



Doosan Engine

Investor Relations
2015.1Q Operating Results



May 2015
Doosan Engine

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Disclaimer

This presentation contains preliminary figures which may be materially different from the final figures.

While the statement in this presentation represent our current assumptions, plans and expectations, and we believe these judgments are reasonable, they are not guarantees of future performance and involve known and unknown risks, uncertainties such as FX & raw material costs, and other factors that may cause actual results to differ materially from the results, performance, achievements or financial position expressed or implied in this presentation.

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Income Statement

✓ Sales W144bn, Operating Loss W12bn

(Wbn)

	'15.1Q	'14.1Q	YoY	'14.4Q	QoQ
Sales	144 ¹	165	-12.6%	296	-51.2%
COGS ratio(%)	(100.6%)	(105.4%)	(-4.8%p)	(96.8%)	(+3.8%p)
Gross Profit	-1	-9		10	
SG&A	11	10		10	
Operating Profit	-12	-19	CR	-0.1	CR
OP margin(%)	(-8.2%) ²	(-11.6%)		(-0.0%)	
Other gain & loss	1.4	0.4		-0.3	
Financial income & expense	-0.8	-1.2		-1.6	
Gain/Loss on Equity method	0.8 ³	-3.9		-1.1	
Pretax Profit	-10	-24	CR	-3	CR
Tax	-2	-5		1	
Net Profit	-8	-19	CR	-4	CR

1Q Main Points (YoY)

1 Sales -12.6% (YoY)

- Sales fell due to the delay of deliveries in marine engine

2 OP margin -8.2% (Operating Loss declined)

- Improvement of product mix
(COGS ratio '14.1Q : 105.4% → '15.1Q : 100.6%)

3 Gain/Loss on Equity method W0.8bn

(Wbn)		'14.1Q	'14.4Q	'15.1Q
	DII	3.4	6.4	6.8
Bobcat	DHEL	-7.3	-7.5	-6.1
		-3.9	-1.2	0.7
	DSD	0	0.1	0.1

Balance Sheet

✓ Net debt W238bn, Net debt ratio 37%

(Wbn)

	'14.12	'15.03	+/-
Current Assets	437	417	-20
Non-current Assets	1,103	1,045	-58
Total Assets	1,540	1,462	-78
Current Liabilities	529	517	-12
<i>Advance receipts</i>	286	274	-12
Non-current Liabilities	310	303	-7
Total Liabilities	839	820	-19
Paid-in Capital	69.5	69.5	0
Capital Surplus	367	367	0
Retained Earnings	297	289	-8
Accumulated other comprehensive income	-33	-84	-51
Total Equities	701	642	-59
Liability ratio	120%	128%	+8%p

Net Debt

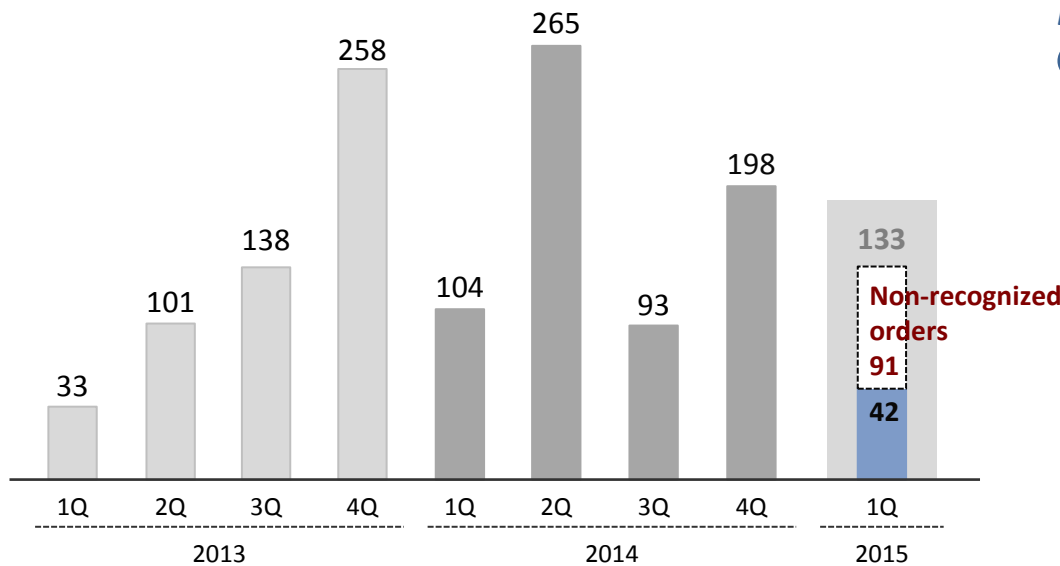
	'14.12	'15.03	+/-
Gross Debt	305	306	+1
Cash & Cash Equivalents	92	68	-24
Net Debt	213	238	+25
Net Debt ratio	30%	37%	+7%p

New Orders

- ✓ 1Q New Orders: W42bn (but considering the non-recognized orders, the actual new orders reached W133bn)
- ✓ As 'Before Contract' is ample, new orders for 2Q will rise noticeably

