

NSG

GROUP



NSG Group Medium-term Plan (MTP) Update at FY17 Q2

**28 October 2016
Nippon Sheet Glass Co., Ltd.**

Agenda

- Key Message
- MTP Progress Assessment
- Key Measures to Achieve MTP Targets
- Summary

Key Message



- The Group has continuously improved its operating profit since the start of the MTP
- However, an additional two years to the original MTP period (FY15-FY18) is needed to achieve the MTP financial targets (ROS: 8%*; Net debt/EBITDA: 3x) due to:
 - Significant changes in the business environment of growth drivers, especially in Display and South America
 - Disparity among the regions in the speed of profitability improvement
- The original MTP financial targets remain unchanged; the Group will designate the three years from FY18 to FY20 as MTP Phase 2 to execute measures to achieve the targets
- During MTP Phase 2, the Group will drive the "VA No.1 Strategy", "Establishment of Growth Drivers", "Business Culture Innovation" and "Enhancement of Global Management" to achieve the MTP targets as well as to continue to improve its financial position and accelerate growth

* ROS: return on sales (Operating Profit before amortization and exceptionals)
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Since the start of the MTP, operating profit of the Group as a whole has continued to improve.

However, two more years beyond the original MTP period (FY15 to FY18) is needed to achieve the MTP numerical targets of ROS above 8% and Net debt/EBITDA 3X. This assessment is based on:

- Significant changes in the operating environment of our key growth drivers, such as Display and Automotive OE in South America; and
- An uneven speed of profitability improvements between the regions.

Despite these setbacks, we are determined to maintain the direction and targets we set in the MTP. We will designate the three-year period from FY18 to FY20 as "MTP Phase 2" to execute measures to achieve the targets.

During "MTP Phase 2," we will initiate several key measures, including "VA No.1 Strategy," "Establishment of Growth Drivers," "Business Culture Innovation" and "Enhancement of Global Management" to achieve the original MTP targets by accelerating growth and stabilizing our financial base.

Long-term Strategic Vision



Long-term Strategic Vision:

Transform into “VA Glass Company”

Strategic Intent

- Transform the whole Group structure into “VA-ready” while increasing the VA ratio in the Group’s sales

Objectives

- Consolidate our trusted reputation as a glass specialist
- Work closely with customers worldwide to offer unique value through our products and services
- Transform business structure from a traditional model to a value-added model

* VA: Value-added

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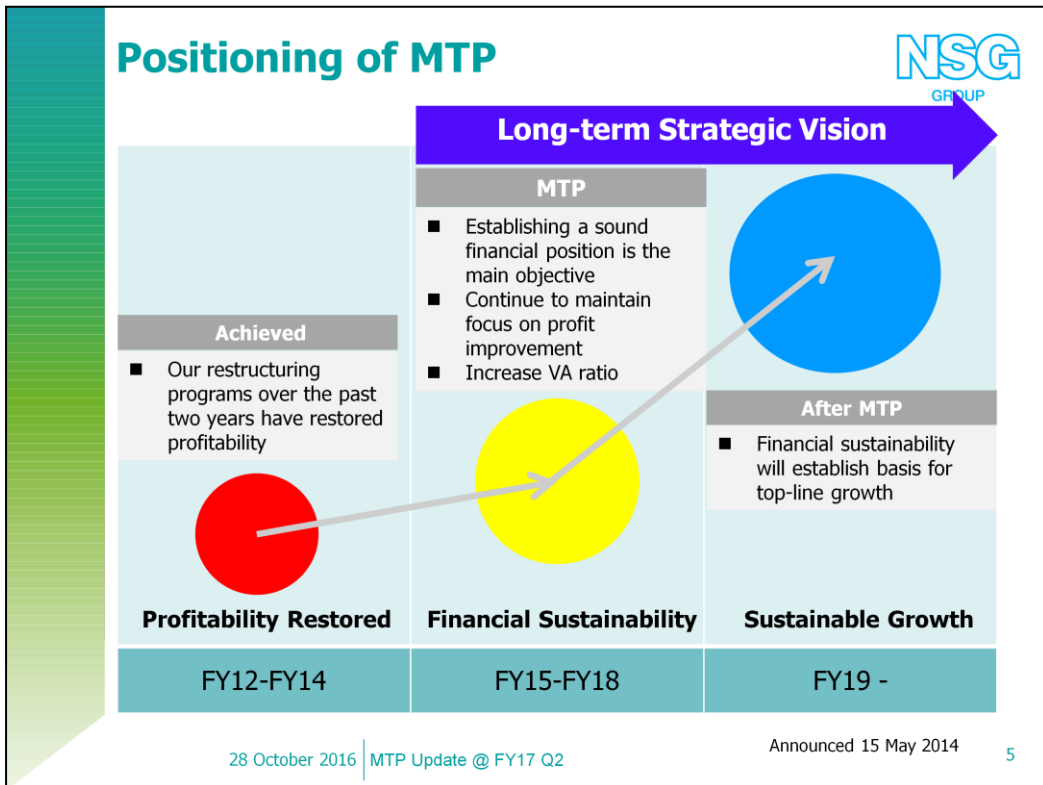
Announced 15 May 2014

