



# Scenarios of High Penetration Renewable and Electric Vehicle in China

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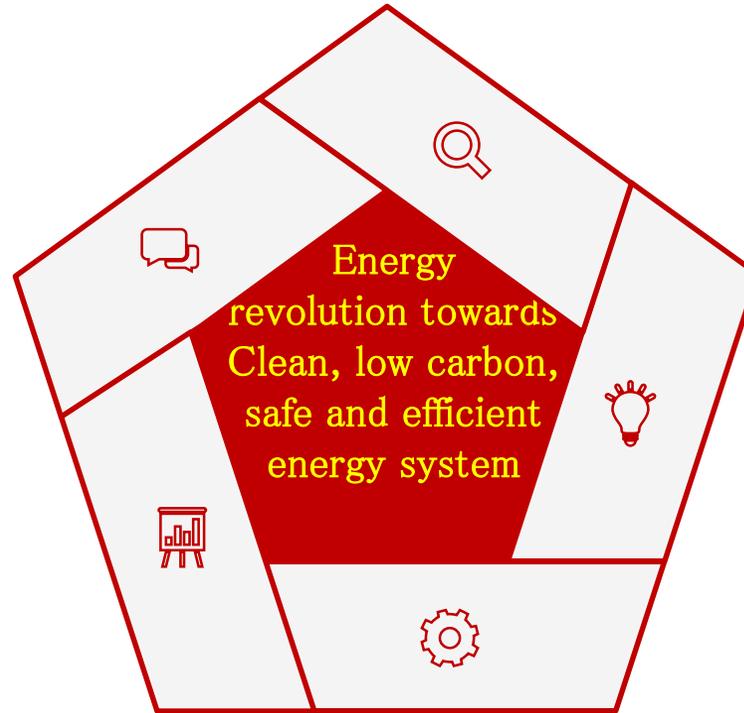
# CREO Scenarios exhibit feasible roadmap and necessary steps

## Energy **cooperation** as platform

increase invoices of energy cooperation, participant transferring to leaders

## Energy **system** revolution as guarantee

Modern energy **market** system, restore the commodity nature of energy products, modernization of energy governance



Energy **technology** revolution as support  
Important breakthrough for energy technology, China to be a energy powerhouse

Energy **consumption** revolution as orientation  
electrification (50%),  
Intelligentization, high efficient energy consumption at middle and high level

