

# **TOSHIBA**

Leading Innovation >>>

## **Energy Systems & Solutions Company Business Strategy**

### **Danny Roderick**

**Company President and CEO**

**Energy Systems & Solutions Company**

**Toshiba Corporation**

**Westinghouse Electric Company Chairman**

**July 6, 2016**

# ➤ I . Company Overview

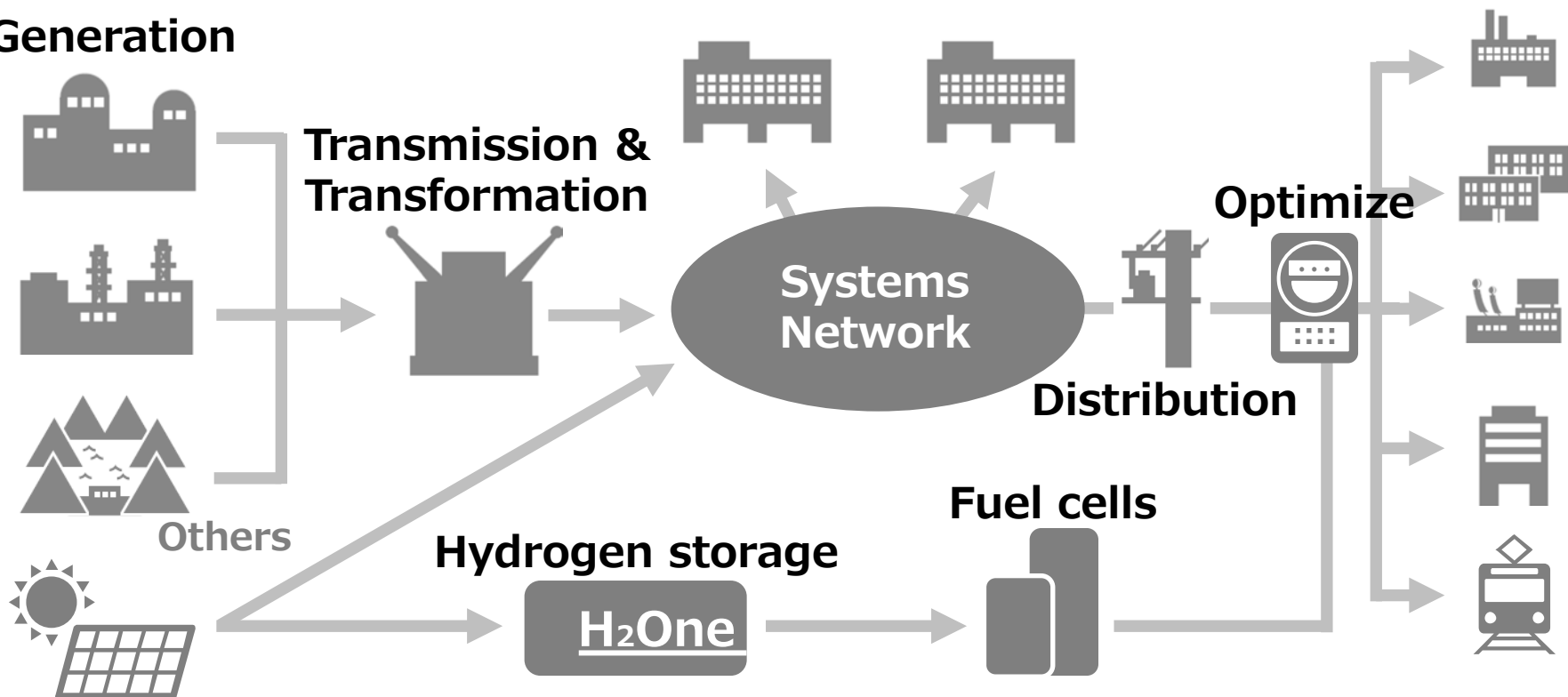
## II . Business Units

- Nuclear Energy Systems & Services
- Thermal Power Systems & Services
- Transmission & Distribution Systems
- Other businesses

# Our Products and Services

## Total Energy Systems and Solutions Provider

### Generation

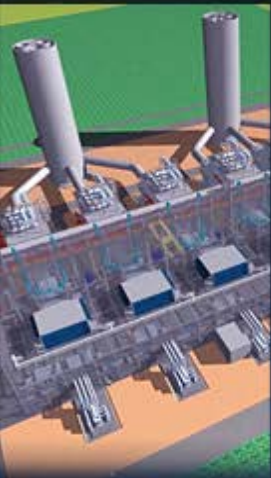


### Energy Systems and Solutions Company

GENERATE Energy

TRANSMIT/STORE Energy

USE Energy



Be a *Truly Global Company*

that provides the world with meaningful technologies and services to generate, transmit and store clean energy and contributes to the realization of a low-carbon society

# Our Organization, Business and People

1,700 B-YEN Revenue/  
Approx. 70% of our people are based outside Japan

## Energy Systems and Solutions Company

Nuclear Energy Systems & Services Div.

Westinghouse Electric Company, LLC

Thermal & Hydro Power Systems & Services Div.

Transmission & Distribution Systems Div.

Solutions & Services Div.

Landis+Gyr Div.

NuGen Div.

Power & Industrial Systems Research and Development Center

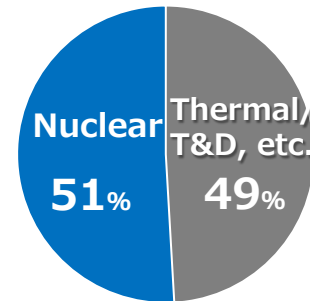
New Energy Solutions Project Team

Keihin Product Operations

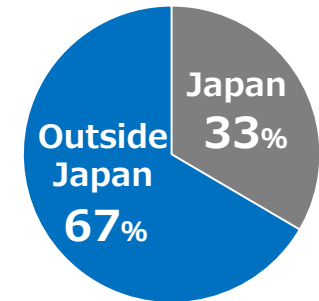
Hamakawasaki Operations

Fuchu Operations – Energy Systems & Solution

## Revenue Breakdown (FY2016 Earnings forecast)

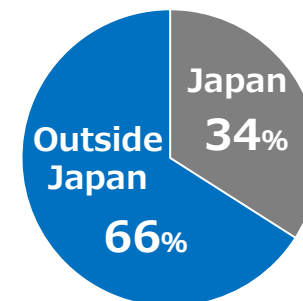


By Business



By Area

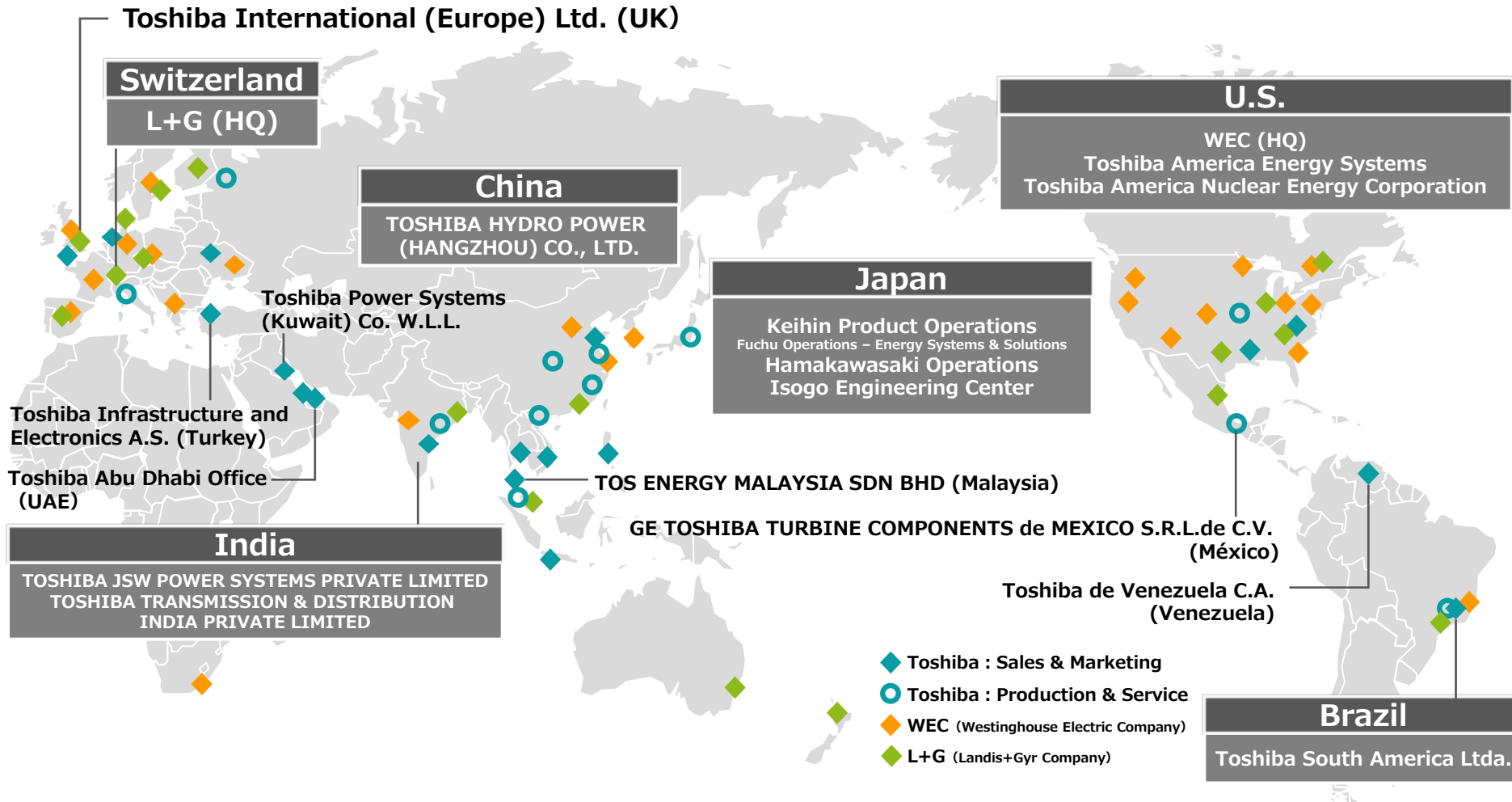
## People Breakdown (April 2016)



