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Future-Ready Lean NO_x Trap (LNT) Technologies

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Agenda

1

LNT, Function, Architecture & Portfolio

2

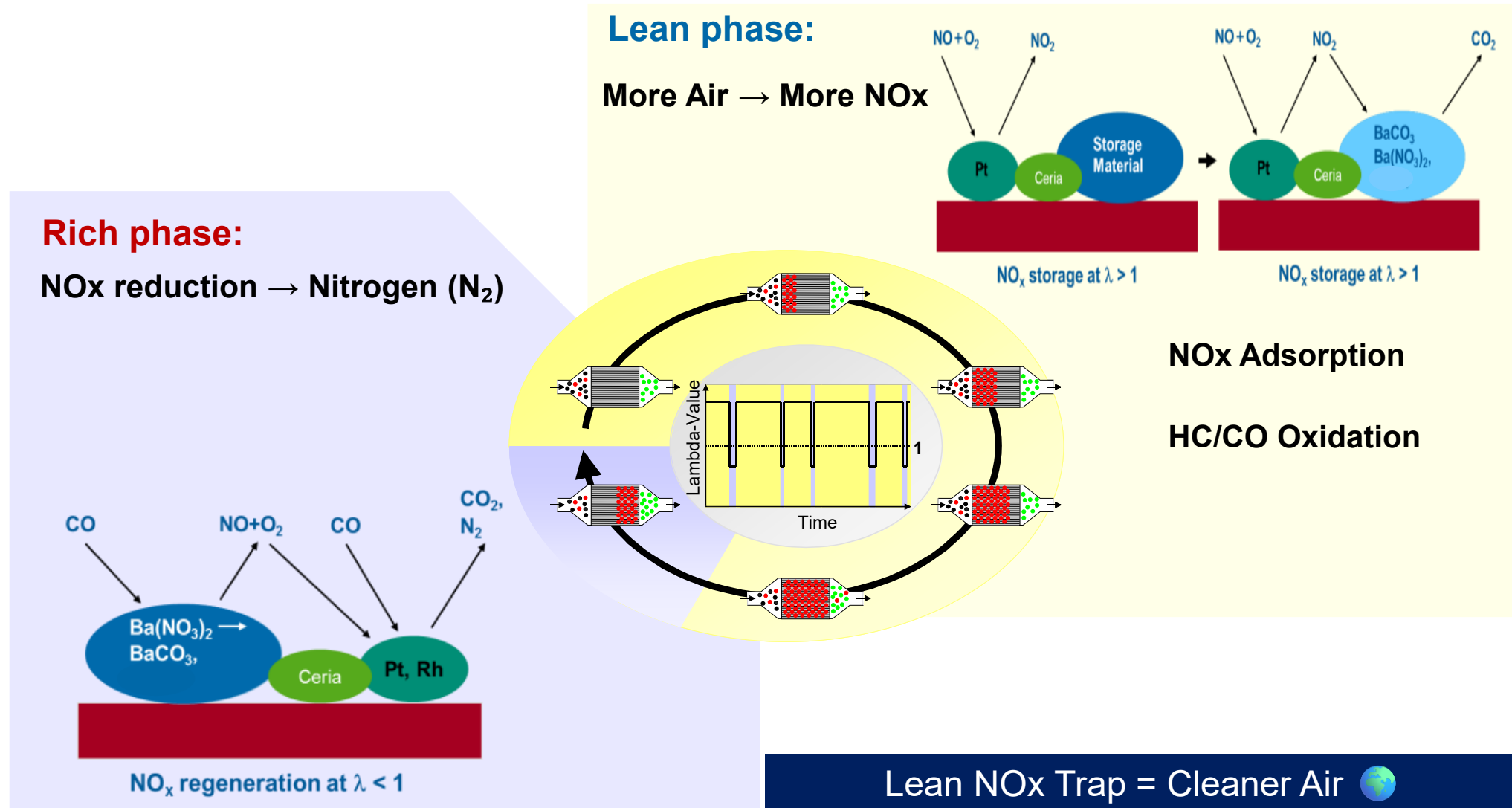
