

Intangible Assets Briefing

Enhancing business models with value centered on intangible assets

December 13, 2024 Asahi Kasei Corporation



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01 Business models with value centered on intangible assets

- Solution-oriented businesses
- Licensing businesses
- Strategy for R&D, IP, and DX
- Strategy for HR



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Overview of Medium-term Management Plan for 2024 focused on the theme "Be a Trailblazer"

Advancing business portfolio transformation and strengthening of the business platform during fiscal 2022–2024



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Progress of MTP (1) Financial Performance

Negative impact of severe operating environment at the beginning, but earnings on a recovery trend in the final year of fiscal 2024





¹ ROIC = (operating income – income taxes) \div average annual invested capital

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Progress of MTP (2) Business Portfolio Transformation

Business portfolio transformation through structural transformation and investment for growth has largely progressed as planned



Progress of MTP (3) Maximum Use of Intangible Assets

Human resources, core technologies, digital technology, and other intangible assets utilized in threesector management



Value creation model utilizing various intangible assets

Achieving two mutually reinforcing aspects of sustainability by leveraging various intangible assets accumulated through business portfolio transformation; creating businesses that exemplify the unique identity of Asahi Kasei while pursuing thorough efficiency



Diverse intangible assets of Asahi Kasei



Further utilization of intangible assets

Advancing transformation to business models with value centered on intangible assets for greater efficiency





Speed

Seizing opportunities and acting boldly while carefully discerning the balance with risks

Asset light

Creating optimal business models/structures without being bound by preconceptions of the process industries

High value-added

Focusing on fields where we can build a competitive position

Building business models with value centered on intangible assets in addition to conventional products and services



Business models with value centered on intangible assets

Promoting solution-oriented businesses and licensing businesses leveraging intangible assets in each sector



Items shown in bold are described in this material

¹ Based on FY24 forecast announced on November 1, 2024, excluding amortization of goodwill from acquisitions

Solution-oriented businesses

Providing optimal solutions to customer issues by utilizing various intangible assets centered on products and services backed by advanced technologies



Features of Asahi Kasei's solution-oriented businesses

Deep insight into customer needs based on **direct networks and trust** with customers

Providing optimal solutions to customer issues through **multiple products and services** (solutions strengthened by complementing products and services that Asahi Kasei does not have **through M&A and alliances**)

3 Establishing business models with **high barriers to entry by leveraging intangible assets** as the source of value for solutions

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Accumulating intangible assets such as data and know-how by providing solutions

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Car interior material

Business model

Centered on *Dinamica* artificial suede, providing value to vehicle manufacturers as a car interior design platform provider with innovative designs and advanced technologies for embellishment and processing



Car interior material business

- Entry into the automotive interior materials business with acquisition of Sage Automotive Interiors in 2018
- Products adopted by many major vehicle manufacturers mainly in Europe and the U.S.
- Advancing development of business platform by establishing optimal production system for each region of the U.S., Europe, Japan, and China



1) Advantageous intangible assets (car interior material)

Customer-specific proposals

Customer-first proposals; relationships of trust

- Separate sales teams for each vehicle manufacturer
- Proposing multifaceted solutions tailored to each customer's vehicle concept
- Deep trust built up over many years

Design

Able to bring customer ideas to fruition

- Outstanding in-house design team to turn concepts of customers' designers into actual products
- Skilled at achieving designs along with performance characteristics such as durability

New material development

Creating new materials based on fabric technology

- Developing new surface materials leveraging technology and expertise accumulated in fabric business
- Comprehensive manufacturing ability including production technology and IP

Designs exuding comfort and prestige



- **Dinamica sales doubled** since acquisition of Sage
- PVC synthetic leather with high growth potential added to product lineup; sales expanded 6-fold in 3 years since launch of JV in China in 2020

Achieving visual effects with advanced designs



• Value-added proposals through design and processing

2) Further utilization of intangible assets (car interior material)



Strengthening the product portfolio in decorative materials and expanding field of provision of value to the entire cabin space by leveraging design capability of Sage and material development capability of Asahi Kasei

Aiming for total automotive interior material business sales of ¥300 billion¹ around fiscal 2030, more than double fiscal 2023 sales

¹ Assuming ¥150/US\$

Ion-exchange membrane process for chlor-alkali electrolysis

Business model

The only company in the industry that provides a one-stop total solution including in-house technology for electrolyzers, membranes, electrodes, cells, and support for optimum operation



