

**TOSHIBA**

Leading Innovation >>>



# **Thailand Manufacturing Plant's Successful Implementation of 3R & Energy Saving Activities**

**Toshiba Corporation  
Storage & Electronic Devices  
Solutions Company  
Feb.16, 2017**

# Agenda

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- **Company Profiles**
  - 1) Storage & Electronic Devices Solutions Company
  - 2) Toshiba Semiconductor (Thailand) Co., Ltd.
- **3R Case: Activities and Awards Achieved in 2015**
- **Energy Saving Case: Management and PM Award Achieved in 2016**
- **Other Awards Achieved History**
- **Proactive Environmental Communications**

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- **3R Case: Activities and**

- Awards Achieved in 2015**

- **Energy Saving Case: Management and**

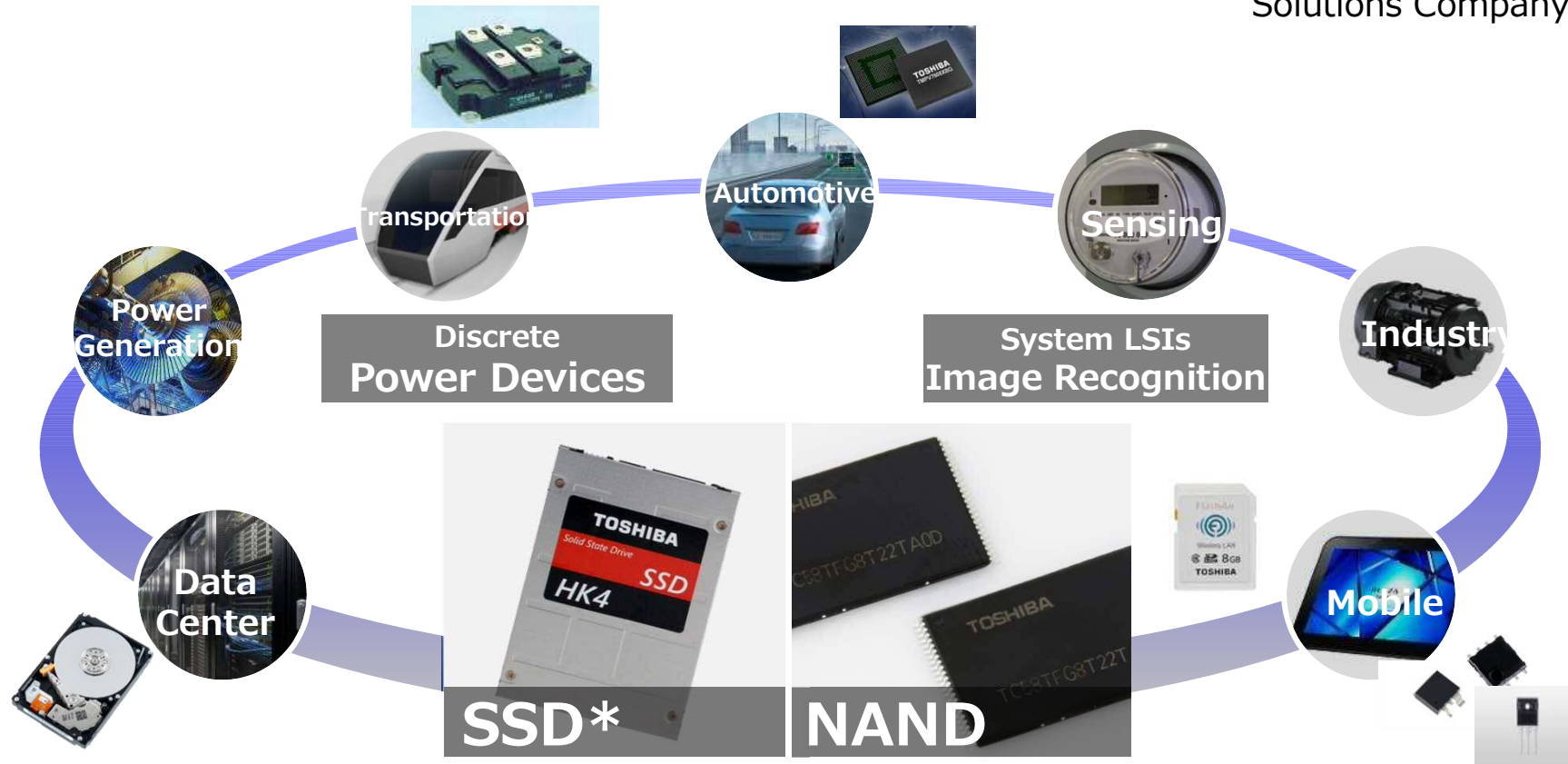
- PM Award Achieved in 2016**

- **Other Awards Achieved History**

- **Proactive Environmental Communications**

# Introduction: Products Domain

Storage & Electronic Devices  
Solutions Company

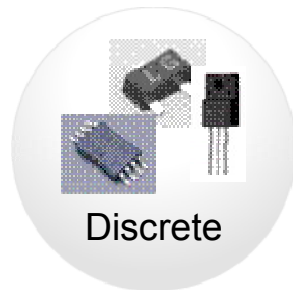


**Industrial Products · Automotive  
Communications · Information Society**

**Contributing to a "Smart Infrastructure"**

# Introduction: Products Line-up

Storage & Electronic Devices  
Solutions Company



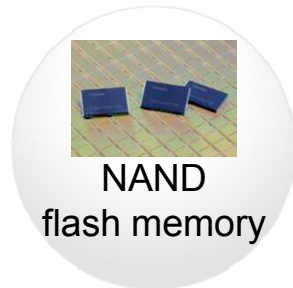
## Discrete Semiconductors

- Small Signal Devices
- Power Devices
- Optic Devices (Photocoupler)