We are growing business globally

# Our Global Network

## We operate in 42 Countries



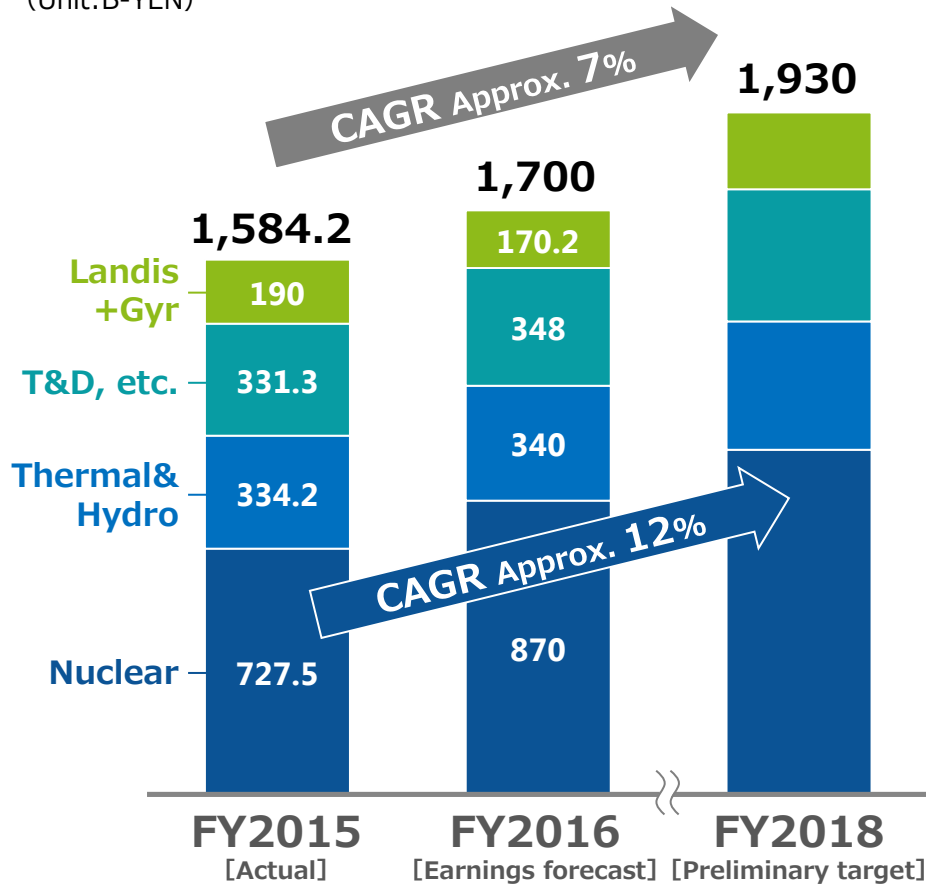
## We have a global voice

# Revenue and Profit Plan

Focus on nuclear and ensure profit in all businesses

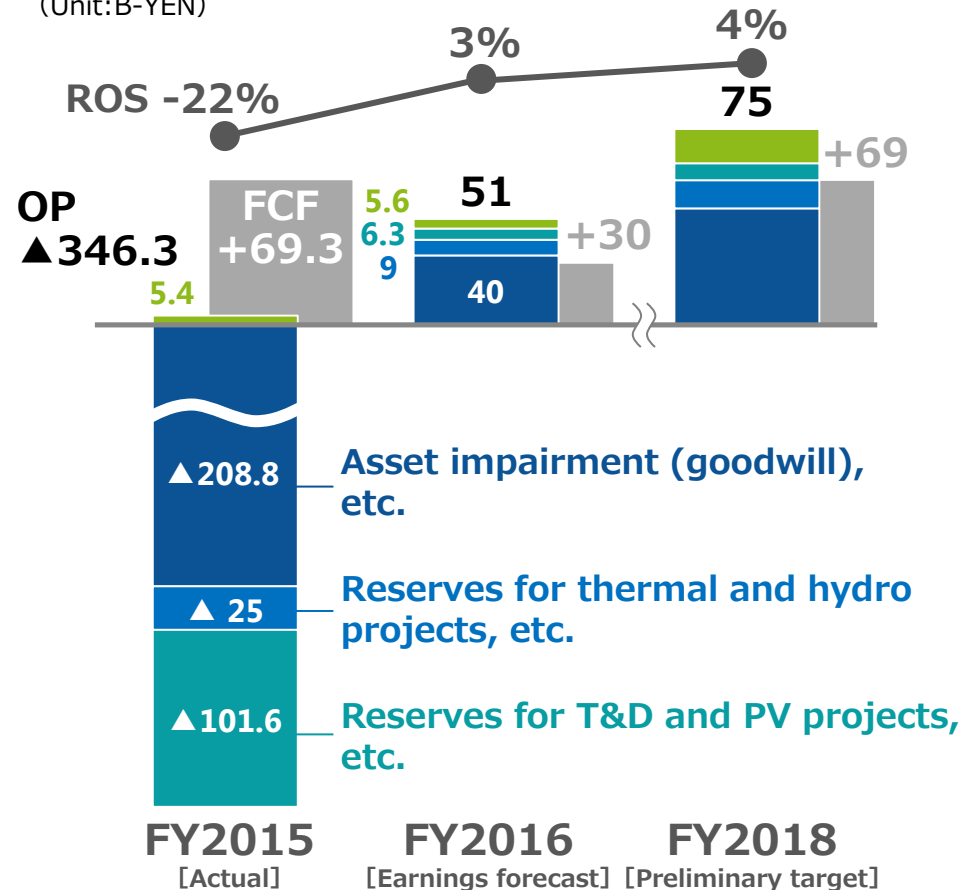
## Revenue

(Unit: B-YEN)



## OP / ROS / FCF

(Unit: B-YEN)

