

Emission Control Manufacturers Association

ECT 2015

"Strategy for compliance of BS-V / BS-VI Norms"

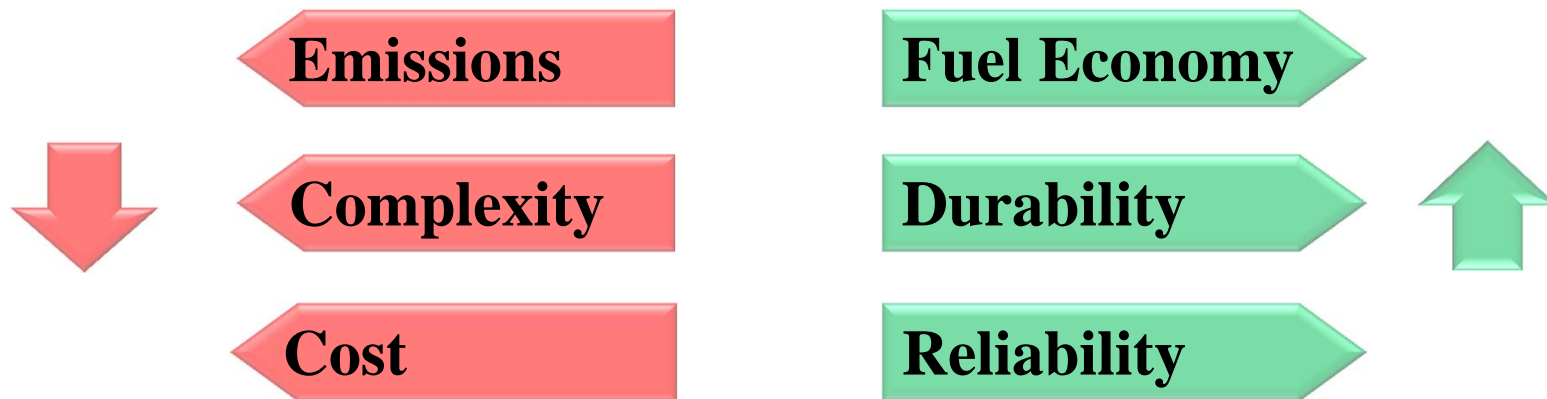
P. Panda

Sr. Vice President – Engineering Division



Strategies for BS5 and BS6 Regulations

Targets and Drivers for BSIV to BSVI



Strategies for BS5 and BS6 Regulations

Regulation : Targets And Approach : Diesel Engine

Regulation : Targets And Approach : Gasoline Engine

Execution : Way Forward

Strategies for BS5 and BS6 Regulations

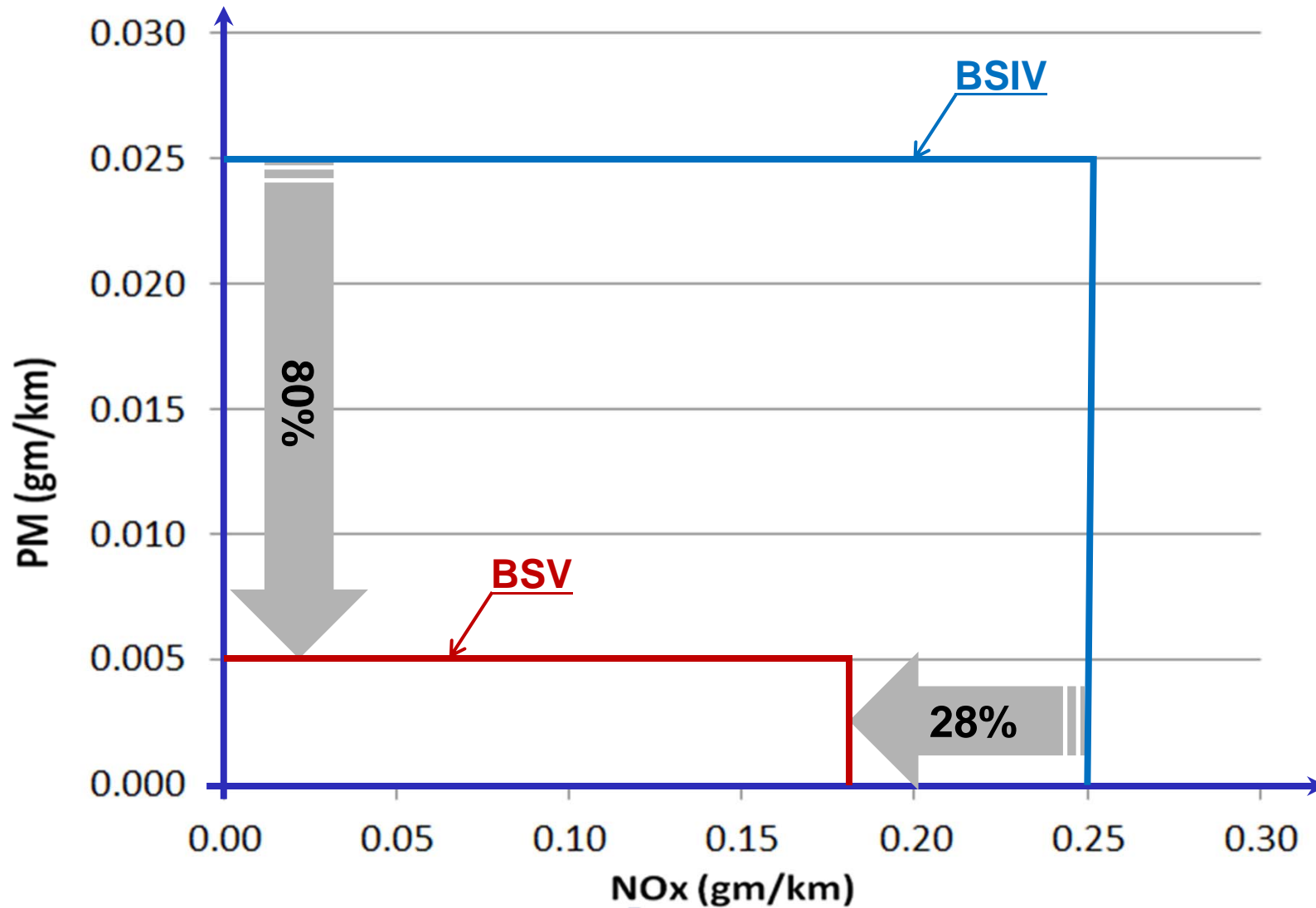
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Execution : Way Forward

