



## **Q&A: Bosch Rapid Catalyst Heating (RCH) with Mohammad Fatouraie, director of Engineering**

### **Q: What is Bosch Rapid Catalyst Heating (RCH)?**

A: RCH is a new Bosch system designed to reduce cold-start emissions in gasoline-powered vehicles. It accelerates catalyst activation, known as catalyst "light-off," during the first seconds of engine operation, when tailpipe emissions are typically at their highest.

### **Q: Why is cold-start emissions reduction important?**

A: Cold-start emissions, which occur before the catalyst reaches its operating temperature, commonly account for the majority of a vehicle's total emissions footprint. While the problem is more pronounced in colder weather, catalyst heating is necessary across all environmental conditions.

### **Q: How does the RCH system work?**

A: RCH uses an integrated, fuel-based auxiliary burner that delivers additional thermal energy directly into the exhaust stream, rapidly raising catalyst temperature during cold start and early drive-off.

The system provides 25+ kilowatts of thermal power, operates independently from the engine, and runs on a standard 12-volt electrical system with a low-pressure gasoline fuel supply.

### **Q: How does RCH differ from existing catalyst heating approaches?**

A: RCH system does not compromise engine efficiency to generate elevated exhaust temperatures. By decoupling catalyst heating from engine operation, RCH reduces calibration complexity and efficiency trade-offs.

Unlike electrically heated catalysts, RCH does not require a high-voltage architecture.

### **Q: What emissions reductions can RCH deliver?**

A: Vehicle testing shows RCH can reduce emissions by up to 70 percent during cold start and early drive-away conditions. These results hold across passenger vehicles and larger platforms, including pickup trucks, under both standard and quick drive-away cycles.

### **Q: Does RCH require significant changes to vehicle architecture?**



A: RCH is compatible with existing vehicle architectures and supports both closely coupled and underfloor catalyst configurations, making it practical for automakers to deploy at scale without major redesigns.

**Q: Is RCH relevant for hybrid vehicles?** A: Yes, RCH is relevant for hybrids. Exhaust thermal management is particularly important in hybridized powertrains, where catalyst temperatures can drop below light-off thresholds during all-electric operation. RCH helps ensure consistent emissions conversion even in these scenarios.

**Q: Are there any cost benefits associated with RCH?**

A: Faster catalyst activation may reduce the required density of precious metal loading and lower calibration complexity, which can help offset system costs while supporting compliance with reduced emissions standards.

**Q: What is the current status of RCH development?**

A: Bosch is continuing validation with OEM partners, with emphasis on durability, packaging flexibility, and readiness for series production.