## Mixed Signal ICs

- Automotive LSI, Analog
- Communication IC
- MCU



## Logic LSI

- ApP Lite™
- ASIC



## Memory

- NAND Flash Memory
- SSD

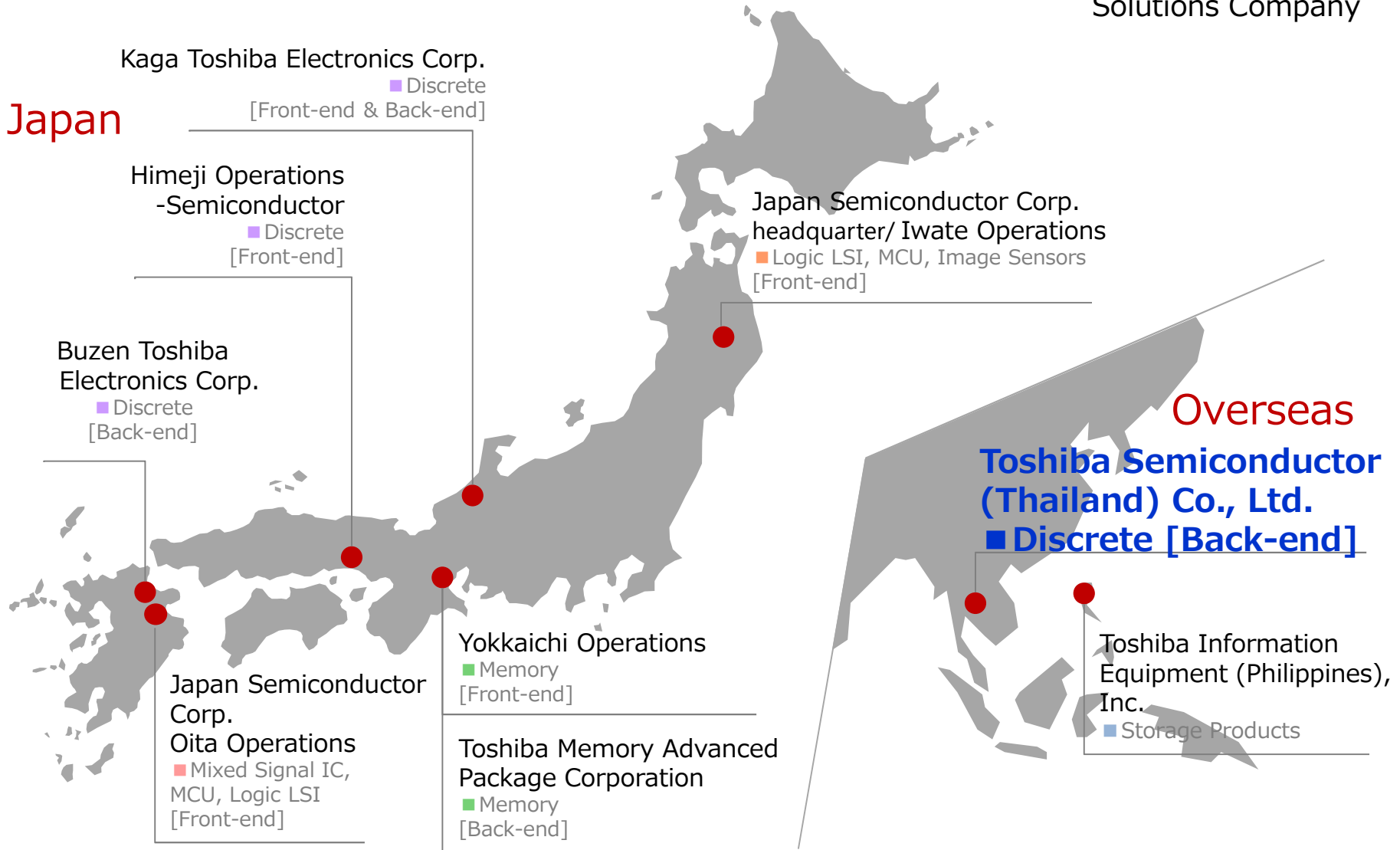
## Storage Products

- HDD

# Introduction: Fabrication Plants

Storage & Electronic Devices  
Solutions Company

## Japan



# Introduction of TST: Company Profile (1)

Please call us “**TST**” !

Company Name:

