
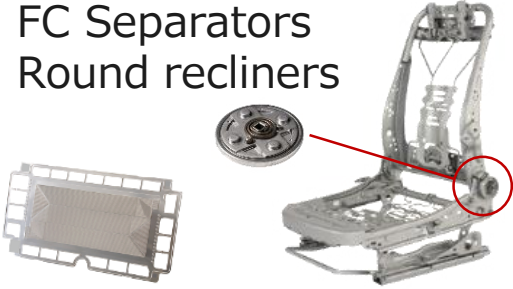
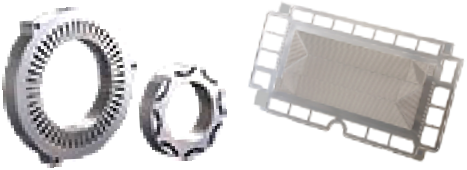




# Lithium-ion Battery

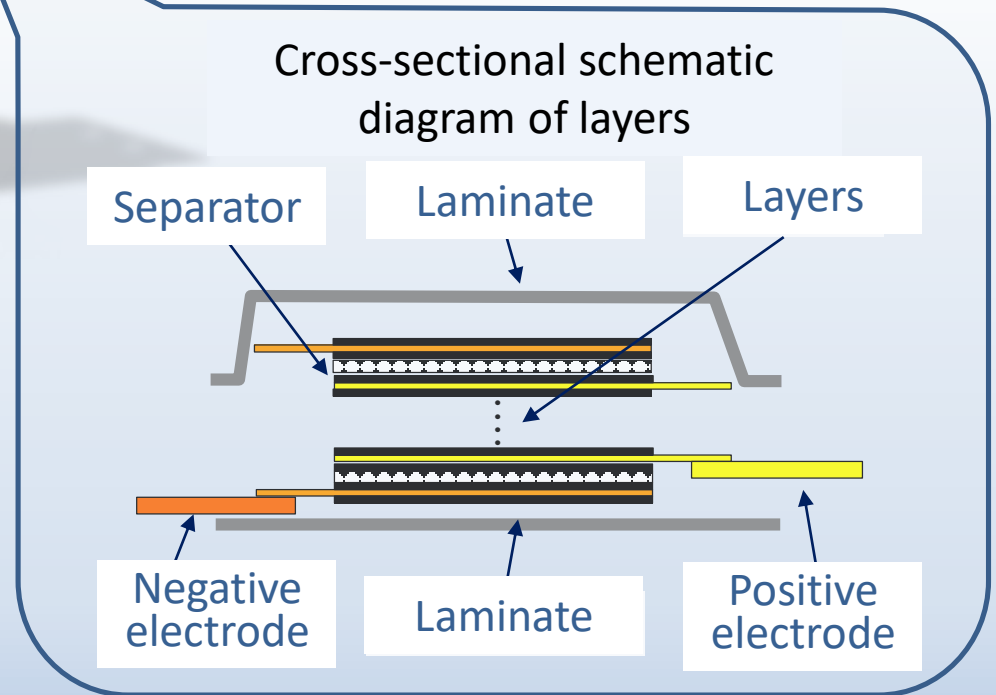
# Toyota Boshoku's Lithium-ion Battery Initiatives

Toyota Boshoku products	Core technologies	Applications for lithium-ion batteries
<p>Filters</p> 	<ul style="list-style-type: none"> <li>■ Filtration technologies</li> <li>■ Microfiber manufacturing technologies</li> </ul>	<ul style="list-style-type: none"> <li>■ Separators</li> </ul>
<p>FC Separators Round recliners</p> 	<ul style="list-style-type: none"> <li>■ Precision molds</li> <li>■ Precision press technologies</li> </ul>	<ul style="list-style-type: none"> <li>■ Assemblies</li> </ul>
<p>Electrical parts (Motor core, FC Separators)</p> 	<p>Electrical testing equipment and technology</p> <div data-bbox="707 1108 904 1253">  <p>Motor bench</p> </div> <div data-bbox="1010 1108 1207 1253">  <p>Battery test bench</p> </div>	<ul style="list-style-type: none"> <li>■ Battery testing (performance/reliability)</li> </ul>