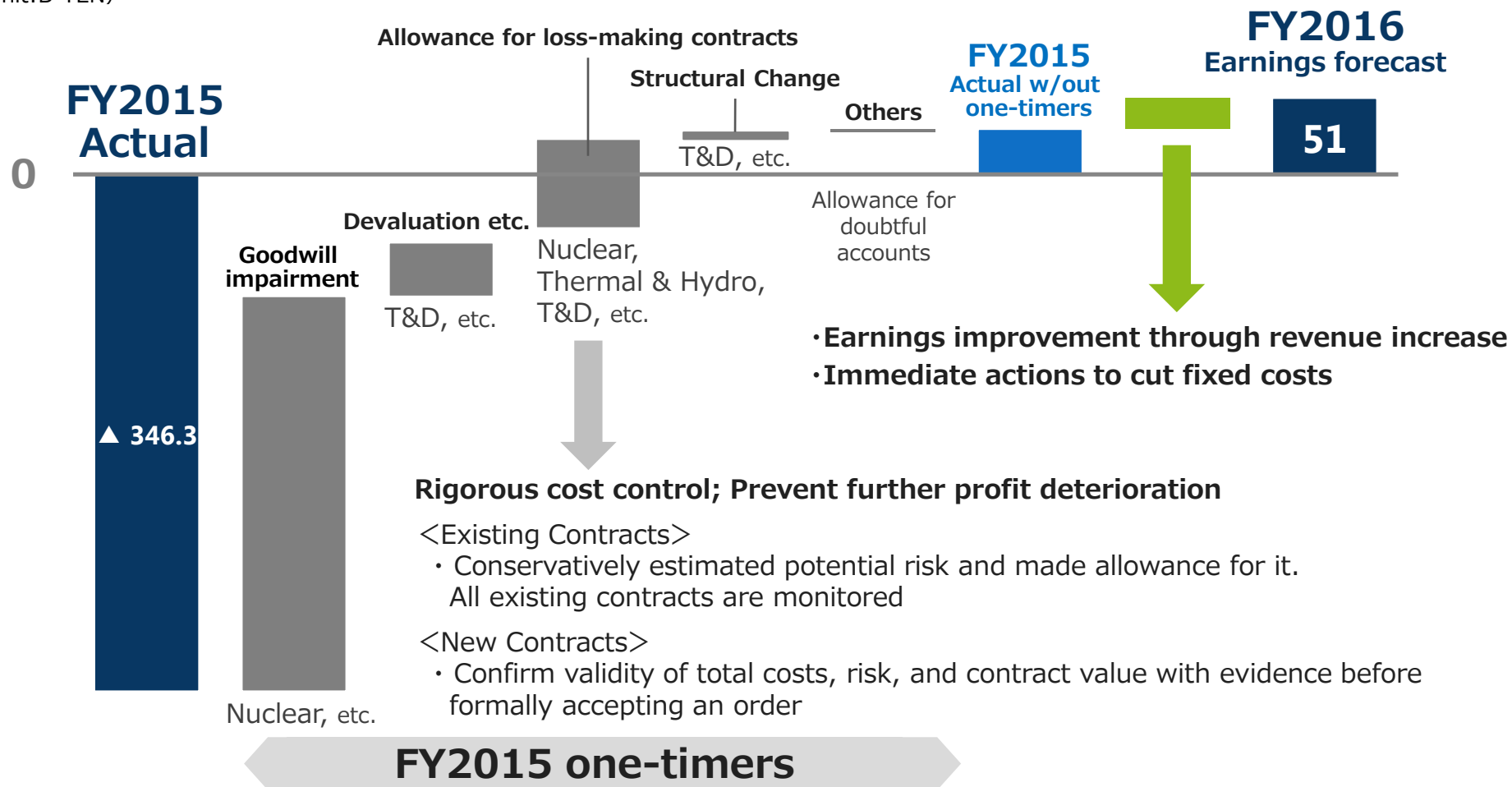


Change to a company which generates OP & Cash predictably

# Operation Profit

## Rigorous cost control to ensure profit

(Unit:B-YEN)



We are leveraging global experiences



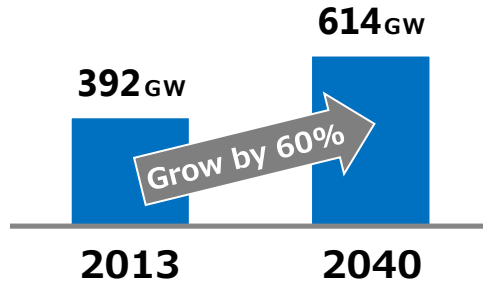
# I . Company Overview

## ➤ II . Business Units

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# Nuclear : Market Outlook / Key Priorities

Outside Japan: Global installed nuclear capacity to grow by 60%※1 (2013→2040)



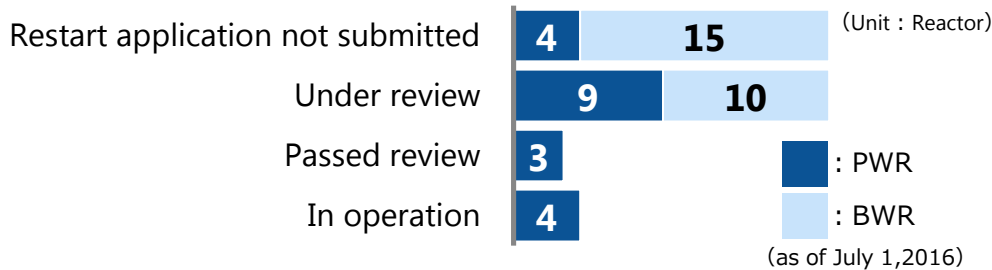
China : Installed capacity – 58 GW by 2020;  
Additional 30 GW or more to be installed

India : Grow up to 60 GW by 2032

U.S. : Gas price decline; Relative competitiveness of nuclear to deteriorate

Europe : U.K. to promote nuclear through feed-in tariffs

## Japan: Growing demand for restart support and SSF※2



+

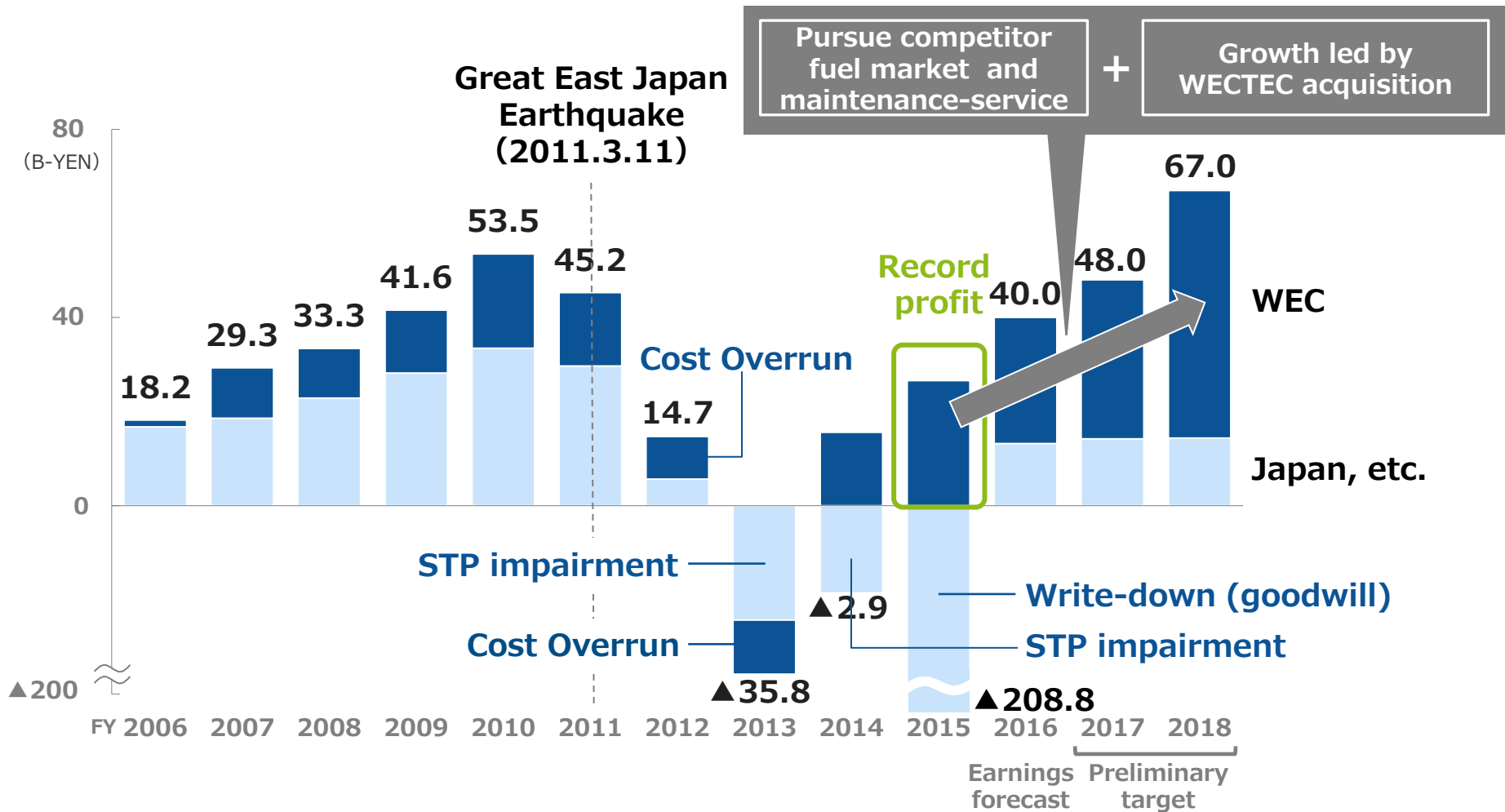
Preliminary design work underway;  
Equipment purchase orders have been placed