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But first, we would like to reiterate our long-term strategic vision and the positioning of MTP.

By transforming into the VA, or value-added, Glass Company, NSG Group intends to not only increase the ratio of VA products in total sales, but to bring significant changes in the way we think, act and respond to customer needs with a concrete added-value.

To achieve that, we will need to build trust as a glass specialist, work closely with customers worldwide and transform our business structure into a VA model.



Just to review, current MTP has been designed to achieve financial sustainability following the period of global economic slowdown when we had to focus on restoring profitability.

Since the MTP's start in FY15, we have been working toward building a sound financial position by improving profitability and increasing the VA ratio.

MTP: Targets and Action Plan



- **Target**
 - **Achieve financial sustainability**
 - **Start transformation into VA Glass Company**

<Financial Target (FY18)>

 - Net debt / EBITDA: 3x
 - ROS: 8%*
 - **Action Plans to achieve targets**
 - Increase value-added product share
 - Maximize utilization of existing assets
 - **Approach**
 - **Architectural + Automotive: improve profitability**
 - **Technical Glass: grow with existing businesses and new products, focus on R&D**
- *Operating Profit before amortization and exceptionals

Establish financial sustainability and start transformation into VA Glass Company

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Here is a summary of the MTP targets and action plans.

Under the MTP, we aim to achieve financial sustainability and start transformation into a VA Glass Company.

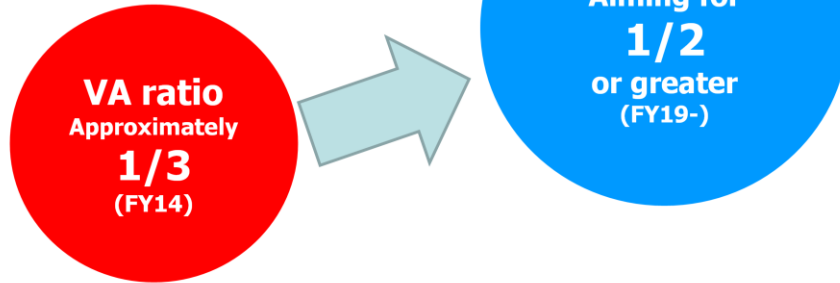
The key performance indicators are Net debt / EBITDA and return on sales ratio, with the targets of 3 times and 8% respectively.

Business Strategy to Achieve Targets



Accelerating VA shift

VA ratio in total sales
Architectural Glass + Automotive Glass (OE) + Technical Glass



Steady increase in VA ratio

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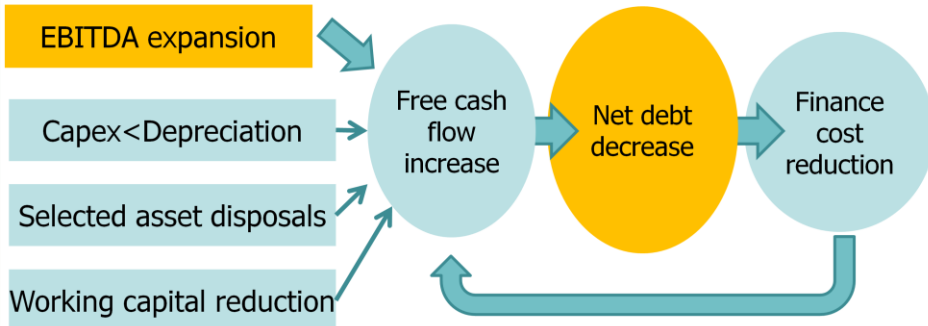
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Our Business Strategy is aimed at increasing the VA ratio from one-third of the total sales before the MTP's start to more than half.