## Energy **production** revolution as cornerstone

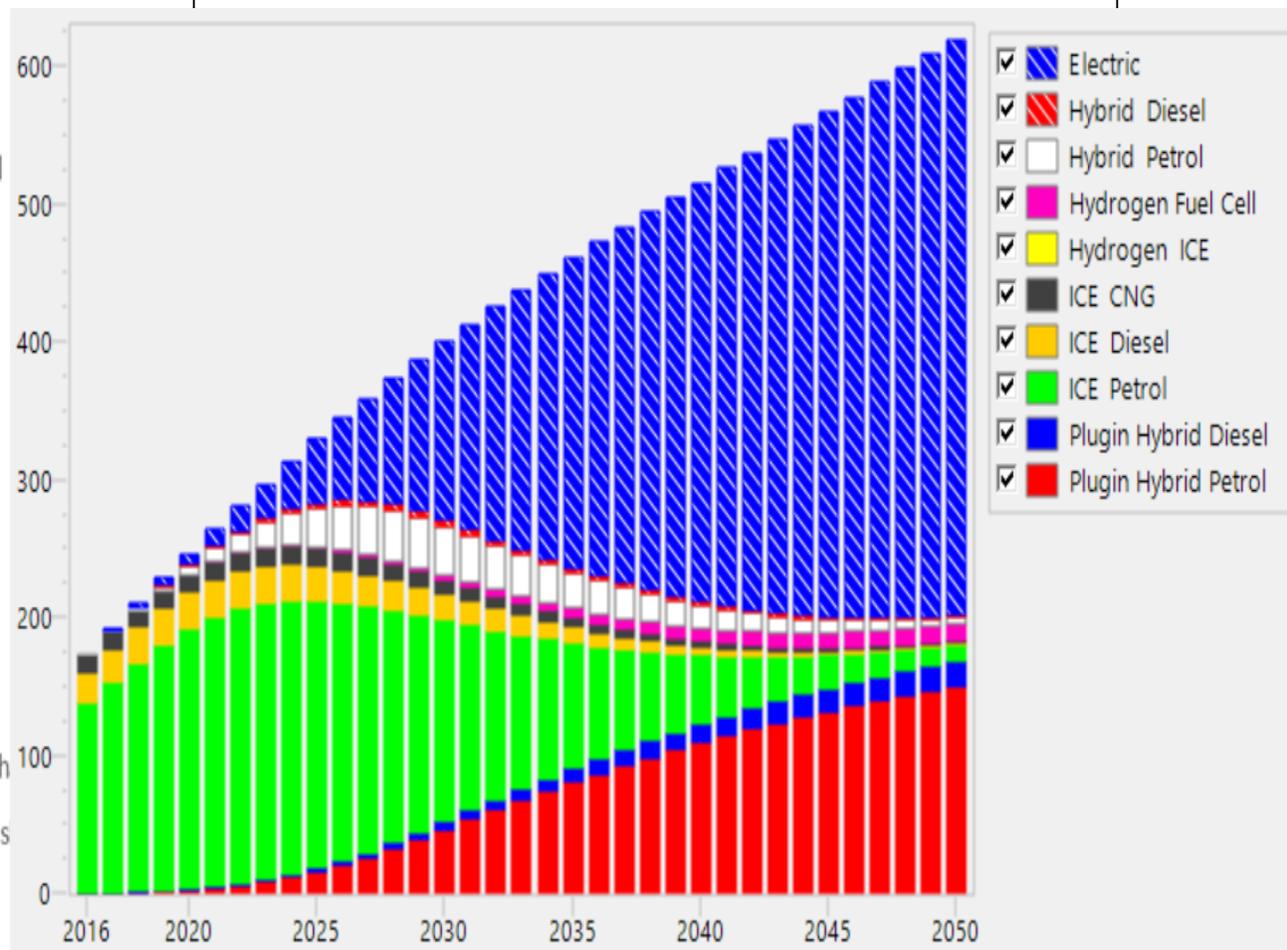
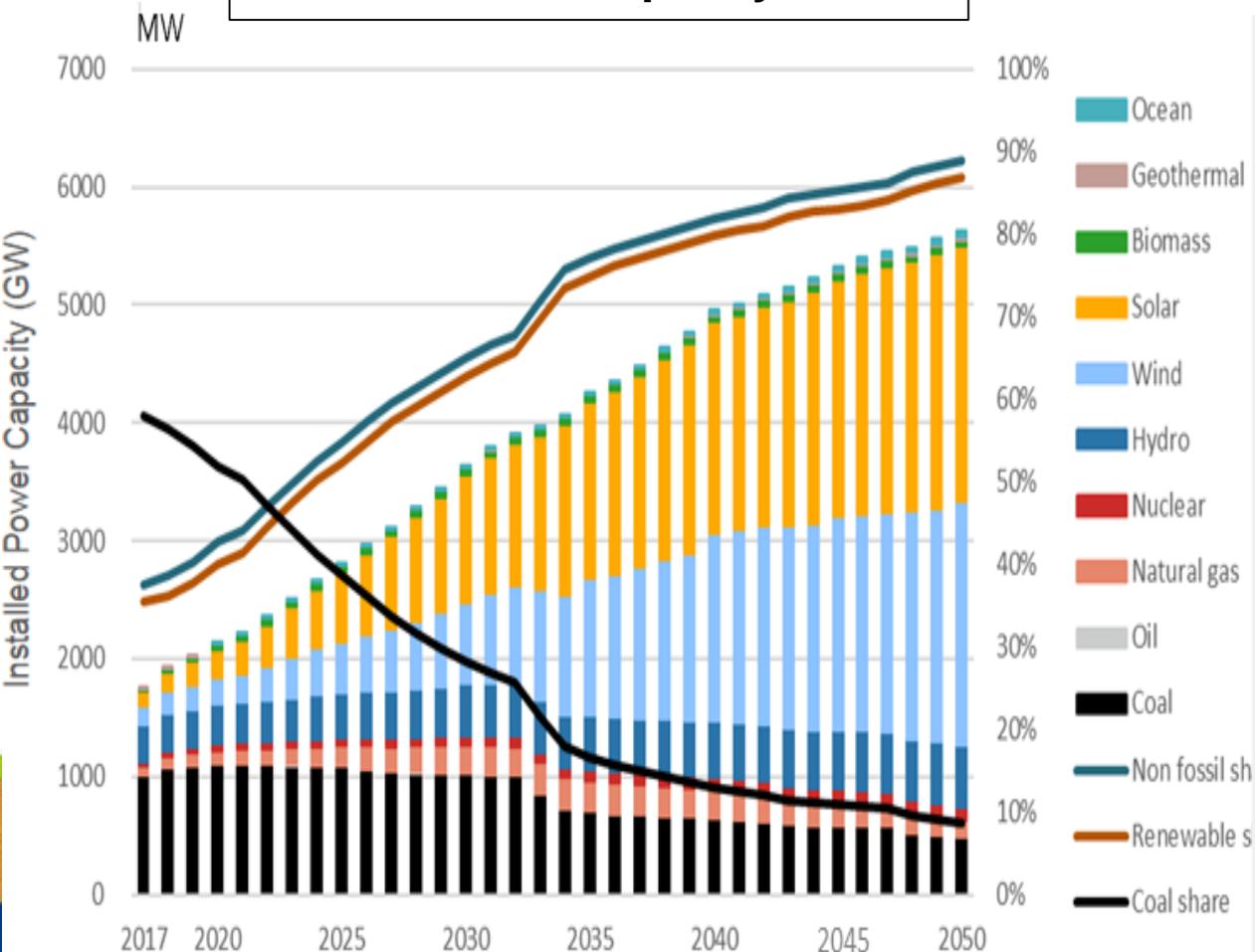
Green, low carbon, safe and efficient energy production and establish the energy mix with 2/3 non-fossil fuel energy

