From: Ray Wieda
To: Water Permit Application
Cc: Rusty Marvel - Tokai; Nathan Siria
Subject: Tokai Carbon GE LLC (AR0037851) Renewal Application
Date: Wednesday, December 19, 2018 8:38:08 AM
Attachments: image001.png

On behalf of Tokai Carbon GE LLC, please find attached a renewal application for NPDES permit AR0037851. Should you have any questions regarding this application, please feel free to contact me or Nathan Siria at (501) 225-7779.

Regards,
Ray

Raymond E. Wieda, PE
FTN Associates, Ltd.
3 Innwood Circle, Suite 220 ~ Little Rock, AR 72211 (501) 225-7779 ~ fax (501) 225-6738
rew@ftn-assoc.com http://www.ftn-assoc.com

TOKAI CARBON GE LLC
2018 NPDES PERMIT RENEWAL APPLICATION
NPDES PERMIT NO. AR0037851

DECEMBER 19, 2018

TOKAI CARBON GE LLC
2018 NPDES PERMIT RENEWAL APPLICATION
NPDES PERMIT NO. AR0037851

Prepared for

Tokai Carbon GE LLC
3931 Carbon Plant Road
Ozark, AR 72949

Prepared by

FTN Associates, Ltd.
3 Innwood Circle, Suite 220
Little Rock, AR 72211

FTN No. 18200-1918-001

December 19, 2018

Tokai Carbon GE LLC
2018 NPDES Permit Renewal Application
NPDES Permit No. AR0037851

ENCLOSURES:

- **ADEQ Form 1**
  - **Proof of Good Standing**
- **EPA Form 2C**
- **Disclosure Statement**
- **Maps & Diagrams**
  - **Site Map**
  - **Topographic Map**
  - **Flood Insurance Rate Map**
  - **Flow Diagram**

ADEQ Form 1

NPDES PERMIT APPLICATION

FORM 1

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF WATER QUALITY
5301 Northshore Drive
North Little Rock, AR 72118-5317
www.adeq.state.ar.us/water

PURPOSE OF THIS APPLICATION

- ☐ INITIAL PERMIT APPLICATION FOR NEW FACILITY
- ☐ INITIAL PERMIT APPLICATION FOR EXISTING FACILITY
- ☐ MODIFICATION OF EXISTING PERMIT
- ☒ REISSUANCE (RENEWAL) OF EXISTING PERMIT
- ☐ MODIFICATION AND CONSTRUCTION OF EXISTING PERMIT
- ☐ CONSTRUCTION PERMIT

SECTION A- GENERAL INFORMATION

1. Legal Applicant Name (The permit will be issued under this name. This is the entity that controls and is responsible for operations and compliance.):

   Tokai Carbon GE LLC

   Note: The legal name of the applicant must be identical to the name listed with the Arkansas Secretary of State.

2. Operator Type: Private ☐ State ☐ Federal ☐ Partnership ☐ Corporation ☒ Other ☐

   State of Incorporation: Delaware

3. Facility Name: Tokai Carbon GE LLC

4. Is the legal applicant identified in number 1 above, the owner of the facility? ☒ Yes ☐ No

5. NPDES Permit Number (If Applicable): AR0037851

6. NPDES General Permit Number (If Applicable): ARG

7. NPDES General Storm Water Permit Number (If Applicable): ARR00C390

8. Permit Numbers and/or names of any permits issued by ADEQ or EPA for an activity located in Arkansas that is presently held by the applicant or its parent or subsidiary corporation which are not listed above:

Permit Name	Permit Number	Held by
Title V Air Operating Permit	0429-AOP-R22	Applicant

9. Give driving directions to the wastewater treatment plant with respect to known landmarks:

   US Interstate 40 to US Hwy 64 (exit 55) then Hwy 64 west to Altus. Facility is 2.5 miles south of the Altus downtown square

   On Carbon Plant Road

10. Facility Physical Location: (Attach a map with location marked; street, route no. or other specific identifier)

    Street: 3931 Carbon Plant Road

    City: Ozark County: Franklin State: AR Zip: 72949

11. Facility Mailing Address for permit, DMR, and invoice (Street or Post Office Box):

Name: Rusty Marvel Title: ESHA Manager

Street: 3931 Carbon Plant Road P.O. Box

City: Ozark State: AR Zip: 72949

E-mail address*: Rusty.Marvel@tokaicarbonusa.com Fax:

* Is emailing all documents (permit, letters, DMRs, invoices, etc.) acceptable to the applicant? ☒ Yes ☐ No

12. Neighboring States Within 20 Miles of the permitted facility (Check all that apply):

Oklahoma ☐ Missouri ☐ Tennessee ☐ Louisiana ☐ Texas ☐ Mississippi ☐

13. Indicate applicable Standard Industrial Classification (SIC) Codes and NAICS codes for primary processes (See Item #3 of the instructions for assistance in determining the correct SIC and NAICS Codes):

3624 SIC Facility Activity under this SIC or NAICS:

335991 NAICS Carbon and Graphite Product Manufacturing

14. Design Flow: _____ MGD Highest Monthly Average of the last two years Flow: 0.0741 MGD

15. Is the outfall equipped with a diffuser? ☐ Yes ☒ No

16. Responsible Official (as described on the last page of this application):

Name: Chris Harris Title: Vice President – Operations

Address: 3931 Carbon Plant Road Phone Number: (479) 468-8000

E-mail Address: Chris.Harris@tokaicarbonusa.com

City: Ozark State: AR Zip: 72949

17. Cognizant Official (Duly Authorized Representative of responsible official as described on the last page of this application):

Name: Rusty Marvel Title: EHSA Manager

Address: 3931 Carbon Plant Road Phone Number: (479) 468-8000

E-mail Address: Rusty.Marvel@tokaicarbonusa.com

City: Ozark State: AR Zip: 72949

18. Name, address and telephone number of active consulting engineer firm (If none, so state):

Contact Name: Ray Wieda, PE

Company Name: FTN Associates, Ltd

Address: 3 Innwood Circle, Suite 220 Phone Number: (501) 225-7779

E-mail Address: rew@ftn-assoc.com

City: Little Rock State: AR Zip: 72211

19. Wastewater Operator Information

Wastewater Operator Name: Ned Ryerson (by contract with ESC, Inc.) License number: 005287

Class of municipal wastewater operator: I ☒ II ☐ III ☐ IV ☐

Class of industrial wastewater operator: Basic ☒ Advanced ☐

SECTION B: FACILITY AND OUTFALL INFORMATION

1. Facility Location (All information must be based on the **front door (gate)** location of the facility):

Lat: 35N ° 24 ‘ 42.85 “ Long: 93W ° 46 ‘ 17.08 “ County: Franklin Nearest Town: Ozark

2. **Outfall** Location (The location of the end of the pipe discharge point.):

Outfall No. 003:

Latitude: 35N ° 23 ’ 26 ” Longitude: 93W ° 46 ’ 39 ”

Description of outfall location: From plant site pump station through 3” force main

Name of Receiving Stream (i.e. an unnamed tributary of Mill Creek, thence into Mill Creek; thence into Arkansas River):

Arkansas River

Outfall No. _____:

Latitude: _____ ° _____ ’ _____ ” Longitude: _____ ° _____ ’ _____ ”

Description of outfall location: _____

Name of Receiving Stream (i.e. an unnamed tributary of Mill Creek, thence into Mill Creek; thence into Arkansas River):

3. **Monitoring** Location (If the monitoring is conducted at a location different than the above **Outfall** location):

Outfall No. 003:

Lat: 35N ° 24 ‘ 36 “ Long: 93W ° 46 ‘ 39 “

Outfall No. _____:

Lat: _____ ° _____ ‘ _____ “ Long: _____ ° _____ ‘ _____ “

Outfall No. _____:

Lat: _____ ° _____ ‘ _____ “ Long: _____ ° _____ ‘ _____ “

4. Type of Treatment system (Include all components of the treatment system and attach the process flow diagram):

Cooling tower blowdown is treated through filter bags for solids removal. The discharge from the pitch impregnation product cooling spray is passed through an oil skimmer and recirculated.

5. **FLOW AND SAMPLE MEASUREMENT**

How are effluent samples collected?

Effluent samples are collected by a contract laboratory certified by ADEQ.

How is flow measured, i.e., v-notch weir, totalizing meter, Parshall flume, etc.?

Flow is measured using a magnetic flow meter.

6. Is the proposed or existing facility located above the 100-year flood level? ☒ Yes ☐ No

NOTE: FEMA Map must be included with this application. Maps can be ordered at www.fema.gov .

If "No", what measures are (or will be) used to protect the facility? _____

7. Population for Municipal and Domestic Sewer Systems: N/A

8. Backup Power Generation for Treatment Plants

Are there any permanent backup generators? Yes ☐ No ☒

If Yes, how many? _____ Total Horsepower (hp)? _____

If no, please explain. Include a description of how the WWTP will be restarted and actions taken to ensure compliance with permit limits once power is restored.

Tokai does not operate a treatment system. Discharge is pumped and would cease during a power outage.

SECTION C – WASTE STORAGE AND DISPOSAL INFORMATION

1. Sludge Disposal Method (Check as many as are applicable):

☐ **Landfill**

Landfill Site Name _____ ADEQ Solid Waste Permit No. _____

☐ **Land Application:** ADEQ State Permit No. _____

☐ **Septic tank** Arkansas Department of Health Permit No.: _____

☐ **Distribution and Marketing**: Facility receiving sludge:

Name: _____ Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

Rail: ☐ _____ Pipe: ☐ _____ Other: _____

☐ **Subsurface Disposal** (Lagoon for which the sole purpose is storing sludge):

Location of lagoon _____ How old is the lagoon? _____

Surface area of lagoon: _____ Acre Depth: _____ ft Does lagoon have a liner? ☐ Yes ☐ No

☐ **Incineration:** Location of incinerator _____

☐ **Remains in Treatment Lagoon(s):**

How old is the lagoon(s)? _____ Has sludge depth been measured? ☐ Yes ☐ No

If Yes, Date measured? _____ Sludge Depth? _____ ft If No, When will it be measured? _____

Has sludge ever been removed? Yes ☐ No ☐ If Yes, When was it removed? _____

☒ **Other** (Provide complete description): Sediments remain in sedimentation pond.

SECTION D - WATER SUPPLY

Water Sources which are downstream of the outfall location, i.e., those which could be affected by the discharge from this facility (check as many as are applicable):

☐ **Private Well** - Distance from Discharge point: ☐ Within 5 miles ☐ Within 50 miles

☒ **Municipal Water Utility** (Specify City): Ozark

Distance from Discharge point: ☐ Within 5 miles ☒ Within 50 miles

☐ **Surface Water**- Name of Surface Water Source: _____

Distance from Discharge point: ☐ Within 5 miles ☐ Within 50 miles

Lat: _____ ° _____ ‘ _____ “ Long: _____ ° _____ ‘ _____ “

☐ **Other** (Specify): _____

Distance from Discharge point: ☐ Within 5 miles ☐ Within 50 miles

NOT APPLICABLE (N/A): ☐

SECTION E: TRUST FUND REQUIREMENTS AND DISCLOSURE STATEMENT

1. Ark. Code Ann. § 8-4-203(b)(1)(A) forbids the Arkansas Department of Environmental Quality from issuing, modifying, renewing, or transferring a permit for a nonmunicipal domestic sewage treatment works without the applicant first fulfilling the trust fund requirements set forth in that section. Ark. Code Ann. § 8-4-203(b)(1)(B) defines "nonmunicipal domestic sewage treatment works" as a device or system operated by an entity other than a city, town, or county that treats, in whole or in part, waste or wastewater from humans or household operations and must continually operate to protect human health and the environment despite a permittee's failure to maintain or operate the device or system. NDSTW's can include, but are not limited to:
    - Sewer Improvement Districts;
    - Subdivisions,
    - Mobile Home Parks,
    - Property Owner' Associates,
    - RV parks, and
    - Apartments

    Exclusions Excluded from this application's Section E.1. requirements for trust fund contribution fees are:
    - State or federal facilities,
    - Schools,
    - Universities and colleges,
    - Entities that continuously operate due to a connection with a city, town, or county, and
    - Commercial or industrial entity that treats domestic sewage from its operations and does not accept domestic sewage from other entities or residences.

    The trust fund form may be obtained from the ADEQ web site at:

    https://www.adeq.state.ar.us/water/permits/npdes/individual/pdfs/ndstw-trust-fund-certification-form.pdf

2. Disclosure Statement:

    Ark. Code Ann. 8-1-106 requires that applicants for any type of permit or transfer of any permit, license, certification or operational authority issued by the Arkansas Department of Environmental Quality (ADEQ) file a Disclosure Statement with their application unless exempt for doing so under Ark. Code Ann. §8-1-106(b)(2). The filing of a Disclosure Statement is mandatory. No application can be considered administratively complete without a completed Disclosure Statement unless that facility is exempt. Publicly traded companies may submit the most recent 10k and 10Q filings to the Securities and Exchange Commission in lieu of the Disclosure Statement. The form may be obtained from the ADEQ web site at:

    https://www.adeq.state.ar.us/ADEQ_Disclosure_Statement.pdf

NOT APPLICABLE (N/A): ☐

SECTION F – INDUSTRIAL ACTIVITY

1. Does an effluent guideline limitation promulgated by EPA (Link to a Listing of the 40 CFR Effluent Limit Guidelines) under Section 304 of the Clean Water Act (CWA) apply to your facility?

   YES ☐ (Answer questions 2 and 3) NO ☒

2. What Part of 40 CFR? N/A

3. What Subpart(s)? N/A

4. Give a brief description of all operations at this facility including primary products or services (attach additional sheets if necessary):

   Tokai Carbon GE LLC manufactures carbon graphite electrodes for use in electric arc furnaces.

5. Production: (projected for new facilities)

Product(s) Manufactured	Last 12 Months lbs/day*		Highest Production Year of Last 5 Years lbs/day*	
(Brand name)	Highest Month	Days of Operation	Monthly Average	Days of Operation
N/A				

* These units could be off-lbs, lbs quenched, lbs cleaned/etched/rinsed, lbs poured, lbs extruded, etc.

NOT APPLICABLE (N/A): ☐

SECTION G - WASTEWATER DISCHARGE INFORMATION

Facilities that checked "Yes" in question 1 of Section F are considered Categorical Industrial Users and should skip to question 2.

1. **For Non-Categorical Users Only**: List average wastewater discharge, maximum discharge, and type of discharge (batch, continuous, or both), for each plant process. Include the reference number from the process flow schematic (reference Figure 1) that corresponds to each process. [New facilities should provide estimates for each discharge.]

No.	Process Description	Average Flow (GPD)	Maximum Flow (GPD)	Type of Discharge (batch, continuous, none)
	See attached flow diagram			

If batch discharge occurs or will occur, indicate: [New facilities may estimate.]

Number of batch discharges: _____ per day Average discharge per batch: (GPD)

Time of batch discharges _____ (days of week) at _____ (hours of day)

Flow rate: _____ gallons/minute Percent of total discharge: _____

Answer questions 2, 3, 4, and 5 only if you are subject to Categorical Standards.

2. For Categorical Users: Provide the wastewater discharge flows for each of your processes or proposed processes. Include the reference number from the process flow schematic (reference Figure 1) that corresponds to each process. [Note: 1) New facilities should provide estimates for each discharge and 2) Facilities should denote whether the flow was measured or estimated.]

No.	Regulated Process	Average Flow (GPD)	Maximum Flow (GPD)	Type of Discharge (batch, continuous, none)

No.	Unregulated Process	Average Flow (GPD)	Maximum Flow (GPD)	Type of Discharge (batch, continuous, none)

No.	Dilution (e.g., Cooling Water)	Average Flow (GPD)	Maximum Flow (GPD)	Type of Discharge (batch, continuous, none)

If batch discharge occurs or will occur, indicate: [New facilities may estimate.]

Number of batch discharges: _____ per day Average discharge per batch: (GPD)

Time of batch discharges _____ (days of week) at _____ (hours of day)

Flow rate: _____ gallons/minute Percent of total discharge: _____

3. Do you have, or plan to have, automatic sampling equipment or continuous wastewater flow metering equipment at this facility?

Current: Flow Metering ☐ Yes Type: _____ ☐ No ☐ N/A ☐
Sampling Equipment ☐ Yes Type: _____ ☐ No ☐ N/A ☐

Planned: Flow Metering ☐ Yes Type: _____ ☐ No ☐ N/A ☐
Sampling Equipment ☐ Yes Type: _____ ☐ No ☐ N/A ☐

If yes, please indicate the present or future location of this equipment on the sewer schematic and describe the equipment below:

4. Are any process changes or expansions planned during the next three years that could alter wastewater volumes or characteristics?

☐ Yes ☐ No (If no, skip Question 5)

5. Briefly describe these changes and their effects on the wastewater volume and characteristics:

NOT APPLICABLE (N/A): ☒

SECTION H -TECHNICAL INFORMATION

Technical information to support this application shall be furnished in appropriate detail to understand the project. Information in this Part is required for obtaining a **construction permit** or for **modification** of the treatment system.

