

# 450-kW Conductive Dynamic Charging System

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Background

Electric Road System (ERS)

Honda ERS

Future Outlook

# Background

Looking towards the realization of a zero-CO<sub>2</sub> society, it will be important to achieve zero emissions of CO<sub>2</sub> during vehicle operation.

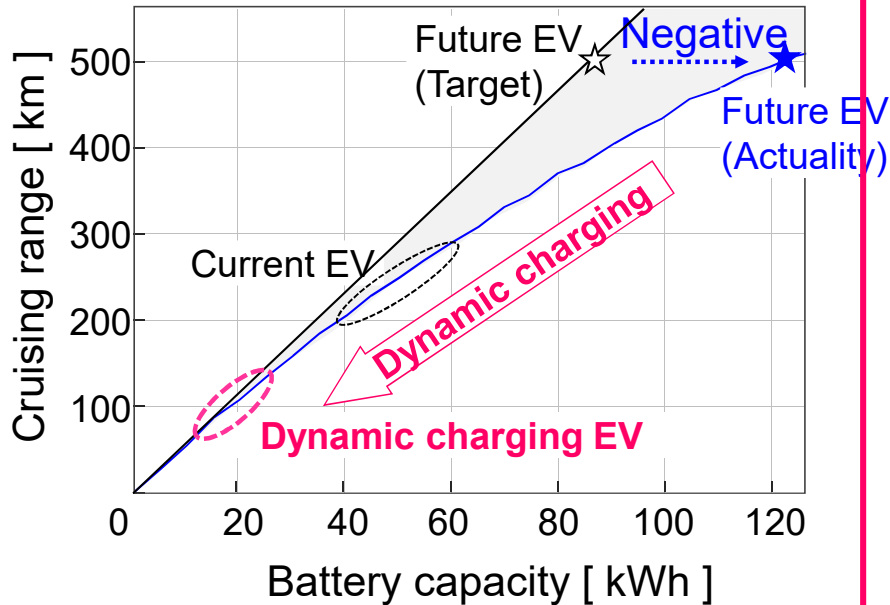


The main issues facing EV are

- Driving range
- Charging (Nuisance, time, congestion at charging stations, provision of infrastructure)
- Decline in dynamic performance due to increased battery weight

## Methods of Extending EV Driving Range

1. Increasing the energy capacity of the batteries, or fitting more batteries



2. Electric Road Systems : ERS  
(Dynamic charging system)

### Air Wire

Siemens/SCANIA



Siemens/Mercedes



<https://www.greenoptimistic.com/electric-highway-siemens/#.WzQxKIInbIU>

### Road Line

Elways



Alstom/Volvo



Volvo's electric roads concept points to a battery-free EV future

Elonroad



Honda



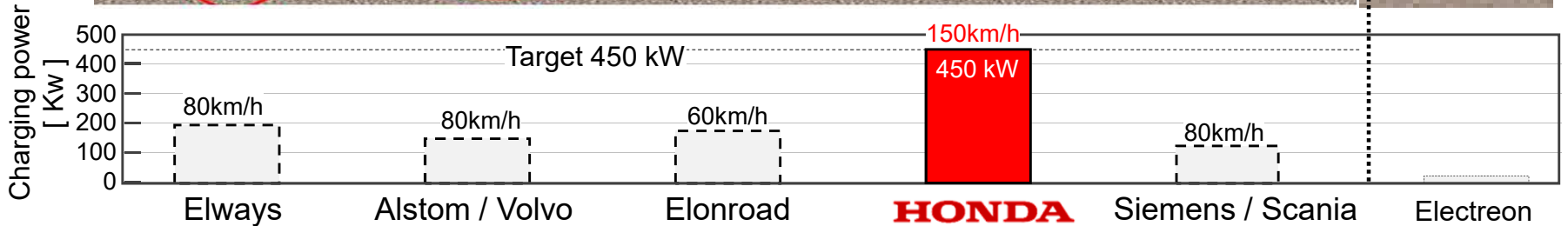
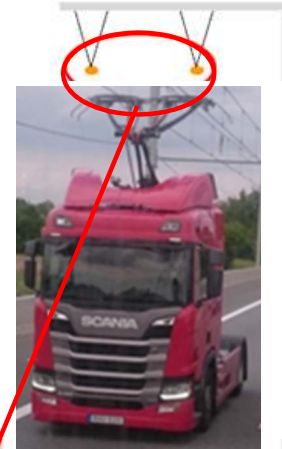
# Electric Road System (ERS)

