

**Denka**

Possibility  
of  
chemistry

FY2022 Results Presentation Topics  
Launch of Mission 2030 Management Plan and  
Growth Strategy for Silicon Nitride and  
G47 $\Delta$ , Oncolytic Herpes Virus May 11, 2023

## 1 Launch of Mission 2030 Management Plan

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- a) Path Toward 2030
  - b) Definition of Three-Star Businesses
  - c) KPI Progress Management
- (Reference) Major Financial / Non-financial KPIs in the Mission 2030 Management Plan
- (Reference) Detail of Megatrends Incorporated in the Mission 2030 Management Plan

## 2 Silicon Nitride Growth Strategy

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- a) Silicon Nitride Business (Powder and Substrate) Supply Chain
- b) Silicon Nitride Market Growth
- c) Future Outlook

## 3 G47Δ, Oncolytic Herpes Virus, Business Development Strategy

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- a) G47Δ Overview
- b) Background of Entering Oncolytic Virus Business
- c) What is Oncolytic Virus Therapy?
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- e) Future Outlook

# Launch of Mission 2030 Management Plan

■ Specialty businesses grew under the Denka Value-Up initiatives

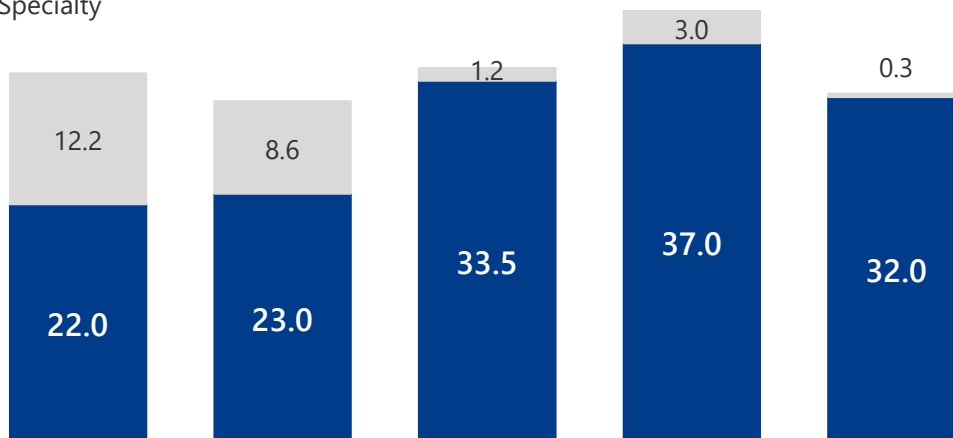
Under Mission 2030, we will concentrate management resources on our Three-Star Businesses to achieve further growth

Denka Value-Up (FY2018-FY2022)

Mission 2030 (FY2023-FY2030)

	FY2018	FY2019	FY2020	FY2021	FY2022	FY2026 (Plan)	FY2030 (Plan)
Operating Income (¥ billions)	34.2	31.6	34.7	40.1	32.3	60.0	100.0 or more
Operating Margin	8.3%	8.3%	9.8%	10.4%	7.9%		15.0% or more

■ Non-Specialty  
■ Specialty



Turn All Businesses Into *Three-Star Businesses\** by 2030

\*Three-Star Business: Businesses incorporating three elements of specialty, megatrends, and sustainability businesses

■ We will move forward with a portfolio shift for products not on track to meet the three elements by FY2030

Three Elements	Definition	Objective
<p><b>Specialty</b></p>	<p><b>ROIC by Product &gt;10%</b>                      (Past Three-Year Avg.)</p>	<p>To emphasize capital efficiency, in addition to profits resulting from market share, uniqueness, and technological capabilities (number of patents)</p>
<p><b>Megatrends</b></p>	<p><b>Three Applicable Focus Areas</b>                      (ICT &amp; Energy, Healthcare, and Sustainable Living)</p>	<p>Businesses judged to have growth potential if said business corresponds to the three focus areas derived from identified megatrends</p>
<p><b>Sustainability</b></p>	<p><b>Less Than 10,000 Tons of CO<sub>2</sub> Emissions by Product</b>                      and  <b>Labor Productivity by Product &gt; 5 Million Yen</b></p>	<p>CO<sub>2</sub> emissions must be included, as emissions represent clear KPIs toward a 60% reduction in 2030 and carbon neutrality in 2050                      In addition, businesses having low labor productivity will find it difficult to continue operations due to the future decline in the working population</p>