1. Describe the treatment system. Include the types of control equipment to be installed along with their methods of operation and control efficiency.

   _____

   _____

   _____

2. One set of construction plans and specifications, approved (Signed and stamped) by a **Professional Engineer** (PE) registered in **Arkansas**, must be submitted as follows:

   a. The plans must show flow rates in addition to pertinent dimensions so that detention times, overflow rates, and loadings per acre, etc. can be calculated.
   b. Specifications and complete design calculations.
   c. All treated wastewater discharges should have a flow measuring device such as a weir or Parshall flume installed. Where there is a significant difference between the flow rates of the raw and treated wastewater, a flow measuring device should be provided both before and after treatment.

3. If this application includes a construction permit disturbing five or more acres, a storm water construction permit must be obtained by submitting a notice of intent (NOI) to ADEQ.

SECTION I: SIGNATORY REQUIREMENTS

Cognizant Official (Duly Authorized Representative)

40 CFR 122.22(b) states that all reports required by the permit, or other information requested by the Director, shall be signed by the applicant (or person authorized by the applicant) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) the authorization is made in writing by the applicant (or person authorized by the applicant);
(2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity responsibility, or an individual or position having overall responsibility for environmental matters for the company.

The applicant hereby designates the following person as a Cognizant Official, or duly authorized representative, for signing reports, etc., including Discharge Monitoring Reports (DMR) required by the permit, and other information requested by the Director:

Signature of Cognizant Official: _____ Date: 12/14/18

Printed name of Cognizant Official: Rusty Marvel

Official title of Cognizant Official: EHSA Manager Telephone Number: (479) 468-8000

Responsible Official

The information contained in this form must be certified by a ***responsible official*** as defined in the "signatory requirements for permit applications" (40 CFR 122.22).

Responsible official is defined as follows:

Corporation, a principal officer of at least the level of vice president
Partnership, a general partner
Sole proprietorship: the proprietor
Municipal, state, federal, or other public facility: principal executive officer, or ranking elected official.

CH *(Initial)* "I certify that the cognizant official designated above is qualified to act as a duly authorized representative under the provisions of 40 CFR 122.22(b)." NOTE: If no duly authorized representative is designated in this section, the Department considers the applicant to be the responsible official for the facility and only reports, etc., signed by the applicant will be accepted by the Department.

CH *(Initial)* "I certify that, if this facility is a corporation, it is registered with the Secretary of State in Arkansas. Please provide the full name of the corporation if different than that listed in Section A above."

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. I further certify under penalty of law that all analyses reported as less than detectable in this application or attachments thereto were performed using the EPA approved test method having the lowest detection limit for the substance tested."

Signature of Responsible Official: _____ Date: 12/18/2018

Printed name of Responsible Official: Chris Harris

Official title of Responsible Official: Vice President – Operations Telephone Number: (479) 468-8000

Proof of Good Standing

Search Incorporations, Cooperatives, Banks and Insurance Companies

Printer Friendly Version

LLC Member information is now confidential per Act 865 of 2007

Use your browser's back button to return to the Search Results

Begin New Search

For service of process contact the Secretary of State's office.

Corporation Name	TOKAI CARBON GE LLC
Fictitious Names	
Filing #	811093898
Filing Type	Foreign Limited Liability Company
Filed under Act	Foreign LLC; 1003 of 1993
Status	Good Standing
Principal Address	
Reg. Agent	CORPORATION SERVICE COMPANY
Agent Address	300 SPRING BUILDING, SUITE 900 300 S. SPRING STREET LITTLE ROCK, AR 72201
Date Filed	01/15/2016
Officers	SCOTT L CARLTON , Manager SCOTT L CARLTON , Incorporator/Organizer
Foreign Name	N/A
Foreign Address	101 PERIMETER PARKWAY, STE 500 CHARLOTTE, NC 28216
State of Origin	DE

Purchase a Certificate of Good Standing for this Entity

Pay Franchise Tax for this corporation

State Of Delaware

Entity Details

11/8/2018 11:01:38AM

File Number:	5897631	Incorporation Date / Formation Date:	12/3/2015
Entity Name:	TOKAI CARBON GE LLC		
Entity Kind:	Limited Liability Company	Entity Type:	General
Residency:	Domestic	State:	DELAWARE
Status:	Good Standing	Status Date:	7/6/2018

Registered Agent Information

Name:	CORPORATION SERVICE COMPANY		
Address:	251 LITTLE FALLS DRIVE		
City:	WILMINGTON	Country:	
State:	DE	Postal Code:	19808
Phone:	302-636-5401		

EPA Form 2C

Please print or type in the unshaded areas only.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
AR0037851

Form Approved.
OMB No. 2040-0086.
Approval expires 3-31-98.

FORM 2C NPDES

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (*list*)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (*name*)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
003	35.00	23.00	26.00	93.00	46.00	39.00	Arkansas River

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
003	Bake furnace non-contact cooling system (heat exchanger spray, non-contact cooling spray, seal troughs)	12,000 gpd	None	4-A	
003	Equipment cleaning station	100 gpd	Drain filter	4-A	
003	Blowdown - bake furnace non-contact cooling system (batch)	200 gpd (6,000 gallons/month)	Dewatering bag filter	4-A	
003	Pitch impregnation product contact cooling spray	1,000 gpd	Oil skimmer	4-A	
003	Graphite furnace electrical non-contact cooling system (heat exchanger spray & non-contact cooling spray)	18,083 gpd	None	4-A	
003	Blowdown - graphite furnace electrical, non-contact cooling system (batch)	67 gpd (2,010 gallons/month)	Dewatering bag filter	4-A	

OFFICIAL USE ONLY *(effluent guidelines sub-categories)*

Please print or type in the unshaded areas only.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
AR0037851

Form Approved.
OMB No. 2040-0086.
Approval expires 3-31-98.

FORM 2C NPDES

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS
Consolidated Permits Program

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For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (*list*)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (*name*)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
003	35.00	23.00	26.00	93.00	46.00	39.00	Arkansas River

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B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
003	Graphite load/unload non-contact				
	cooling system (heat exchanger spray	3,630 gpd	Drain filter	4-A	
	& non-contact cooling spray)				
003	Graphite load/unload non-contact	800 gpd	Dewatering bag filter	4-A	
	cooling system blowdown				
003	Graphite furnace thermal non-contact	8,000 gpd	None	4-A	
	cooling system (heat exchanger spray				
	& non-contact cooling spray)				
003	Blowdown - graphite furnace thermal	120 gpd (3,600 gallons/month)	Dewatering bag filter	4-A	
	non-contact cooling system (batch)				
003	Graphite product contact cooling	3,000 gpd	Drain filter	4-A	
	spray				

OFFICIAL USE ONLY (*effluent guidelines sub-categories*)

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☑ YES (*complete the following table*) ☐ NO (*go to Section III*)

1. OUTFALL NUMBER (*list*)	2. OPERATION(*s*) CONTRIBUTING FLOW (*list*)	3. FREQUENCY a. DAYS PER WEEK (*specify average*)	3. FREQUENCY b. MONTHS PER YEAR (*specify average*)	4. FLOW a. FLOW RATE (*in mgd*) 1. LONG TERM AVERAGE	4. FLOW a. FLOW RATE (*in mgd*) 2. MAXIMUM DAILY	4. FLOW B. TOTAL VOLUME (*specify with units*) 1. LONG TERM AVERAGE	4. FLOW B. TOTAL VOLUME (*specify with units*) 2. MAXIMUM DAILY	4. FLOW C. DURATION (*in days*)
003	Bake furnace non-contact cooling system blowdown	0.2 (1/month)	12	--	0.006	--	6,000 gpd	1
003	Graphite furnace electrical non-contact cooling system blowdown	0.2 (1/month)	12	--	0.002	--	2,010 gpd	1
003	Graphite furnace thermal non-contact cooling system blowdown	0.2 (1/month)	12	--	0.0036	--	3,600 gpd	1
003	Graphite load/unload non-contact cooling system blowdown	0.2 (1/month)	12	--	0.0008	--	800 gpd	1

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☐ YES (*complete Item III-B*) ☑ NO (*go to Section IV*)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (*or other measure of operation*)?

☐ YES (*complete Item III-C*) ☑ NO (*go to Section IV*)

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION a. QUANTITY PER DAY	1. AVERAGE DAILY PRODUCTION b. UNITS OF MEASURE	1. AVERAGE DAILY PRODUCTION c. OPERATION, PRODUCT, MATERIAL, ETC. (*specify*)	2. AFFECTED OUTFALLS (*list outfall numbers*)

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operations of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ YES (*complete the following table*) ☑ NO (*go to Item IV-B*)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS a. NO.	2. AFFECTED OUTFALLS b. SOURCE OF DISCHARGE	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE a. REQUIRED	4. FINAL COMPLIANCE DATE b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (*or other environmental projects which may affect your discharges*) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

CONTINUED FROM PAGE 2

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding – Complete one set of tables for each outfall – Annotate the outfall number in the space provided.
NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ YES (*list all such pollutants below*) ☑ NO (*go to Item VI-B*)

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☑ YES (*identify the test(s) and describe their purposes below*) ☐ NO (*go to Section VIII*)

Biological tests for chronic toxicity have been conducted quarterly or semi-annually in accordance with NPDES permit AR0037851. Results are on file with ADEQ.

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☑ YES (*list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below*) ☐ NO (*go to Section IX*)

A. NAME	B. ADDRESS	C. TELEPHONE (*area code & no.*)	D. POLLUTANTS ANALYZED (*list*)
Environmental Services Company, Inc.	13715 West Markham Little Rock, AR 72211	(501) 221-2565	All

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE (*type or print*)	B. PHONE NO. (*area code & no.*)
Chris Harris, Vice President - Operations	(479) 468-8000
C. SIGNATURE	D. DATE SIGNED
Chris Harris	12/18/18

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): AR0037851

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)* [redacted] OUTFALL NO. 003

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (*if available*) (2) MASS	d. NO. OF ANALYSES	3. UNITS (*specify if blank*) a. CONCEN-TRATION	3. UNITS b. MASS	4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	4. INTAKE b. NO. OF ANALYSES
a. Biochemical Oxygen Demand (*BOD*)	3.5	2.01	3.5	2.01	3.5	2.01	1	mg/L	lb/day			
b. Chemical Oxygen Demand (*COD*)	39.9	23.48	22.75	13.42	7.3	4.84	48	mg/L	lb/day			
c. Total Organic Carbon (*TOC*)	< 1	< 0.57	< 1	< 0.57	< 1	< 0.57	1	mg/L	lb/day			
d. Total Suspended Solids (*TSS*)	44	32.45	16	11.73	4.18	2.86	48	mg/L	lb/day			
e. Ammonia (*as N*)	0.07	0.04	0.07	0.04	0.07	0.04	1	mg/L	lb/day			
f. Flow	VALUE 0.1025		VALUE 0.0741		VALUE 0.0458		208	MGD	--	VALUE		
g. Temperature (*winter*)	VALUE ambient		VALUE ambient		VALUE ambient		--	°C		VALUE		
h. Temperature (*summer*)	VALUE ambient		VALUE ambient		VALUE ambient		--	°C		VALUE		
i. pH	MINIMUM 6.6	MAXIMUM 8.1	MINIMUM 6.6	MAXIMUM 8.1			48	STANDARD UNITS				

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X" a. BELIEVED PRESENT	2. MARK "X" b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (*if available*) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCEN-TRATION	4. UNITS b. MASS	5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE b. NO. OF ANALYSES
a. Bromide (24959-67-9)		X												
b. Chlorine, Total Residual		X												
c. Color		X												
d. Fecal Coliform		X												
e. Fluoride (16984-48-8)		X												
f. Nitrate-Nitrite (*as N*)		X												

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (*as N*)		X												
h. Oil and Grease	X		11.1	8.13	8.7	4.81	2.64	1.68	48	mg/L	#/day			
i. Phosphorus (as P), Total (7723-14-0)		X												
j. Radioactivity														
(1) Alpha, Total		X												
(2) Beta, Total		X												
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (*as SO_4*) (14808-79-8)		X												
l. Sulfide (*as S*)		X												
m. Sulfite (*as SO_3*) (14265-45-3)		X												
n. Surfactants		X												
o. Aluminum, Total (7429-90-5)		X												
p. Barium, Total (7440-39-3)		X												
q. Boron, Total (7440-42-8)		X												
r. Cobalt, Total (7440-48-4)		X												
s. Iron, Total (7439-89-6)		X												
t. Magnesium, Total (7439-95-4)		X												
u. Molybdenum, Total (7439-98-7)		X												
v. Manganese, Total (7439-96-5)		X												
w. Tin, Total (7440-31-5)		X												
x. Titanium, Total (7440-32-6)		X												

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
AR0037851	003

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)		X		< 0.02	< 0.01	< 0.02	< 0.01	< 0.02	<0.01	1	ug/L	#/day			
2M. Arsenic, Total (7440-38-2)		X		1.15	< 0.01	1.15	< 0.01	1.15	<0.01	1	ug/L	#/day			
3M. Beryllium, Total (7440-41-7)		X		< 0.5	< 0.01	< 0.5	< 0.01	< 0.5	<0.01	1	ug/L	#/day			
4M. Cadmium, Total (7440-43-9)		X		< 0.5	< 0.01	< 0.5	< 0.01	< 0.5	<0.01	1	ug/L	#/day			
5M. Chromium, Total (7440-47-3)		X		< 1	< 0.01	< 1	< 0.01	< 1	<0.01	1	ug/L	#/day			
6M. Copper, Total (7440-50-8)		X		3.66	< 0.01	3.66	< 0.01	3.66	<0.01	1	ug/L	#/day			
7M. Lead, Total (7439-92-1)		X		< 0.5	< 0.01	< 0.5	< 0.01	< 0.5	<0.01	1	ug/L	#/day			
8M. Mercury, Total (7439-97-6)		X		0.0115	< 0.01	0.0115	< 0.01	0.0115	<0.01	1	ug/L	#/day			
9M. Nickel, Total (7440-02-0)		X		3.79	< 0.01	3.79	< 0.01	3.79	<0.01	1	ug/L	#/day			
10M. Selenium, Total (7782-49-2)		X		< 5	< 0.01	< 5	< 0.01	< 5	<0.01	1	ug/L	#/day			
11M. Silver, Total (7440-22-4)		X		< 0.5	< 0.01	< 0.5	< 0.01	< 0.5	<0.01	1	ug/L	#/day			
12M. Thallium, Total (7440-28-0)		X		< 0.5	< 0.01	< 0.5	< 0.01	< 0.5	<0.01	1	ug/L	#/day			
13M. Zinc, Total (7440-66-6)		X		53.89	0.03	53.89	0.03	53.89	0.03	1	ug/L	#/day			
14M. Cyanide, Total (57-12-5)		X		< 10	< 0.01	< 10	< 0.01	< 10	<0.01	1	ug/L	#/day			
15M. Phenols, Total			X												
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Accrolein (107-02-8)			X												
2V. Acrylonitrile (107-13-1)			X												
3V. Benzene (71-43-2)			X												
4V. Bis (*Chloro-methyl*) Ether (542-88-1)			X												
5V. Bromoform (75-25-2)			X												
6V. Carbon Tetrachloride (56-23-5)			X												
7V. Chlorobenzene (108-90-7)			X												
8V. Chlorodi-bromomethane (124-48-1)			X												
9V. Chloroethane (75-00-3)			X												
10V. 2-Chloro-ethylvinyl Ether (110-75-8)			X												
11V. Chloroform (67-66-3)			X												
12V. Dichloro-bromomethane (75-27-4)			X												
13V. Dichloro-difluoromethane (75-71-8)			X												
14V. 1,1-Dichloro-ethane (75-34-3)			X												
15V. 1,2-Dichloro-ethane (107-06-2)			X												
16V. 1,1-Dichloro-ethylene (75-35-4)			X												
17V. 1,2-Dichloro-propane (78-87-5)			X												
18V. 1,3-Dichloro-propylene (542-75-6)			X												
19V. Ethylbenzene (100-41-4)			X												
20V. Methyl Bromide (74-83-9)			X												
21V. Methyl Chloride (74-87-3)			X												