Ion-exchange membrane process for chlor-alkali electrolysis

- System using ion-exchange membranes to electrolyze brine to produce chlorine, hydrogen, and caustic soda
- The only company in the industry that provides all constituent technologies (electrolyzers, membranes, electrodes, and cells)
- Electrolyzer adopted at more than 160 plants in 30 countries worldwide
- In 2020 acquired Recherche 2000 Inc. (R2) that develops and sells monitoring equipment and systems for chlor-alkali electrolysis

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1) Advantageous intangible assets (ion-exchange membrane process chlor-alkali electrolysis)

Product technology

Core technologies for electrolysis and membranes, production technology

• Technology for broad product lineup to provide total solutions for production issues at customers

Operational expertise

Knowledge and expertise to deal with unexpected changes in electrolyzer operation

- Continual customer support with sales and technical support teams located at several sites worldwide
- Operational expertise and product technology to identify causes of problems during operation and implement solutions

Customer base

Long-standing relationships of trust with customers

- Knowledge and experience built through 50 years of customer support
- People and teamwork for customer-focused problem solving



Change from conventional sales to solution-oriented business

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2) Further utilization of intangible assets

(ion-exchange membrane process chloralkali electrolysis)

DX for enhanced plant operation and maintenance

- Data-driven services for optimal operation by monitoring
- Creating new services through design thinking and agile development

Customer value	Solutions being provided	Solutions under development
Optimizing maintenance	 Cell rental service (advancing from demonstration trial to service provision) 	 Electrolyzer maintenance program, app for service and maintenance Rental of renovated cells
Avoiding	 Operation monitoring/	 Problem-prediction software for
problems	analysis software	membranes
Optimizing	 App for calculating	 Operation control software to
operating	current efficiency of	adapt to power price fluctuations App for optimal current
conditions	each cell	distribution to each cell

Application to hydrogen-related business

- Applying accumulated customer base, technology, and service platform to alkaline water electrolysis
- Alliances with various partners based on long track record

Example:

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Business emphasis on customer experience

De Nora¹

Long-term global leadership in electrolysis

- Started joint development, evaluation, and sale **of small-scale** electrolyzers
- **Reinforced product lineup** and enhanced services for new customers



Targeting sales of ≈¥100 billion in the hydrogen business around 2030, followed by further global expansion as a key player in the industry

(commercialization scheduled in 2025; targeting orders in Japan and Asia to build track record of installation and operation) ¹ World's largest-scale supplier of functional catalyst coatings and insoluble electrodes for electrochemical and industrial applications

Critical Care

Business model

A market leader with innovative medical devices in the area of serious cardiopulmonary conditions; strong network with cardiologists through sales of *LifeVest*



Critical Care

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- LifeVest wearable defibrillator, an innovative medical device, as a flagship product; market penetration by strengthening relationships with cardiologists while emphasizing clinical value
- Acquisitions of Respicardia, Inc. and Itamar Medical, Ltd. in 2021; gained innovative devices to treat and diagnose sleep apnea, which often occurs in patients with heart disease



1) Advantageous intangible assets (critical care)

Position in the field

Firm market position

- Specialized knowledge and clinical value accumulated with LifeVest for over 20 years
- Network and trust with cardiologists and health insurance organizations

Operational expertise

Operation supporting unique products

- Operational excellence accumulated over many years (e.g. fitting completion rate of >99% within 24 hours of order receipt)
- Corporate culture originated as a startup company of constantly taking on challenges, continuing to improve, and developing human resources

Established evidence

Evidence of efficacy and safety

- Algorithm to accurately detect changes in cardiac function (clinical data accumulated over 20 years, and evidence obtained from long-term tracking provide advantage over competitors)
- Able to update the product utilizing data science and machine learning based on accumulated data



- Wearable defibrillator for patients at elevated risk of sudden cardiac arrest
- **Product overview** • If life-threatening arrythmia is detected, defibrillating shock is administered within about a minute
 - Providing further added value by expanding functions through continuous data collection



• Worn by more than 1 million patients around the world, saved thousands of lives since launch over 20 years ago

2) Further utilization of intangible assets (critical care)

Expanding sleep apnea business

In addition to established connections with sleep specialists, collaboration with the *LifeVest* team allows connections with cardiologists, enabling development of potential market of undiagnosed patients





Applying the *LifeVest* business model

With at-home medical care expected to expand in various fields, **the major success factors of at-home medical care** that have been built up over many years may be applied to other businesses over the medium to long term; **investments in several startup companies**



Expertise

- Negotiations with regulatory authorities and health insurance organizations
- Technology for patient care with remote monitoring
- 24-hour, 365-day support system/emergency response
- Analysis of data collected from medical devices