## ■ Establish a management mechanism and strive to achieve KPIs as a united Denka Group

### Portfolio Transformation Committee

#### (Overview)

Chaired by the president, the committee deliberates on measures to achieve 100% Three-Star Businesses across our organization

#### (Progress and Future Steps)

- Assigned star ratings for each product (updated annually)
  - Address products that are one-star and unprofitable during FY2023
- Determine policy within 3 years

### Sustainability Committee

#### (Overview)

Chaired by the president, and with the chairperson, outside directors, and full-time Audit Committee members as observers, the committee deliberates on progress and initiatives related to non-financial targets and KPIs under the Mission 2030 management plan, and makes recommendations when warranted

#### (Future Steps)

- The Administration Department reports twice a year on the status of activities and progress of KPIs
- Business divisions report once a year on responses to risks and profit-earning opportunities with respect to sustainability issues

### Incorporate Personal Goals Into the *Mission 2030* Management Plan (Internal Acceptance)

#### (Overview)

- Each department head incorporates the financial and non-financial KPIs of Mission 2030 into clear organizational goals, and each employee incorporates these organizational goals into personal goals for which they will be evaluated

#### (Objective)

- To break down ROIC into profitability and capital efficiency (CCC, etc.) elements, tying the achievement of KPIs to everyday workplace operations to ensure these KPIs are internalized by employees

2030 KPI Targets

Financial	Operating income	¥100 billion or more	Operating margin	15% or higher
	ROE	15% or higher	ROIC	10% or higher
	Approved investment amount	¥540 billion (8 years from FY2023 to FY2030)	Total Return Ratio	50% level
Non-financial	CO <sub>2</sub> emissions	60% reduction compared with FY2013 (1 million tons)	Maximum output of renewable energy power	150MW
	Rate of lost-worktime injuries: (Number of deaths and injuries ÷ Total hours worked × 1 million)	0.2 or less	Managerial positions occupied by women, foreign nationals, and mid-career hires	50%

Business Segments and *Mission 2030* Megatrends (Breakdown of Operating Income Targets)