# High share VRE and EVs at production and consumption sides in 2050

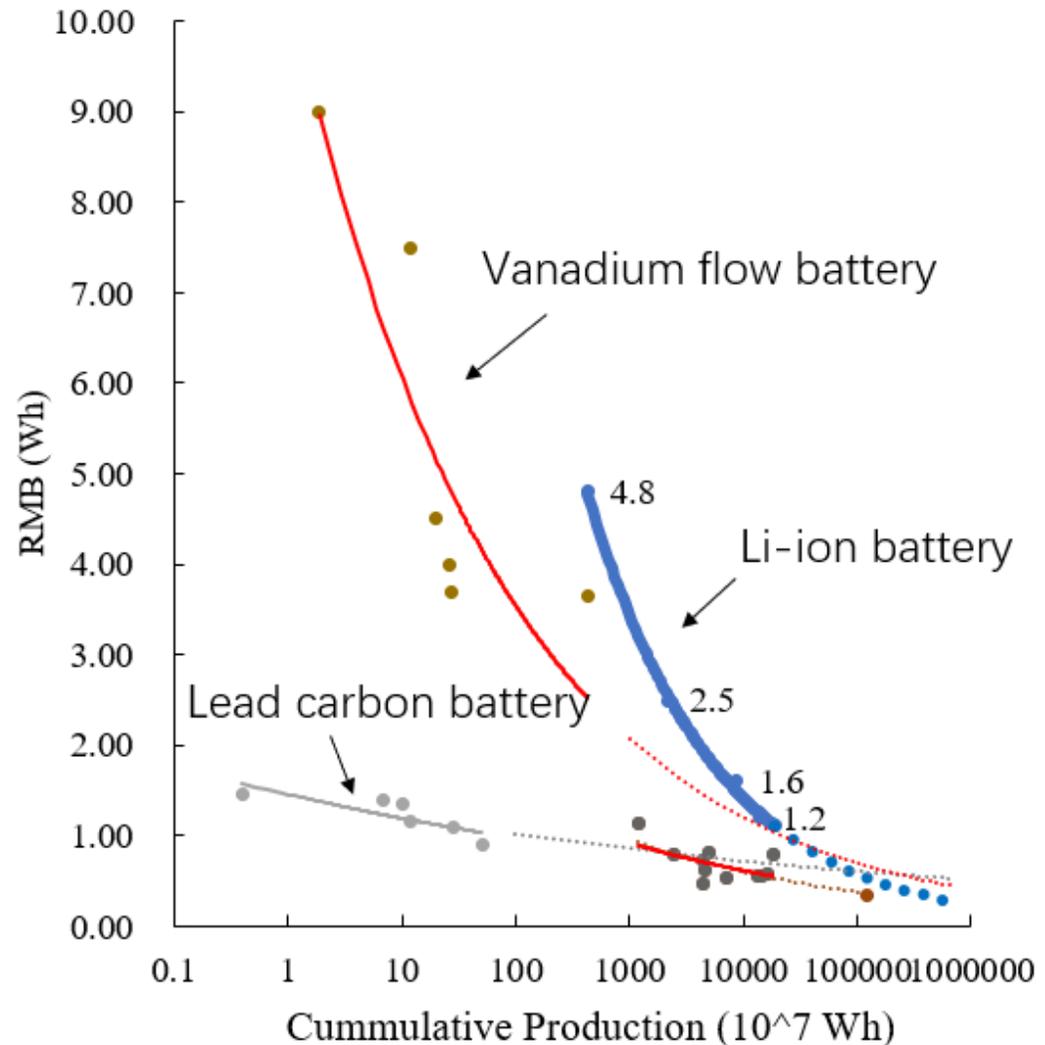
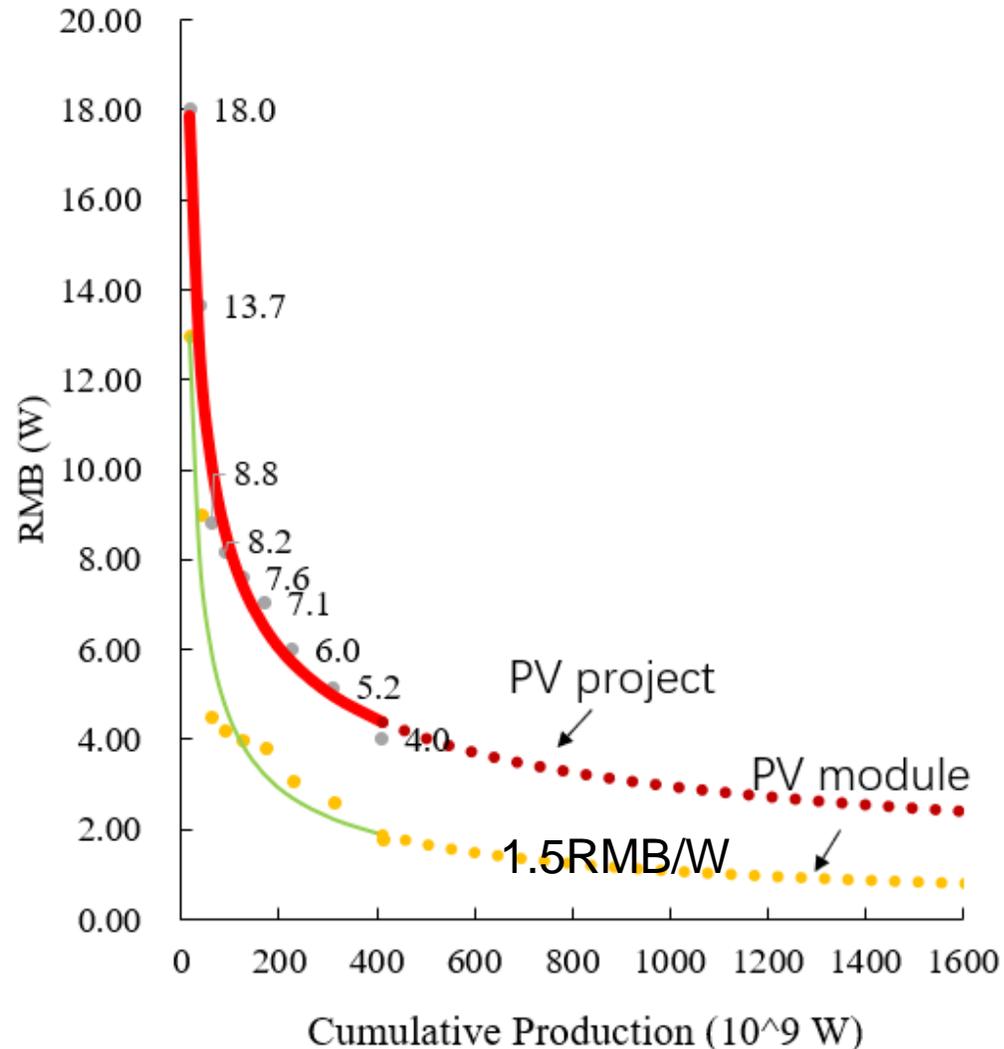
## Challenges of safety and Opportunities of flexibility

