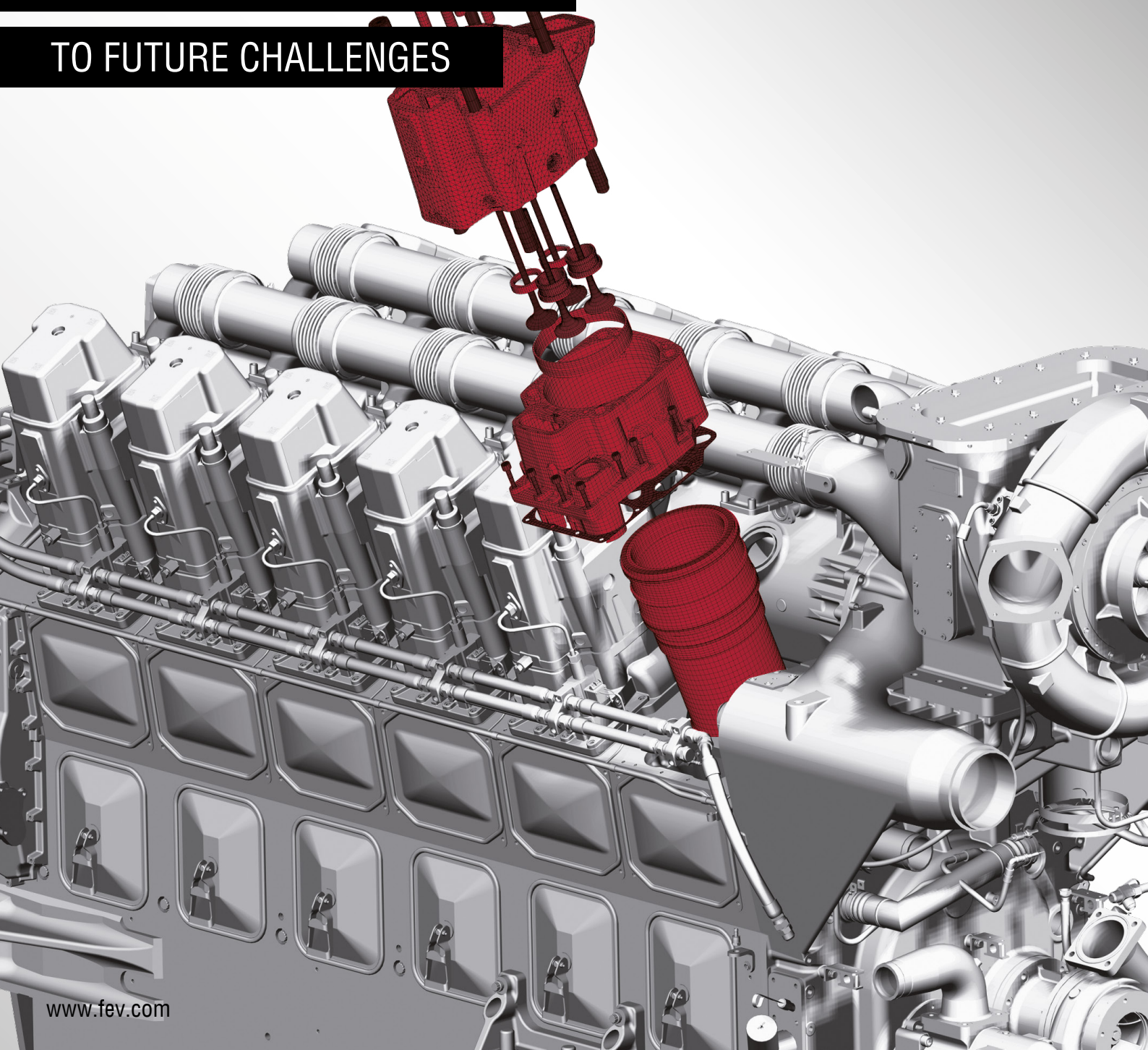




# Large Engine Development



COMPREHENSIVE SOLUTIONS  
TO FUTURE CHALLENGES



## >> Comprehensive experience results in an effective large engine development <<



FEV offers a full range of large bore engineering services and resources that allow our customers to achieve best-in-class solutions such as:

- > Design and FE analysis
- > Mechanical engineering
- > Combustion system development
  - Diesel
  - Dual fuel
  - Gaseous fuel
- > Efficient methods
- > Single cylinder engine (SCE)
  - High speed engines
  - Medium speed engines

- > Engine and exhaust aftertreatment system calibration
- > Engine controls and OBD
- > Emission certification

FEV supports its customers and meets project requirements by developing new systems and components and by optimizing existing systems. We create roadmaps that offer a view into the future; they leverage available technologies and consider all of the engineering disciplines. FEV offers rich large bore engine experience and has complet-

ed many engine design and development programs for the world's large bore engine industry.