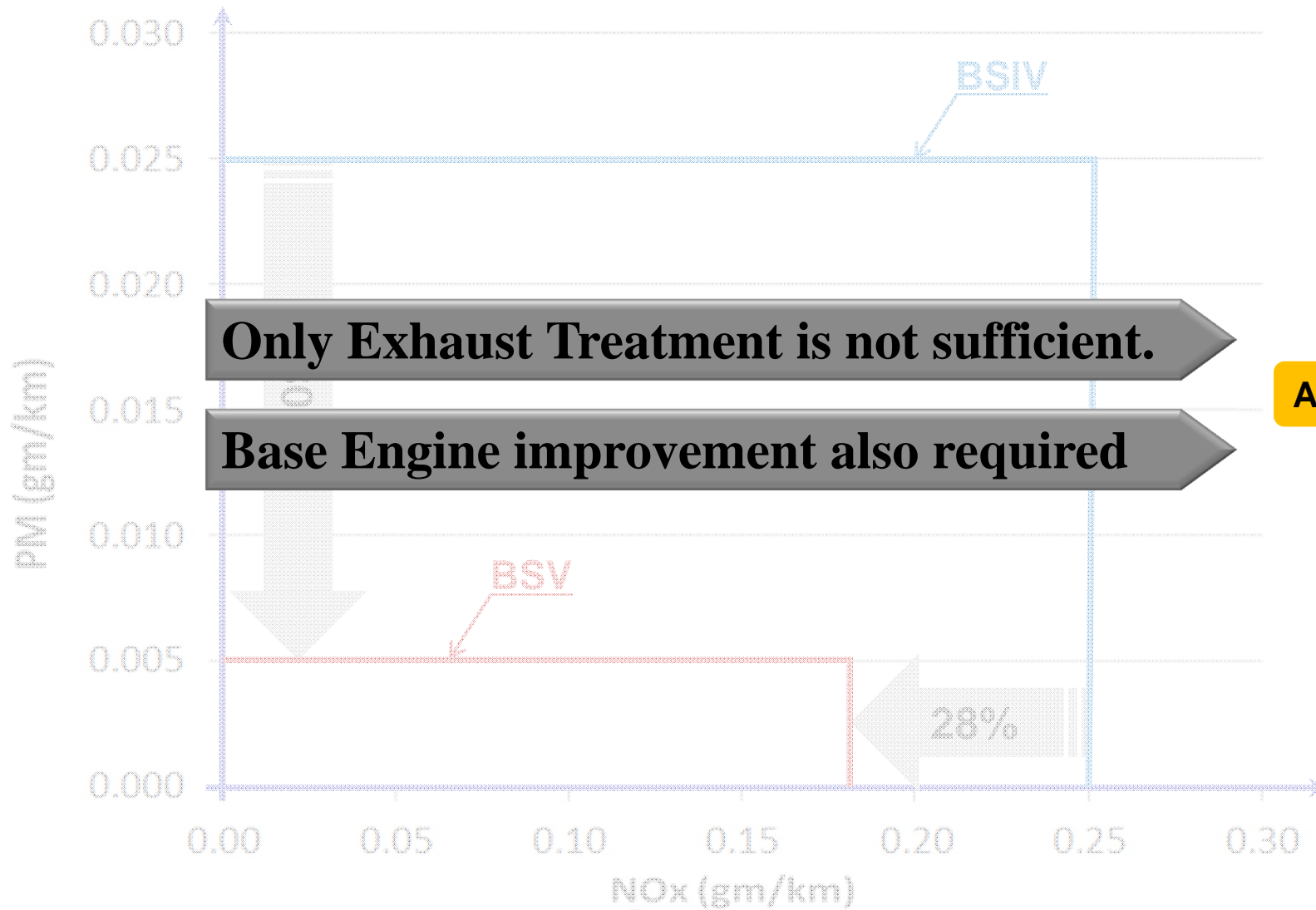
Strategies for BS5 and BS6 Regulations

Regulation : Targets & technical requirements from **BSIV** to **BSV**



Strategies for BS5 and BS6 Regulations

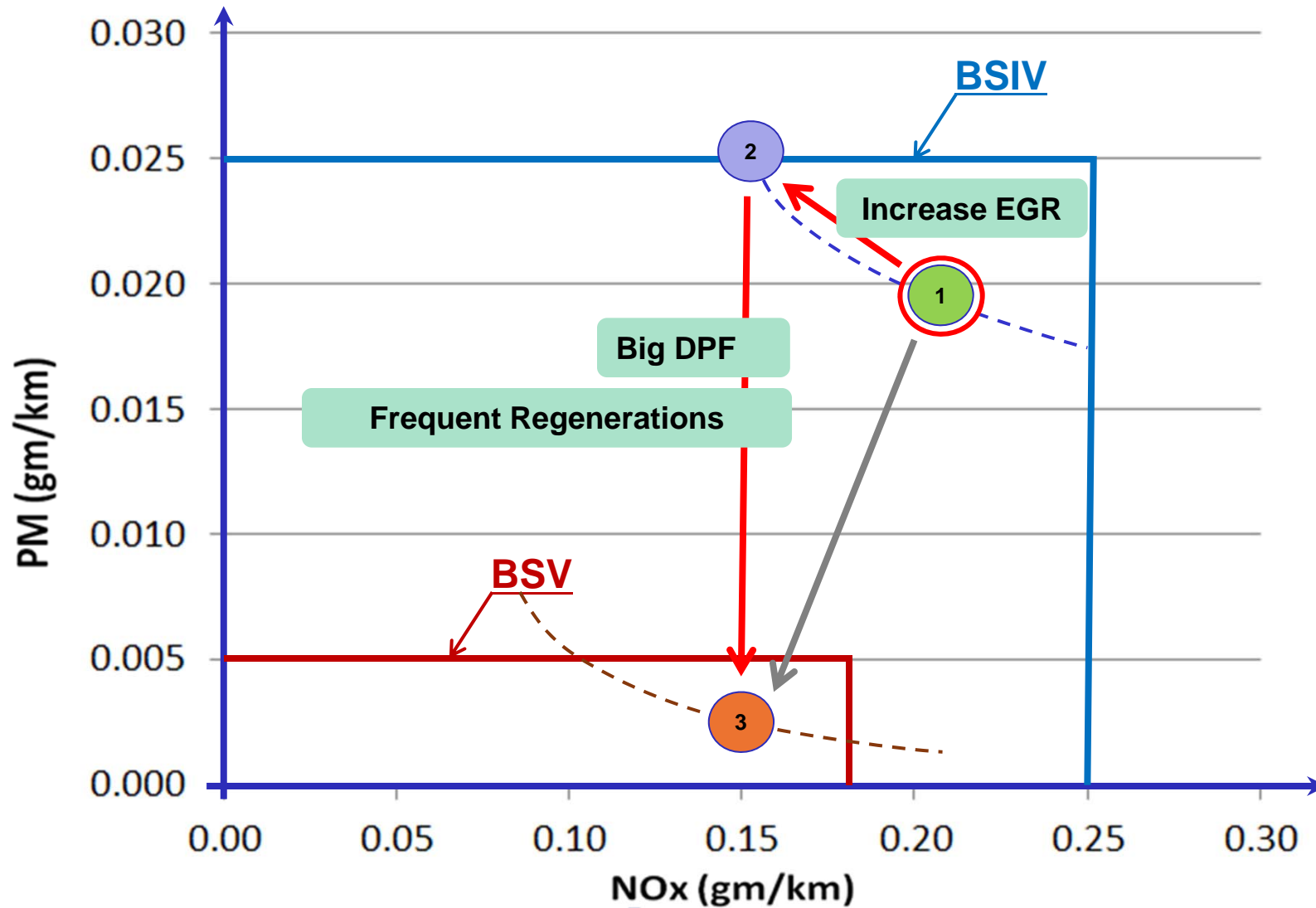
Regulation : Targets & technical requirements from *BSIV* to *BSV*