**Toshiba Semiconductor (Thailand) Co., Ltd.**

Established: October 11, 1990

Capital: 1,215 Million Baht (35.1 USD (Mil))

Representative: Mr. Yoshiaki Aizawa, President

Business: Manufacturing Discrete Semiconductor

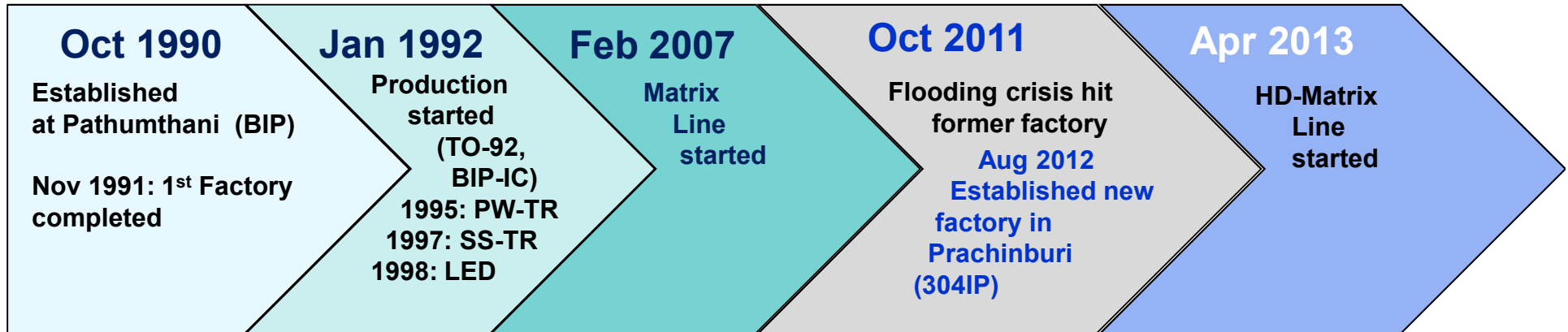
Number of Employees: 770 as of Oct / 2016

Shareholders: Toshiba Corporation: 98.8%, others: 1.2%

Location: 572 Moo 7, 304 Industrial Park, T. Thatoom A. Srimahaphot,  
Prachinburi 25140, Thailand