Next Gen Development

3

Summary & Outlook

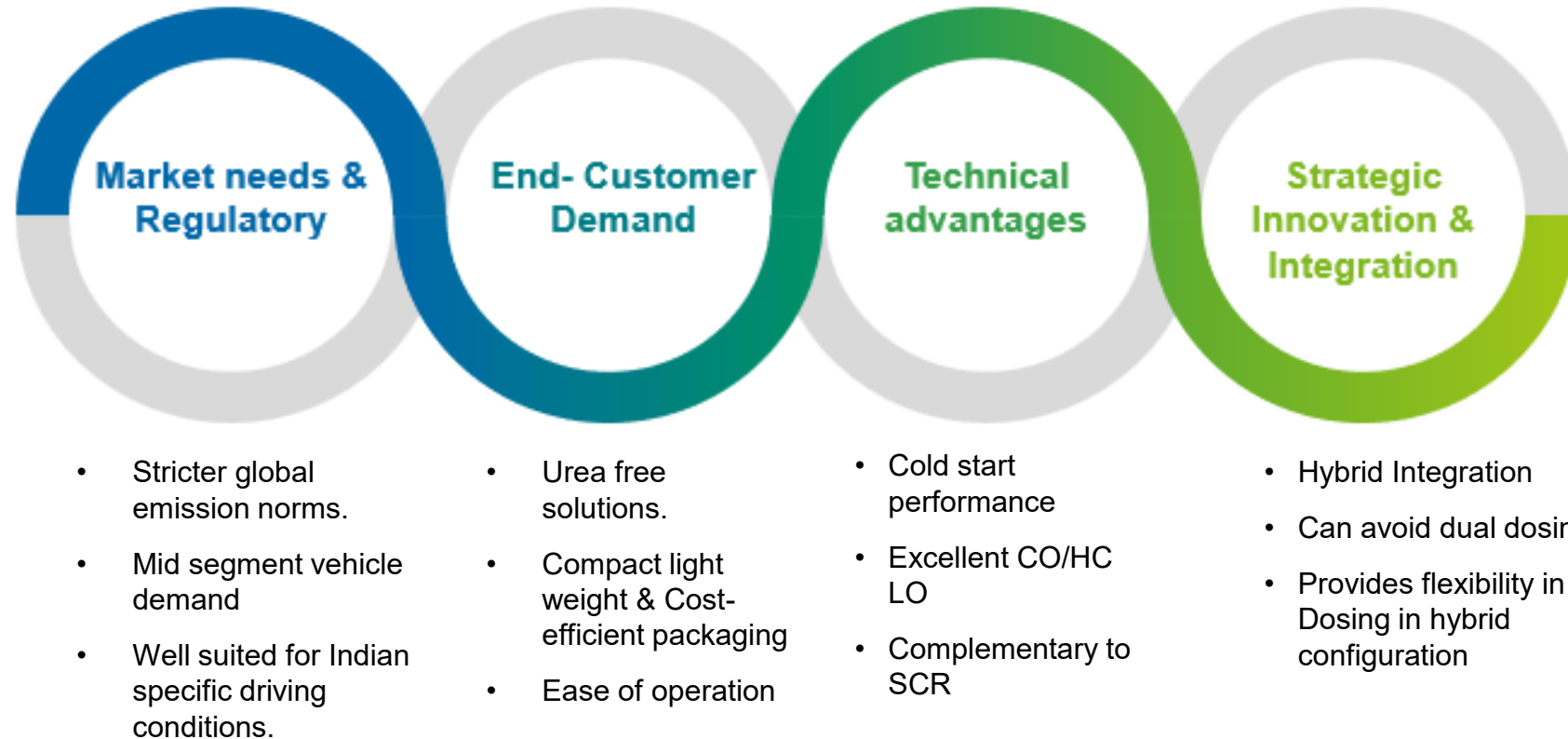
Advanced Emission system : LNT Technologies

What is **L**ean **N**Ox **T**rap (LNT)



Advanced Emission system : LNT Technologies

Why **L**ean **N**Ox **T**rap (LNT)