Finance Strategy to Achieve Targets



Target Net debt/EBITDA: 3x



Positive spiral leads to achievement of targets

Improve financial position

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As for Financial Strategy, we are working toward creating a positive cycle of expanding EBITDA, increasing cash flow by review of assets and management of working capital, leading to a decrease of net debt and financing cost.

MTP Progress Assessment: External Factors

Upsides

- Strong architectural glass market in North America
- Demand upturn for automotive OE glass in Europe and North America
- Significant energy cost reduction

Downsides

- Intensified competition in Display market
- Decline or slowdown in emerging markets such as South America and China
- Slower market recovery for architectural glass in Europe, while a clear sign of improvement in prices and volume seen in 2016
- Negative translational impact of the Japanese yen appreciation

Despite some upsides, significant downsides

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Based on the MTP we have explained, now let us review the progress we made over the last two and a half years.

First, we have seen some changes in our business environment.

Upsides in the external business environment are as follows:

- Since spring of 2014 when the MTP started, the North American architectural glass market has constantly enjoyed a robust demand for two and a half years.
- Automotive glass market in North America has been in a good shape since 2014. The vehicle production in Europe has begun to show a clear sign of recovery since 2015.
- From the end of 2014, fuel prices began to fall and have benefited the Group.

Downsides in the external business environment are as follows:

- In the Display market, competition has intensified with new entrants coming to the market in summer 2015, pushing down prices substantially.
- In emerging markets such as South America and China, the economic growth has slowed or contracted since 2014. Especially in Brazil, the vehicle production has tumbled every year and the downswing continues even now.
- It took more time than expected for the architectural glass market in Europe to recover. But starting this year, the markets are showing significant price rise and capacity utilization improvement.
- Since the turn of 2016, due to the Japanese yen appreciation trend, in particular, after the Brexit referendum, lowering the Group's revenues and profits in the Japanese yen terms.

MTP Progress Assessment: Internal Factors



Achievements

- Steady increase in VA ratio
- Improved capacity utilization
- Working capital reduction and capital expenditure management
- Downsizing of and exit from unprofitable business

Challenges

- Regional differences in profitability improvement rate
- Reduction of finance costs
- Balance sheet improvement

VA shift progressing on plan but regional difference in profitability and balance sheet challenges remain

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Next, let us summarize our internal efforts and our achievements over the past two and a half years.

The VA (value-added) ratio in the revenue, which was about one third at the start of MTP, now stands over 40%, as a result of steady efforts made in all regions and businesses.

- Especially the VA ratio in Architectural Glass North America is high and leading the rest of the Group. Architectural Glass has been driving a wide range of VA products including vacuum glazing, glass substrate for thin film photovoltaic application and online coating, capitalizing on our proprietary technologies.
- In Automotive OE, super UV shielding glass, complex shape windshields and other VA innovation is moving ahead.

The level of capacity utilization has also seen an improvement in several regions.

