TOSHIBA
Leading Innovation

Environmental Vision 2050

Innovation: technology, resource productivity and industrial policy

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Toshiba of Europe Limited

12-13 Sep. 2017
The 9th LCS-RNet Annual Meeting in Warwick, UK

LCS·R Net

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- Toshiba overview
- Environmental vision 2050
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About Toshiba Group

Company Name: TOSHIBA CORPORATION

HQ Address:
1-1, Shibaura 1-chome, Minato-ku, Tokyo, Japan

Founded: July 1875

Common Stock: ¥200,000 million

Net Sales: ¥4,870.8 billion (As of June 23, 2017)

Number of employee: 153,492

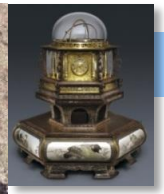
History of Toshiba

田中久重
田中製造所を東京銀座
煉瓦街（現・８丁目）
に設立

142 yrs

64 yrs

78 yrs



1875

1904
芝浦製作所

1890

藤岡市助
白熱舎を
東京京橋に設立

1899
東京電気

1939/7

1939
東京芝浦電気㈱

1939/8

1950

1960

1984
㈱東芝

1982

2002

2006

2017

Toshiba Firsts of Their Kind (Example)

①Japan's first induction motor
②Japan's first electric washing machine and electric refrigerator
③Japan's first electric rice cooker
④Japan's first color TV

1875

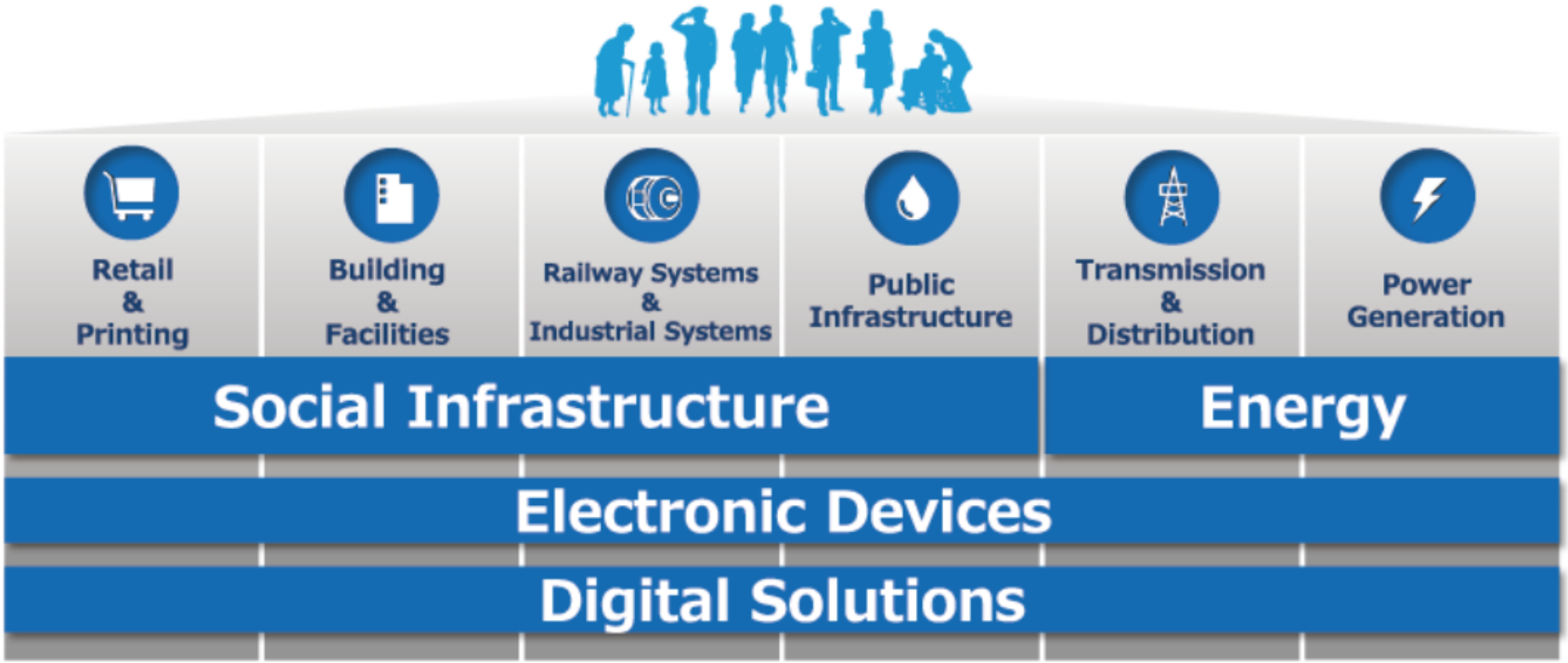
2017

1890

⑤World's first mail processing equipment
⑥World's first laptop PC
⑦World's first large-capacity ultra-supercritical-pressure steam turbine
⑧World's first 4Mbit NAND-type electrically erasable and programmable read-only memory

Vision

**Toshiba will contribute to a sustainable society by focusing on business domains,
centered on infrastructure, that sustains modern life and society
and create new value with reliable technologies.**