Strategies for BS5 and BS6 Regulations

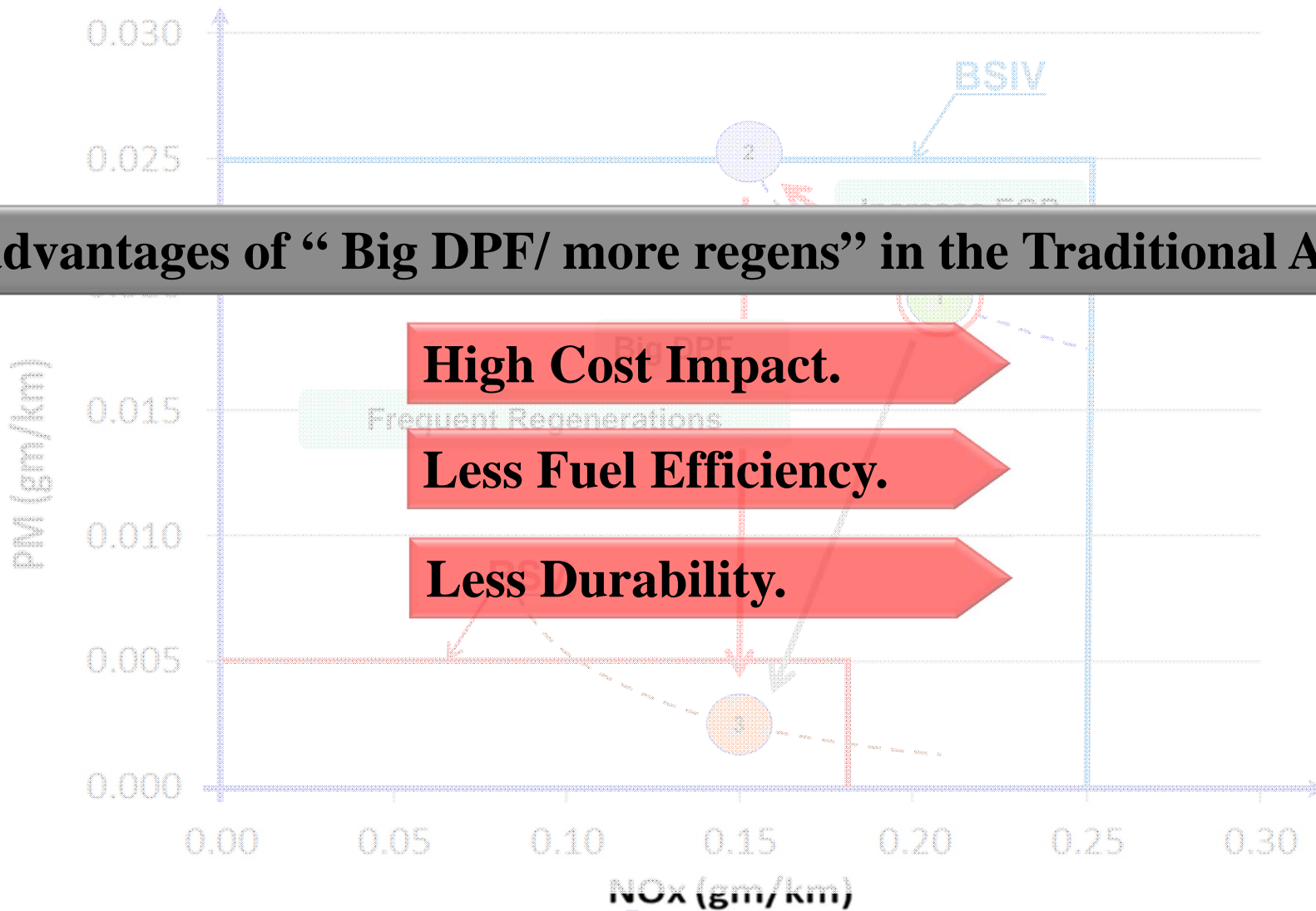
Regulation : Targets & technical requirements from **BSIV** to **BSV**

Traditional Approach



Strategies for BS5 and BS6 Regulations

Regulation : Targets & technical requirements from BSIV to BSV Traditional Approach



Disadvantages of “ Big DPF/ more regens” in the Traditional Approach:

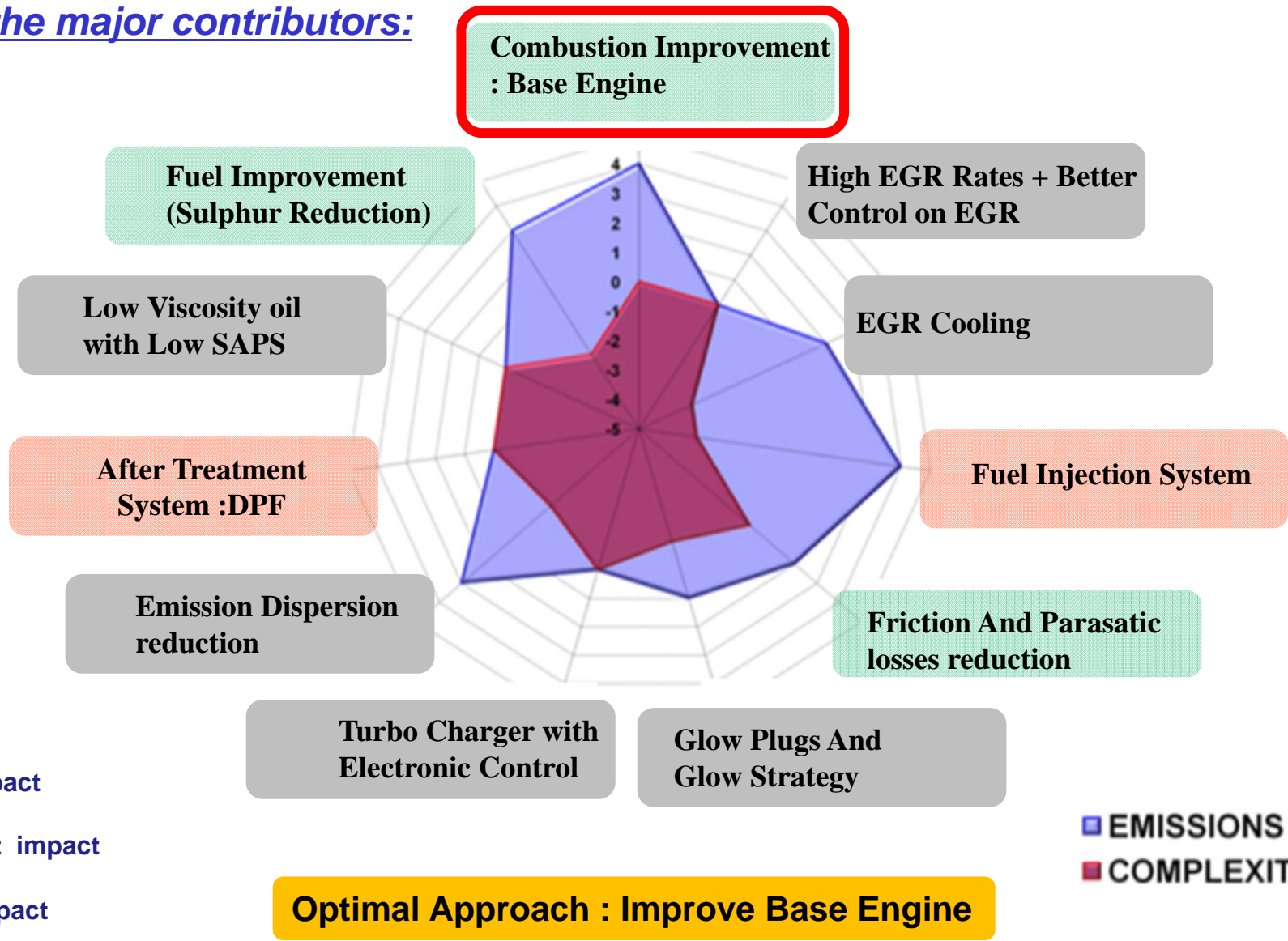
High Cost Impact.