Conductive

Inductive

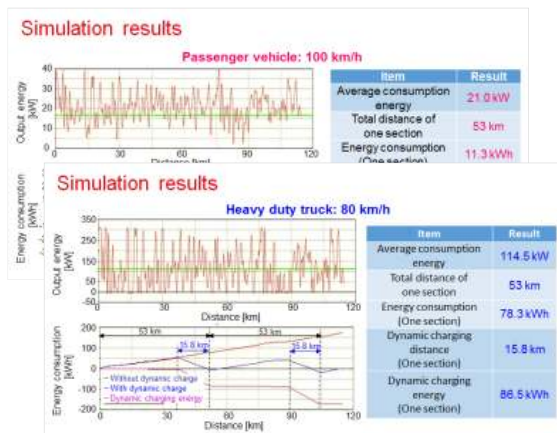


Volvo's electric roads concept points to a battery-free EV future

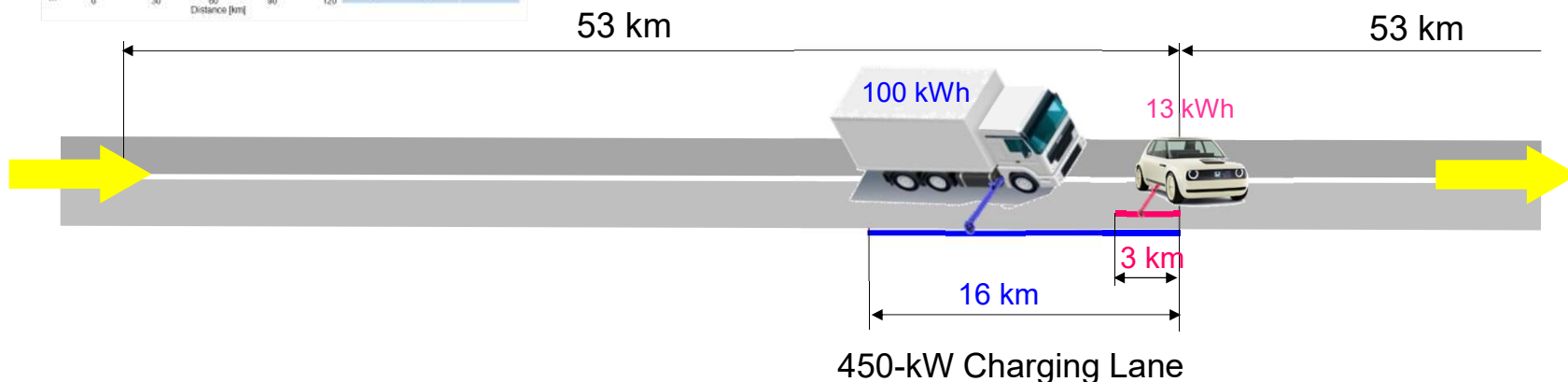


# Electric Road System (ERS)

## 450-kW ERS simulation results



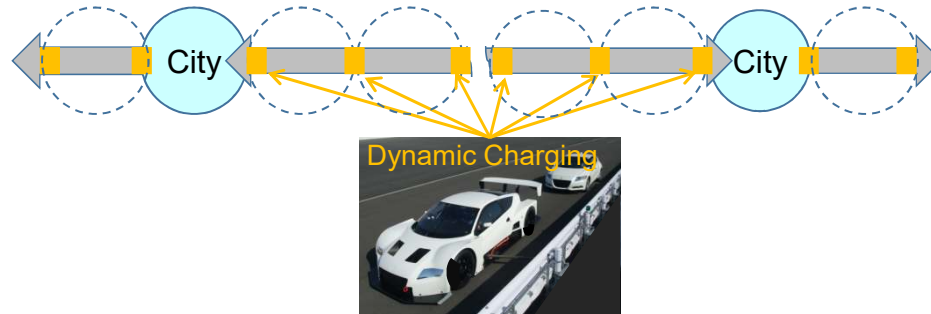
	Passenger vehicle	Heavy duty track
Average speed	100 km/h	80 km/h
Average consumption energy	21.0 kW	114.5 kW
Total distance of the one section	53 km	
Dynamic charging distance	3 km	16 km
Minimum battery capacity	13 kWh	100 kWh



## Goal

### *“ Vehicle Revolution ”*

To extend the cruising range for EVs by enabling unlimited cruising range by simultaneously supplying energy and charging while running.