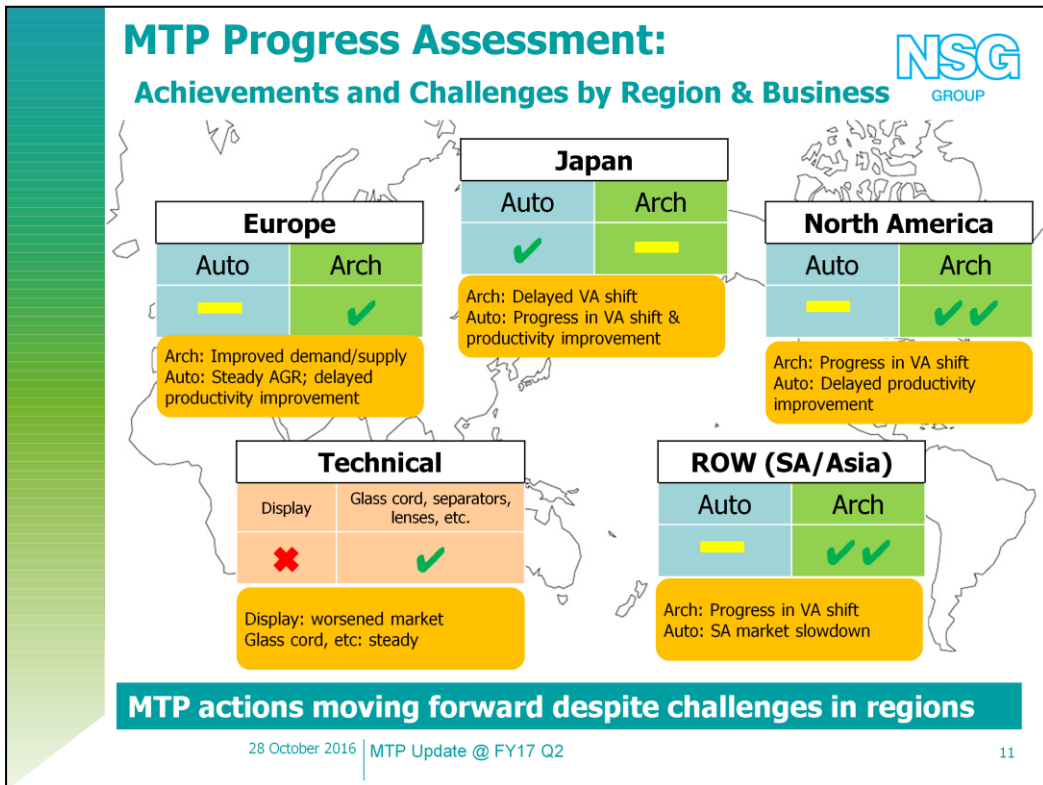
Since the start of the MTP, we have continued to reduce our working capital by more than JPY 20 billion. The capital expenditure has also been managed below depreciation. Together, they contribute to generation of free cash flow.

At the end of March 2016, we decided to exit from the rolled glass business for crystalline silicone photovoltaic applications in China and downsize other underperforming businesses. They are contributing to a higher profitability this financial year.

The speed of recovery varies by region and business. Automotive Europe and North America as well as Architectural Glass Japan are yet to achieve the expected improvement in operational efficiency. The Display business and emerging markets deteriorated significantly.

The Group's net debt has remained around JPY 370 to 380 billion since the start of MTP and the finance cost stays at a high level, squeezing the Group's bottom line.

Also, the shareholders' equity declined due to the impairment losses incurred at the end of FY16 and decreased even more due to appreciation of the Japanese yen following the Brexit referendum back in June this year.



In terms of our performance by regions, architectural glass market in Europe saw an upturn and automotive replacement glass business is moving steadily but a delay in improving manufacturing productivity is a challenge.

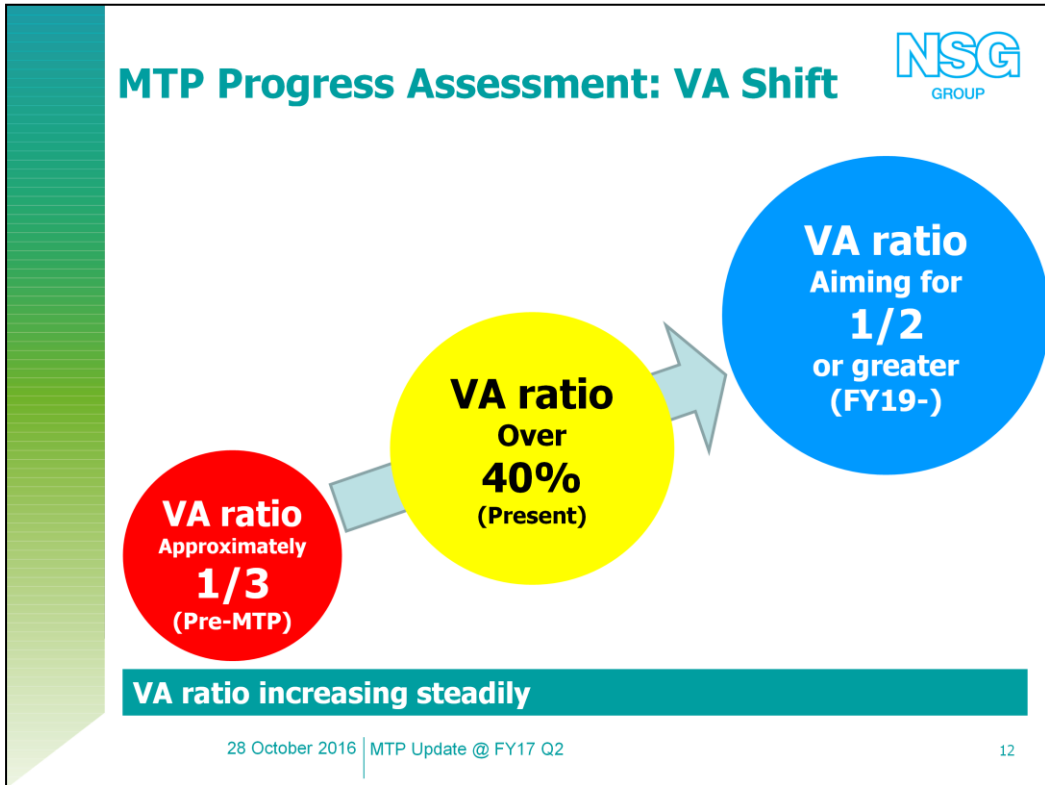
In Japan, progress of VA shift and productivity improvement are lifting our automotive business while the architecture business is lagging behind in a shift to VA.