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*)															
22V. Methylene Chloride (75-09-2)			X												
23V. 1,1,2,2-Tetrachloroethane (79-34-5)			X												
24V. Tetrachloro-ethylene (127-18-4)			X												
25V. Toluene (108-88-3)			X												
26V. 1,2-Trans-Dichloroethylene (156-60-5)			X												
27V. 1,1,1-Trichloro-ethane (71-55-6)			X												
28V. 1,1,2-Trichloro-ethane (79-00-5)			X												
29V Trichloro-ethylene (79-01-6)			X												
30V. Trichloro-fluoromethane (75-69-4)			X												
31V. Vinyl Chloride (75-01-4)			X												
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)			X												
2A. 2,4-Dichloro-phenol (120-83-2)			X												
3A. 2,4-Dimethyl-phenol (105-67-9)			X												
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X												
5A. 2,4-Dinitro-phenol (51-28-5)			X												
6A. 2-Nitrophenol (88-75-5)			X												
7A. 4-Nitrophenol (100-02-7)			X												
8A. P-Chloro-M-Cresol (59-50-7)			X												
9A. Pentachloro-phenol (87-86-5)			X												
10A. Phenol (108-95-2)			X												
11A. 2,4,6-Trichloro-phenol (88-05-2)			X												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)			X	ND	--	--	--	--	--	1	µg/L	--			
2B. Acenaphtylene (208-96-8)			X	ND	--	--	--	--	--	1	µg/L	--			
3B. Anthracene (120-12-7)			X	ND	--	--	--	--	--	1	µg/L	--			
4B. Benzidine (92-87-5)			X	ND	--	--	--	--	--	1	µg/L	--			
5B. Benzo (*a*) Anthracene (56-55-3)			X	ND	--	--	--	--	--	1	µg/L	--			
6B. Benzo (*a*) Pyrene (50-32-8)			X	ND	--	--	--	--	--	1	µg/L	--			
7B. 3,4-Benzo-fluoranthene (205-99-2)			X	ND	--	--	--	--	--	1	µg/L	--			
8B. Benzo (*ghi*) Perylene (191-24-2)			X	ND	--	--	--	--	--	1	µg/L	--			
9B. Benzo (*k*) Fluoranthene (207-08-9)			X	ND	--	--	--	--	--	1	µg/L	--			
10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1)			X	ND	--	--	--	--	--	1	µg/L	--			
11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4)			X	ND	--	--	--	--	--	1	µg/L	--			
12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1)			X	ND	--	--	--	--	--	1	µg/L	--			
13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7)			X	ND	--	--	--	--	--	1	µg/L	--			
14B. 4-Bromophenyl Phenyl Ether (101-55-3)			X	ND	--	--	--	--	--	1	µg/L	--			
15B. Butyl Benzyl Phthalate (85-68-7)			X	ND	--	--	--	--	--	1	µg/L	--			
16B. 2-Chloro-naphthalene (91-58-7)			X	ND	--	--	--	--	--	1	µg/L	--			
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)			X	ND	--	--	--	--	--	1	µg/L	--			
18B. Chrysene (218-01-9)			X	1.41	--	--	--	--	--	1	µg/L	--			
19B. Dibenzo (*a,h*) Anthracene (53-70-3)			X	ND	--	--	--	--	--	1	µg/L	--			
20B. 1,2-Dichloro-benzene (95-50-1)			X	ND	--	--	--	--	--	1	µg/L	--			
21B. 1,3-Di-chloro-benzene (541-73-1)			X	ND	--	--	--	--	--	1	µg/L	--			

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
22B. 1,4-Dichlorobenzene (106-46-7)			X	ND	--	--	--	--	--	1	µg/L	--			
23B. 3,3-Dichlorobenzidine (91-94-1)			X	ND	--	--	--	--	--	1	µg/L	--			
24B. Diethyl Phthalate (84-66-2)			X	ND	--	--	--	--	--	1	µg/L	--			
25B. Dimethyl Phthalate (131 -11-3)			X	ND	--	--	--	--	--	1	µg/L	--			
26B. Di-N-Butyl Phthalate (84-74-2)			X	ND	--	--	--	--	--	1	µg/L	--			
27B. 2,4-Dinitrotoluene (121-14-2)			X	ND	--	--	--	--	--	1	µg/L	--			
28B. 2,6-Dinitrotoluene (606-20-2)			X	ND	--	--	--	--	--	1	µg/L	--			
29B. Di-N-Octyl Phthalate (117-84-0)			X	ND	--	--	--	--	--	1	µg/L	--			
30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)			X	ND	--	--	--	--	--	1	µg/L	--			
31B. Fluoranthene (206-44-0)			X	ND	--	--	--	--	--	1	µg/L	--			
32B. Fluorene (86-73-7)			X	ND	--	--	--	--	--	1	µg/L	--			
33B. Hexachlorobenzene (118-74-1)			X	ND	--	--	--	--	--	1	µg/L	--			
34B. Hexachlorobutadiene (87-68-3)			X	ND	--	--	--	--	--	1	µg/L	--			
35B. Hexachlorocyclopentadiene (77-47-4)			X	ND	--	--	--	--	--	1	µg/L	--			
36B Hexachloroethane (67-72-1)			X	ND	--	--	--	--	--	1	µg/L	--			
37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5)			X	ND	--	--	--	--	--	1	µg/L	--			
38B. Isophorone (78-59-1)			X	ND	--	--	--	--	--	1	µg/L	--			
39B. Naphthalene (91-20-3)			X	ND	--	--	--	--	--	1	µg/L	--			
40B. Nitrobenzene (98-95-3)			X	ND	--	--	--	--	--	1	µg/L	--			
41B. N-Nitrosodimethylamine (62-75-9)			X	ND	--	--	--	--	--	1	µg/L	--			
42B. N-Nitrosodi-N-Propylamine (621-64-7)			X	ND	--	--	--	--	--	1	µg/L	--			

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
43B. N-Nitro-sodiphenylamine (86-30-6)			X	ND	--	--	--	--	--	1	µg/L	--			
44B. Phenanthrene (85-01-8)			X	ND	--	--	--	--	--	1	µg/L	--			
45B. Pyrene (129-00-0)			X	ND	--	--	--	--	--	1	µg/L	--			
46B. 1,2,4-Tri-chlorobenzene (120-82-1)			X	ND	--	--	--	--	--	1	µg/L	--			
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)															
2P. α-BHC (319-84-6)			X												
3P. β-BHC (319-85-7)			X												
4P. γ-BHC (58-89-9)			X												
5P. δ-BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Enosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

CONTINUE ON PAGE V-9

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
AR0037851	003

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICIDES (*continued*)															
17P. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

DISCLOSURE STATEMENT

Disclosure Statement

Arkansas Code Annotated Section 8-1-106 requires that all applicants for the issuance or transfer of any permit, license, certification or operational authority issued by the Arkansas Department of Environmental Quality (ADEQ) file a disclosure statement with their applications. According to ADEQ's Disclosure Statement form, applicants that are a publicly held company may submit the most recent annual and quarterly reports in lieu of a Disclosure Statement.

Tokai Carbon GE, LLC is a wholly owned subsidiary of Tokai Carbon Co, Ltd, a publicly held company traded on the Tokyo Stock Exchange. As such, the most recent annual report (2017) and quarterly report (Q3 2018) for Tokai Carbon Co, Ltd. are included with this application in lieu of a Disclosure Statement.

ANNUAL REPORT 2017

January 1, 2017 — December 31, 2017

Building a future of technology and trust

TOKAI CARBON CO., LTD.

Ties of Reliability

Our corporate philosophy is Ties of Reliability. This represents our belief in the importance of the reliability between Tokai Carbon and our stakeholders (customers, shareholders, employees, and communities). The reliability forms the foundation of our business and enables us to continue our business activities. And the pillar that supports this foundation of reliability is the cycle of value that exists between company and stakeholder.

The cycle of value is represented by stakeholders entrusting management resources with a company, and that company in turn utilizing those management resources to create added value (assets and profit in the form of products and services) that is returned to the stakeholder. This concept allows us to provide added value to our stakeholders, thus enabling them to achieve their individual goals. Using this cycle of value to earn the reliability our stakeholders place in us, we are able to further ties of reliability between company and stakeholder.

Guidelines

By applying the following four guidelines, the Tokai Carbon Group will continue pursuing our corporate philosophy through our unique activities as a manufacturer of carbon materials.

Ability to create value

To fulfill our mission upheld by our corporate philosophy, the ability to create added value from the management resources entrusted to us is a must. This is at the root of profitability and we work endlessly to enhance our capabilities.

Fairness

Fair enterprise management is critical to ensuring a smooth cycle of value. To sustain the cycle of value, we aim for fairness in competition and profit distribution.

Ecology

We consider the environment a silent stakeholder. The environment is not only one of our business resources, but it is also where all resources come from and finally return to. We keep in mind that a company's cycle of value is part of the cycle of nature, and aim for harmony between business management and the environment.

Internationalism

We conduct sales and operate manufacturing sites around the world. As a result, our stakeholders span the entire globe. We are committed to fairness, ecology, and maintaining the ability to create value that is applicable worldwide. We will practice and promote our cycle of value on a global scale.

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A New Century for Tokai Carbon Begins

Since our founding in 1918 as a pioneer in the Japanese carbon industry, we have provided diverse products in a wide range of industrial sectors, such as steelmaking, chemicals and automobiles. By doing so, we have helped develop Japan's economy and, since the 1980s, we have also expanded our operations abroad. Our corporate philosophy is "Ties of Reliability." While I believe that our endeavors to deepen trust with all our stakeholders worldwide—including our customers, shareholders and local communities—have brought us where we are today, we remember that it is not our company's past that will build trust in the future, but rather who we are moving forward. Now, as technology, including AI and IoT, and society itself transform at unbelievable speed, our history and traditions from the past 100 years hold little meaning on their own. I understand that this is an age in which the only companies that survive will be the ones that are flexible, daring and quick to innovate in response to the changing times and the needs of our era. We aspire to be a company that exceeds your past expectations of Tokai Carbon in a positive way. We further aspire to ready ourselves to raise corporate value by making a fresh start, thereby contributing to society. I hope I can count on your continued support.



President & CEO



Hajime Nagasaka

Financial Highlights for FY2017

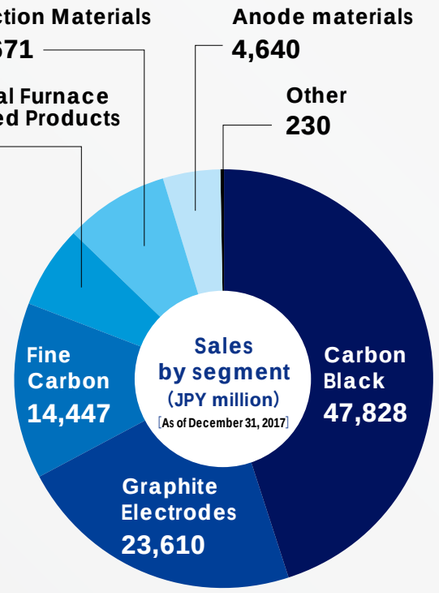
Net sales increased in all business segments, growing 19.9% year on year.
The main factor is the strong performance in the Carbon Black business. In addition, the Industrial Furnace & Related Products business enjoyed favorable results. The new manufacturing base for graphite electrodes in North America contributed to sales from November.

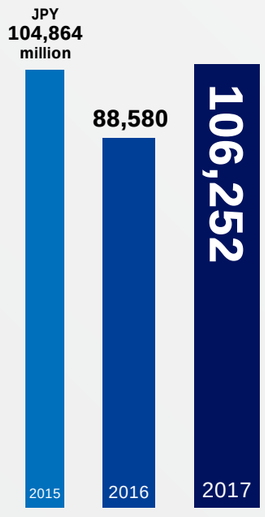
Achieved recovery in operating income.
Structural reforms, etc. delivered results and operating margin improved in the main business segments.

Net sales JPY **106,252** million

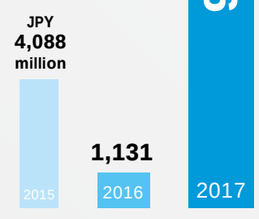
Operating income JPY **11,486** million

Ordinary income JPY **13,249** million

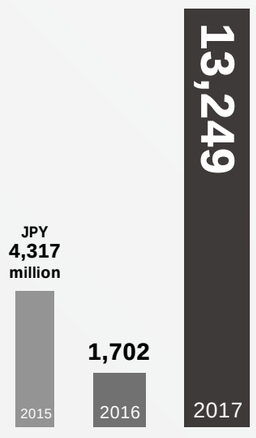




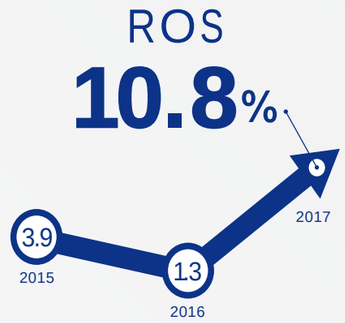
Trends in net sales

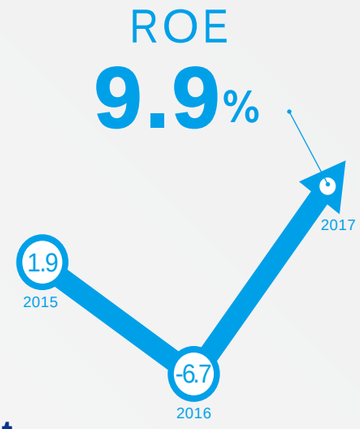


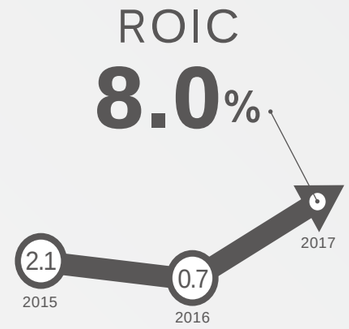
Trends in operating income



Trends in ordinary income







Business Environment

Carbon Black business
Environmental regulations in China affected the supply of raw materials and production, creating a tight market. Inquiries from tire manufacturers remained at high levels.

Graphite Electrode business
The supply and demand balance tightened due to stricter environmental regulations in China and decreased supply of our main raw materials. The favorable turnaround in market conditions will be reflected fully from the 2018 shipments.

Fine Carbon business
Demand for graphite materials and CVD/CC products increased due to the strong market conditions for solar batteries and semiconductors. Achieved recovery in earnings due to the effects of the business restructuring implemented in the previous fiscal year and price increases, etc.

Earnings trends

Net sales
Net sales grew 19.9% year on year, due mainly to the higher sales volume and selling price of carbon black. The new North American manufacturing base for graphite electrodes contributed to sales in November and December (sales of JPY 2,180 million) for the fiscal year under review.

Operating income
Operating income was up 915.1% year on year, due to factors including higher sales volume, improvement in operating margin and effects of structural reforms.

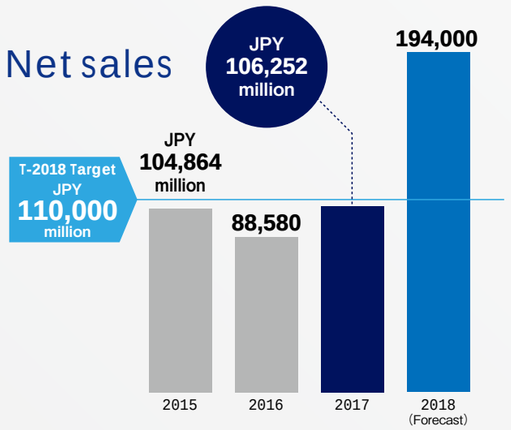
Main items of extraordinary income/losses
Gain on sale of land for golf driving range, etc.: JPY 2,567 million (extraordinary income)
Gain on liquidation of two non-consolidated subsidiaries: JPY 522 million (extraordinary income)
Loss on sale of share of other comprehensive income of two entities accounted for using equity method: JPY 470 million (extraordinary losses)

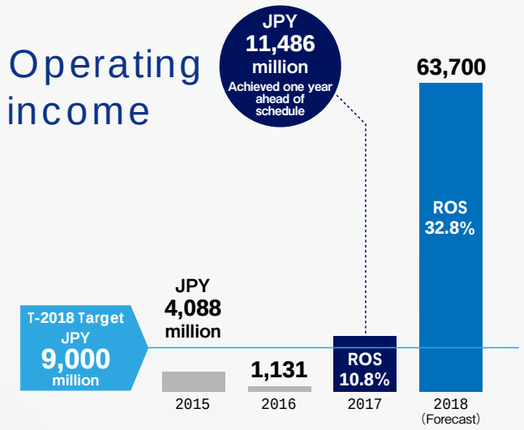
Changes in sales by segment (compared with FY2016)

Carbon Black	Graphite Electrodes	Fine Carbon	Industrial Furnace & Related Products	Friction Materials	Anode materials
UP JPY 10,063 million	UP JPY 2,896 million	UP JPY 1,522 million	UP JPY 1,579 million	UP JPY 1,065 million	UP JPY 509 million

Mid-Term Management Plan

In the mid-term management plan T-2018, we set numerical targets, net sales 110 billion yen, operating income 9 billion yen and ROS 8%, these were mostly achieved one year ahead of schedule.