Gaining potential business opportunities in the field of cardiopulmonary and respiratory diseases as populations age and medical technology advances

Targeting sales of \$4 billion (≈¥600 billion¹) around 2030, approximately double fiscal 2023 sales

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Overseas Homes

Business model

An integrated construction system provided to builders by combining the main steps of the construction process; unique business model bringing greater efficiency to construction sites and higher quality to homes in North America



North American Homes

- Lateral integration of subcontractors to home builders by acquiring companies with proven track records in Arizona, Nevada, and Florida
- **Consolidating five main structural steps** that are usually contracted separately; expanding business by shortening construction periods and improving work efficiency at construction sites in North America, where construction periods are long



¹ Total for North American and Australian Homes

1) Advantageous intangible assets (overseas homes)

Expertise to shorten construction periods

Manufactured home assembly technology and expertise

- Applying advanced manufactured home expertise to achieve innovations in North American home construction (construction period reduction of up to **50%** or more compared to average)
- Starting construction period guarantee service

Quality control expertise

Unified quality control method

- Synergos manages progress on behalf of the builder; with unified management of different process steps, responsibility is clear when flaws occur
- Applying worksite management expertise to reduce material usage by eliminating waste, raise quality through tidiness, etc.

Diverse human resources

Problem-solving ability, consensus-building ability

 Leadership for drawing together diverse acquired companies focused on results in solving customers' problems and executing strategy

Providing the value of shorter construction period through unified management of the 5 main process steps

Home construction process





Eliminating wasted time between each step, improving efficiency and quality by systematization



2) Further utilization of intangible assets (overseas homes)



Expanding to Florida following Arizona and Nevada, states with high demand for homes (FY24 acquisition of ODC Construction, LLC)

Targeting sales of ¥500 billion around 2030 (approximately double fiscal 2023 sales) for North American and Australian homes businesses combined



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Examples of licensing: Production processes using CO₂ as raw material

Contributing to global low-carbonization world by licensing production processes that use CO₂ as a raw material to chemical manufacturers worldwide

Intangible assets			Provision of value	Applications
Licensing technology and know-how for stable operation based on process technology using CO ₂ as raw material			Licensing to chemical	Manufacturing plants for components of LIB electrolyte
Example 1	Licensing technology and know- how from plant construction to			
for components of LIB electrolyte	stable operation Technology being licensed Technical support and training • Providing a process design package • Providing IP rights and technological know-how	Contributing to CO ₂ reduction for chemical manufacturers	CO ₂ consumption: 110,000 tons/year (commercialized in 2021)	
Manufacturing technology for polycarbonate				polycarbonate
Process technology utilizing CO ₂ × Ultra-precise refining technology	 Operator training and practical analysis training Quality assurance and safe operation Assurance of plant performance and quality Utilizing remote technology 	ng y	 Advanced production technology Larger plants Improved production efficiency 	CO₂ consumption: 200,000 tons/year (commercialized in 2002)

New form of licensing business (TBC)

TBC: Technology value Business Creation

Generating earnings through both "speed" and "asset light" factors by gaining value from intangible assets (patents, know-how, data, algorithms, etc.) comprising Asahi Kasei's vast accumulated technology by providing them in various forms not limited to licensing



TBC example #1: Lithium-ion capacitor (LiC) technology

Providing technology license package with patents and technological know-how centered on proprietary developed lithium pre-doping technology; multiple projects in progress, aiming to obtain earnings from the R&D stage



TBC example #2: High ionic conductive electrolyte technology

Achieving high battery performance through co-creation with battery manufacturers utilizing IP for high ionic conductive electrolyte technology; discussions in progress with battery manufacturers, aiming to commercialize and expand quickly

In	tangible assets	Provision of value	Application examples
Electrolyte with higher ionic conductivity than conventional electrolyte leveraging energy storage and material technologies of Asahi Kasei - Proof of Concept (PoC) performed jointly with a battery manufacturer		Licensing to LIB manufacturers	EV
Development of high ionic conductive electrolyte	Development of high ionic conductive electrolyte		
	Provision of IP licenses For the second secon	Wider operating temperature range	
		Smaller size	 Extended driving range Longer range at low temperature Longer service life at high temperature
Electrolyte composition design technology × Membrane separation technology		Lower cost	

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R&D Combining various core technologies

Asahi Kasei's distinctive portfolio of core technologies has been continually burnished through a century of new business creation



R&D Integrating tangible and intangible assets

Creating businesses with combinations of diverse core technologies and leveraging intangible assets in R&D

R&D concepts

 Shifting from R&D centered on tangible assets (capex) to R&D integrating tangible and intangible assets (IP, DX, etc.)