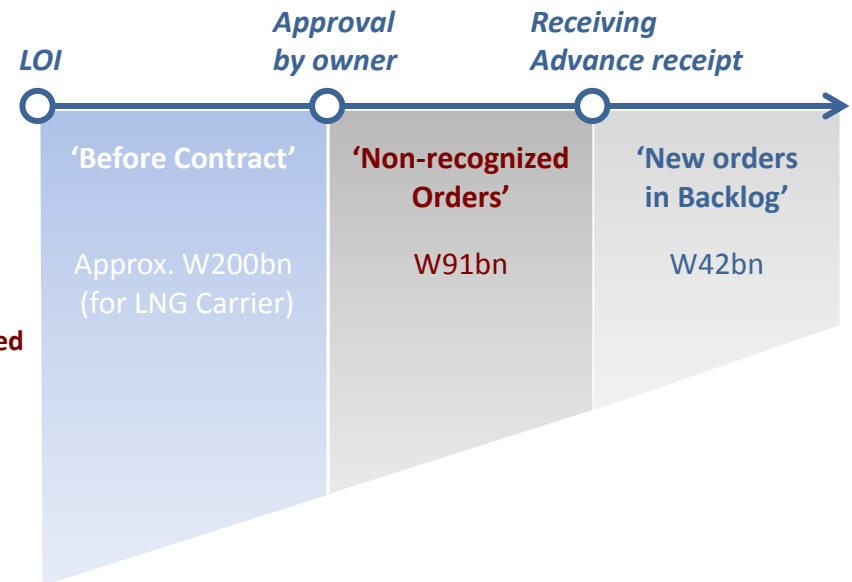
Quarterly New Orders Trend

(Wbn)



Process of taking New Orders

(Wbn)



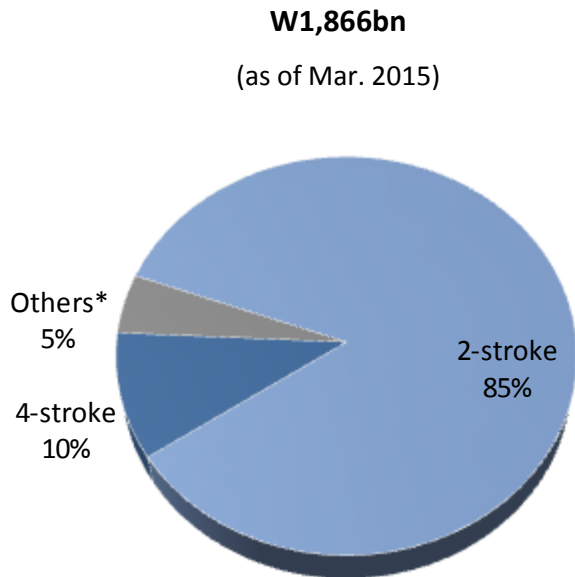
※ New orders: based on receiving advance receipts

Order Backlog

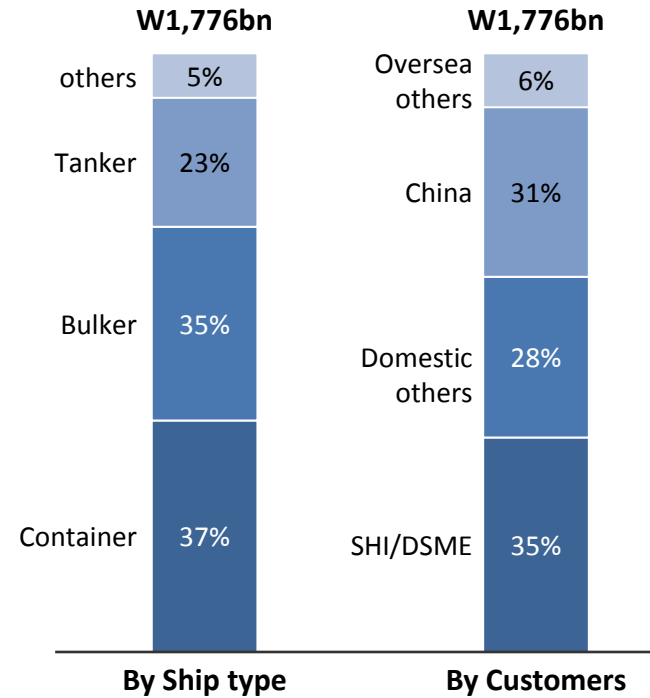
✓ Order Backlog: W1.9tr, marine engine accounts for 95%

Order Backlog Breakdown

(Wbn, %)