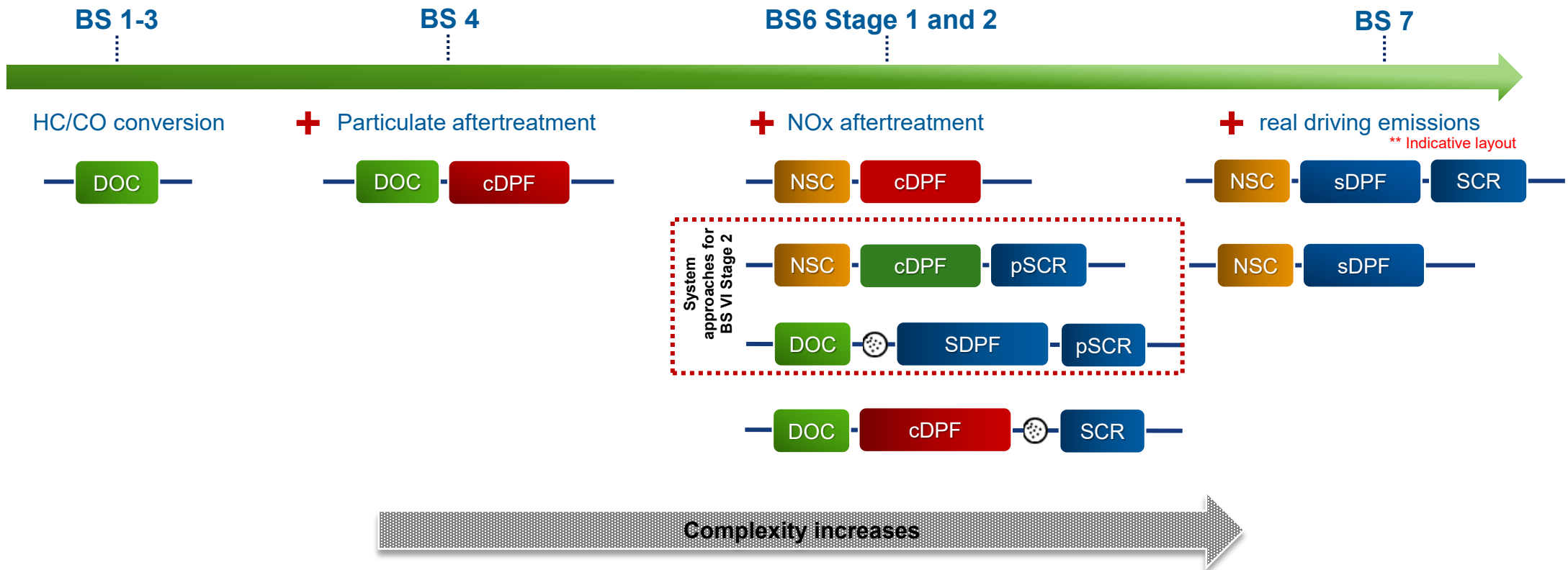


Advancing LNT technology strategically , Umicore ensures long term value and market leadership in emission control solutions.