The shift to VA is at the highest level in our North American architecture business but the productivity improvement in automotive business is below that of Europe.

In other regions, including South America and Asia, VA shift is going well in architecture business while the automotive business has been impacted by a downturn in the South American markets.

For Technical Glass, glass cord, battery separator and lens are performing very well despite the collapse of display markets.

Although the overall performance is mixed, key actions under the MTP are progressing in each region.



Just to add more detail to how VA shift is progressing, the ratio has reached over 40% at the end of FY17 2Q.

This is being driven by several VA products, including solar glass, complex shape automotive glass and coating technology for architectural glass.

The VA shift is being driven largely by our architectural and automotive businesses.

MTP Progress Assessment: KPIs (1)



[KPI trend]

Progress made with all KPIs

	FY14 (pre-MTP)	FY17 Forecast	MTP Assumptions
ROS	3.7%	Approx. 6%	8.0% or more
Net debt/EBITDA	7x	>5x	3x
VA ratio	1/3	40%+	1/2

[Return on Sales (ROS) by business]

Mixed progress among businesses

	FY14 Q2 Actual	FY17 Q2 Actual	Progress (ROS: 8% or more)
Architectural Glass	3.7%	10.5%	↑ ↑
Automotive Glass	3.0%	3.5%	↗
Technical Glass	10.0%	2.1%	↓

Despite mixed progress among businesses, progress being made towards targets

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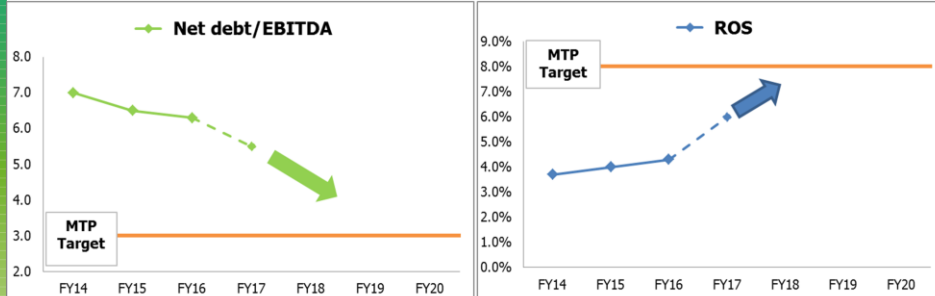
The quantitative assessment of the progress in terms of the KPIs is as follows:

Return on sales (ROS) by business indicates Architectural Glass is making a solid progress while Automotive Glass is lagging behind.

Performance of Technical Glass has deteriorated significantly due to the slowdown of Display business.

The Net debt/EBITDA ratio, though improving, still has a gap to close.

MTP Progress Assessment: KPIs (2)



Improvement since the MTP launch but two additional years needed for target delivery

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The graph on the left shows progress and projection of Net debt/EBITDA and the graph on the right shows progress and projection of ROS.

We expect to achieve both targets in two years.