**Marine Engine
(2 & 4-stroke)
: W1,776bn**



* Others: Diesel Power Plant, SCR

I. 2015.1Q Operating Results

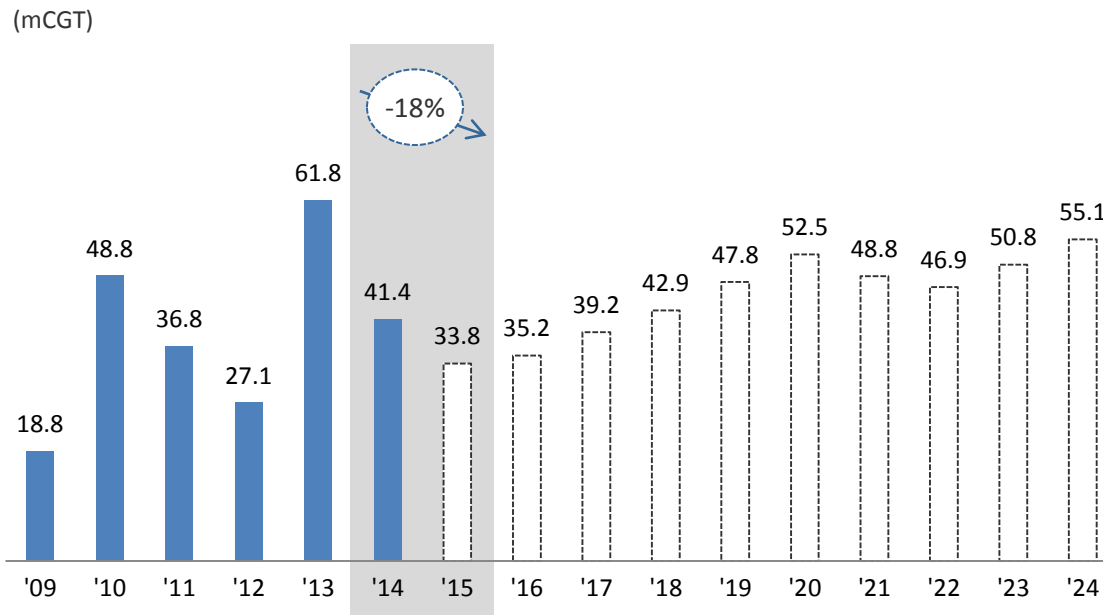
II. Investment Points

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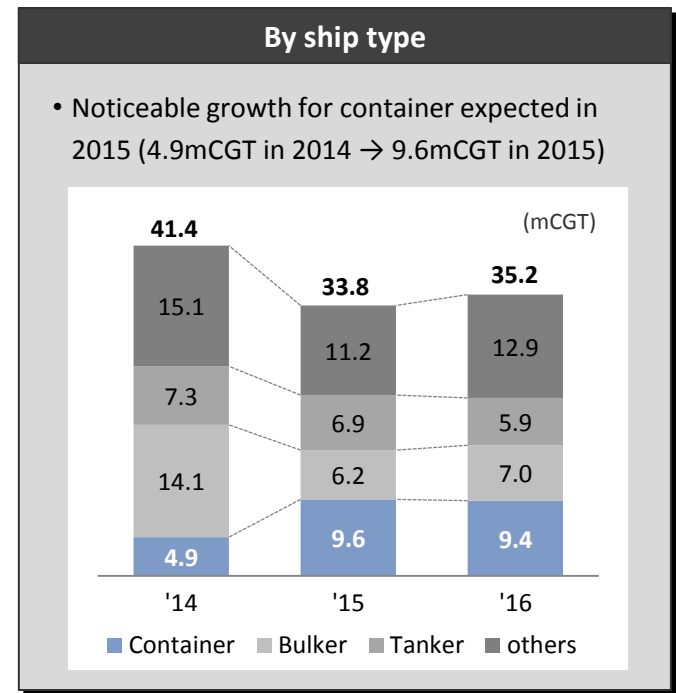
Shipbuilding Market Outlook

- ✓ Shipbuilding market size in 2015 is estimated to be decreased by 18% YoY
- ✓ By ship type, offers for containership is expected to be double the level of 2014

Global New Orders Outlook



※ Source : Clarkson Forecast Report (March 2015)

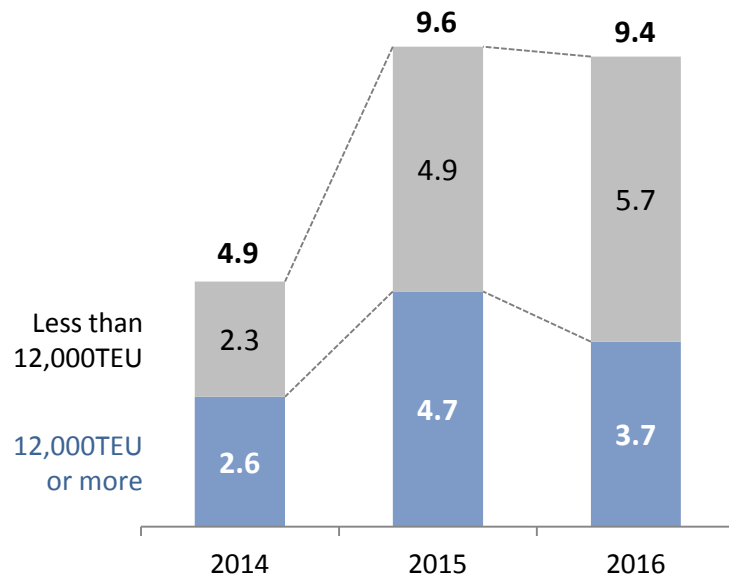


Investment Point 1. Strong market for Containership

- ✓ Large Containership over 12,000TEU is expected to grow by 81% which is 4.7mCGT(70 ships) worth
- ✓ With our strong market presence, containership market growth will bring us more opportunities

Containership Market Outlook

(mCGT)



※ Source: Clarkson, The Newbuilding Market 2015-2027 (March 2015)

Newbuilding demand for Large Containership

	Owner(Chartering)	Size(TEU)	No. ships	Remark
Shipbuilder decided ¹⁾	Shoei Kisen(Evergreen)	18,000	11	Imabari
	Costamare(MOL)	20,150	4	SHI
	CMA-CGM	20,600	3	HHIC-Phil
	OOCL	21,100	6	SHI(Option 6 ships)
	MSC	11,000	5	HHIC-Phil
Shipbuilder not decided ²⁾	APM Maersk	19,000	4	Option 2 ships
		14,000	5	Option 5 ships
	Yang Ming	20,000	11	
	COSCO	20,000	9	
	ZIM line	14,000	5	Option 5 ships
	Hapag-Lloyd	12,000	5	
	Seaspan	14,000	6	

1) Clarkson Website(www.clarkson.net)

2) News, Market information

Investment Point 2. More Opportunities in LNG Carrier Engine

- ✓ Gas-fuelled ship ratio is growing, and customers pay more attention to 2-stroke DF than 4-stroke DF engine
- ✓ It will contribute to sales growth and profitability of Doosan Engine

LNG-fuelled Engine

	4-stroke DF		2-stroke DF	
	DFDE ¹⁾	X-DF ²⁾	ME-GI ³⁾	
Main Engine	2 * 12V50DF 2 * 8L50DF	2 * 72DF	2 * 5G70ME-GI	
Aux. Engine	N/A	4 * Gen-set	4 * Gen-set	
Gas Pressure	6 Bar	16 Bar	300 Bar	
Re-Liq. Plant	No	No	Yes	
NOx Tier III	Complies on Gas	Complies on Gas	Need SCR or EGR	
Efficiency	●	● ● ●	● ● ●	
CAPEX ⁴⁾	Same	Same	Same	
OPEX	More	Less	Less	
Experience	Sufficient	Not at all	Very Small	