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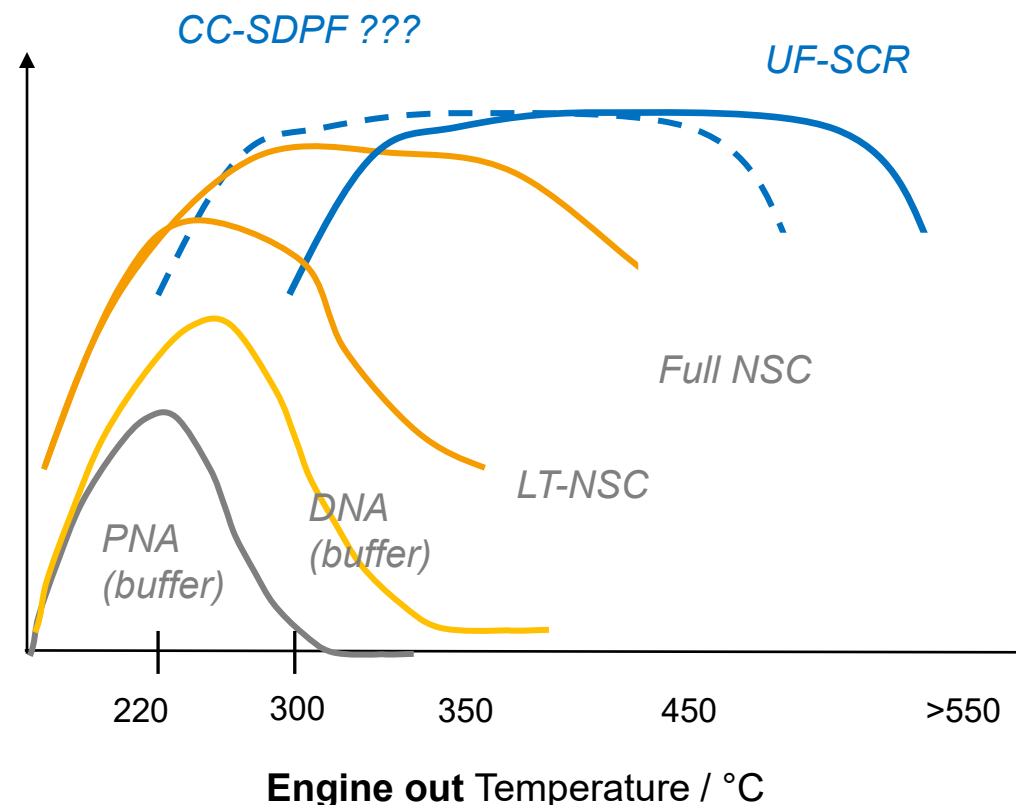
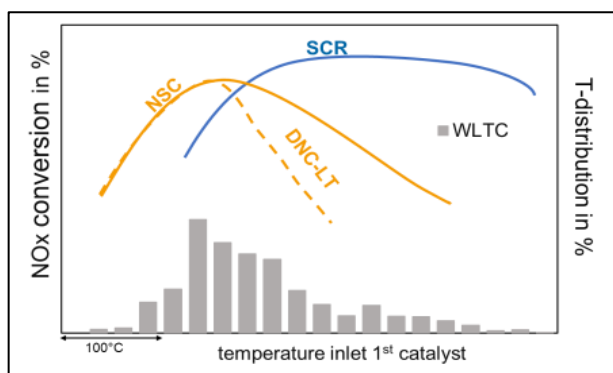
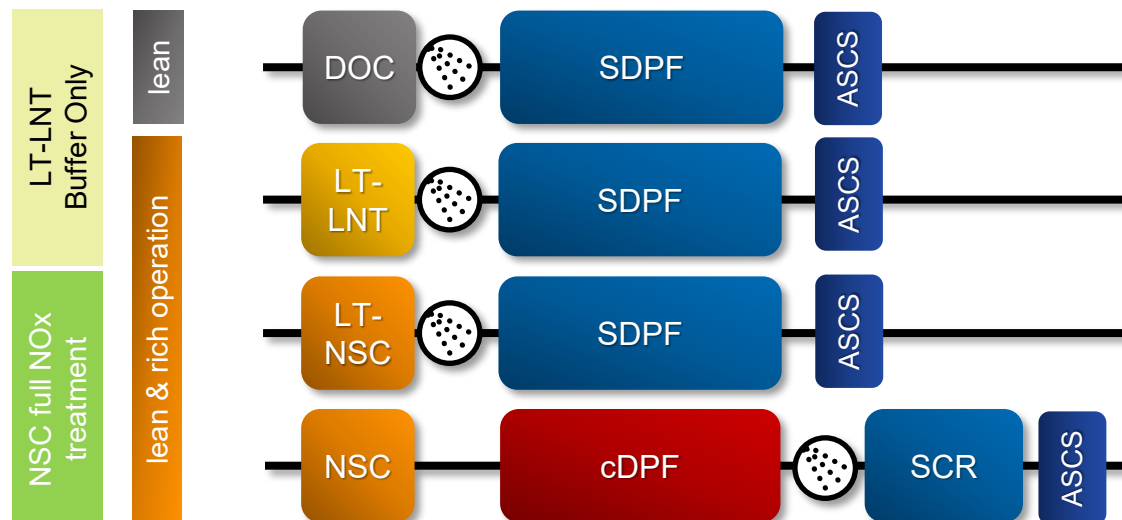
Aftertreatment systems for LDD



Increasing legislative mandates are fueling after treatment system complexity – “ Sparking the next wave of innovation ”

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Variants of LNT architectures & system layout



Smart integration of aftertreatment tech is the key to unlocking peak NOx conversion - Tailored solutions for dynamic engine conditions !