# Introduction of TST: Company Profile (2)



## TST Products Line-Up (Small Signal, Optical Devices)

### Small Signal Semiconductor Devices

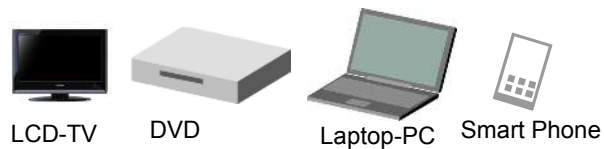


### Optical Semiconductor Devices



### Application products

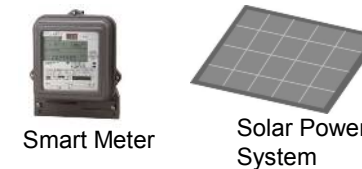
#### Home Appliances



#### Office Appliances



#### New Energy Business





# TST's Efforts to Mitigate Surrounding Environmental Impacts



Wet scrubber

Wet scrubbers treat air from QA analysis rooms by setting parameters that comply with "Notification of Ministry of Industry" standards related to air emission from factory standards, B.E.2549 (2006).

**Air pollution control**

Noise levels from inside the factory are measured in order to assure that 24 hour production does not negatively impact the local community or other nearby facilities.

**Noise pollution control**



Sound monitoring



Wastewater treatment plant

Wastewater from production processes are treated through chemical processes. After the treatment, wastewater is sent to a central wastewater treatment facility in the 304 Industrial Park.

**Waste water control**

**Industrial waste control**

Industrial wastes are separated into four categories: recycling, reusing, burning and for final disposal.



Industrial waste management



# Agenda

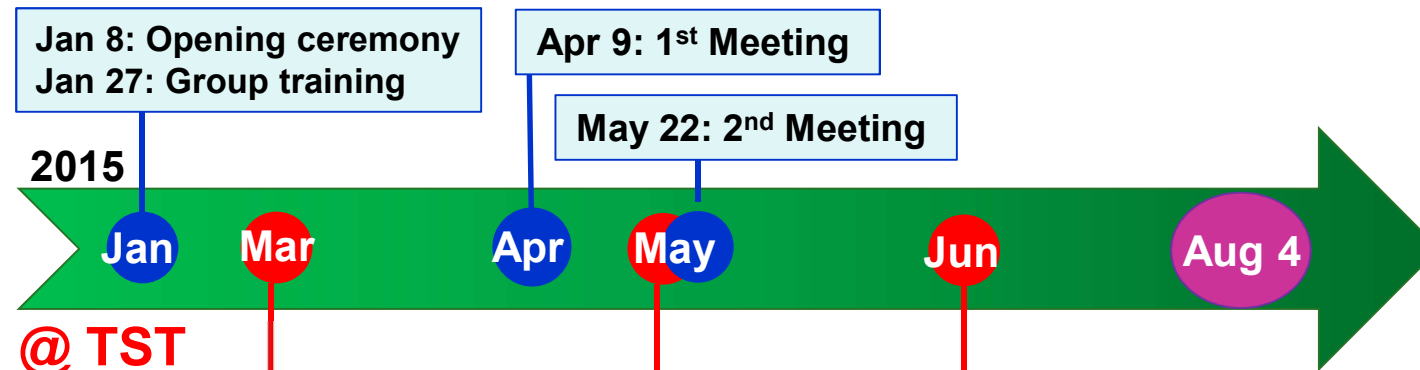
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- **Proactive Environmental Communications**

# TST Received Government's Excellent 3R Awards (1)

**3Rs Awards Achievement: Action Promotion Period (TTL = 7 Months)**

@ Bangkok. (group meeting with DIW\*1)



**3Rs Awards :**

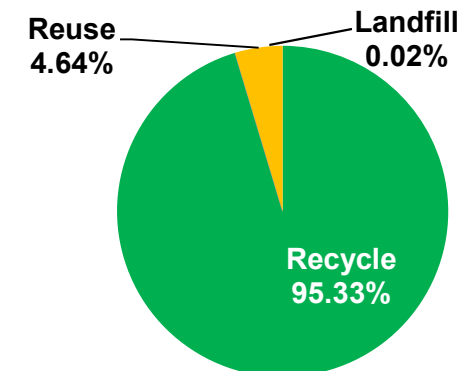
1. 3Rs
2. Zero Waste to Landfill Achievement
3. 3Rs Plus



Mar 9: 1<sup>st</sup> Coaching    May 14: 2<sup>nd</sup> Coaching    June 23: Auditor Verification