1) DFDE : Dual Fuel Diesel Electric (from Wartsila-Hyundai)

2) X-DF : X-type Dual Fuel (from Wartsila)

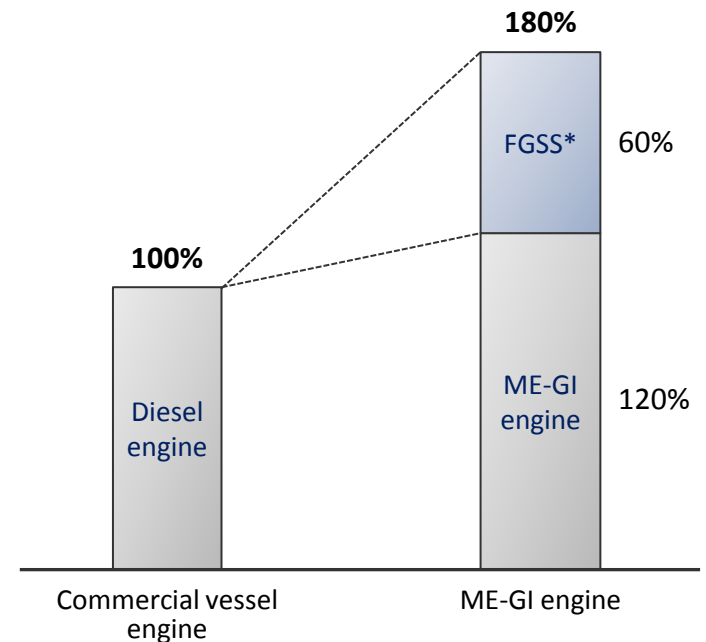
3) ME-GI : MAN Electric-driven Gas Injection (from MAN D&T)

4) CAPEX : depending on exact configuration

※ Source: Maran Gas Maritime Inc. (8th World Ocean Forum, Sep. 16~19, 2014)

Price Structure Comparison

(Diesel engine vs. ME-GI engine)



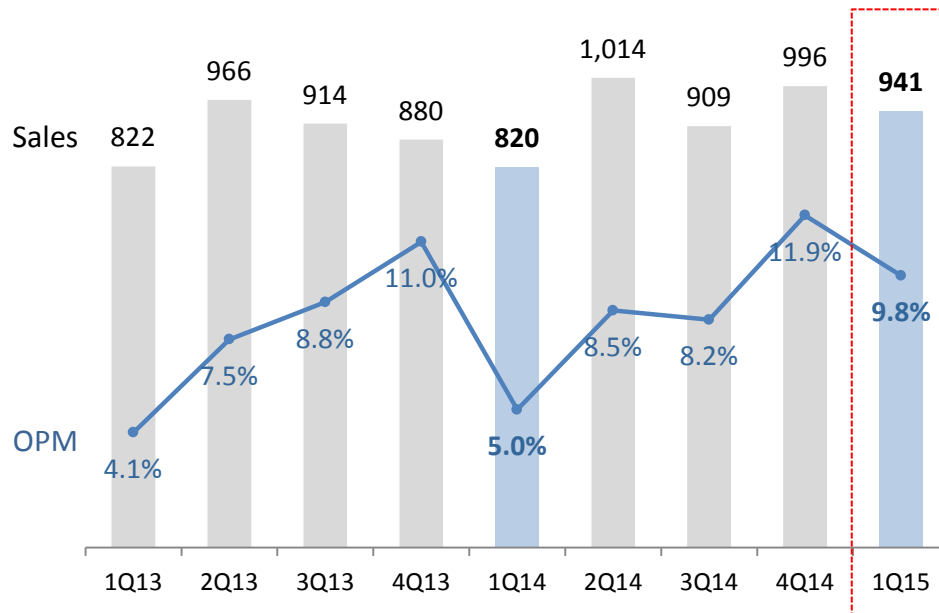
* FGSS : Fuel Gas Supply System(It will be outsourced to DSME)

Investment Point 3. Value of Bobcat

✓ 1Q Sales: W941bn(+14.6% yoy), OP margin 9.8%(+4.8%p yoy)

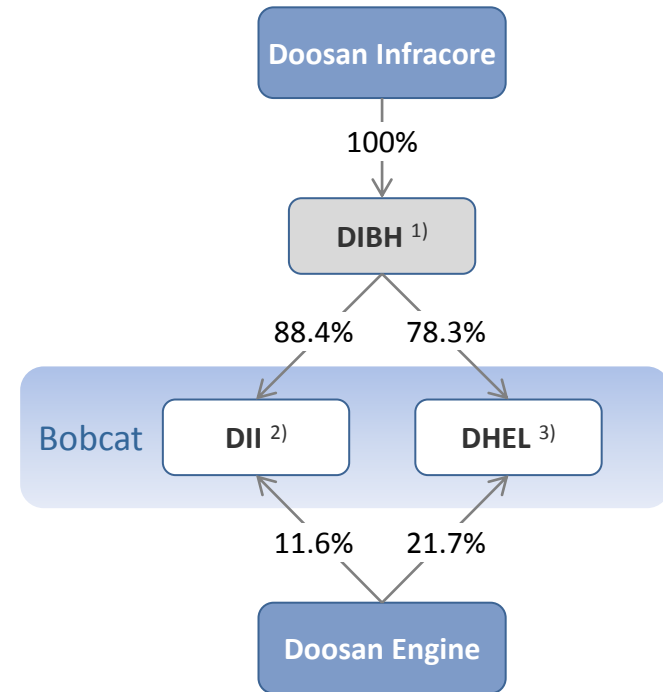
DIBH Earnings Trend (Quarterly)

(Wbn)



Ownership Structure of Bobcat

(%)



- 1) DIBH: Doosan Infracore Bobcat Holdings (Korea)
- 2) DII: Doosan Infracore International, Inc. (US)
- 3) DHEL: Doosan Holdings Europe Ltd. (Ireland)

IMO Regulation : NOx

NOx (Nitrogen Oxides)

Global as Tier II | after Jan. 2011

ECA as Tier III | after Jan. 2016

Under **14.4 g/kWh**

Under **3.4 g/kWh**

ECA (Emission Control Areas) by MEPC¹⁾

MEPC 66th decided to keep the implementation date of the NOx Tier III requirements as of 1st January 2016.