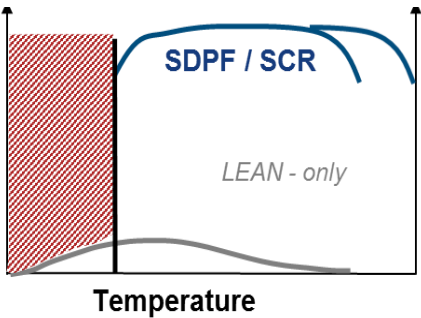
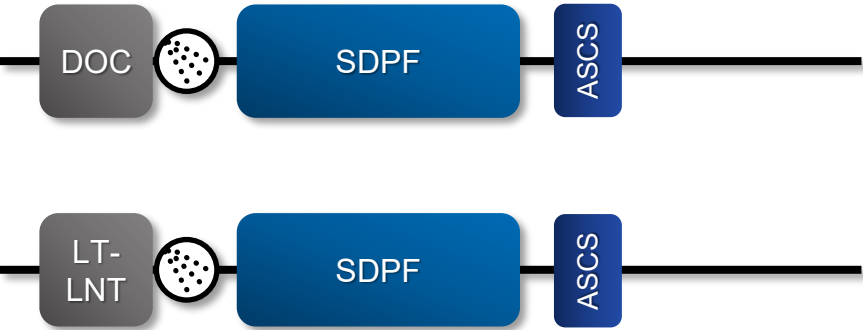


Advanced Emission system : LNT Technologies



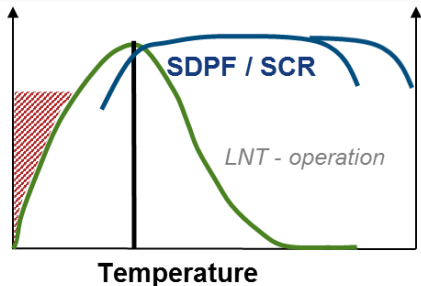
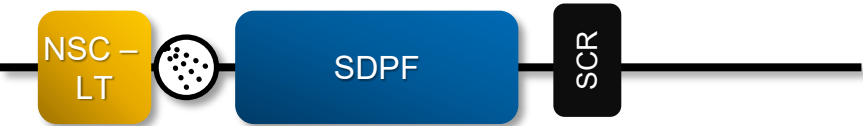
Performance Window: Lean vs L/R Operation

Lean Operation:

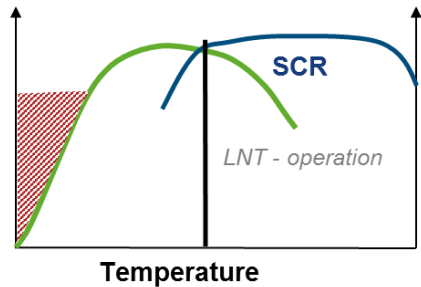
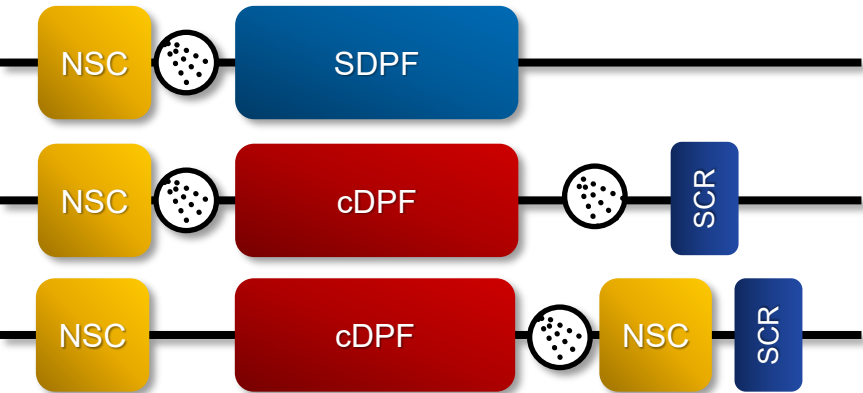
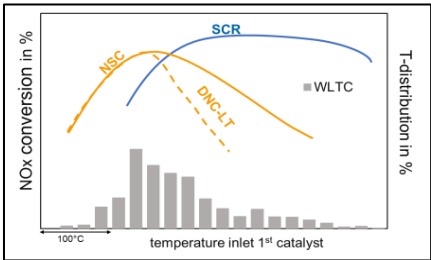