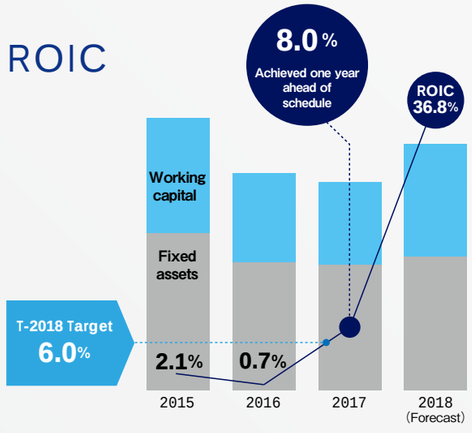




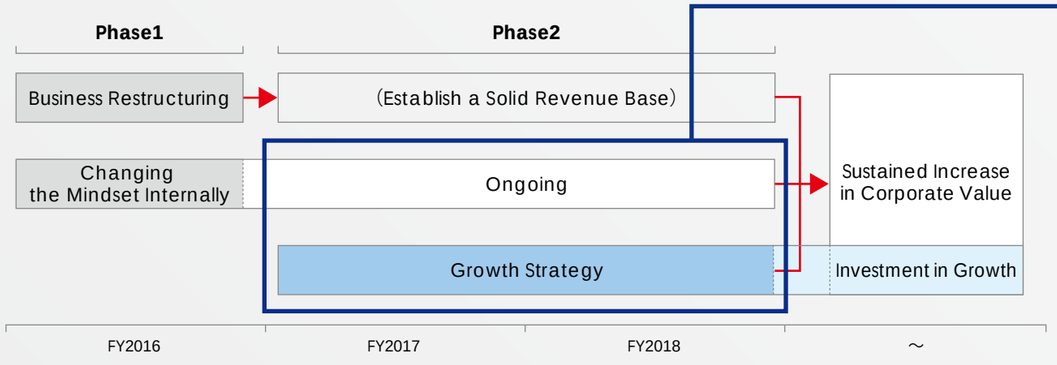
Achieved the performance target of ROIC (return on invested capital) of 6% or higher one year ahead of schedule.

Inventory reduction
Reduced inventory levels of all business segments by JPY 13.5 billion (FY2016)

Fixed asset reduction
Reduction in production capacity of fine carbon
Reduction in production capacity of carbon black
Sale of idle assets of Tokai Konetsu Kogyo
Sale of land, etc. of Nagoya Green Club
Recorded impairment loss of about JPY 10 billion in main business segments (FY2016)



Status of progress on T-2018



Changing the mindset internally

Will continue to work on initiatives for the remainder of T-2018.

Item	Measures	Results
(1) Energizing human capital	Implement human resources exchanges between business segments	・Human resource exchanges between business divisions (ongoing) ・Embarked on revision of the personnel system
	Recruit human resources from outside the company	・Already hired above 20 external experts at Administration, Accounting, R&D, Engineering, Corporate Planning, Human Resources, etc. (ongoing)
	Expand training programs	・Introduced overseas language study program ・Expanded selective training
(2) Reinstating the right to claim "Tokai, an expert in technologies"	Expand the Technology Division	・Expanded work on improving productivity (Fine carbon, etc.) ・Carbon black product development, Quality improvement of graphite electrode products (collaboration between industry and academia)
(3) Strengthening the corporate division	・Reinforce functions of the Board of Directors and the Management Committee ・Strengthen governance	・New governance system established ・Expanded and strengthened corporate division ・Strengthened controls at overseas subsidiaries
(4) Other	Engage in internal PR to change mindsets internally	・Distribute messages from the president internally (ongoing)

Growth strategy

The Group will take measures suitable for the external environment and potential market for each business segment.
Under the growth strategy focusing on (1) improving profitability, (2) expanding business domains and (3) M&A, the Group implemented an M&A strategy of acquiring a graphite electrode manufacturing base in North America by utilizing a strategic investment budget of about JPY 50 billion in FY2017 in an effort to optimize its business portfolio.

(3) M&A
・Existing business domains
・Expand business segments to include electronic components and automotive-related products

2017 M&A

TOKAI CARBON GE HOLDING LLC
(North American manufacturing base for graphite electrodes)
Acquisition price: Approx. JPY 12.9 billion
Production capacity: 30,000 tons/year
Contribution to consolidated performance: Started contribution to consolidated performance from November 2017.



This acquisition will enable Tokai to acquire a manufacturing base in North America, thereby increasing the company's presence in the world's largest electric furnace steel market and building a solid business base as a global competitor, supported by a tri-regional structure consisting of bases in Asia, Europe, and North America. Tokai Carbon also expects the partial relocation of production in Japan to North America will lead to optimizing the company's global production structure and improving its cost competitiveness.

1. Summary of business combination
(1) Name of acquired company and business description
Name of acquired company: SGL GE Carbon Holding LLC
Business description: Manufacturing, selling and R&D for graphite electrodes
(2) Ratio of acquired voting rights: 100%

2. Period of performance of the acquired company included in the consolidated financial statements
The performance from November 1, 2017 to December 31, 2017 is included in the consolidated financial statements under review as October 31, 2017 is the deemed acquisition date.

3. Acquisition cost of the acquired company and its breakdown by type of consideration
Consideration for acquisition
Cash
JPY 13,376 million (US$118,184 thousand)
Acquisition cost
JPY 13,376 million (US$118,184 thousand)

4. Details and amount of major costs related to acquisition
Remuneration, commissions and other fees to advisors, etc.: JPY 409 million

5. Goodwill arising from company acquisition, cause for accrual, and method and period of amortization
(1) Amount of goodwill: JPY 7,405 million (US$65,443 thousand)
The above amount is calculated tentatively because allocation of the acquisition cost has not been completed as of the end of the consolidated fiscal year under review.
(2) Cause for accrual
It is primarily additional future income-generating power expected to be derived from business development going forward.
(3) Method and period of amortization
Amortization over a 10-year period on a straight-line basis

Outlook

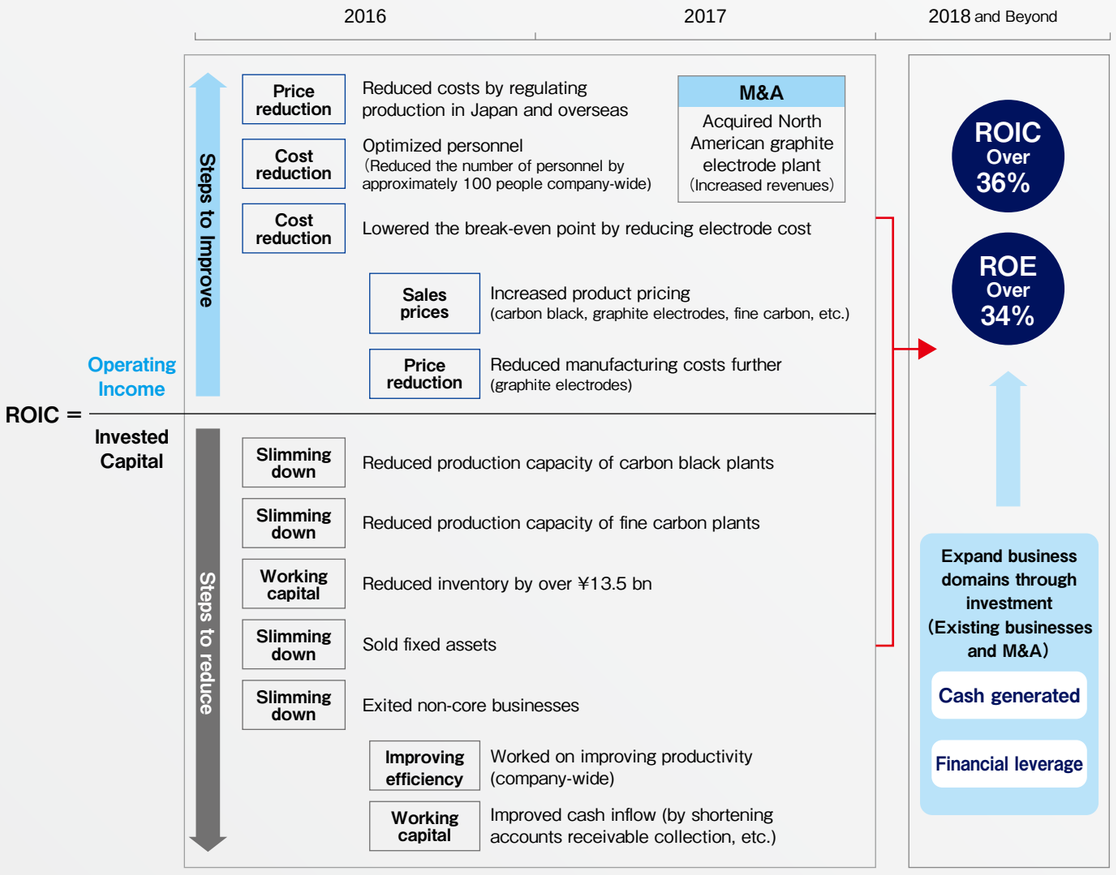
From 2018 onwards, the Group will aim to improve ROE by further expanding the business domains. It will do this by investing in its existing businesses and M&A deals by using cash generated through structural reforms and financial leverage.

In this manner, the Group will change its direction from focusing on asset reduction, which was listed as a priority measure for the ROIC target, to focusing on aggressive business expansion aiming to boost medium- and long-term earnings.

Shrink & Grow

Shrink: During the Mid-Term Management Plan, structural reforms were undertaken which led to constitutional change by improving ROIC.

Grow: In 2018 and beyond, we will focus on expanding our business domains with the cash generated from our core business and through financial leverage.



Issues to Work on Over the Mid to Long-term

Expand business domains

- Invest in existing businesses and expand via M&A and other means (Target of over ¥200 billion in net sales)
- Commercialize the next-generation products under development and introduce them to the market

＜Expand to growth markets＞
- Strategic investment in automotive and electronics-related areas
- Respond to growth in demand for thermal processing for semiconductor-related applications for the electric vehicle, AI, and IoT industries.

Stabilize profitability

- Build a business model that is resilient to changes in the economic environment (Introduce formulaic measures, etc.)
- Improve the soundness of the business portfolio (achieve a balance among the three main businesses)

Sustainable growth in corporate value

Optimize production locations in Japan & overseas

- Strengthen the tripolar structure for electrodes (in the U.S., Europe, and Japan)
- Implement efficient governance and optimize production for the multipolar location structure

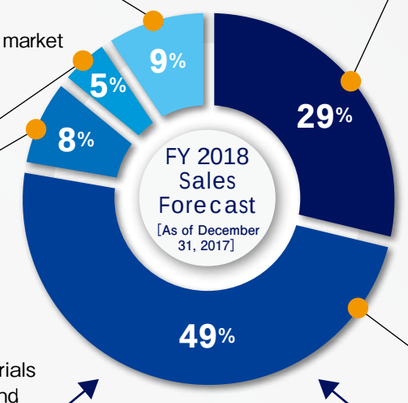
Policy on Expanding Business Domains

Achieve growth by linking the three pillars of existing businesses, development products, and M&A.

Others
- Invest in increasing LiB anode material production capacity
- Friction materials for the assembly market

Industrial Furnaces and Related Products
- Expand the scale of the industrial furnaces business
- Develop products with special features

Fine Carbon
- Expand sales of performance materials (CVD/CC) for the power device and organic electroluminescent markets



Carbon Black
- Proactively expand to growth markets
- Advance development of high strength carbon black and large grain carbon black

Graphite Electrode
- Strengthen the tripolar structure (of the U.S., Europe, and Japan)

Commercialize newly developed products

Invest in M&A (automotive & electronics industries)

Business

The Tokai Carbon Business Model



A pioneer in Japan's carbon industry, Tokai Carbon aims to build strength through innovation and achieve greater profitability. We put top quality and customer satisfaction first and are on our way to being a global leader in carbon materials.

01 Main Business Connections

Raw material manufacturers
Trading companies
Subcontractors

Main banks
MUFG Bank, Ltd.
Shareholder register manager
Mitsubishi UFJ Trust and Banking Corporation

02 Business Areas

Graphite electrodes | **Carbon black** | **Fine carbon** | **Industrial furnaces and related products** | **Friction materials** | **Anode materials, etc.**

Tokai Carbon's Strengths

- High market recognition as a 100-year old company.
- Extensive technical know-how as innovator behind carbon black and graphite electrodes.
- Maintains high market share in niche industries of friction materials, industrial furnaces, EREMA heating elements, thermal black, and more.
- Possesses wide range of heat treatment technology across multiple businesses.

03 Customers

Basic policies for customers ▶ Importance of long-term relationships

Face-to-face industries

Automobile industry (Tires, rubber parts, etc.)
Steel industry (Electric arc furnace steelmaking)
Semiconductor industry
General industry, construction equipment

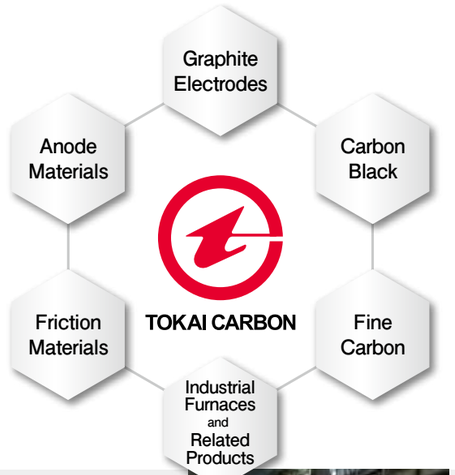
04 Value Creation

1. **Stable supply of critical security components (Tire and break materials, etc.)**
2. **Supporting infrastructure demand around the world (Steel, electronic components, power generation, etc.)**
3. **Providing major equipment as the foundation for cutting-edge information technologies**
4. **Returns to shareholders, employment**

Management base to deliver this value

- Sound financial base
- Management system (full CGC compliance, sharing issue awareness beyond management level, human resource activation)
- "Ties of Reliability" philosophy

Tokai Carbon has dedicated to develop Carbon products that are indispensable to various industries for more than a century as a comprehensive carbon manufacturer. We possess products with world top class quality with highest share in the market and strive for developing carbon materials to meet the future demand which will contribute to the future direction humanity will head in. With our global network, our activity is giving a solution worldwide to contribute to the diversifying market request.



P.13

Graphite Electrodes Division

Used as critical components of electric furnaces which melt metal scrap and recycle it into new steel





P.15

Carbon Black Division

When you see black rubber, plastic and ink, recall

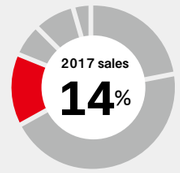




P.17

Fine Carbon Division

Contributes to all industries, ranging from smartphones to space development

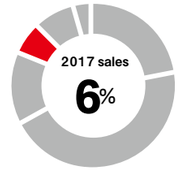




P.19

Industrial Furnaces and Related Products Division

Maximizes functions of items including glass and electronic component materials





P.21

Friction Materials Division

Supports best performance with tens of thousands of line-ups





P.22

Anode Materials Division

Contributes to increased performance including mileage in electric cars





Graphite Electrodes Division

In the steelmaking process, iron scrap gets melted in an electric arc furnace and recycled. Graphite electrodes, a kind of conductor, are an essential component in this kind of furnace. They can melt scrap at a temperature of about 1600℃.

What are Graphite Electrodes?

Did you know that there are two ways to make iron? The blast furnace method and the electric arc furnace method. The electric arc furnace method recycles used iron scrap by melting it in an electric arc furnace. It is the graphite electrodes inside the furnace that actually melt the iron. Graphite has high thermal conductivity and is very resistant to heat and impact. It also has low electrical resistance, which means it can conduct the large electrical currents needed to melt iron. In recent years, graphite electrodes have been made even more efficient: they can now conduct even higher currents and more power. Using the expertise collected over a century of innovation, Tokai Carbon has developed the world's biggest electrodes. They measure 32 inches (about 80 cm) in diameter and are 3 meters long. Tokai Carbon's graphite electrodes are made to last, making them a trusted name in the industry.

1
First company in Japan to commercially manufacture 32-inch dia. graphite electrodes using our uitra-large diameter graphite electrode manufacturing technology.

Strength

2
Proximity to needle coke manufacturer ensures stable supply.

3
Efficient supply of high-quality graphite electrodes though our tripolar global production platform.

01 Main Raw Materials



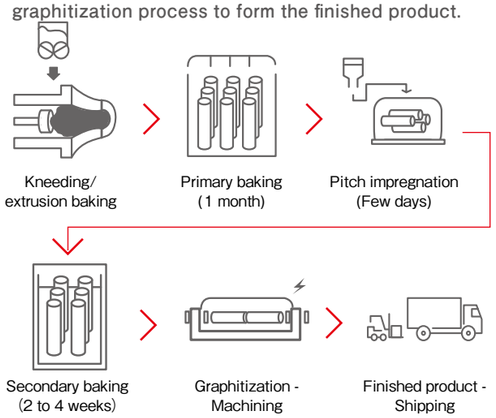
Needle coke
Needle-like crystals develop. Low thermal expansion coefficient.



Pitch
Produced by heat treatment of coal tar. Carbonizes under heat (50% yield).