MTP Progress Assessment: Summary

- Continuously improved operating profit
- Capacity utilization improved as planned
- The VA ratio increasing steadily
- Uneven results between regions and businesses
- Priority: Shift into a business structure to enable stable generation of profits

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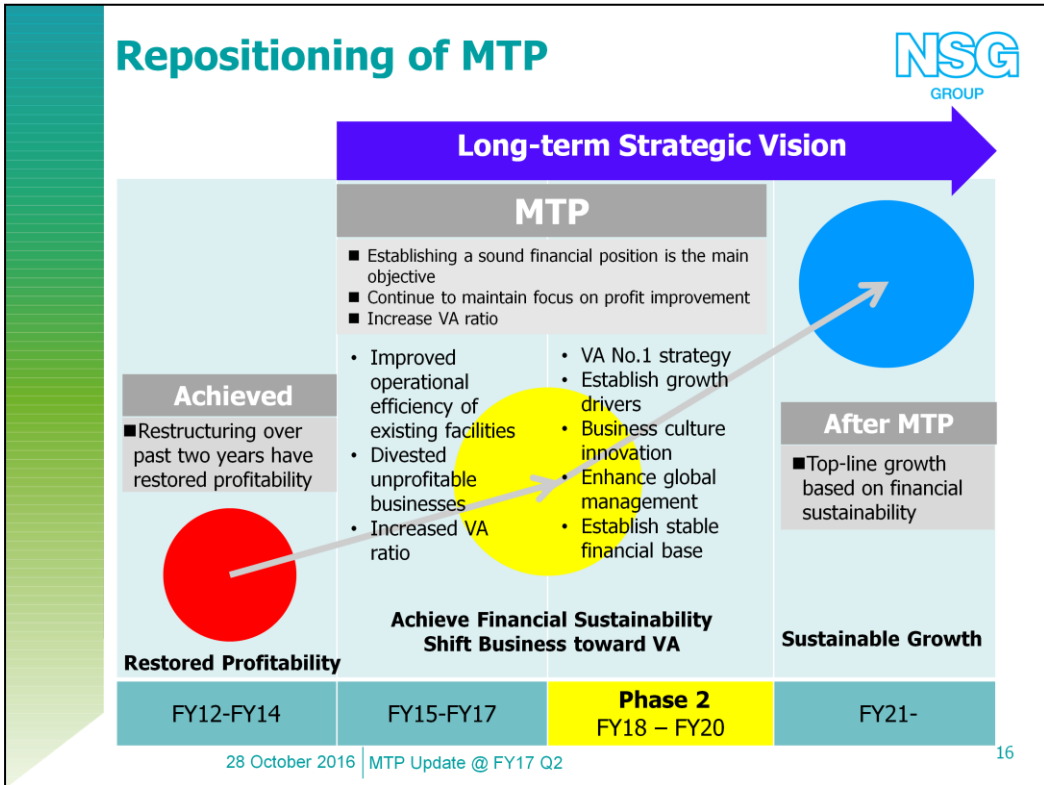
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To recap, the Group's operating profit has been improving continuously since March 2014.

Under the MTP direction, there has been a significant improvement in capacity utilization and VA ratio.

However, our results are not yet uniform between regions and businesses.

Accelerating the shift into a business structure that can generate profits consistently is a priority.



Based on the review of MTP progress so far, the Group will initiate “MTP Phase 2” for a period of three years to achieve financial targets in FY2020.

MTP Phase 2: Basic Strategy



Positioning of MTP Phase 2

- MTP's main objectives – achieving financial sustainability and developing the Group further toward VA Glass Company – remain unchanged, as the basic conditions for achieving the Long-term Strategic Vision of "Transformation into VA Glass Company"
- In light of the MTP progress and changes in business environment, the Group will take more focused approach and proactive measures to ensure the achievement of the MTP financial targets

Basic Policy

- Accelerate and evolve the VA strategy to build a robust profit base for sustainable growth
- Review each work process to develop a leaner business structure

Financial Targets (unchanged): to be achieved in FY20

- ROS: 8% or above
- Net debt / EBITDA: 3x

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The strategy for MTP Phase 2 is based on a clear positioning and basic policy. The original MTP objectives to achieve financial sustainability and drive a shift toward VA remain unchanged as the achievement of these objectives is critical to realizing our long-term strategic vision of "Transforming into VA Glass Company."

However, in light of the actual MTP progress and recent changes in business environment, the Group will take a focused approach to implement proactive measures to ensure the achievement of MTP targets.

The policy behind specific key measures include building a robust profit base for sustainable growth by accelerating VA strategy and making our business structure leaner by reviewing each work process.