Limited NOx reduction and HC/CO oxidation at low temperature

Lean/Rich Operation:



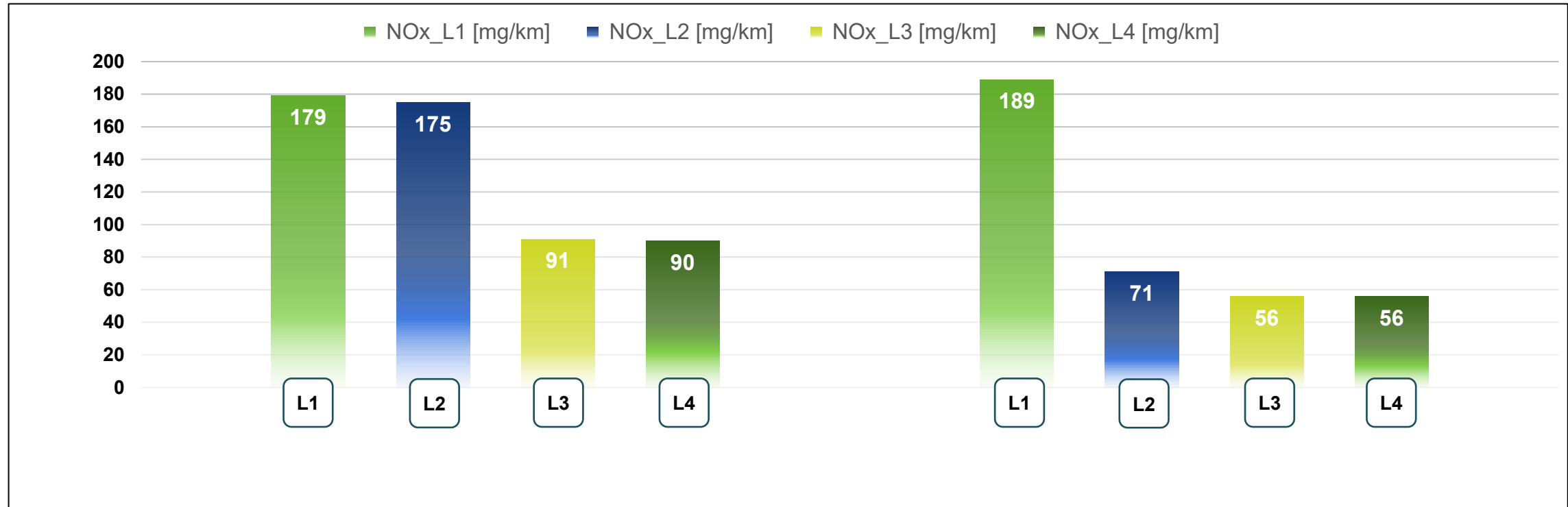
Excellent CO/HC light off and good NOx performance in city driving.