Key Priorities

- Achieve growth in global markets
- Supplying service & fuel for competitor reactor
- Extending decommissioning business globally
- Extending new AP1000™ construction business

# Nuclear Business Performance (Operating Profit)

## WEC: Posted record profit in FY2015



**We will grow and generate profit**

# Service and Fuel Businesses

## Maintenance – Service

**Execute 160 to 200 projects every year**

- Outages, Heavy component replacements, I&C system upgrades, etc.

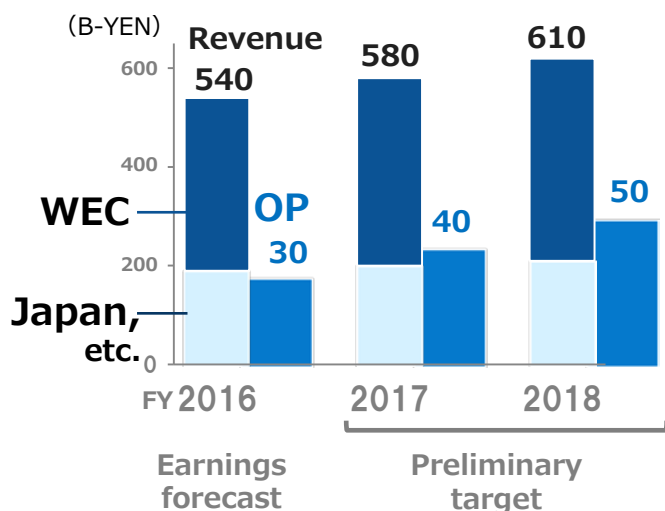
## Fuel

- Supply high quality fuel to world's various reactors (PWR, BWR, AGR, VVER) (30%\*<sup>1</sup> share in global fuel market)
- Pursue competitor fuel market (U.S. BWR market, Europe and Russian VVERs) with reliability-improved fuel

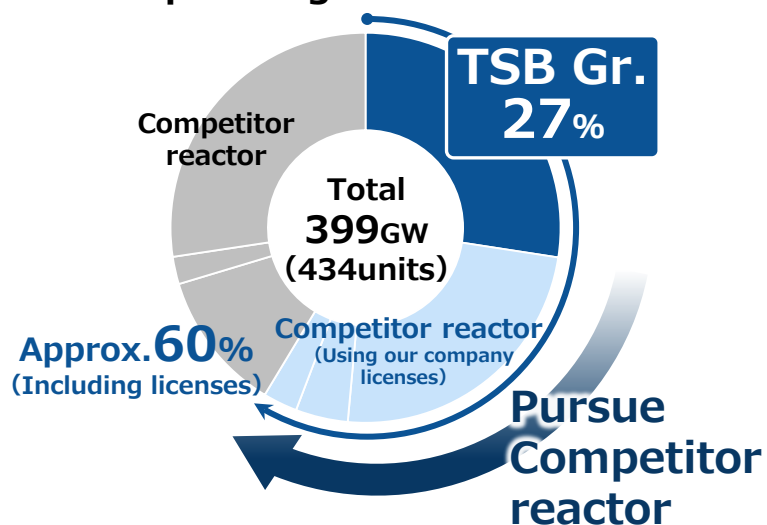
## DD&R

- Promote sales to win orders primarily in Europe (Germany, Spain, U.K., etc.), North America

### Service and Fuel Businesses Plan



### Operating Plant Share\*<sup>2</sup>



Shipment of new SG\*<sup>3</sup>



Refueling

**Expand business with our technology and know-how**

\*<sup>1</sup> : NAC Fuel-Trac Data April 2014 – Average of FY13-FY15

\*<sup>2</sup> : Source...JAIF "World Nuclear Power Development Outlook 2016"

Reactors...Prime contractor projects (installed capacity as of January 1, 2016) , \*<sup>3</sup> : Steam Generator

# Japan Business / New Technologies

## LWR※1

- **Pre-restart:** Safety margin enhancement, safety review support, SSF
- **Post-restart:** Outages, life extension, etc.

## Fukushima Daiichi

- Contribute to decommissioning efforts leveraging various resources of Toshiba Group entities (development of robots for spent fuel and debris removal)

## DD&R

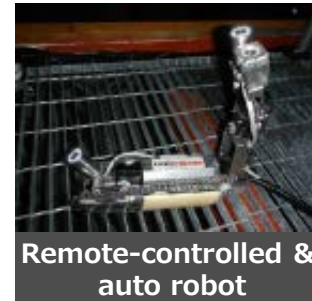
- Participate in Japanese DD&R market with WEC experience and expertise

## New Tech-nologies

- **Nuclear fusion:** ITER※2 component manufacturing, Participation in fusion prototype reactor projects
- **Heavy ion radiotherapy system:** Downsizing through super-conductivity technology and promote in and outside Japan

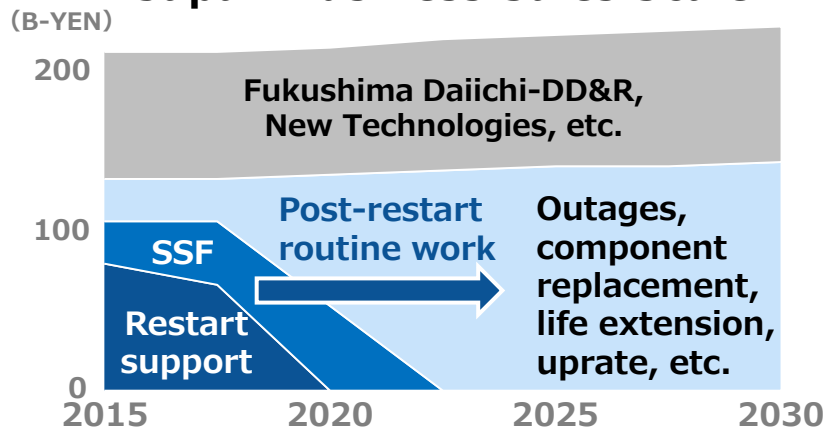


125V DC batteries  
TEPCO's Kashiwazaki-Karawa



Remote-controlled & auto robot

## Japan Business Sales Scale



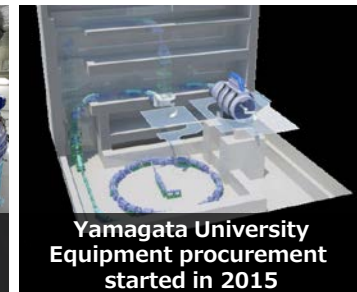
## Heavy ion cancer treatment equipment



National Institute of Radiological Sciences  
Treatment started in 2011



Kanagawa Cancer Center  
Started treatment in 2015



Yamagata University  
Equipment procurement started in 2015

# Deliver cutting-edge technology into Global Market

# Construction Projects Underway (China and the U.S.)

Zhejiang  
Sanmen 1, 2



**Sanmen 1 – Containment vessel inside**

Photos © Sanmen Nuclear Power Company, Ltd. All rights reserved.

Shandong  
Haiyang 1, 2



**Haiyang 1 Control Room**

Photos © Shandong Nuclear Power Company Ltd. All rights reserved.

Georgia  
Vogtle 3, 4



**Vogtle 3 CA01 module setting**

Photos © Georgia Power Company. All rights reserved.

South Carolina  
V.C. Summer 2, 3



**V.C. Summer 2 Reactor Building**

Photos © South Carolina Electric & Gas Company. All rights reserved.