- **NOx ECA** : North American area including US Caribbean sea

For any future new ECA, the Tier III requirement will be made mandatory for ships constructed on or after the announcement of the establishment of the ECA, or any date decided by the parties proposing the ECA but not earlier than the announcement date.

1) MEPC : Marine Environment Protection Committee



● North American ECAs(NOx, SOx, PM)

● Baltic & North Sea ECAs(SOx)

● Discussed ECAs

- ✓ After the first order of SCR in Oct. 2014, inquiries for SCR orders are increasing
- ✓ Pricing for SCR will be around 15~20% of engine price

SCR (Selective Catalytic Reduction)

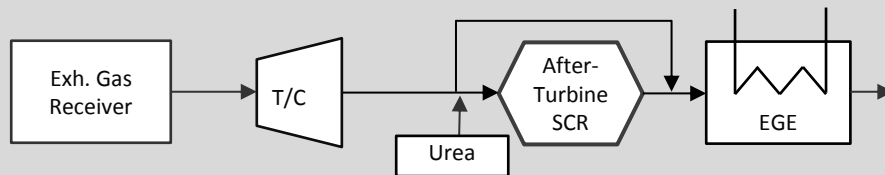
- NOx reduction method using catalyst and reactant(urea)
- High NOx reduction efficiency (≥80%)
- Consist of Reactor, Urea Dosing System, Control System

“Most effective and proven solution”

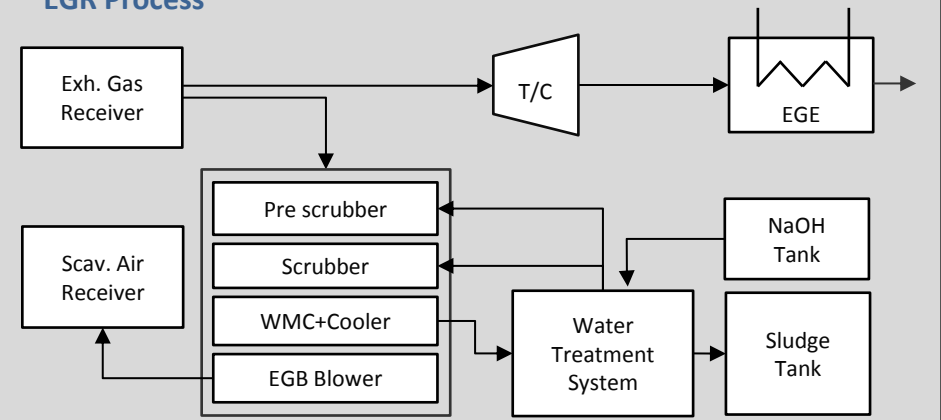
EGR (Exhaust Gas Recirculation)

- NOx reduction by decreasing O₂ concentration of scavenge air
- Engine integrated + additional equipment
- More complex design

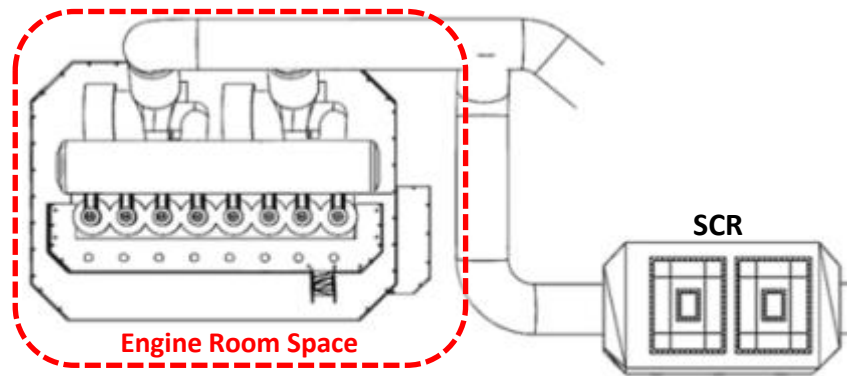
* DeNOx Process



* EGR Process



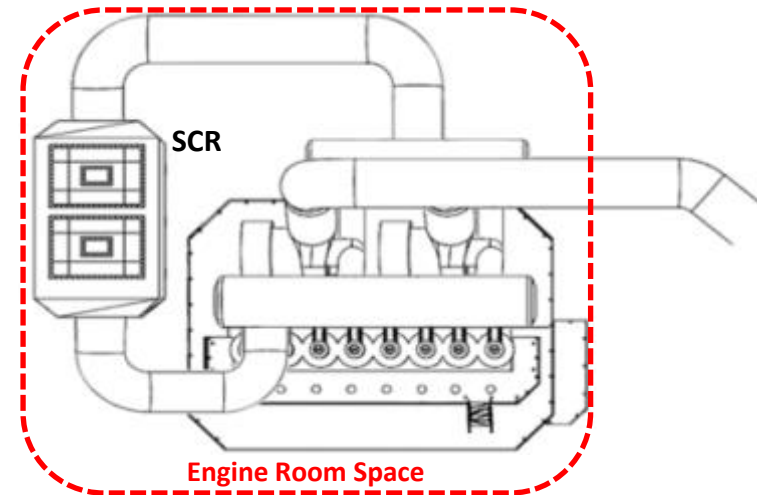
After-turbine SCR (LP)