**Mar 9 - Apr 30**  
**Action Item: Spray cans**  
 Changed disposal method  
**Landfill → Recycle**

**May 14 - June 2**  
**Action Item: Battery (Lead type only)**  
 Changed disposal method  
**Landfill → Recycle**



**FY 2015 Waste disposal breakdown**

# TST Received Government's Excellent 3R Awards (2)

Award	Criteria	TST original status	Action / Good point									
<b>3Rs Award</b>	Results of waste management following 3Rs criteria (12 categories): <b>Score&gt;80 %</b>	Already achieved criteria	<b>Good point:</b> Wastes storage <b>TST ≤ 75 days</b> (Legal requirements ≤ 90days)									
<b>Zero Waste to Landfill Achievement</b>	Zero waste disposal to landfill (Administration's criteria) <b>Except for :</b> 1. Lamp 2. Battery (only Ni-Cd & Alkaline) 3. Insulation (There're no methods to recycle in Thailand)	TST had two remaining waste items to achieve administration's criteria as shown below. <table border="1" data-bbox="1055 730 1532 959"> <thead> <tr> <th rowspan="2">Type of waste</th> <th colspan="2">Disposal Method</th> </tr> <tr> <th>Before</th> <th>After</th> </tr> </thead> <tbody> <tr> <td>Spray Cans</td> <td rowspan="2">Landfill</td> <td rowspan="2">Recycle</td> </tr> <tr> <td>Lead-acid batteries</td> </tr> </tbody> </table> (Detail: P. 13)	Type of waste	Disposal Method		Before	After	Spray Cans	Landfill	Recycle	Lead-acid batteries	<b>Action :</b> 1. To find new disposers 2. To request permissions from <b>DIW</b> * 1).  <b>Good point :</b> TST reduced hazardous wastes, for instance, by separating batteries from temp recorders.
Type of waste	Disposal Method											
	Before	After										
Spray Cans	Landfill	Recycle										
Lead-acid batteries												
<b>3Rs+ Award</b>	In addition to 3Rs Award's criteria: Pursuing business results as below. <b>1.DPP ≤ 4 year</b> (Discounted Payback Period) <b>2.ROI ≥ 100 %</b> (Return On Investment)	Target of TST's project: Reduction of lead frames and mold resin wastes. <b>DPP &amp; ROI: Largely achieved</b> (Detail: P. 13)	<b>Good point :</b> TST has good waste management system control and advanced effective projects to achieve this award.									

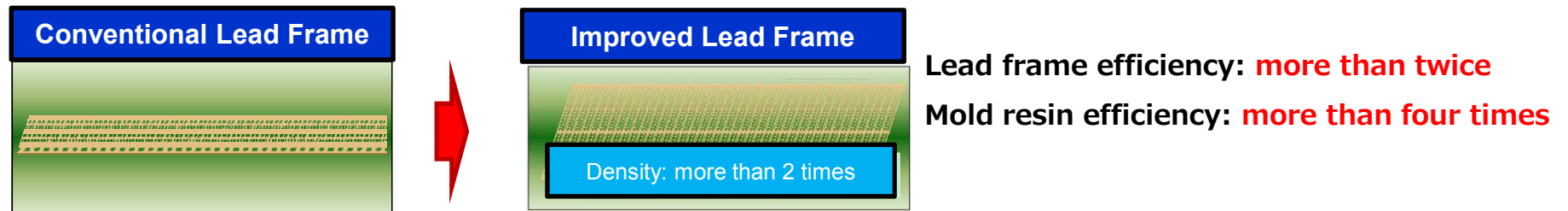
\* 1) Remark: **DIW** ; Department of Industrial **W**orks

# TST Received Government's Excellent 3R Awards (3)

## Case examples of 3Rs measures

### \* Efficient use of raw material and reduction of wastes.

- 1) Changed lead frame to higher density type: 25.3 tons/year reduction.
- 2) Changed design of mold resin (**smaller size**): 1.6 tons/year reduction.



### \* Promote waste amount reduction measures along Government (DIW) criteria

Promoted recycling of Spray Cans and Batteries by decomposing components, and achieved "Zero Waste to Landfill." Criteria defined by Thai administration (DIW).