**AP1000™ construction well underway in China and the U.S.**



2009

2015

**Sanmen is on the commercial operation phase**

# Pursue New Build Opportunities

Of 400+ new units to be built around the globe



Indian government allocated six AP1000™ reactors to be built by Westinghouse in Andhra Pradesh



NuGen Project :  
Three AP1000™ reactors to be constructed at Moorside



Exclusive negotiation underway to build nuclear power plants at the third site



Florida Power & Light Company (FPL) applied for a COL for AP1000™



Win identified AP1000™ I&C opportunities

	Ongoing projects	Plan (through FY2030)
Country	U.S. and China	U.K., India, Turkey, etc.
Unit	8	Total 37 or more

Pursue contracts for 45※ or more reactors



# I . Company Overview

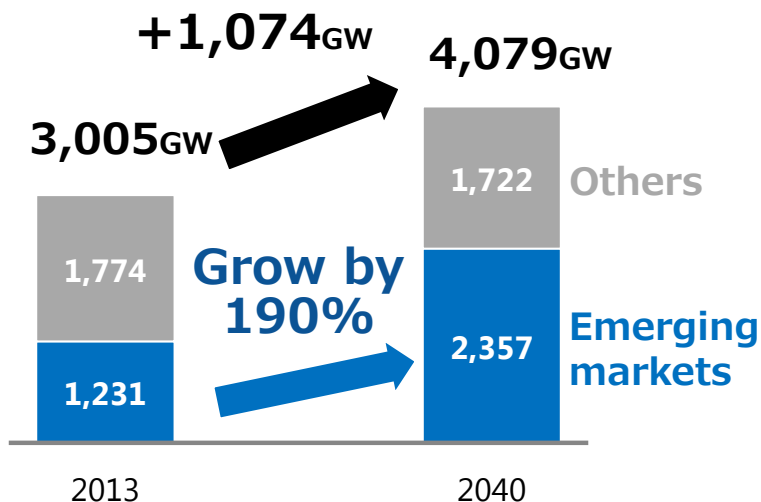
## ➤ II . Business Units

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- **Thermal Power Systems & Services**
- Transmission & Distribution Systems
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# Thermal : Market Outlook / Key Priorities

Increasing demand for new build in emerging markets;  
Increasing demand for services  
to achieve high efficiency and low environmental load

## Installed thermal capacity



〈Installed thermal capacity<sup>※1,2</sup>〉  
(2013→2040)

Worldwide : Up by **1,074GW**

Emerging markets : **190% growth**

〈market size for services<sup>※1,3</sup>〉

[Steam Turbine, Boiler]

Worldwide : **1,800 B-YEN/year**

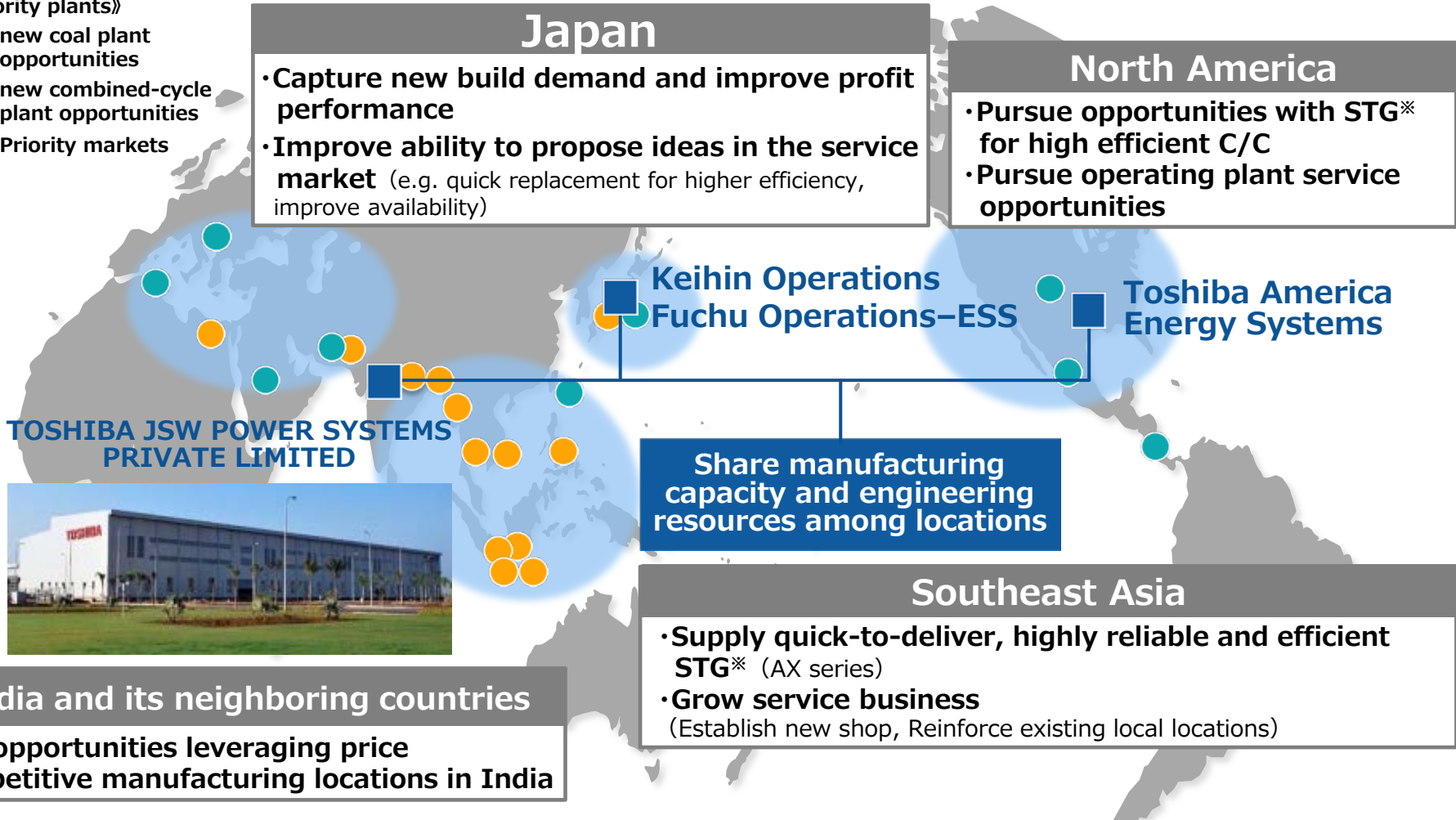
## Key Priorities

- Win opportunities in priority markets while focusing on profitability
- Grow service business leveraging extensive delivery records
- Develop and deliver new products that satisfy needs to lower environmental load

# Regional Strategy

《Priority plants》

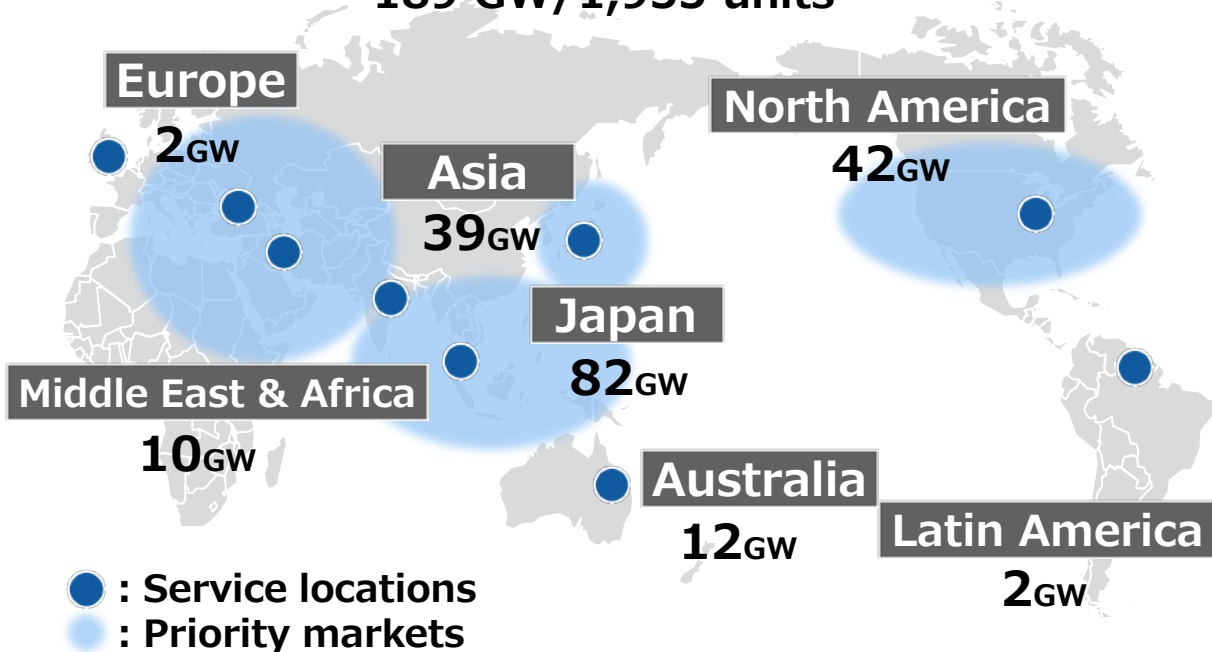
- : new coal plant opportunities
- : new combined-cycle plant opportunities
- : Priority markets