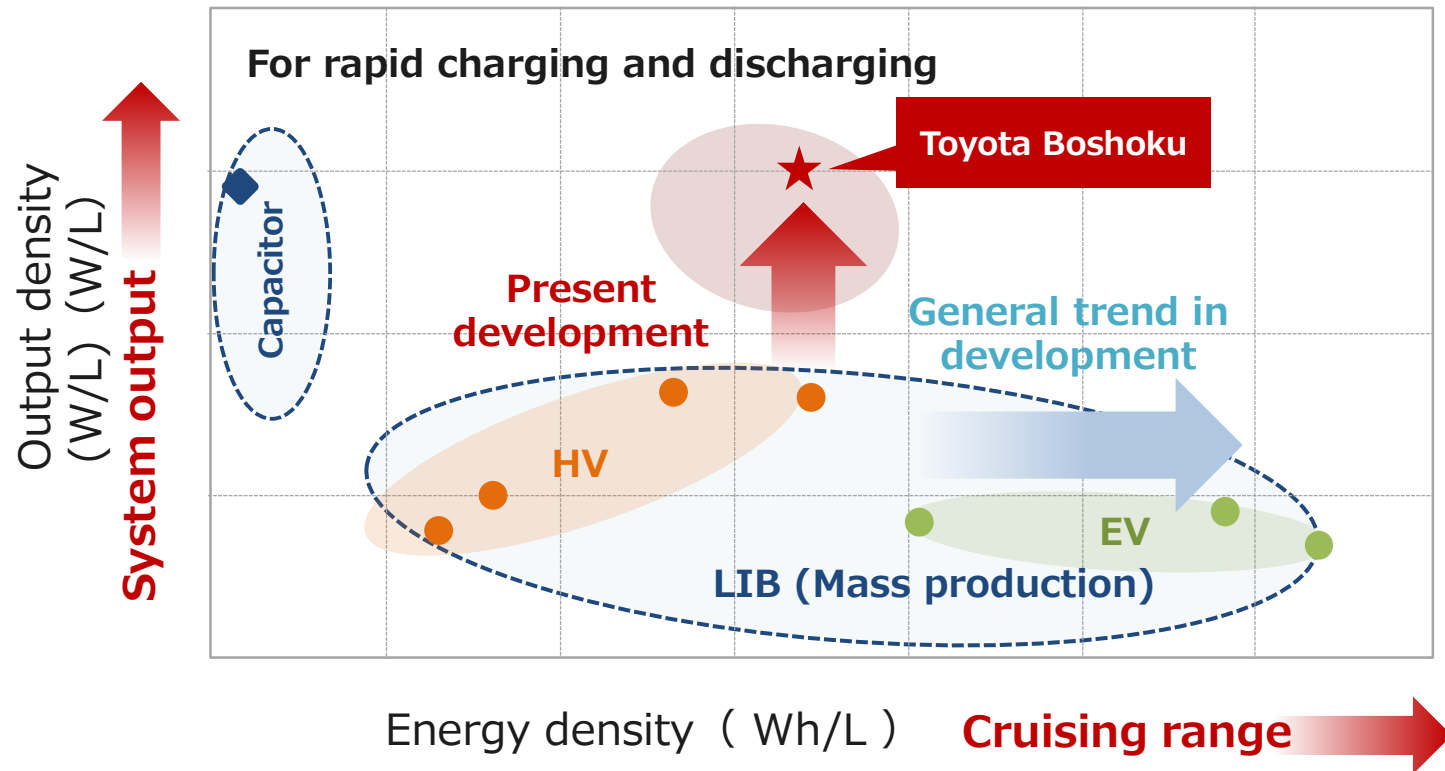
# Structure of Toyota Boshoku Lithium-ion Battery