There is no change in the financial target of ROS above 8% and Net debt/EBITDA 3x. These goals are to be achieved by FY20.

MTP Phase 2: Key Measures (1)

1. Drive VA No.1 Strategy

- Focus resources on VA shift in the areas with “high growth potential” and “NSG’s core strength” to aim for a leading market position
- Build stronger relationship with customers and speed up actions while considering strategic alliances

The first key measure in MTP Phase 2 is “VA No.1 Strategy.”

The strategy has two components.

One is to aim for a leading market position in the areas with high growth potential where NSG has core strengths.

Another is to enhance relationship with customers while exploring strategic alliances when appropriate.

MTP Phase 2: Drive VA No.1 Strategy



Technical:

Become No.1 or "only one" in global niche areas with NSG's core strength



Architectural & Automotive:

Capture expanding customer needs, respond with proprietary technology

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How can we apply "VA No.1 Strategy" to each of our businesses?

In the architecture and automotive businesses, that will mean capturing expanding customer needs and responding to them with NSG Group's proprietary technology.

Specifically, our unique products and technology, such as SPACIA® vacuum glass, coating technology for thin-film solar glass, advanced press bending for automotive glass represent the areas of NSG Group's core strengths where the leading market position will be pursued.

As for Technical Glass where we are already No.1 or "only one" in some areas, we will continue to drive the strategy to build a global niche position in the areas of our core strength, including glass cord and information device.

MTP Phase 2: Key Measures (2)



2. **Establish Growth Drivers**

Accelerate generation of new profitable growth with focus & selection

Architectural: Realize high VA in energy saving/generation, health/hygiene and design/visibility

• Solar glass, coated products
SPACIA®



Automotive: Deliver new values in automated driving & connected cars, UV/IR block and light weight

• Complex shape, camera/sensor ready
light weight, HUD, heat wave reflection
wired HWS, anti-fog, glass antennas



Technical: Generate new businesses in advanced thin glass, communication devices, high-strength glass cord and super glass paper for separator



Cover glass



Communication devices



Glass cord



Battery separators

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The second key measure for MTP Phase 2 is to establish several drivers for growth by focusing resources on select candidates in our R&D to accelerate their market launch, or expand sales of the already launched products.

Some of the products mentioned in our VA No.1 Strategy are expected to make significant contributions to our future growth.

For architecture, solar glass, coating glass, vacuum glass and OptiWhite appear promising in the areas of saving or generating energy, health and hygiene, design and visibility.

For automotive, complex-shaped glass and other products designed for automated drive/connectedness, UV and IR block and lighter weight are expected to offer new values.

For technical glass, new technological applications and products in high-strength cover glass, information device, glass cord and battery separator appear promising.

MTP Phase 2: Key Measures (3)

3. Business Culture Innovation

- Continue to optimize each work process towards a leaner business structure
 - Enhance “*monozukuri*” – manufacturing excellence
 - Optimize global R&D structure based on customer viewpoints
 - Strengthen customer-oriented marketing

4. Enhance Global Management

- Advance global management to achieve the Group’s optimization
 - Drive talent development, promote employee diversity
 - Enhance faster decision-making with flexible organizational management
 - Continue to reduce cost across the Group