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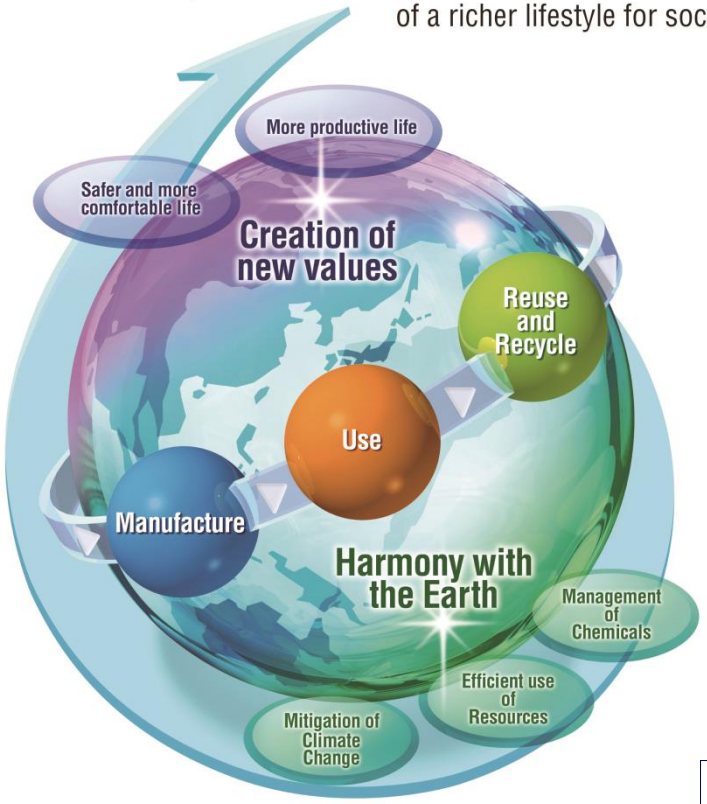
Environmental Management of Toshiba Gr.

Environmental Vision 2050

Environmental Vision 2050

Toshiba Group practices environmental management that promotes harmony with the Earth, contributing to the creation of a richer lifestyle for society.