## Effects

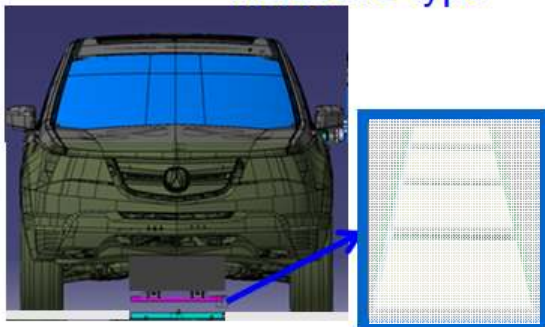
- Unlimited vehicle cruising range
- Zero stationary charging time
- Reduced battery load (1/10)
- More enjoyable driving thanks to a lifting of the power limitations on EVs

# Early examination of Honda ERS

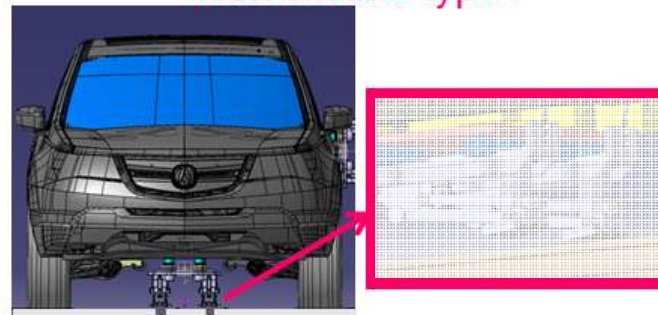
We considered the power supply from in-road at the first stage



Inductive type



Conductive type



In the Inductive type : There are safety issues related to electromagnetic noise.



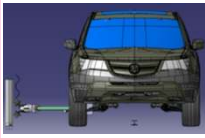
In both types: There are issues with foreign matter, positioning, and road maintenance.



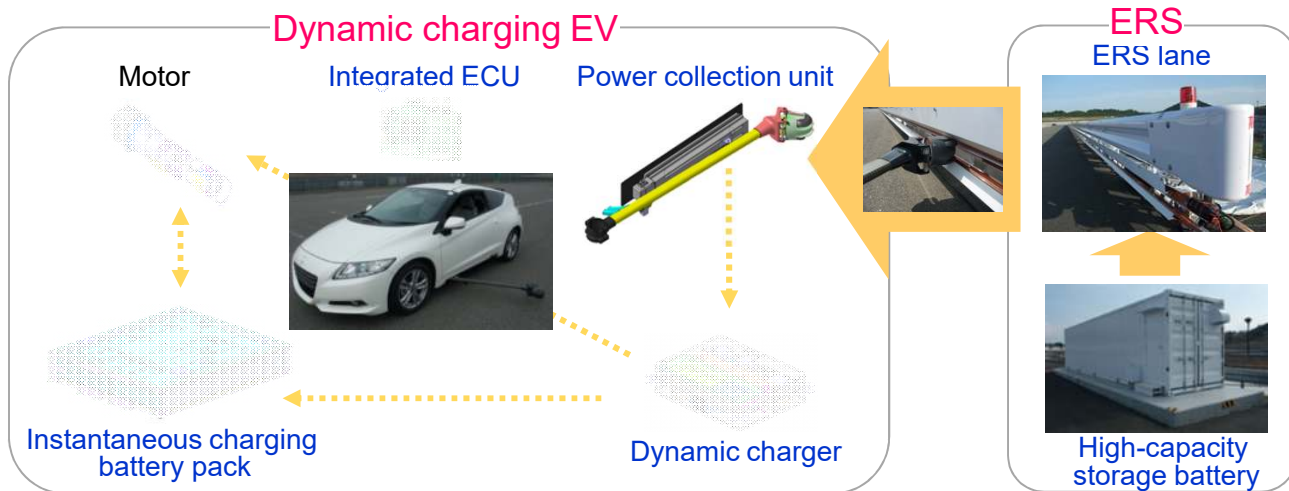
# Honda ERS

## Comparison of ERS Methods






3 High score 2 Medium score 1 Low score

Type	Incuctive-type			Conductive-type		
	Overhead	In-road	Side	Overhead	In-road	Side
	 <a href="https://monoist.atmarkit.co.jp/mn/articles/1207/09/news076.html">https://monoist.atmarkit.co.jp/mn/articles/1207/09/news076.html</a>			 <a href="https://www.nikkan.co.jp/articles/view/00465558">https://www.nikkan.co.jp/articles/view/00465558</a>		
Supply power	1	2	1	3	3	3
Charging time	1	2	1	3	3	3
Electromagnetic noise	1	1	1	3	1	3
Motorcycle	1	1	1	3	1	3
Foreign matter on the road	3	1	2	3	1	2
Convenience	2	2	3	2	1	3
Cost	1	1	1	2	1	3