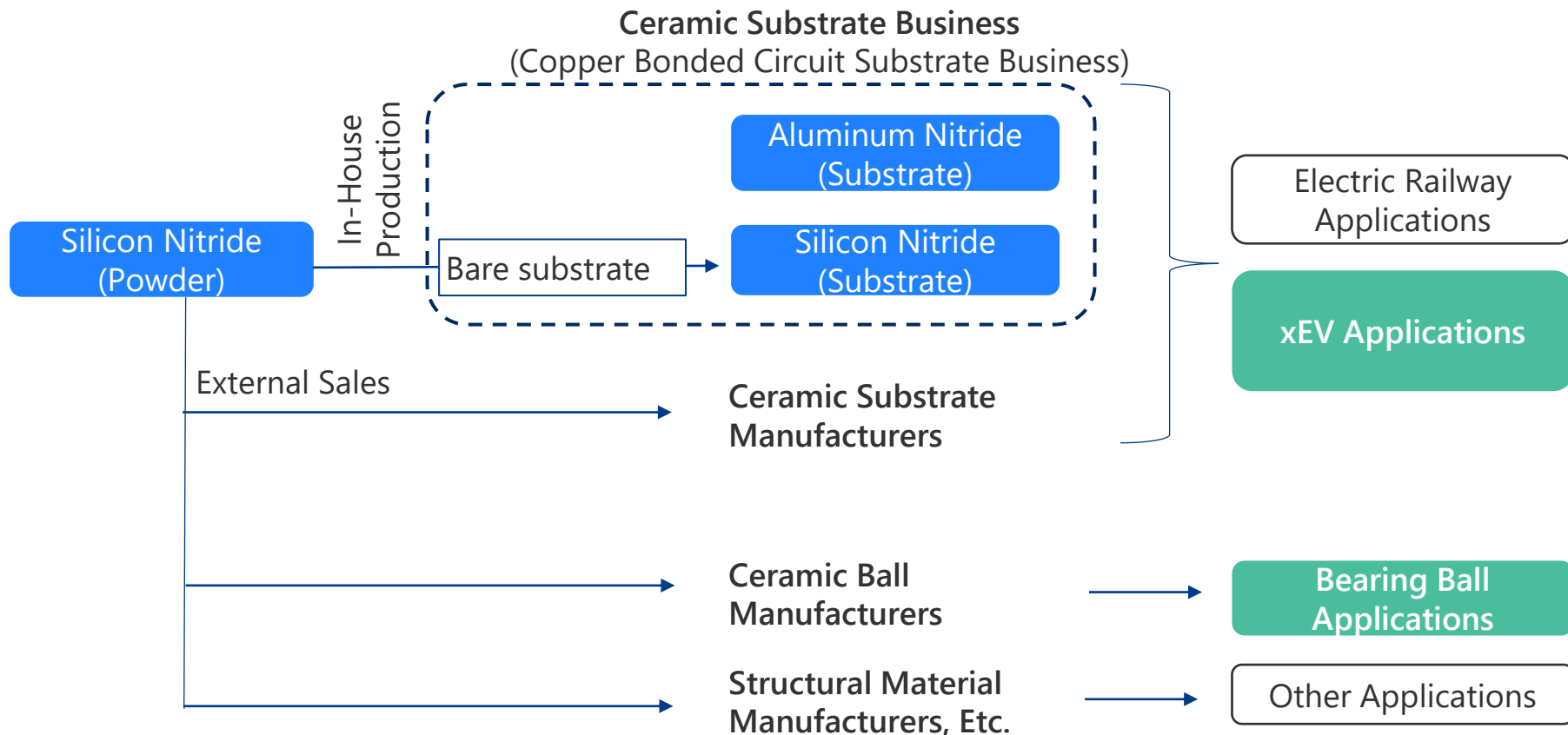
Segment	FY		Management Plan: Three Megatrend Areas	FY		(¥ billions)
	2026	2030		2026	2030	
Electronics & Innovative Products	30.0	45.0	→ ICT & Energy	30.0	45.0	
Life Innovation	20.0	40.0	→ Healthcare	20.0	40.0	
Elastomers & Infrastructure Solutions	3.0	5.0	→ Sustainable Living	10.0	15.0	
Polymer Solutions	7.0	10.0				
<b>Total</b>	<b>60.0</b>	<b>100.0</b>	<b>Total</b>	<b>60.0</b>	<b>100.0</b>	



# Silicon Nitride Growth Strategy

Silicon Nitride Business (Powder and Substrate) Supply Chain

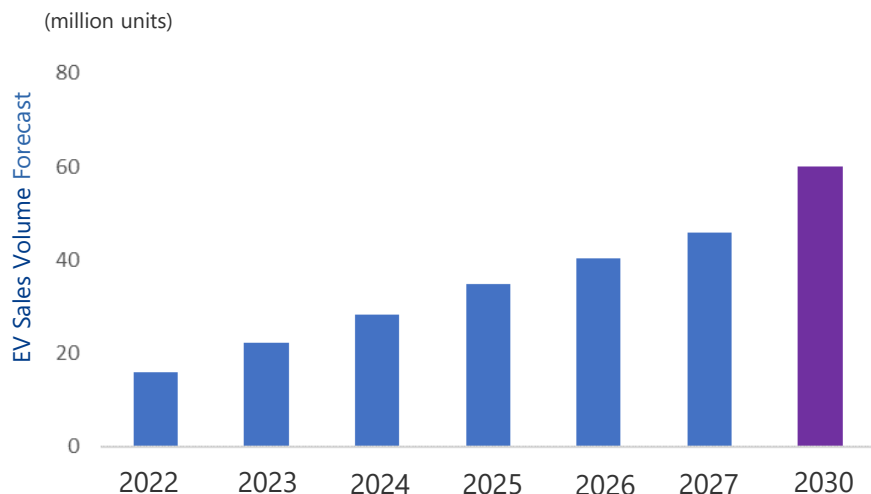
(by Market Application)



