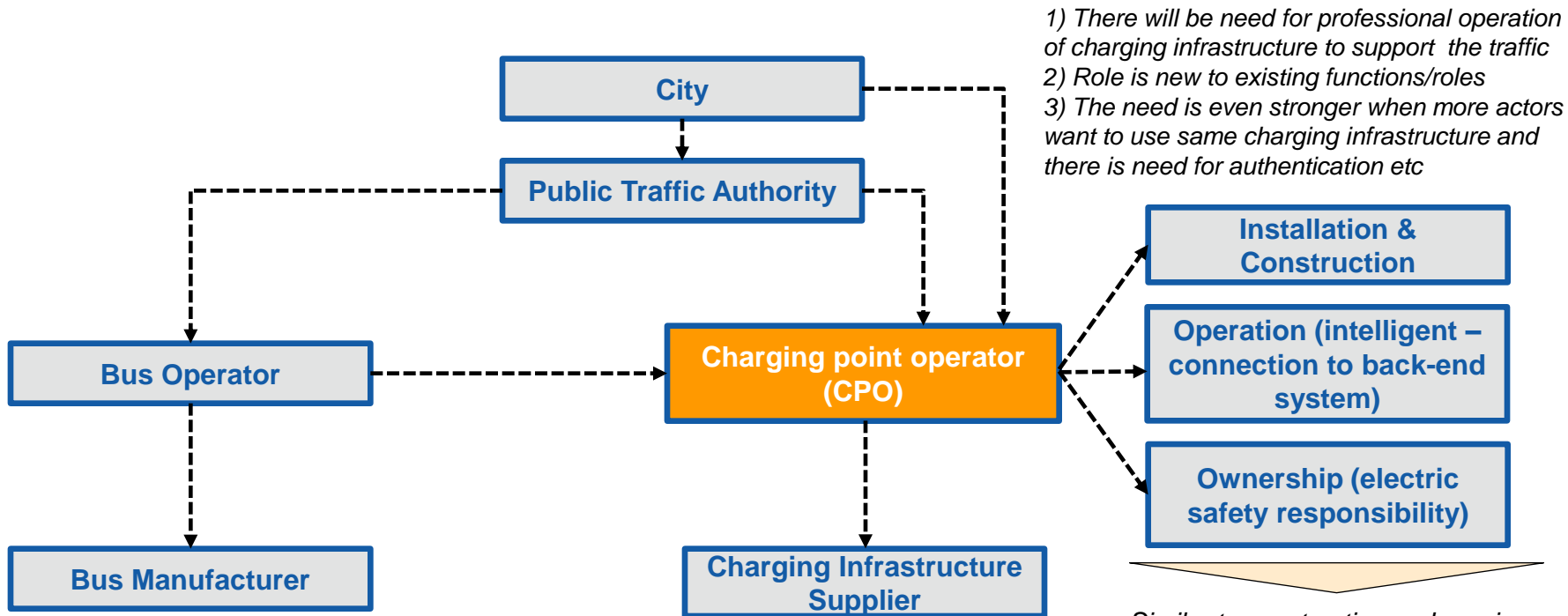


The Challenges

1. A disruptive technology
 - Does not fit a “BAU” world -> political will and/or a true enthusiast important
2. System lock-ins
 - Long contracts -> difficult for new technologies to get introduced
 - Benefits and costs -> not the same “wallet pocket”
3. Charging infrastructure
 - What? Type of charging
 - Who? Ownership and investment
 - How? Business model



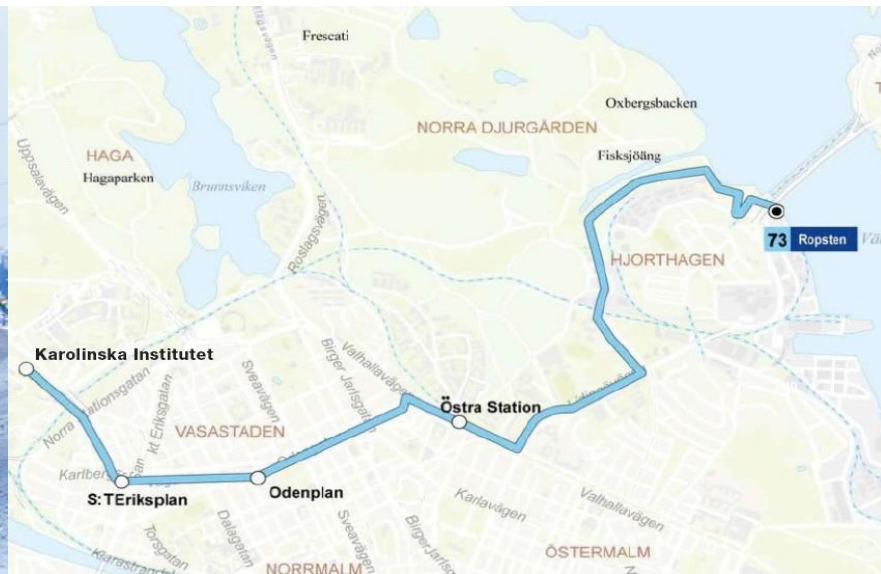
The Charging Operator



- 1) There will be need for professional operation of charging infrastructure to support the traffic
- 2) Role is new to existing functions/roles
- 3) The need is even stronger when more actors want to use same charging infrastructure and there is need for authentication etc