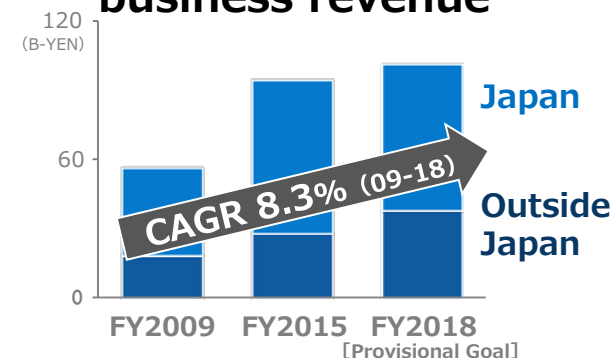
Promote sales and marketing initiatives to win orders primarily in priority markets while ensuring profitability

# Services Business

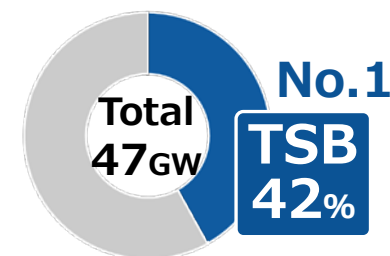
Delivered thermal power facilities :  
189 GW/1,955 units



## Thermal services business revenue



U.S. STG cumulative orders share\*



Policy

- Deliver solutions featuring reliability and maintainability of our products
- Deliver total plant services leveraging IoT (e.g. guaranteed delivery)
- Expand overseas service network  
(establishing maintenance shops, partnership with local entities)

Expand business by utilizing our global experience and service center

# New Technologies (Development Roadmap)

(Efficiencies are stated in transmission end LHV)

## Combined-cycle

1,600°C class  
Thermal efficiency 61%+

Deliver solution of valuable plant based on lifecycle

## Coal

High-capacity USC  
standard unit  
thermal efficiency 42%

## New cycle

Satisfy needs of sustainable societies

Enhance power system stabilization capability  
(supplement variability of natural energies)



A-USC 700°C class  
Thermal efficiency 46%+

Unique Technology

Realize with A-USC 750°C



Integration with CCS/CCU technologies



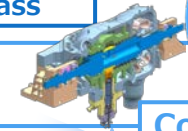
High-efficiency USC for emerging markets  
300MW class

USC 150MW class

Unique Technology

Supercritical CO2 cycle  
25MW demonstration plant

Commercial 300MW class



Coal gasification CO<sub>2</sub> Cycle

Market launch timing



Policy

**Combined-cycle:** Pursue world's highest efficiency technology to satisfy diversifying needs (for hydrogen-based society, CHP※)

**Coal** : Deliver comprehensive BTG solutions leveraging efficiency enhancement technology and government financing

**New cycle** : Establish differentiation technology through early commercialization of advanced technology

**We are ready for the future**

# I . Company Overview

## ➤ II . Business Units

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# T&D : Market Outlook / Key Priorities

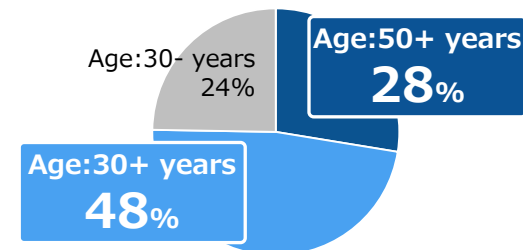
Japan: New business opportunities and replacement demand generated by the power systems reforms

## Power Systems Reforms

- Market expectation for transparent transmission costs and reduced costs
- Emergence of PPS as a result of the deregulation of the power supply market

## Equipment Replacement Demand<sup>※1</sup>

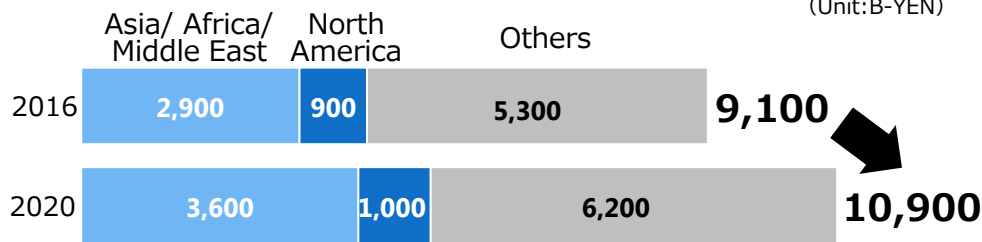
- Equipment aged 30+ years account for more than 75%
- There is a growing demand for replacement



Outside Japan: Growing demand primarily in Asia, Middle East, and Africa

## Market Size: T&D, Transformers<sup>※2</sup>

(Unit: B-YEN)



## Asia:

Growing demand in India, South-East Asia and Middle East driven by electricity infrastructure development

## North America:

Emerging demand for storage batteries driven by growth in renewable energy sources in addition to replacement demand

Key Priorities

- Business expansion mainly in India - Growth business
- Profit generation - Steady profit stream business
- Participation in the solution market - Collaboration with Landis+Gyr

# Regional Strategy

Leverage regional strengths for business growth

 : Steady Profit Stream Business

 : Growth Opportunities

## Middle East

Increase market share building upon already high market share and well-established sales and service network

## Japan

Generate profit consistently leveraging delivered facilities and equipment

## North America

Increase orders leveraging synergies with Landis+Gyr

## India, Southeast Asia, Africa

Increase orders leveraging production facilities in India to respond to growing demands

We are re-building our marketing strategies



# Growth Opportunities

## Business growth with production facilities in India as a hub (Toshiba Transmission and Distribution India Private Limited)

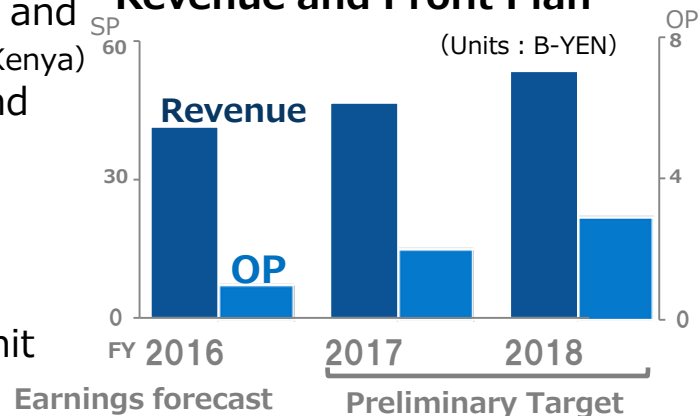
### Distribution transformers

- Supply equipment to growth markets including South East Asia and Africa (won a contract in April 2016 to deliver approx. 8,000 transformers to Kenya)
- Profitability improvement through productivity enhancement and production throughput increase

### Transformers, switchgears (new modes)

- Complete production facilities upgrade and technical transfers from Japan
- Accelerate sales efforts leveraging the sale of the first model unit for the Indian market

### Toshiba T&D India Private Limited Revenue and Profit Plan



## Pursue opportunities leveraging Landis+Gyr's sales network

### North America

- Promote storage battery system for ancillary services<sup>※1</sup> leveraging performance advantages of the SCiB<sup>TM</sup>