- Located after Turbocharger
- Flexible arrangement in engine room and simple piping line
- Minimized modification of engine room design

**“ Best Solution for IMO Tier III Compliance,
Shipyard Design & Ship-owner Operation ”**

Pre-turbine SCR (HP)



- Located between Exhaust gas receiver and Turbocharger
- Limited arrangement in engine room and complex piping line
 - Must be arranged near the main engine
 - Influenced by number of turbochargers
- Influence on engine room design

Appendix

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- II. History
- III. Plants
- IV. Manufacturing infrastructure
- V. Business areas
- VI. IMO Environmental Regulations
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Appendix 1. Company Overview

Overview

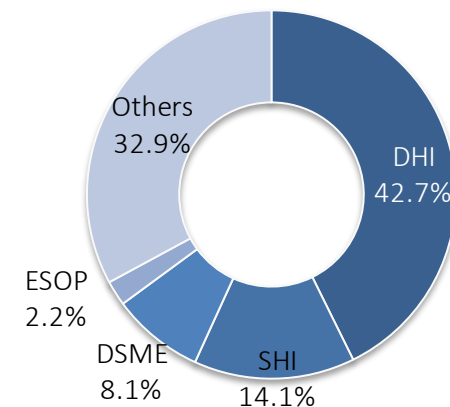
Company	Doosan Engine Co., Ltd.
Date of Foundation	Dec. 30, 1999
Address	Sinchon-dong 69-3, Seongsan-gu, Changwon-si, Gyeongnam
Business	Marine diesel engines / Diesel engines for power plants
Exports	Local/direct Exports(96%), Domestic(4%)
Capital	W69.5bn
No. of Employees	1,008 [As of Dec. 2014]
Subsidiary	Doosan Marine Industrial (DMI) Dalian Co., Ltd. (100% owned)

Business Areas

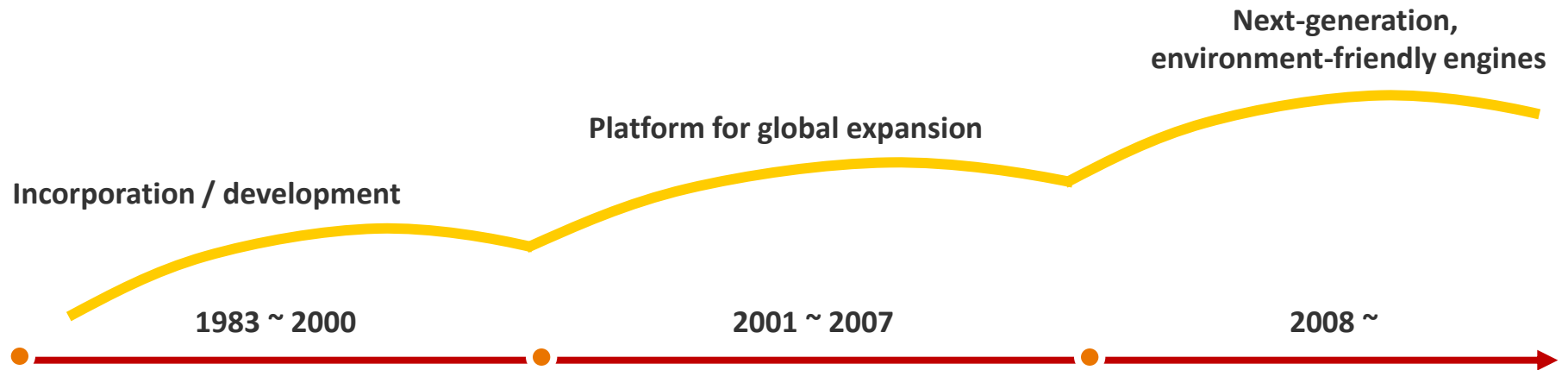
Business Areas	Sales (2014)	% of sales
2-stroke engine	W671bn	75%
4-stroke engine	W157bn	18%
Diesel power plant	W21bn	2%
Engine parts & C/S	W40bn	5%
Total	W889bn	100%

Shareholders

[As of 2014.12.31]



Appendix 2. History



1983

- Doosan Heavy Industries launches engine business

1994

- Samsung Heavy Industries(SHI) launches engine business

1999

- Doosan Heavy Industries(DHI) and SHI agree to establish a JV, **HSD Engine**

2000

- HSD Engine establishes R&D center
- Capital Increase of W25bn (DSME participated)

2001

- Signs business transfer agreement with DHI, on internal combustion generators

2002

- **Receives WCP (world class product) award from the Ministry of Commerce, Industry & Energy for its large diesel engines**

2005

- Changes company name to Doosan Engine Co., Ltd.

2006

- Establishes DMI in China, and builds plants

2007

- **Receives US\$1bn Export Tower Award**

2008

- Constructs additional assembly line and 4-stroke engine production line
– Capacity : 2-stroke(12mn HP) and 4-stroke (500 units p.a.)