Less Fuel Efficiency.

Less Durability.

Strategies for BS5 and BS6 Regulations

Analyzing the major contributors:



- Low cost impact
- Medium Cost impact
- High cost impact

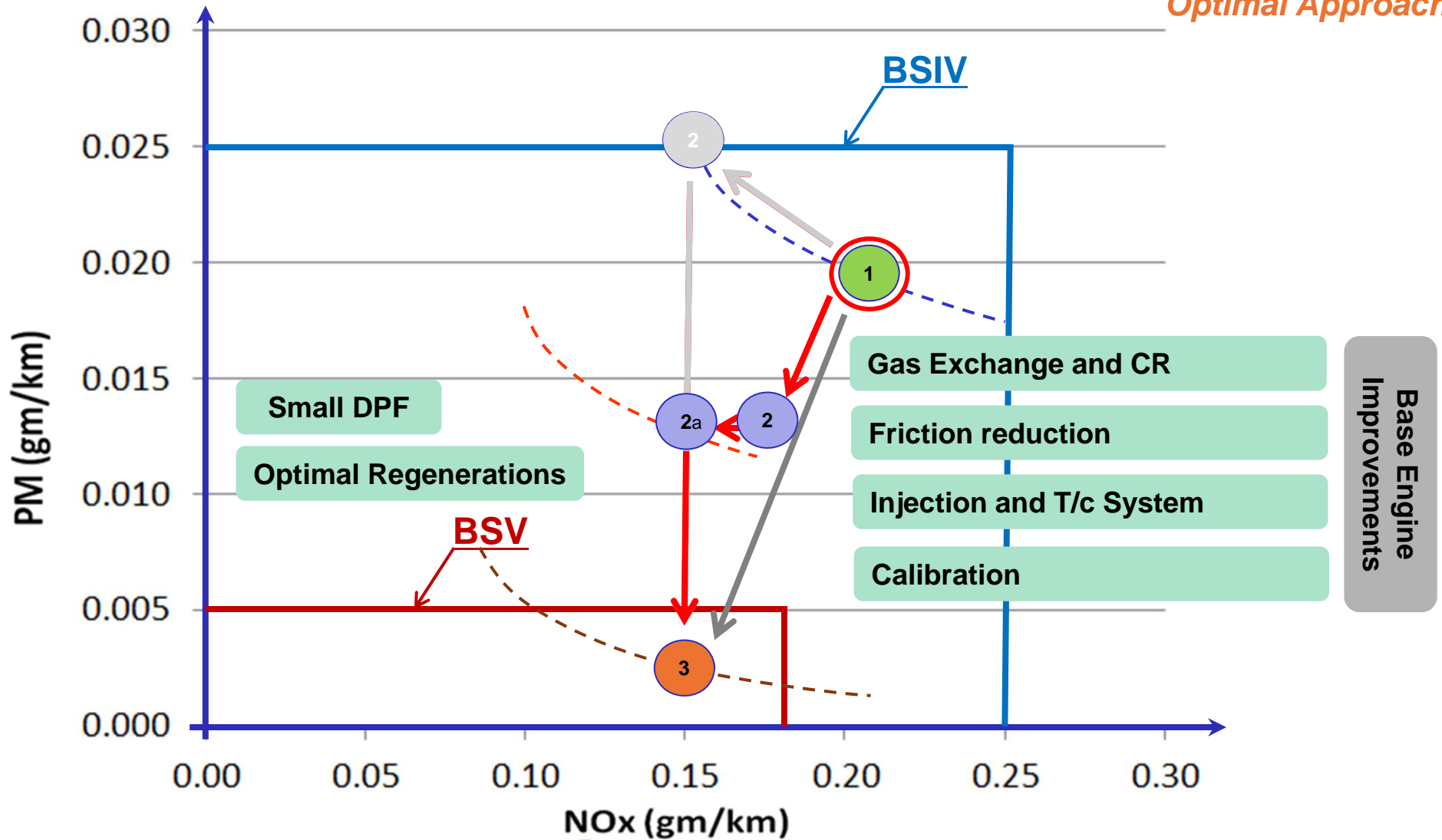
- EMISSIONS
- COMPLEXITY / COST

Strategies for BS5 and BS6 Regulations

Regulation : Targets & technical requirements from **BSIV to BSV**

Traditional Approach

Optimal Approach

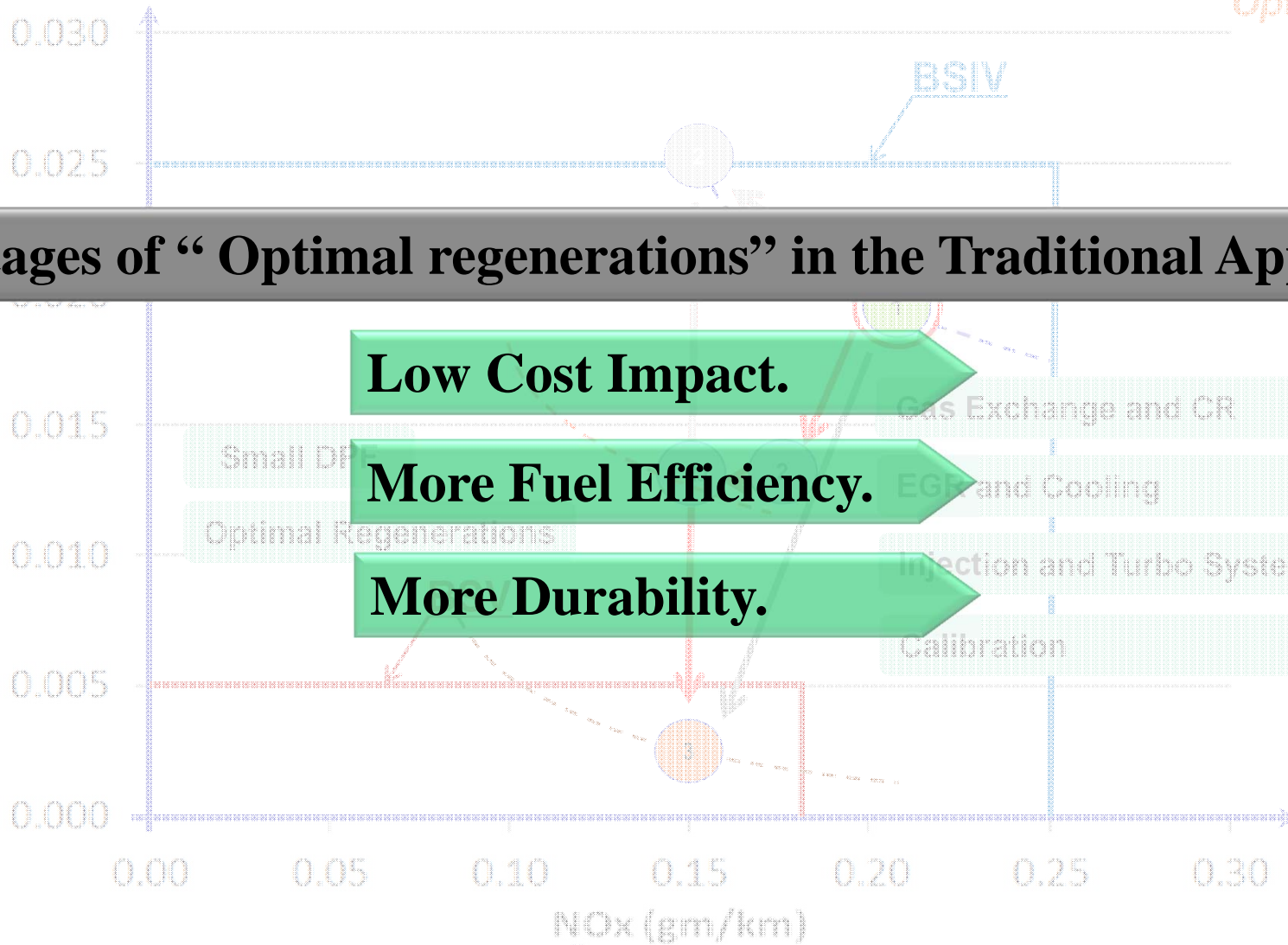


Strategies for BS5 and BS6 Regulations

Regulation : Targets & technical requirements from BSIV to BSV

Traditional Approach

Optimal Approach



Advantages of “Optimal regenerations” in the Traditional Approach:

Low Cost Impact.

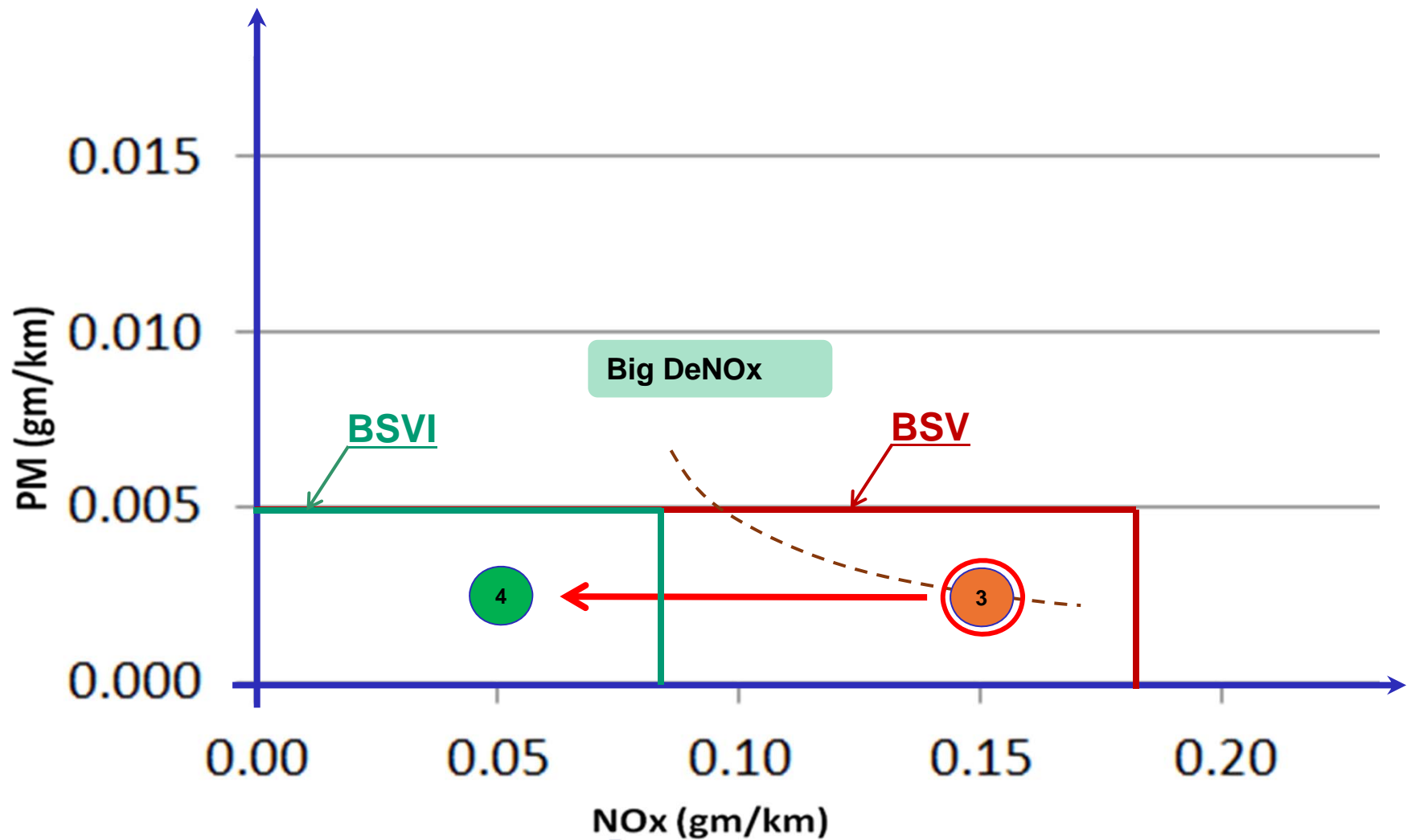
More Fuel Efficiency.

More Durability.