02 Manufacturing Process

Needle coke and pitch are mixed and then molded. Heat treatment is then applied in the baking and graphitization process to form the finished product.

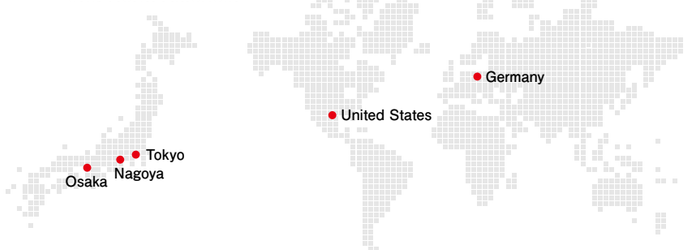


Annual production capacity

Japan	United States	Germany
38 thousand ton	30 thousand ton	28 thousand ton

03 Sales

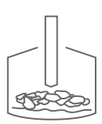
Reach customers worldwide with tripolar structure in Asia, Europe and North America.



Head Office (Tokyo), overseeing global sales

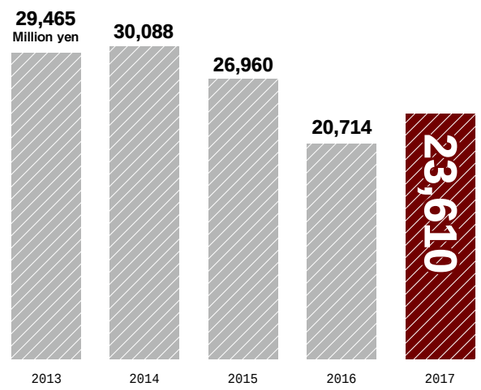
Sales and technical service network covering all of Europe and the Americas.

04 Customers

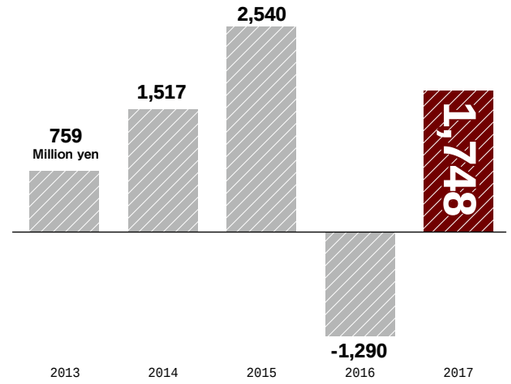


Steel manufacturers (electric arc furnace steelmaking)

Net sales



Operating income



Status of Business

In the Graphite Electrodes business, sales prices continued to decline due to a structural imbalance between supply and demand. However, electrode market conditions have improved since the second half of the fiscal year under review, following a global recovery in electrode demand and a shortage in supply of major materials. Having said that, the year-on-year increase in net income is mainly attributable to the benefits derived from structural reform, and a full-scale impact of the sales price improvement will be seen from the following fiscal year.
Since November 2017, the Group has been consolidating TOKAI CARBON GE HOLDING LLC, a manufacturing base in North America, and incorporating its sales of ¥2,180 million in the fiscal year under review.
As a result, net sales for the Graphite Electrodes business increased 14.0% year-on-year to ¥23,610 million, and operating income was ¥1,748 million (compared to an operating loss of ¥1,290 million during the previous fiscal year).

In the graphite electrode business, we acquired a manufacturing base in North America, the world's largest electric furnace steel market. The long-sought after tri-regional structure consisting of bases in Asia, Europe, and North America was established.



TOKAI CARBON GE HOLDING LLC
(North American manufacturing base for graphite electrodes)
Location: 160 Greentree Drive Suite 101, Dover, DE, USA
Acquisition price: Approx. ¥12.9 billion
Production capacity: 30,000 tons/year
Contribution to consolidated performance:
Start contribution to consolidated performance from November 2017

Graphite Electrodes Varieties



For DC Furnaces (direct current furnaces) / Size: 22-32 inches
Electrodes for DC furnaces, which require 1 column of graphite electrodes. High maximum current density. The diameter of these electrodes is getting bigger: the current maximum diameter is 32 inches (801 mm).



For AC Furnaces (alternating current furnaces) / Size: 16-28 inches.
Alternating current furnaces require 3 columns of graphite electrodes. They mostly use 20-28 inch electrodes, the standard size in electric furnaces.



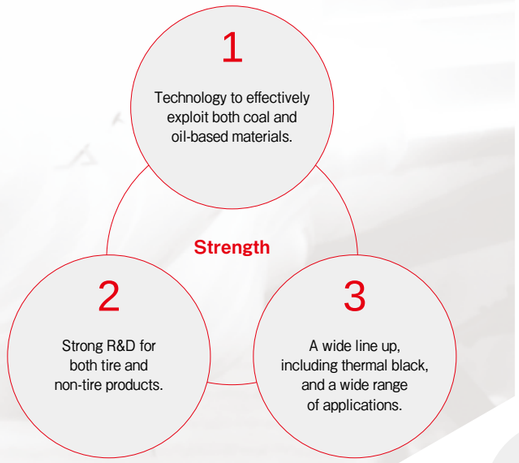
For LF Furnaces (refining furnaces) / Size: 10-18 inches
These electrodes are for refining materials like molten steel. LF Furnaces have a smaller capacity than DC.

Carbon Black Division

Carbon black is mainly used to reinforce the rubber in tires. It is also used as a black pigment in many of the black-colored products you come across in everyday life.

What is Carbon Black?

There is a reason why tires are black. It's because fine particles of carbon called "carbon black" are mixed in with the rubber. In fact, carbon black can make up about 30% of the weight of a tire. Its job is to make the tires stronger and more long-lasting. Carbon black can also be found in the black ink used in inkjet printers and in the rubber parts of many industrial products. Carbon black's nano-scale particles mean that it has a wide range of applications. An essential part of many newly developed products, it plays a role in many facets of our lives.



01 Main Raw Materials



Carbon black feedstock oil

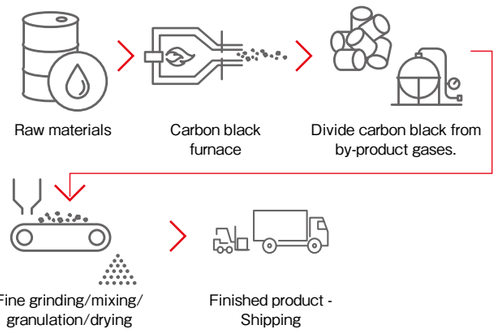


Natural Gas
*Thermal Black

02 Manufacturing Process

Soot-like carbon particles are generated through the incomplete combustion of oil to make carbon black.

Within 24 hour



Annual production capacity

Furnace black:

Japan 201 thousand ton

Thailand 180 thousand ton

China 70 thousand ton

Thermal black:

Canada 45 thousand ton

03 Sales

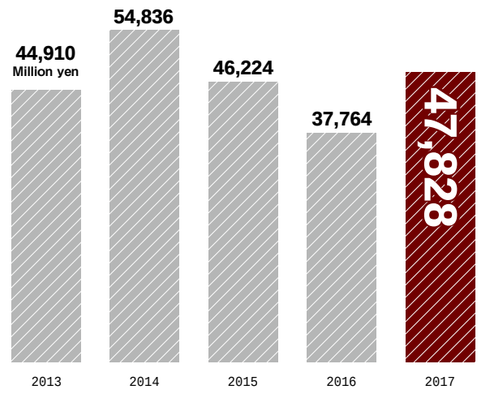
Three sales bases in Japan, Thailand and China meet demand in those countries and the Asia region. Thermal black is sold to more than 44 countries worldwide from our Canadian sales base.



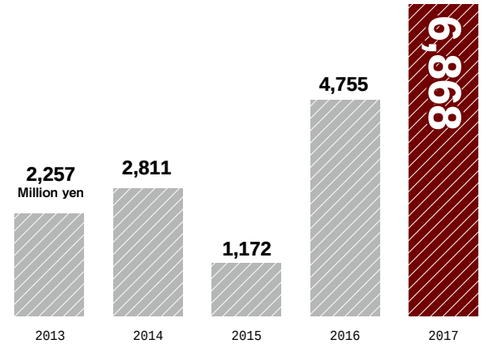
04 Customers

Bridgestone Corporation
Sumitomo Rubber Industries, Ltd.
TOYO TIRE & RUBBER CO., LTD.
The Yokohama Rubber Co., Ltd.
(Alphabet order)

Net sales



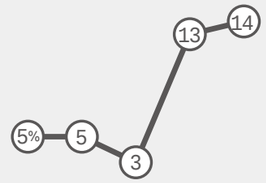
Operating income



Status of Business

The Carbon Black business recorded year-on-year growth in both sales and profit due to robust demand from the tire and automotive industries, which are end-users, an increase in product prices that accompanied the rise in the price of crude oil, and the benefits derived from structural reform last year. As a result, net sales for the Carbon Black business increased 26.6% year-on-year to ¥47,828 million, and operating income rose 44.4% year-on-year to ¥6,868 million.

Transition of ROS in carbon black business





Our plants are operating fully due to the effects of environmental regulations and the course of regression regarding the technology of tire manufacturers.

Carbon Black Varieties



SEAST

SEAST is a variety of carbon black that is added to rubber to make it stronger and more resistant to wear. It is used in the rubber parts of industrial machines and various sizes and models of tire. SEAST's superior quality works as demanded, which has won it a loyal following and given Furnace Black for Rubber top share on the domestic market. As an industry leader, it is Tokai Carbon's duty to research and develop new products in response to social trends and our customers' technological innovations. This is why we are now developing new products to meet upcoming demand in the growing electric car market.



TOKABLACK

TOKABLACK is a version of carbon black for coloring and conductive parts. Tokai Carbon developed TOKABLACK based on the same technology behind SEAST (see description above). It is used as a colorant in newspaper and printer ink and plastics and as an antistatic agent in laser jet printer rollers. TOKABLACK is known for its excellent performance as a conductive layer in electric cables and as a central semiconductive layer in insulators. As a result, it is in high demand and can be found in a lot of the essential infrastructure that supports our everyday lives.



Aqua Black

Carbon black is not normally water soluble, so we used our exclusive surface treatment technology to create Aqua Black, a version that is mixable with water. Aqua Black's carbon particles disperse much more easily in water without the need for a dispersing agent. This property enabled us to develop the richest black inkjet printer ink. The research and development of this new carbon black material gave birth to a new market which is now showing very promising growth.

Business

Fine Carbon Division

Tokai Carbon offers a range of special graphite products for silicon semiconductors, solar cell manufacturing, and more. Available in many shapes and sizes, they are suitable for a wide range of applications in general industry, including in all kinds of molds and nozzles for continuous casting.

What is Fine Carbon?

The word "fine" in English has a double meaning: it can mean "wonderful", and it can also mean something broken down or refined into small pieces. So, as the name suggests, fine carbon is made from tiny carbon particles broken down to the micron level. It is used in semiconductors and other fields that demand high precision. Resistant to heat and corrosion, conductive and easy to process, fine carbon is used in molds, casts and a wide range of other applications in general industry. Tokai Carbon, one of only a handful of fine carbon manufacturers around the world, offers a wide variety of products to suit our customers' needs.

Strength

1 Offer multiple Product lines to meet customer needs.

2 Global network positions us closer to customers.

3 Support state-of-the-art technology in semiconductors and more.

01 Main Raw Materials



Amorphus cokes



Pitch

02 Manufacturing Process

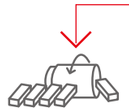
Materials manufacture is centeralized at the Tanoura Plant in Kumamoto Prefecture, and post-processing (processing, refining, SiC coating, etc.) is done both in Japan and at our international bases in Asia, Europe and North America.

Isotropic graphite

6 to 6 months



4 to 6 months



Processing

1 month



Finished product - Shipping

1 month

Annual production capacity

Speciality graphite
Japan
6 thousand ton

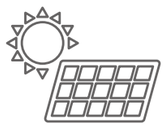
03 Sales

Comprehensive service to Japanese customers from 3 domestic bases. Global sales network in Asia, Europe and North America through our group companies.

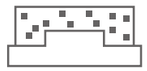


Head Office (Tokyo), overseeing global sales

04 Customers

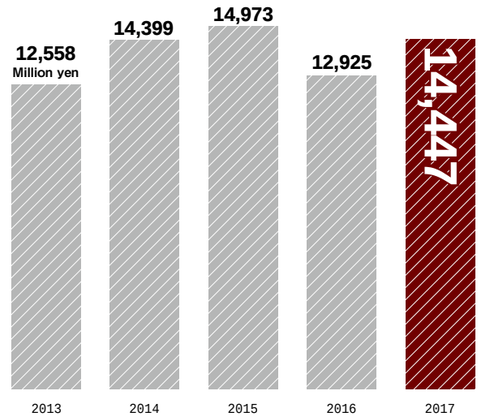


Semiconductor manufacturers/Solar cell manufacturers (monocrystalline and polycrystalline silicon manufacturing and semiconductor manufacturing processes, etc.)

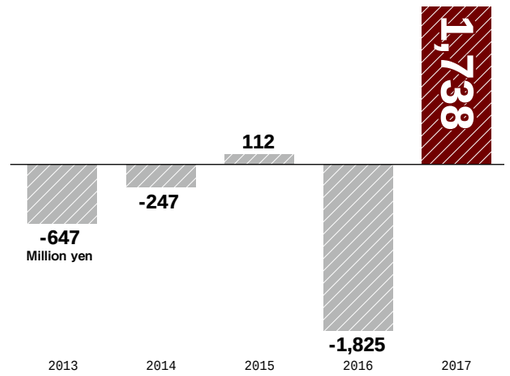


Continuous casting manufacturers/ Mold manufacturers and many more.

Net sales



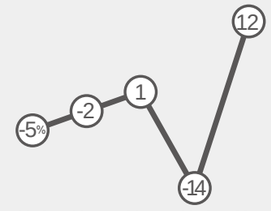
Operating income



Status of Business

With strong demand in the market for general industrial-use products, the solar cell and semiconductor markets remained robust and graphite materials and CVD/CC products have seen increasing demand. This has helped the Group maintain a high level of operation in its production facilities. In addition, due to the benefits from the rationalization implemented last year and an increase in product prices, the Fine Carbon business recorded year-on-year growth in both sales and profit.
As a result, net sales for the Fine Carbon business rose 11.8% year-on-year to ¥14,447 million, and operating income was ¥1,738 million (compared to an operating loss of ¥1,825 million during the previous fiscal year).

Transition of ROS in fine carbon business





Earnings recovered due to cost reduction under the Mid-Term Management Plan's structural reform and favorable turnaround in business environment of semiconductors and solar batteries

Fine Carbon Varieties



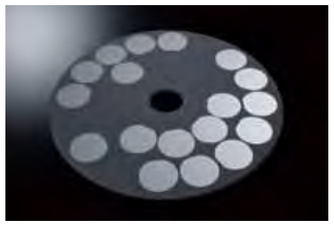
Isotropic Graphite G/HK Series

Isotropic graphite is a type of fine carbon formed by applying equal pressure from all directions. Tokai Carbon offers a wide line up of chemical-resistant, self-lubricating isotropic graphite products. It includes the HK Series, which is graphite for discharge machining, a method a making intricately shaped molds using electrical discharges (sparks). We also offer the G Series, graphite which expands little under heat and therefore has excellent thermal shock resistance.



Extruded Graphite

Extruded graphite is a bar-shaped version of fine carbon. Each bar is created by forcing section after section of graphite out of a metal mouthpiece. It is available in both solid and hollow forms. Extruded graphite is used in the heater of vacuum furnaces and heat treatment furnaces.



SiC Coated Carbon

SiC coated carbon is made by applying a mix of silicon and carbon to the surface of fine carbon. In semiconductor manufacturing, impurities have to be avoided at all costs. SiC coated carbon's coating and super high-purity materials prevent the release of graphite dust and other fine particles, ensuring a clean manufacturing process and winning this product a great reputation.

Industrial Furnaces and Related Products Division

Industrial furnaces and related products used for heat treatment of ceramics, electronic components, metals, glass and more. Produced and sold by group company Tokai Konetsu Kogyo Co., Ltd.

What are EREMA (silicon carbide) Heating Elements and Industrial Furnaces?

The flat glass used in smartphone liquid crystal screens is made in a gas or oil furnace. It comes out of the furnace very hot and needs to be cooled down slowly. EREMA heating elements are responsible for that delicate temperature regulation. In 1927, EREMA became the first silicon carbide heating elements to be sold commercially in Japan. We have been improving their quality ever since and are now the biggest producer in the industry. Industrial furnaces are used to heat, melt and sinter glass, ceramics, electronic components, metals and powders. As a comprehensive manufacturer, we design and manufacture industrial furnaces as well as the heating elements and refractory materials that go in them. From small test furnaces to large scale industrial equipment, we enlist a wide range of technologies to produce furnaces and related products for all fields.