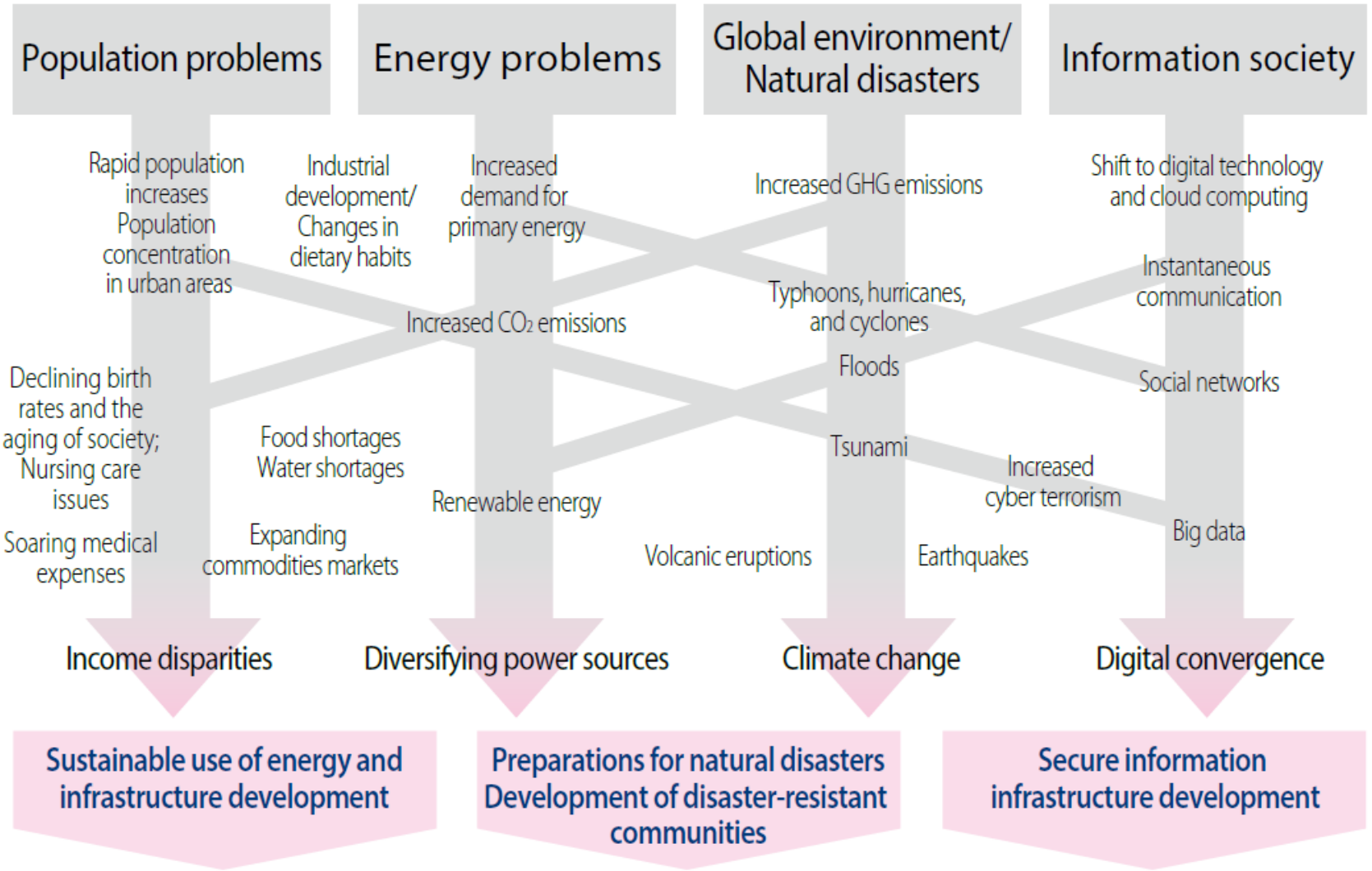
Ideal Situation in 2050

Issues to be solved in Realizing 《Affluent lifestyles in Harmony with the Earth》

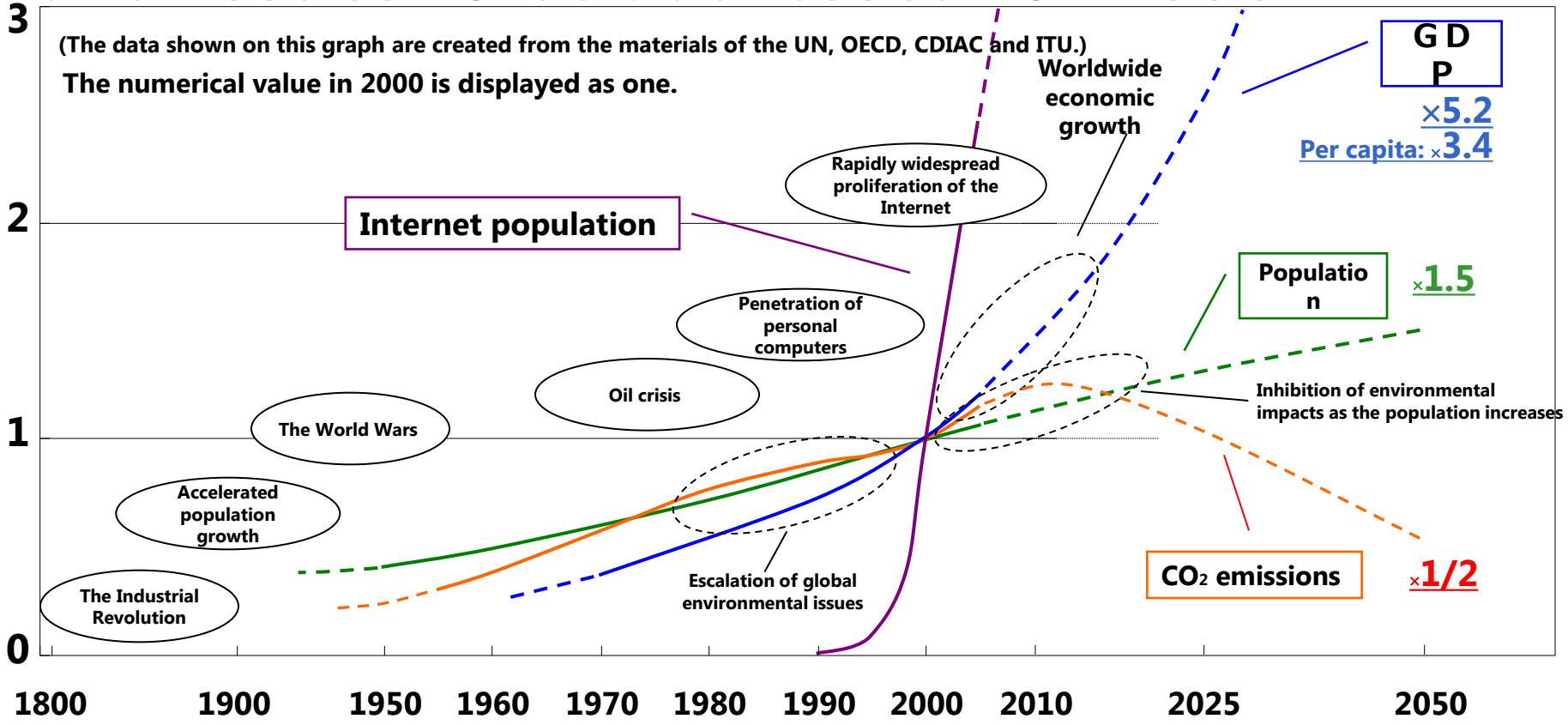
- **Reduce Environmental Impact due to Increasing World Population**
- **Mitigating Environmental Impact due to Economic Development**
- **Creation of New Values**

Environmental Vision 2050

Mega trends



Background of Global Environment Problems and Issues to be addressed for 2050



- Global Environmental Issues were Further Accelerated as the Global Economy Developed rapidly in the wake of the Industrial Revolution.
- Considerable time is required to take Measures and obtain Results from the Same.

Toshiba has announced an Environmental Vision envisaging the Ideal Situation in 2050.

Concept of Eco-efficiency and Factor

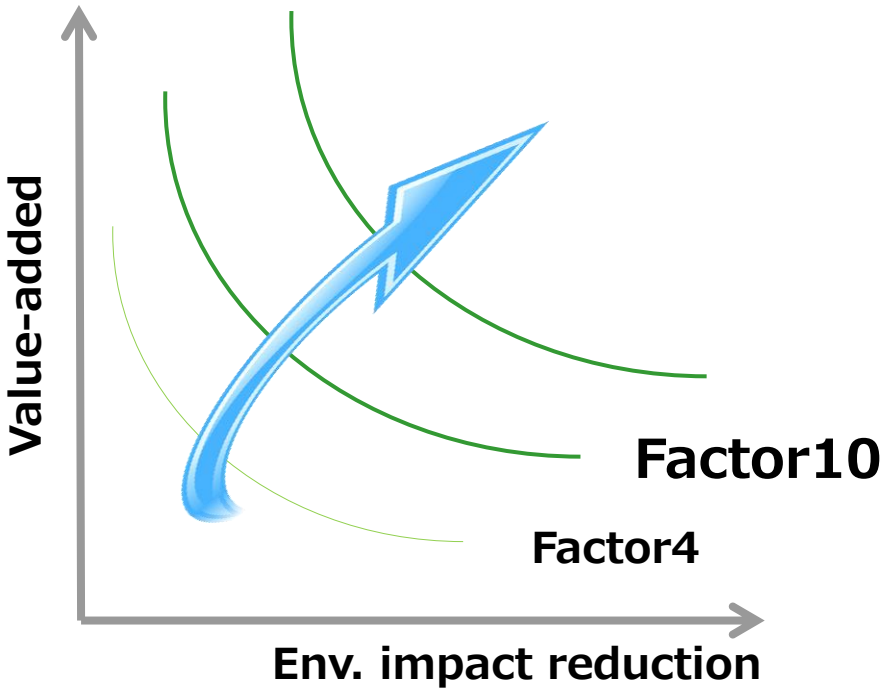
$$\text{Eco-efficiency} = \frac{\text{Performance (Sales or product value)}}{\text{Environmental impacts}}$$