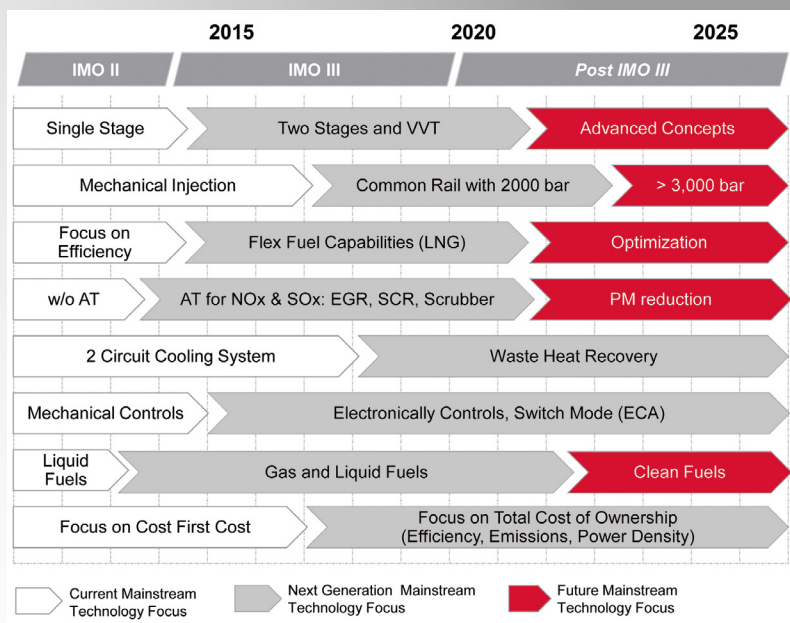
For more than 30 years, we have provided comprehensive experience in large engine design and development to our customers and we continue to support them, today and in the future.



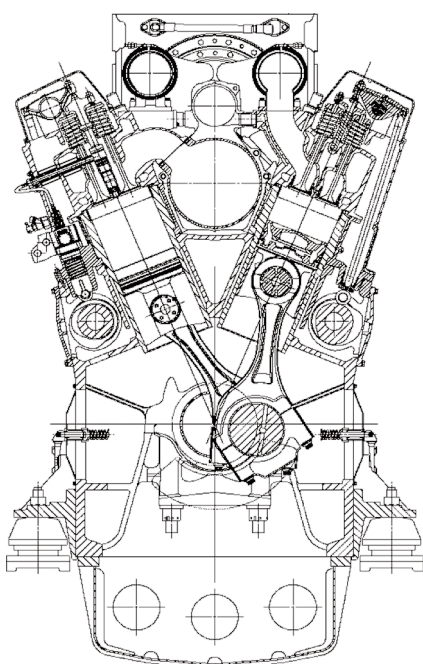
>> Latest technologies are  
considered to achieve future targets <<

AT FEV, LARGE ENGINE DEVELOPMENT  
PROJECTS ARE TARGETED WITH  
ACHIEVING:

- > Excellent durability and reliability
- > Optimized product cost/value
- > Low cost of ownership
- > Good maintainability
- > Best fuel efficiency
- > Compliance with future  
emissions standards
- > High performance
- > Optimized NVH



Roadmap: Solutions to meet Future Requirements








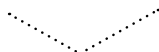





Comprehensive Design for Reliable Large Engines  
Source: 24th CIMAC World Congress, Paper No. 027



Realized Large Engine

## &gt;&gt; RELEVANT FEV LARGE ENGINE EXPERIENCE &lt;&lt;

Reference	Project Scope	Demonstrated Expertise
 <b>ANGLO BELGIAN CORPORATION</b>	Concept and series engine design  Advanced CAE simulation	Prototype Development, Design, CAE, Procurement
	Genset and locomotive frame design and CAE	
	Single cylinder engine design, procurement, installation and commissioning	First Single Cylinder Engine, Combustion Testing
	Single cylinder engine testing  Engine conversion Diesel - Gas and Gas – Diesel	  Multi Cylinder Engine, Combustion, Function and Durability Testing
 <b>MAN Diesel &amp; Turbo</b>	CAE based gas engine combustion prediction	
	Combustion system development (Diesel, HFO, Gas, DF)	Field Testing
	Emissions and exhaust aftertreatment system development  Complete engine family development	
 <b>WÄRTSILÄ</b>	Durability testing	

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