Strategies for BS5 and BS6 Regulations

Regulation : Targets & technical requirements from **BSV to BSVI**

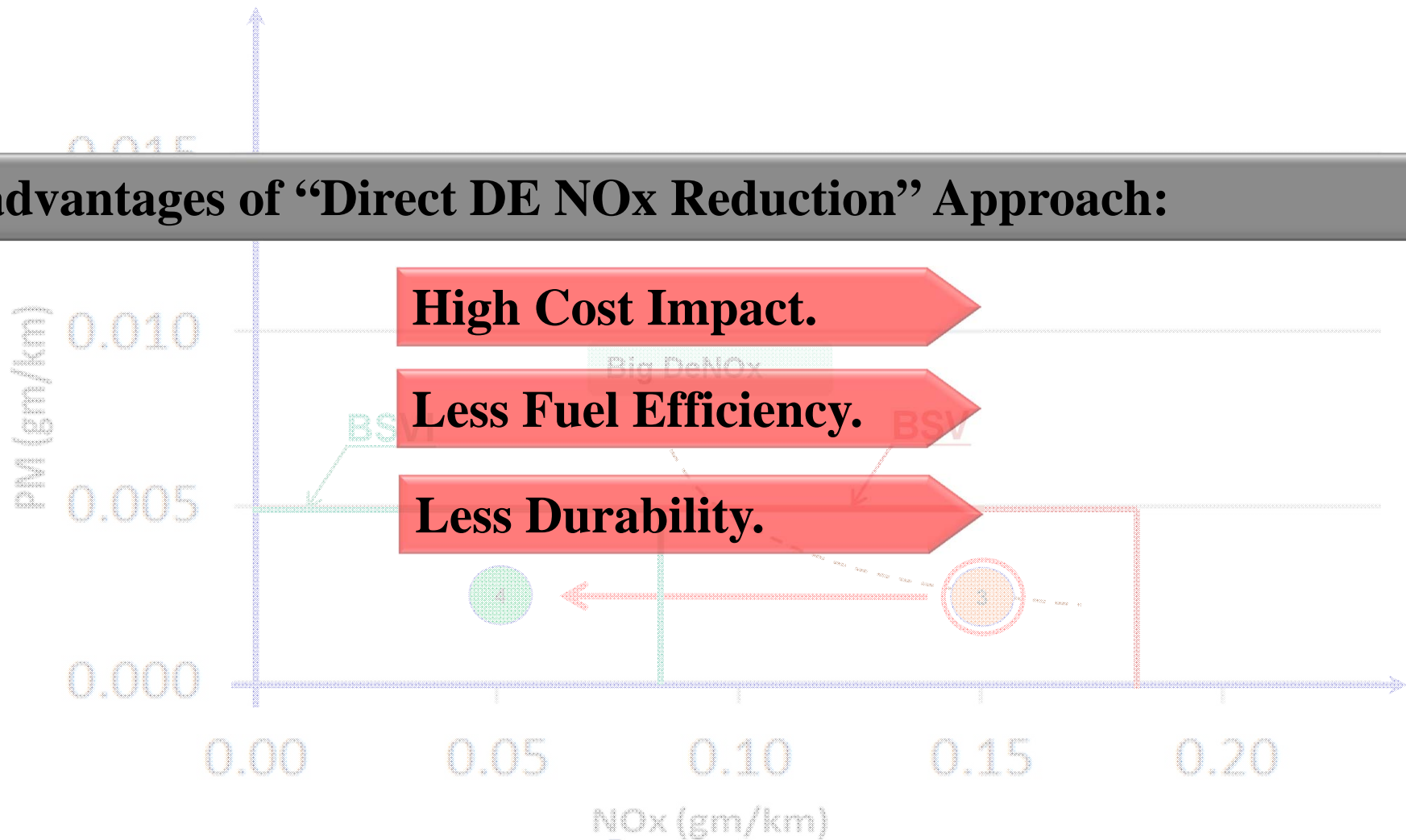
Traditional Approach



Strategies for BS5 and BS6 Regulations

Regulation : Targets & technical requirements from BSV to BSVI Traditional Approach

Disadvantages of “Direct DE NO_x Reduction” Approach:

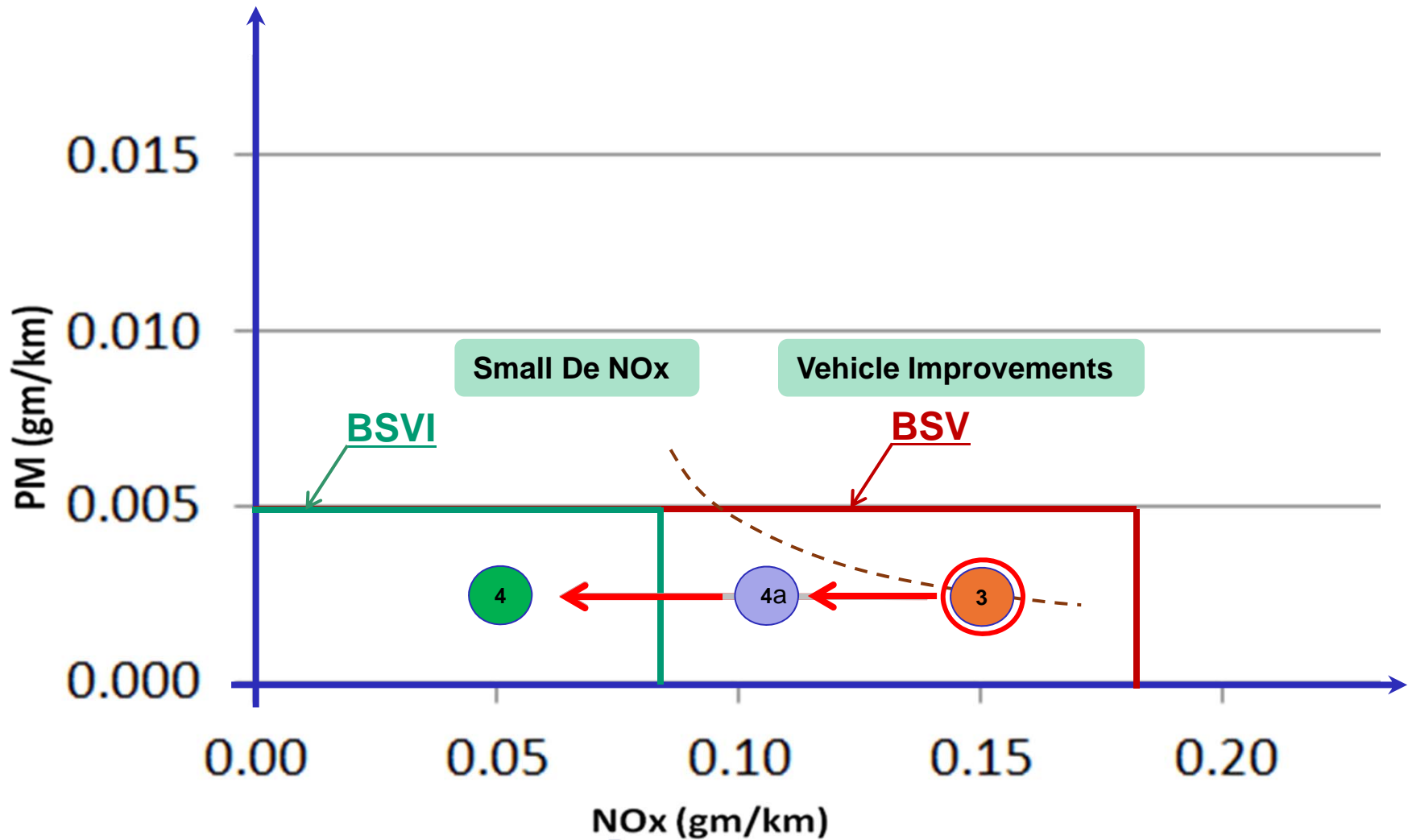


Strategies for BS5 and BS6 Regulations

Regulation : Targets & technical requirements from **BSV to BSVI**

Traditional Approach

Optimal Approach



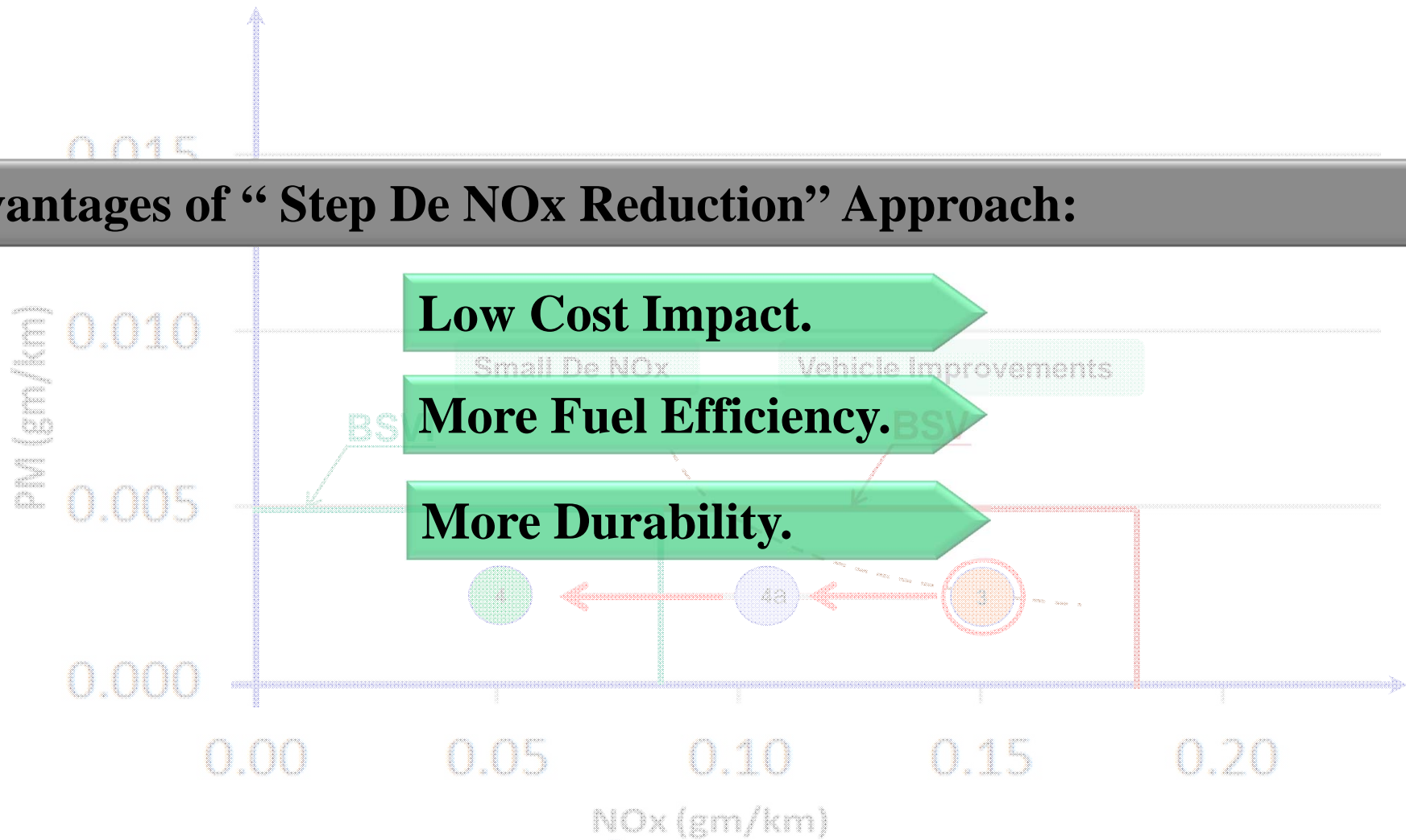
Strategies for BS5 and BS6 Regulations

Regulation : Targets & technical requirements from BSV to BSVI

Traditional Approach

Optimal Approach