**RE share in Generation: 80%**  
**VRE share in capacity: 80%**

**EV SHARE in fleet: 80%**



# Rapid Reduction of VRE and EV(Battery) Cost subsidy free after 2020

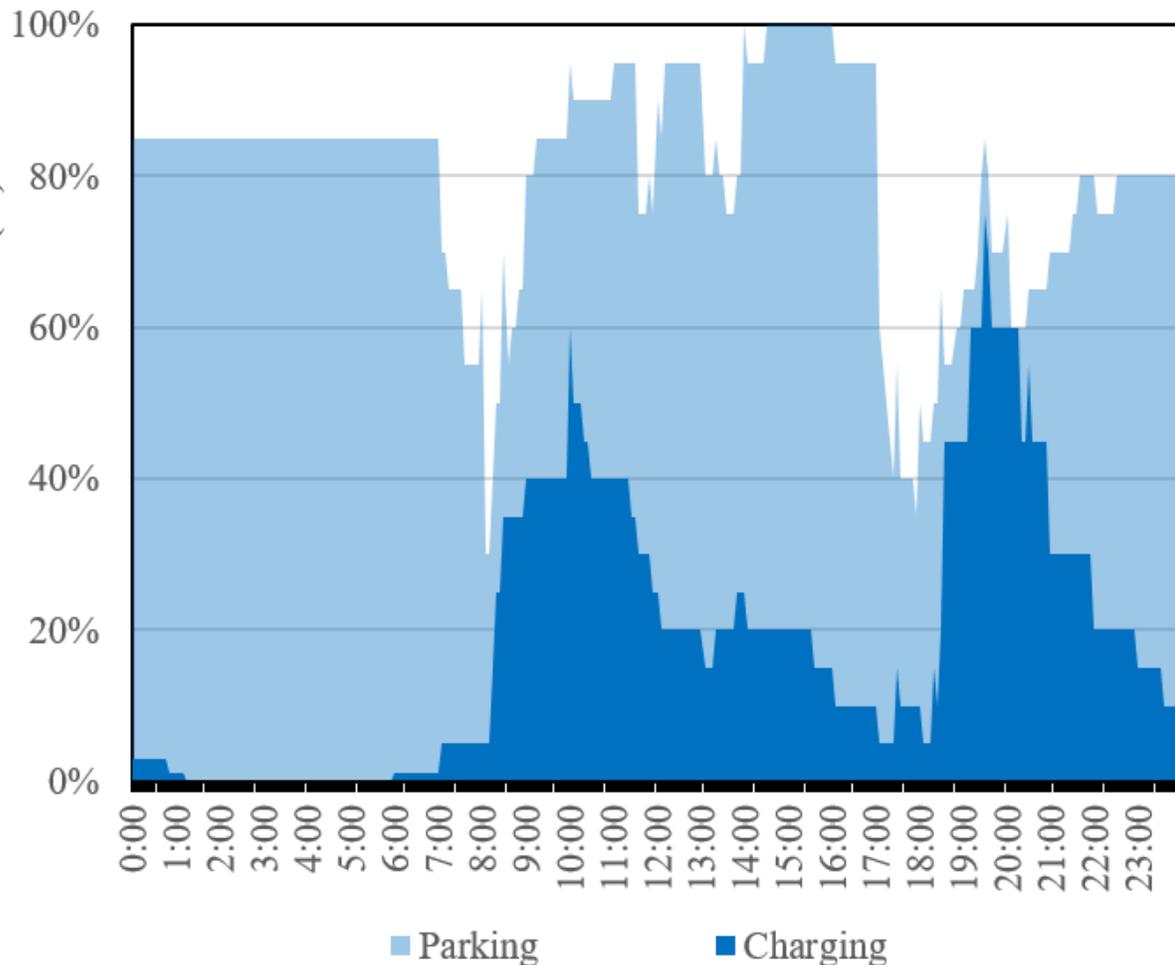


# EV technology improvements and deployment

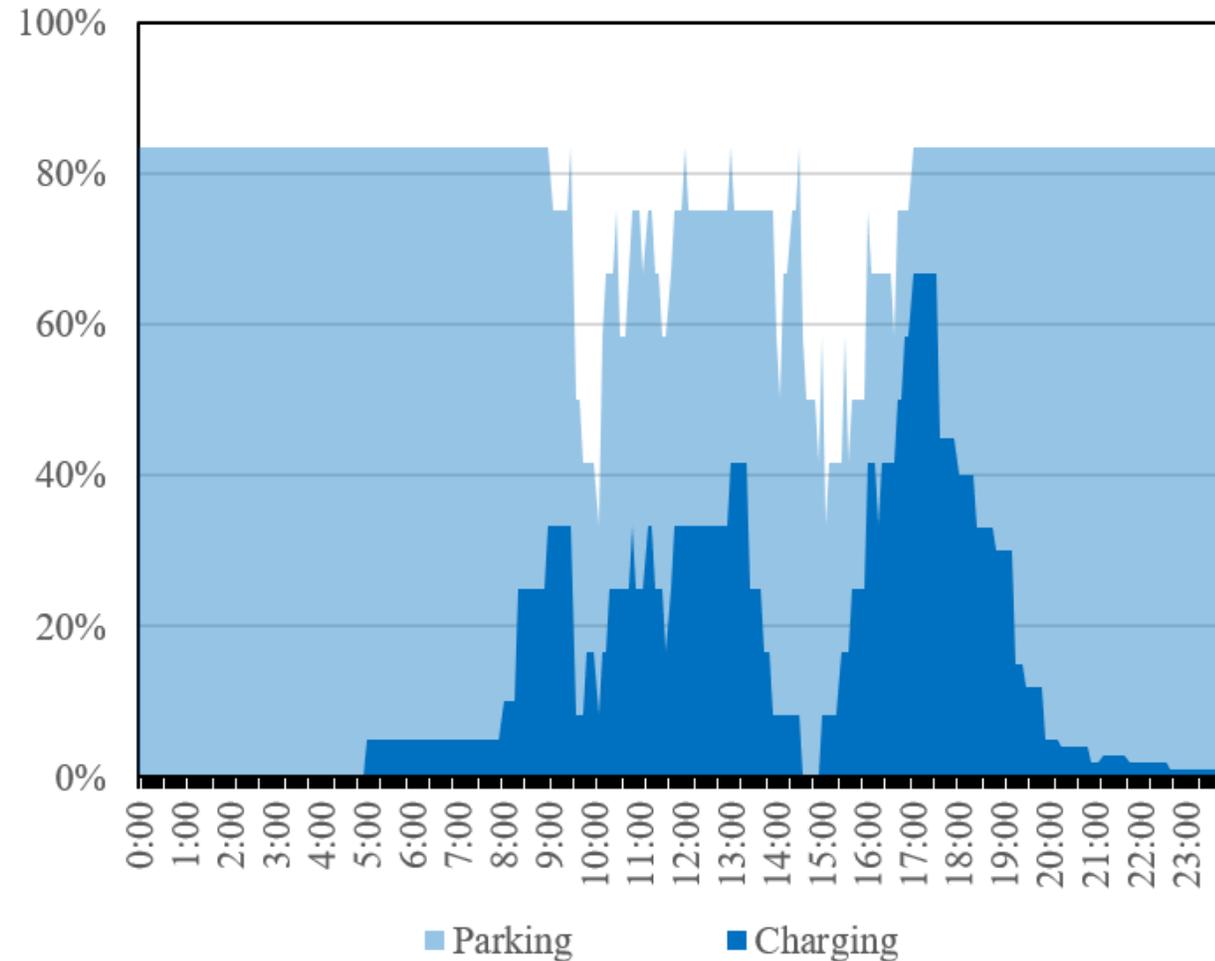
	Target	2020	2025	2030	2050
EV	Sales (Million/Year)	2	9	16	35
	Fleets (Million)	5	34	90	400
	Efficiency (A0) (kWh/100km)	12	11	10	10
Battery	Capacity (kWh)	50	80	100	120
	Energy Intensity (Wh/kg)	250	280	350	-
	cycle lifetime	3000	3500	4000	5000
	Battery cost (RMB/Wh)	0.6	0.5	0.4	0.3
	System Cost (RMB/Wh)	1	0.9	0.8	0.6
Charging	capacity	AC 7kW DC≤120kW	AC 7kW DC≤350kW	AC 7kW DC≤500kW	AC 7kW DC≤500kW
	Decentralized (Million)	4.8	24	85	330
	Centralize station (Thousand)	12	50	80	100