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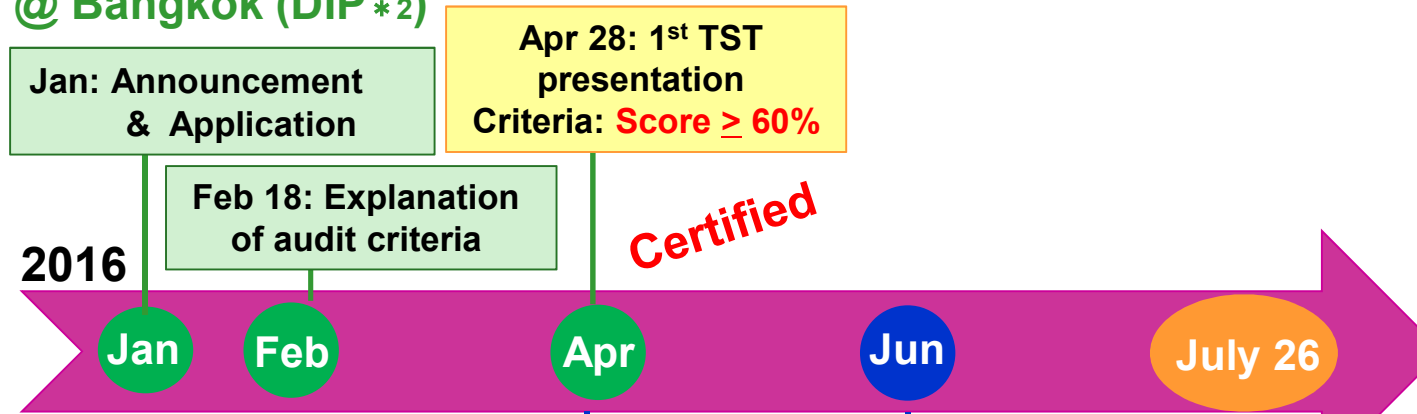
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# TST Received PM Awards Relevant to Energy Saving (1)

PM 's Award\*1 Achievement: Action Promoted period (TTL = 7 Months)

@ Bangkok (DIP \*2)



Six companies archived awards

@ TST



\* 1: Remark: TST was recognized by Prime Minister's Industry Awards of Energy Management

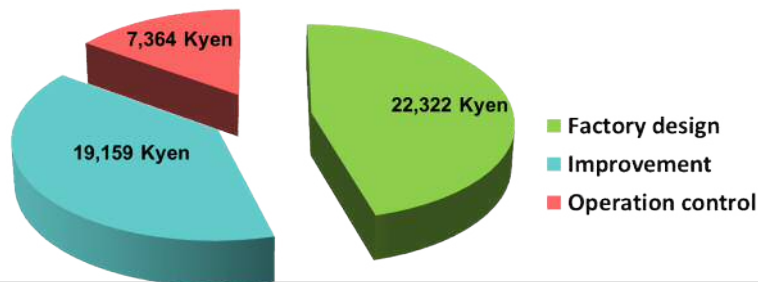
\* 2: DIP: Department of Industrial Promotion

# TST Received PM Awards Relevant to Energy Saving (2)

Award	Outlines	TST's efforts to receive awards
<b>FY2016</b> <b>The Prime Minister's Industry Award 2016</b> <b>(Energy Management Category)</b>	@1 <sup>st</sup> presentation following criteria (6 sections) Total score: 1,000 (Score $\geq$ 600 required to pass) @Site audit following criteria: 6 sections Total score: 1,000 (Score $\geq$ 800 Required to pass) Auditor team: total 15 persons (Experts from various fields and academia)	1. TST's continuous cost saving measures related to this award's criteria. (e.g. utilize cutting-edge technologies and low power operation systems.) 2. Data recording used for analyzing energy usage. 3. Prepared SWI (Specification Work Instruction) and followed up.