Factor = Degree of improvement in eco-efficiency

$$\frac{G}{CO_2} = \frac{G}{P} \times P \times \frac{1}{CO_2}$$

$$\times 3.4 \times 1.5 \times 2 = \times 10$$

Eco efficiency ⇒ Factor 10



Aiming to achieve the “Factor 10”

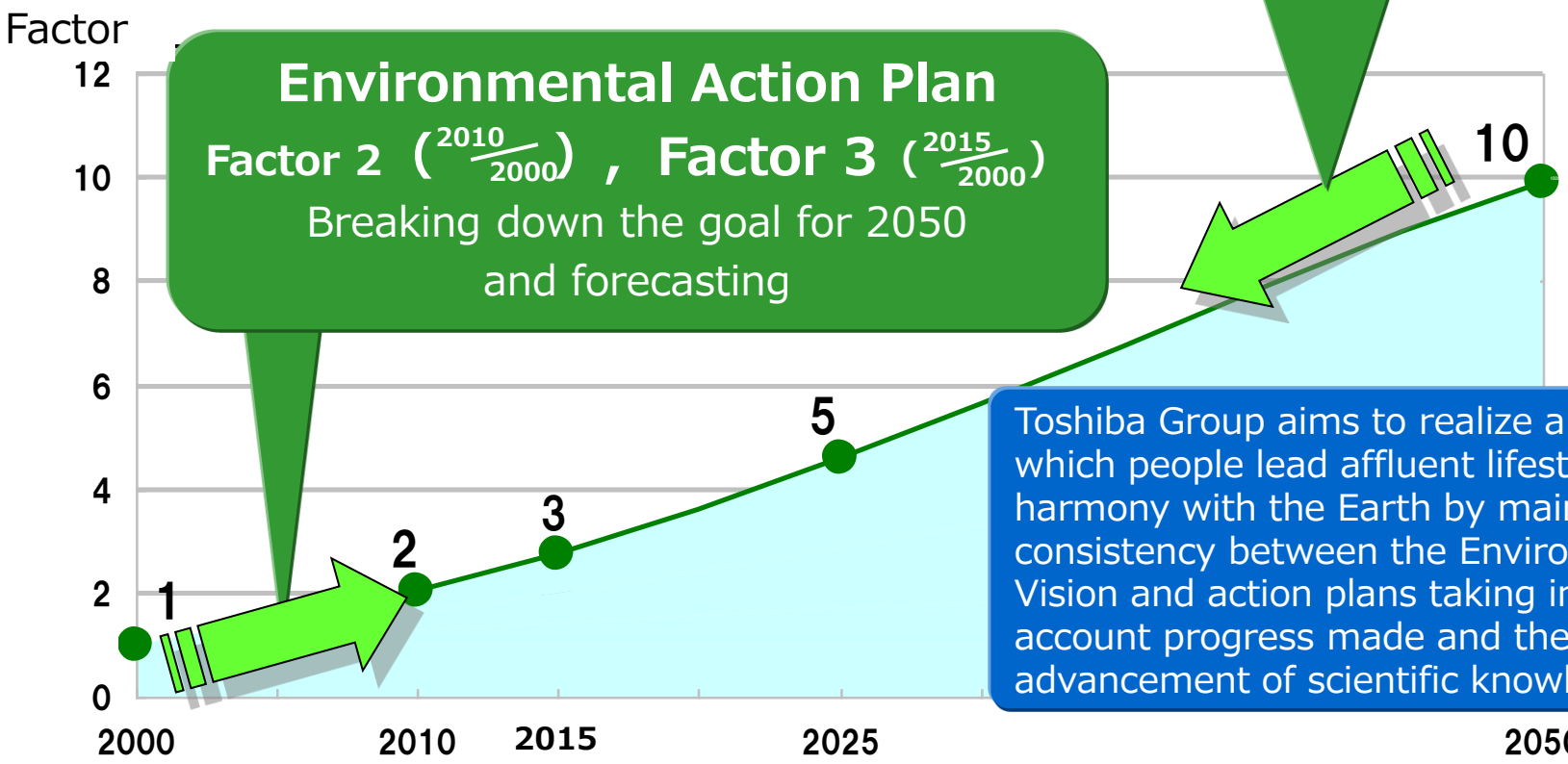
Environmental Vision 2050 : Factor 10 ($\frac{2050}{2000}$)

Backcasting from the ideal situation in 2050

Environmental Action Plan

Factor 2 ($\frac{2010}{2000}$) , Factor 3 ($\frac{2015}{2000}$)

Breaking down the goal for 2050 and forecasting



Toshiba Group aims to realize a world in which people lead affluent lifestyles in harmony with the Earth by maintaining consistency between the Environmental Vision and action plans taking into account progress made and the advancement of scientific knowledge.