Strength

1
EREMA (silicon carbide) heating elements: trusted, long-lasting, varied line up for different uses, proven performance.

2
Industrial furnaces: custom-made, proven performance, strong on development.

3
Comprehensive service including supply of heaters, heat resistance and high temperature materials.

01 Main Raw Materials

SiC (silicon carbide)
EREMA (silicon carbide)
heating elements raw materials

Various industrial machines/materials
For industrial furnaces,
we deal with the design
through assembly stages,
so do not produce the raw materials.

02 Manufacturing Process

EREMA (silicon carbide) heating elements

Manufacture SiC as a raw material

About 1 month

Industrial furnaces

4 to 8 months (depending on manufacturing process)

Design/ Manufacture/ Delivery

Determine specifications in advance, proceed from quote to order

Discuss details in meeting - Detailed design - Approval

Materials procurement - Assembly - Testing

Shipping - Installation on site

Test run at installation site

Delivery (official delivery)

03 Sales

Exporting across Asia and worldwide from our sales bases in Japan and China.

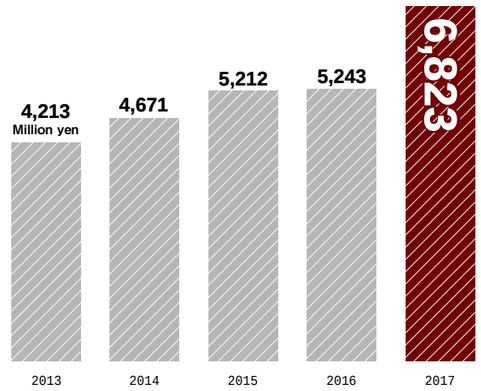


04 Customers

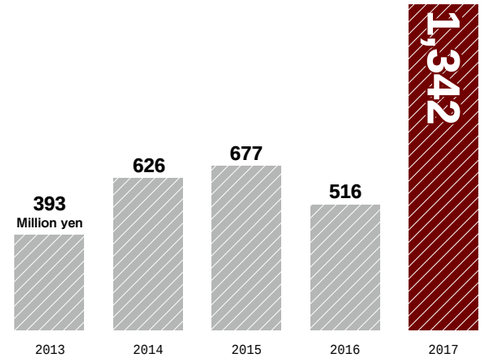
Electronic components industry
LiB-related industry
Sheet glass/optical glass

Other industries involving heat treatment
Ceramic materials and many other industries
We work with a variety of distributors.

Net sales



Operating income



Status of Business

Net sales of industrial furnaces increased significantly from the previous fiscal year as capital expenditure increased in both the information technology related industries and energy-related industries, which are the major demand destinations.
Net sales for heating elements and other products increased from the previous fiscal year due to strong demand from the electronic components industry and glass industry, while demand from China's power infrastructure declined.
Operating income increased from the previous fiscal year due to higher sales of industrial furnaces and an improvement in the profitability of Chinese subsidiaries in the heating element business.
As a result, net sales for the Industrial Furnaces and Related Products business increased 30.1% year-on-year to ¥6,823 million, and operating income rose 160.0% year-on-year to ¥1,342 million.





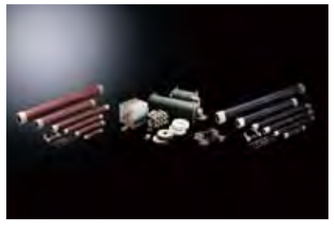
High demand from markets of electrolytic capacitors and anode materials

Industrial Furnaces and Related Products Varieties



EREMA (silicon carbide) Heating Elements

- Can withstand a surface temperature of 1500℃ (or 1600℃ for SG and SGR models).
- High heat generation capacity per unit area. 5 to 10 times that of Nichrome heating elements.
- Strong, durable and chemically stable.
- A heat source that does not cause air or noise pollution.
- Available with a variety of coatings to withstand steam and noxious gas.
- Easy to handle.



EREMA Resistors

- Coil-free. Non-inductive.
- Do not snap. Very reliable.
- Very resistant to high voltage. Small in size but can handle high power.
- Can withstand high temperatures. Thermally and chemically stable.
- Can be used in water, steam and oil.



Industrial Furnaces

We custom manufacture all our industrial furnaces. In our design process, we insist on the following.

- We select and computerize factors such as temperature, atmosphere and pressure appropriate to the product processing software.
- We endeavor to automize product insertion and removal and to save on energy and space.
- We prioritize safe design.

Business

Friction Materials Division

Friction materials regulate power transmission in industrial and construction machinery and in the brake and clutch parts of vehicles like motorbikes, trucks, buses and trains.

Friction Materials

Brakes and clutches may seem completely different, but they are in fact very similar. Brakes use friction to reduce speed, and clutches use friction to control power transmission. Both parts rely on friction materials to function. Tokai Carbon is a leading company in friction materials. We hold a big share in the large-sized motorcycle market, where power control is particularly challenging. We also manufacture the sliding materials—that is, materials developed to glide without any friction—used in hydraulic machine parts. Both friction and sliding materials are essential to smooth power transmission in machines and vehicles.

Strength

1 Comprehensive friction materials manufacturer producing sintered, paper, carbonaceous and resin friction materials.

2 Development strength to customize materials for each customer.

3 Customer service based on years of experience.

01 Manufacturing Process

Materials manufacture is consolidated at the Tanoura Plant in Kumamoto Prefecture, and post-processing (processing, refining, SiC coating, etc.) is done both in Japan and at our international bases in Asia, Europe and North America.

Main Lining Materials:Sintering



Main Lining Materials:Paper



02 Sales

Group Sales Offices.



03 Customers

Motorcycle	Tractor	Conbine
Hydraulic shovels	Dump truck	Forklift
ndustrial robots	Railroads	Ships

Friction Materials Varieties



Sintered Metal Friction Materials

Sintered metal friction materials are a product of powder metallurgy. Metal powders like copper and tin are first mixed with friction modifiers like ceramic and powdered graphite lubricant and are then molded and sintered (made solid).
Tokai Carbon began manufacture of sintered metal friction materials in 1949. In 1978, after years of R&D, we were the first in the world to apply this technology to motorcycle brake pads. Very durable, our sintered metal friction materials are also used in the clutches and brakes of construction and agricultural machinery and in machine tools.



Paper Friction Materials

Paper friction materials are non-asbestos friction materials developed and sold by Tokai Carbon. They are available in a range of grades to fit a wide variety of applications, from parking brakes to heat and wear-resistant clutches.



Carbonaceous Friction Materials

Tokai Carbon's carbonaceous friction materials are (1) flat (μ-v &μ-P), (2) compatible with many oils, and (3) very durable and stable. They improve performance of products they are in.

Business

Anode Materials Division

Tokai Carbon produces anode materials for secondary lithium-ion batteries and supplies them to battery manufacturers. Secondary lithium-ion batteries are used in, for example, smartphones and electric cars. This new division has a lot of growth potential.

What are Anode Materials?

Lithium-ion batteries are rechargeable. They are used in things like mobile phones, computers, hybrid and electric cars. The cathode (positive electrode) is made from lithium oxide, and the anode (negative electrode) is made from carbon. Tokai Carbon produces and sells materials for the anode. Uniform quality and low cost are essential, particularly for anode materials used in large scale lithium-ion batteries like those in electric cars. At Tokai Carbon, we apply our excellent graphite production technology developed over our hundred-year history and use competitively priced raw materials to support the future of lithium-ion batteries.

Strength

1 Exploit the same heat treatment technology and equipment developed for our graphite electrode business.

2 Achieve the stable and uniform quality needed for bigger batteries.

3 Provide materials to growth areas like electric car and electroic device industries.

01 Main Raw Materials



Natural graphite **Cokes**

02 Manufacturing Process

We produce the high quality and safe materials our customers demand by combining multiple raw materials and processing them in the optimal way.

Anode materials



Production/development base: Production Technology Center (Hofu, Yamaguchi Prefecture)

03 Sales

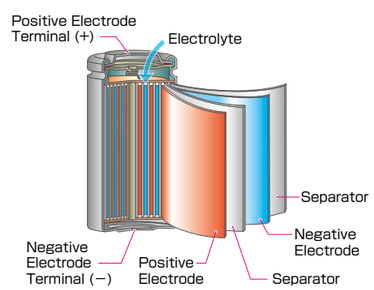
We supply anode materials to major battery manufacturers through Mitsubishi Chemical Corporation.

04 Customers

The Lithium Ion Battery will be supplied to western electrice vehicle makers through the battery producers.

How Lithium-Ion Batteries Work

Unlike zinc-carbon batteries, lithium-ion batteries are rechargeable. Lithium ions can move back and forth between the positive and negative electrodes. This means they can move away from the graphite anode to the positive electrode during discharge and can then move back to it during charging. This mechanism works because of graphite's structure and chemical stability. Lithium-ion batteries have a bigger battery capacity and operating voltage compared to other types of rechargeable battery and can withstand "top up" charging (charging before the battery is fully discharged). This makes them very powerful for their size and weight. Lithium-ion batteries are now gathering attention as batteries for electric cars.



Business

Research & Development



Tokai Carbon's R&D work covers everything from basic carbon materials research to innovative product development. We provide advanced technical solutions and develop cutting edge technology for application in new fields.

01 Research & Development Policy/System

At Tokai Carbon, we want to keep refining our existing line up while breaking new ground with never-before-seen products across our six business areas. This is why we invest heavily in keeping our research and development system ready and up-to-date.
We currently work across three research bases: our main integrated research labs at Fuji, and our Chita and Hofu Laboratories.
Our research addresses the needs of our customers and of our times, and produces many world-first products and technologies for a wide range of fields. In recent years, we have been working in collaboration with public research institutes and universities to further unlock the potential of carbon.



General Manager of R&D Strategy Division,
Toshiaki Fukuda

02 Propriety Technology

Tokai Carbon was built on its graphite electrode manufacturing technology. With this as a starting point, our research fully exploits those raw materials and their by-products, as well as our plants, heat treatment technology and facilities.
Incorporating outside technology where needed, we develop a wide range of unique technologies for our six business areas.

03 Our Research Labs



◆Fuji Research Laboratory

This integrated research lab is equipped with the latest research facilities, including an electron microscopy room, experimental lab, and prototype workshop. Our research here addresses the pressing needs of the day—whether in the semiconductor or automotive industries or energy & environment or aerospace fields —to develop unique new technologies and products.
We also work in sync with each business division and plant to develop new solutions for our customers and to support market expansion by improving product quality.



◆Chita Laboratory

The Chita Laboratory shares a site with the Chita Plant. This direct link between our research activities and our production line helps speed up the transition from development to production. This lab is devoted to developing commercial applications for carbon black. We gather academic data on carbon and rubber materials and use it to develop new materials. We are particularly focused on developing environmentally-conscious products for the automotive industry.
Going forward we will continue to develop new solutions tailored to our customers' needs.



◆Hofu Laboratory

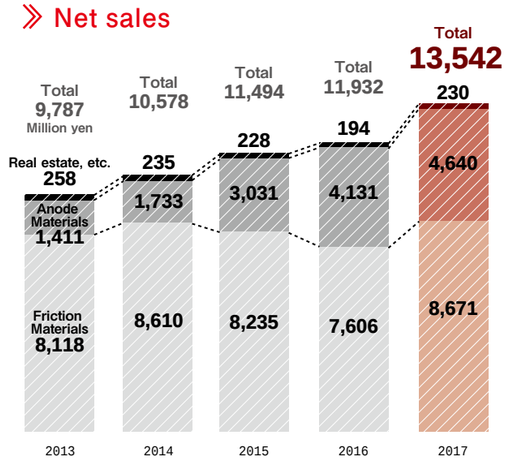
At Hofu Laboratory, we work on improving the quality of Tokai Carbon's artificial graphite electrodes through prototype construction and evaluation analysis. Our research ranges from analyzing raw materials to investigating electrode characteristics. The results of this research are applied to the manufacturing process to achieve more stable production.
Hofu Laboratory is Tokai Carbon's main lab for graphite electrode research and is responsible for linking the technology at our Japanese, German and U.S. production centers. Our researchers work hard day-in day-out to ensure the optimal performance of the graphite electrodes our customers use.

04 Joint research

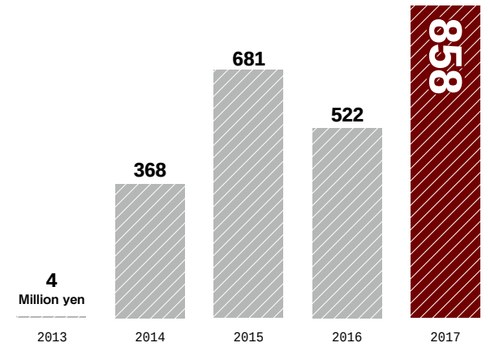
Tokai Carbon has more than 60 years experiment of form controlling technology of Nano Carbon and now collaborating with Toyohashi University of Technology for further development. With its character of higher thermal conductivity as metal and on top higher strength as diamond, Nano Carbon is one of the most versatile materials on earth that has potential for innumerable applications.

◆ Performance overview of other business segments
(friction materials, anode materials, real estate, etc.)

≫ Net sales



≫ Operating income



Friction materials

≫ Status of Business

With higher demand for machine tools including industrial robots, construction machinery, mining machinery, etc., net sales of friction materials remained solid.
As a result, net sales of friction materials grew 14.0% year-on-year to ¥8,671 million.



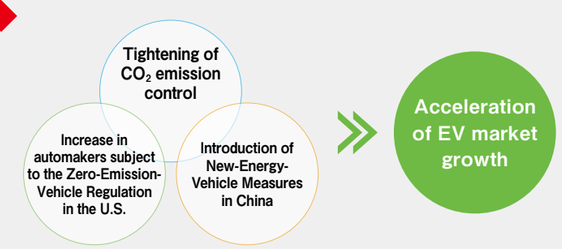


Solid demand for friction materials for machinery for mining use and robot arms

Anode materials

≫ Status of Business

Due to expansion of the electric vehicle market that accompanied the strengthening of global environmental regulations, net sales of anode materials for secondary lithium-ion batteries rose.
As a result, net sales of anode materials grew 12.3% year-on-year to ¥4,640 million.



Other

Net sales from real estate leasing and other businesses increased 18.3% year-on-year to ¥230 million.

A golf practice range which Tokai Carbon had been managing in Nagoya, the company's founding place, was sold off on December 31, 2016. This was conducted as part of the structural reform where assets were streamlined by withdrawing from the so-called non-core business.



The above factors resulted in net sales for Other Operations of ¥13,542 million, an increase of 13.5% year-on-year. Operating income increased 64.3% year-on-year to ¥858 million.

Environmental Conservation Activities

Tokai Carbon Group positions protection of the global environment as one of the highest priority management issues. Through the implementation of the environmental management system developed in line with ISO14001, we work to achieve harmony between our business activities and the environment.
To achieve harmony between our business activities and the environment and realize a sustainable, recycling-based society, one of our highest management priorities is to quantitatively and qualitatively ascertain and evaluate the impact our business activities, particularly production and distribution activities, have on the environment and to work towards reducing that load.

Environmental philosophy and policy

Tokai Carbon Group has outlined the following Environmental Philosophy and Environmental Policy to promote environmental conservation activities.

Environmental philosophy

Tokai Carbon Group views the protection of the global environment as one of its highest-priority management issues. We work to achieve harmony between business activities and the environment, and conduct activities towards the realization of a sustainable, recycling-based society.

Environmental policy

1. Enhance environment management system

Work to maintain and improve environment management system and conduct environmentally conscious corporate activities.

2.Promote effective use of resources and energy

Work to protect the global environment through conserving resources and energy, minimizing industrial waste, and reducing emissions of greenhouse gases and toxic substances.

3.Comply with relevant environmental laws

Adhere to laws, ordinances, and agreements related to the environment and, as necessary, outline voluntary management standards to work towards environmental protection.

4.Promote environmental education activities and social contribution activities

Elevate environmental awareness through environmental education, participate in local environmental conservation activities to increase local environmental protection and communication.

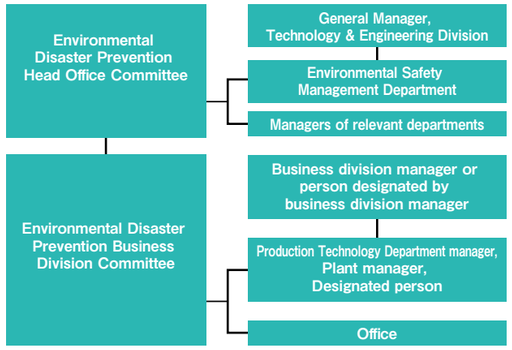
5.Disclose environmental information

Disclose environmental information related to corporate activities through IR activities to ensure social transparency.