2009

- Capital Increase of W33bn (Placement on shareholders, ESOP)

2011

- **IPO listing in KRX (2011. 1. 4)**

2012

- Achieves cumulative production of 80mn HP within shortest period(Jan. 2012)

2013

- **Commercialization of ME-GI engine (Mar. 2013)**

Appendix 3. Plants



Dalian, China plant



- Size : 57,904m²
- Product line-up : Diesel engine parts
- Production capacity : 250 blocks of engine canning parts

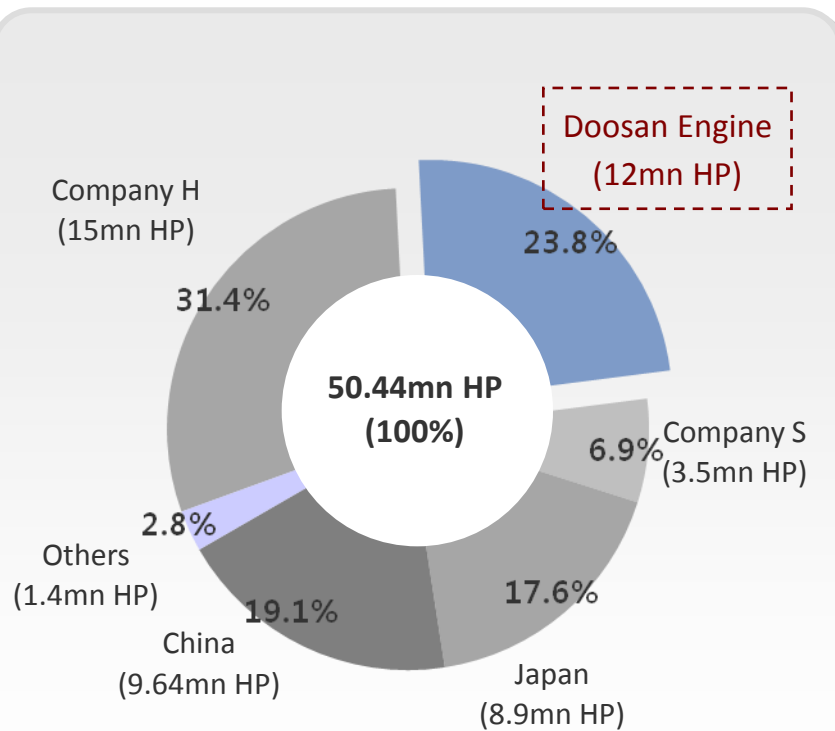


- Products : Diesel engines
- Size : 328,000m²
- Overview

Classification	Size(m ²)	Production CAPA (per year)
2-stroke engine plants	42,720	12,000,000 HP
4-stroke engine plant	17,010	2,000,000 HP
Processing plant	27,100	
Canning plant	4,894	
Total Capacity		14,000,000 HP

Second largest diesel engine production facility in the world

2-stroke diesel engine production Capacity



Note : Estimates based on each company's 2010 annual report

Production facilities and infrastructure

1. 2-stroke diesel engine plant

- Production capacity : 12mn HP
(Operating in 6mn HP)
- Assembly and testing plants
- Processing plant (7 Plano Millers, 8 Boring)
- Canning plant(250 blocks/year)

2. 4-stroke diesel engine plant

- Production capacity : 500units
- Assembly and testing plants
- Processing plant (5 Plano Millers, 4 Mill-Turns)

3. Top-of-line production infrastructure

- High-quality supply chain
(Quality/stable procurement and joint R&D)
- Cutting-edge production system
("Flow production", "fool-proof" system)
- Skilled design and production workforce

Appendix 5. Business Area : 2-stroke diesel engine

2-stroke diesel engine



- Main Business (72% of total sales in 2013)
- Uses : Large vessels
(e.g. Container, Tanker, Bulker, LNG carriers)
- Market position : No.2 globally, with 24% m/s
- Customers : SHI, DSME, Yangzijiang(China)
Sinopacific(China), COSCO(China)

Containership engines



Oil tanker engines



LNG carrier engines



Bulk carrier engines



Appendix 5. Business Area : 4-stroke diesel engine

4-stroke diesel engine



- New growth business (18% of total sales in 2013)
- Uses : Auxiliary engines in large ship engines, Propulsion engines in small to mid-sized ships
- Customers : SHI, DSME, China, Brazil

Warship engines



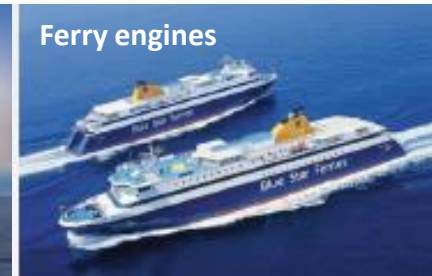
Cruise engines



Drillship engines



Ferry engines



Appendix 5. Business Area : Power plants (2 & 4-stroke)

Diesel Power Plant

4-stroke Diesel Power Plant

- 4-stroke diesel power plant engine
- Generates 1~25MW power suited for small capacity power plant
- Installed in small islands or remote areas and used for emergency purpose

(Philippines, Fujairah, Bangladesh)



EDG* for Nuclear Power Plants

No.1 supplier of emergency generators for nuclear power plants

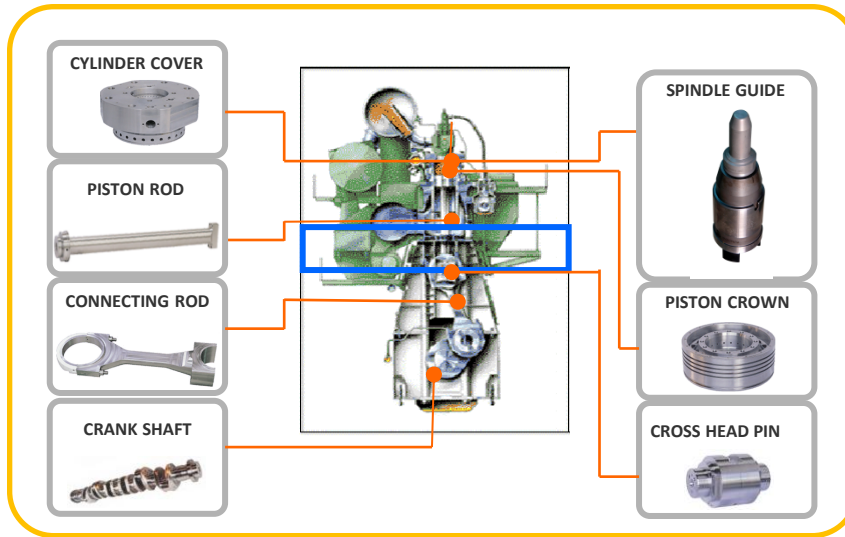
- Exclusive supplier of emergency generators for nuclear power plants in Korea; Orders to grow from rise in nuclear power plant exports
- Generates power capacity of 3,500 ~ 9,000KW
- Supplied to the major nuclear power plants in Korea