**Blue Box** : Manufactured and Marketed by Denka

**Green Box** : Growing Market

### xEV Heat Dissipation Substrate Applications

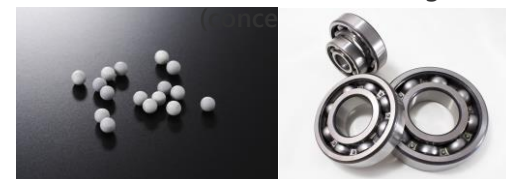


- Silicon nitride substrate is used as insulating substrate for inverter power modules in connection with the electrification of automobiles.
- The replacement of other insulating materials with silicon nitride is also progressing in connection with higher efficiency, etc.
- Adoption of silicon nitride substrate will continue to increase.

### Bearing Ball Applications

- EV trends are leading toward extended cruising range and shortened charging time, which increases withstand voltage.
- As a result, take measures to avoid the risk of electrical corrosion are necessary, and the adoption of ceramic balls meeting safety and reliability requirements for EVs is accelerating worldwide.

Silicon nitride ball and bearing



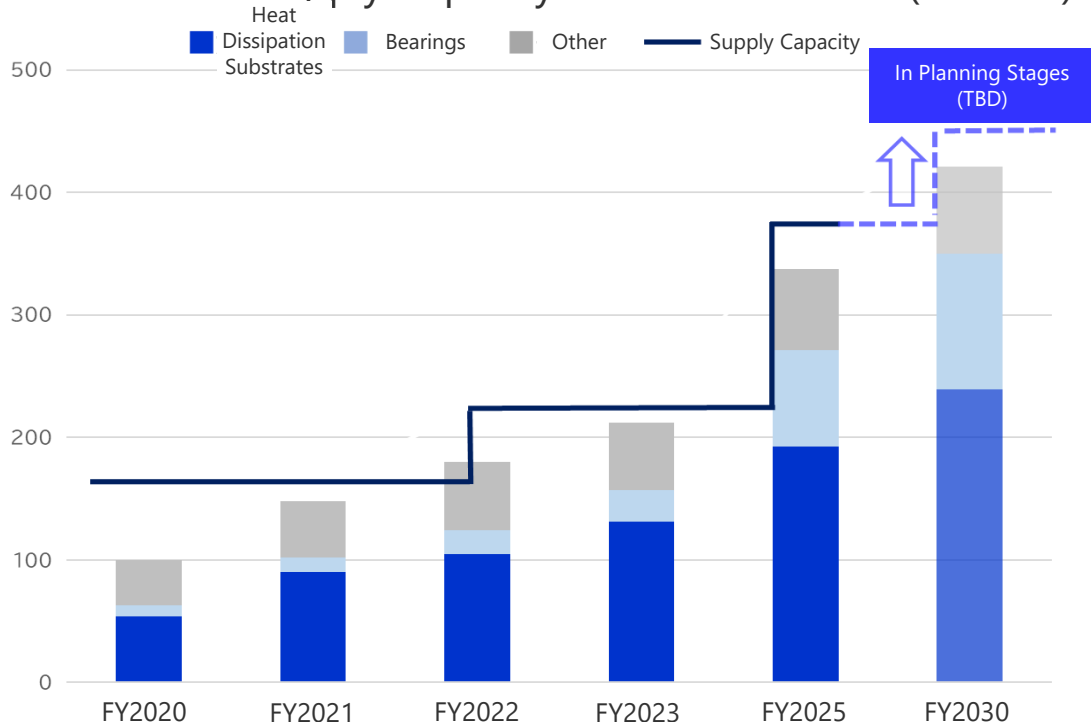
Silicon Nitride (Powder)

(Our Strengths)

- Reliable quality and cost-effective performance that answer keywords required in the xEV (automotive) market: heat dissipation, light weight, high rigidity, and long useful life
- We enjoy an overwhelming supply capacity to meet strong market demand.