Laminated-type  
Lithium-ion battery

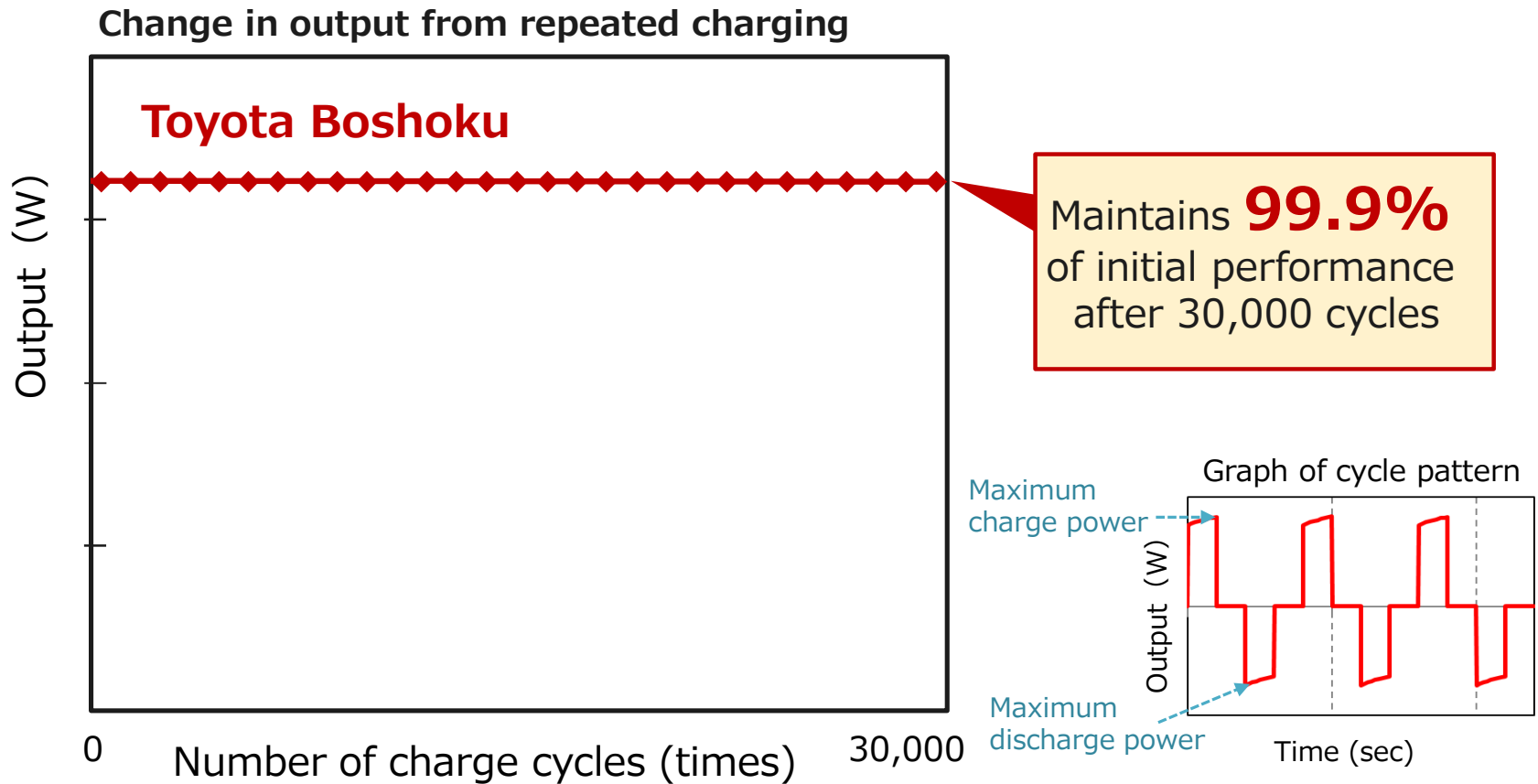


# Features of Toyota Boshoku Lithium-ion battery (high output and capacity)



Features size and capacity comparable to HV batteries along with output characteristics of capacitors