<b>Feb 23 - June 9: Weekly meeting with leaders to prepare data following audit criteria</b> <b>Audit criteria: 6 sections, Total score: 1,000 (Audit results <math>\geq</math> 800 to be certified)</b>	
Section 1: Policy & energy target <b>(50 score)</b> , Section 2: Organization of energy management <b>(50 score)</b> , Section 3: Planning & implementation <b>(400 score)</b> ,	Section 4: Operational control <b>(200 score)</b> Section 5: Monitoring, control, energy index <b>(100 score)</b> Section 6: Management review <b>(200 score)</b>

## Results of TST's remarkable energy saving measures (FY2013 to FY2016)

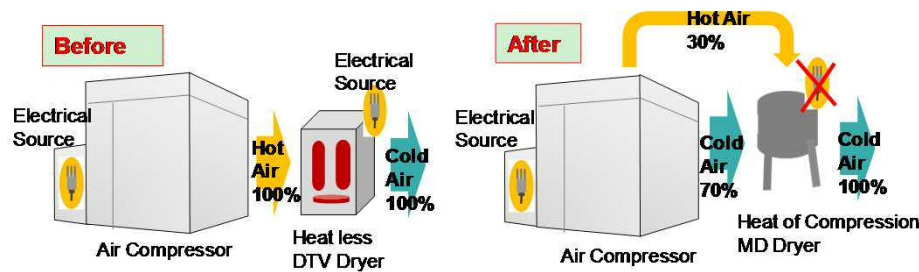


**Remark :** Total cost saving for 3 years (FY2013 to May 2015) was **48,845** k-yen resulting from 14 activities (  $\doteq$  2,000 tons-CO2 reduction)

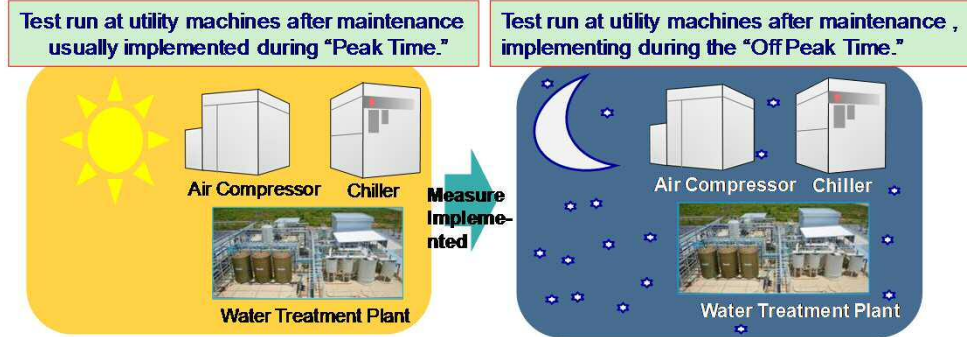


# TST Received PM Awards Relevant to Energy Saving (3)

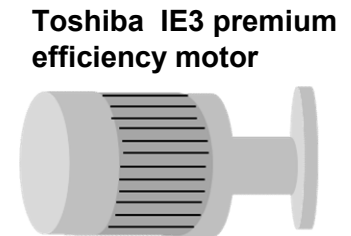
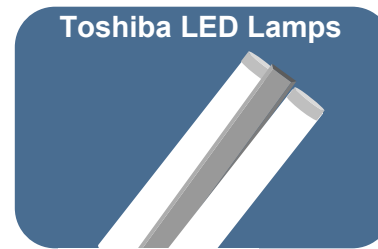
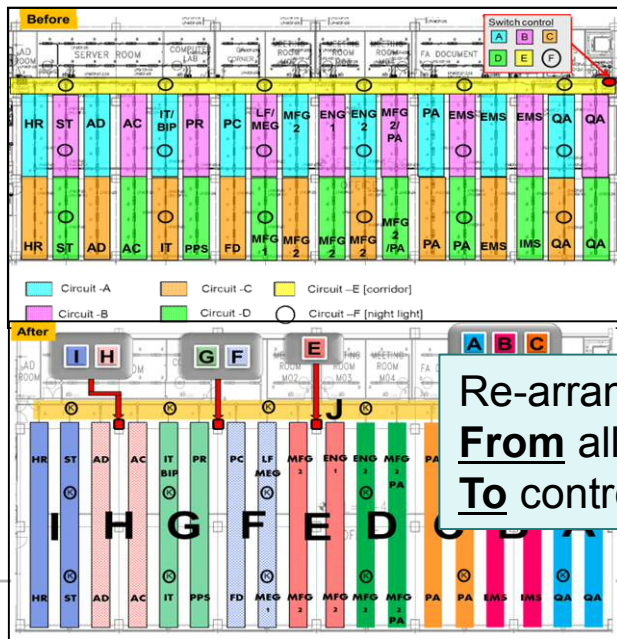
## Case examples of energy saving measures