urea dosing unit

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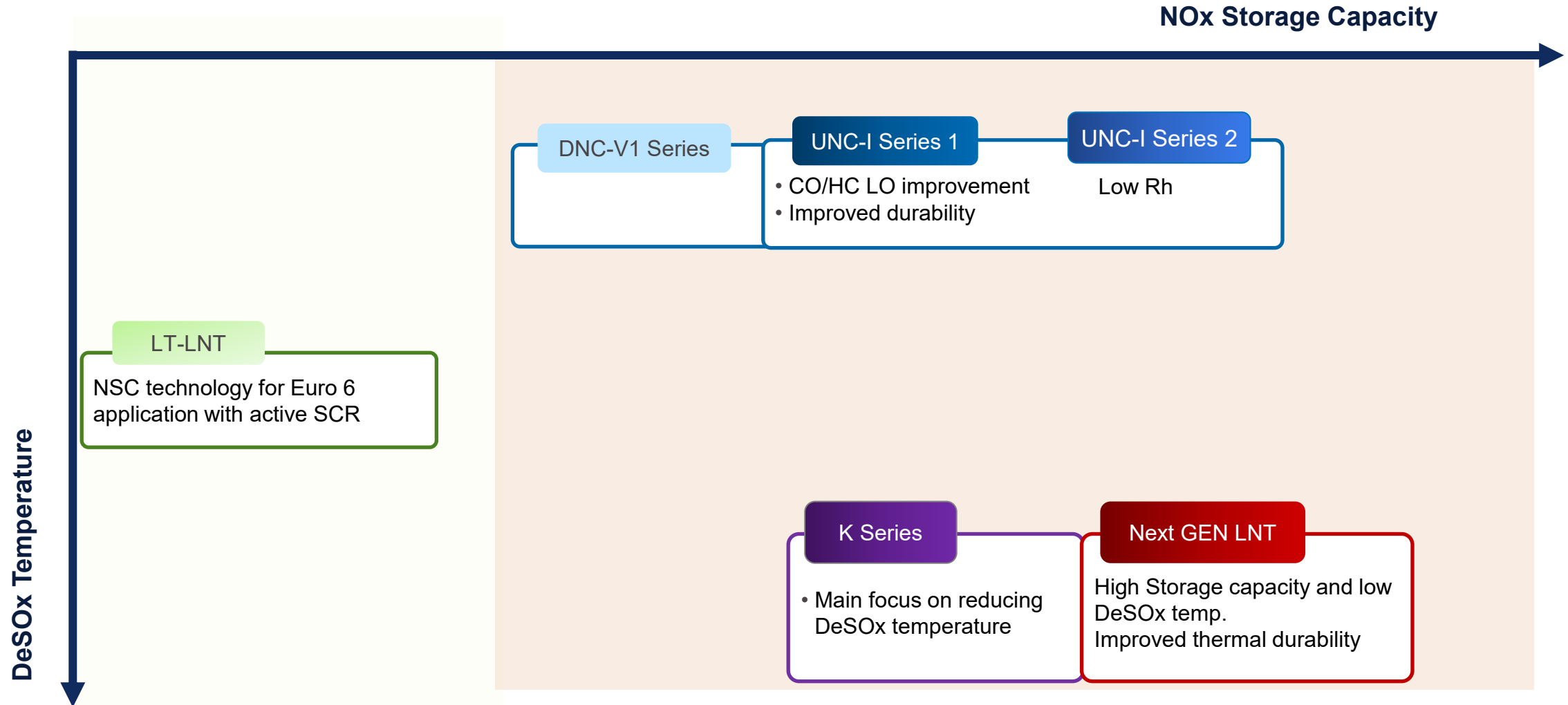
LNT & SCR – Pathways to NO_x reduction



LNT/SCR system has higher potential to reduce overall NO_x than DOC/SCR System.

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NSC technology portfolio / Roadmap

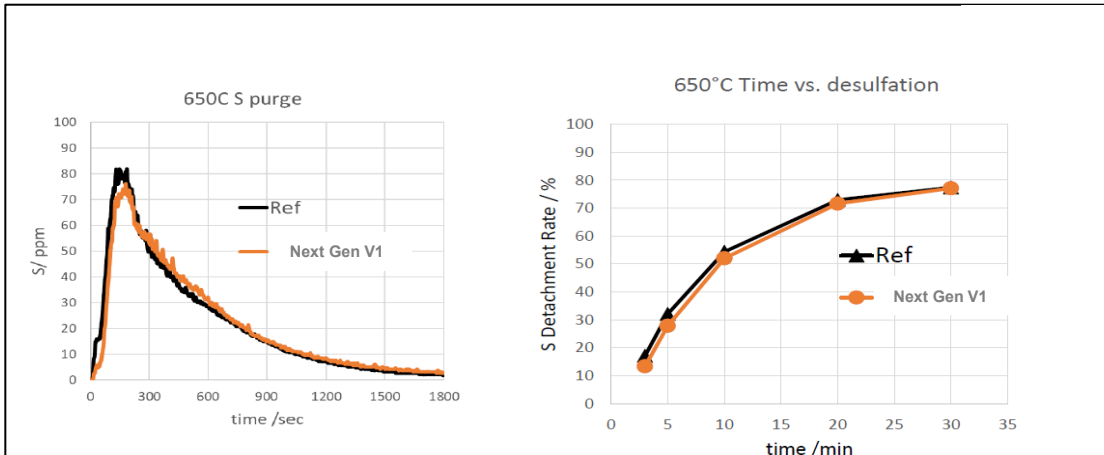
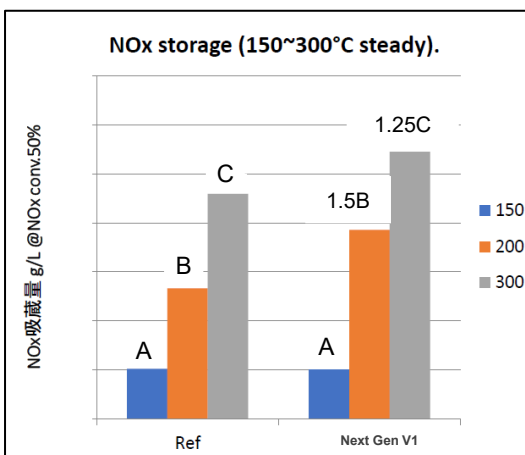