* EDG (Emergency Diesel Generator) : EDG is a diesel-powered emergency backup systems for nuclear power plants

Appendix 5. Business Area : Parts & C/S

Main engine parts



- Uses : Ship engines, Retrofit
- Customers :
 - 14 agencies (12 domestic, 2 overseas)
 - Ship owners: A.P.Moller(Denmark), CSCL(China), NOVO Ship(Russia)
- Market size : W600bn(as of 2012)
- Business overview
 - Domestic production of engine parts
 - Developing paid A/S items



CYLINDER COVER



ROD(CON/PISTON)



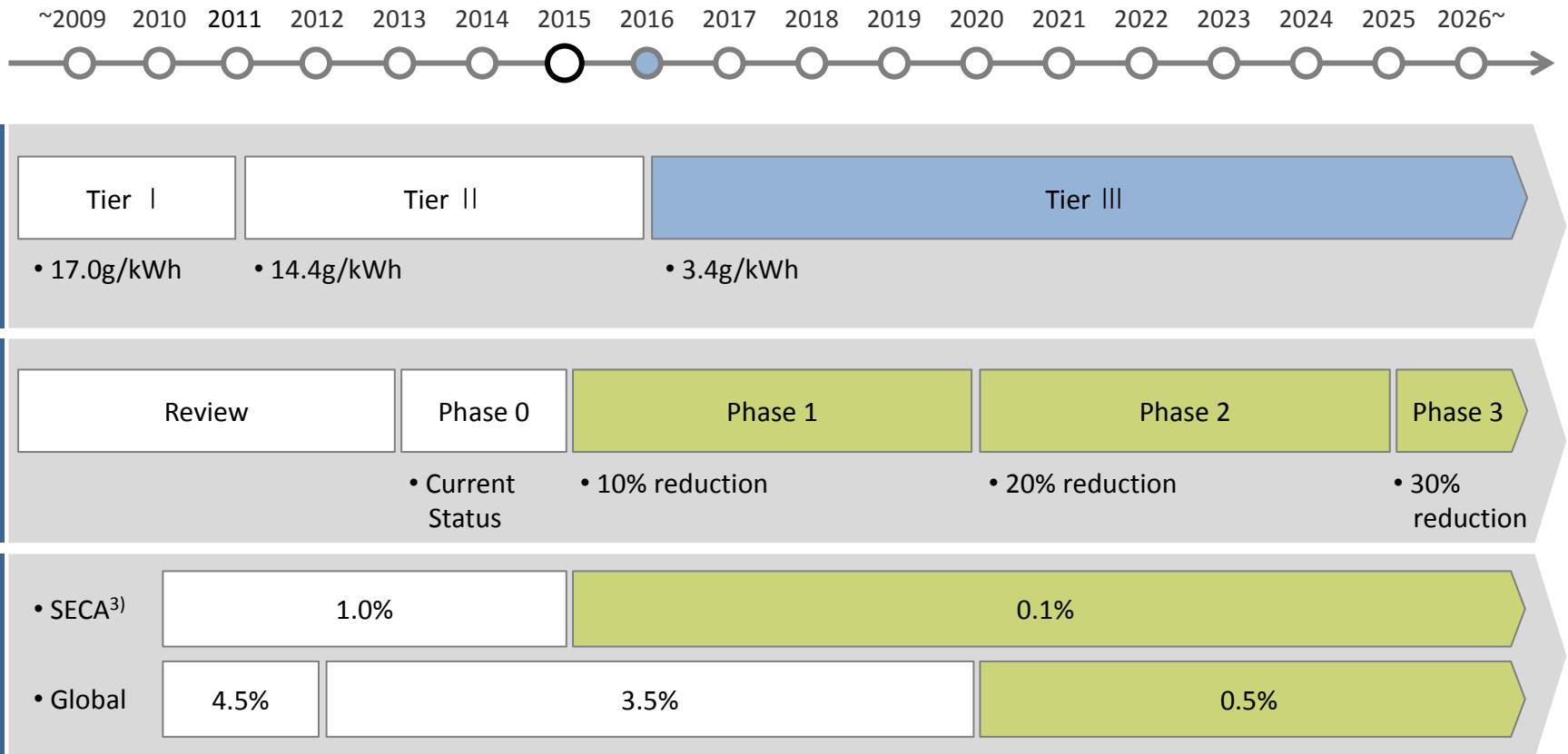
ALPHA RETROFIT



CROSS HEAD PIN

Appendix 6. IMO Environmental Regulation

IMO Regulation Milestone



1) NOx : Nitrogen Oxides

2) SOx : Sulphur Oxides

3) SECA(SOx Emission Control Area): Baltic Sea, North Sea, North American area including US Caribbean sea

Appendix 7. Doosan Group IR contact Point

For further information about our company or affiliates, please contact us at the following.

Company	Name	Phone	E-mail
Doosan Engine	Mr. LIM Taewoo	82-2-519-5876	taewoo.lim@doosan.com
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Doosan Heavy	Ms. WON Youngsoo	82-2-513-6789	youngsoo.won@doosan.com
Doosan Infracore	Ms. OH Hyunji	82-2-3398-8416	hyunji.oh@doosan.com
Doosan E&C	Ms. LEE Hayoung	82-2-510-3896	hayoung.lee@doosan.com