(Future Outlook)

Demand and Supply Capacity for Silicon Nitride (Powder)



\*Trends in demand and supply capacity, indexing FY2020 demand to 100

- Expand facilities further to meet the strong xEV market demand (Scheduled to Begin Operations in 2025)
- In addition to high-growth heat dissipation substrate applications, we will also capture applications for bearing balls, which have been under increasing demand in recent years

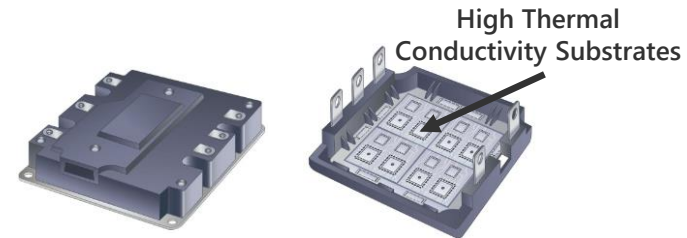
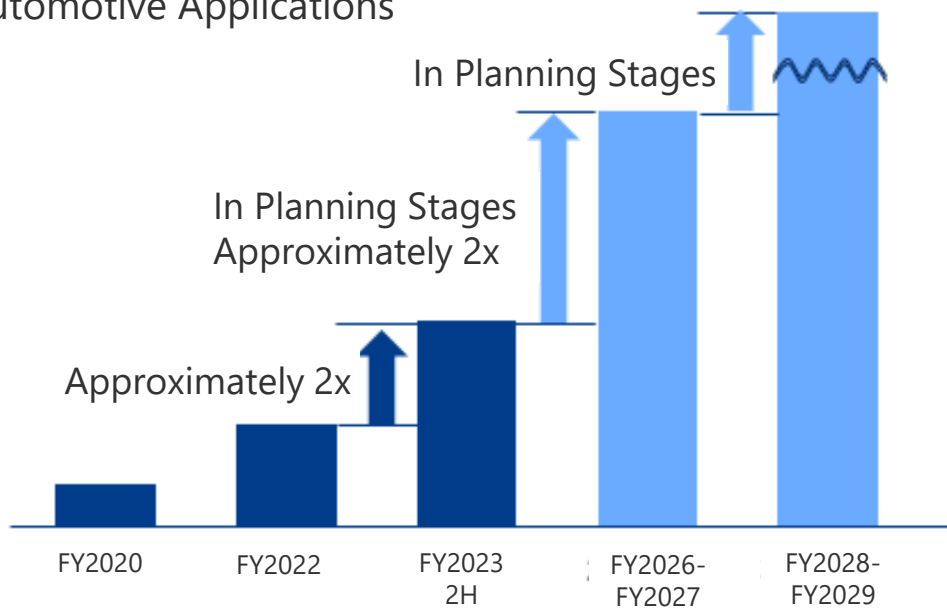
Ceramic Substrates (Silicon Nitride, Aluminum Nitride)

(Our Strengths)

- The only manufacturer that manufactures silicon nitride powder, bare substrate, and copper bonded circuit substrate in an integrated manufacturing process. This advantage allows us to respond flexibly to the characteristics required to achieve higher performance.
- Experience in the electric railway industry, and history of performance in the automotive industry
- The only manufacturer with a lineup of two types of products, aluminum nitride and silicon nitride, allowing us to respond to either thermal conductivity-oriented or reliability-oriented module design

(Future Outlook)

Supply Capacity of Silicon Nitride Ceramic Substrate for Automotive Applications



- Raise capacity to meet increasing demand for automotive products (further expansion planned, including doubling in the second half of FY2023)
- Introduce more high-productivity processes and utilize AI-based inspection systems (Adopting AI to inspect for defective products, a process traditionally handled by human visual inspection)

# G47 $\Delta$ , Oncolytic Herpes Virus, Business Development Strategy

## What is G47Δ?

- G47Δ is triple muted, third generation oncolytic herpes simplex virus type 1, invented by Professor Tomoki Todo of the Institute of Medical Science, the University of Tokyo.
- G47Δ is designed to replicate only in cancer cells and to selectively kill them, while it doesn't replicate in normal cells even if infected.