# Parking and Charging Behaviors based on survey: flexibility in private and commercial EV charging time

Private EVs

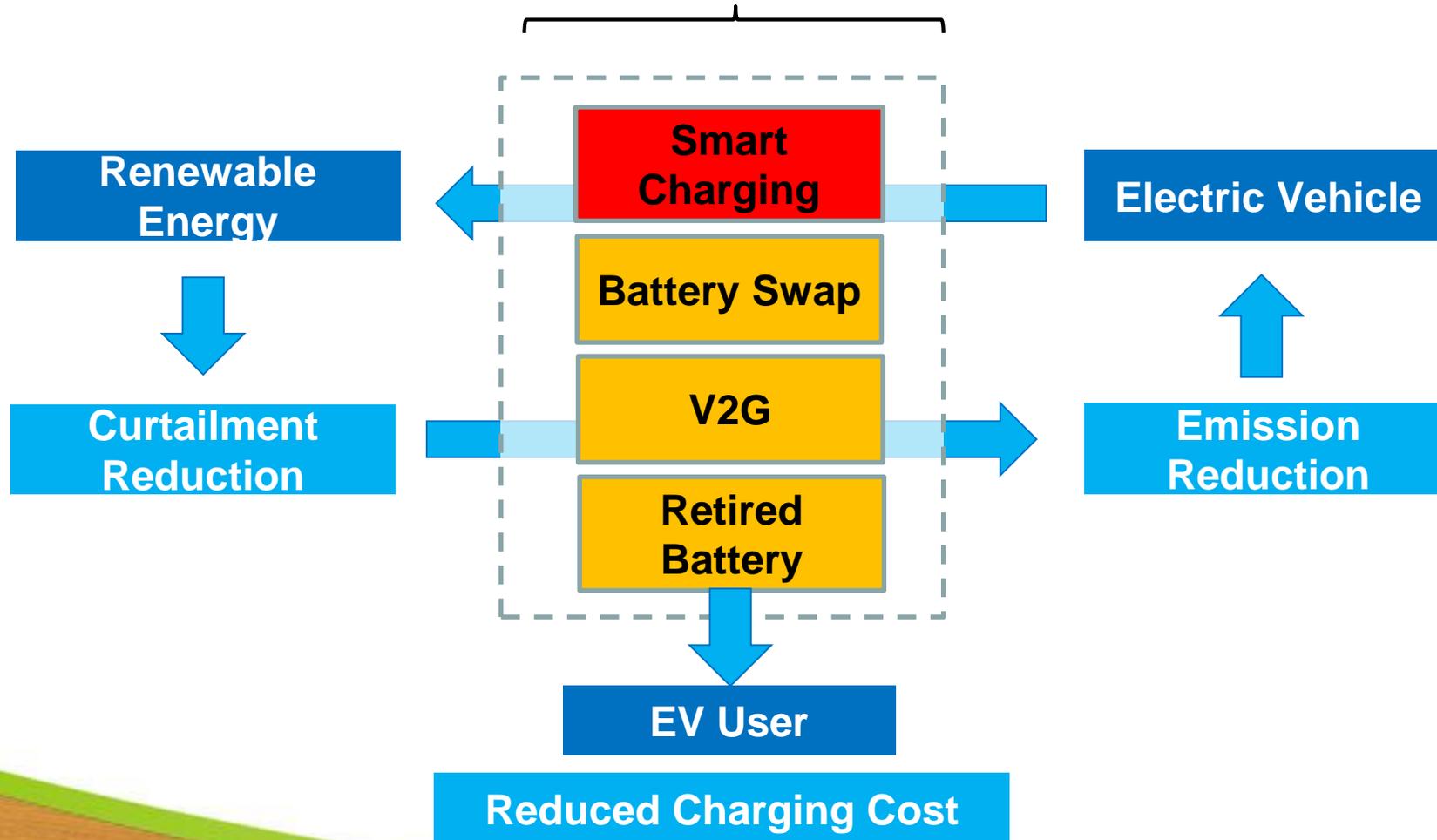


Commercial EVs



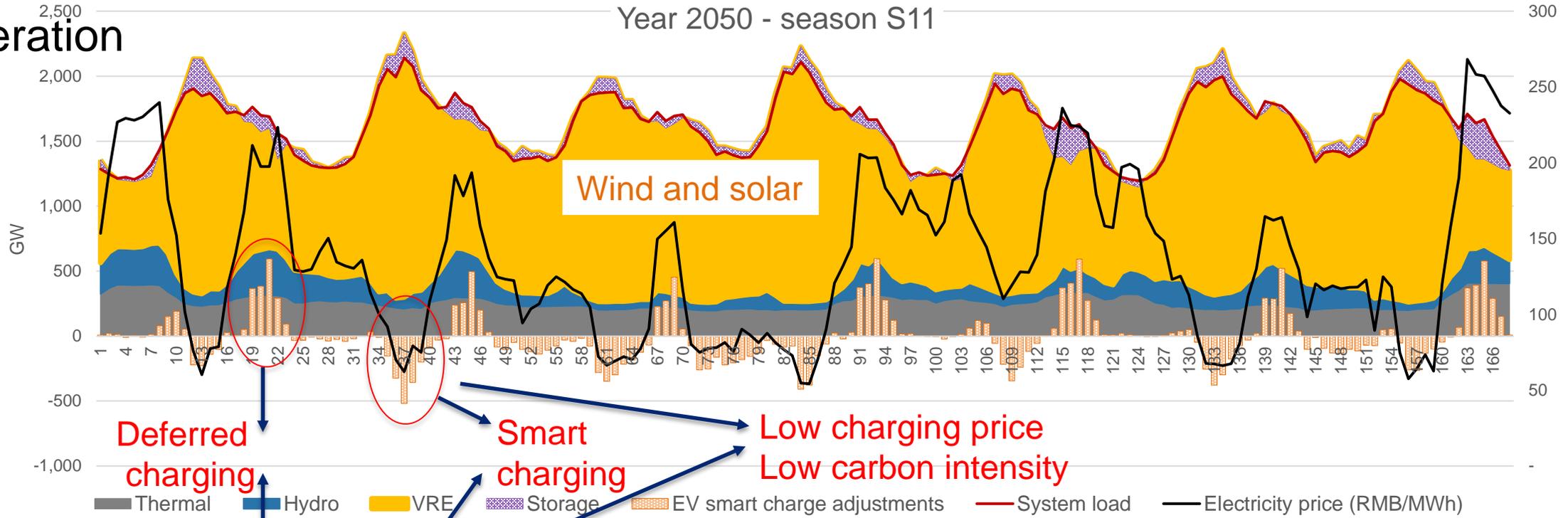
# Multiple Benefit of Coordination of High RE and EV