Promotional structure for environmental disaster prevention

Environmental disaster prevention organization

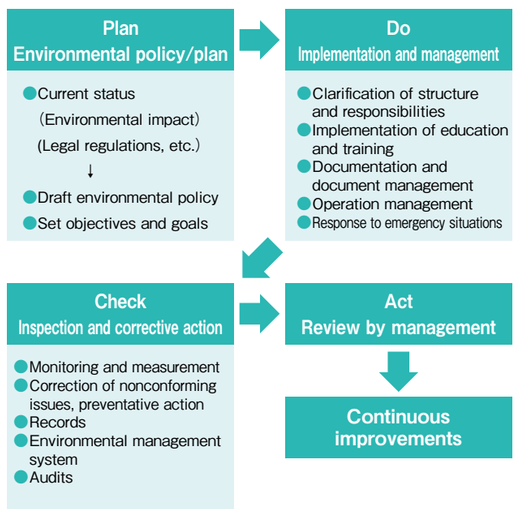
The environmental disaster prevention organization consists of the Environmental Disaster Prevention Head Office Committee which convenes at the main office, and Environmental Disaster Prevention Business Division Committees which are convened by each business division (including participation by Group companies).
Major strategies and policies are drafted by the Head Office Committee and the activities of each business division are linked with environment management ISO14001 to challenge ourselves to reach more effective and high-level goals.



Environment management system

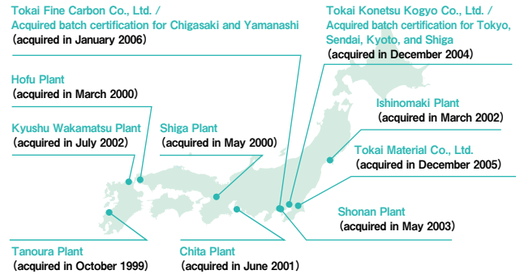
ISO14001 Environment management syste

The ISO14001 Environment management system is the most fundamental scheme involved in company-wide environmental disaster prevention activities and uses the PDCA cycle (Plan > Do > Check > Act) for continuous improvements.



Status of environment management system certification

ISO14001 is an important system to promote environmentally conscious corporate activities and efforts are made to acquire such certificate.



Status of environment management system audits

Internal audits by designated auditors, and external audits by external environmental certification bodies are regularly conducted to increase the effectiveness of our environmental conservation activities. No serious recommendations were issued during the external audit conducted in 2016.

Environmental education and awareness

In order for a company to promote environmental initiatives, it is important for each employee to gain a deeper understanding of environmental issues and act with environmental awareness.
Tokai Carbon outlines environmental education and awareness activities in the environmental policy and proactively conducts various education and awareness activities related to the environment.
We also systematically promote the cultivation of certified environmental persons, including pollution control managers and qualified persons for energy management necessary for conducting business activities.

Environmental risk assessment

Under the environment management system, we identify potential environmental pollution accidents and work to prevent environmental pollution. To minimize environmental impacts in the event of an emergency situation, systems and procedures have been established. Initiatives related to environmental risk assessments are also promoted, including those for risks related to plants without management certification.
To ensure such systems and procedures, emergency response education and training are conducted, and reviewed whenever necessary based on such results.

Initiatives to reduce environmental load from business activities

Medium-term goals are established and in-house environmental activities are promoted mainly by each Environmental Disaster Prevention Committee.

- Improve the basic unit of CO_2 emissions from production activities
- Reduce treatment volume of consigned industrial waste and landfill volume
- Initiatives related to shipping, raw materials, secondary materials, packaging and wrapping materials, etc.

(1) Activities related to reducing energy consumption and environmental load from shipping

We promote energy conservation and resource conservation activities, including reducing shipping distances and improving load efficiency, through partnerships with shipping and loading companies.
Tokai Unyu, a Group company which is the main shipper for Tokai Carbon products, has also adopted fuel efficient vehicles and promotes eco-driving, shared shipping, and other environmentally friendly shipping initiatives.

(2) Green procurement and green purchasing

As a part of our environmental activities, when procuring product raw materials, parts, materials, services, etc. from suppliers, we work with priority to select goods and services with a low environmental burden.

1)Fuel

To reduce CO_2 emissions, we have switched some of our fuel from heavy oil to gas.

2)Secondary materials

To reduce industrial waste, we have switched to materials with value after initial use and reusable secondary materials.

3)Packaging and wrapping materials

To ensure the effective use of limited resources, we are fully considering environmentally friendly packaging and wrapping through efforts which include simplifying packaging and using recycled materials. We are also adopting a method of using returnable boxes that can be used repeatedly, while accepting and reusing shock absorption materials to contribute to resource conservation.

4)Green purchasing

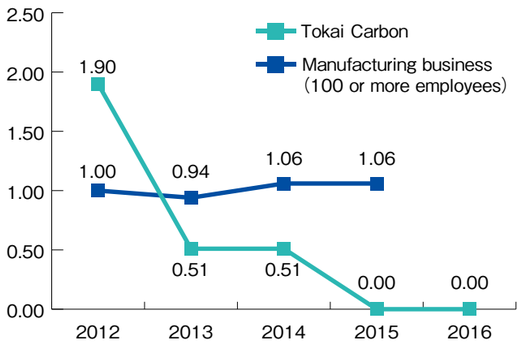
We believe that to develop a sustainable, recycling-based society it is extremely effective to purchase while sufficiently considering necessity and purchase by prioritizing products with minimal impact on the environment. With this in mind, we have developed a Green Purchasing Basic Policy and Green Purchasing Procedures, actively promoting green purchasing under these uniform standards.

(3) External partnership

Through the Japan Chemical Industry Association, we proactively participate in the Voluntary Action Plan and Responsible Care activities led by the Japan Business Federation, and in initiatives taken by the Japan Carbon Association and the Carbon Black Association.

Occupational health and safety

Transition in frequency rate of lost workdays*



* Frequency rate: Indicated as the frequency of labor accidents and represents the number of injuries and deaths per million total working hours. The frequency rate of lost workdays for the most recent 5 years is as shown in the graph. The rate is zero in 2016, the same as in 2015.
* As of February 2017, the fiscal 2016 frequency rate for manufacturing businesses (100 or more employees) is not yet published.

Health and safety management structure

We believe having initiatives under a united front between labor and management is vital to eliminating labor accidents. To confirm the status of health and safety activities at each plant and to deliberate and decide core initiatives related to health and safety of the company, Central Health and Safety Committee meetings attended by representatives from labor and management are held.
Tokai Carbon holds monthly Regional Health and Safety Committee meetings to promote health and safety activities.

Health and safety initiatives

Aiming to eliminate labor accidents, as a means of risk assessment we conduct continuous safety management activities with the full participation of all employees, including activities for identifying risks, submitting near-miss reports, and conducting RPT (risk prediction training).

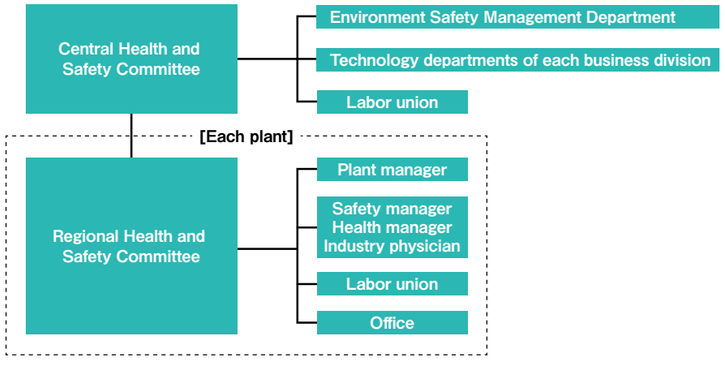
Sharing information on labor accidents

In the event of a labor accident or a significant near-miss event (cases that do not result in a labor accident but have potential to lead directly to a serious accident), we disseminate the information internally and to Group companies to raise awareness and prevent the occurrence of similar incidents.

Mental health initiatives

As mental health measures in workplaces, we hold training seminars at each of our plants and take initiatives which give special consideration to mental health. A system has also been established which allows employees to consult with a physician upon request.

◆Tokai Carbon Health and Safety Organization Chart



Human resource utilization

To increase our ability to create value and do so in a way that is applicable worldwide, goals which are adopted in our basic philosophy, we are taking initiatives with the aim of enhancing the capabilities of our employees through human resource development and creation of value as an organization.

Certification and ranking system

We implement a certification and ranking system that varies depending on the course each employee takes, and such course is determined by individual responsibility, department assignment, and rotation.
This system allows for course changes based on work demands and individual preferences, as well as rapid promotion of talented personnel.

Evaluation system

We employ a goal management system which sets up performance goals and topics and clarifies target goals for each employee. Each employee has an interview where specific goals are set and progress evaluations are given to increase individual motivation. The system is intended to be used in human resource development and performance management.
To enhance understanding of the personnel evaluation system and goal management system, and to eliminate inconsistency in evaluations, we provide training for employees who become new evaluators to ensure the system is implemented effectively.

Self-assessment

Mainly for general career track employees, whose position rotation is one factor of human resource development, this system allows employees to convey every year their desired position, workplace and other matters to the company. This includes an assessment of the volume and quality of their current assignments and their future goals. The contents, with the results of the individual review by HR personnel, is reported to the Executive Officer of Human Resources via the business manager, and is used as basic information for career development, human resource development, and ascertainment of the workplace environment.

Education and training

We link and promote OJT (On the Job Training) in which employees acquire necessary skills and knowledge at their workplace through actual work with the above-mentioned goal management system. Off-JT (Off the Job Training) has also been established, including level-based training that begins with training for new hires. The program content is revised as necessary to reflect participant feedback and actual business needs. We also conduct career design training aimed at responding to diversity and inclusion, including promotion of women's participation and advancement.
As support for acquiring diverse skills and knowledge through self-improvement, we have established correspondence learning systems and a public qualification acquirement program.
From fiscal 2017, we selected future management candidates from among young employees, middle management, and senior management ranks to participate in the overseas language training, global leadership training, and executive management training to have them develop the knowledge required as next-generation leaders.

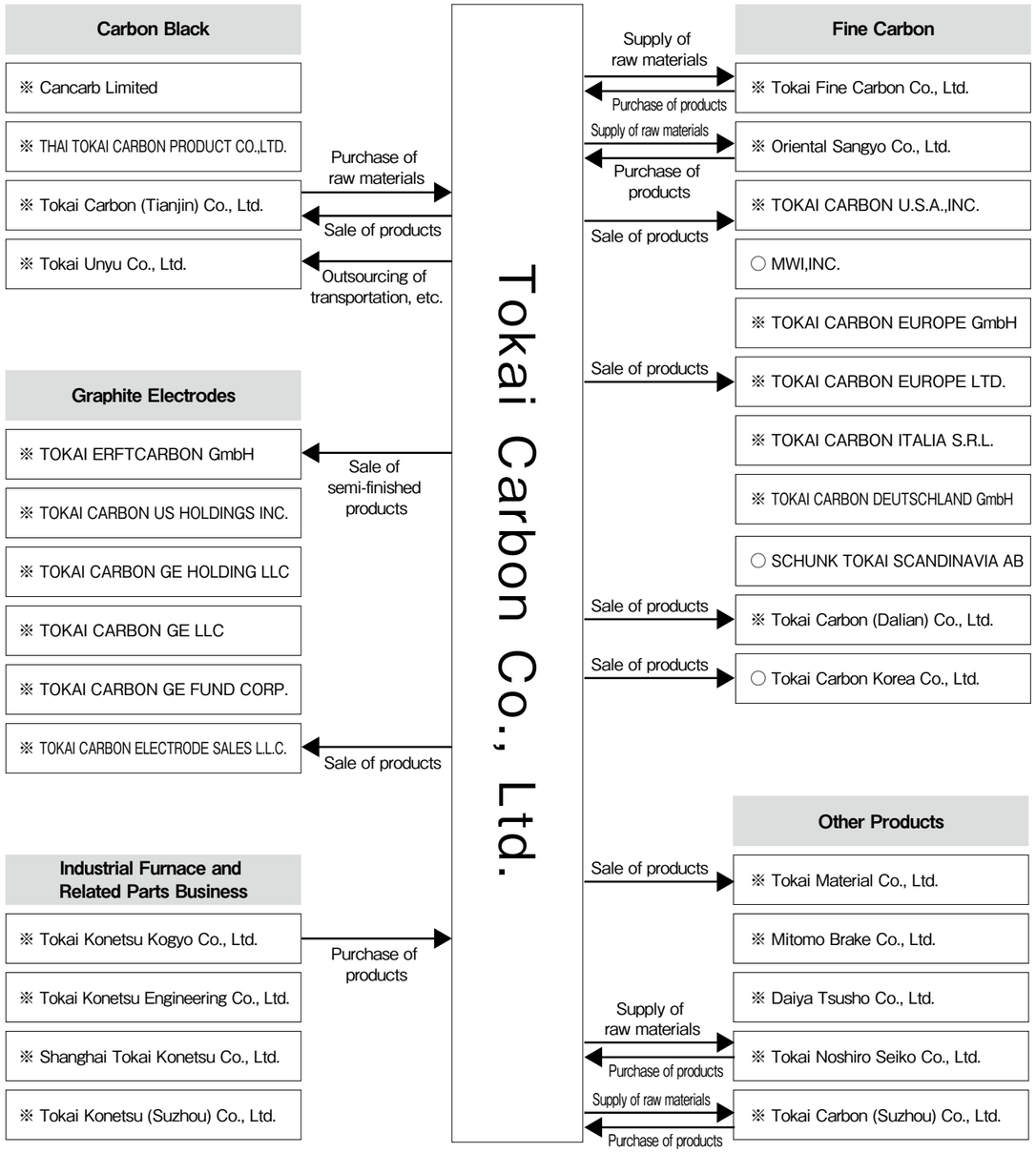


Continuous employment system

We have established a system that enables motivated and skilled elderly workers to continue their employment after the mandatory retirement age. We support a diverse range of workstyles, enabling workers to choose both full-time and half-time (working only in the AM or PM) positions. Guidance for skill succession is included in the evaluation criteria of each employee, not to mention the utilization of accumulated skills and capabilities of elderly workers. The system is further promoted by clarifying roles through the designation of skills succession supervisors (Meisters).

Overview of company

Business description



(Notes)

1. ※: consolidated subsidiaries, ○: affiliates accounted for by the equity method
2. TOKAI CARBON ELECTRODE SALES INC., a consolidated subsidiary, changed its company name to TOKAI CARBON US HOLDINGS INC. as of October 23, 2017.
3. TOKAI CARBON GE HOLDING LLC became a consolidated subsidiary following the acquisition of all of its shares through TOKAI CARBON US HOLDINGS INC. as of November 7, 2017. As a result, TOKAI CARBON GE LLC and TOKAI CARBON GE FUND CORP., which are subsidiaries of the acquired company, also became consolidated subsidiaries.
4. SGL TOKAI CARBON LTD. SHANGHAI, which was previously an affiliate accounted for by the equity method, has been excluded from the scope of application of the equity method as a result of the sale of all shares by the Company during the current consolidated fiscal year.
5. SGL TOKAI PROCESS TECHNOLOGY PTE. LTD., which was previously an affiliate accounted for by the equity method, has been excluded from the scope of application of the equity method as a result of the sale of all shares by the Company during the current consolidated fiscal year.
6. Nagoya Green Club Co., Ltd. and LANCOM TOYO CO., LTD., which were previously non-consolidated subsidiaries and were not accounted for by the equity method, has been fully liquidated during the current consolidated fiscal year.