## Characteristics

- The G47Δ pharmaceutical has been approved for the first oncolytic virus products for cancer treatment in Japan, the second in the world. Being indicated for malignant glioma, it is the first, even in the world, for a viral pharmaceutical against brain tumors.
- The G47Δ is a novel therapy that could potentially cure refractory cancers, which have been difficult with conventional therapies.

## Background of Entering Oncolytic Virus-Business

- With production know-how, which had been nurtured through abundant Vaccines and Viral Diagnostic agents, Denka could scale up commercially producing the pharmaceutical.
- We had experience in legal procedures to handle designing recombinant virus (the Cartagena Protocol) .
- Denka was highly motivated in contributing to saving many precious lives by playing an important role to disseminate the new oncolytic virus therapy, in which effectiveness and safety that exceed conventional therapies could be expected, while the number of cancer patients were anticipated to keep increasing.

2015:	Joint Development Contract on G47Δ Production Process was signed between Denka and the venture company that had licensing right:
2020:	Production and Sales Approval was filed by the Sales Company
June 2021:	Approval was granted with conditions and time limits Indication was malignant glioma
August:	NHI drug price listed. Denka started commercial manufacturing
November:	Sales Company started shipments to a limited number of medical institutions



## c) What is Oncolytic Virus Therapy?

### Disadvantages of Current Standard Cancer Treatment Methods

(Treatment Method)	(Disadvantages)
(1) Surgery	<ul style="list-style-type: none"><li>• Extirpation is not possible depending on cancer location, for example, brain and heart.</li><li>• Heavy physical burdens need to be accepted.</li></ul>
(2) Chemotherapy	<ul style="list-style-type: none"><li>• Frequent side effects throughout the body are observed, and sometimes cancers gain resistance against chemical substances used.</li></ul>
(3) Radiation Therapy	<ul style="list-style-type: none"><li>• Severe damages are given to normal areas, and it cannot be applied to the same area multiple times.</li></ul>