\*Used hot air from air compressors, supplied to MD dryers for regeneration (Zero Purge)



Alternate running machine at **Off-Peak** time



Adopted LED lighting and high-efficiency IE3 motors

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# TST's Other Awards Achieved History (1)



## TST's Other Awards Achieved History (2)

Award	Criteria	TST's efforts to receive awards
<b>Green Industry</b> Level 3: Green System (2014)	ISO 14001 management system.	HQ & Top management implementation policy to enhance TST's EMS level.
<b>Green Meeting Certificate</b>	Company demonstrates policy for meetings, trainings or seminars to utilize natural resources and environmental impact reduction measures with audit criteria	Information accumulated over a long period of time from various environmental activities utilized for its meetings, trainings, and seminars.
<b>Good Governance Project</b> (Best Practice Award 2015)	Company should incorporate audit criteria (7 items): 1. Community accessibility to company information, 2. Community participation in environmental policies, 3. Transparency, 4. CSR, 5. Legal, 6. Social accountability, 7. Sustainability	TST had not disclosed environmental information to nearby community (Criteria item 1) <b>Action : Provide TST's environmental information through:</b> 1. Via e-mails sent to fellow industrial park companies 2. Through information boards located in employee's residential areas
<b>CSR-DIW Awards</b> (Continuous Awards)	Committee audits following 7 core subjects as below: 1. Organizational governance, 2. Human rights, 3. Labor practices, 4. Environment, 5. Fair operating practices, 6. Consumer issues, 7. Social development	This project is managed by government and private sector. Supporters drawn from top management and TST CSR Club. Awards concept is similar to the Toshiba's Standard Code of Contact policy.








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# TST's Environmental Communications (1)

Activity	FY2014	FY2015	FY2016
<b>Environmental activity</b>	  <p>Employee environmental &amp; energy awareness</p>    <p>Free tree program</p> <p>Promote Green News</p> <p>Emergency practices</p>   <p>Safety, Environmental and Energy Week</p> <p>TST Earth Hour</p>	  <p>Employee environmental &amp; energy awareness</p> <p>Waste treatment site visits</p>    <p>Free tree program</p> <p>Promote Green News</p> <p>Emergency practices</p>   <p>Safety, Environmental and Energy Week</p> <p>TST Earth Hour</p>	  <p>Employee environmental &amp; energy awareness</p> <p>Waste treatment site visits</p>   <p>Waste treatment site visits</p> <p>Promote Green News</p>  <p>Emergency practices</p>
	<b>Communication</b>	 <p>Donated Pli Bai magazine to 50 schools</p>   <p>TST dam construction: total 3 dams</p> <p>Tree planting area: total 1,000 m<sup>2</sup></p>  <p>Donation of old calendars used to make books for blind people</p>	 <p>Donated Pli Bai magazine to 50 schools</p>   <p>Tree planting area: total 8,000 m<sup>2</sup></p> <p>Mangrove project: total 500 trees</p>  <p>Donation of old calendars used to make books for blind people</p>

# TST's Environmental Communications (2)

## In association with local government

Category	Activity			
<p>School &amp; Community</p>	 <p>Donated Pli Bai magazine to 50 schools</p>	 <p>Organic Fertilizer Education</p>	 <p>Wat Buyaybai school renovation</p>	 <p>Children Developmental Center lunch</p>
	 <p>Fire drill and first aid training</p>	 <p>Economic activity by local communities in TST</p>	 <p>Dialogues with community</p>	 <p>TST's 25th Anniversary Bus Station donation</p>
<p>Buddhist Ceremony</p>	 <p>Toshiba donated lighting on Asarnha Bucha day</p>	 <p>Donation to temple</p>	 <p>TST Foundation Day</p>	 <p>Offering given on Visakha Bucha day</p>
<p>CSR Activities (Old Calendar Donation for making book to the blind)</p>	 <p>Donation to school for the blind children in Bangkok</p>	 <p>Educational Technology for Blind Center</p>	 <p>Supporting Blind, Pathumthani</p>	
<p>Toshiba Group Global Environmental Action</p>	 <p>TST dam construction: 3 dams</p>	 <p>Mangrove project: 500 trees</p>	 <p>Aluminum &amp; staples donation to foundation</p>	

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