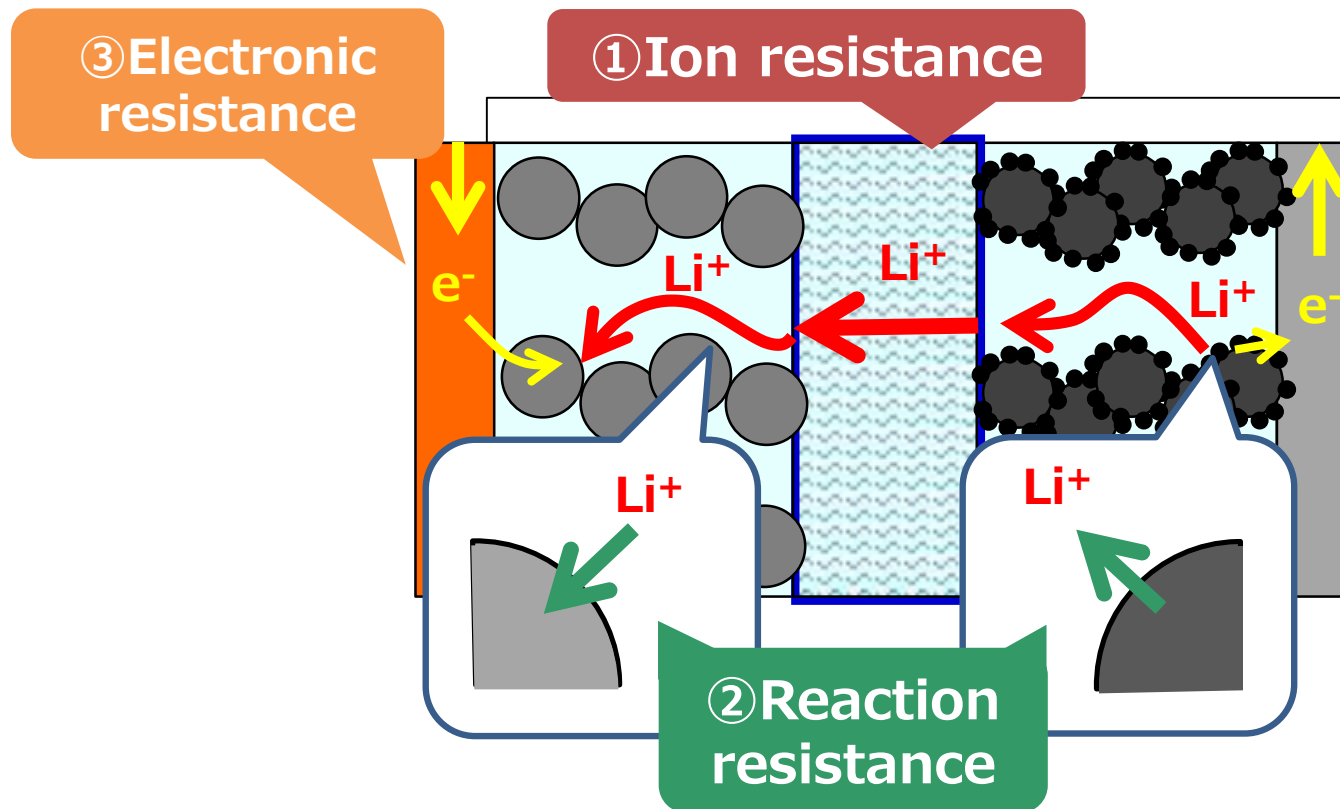
# Features of Toyota Boshoku Lithium-ion battery (high reliability)