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NSC Next Gen Tech – Initial performance results

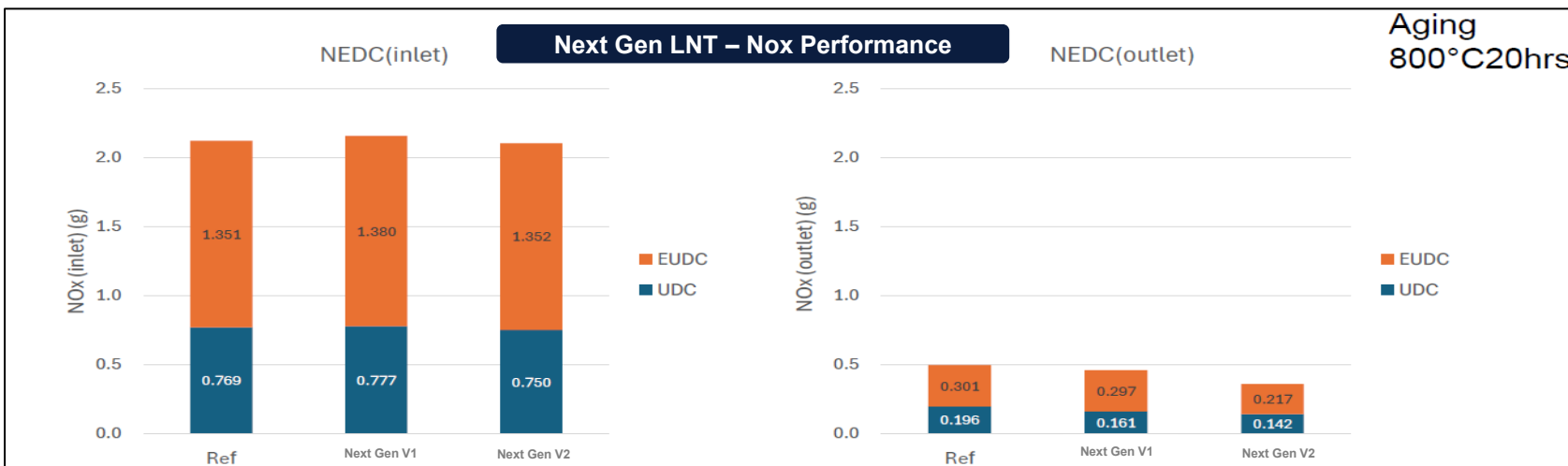
Raw Material Screening in progress,
initial breakthrough with Next Gen Tech

Next Gen LNT – DeSOx Performance



Next Gen LNT shows:

- Promising NOx storage at low temperatures.
- Effective sulfur purge and desulfation.
- Strong performance under simulated driving conditions.
- High thermal durability.



This points to a **next-generation NSC (NOx Storage Catalyst)** with potential for **commercial deployment in emission control systems.**



Advanced Emission system : LNT Technologies

Summing Up



Umicore continues to refine the LNT formulation to enhance performance and ensure compliance with WLTP and upcoming emission standards.



Next-Gen LNT technology demonstrates significant NOx storage gains without compromising DeSOx efficiency, marking a breakthrough in catalyst performance.



Combining LNT with SCR provides robust performance and flexible operation while capable of meeting strict emission standards.

With decades of expertise, Umicore continues to invest in next-generation LNT solutions, leveraging advanced materials and smart system integration, to meet future legislative emission requirements.



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