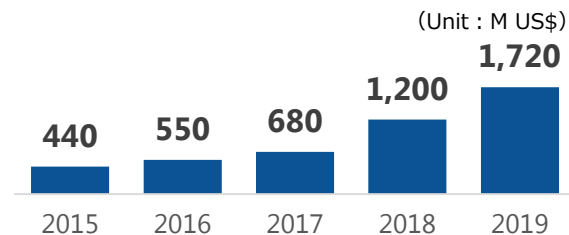
### Europe

- Deliver power distribution enhancement solutions<sup>※2</sup>

### Asia etc.

- Deploy for Japanese Power company's AMI model outside Japan

### Storage battery market in North America<sup>※3</sup>



## Expand our business in the emerging markets by taking full advantage of our global network

# Profit Generation - Steady Profit Stream Business

## Established high share in Japan and Middle East

### Japan

#### Capture new opportunities that are driven by power systems reforms

- Reinforce grid connection between utilities (connecting East and West, Hokkaido and Main Island connections)
- Pursue power demand-supply control system opportunities for PPS

#### Win new demand for replacement

- Promote replacement of aging facilities
- Promote consolidation and enhancement of power system control center systems

### Middle East

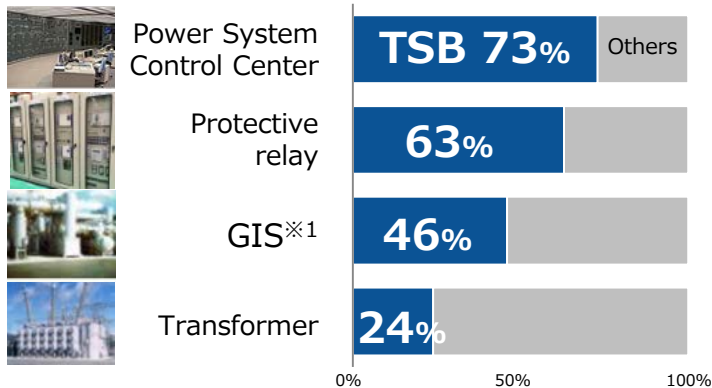
#### Strong local presence to satisfy customer needs

- Integrated sales and service network with TSB Abu Dhabi Office as a hub  
TSB Abu Dhabi Office : Established in August 1988; 120 personnel

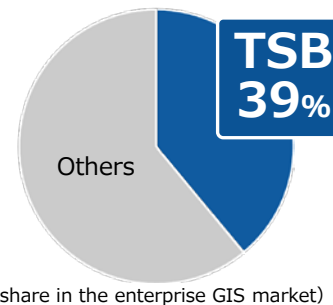
#### Optimal product delivery to customers who prioritize quality

- Develop and deliver dedicated model to reinforce competitiveness
- Capture expansion and replacement demands leveraging delivered equipment

#### TSB share in installed infrastructure market<sup>※2</sup>



#### Share in UAE Installed GIS market<sup>※2</sup>



Strengthening competitiveness through our technological advantages and high reliability

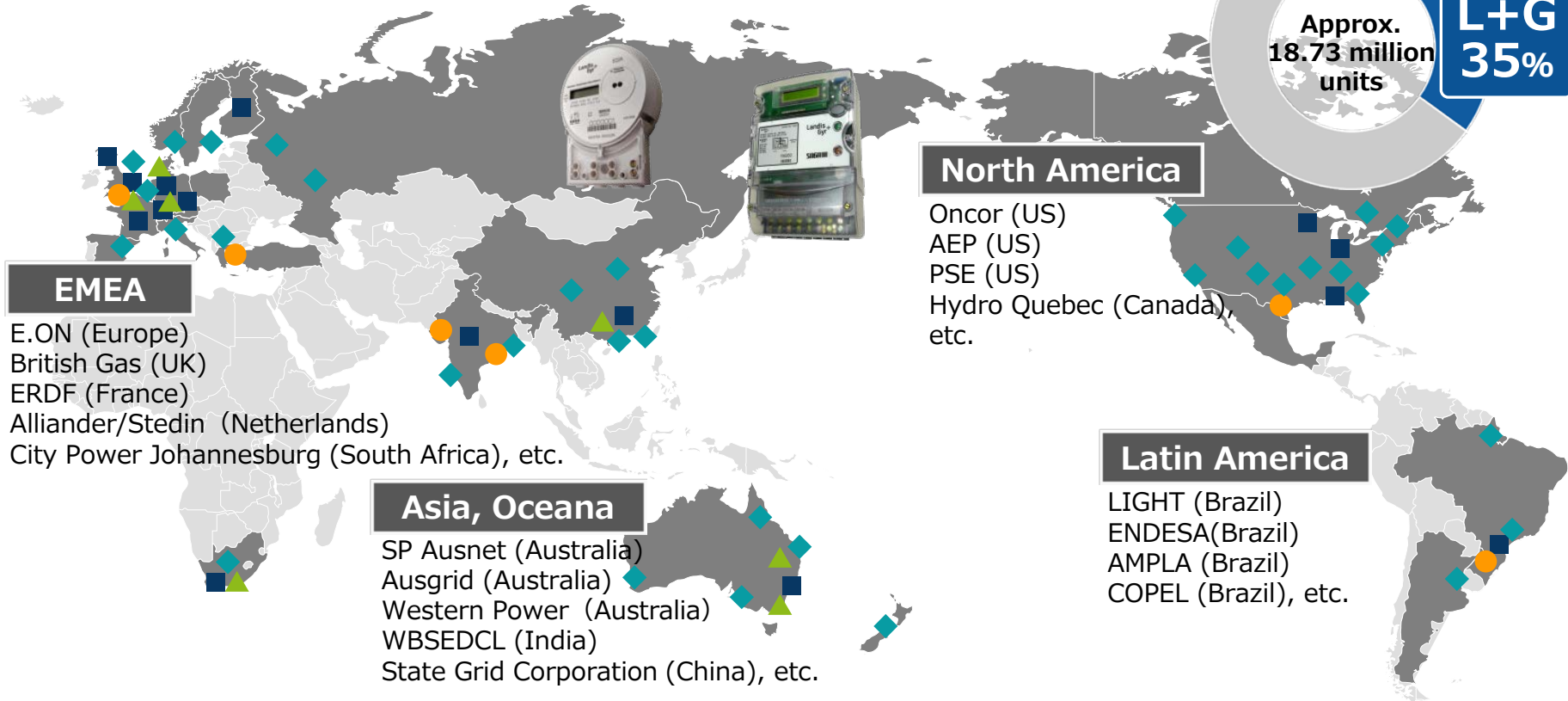
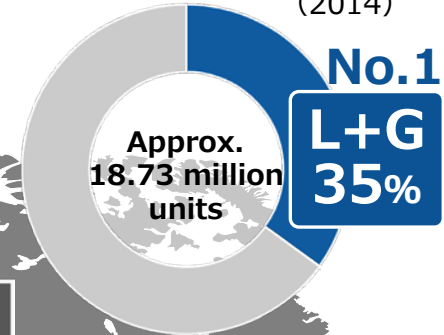
# Landis+Gyr

3,500+ customers and locations in 30+ countries

## Landis+Gyr's network and major customers

Share in household power AMI\* (2014)

■ : R&D center   ● : Mass production site   ▲ : Assembly shop   ◆ : Sales location



We are expanding Smart Grids sales globally

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## ➤ II . Business Units

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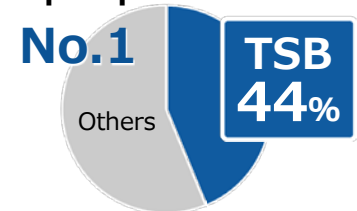
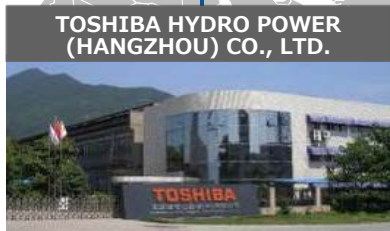
# Hydro & Geothermal

**Hydro: Deliver cost-competitive and high-performance products from locations in Japan and China to markets around the world**