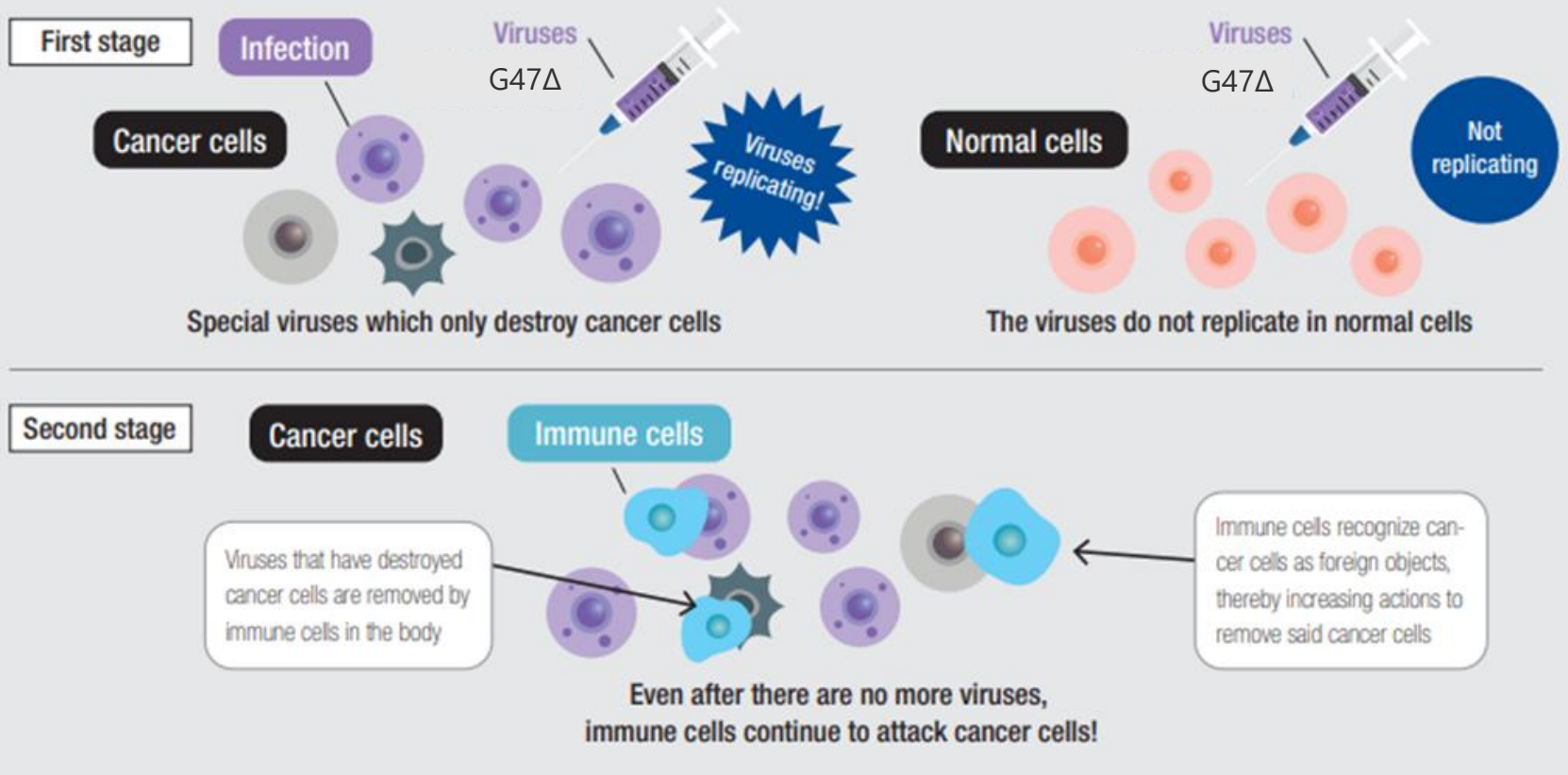
### What is Oncolytic Virus Therapy?

- Oncolytic virus therapy uses wild-type virus that are genetically recombined by genetic engineering.
- It is a completely new therapy from the conventional ones above and is expected to have the potential to change the cancer treatment system fundamentally.

d) Effects of G47Δ

Effects of G47Δ

Two-stage effects of G47Δ, oncolytic herpes virus



## Future Outlook

### (1) Supply Capacity Expansion

(Announced April 12, 2023)

[https://www.denka.co.jp/eng/storage/news/pdf/456/20230412\\_denka\\_g47\\_en.pdf](https://www.denka.co.jp/eng/storage/news/pdf/456/20230412_denka_g47_en.pdf)

Investment : Approximately 12 billion yen

Completion date (tentative) : 1. Phase 1: End of FY2025  
2. Phase 2: Second half of FY2027

- Construction will be conducted in two phases to increase supply capacity as quickly as possible.

### (2) Number of Patients

- The indication currently approved for is only malignant glioma, the number of which annually diagnosed is approximately 3,000 in Japan .
- In foreign countries, there are more than 50,000 in Europe and the U.S. combined. With China and other countries included, significant number of patients are estimated to exist.

### (3) Clinical Studies on Other Cancers

- G47Δ is theoretically effective in any solid cancers, and clinical studies are in progress at multiple domestic universities for other cancers than malignant glioma.

## Cautionary statement regarding forward-looking information

Target figures in this material are not forecasts of business results.

In addition, any description relating to the future in this material is subject to known or unknown risks and uncertainties, although it is based on management's current assumptions and beliefs in light of the information currently available to it. Please be cautioned that a number of important factors could cause actual results to differ significantly from the description in the material.

Such risks and uncertainties include adverse economic conditions, currency exchange rate fluctuations, adverse legislative and regulatory developments, delays in new product launch, pricing, and product initiatives of competitors, the inability of the Company to market existing and new products effectively, interruptions in production, infringements of the company's intellectual property rights and the adverse outcome of material litigation.

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# Denka

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