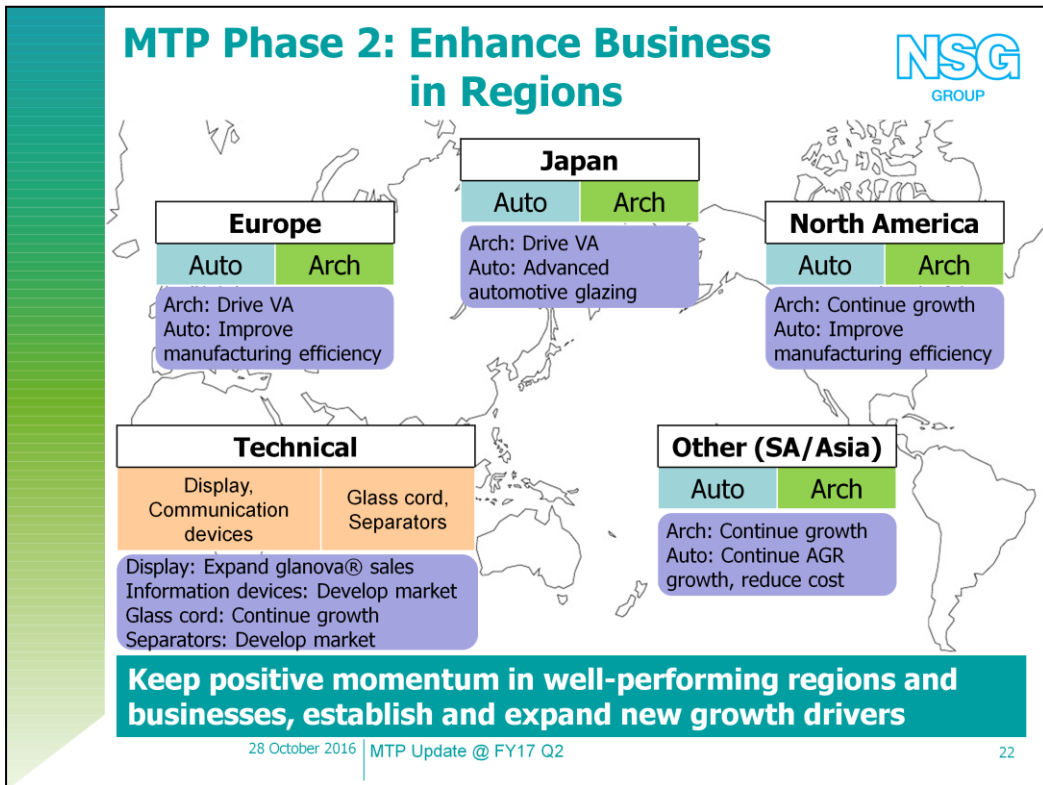
In addition to the measures directly driving business growth, we will promote innovation in our business culture and enhance the effectiveness of our management globally.

Key actions for business culture innovation are aimed at:

- Building a leaner business structure
- Driving manufacturing excellence in each region
- Reflecting more customer viewpoints in global R&D; and
- Strengthening customer-oriented marketing.

Key actions for global management are aimed at improving the effectiveness of our management at local, regional and global level to realize the full potential of the Group as a whole.

This will be achieved by driving talent development, promoting employee diversity, improving management flexibility for faster decision-making and continuing to reduce cost across the organization.



Here is an overview of how we will expand our business in each region during MTP Phase 2.

In Europe, we will drive VA in architecture and focus on the improvement of manufacturing efficiency in automotive.

In Japan, we will expand high-performance glass in automotive and continue to drive VA in architecture.

In North America, we will continue the exceptional growth in architecture and work on the improvement of manufacturing efficiency in automotive.

In the rest of the world, including South America and Asia, we will continue to drive the favorable momentum in architecture and reduce automotive cost in response to a market downturn while seeking growth in after-market repair.

And in Technical Glass, we will expand sales of glanova®, a high-strength cover glass for display and generate new demands and growth opportunities in glass cord, battery separator and information device.

Summary

- An additional two years to the original MTP period is needed to achieve the MTP financial targets
- The original MTP financial targets remain unchanged; the Group will designate the three years from FY18 to FY20 as MTP Phase 2 to execute measures to achieve the targets
- During MTP Phase 2, the Group will drive the "VA No.1 Strategy," "Establishment of Growth Drivers", "Business Culture Innovation" and "Enhancement of Global Management"
- Drive for No.1 position in VA, including coated products and solar glass in Architectural, advanced automotive glazing in Automotive, and glanova®, glass cord and battery separators in Technical to achieve the MTP targets and continue to improve its financial position

To summarize:

Since the MTP's start 2.5 years ago, operating profit has been improving year on year as a result of solid execution of key measures.

However, two more years beyond the original MTP period (FY15 to FY18) are needed to achieve the numerical targets.

The original MTP targets remain unchanged and we will designate the three-year period from FY18 to FY20 as "MTP Phase 2" to execute additional measures to achieve the targets.

During "MTP Phase 2," we will initiate several key measures, including "VA No.1 Strategy," "Establishment of Growth Drivers," "Business Culture Innovation" and "Enhancement of Global Management."

NSG Group will drive for No.1 position in VA, including coated products and solar glass in architectural glass, advanced glazing in automotive, glass and glanova®, glass cord and battery separators in technical to achieve the MTP financial targets and continue to improve its financial position.

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