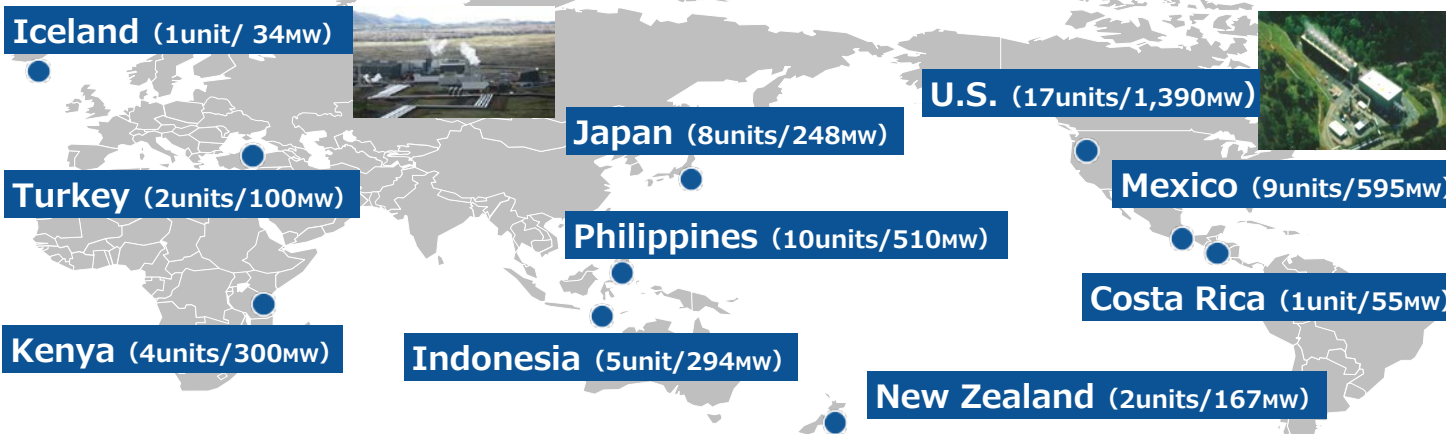
## Delivery record

**Hydroelectric turbines 2,326 unit / Generators 1,812 units (1st unit shipped in 1902)**

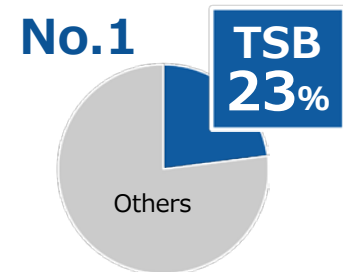
**share in global variable speed pumped plant market\*1**



**Geothermal: Generate more orders leveraging #1 market share and partnership with Ormat Technologies**



**cumulative share in global market\*2**



**Expanding business to environmentally-conscious markets**

# PV & Energy Management Service

Promote energy services and solution business and improve profit structure through Generation, battery storage, and IoT technologies

## PV

### Japan

Industrial :

Pursue opportunities leveraging experience in mega-scale PV system (installed at more than 2,500 locations)

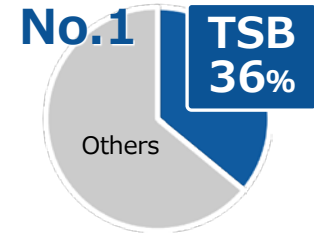
Residential : Grow share leveraging world's #1 conversion efficiency (20.1%) module

### Outside Japan

North America : Won large PV system (50 MW class) contract for a major utility (FY2015)



share in terms of sales to J-utilities<sup>※1</sup>

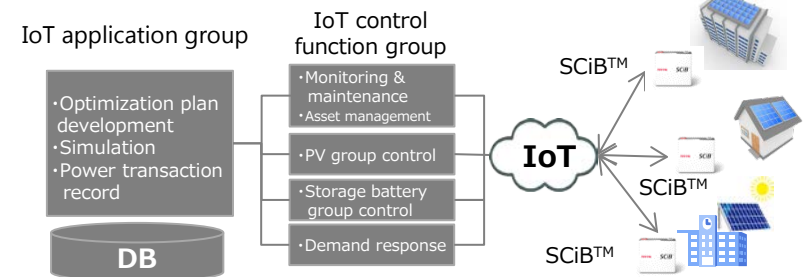


## Energy management solutions

- Utilize demand-supply control technology which has been delivered to J-utilities
- Demonstrate storage battery SCADA<sup>※2</sup> and Megawatt Aggregation, etc. at Yokohama Smart City Project



### Storage Battery IoT Service Structure



Contribute to the realization of "Smart Energy Societies" globally

# Freeport Liquefaction Tolling Agreement

Long-term sales of Liquefied Natural Gas (LNG) and power generation equipment as a total package

## Toshiba Corporation

Feed Gas  
(to be  
procured  
in market)

### Liquefaction Tolling Agreement

- Concluded in 2013
- 2.2 million ton×20 years (From 2019)

Payment of Liquefaction  
Tolling Fee

Provide Natural Gas  
Liquefaction Tolling Service

LNG

Power Generation  
Equipment



LNG

Customer

Currently, Toshiba is in negotiation with multiple customers for sales of over 2.2 million tons of LNG

## FLNG Liquefaction 3, LLC

(which owns and operates Freeport Liquefaction Terminal Train 3)

Toshiba receives liquefaction tolling service, converting natural gas to LNG  
(Toshiba does not invest in the liquefaction facilities)

Image courtesy of Freeport LNG, Development L.P.

We ensure stable LNG supply to customers

# Hydrogen

World's first

## Fuel Cells

### ◆ Ene-Farm

- **Delivered 70,000+ units thus far**
- Best-in-class durability and versatility (80,000 hours; compatible with city, propane natural gas)
- Broad range of product offerings for multifamily apartment buildings
- Supplied units to DBR Thermea (Europe)



### ◆ Pure hydrogen fuel cells

- **World's best generating efficiency - 55%**
- Development of 700-watt and 3.5-kW units underway

## H2One™

Stand-alone hydrogen energy supply system



Huis Ten Bosch  
(operation started in March 2016)



Yokohama City Port Authority  
(operation started in April 2016)

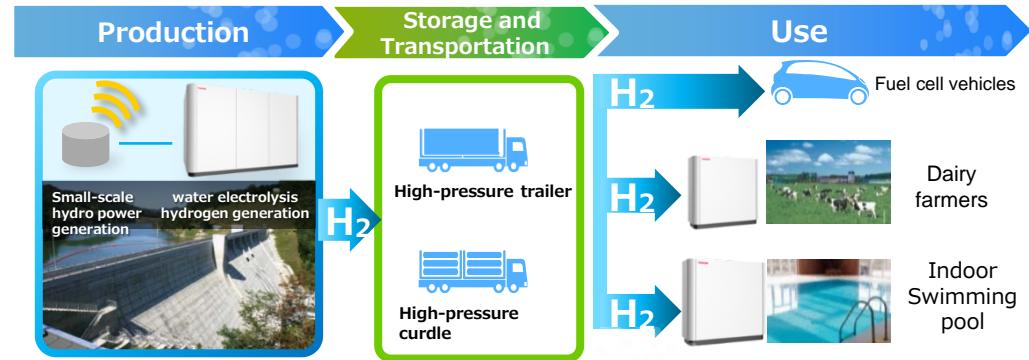
### ◆ Development of on-board units:

Clean and quiet power-supply car



## Participation in large-scale verification projects

- ◆ **Kushiro, Hokkaido prefecture: Hydrogen supply chain verification project**\*1 (for 5 years starting from 2015)
- ◆ **Scotland: Large scale-scale verification test**\*2 (for 5 years starting from 2015)



Hydrogen Supply in Kushiro-Shiranuka District, Hokkaido prefecture

We will be the "Leading Company" to realize CO<sub>2</sub>-free societies

\*1 : Our company provide small hydroelectric power generation, water electrolysis hydrogen production, hydrogen utilization equipment, carry out the entire business summary

\*2 : Our company to implement the provision and control of the entire system of hydrogen EMS



# Forward-looking Statements

- This presentation contains forward-looking statements concerning future plans, strategies and performance of Toshiba Group.
- These forward-looking statements are not historical facts, rather they are based on management's assumptions and beliefs in light of the economic, financial and other data currently available.
- Since Toshiba Group promotes business in various market environments in many countries and regions, its activities are subject to a number of risks and uncertainties that, without limitation, relate to economic conditions, worldwide mega-competition in the electronics business, customer demand, foreign currency exchange rates, tax rules, regulations and other factors. Toshiba therefore wishes to caution readers that actual results might differ materially from our expectations.
- Toshiba's fiscal year (FY) runs from April 1 to March 31. All figures are consolidated totals for the 12 months , unless otherwise indicated.

**TOSHIBA**

**Leading Innovation >>>**