Advantages of “ Step De NOx Reduction” Approach:



Strategies for BS5 and BS6 Regulations

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Regulation : Targets And Approach : Gasoline Engine

Execution : Way Forward

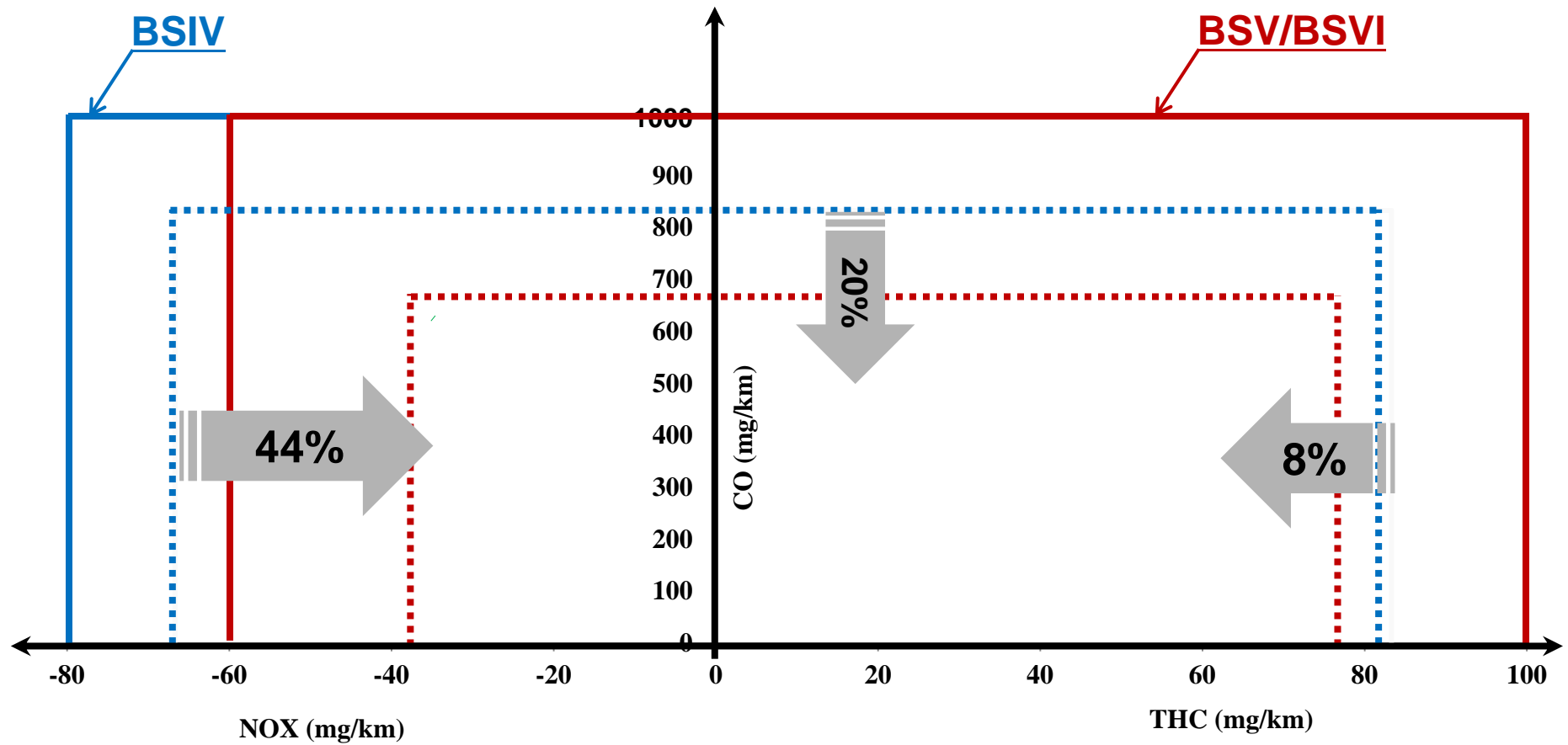
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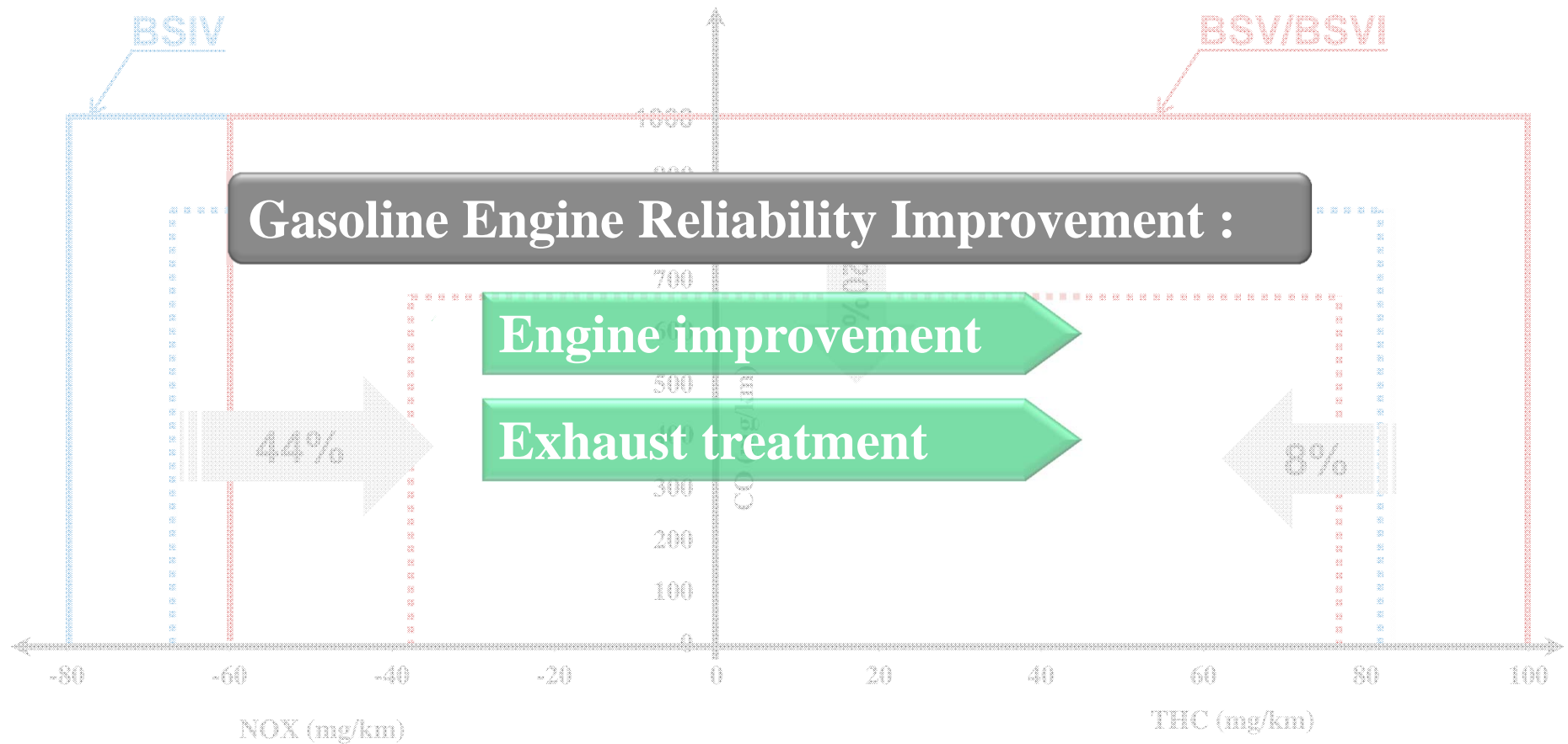
Execution : Way Forward