**Ensures high reliability even with rapid charging and discharging at high power**

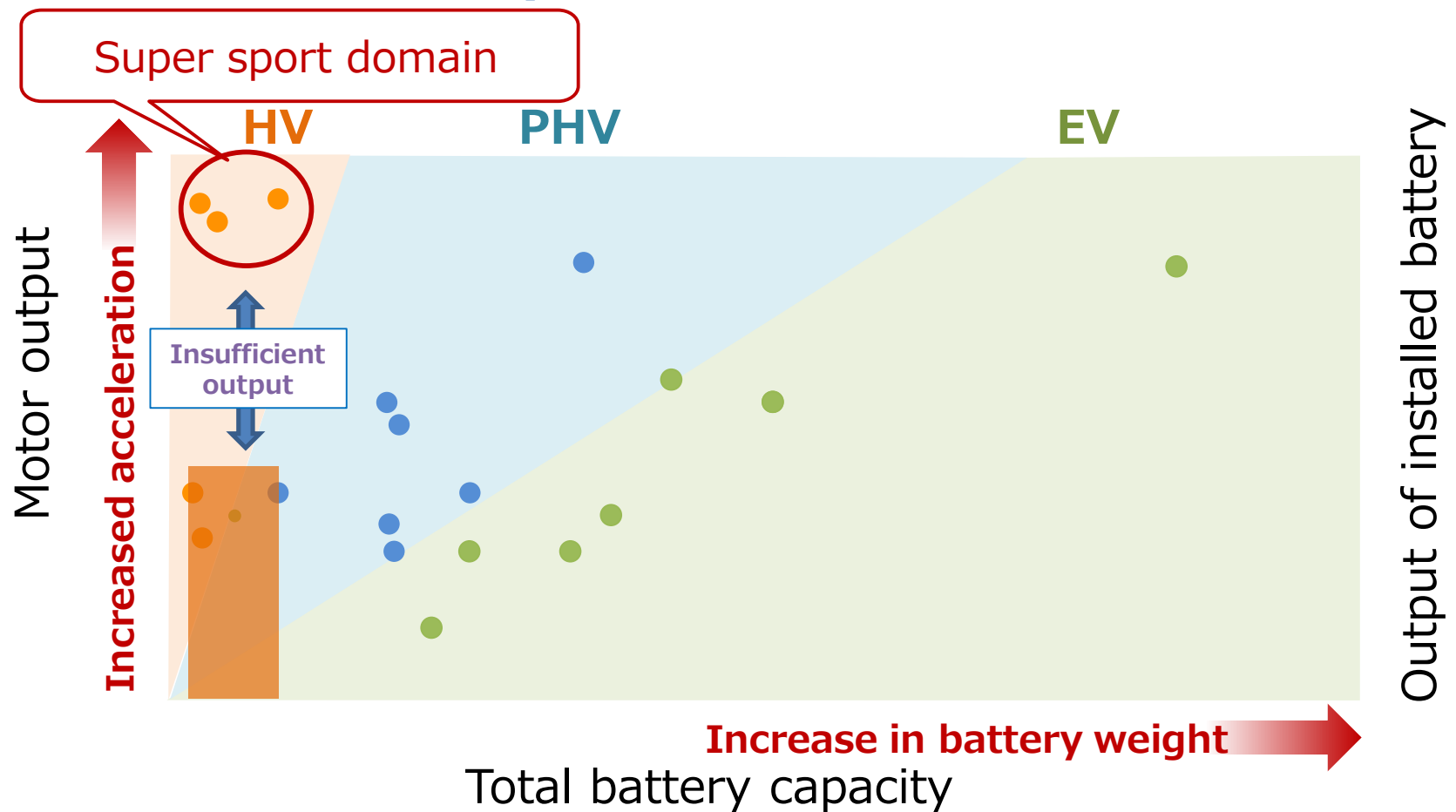
# High-Output Mechanism

Three resistive components in the battery



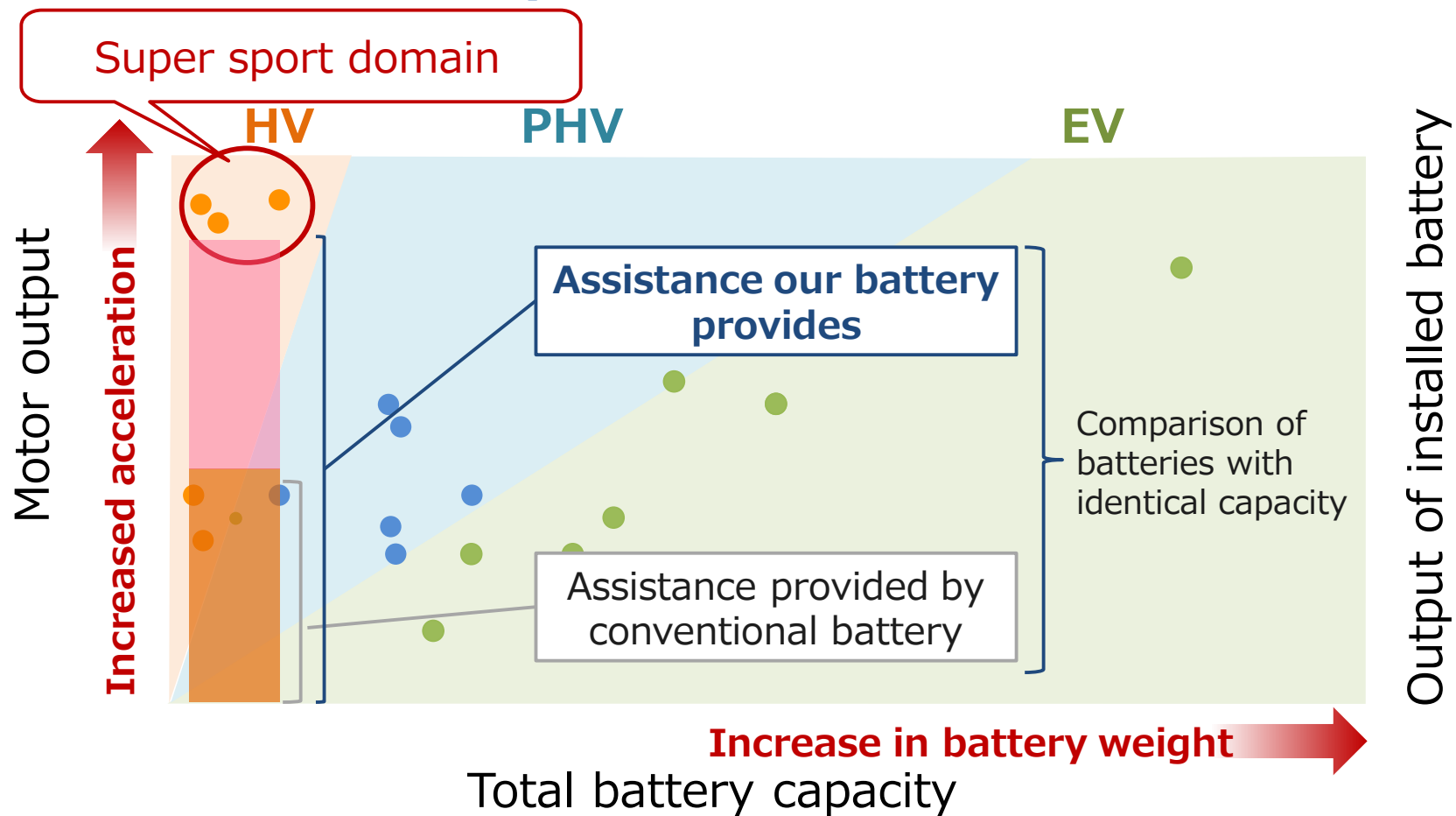
Separator reduces ion resistance  
to achieve high output

# Suggested applications for Toyota Boshoku lithium-ion battery



With high-output HV vehicles restricted by battery capacity, the battery output does not reach the motor output limit

# Suggested applications for Toyota Boshoku lithium-ion battery



**Enables maximum motor output using battery with capacity comparable to conventional HV vehicle batteries**



# Summary

Core technologies  
• Microfiber manufacturing technologies

**Separators**



Core technologies  
• Precision molds  
• Precision Press technologies

**Electrode  
Assemblies**



**Lithium-ion  
Battery**

**This results in the following benefits:**

- Performance : **Size and capacity comparable to HV batteries along with output characteristics of capacitors**
- Reliability : **Over 30,000 rapid charge and discharge cycles**
- Safety : **Equivalent to conventional products**

# Summary of Toyota Boshoku Lithium-ion battery features

## Feature①

Size and capacity of HV batteries with capacitor output characteristics



**Enables full use of high-output motors, even with HV batteries**

Enables 30-second assist during acceleration, equivalent to 100 kW, in HV equipped with 1-kWh battery

## Feature②

High reliability



**Even with full acceleration and deceleration, can be used for over 30,000 cycles**

(comparable to vehicle's service life)



**High output for HV vehicles**

**Contributes to super sport and premium vehicle driving**

# Future Plans

**1 Verify productivity for commercialization**

**2 Entry into the super sport and premium markets with small volume production of high-value added products**

- Currently offering proposals domestic and overseas super sport car manufacturers