2) R&D fields aligned with GG10 strategies

Future manufacturing value provision

3) extending from Health Care Sector to Material Sector

R&D to drive business transformation
4) leveraging differing technologies and insight of the 3 sectors

ledium to long-term subjects for business creation				
		Business contribution period 20	030	2040
Core technology	 Polymers Compound semiconductors 	Electronic materials Next-gen semiconductor materials Ult AIN	t ra-wide bandgap semico substrate, power semiconductors, UV	nductors ′C laser diode
	PolymersFibers	Multimaterials CRS, CNF, resin glazing, etc.	Sustainable polymers Cellulose, recycled, long-life	
	 Catalysts Inorganic synthesis Chemical processes 	CO₂ chemistry Special isocyanates	Sustainable chemistry Bio-based feedstock	
	 Electrochemistry Polymers Membranes and separation 	Batteries Electrolytes, lithium doping Hyd	drogen rogen production	
	 Membranes and separation Biotechnology 	Separators Wet-process, dry-process Bioproc FO/MD met	:ess mbrane systems	

IP Timely alignment with corporate/business strategies

The Intellectual Property Intelligence Department was established under the supervision of Executive Officer for Corporate Strategy in April 2022 to accelerate the utilization of IP and intangible assets throughout the Asahi Kasei Group



Strategic planning and execution for 10 Growth Gears through utilization of IP and intangible assets

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IP Proactive IP strategy

Proactive IP strategy promotes portfolio transformation by 1) advancing businesses through IP landscaping, 2) increasing the number of DX-related patent applications for solution-oriented businesses, and 3) initiatives for IP licensing



2) Increasing the number of DX-related patent applications

Increasing the number of DX-related patent applications that provide customer value, a key for solution-oriented businesses



3) Active IP licensing

Promoting IP licensing focusing on co-creation businesses and monetization



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DX On-site initiatives

Entered the Digital Normal Period where all employees work with mindset of digital technology utilization



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DX Maximum use of intangible assets

In addition to conventional DX measures, promoting the use of intangible assets for acceleration of solution-oriented businesses, etc., from a digital perspective

Major DX promotion measures

Enhancing management

Group-wide projects	 Visualization of management status and carbon footprint 	
Shared value chain subjects	 Sales, marketing, customer support Materials informatics (MI) and other R&D-related Smart factories and other production/ manufacturing-related Quality assurance 	
Reinforcing digital foundations		
HR/organizations	 Planning and operation of program for fostering digital personnel Establishing a system and organizational culture to accelerate DX 	
Data/security	Development and operation of core systems	

• Establishment of company-wide security platform

Additionally

Accelerating solution-oriented businesses

Enhancing ability to discern and apply digital technology

Maximizing the value of licensing businesses

Core technology/production technology × Digital technology nurtured in development

+

Generative AI deployed and accelerated company-wide

04 Strategy for R&D, IP, and DX

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DX Accelerating intangible asset utilization with generative AI

Generative AI is used in over 50 projects to improve business process efficiency, strengthen competitiveness, and reduce risks; now working to consolidate data, information, and expertise across business units

Strengthening competitiveness

Creating new value by developing AI models tailored to our company

- New product development by finding new applications
- Utilizing sales record analysis for customer proposals and product development
 - Alliance partner selection
 - Human resources matching

Reducing risks

Examples

Reducing business risks by analyzing vast amount of accumulated data and know-how

- Improving safety and strengthening compliance by passing on skills
- Achieving both quality and efficiency in quality management



Greatly contributing to strengthening and expanding each business

by fully utilizing the valuable intangible assets of the 3 business sectors





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Active engagement of diverse human resources

Human resources with diverse work experience, expertise, and capabilities are actively engaged across different businesses and different sectors



Asahi Kasei's corporate mission and culture attract diverse human resources

Co-creation by diverse personnel (1)

Car Interior Material





 \Box

Obtained through M&A; specialist in platform business

- Outstanding leadership with strategic execution capabilities
- Connecting Sage's platform vision with Asahi Kasei's products, technologies, and human resources



Well-versed in needs for artificial suede and fibers; outstanding on-site capabilities

- Experienced in trading, sales, and overseas assignment in fibers
- Building deep relationships of trust with customers based on understanding of the business and customer needs

lon-exchange membrane process for chlor-alkali electrolysis



Mid-career hire with marketing and business planning skills

- Extensive trading experience in previous employment at trading company
- Experience at Asahi Kasei in technology planning, marketing, new business development, photosensitive materials, etc.