# Honda ERS



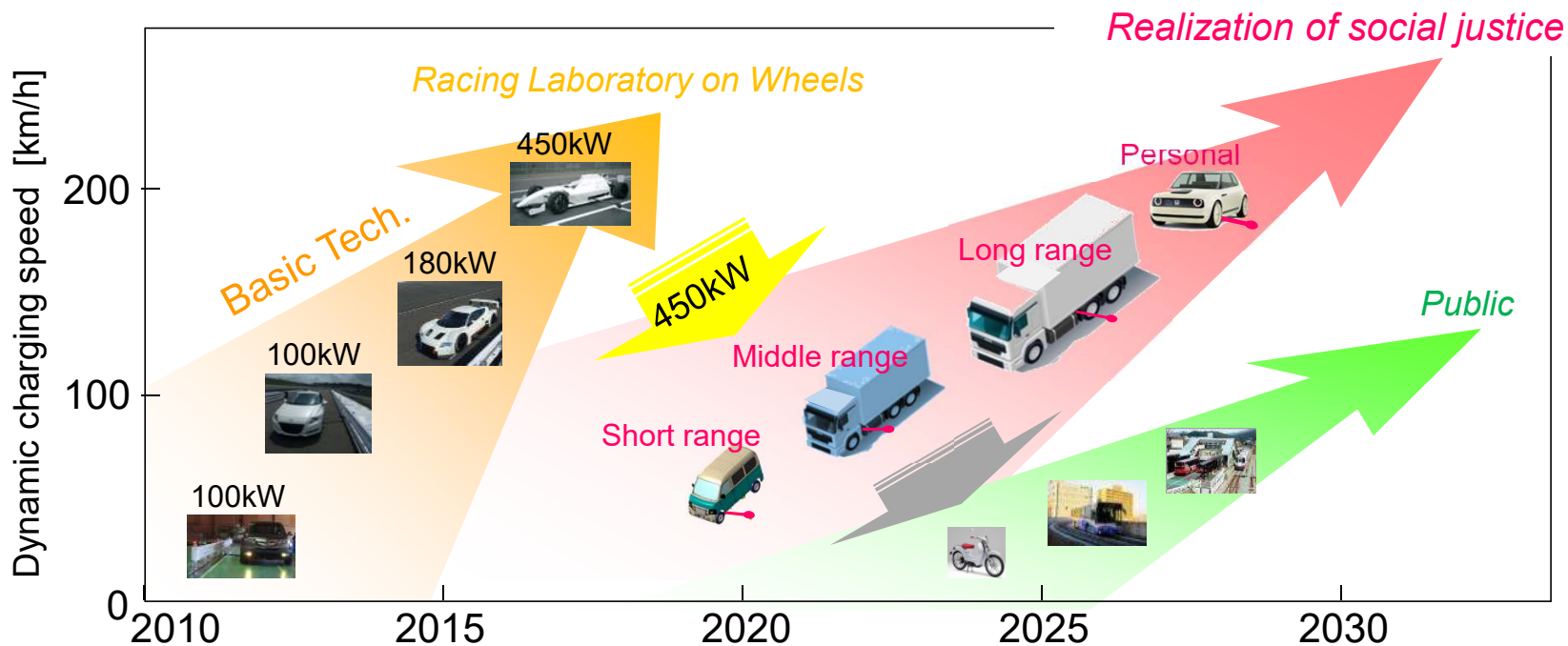
# Honda ERS

	Type-0	Type-1	Type-2	Type-3	Type-4 (In development)
Vehicle					
ERS power	100 kW	100 kW	180 kW	450 kW	450 kW
Power supply voltage	DC 375 V	DC 375 V	DC 600 V	DC 750 V	DC 750 V
Power supply current	300 A	300 A	300 A	600 A	800 A
Power transmission distance	0.1 - 1.2 m	0.1 - 1.2 m	0.1 - 1.3 m	0.1 - 1.3 m	0.1 - 1.5 m
Max. charging speed	Max. 20 km/h	Max. 70 km/h	Max. 155 km/h	Max. 150 km/h	Max. 120 km/h
ERS lane length	20 m	100 m	300 m	385 m	Over 400 m



# Future Outlook

Promotion of substitution of internal combustion engine vehicles  
and realization of carbon free society by ERS



# **HONDA**

The Power of Dreams

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