## *RE – EV coordination*

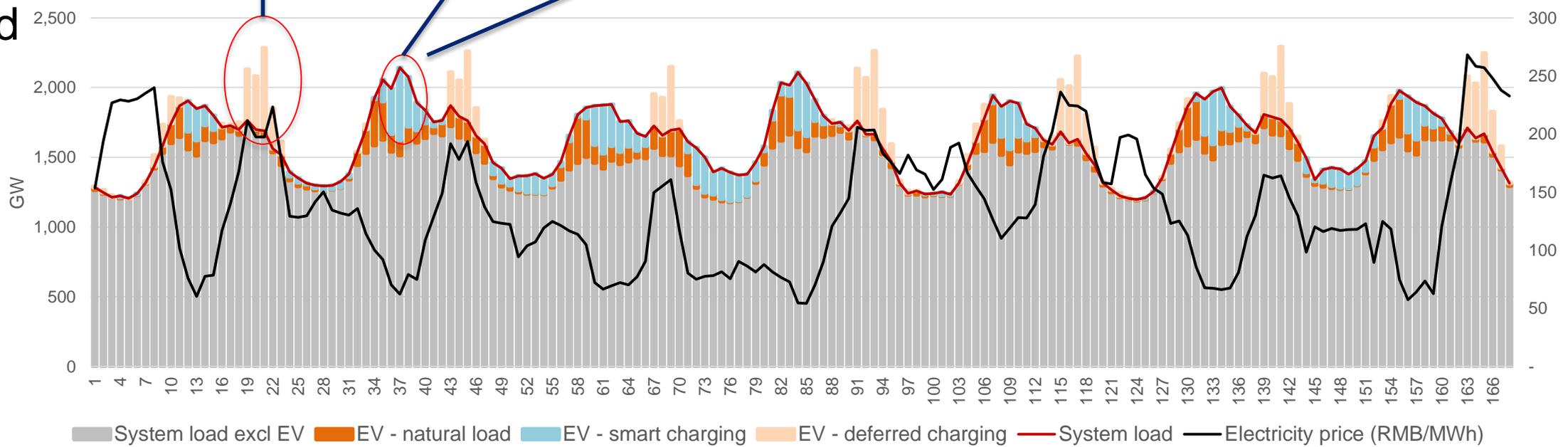


# Generation

Year 2050 - season S11



# Load

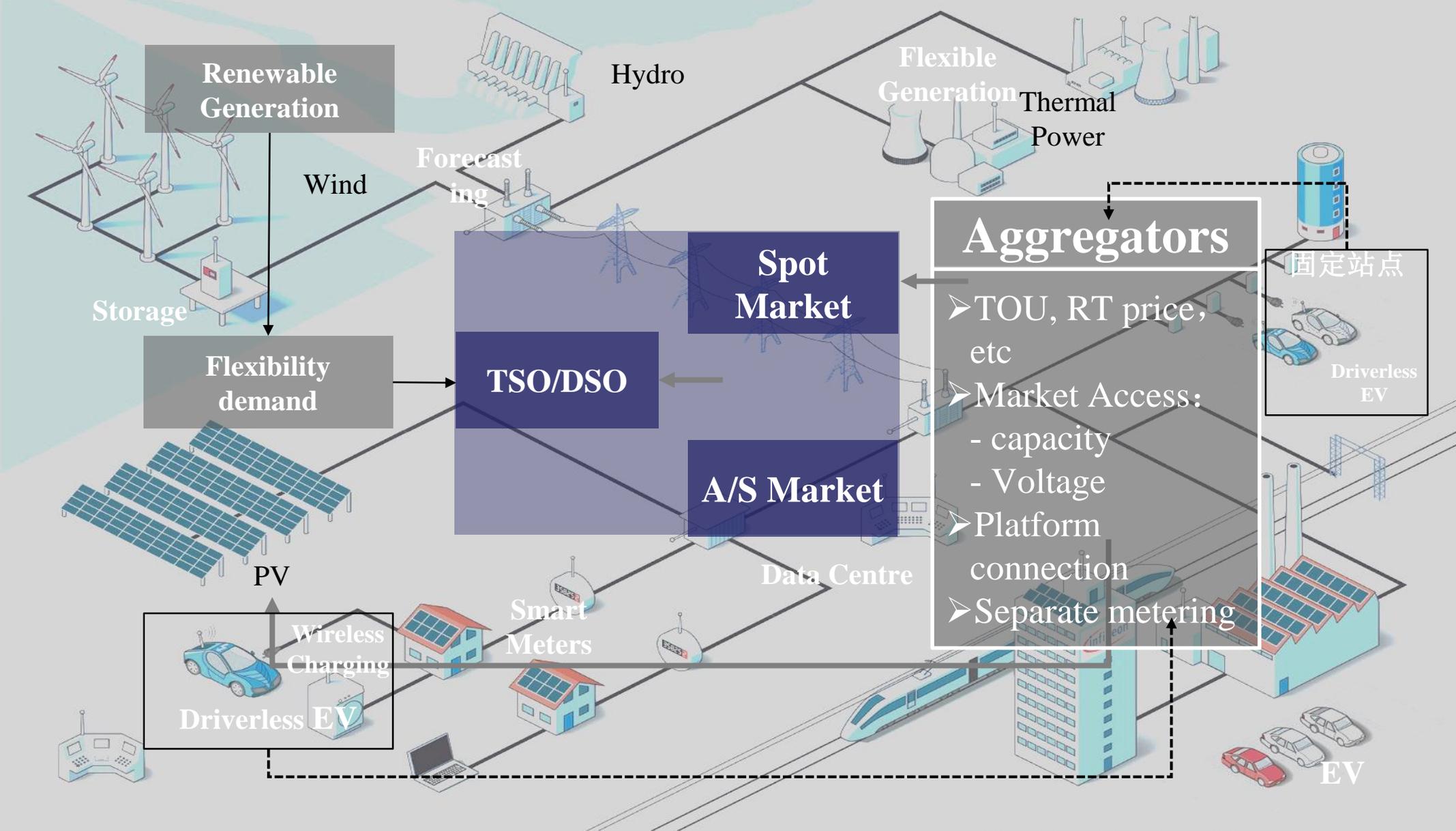


Deferred charging

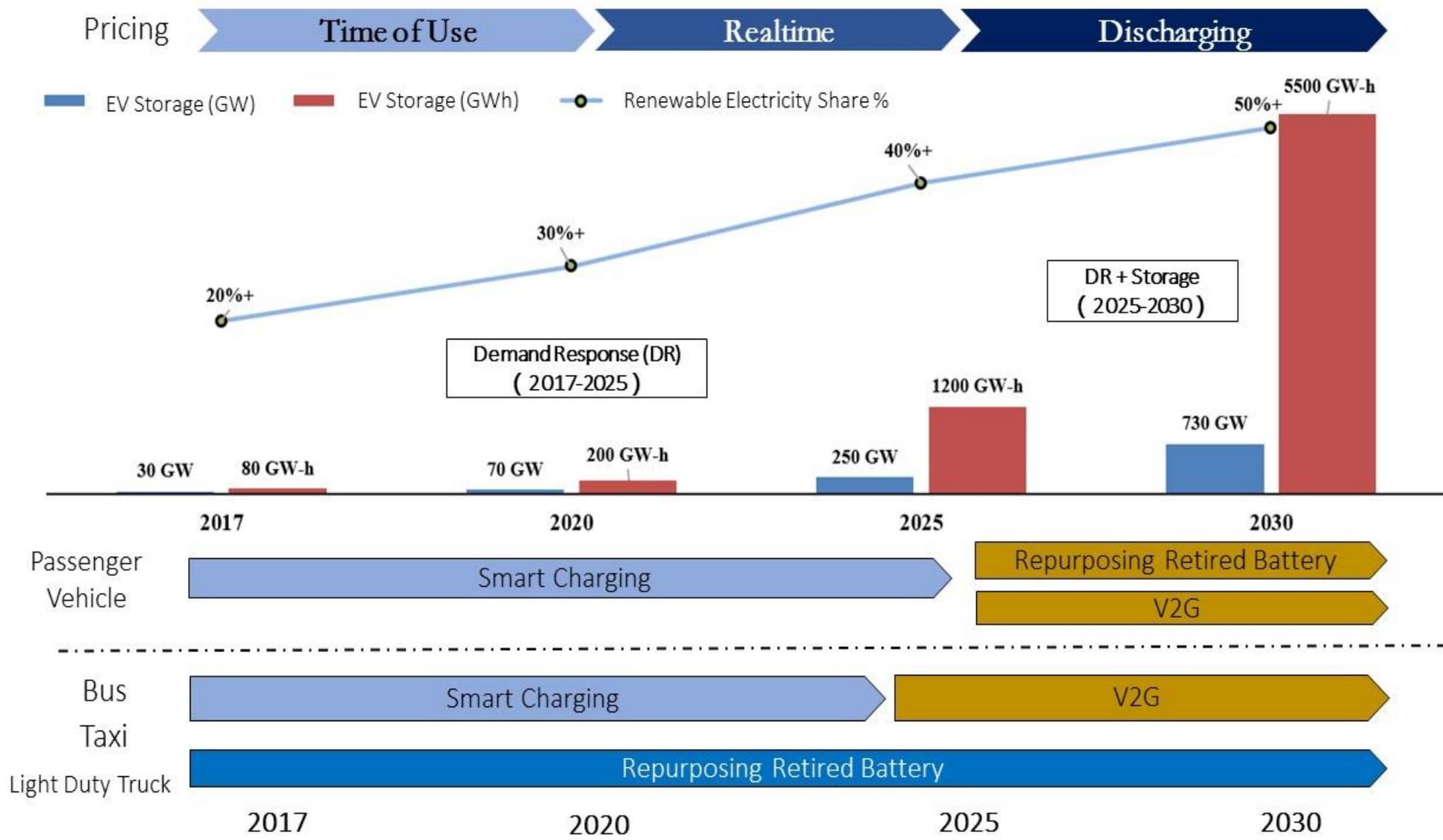
Smart charging

Low charging price  
Low carbon intensity

# Open Power Market and New Players are essential



# Long Term Roadmap from Near future : DR under time-of-use pricing



Thank you !

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