Group Master specialized in electrolysis membranes

- Managing the business as Division Head while serving Lead Expert in electrochemistry
- Deep understanding of the business and customers through experience in material/system development, sales, and overseas posting

Co-creation by diverse personnel (2)

Overseas Homes





Transforming the U.S. home-building business

- Long experience in financial management of a home builder
- Shares Asahi Kasei's vision for home construction



Led overseas expansion of the Homes business after experience with M&A in corporate function

- Experience with new product development and sales to building contractors and home builders when working in Construction Materials
- Experience with M&A in Material sector when working in Corporate Strategy

TBC*





Expert in utilizing intangible assets who led the IP business of IBM

- Served Chief Technology Officer and led the IP business of IBM
- Capable of objectively evaluating the potential of Asahi Kasei's intangible assets



Leading the TBC Project with profound knowledge of R&D

- Responsible for data science and digital technology promotion in R&D
- Leading materials informatics while promoting DX in R&D

HR strategy of Asahi Kasei

Strengthening businesses with intangible assets by heightening co-creativity while leveraging diversity



Strengthening professional human resources: Expanding the Group Masters program

Originating with R&D specialists in the Material sector, the program includes highly specialized human resources in each of the three sectors; in the current MTP, it was expanded into fields such as marketing, IP, finance, and digital innovation



Strengthening professional human resources: Enhanced recruitment strategy

Actively recruiting human resources with diverse experience and backgrounds

Personnel with doctoral degrees

- Currently 373* personnel hired with doctoral degrees, and around 15–25 hired annually (approximately 15% of new graduates hired in technical fields)
- Personnel with doctoral degrees are assigned to recruitment
- Personnel with doctoral degrees may be assigned to unrelated fields
- Some personnel earn doctoral degrees after being hired

Technical college graduates

 Annual hiring of around 50–100 (among the highest in Japan)

- ✓ Active roles in manufacturing and R&D
- Many working as General Managers and Senior General Managers after demonstrating management aptitude

Mid-career hires

- 362 mid-career hires in fiscal 2023 with mid-career hire rate of 50%
- Accounting for of 16.3% managerial positions in Japan
- ✓ Diverse recruitment from various industries and fields
- ✓ Many are Group Masters (Experts), who lead in various fields

Co-creation across fields by leveraging high level of expertise Key personnel straddling on-site skill and management ability

Spurring innovation with external knowledge and different values

Corporate culture of joining individuals: Leveraging human resources across organizations

Personnel transfers across business units and utilizing a talent management system to visualize human resources

Strategic personnel transfers

Expert employee recommendation system "SPACE"

Utilizing IP information to identify internal specialists and support the creation of innovation



Talent management system "CaMP"

Visualization of employee skills, experience, and career goals; used by managers and HR for organizational management and personnel allocation

Autonomous career development

Open position posting system

Since its launch in 2003, some 500 personnel have been transferred through the system (around 70 out of 200 applicants transferred in 2023)

Testing a more advanced talent matching platform using generative AI

Conducting internal trials of a system that enables more advanced searches by creating a database of various information related to people, such as work experience, knowledge, and qualifications; aiming to create a platform that allows full engagement of all diverse employees





Testing additional options such as internal concurrent assignments and external crossboundary experience

Asahi **KASEI Corporate culture of joining individuals: Energizing organizations** through leader development

Strategically developing human resources as future management candidates while firmly advancing **DE&I** initiatives

Program for developing next-generation leaders

Implementing training program to strengthen leadership and teamwork for candidates to be Executive Officer (among General Managers and Senior General Managers) Started in 2019, currently with 90 candidates to be Executive Officer (triple the expected requirement)

Keys to developing next-generation leaders

- Fostering candidates to be both Executive Officers and business division leaders is essential
- Encouraging **motivation and action for further growth** by implementing the program across all 3 sectors

Active engagement of diverse human resources

Promoting **DE&I**

- Enhancing active participation of women and global human resources
- Leader for DE&I hired from outside of the company to promote diversity



Joined Asahi Kasei in 2023; worked for a major non-life insurance company and seconded to the Ministry of Economy, Trade, and Industry serving as Director of the Economic and Social Policy Division, Economic and Industrial Policy Bureau

General Manager, DE&I Promotion, Human Resources; Managing Executive of Asahi Kasei

Material



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Creating for Tomorrow

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