Strategies for BS5 and BS6 Regulations



- BSIV with DF
- BSV/BSVI with DF

Strategies for BS5 and BS6 Regulations



Gasoline : Challenge is not the emission Limits but the *Fuel Efficiency*

Strategies for BS5 and BS6 Regulations

Regulation : Targets And Approach

Execution : Way Forward

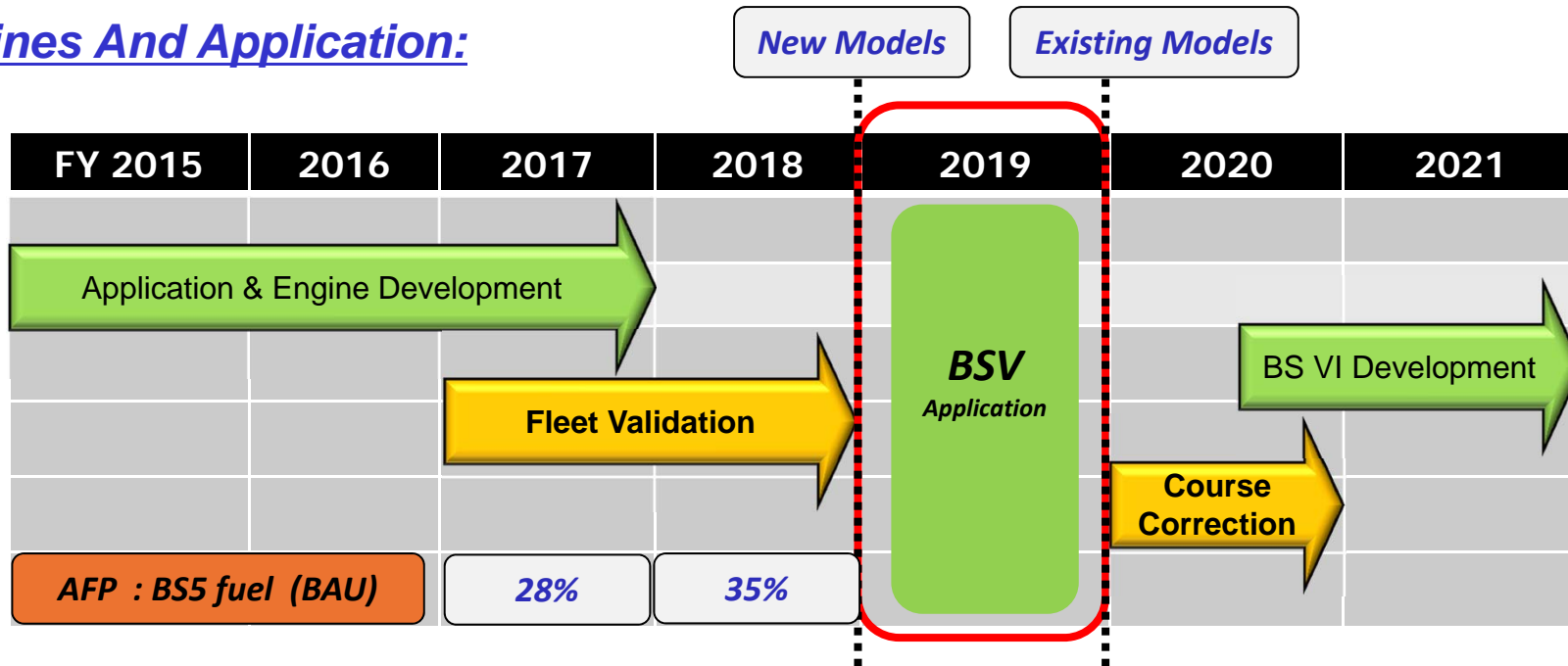
Strategies for BS5 and BS6 Regulations

Regulation : Targets And Approach

Execution : Way Forward

Strategies for BS5 and BS6 Regulations

Timelines And Application:



Front Load Development Work

BSV Fuel for fleet validations

Quantum :

Total Variants : 350

Total Manufacturers : 10

Variants / Manufacturer : 35

BSV Application / month: 3

Strategies for BS5 and BS6 Regulations

Summary :

- 1. After Treatment of exhaust is not sufficient, the base engine needs to be worked upon.*
- 2. Apart from the base engine, vehicle improvements are also required.*
- 3. Front Load development work needs to be done for meeting BSV applications in 2019.*
- 4. Fuel implementation*

Strategies for BS5 and BS6 Regulations

Thank You