Breakdown to the business process

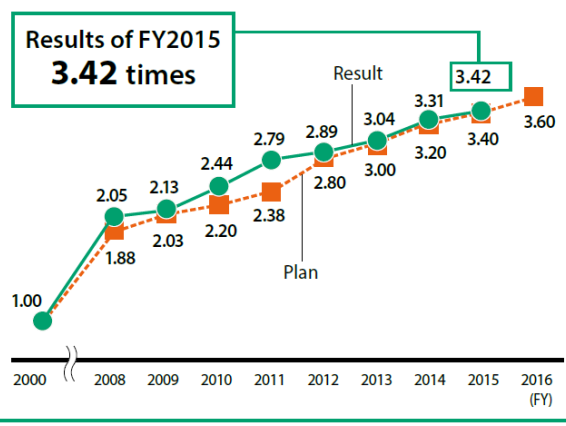
Environmental impact of products
(from procurement of raw materials to disposal/recycling)

80%

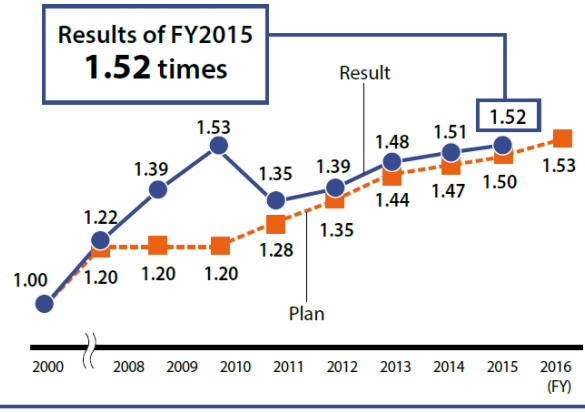
Environmental impact of business processes
(during manufacturing)

20%

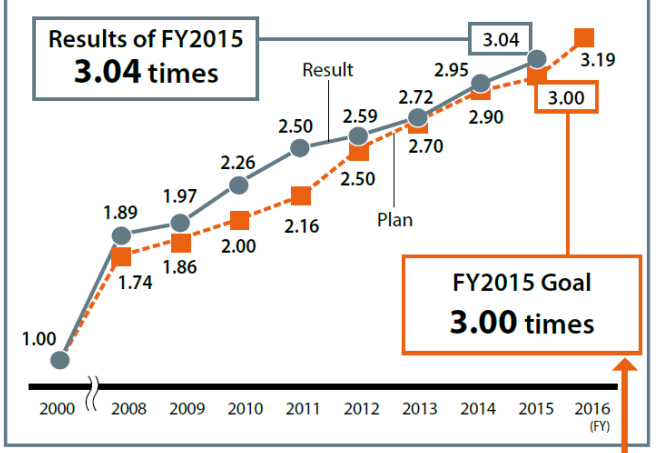
Product eco-efficiency



Business process eco-efficiency

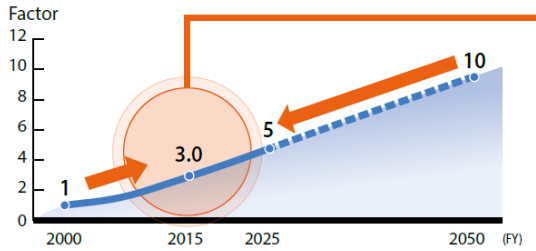


Progress of overall eco-efficiency



Achieving our goals for the two eco-efficiency figures will achieve our goal for overall eco-efficiency (3.00 times).

Product eco-efficiency (3.40 times) × 0.8 + Business process eco-efficiency (1.50 times) × 0.2 = Overall eco-efficiency (3.00 times)

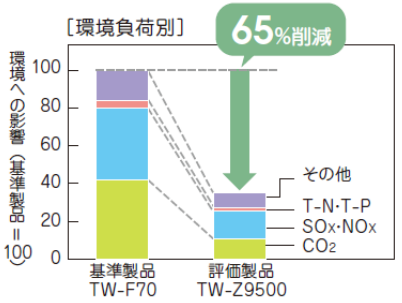


Goal-setting by backcasting from 2050

Example of “Product Factor”

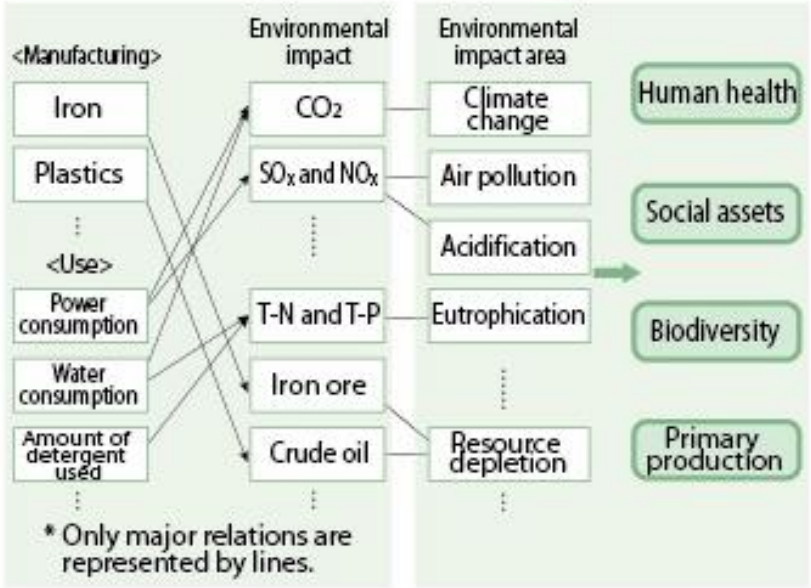
■ Factor T

Factor **5.95** = Value factor **2.05** × Environmental impact reduction factor **2.90**



■Value assessment using QFD

■ Environmental impact assessment using LIME



5th Environmental Action Plan

4 Strategies with the `4 Greens`

Establish and execute the 5th Environmental Action Plan

Greening of Products

Creation of No.1 environmental performance products

Increase sales with eco targets and revolutionary environmental products

Excellent ECP sales: 1.8 trillion yen (**2015**)

Heat source system "Universal Smart X"

Power device

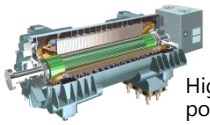
Greening by Technology

Global development of leading low-carbon technology

Best mix of energy to realize an energy saving society

Energy related product sales: 1.9 trillion (**2015**)