Similar to constructing and running public fast and normal charging networks as Vattenfall does today

The Real-Life Demonstration



The Implementation



An electrification of lines 53, 54, 55, 61, 67, 74 in Stockholm:

Bus type	TCO (kr/km)
Biodiesel HEVs	14
PHEVs incl charging	15
Biogas	16

Emission-reductions for PHEVs	Bio-gas	HEVs
CO2	-80%	-75%
NOx	-90%	-75%
PM10	-50%	-75%

Environmental values not included in TCO cost

Assumptions: 1) 62 PHEVs (run on approx 75 % electricity) 2) Within existing time tables – half of time at end stops utilized for charging 3) Not optimized lines but lines with reasonable physical prerequisites 4) 12 end station chargers 5) In total 2,6 million km

The Electric Future of Road Transports...

– Not an *if* but a *when*!

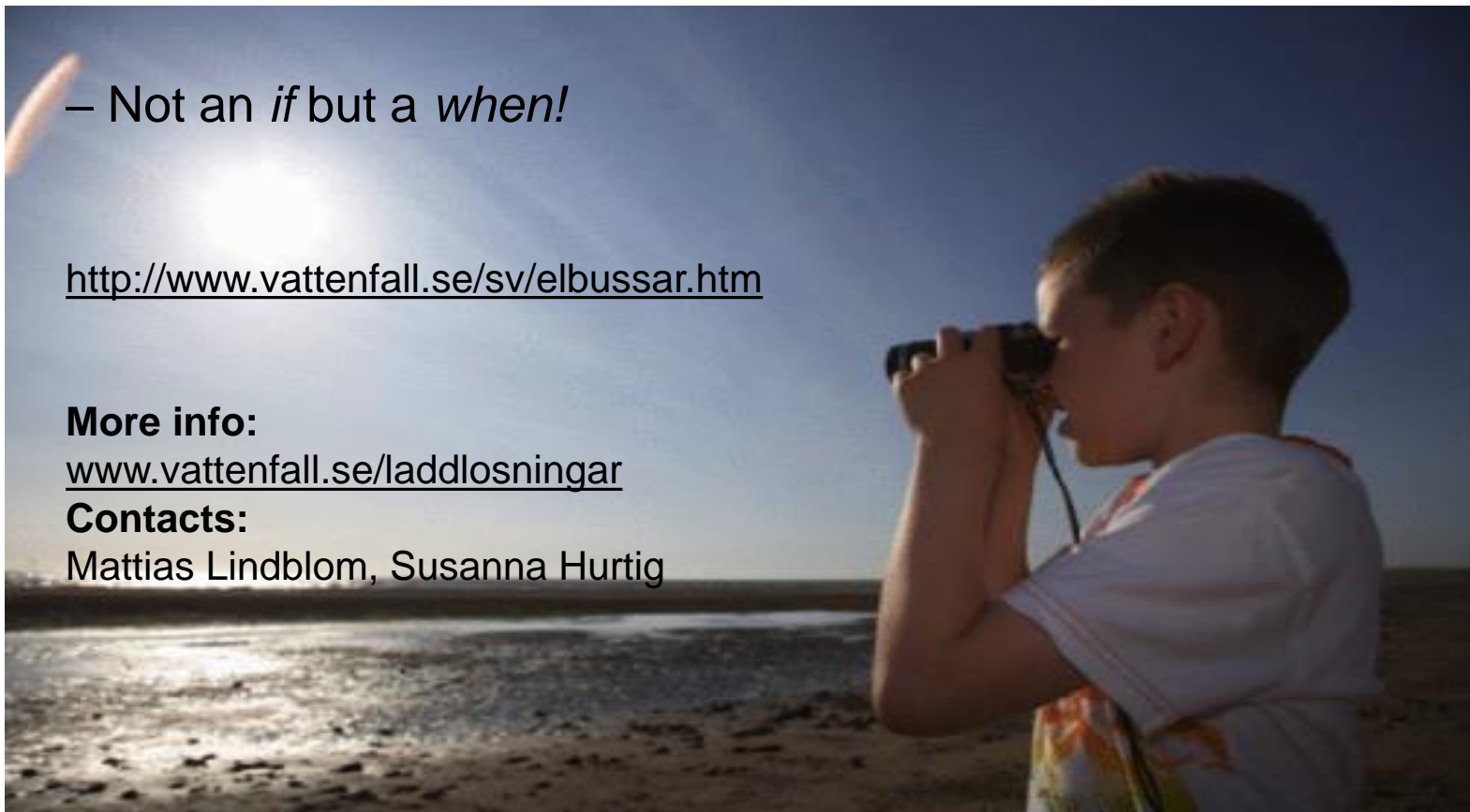
<http://www.vattenfall.se/sv/elbussar.htm>

More info:

www.vattenfall.se/laddlosningar

Contacts:

Mattias Lindblom, Susanna Hurtig



1 windmill = 400 electric buses



1 wind mill á 5 MW, 4000 h/år \Rightarrow 20 000 MWh per year
1 bus á 40 000 km and 1,2 kWh/km \Rightarrow 400 buses per wind mill