Mega Solar



High efficiency hydrogen-powered, indirect cooling turbine power generator

Greening of Process

Pursuit of world's lowest level of environmental impact

Achieve reductions in cost and power use through highly efficient production

30,000 ton reduction in CO_2 with investment of 3.7 billion yen on cost-saving devices

1.5 times the eco-efficiency of 2000 (**2015**)

High efficient semiconductor production plant

High efficient cooling machine

Green Management

Implement Simultaneous Environmental Action initiative by all employees throughout the world

Develop through the employee participation site "TOSHIBATON"

One of the top environmentally-conscious companies in the world

Employee participation site "TOSHIBATON"

Earth Hour

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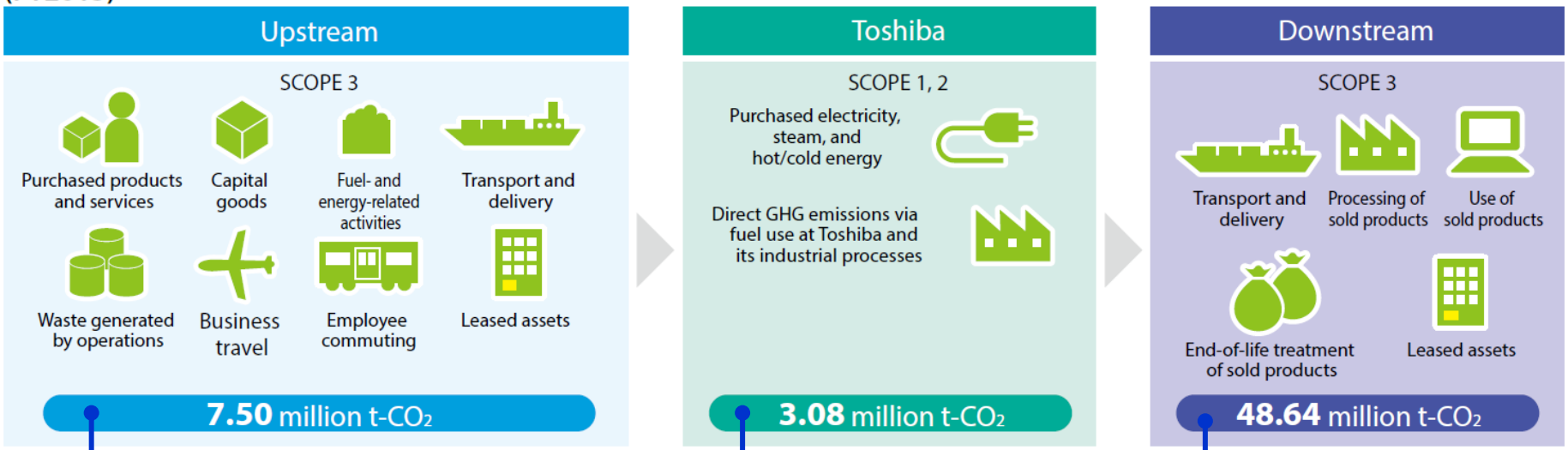
GHG emissions from Toshiba business

GHG emissions in value-chain

(FY2015)



KPIs:
- **Resource-saving of Products**
- **Recycled material ratio**
- **Specified chemical substances reduction**

etc.

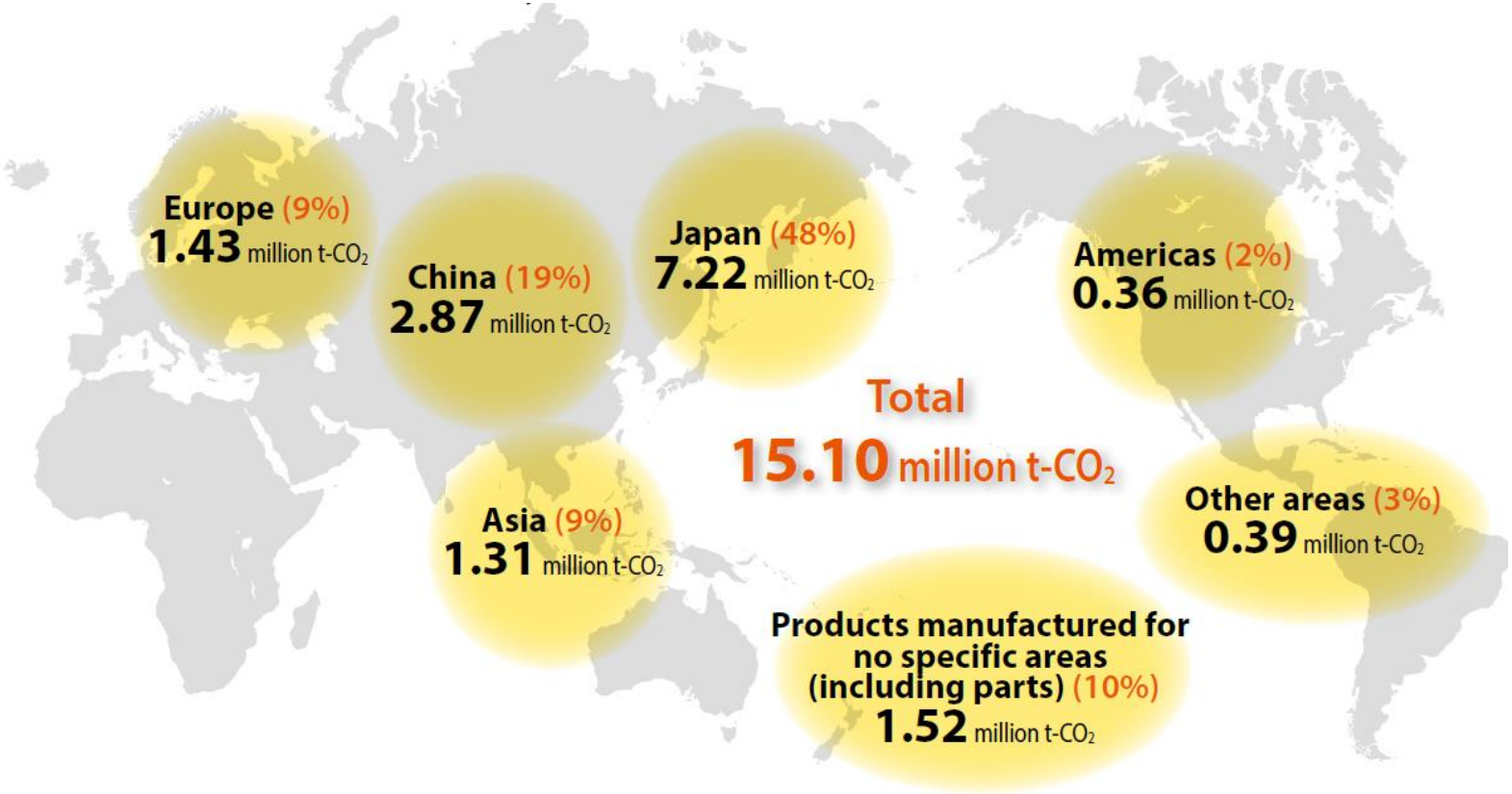
KPIs:
- **Total GHG emissions**
- **Energy-derived CO2 intensity**
- **Waste volumes, Waste disposal ratio**
- **Water reduction**

etc.

KPIs:
- **Sales amount of excellent ECPs**
- **Reduction of CO2 emissions through Products**

etc.

CO_2 emission reduction by Toshiba products



【Estimation Process】

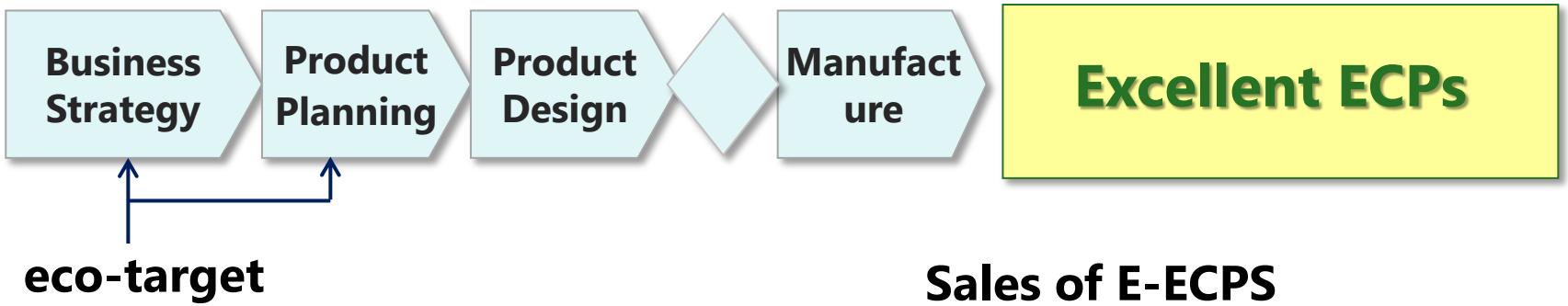
CO_2 emission reduction = CO_2 (conventional) – CO_2 (new product)

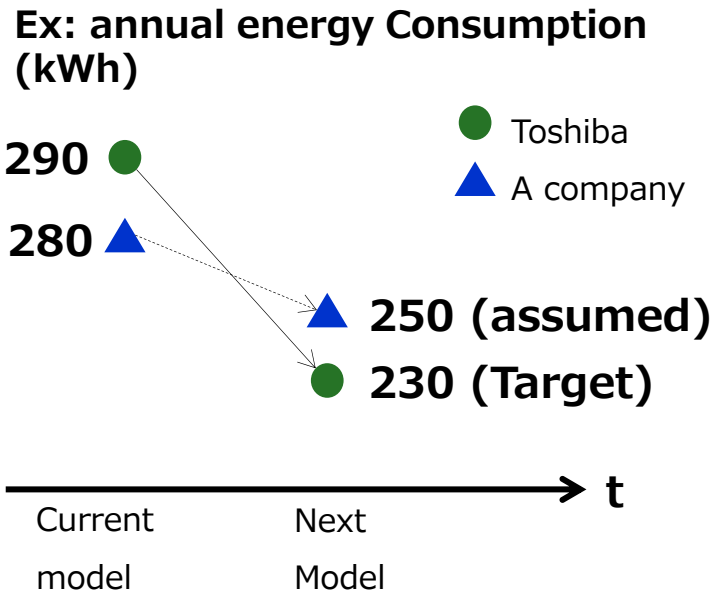
*conventional product has been set in line with the product lifetime

Annual CO_2 emission compared ⇒ **Accumulated amount during half of the product lifetime**

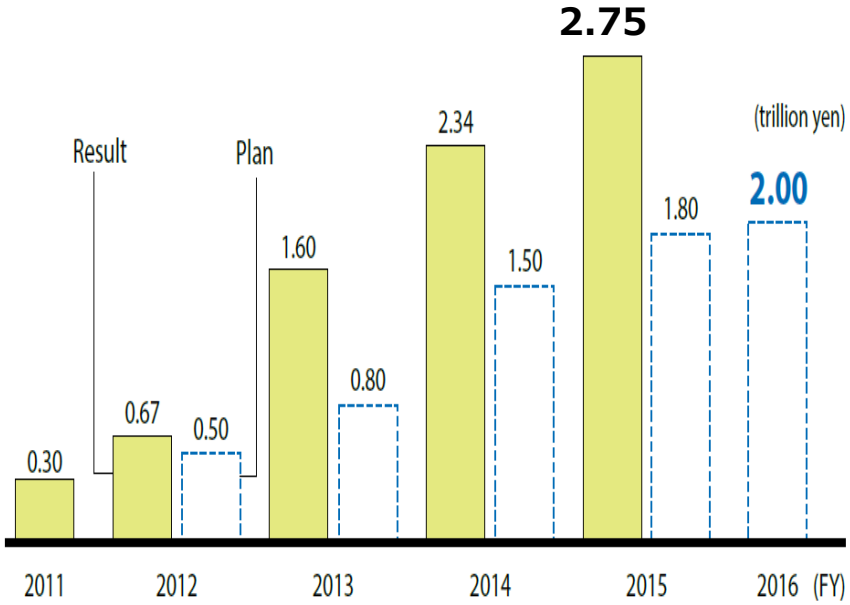
How eco-products developed ?

Creation of Environmentally Conscious Products





Sales of E-ECPS



Excellent ECPs

- **Multi-room air conditioner for buildings and factories**
  - Super Module Multi SMMS-e series
  - Highest energy-saving performance*, with an ESSR (EU energy-saving indicator) value of 7.17

* Correct as of the products' times of release and may not be correct at the current time

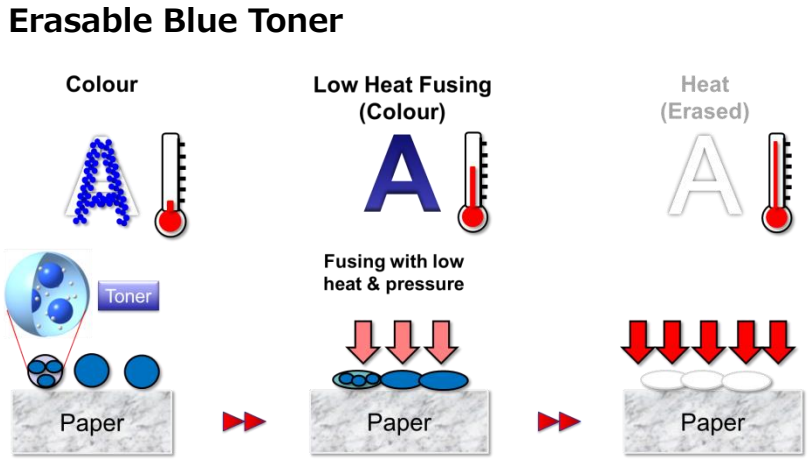
- **LED**
  - Adjustable illumination, halogen-bulb-type, mini-krypton LED light bulb featuring GaN* technology
  - Power consumption reduced by approx. 85% compared to conventional light bulbs

*Gallium Nitride

- **TOSHIBA machine-roomless elevator**
  - SPACEL-GR II
  - Reduce power consumption by 50%, designed to use regenerative power, to reduce standby power consumption, to adopt LED lighting, and to improve system efficiency

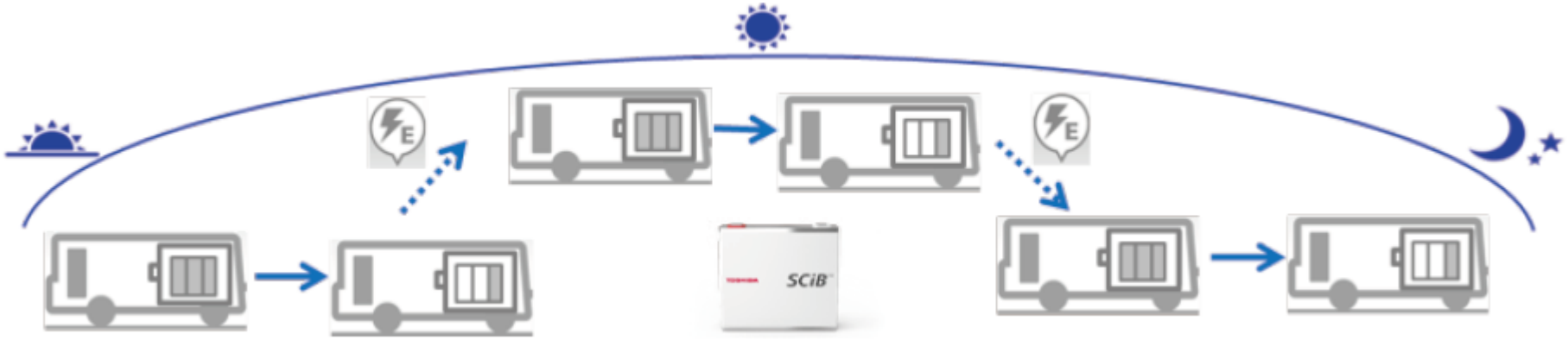
Paper Reuse System

- **Hybrid MFP / e-STUDIO5008LP series**
  - The world's first multifunction printing system with erase function
  - "Reuse" cassette attribute available
  - Save up to 80% of paper or more



SCiB™ Rechargeable Battery

- **SCiB**
  - Rapid: Rechargeable in 6 minutes
  - Long life: Over 15,000 cycles
  - Safety: Uses highly safe lithium titanium oxide (LTO) etc.
- **Applications**
  - EV bus system
    - CO_2 emissions reduced by approx. 40% compared to diesel buses



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Summary

- **Environmental Management**
  - Long-term vision for 2050
  - Mid-term action plan
  - Factor, Decoupling indicator
  - KPIs to link the business process and the environment

- **GHG emission reduction through Products**
  - Benchmarking the environmental performance in product planning phase
  - Needs for “Eco-innovative” products and services


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