Status of subsidiaries and affiliates

Name	Location	Capital or investment (Million yen)	Main line of business	Ownership ratio of voting rights (%)	Relationship			
					Concurrently serving director etc.	Lending and borrowing of funds	Business transactions	Equipment leasing
(Consolidated subsidiaries)								
Tokai Unyu Co., Ltd.	Minato-ku, Tokyo	39	Carbon Black	100.0	✓	Borrowing	Transportation and packaging of Company products	Leasing office and part of warehouse site, building, etc.
Tokai Fine Carbon Co., Ltd.	Chigasaki-shi, Kanagawa	220	Fine Carbon	100.0	✓	Borrowing	Processing of Company products	Leasing part of plant site, building, etc.
Oriental Sangyo Co., Ltd.	Kofu-shi, Yamanashi	40	Fine Carbon	83.6	✓	Borrowing	Processing of Company products	—
Tokai Konetsu Kogyo Co., Ltd.	Taito-ku, Tokyo	1,400	Industrial Furnaces and Related Products	100.0	✓	Borrowing	Purchase of refractories etc.	—
Tokai Konetsu Engineering Co., Ltd. (Note)2	Omihachiman-shi, Shiga	50	Industrial Furnaces and Related Products	100.0 (100.0)	—	—	—	Leasing part of plant site
Tokai Material Co., Ltd.	Yachiyo-shi, Chiba	250	Other Operations	100.0	✓	Lending	Sale of Company products	Leasing part of plant site, building, etc.
Tokai Noshiro Seiko Co., Ltd.	Noshiro-shi Akita	10	Other Operations	100.0	✓	Borrowing	Supply of the Company raw materials and purchase of products	Leasing part of plant site, building, etc.
Mitomo Brake Co., Ltd. (Note) 2	Ogawa-machi, Hiki-gun, Saitama	10	Other Operations	67.1 (67.1)	✓	—	—	—
Daiya Tsusho Co., Ltd. (Note) 2	Koto-ku, Tokyo	10	Other Operations	100.0 (100.0)	✓	—	—	—
Cancarb Limited (Note) 3	Medicine Hat Canada	CAD 135,276,731	Carbon Black	100.0	✓	—	—	—
THAI TOKAI CARBON PRODUCT CO.,LTD. (Notes) 3, 7	Bangkok Thailand	THB 800,000,000	Carbon Black	100.0	✓	—	—	—
Tokai Carbon (Tianjin) Co., Ltd. (Note) 3	Tianjin People's Republic of China	USD 146,000,000	Carbon Black	100.0	✓	—	Sale of Company products and purchase of raw materials	—
TOKAI CARBON US HOLDINGS INC.(Notes) 3, 5	Hillsboro U.S.A.	USD 140,001,000	Graphite Electrodes	100.0	✓	—	—	—
TOKAI CARBON GE HOLDING LLC(Note) 2	Charlotte U.S.A.	USD 1,000	Graphite Electrodes	100.0 (100.0)	—	—	—	—
TOKAI CARBON GE LLC (Notes) 2, 3, 6	Charlotte U.S.A.	—	Graphite Electrodes	100.0 (100.0)	—	—	—	—
TOKAI CARBON GE FUND CORP.(Note) 2	Charlotte U.S.A.	USD 1,100	Graphite Electrodes	100.0 (100.0)	—	—	—	—
TOKAI CARBON ELECTRODE SALES L.L.C.(Note) 2	Cleveland U.S.A.	USD 100,000	Graphite Electrodes	70.0 (70.0)	✓	—	Sale of Company products	—

Status of subsidiaries and affiliates

Name	Location	Capital or investment (Million yen)	Main line of business	Ownership ratio of voting rights (%)	Relationship			
					Concurrently serving director etc.	Lending and borrowing of funds	Business transactions	Equipment leasing
(Consolidated subsidiaries)								
TOKAI ERFTCARBON GmbH	Grevenbroich Germany	EUR 818,067	Graphite Electrodes	100.0	✓	—	Sale of Company products	—
TOKAI CARBON U.S.A.,INC.	Hillsboro U.S.A.	USD 16,200,000	Fine Carbon	100.0	✓	—	Sale of Company products	—
TOKAI CARBON EUROPE GmbH	Grevenbroich Germany	EUR 240,000	Fine Carbon	100.0	✓	—	—	—
TOKAI CARBON EUROPE LTD.	West Midlands U.K.	GBP 2,500,000	Fine Carbon	100.0	✓	—	Sale of Company products	—
TOKAI CARBON DEUTSCHLAND GmbH	Buchholz-Mendt Germany	EUR 52,000	Fine Carbon	100.0	✓	—	—	—
TOKAI CARBON ITALIA S.R.L. (Note) 2	Milan Italy	EUR 240,000	Fine Carbon	100.0 (100.0)	✓	—	—	—
Tokai Carbon (Dalian) Co., Ltd.	Dalian, People's Republic of China	RMB 11,000,000	Fine Carbon	51.0	✓	—	Sale of Company products	—
Shanghai Tokai Konetsu Co., Ltd. (Note) 2	Shanghai People's Republic of China	USD 3,400,000	Industrial Furnaces and Related Products	100.0 (100.0)	✓	—	—	—
Tokai Konetsu (Suzhou) Co., Ltd. (Notes) 2, 4	Suzhou People's Republic of China	USD 2,250,000	Industrial Furnaces and Related Products	50.0 (50.0)	—	—	—	—
Tokai Carbon (Suzhou) Co., Ltd.	Suzhou People's Republic of China	RMB 29,000,000	Other Operations	100.0	✓	—	Supply of the Company raw materials and purchase of products	—
(Affiliates Accounted for by Equity Method)								
Tokai Carbon Korea Co., Ltd.	Anseong Republic of Korea	1,000 KRW 5,837,500	Fine Carbon	35.4	✓	—	Sale of Company products	—
MWI, INC. (Note) 2	Rochester U.S.A.	USD 10,429	Fine Carbon	40.0 (40.0)	✓	—	—	—
SCHUNK TOKAI SCANDINAVIA AB (Note) 2	Trollhättan Sweden	SEK 200,000	Fine Carbon	50.0 (50.0)	✓	—	—	—

(Notes)

1. The "Main line of business" column includes business segment information.
2. Figures in ( ) in ownership ratio of voting rights indicate indirect ownership ratio included in the total.
3. Cancarb Limited, THAI TOKAI CARBON PRODUCT CO. LTD., Tokai Carbon (Tianjin) Co., Ltd., TOKAI CARBON US HOLDINGS INC., and TOKAI CARBON GE LLC are specified subsidiaries.
4. Not more than 50% of Tokai Konetsu (Suzhou) Co., Ltd. is owned, but it is treated as a consolidated subsidiary since it is substantially controlled by the Company.
5. TOKAI CARBON ELECTRODE SALES INC. changed its name to TOKAI CARBON US HOLDINGS INC.
6. The capital of TOKAI CARBON GE LLC is not stated because the company is a Limited Liability Company under US laws, which does not have exactly the same concept of capital as a general company has.
7. Net sales for THAI TOKAI CARBON PRODUCT CO., LTD. (excluding inter-company sales between consolidated companies) accounts for over 10% of the consolidated net sales.
   Principal information on profit and loss, etc.
   (1) Net sales ¥14,275 million
   (2) Ordinary income ¥1,578 million
   (3) Net income ¥1,261 million
   (4) Net assets ¥9,729 million
   (5) Total assets ¥11,842 million

Employees

(1) Status of consolidated companies

As of December 31, 2017

Segment name	Number of employees
Carbon Black	529 (26)
Graphite Electrodes	479 (47)
Fine Carbon	452 (121)
Industrial Furnaces and Related Products	229 (28)
Other Operations	349 (193)
Corporate (common)	104 (26)
Total	2,142 (442)

(Note)
The number of employees is that of regular employees, and the average annual number of temporary employees is indicated in parentheses.

(2) Status of the Company

As of December 31, 2017

Number of employees	Average age	Average years of service (years)	Average annual salary (yen)
693 (236)	40.3	14.1	6,281,626

Segment name	Number of employees
Carbon Black	198 (21)
Graphite Electrodes	147 (39)
Fine Carbon	116 (32)
Other Operations	128 (116)
Corporate (common)	104 (26)
Total	693 (236)

(Note)

1. The number of employees is that of regular employees, and average annual number of temporary employees is indicated in parentheses.
2. Average annual salary includes bonuses and non-standard wages.

(3) Status of labor union

Major union organizations in the Group (the Company and its consolidated subsidiaries) are Tokai Carbon Labor Union (member affiliated with the Japanese Federation of Energy and Chemistry Workers' Union; 586 members) and Tokai Konetsu Labor Union (member affiliated with the Chemical and General Workers' Union Confederation; 82 members). There are no particular matters concerning labor-management relations which require mentioning.

Status of Business

Management policy, business environment, and challenges to be addressed, etc.

Forward-looking statements in the document are based on the judgments of the Group at the end of the current consolidated fiscal year.

The Japanese economy is expected to remain on a recovery path as the world economy is forecast to grow moderately. However, given uncertainties such as the developments of situations on the Korean Peninsula, the inward focus of the U.S. government, the economic trend of the Chinese economy associated with the shift from quantity to quality, and the threat of spreading terrorism, it is imperative to establish a structure that can respond quickly to an economic downturn while closely tracking future developments.

In the industries related to the Group, the business environment underwent significant changes compared to the previous fiscal year. These changes included the rebound of global demand and the soaring electrode prices caused by the tightening supply of needle coke, a key raw material, in the graphite electrodes business, the rebound of carbon black market supported by robust worldwide automobile production, and the rebound of demand supported by the strong solar cell and semiconductor market in the fine carbon business. Amid these conditions, the Group achieved its numerical goals for 2018, including ¥110 billion in net sales, ¥9 billion in operating income, ROS of 8% or more, and ROIC of 6% or more, one year ahead of schedule except for net sales, due to the benefits derived from the structural reform implemented in the initial year of the Mid-Term Management Plan T-2018 and due to a favorable business environment.

In 2018, while continuing to tackle some of the key challenges of T-2018, including "Changing the Mindset Internally" and "Reinstate the Technological Expertise," the Group will strive not only to improve the profitability of the existing businesses but also to expand the business domains of the Group by working on the anode material business. The anode materials market is expected to expand, creating new business through the development of new products, etc. An early launch of a Tripolar Global Structure consisting of Japan, the U.S. and Germany, including TOKAI CARBON GE HOLDING LLC located in the U.S., which was acquired in November 2017, is one of the most important challenges in 2018. In addition, the Group aims to work on the next step of the M&A strategy, which will utilize the strategic investment budget, the development of growth strategies with a view to the next mid-term management plan.

With respect to challenges on business management, the Group recognizes that management focused on compliance is the minimum requirement. Under the highly uncertain management environment, the enhancement of risk management system including domestic and overseas group companies is a challenge the Company must address. In order to achieve sustainable growth as a listed company, the Group will continue to work on strengthening its corporate governance, including establishment of an effective system of management supervision by the Board of Directors. The Group will also work on development and strengthening of human resources to address such various challenges.

The Group aims to meet the expectations of its stakeholders, including customers and shareholders, by augmenting its corporate value over the medium to long term in accordance with the four guidelines (ability to create value, fairness, ecology, internationalism) based on the corporate philosophy "Ties of Reliability" and to fulfill its corporate social responsibility (CSR).

Risk of Business, etc.

Of the matters relating to Status of Business and Status of Accounting stated in the Securities Report, major factors that might affect investor decisions are described below. The forward-looking statements in the following paragraphs are based on the judgments of the Group as of the submission date of the report (March 29, 2018).

(1) Risks associated with the financial and economic environment

1) Domestic and overseas environment surrounding the Group's business

The Group conducts business operations not only in Japan but also in Asia, Europe, and the United States, so trends in the global economy may affect the Group business performance. Future domestic and overseas economies are expected to show a moderate recovery but there are many risk factors including the policies of the new administration in the United States. If the global economy deteriorates, contrary to predictions of a rebound, the Group's business performance may be adversely affected.

2) Fluctuations in exchange rates

Since the Group engages in international business activities such as import of raw materials and export of products, fluctuations in exchange rates affect the Group business performance. In addition, as exchange rates are used for converting financial statements of the Group's overseas subsidiaries prepared in foreign currencies into Japanese yen, the fluctuations affect the Group's consolidated financial results. In the case of the Group, the appreciation of the yen against the US dollar and the euro, in particular, tends to have an unfavorable impact on the Group's business performance, while the depreciation of the yen has a favorable impact.

3) Financing

The Group conducts financial operations with emphasis on the stability of financing and the maintenance of liquidity, but there is a possibility that turmoil in major international financial markets including Japan may make the Group's planned financing difficult. In addition, increase in interest-bearing debt, a rise in interest rates, downgrading of the Group's credit, etc., which will cause interest expenses to increase and financing capacity to decrease, may affect the Group's business performance adversely.

4) Material procurement

The Group procures raw materials from a large number of suppliers in Japan and abroad and strives to secure raw materials in a stable manner and at an optimal price. However, if higher raw material procurement prices arising from future global economic trends cannot be properly passed on through the selling prices, the Group's business performance may be adversely affected.

5) Securities held by the Group

The Group may acquire and hold equity shares of its business partners, etc. based on the judgment that such holdings will enhance the Group's corporate value over the medium-to-long term by creating and maintaining business opportunities, and by establishing, maintaining, strengthening business and collaboration relations, etc. If the market prices of the shares held decline significantly, the Group's business performance may be adversely affected.

(2) Risks associated with the industry and business

1) Competition with other companies

The Group is in a severely competitive environment with various companies in each business segment, and as a result, many products are exposed to pricing pressure. The Group aims to make efforts to reduce costs, improve efficiency, and pursue technological capabilities. However, if sufficient results are not achieved, net sales and profitability may decrease due to a declining share, falling sales prices, etc. In such situation, the Group's business may be adversely affected. Particularly in the case of the graphite electrodes business, where the market fluctuates considerably, the market trends may have a material effect on the Group's business performance.

2) Globalization of corporate business activities

The Group positions business expansion in overseas markets as a component of its business strategy. Global business expansion entails a variety of risks, which are different from those related to domestic business, such as political instability, unanticipated changes in legislation and regulation, differences in religion and culture, and local labor relation problems, in addition to uncertainties in economy and foreign exchange rates. If the Group is unable to respond properly to such risks, the Group's business performance may be adversely affected.

3) Research and development

Based on the understanding that research and development is indispensable for sustainable enhancement of corporate value, the Group is working on research and development relating to next-generation technology, and its commercialization mainly at Fuji Research Laboratory. However, if the Group is unable to timely develop new technology that responds to future market needs, the Group's growth potential or profitability may be weakened and the Group's business performance may be adversely affected.

4) Acquisition, business alliance, and strategic investment

The Group aims to aggressively pursue acquisitions, business alliances, and strategic investments, as a component of its growth strategy. However, there is a possibility that changes in the business environment, assumptions, etc. may make it difficult to achieve the results initially assumed. If recording impairment loss of goodwill becomes necessary to reflect a decrease in expected future cash flows, for example, the Group's business performance may be adversely affected.

5) Dependence on a specific industry

Approximately 60% of the Group's net sales is derived from the rubber industry and the steel industry. Thus, if the business in these industries deteriorates, resulting in lower net sales and profitability, the Group's business performance may be adversely affected.

6) Securing talented human resources

The Group's competitiveness and future prospects depend on securing and developing talented personnel equipped with specialized knowledge and skills in each of the divisions including research, development, technology, manufacturing, sales, planning and administration as well as management. However, the competition to secure human resources is also becoming intense. In the event that the Group is unable to hire or develop talented personnel as planned, or to keep talented personnel from leaving the Group, the Group's business performance may be adversely affected.

(3) Other risks

1) Regulatory restrictions and litigations

The Group conducts business activities in Japan and overseas, in accordance with various laws and regulations. The Group strives to ensure thorough compliance with laws and regulations across the entire group. However, introduction of new laws and regulations or unanticipated changes of the existing laws and regulations may impose restrictions on the Group's business activities or add to costs, etc., impacting the Group's business performance adversely. In addition, if the authorities judge the Group to be in violation of these laws and regulations, the Group will be subject to administrative punishment including surcharges, criminal charges, lawsuits, etc., and see its reputation damaged. If this happens, the Group's business performance may be adversely affected.

2) Environmental regulations

The Group responds to various environmental laws and regulations related to air pollution, water pollution, soil and groundwater contamination, waste disposal, energy conservation, countermeasures against global warming, etc. in Japan and overseas. In the future, new environmental regulations may be introduced and the existing regulations may be tightened. If the authorities judge the Group to be in violation of these laws and regulations, the Group's business performance may be adversely affected.

3) Intellectual property

The Group, positioning intellectual property as an important management resource, endeavors to prevent infringement of third party intellectual property rights and to protect the Group's intellectual property rights. However, due to differences of opinion, etc., if a third party files an infringement lawsuit seeking injunction against the use of patents, etc. or a lawsuit seeking compensation for damages, or if the Group's competitive advantage is hindered by a third party's infringement of intellectual property rights, the Group's business performance may be adversely affected.

4) Disaster and accident

The Group emphasizes safety and prevention of accidents at its plants, which is the basis for the manufacturing industry. However, if natural disasters such as earthquakes, tsunamis, typhoons or floods, or incidents such as fire, explosion or terrorist attacks occur, causing considerable damage to employees, facilities, information systems, etc. of the Group, this may have an adverse effect on the Group's business activities and business performance through physical and human damage costs and erosion of reputation.

5) Quality and Product liability

At its major domestic production bases, the Group takes all possible measures to ensure the quality of the product by obtaining the Quality Management System (ISO9001) and establishing regulations on quality control, standards, work standards, etc. However, in the event of serious product defects or product liability lawsuits filed against the Group due to unanticipated causes, the Group's business performance may be adversely affected.

6) Information security

The Group strictly manages confidential information relating to production technology, research and development, procurement, sales, etc. that is held by the group for its business execution. However, if such confidential information is lost or leaked through unauthorized access such as infection to computer viruses and cyber-attacks or under other unforeseen circumstances, the Group's business performance may be adversely affected.

Important agreements for operation, etc.

The Company resolved, at an extraordinary meeting of the Board of Directors held on September 28, 2017, to acquire from SGL GE Holding GmbH, a manufacturer of graphite electrodes, all shares of SGL GE Carbon Holding LLC, which is responsible for the US business of SGL GE Holding GmbH. The Company concluded the share transfer agreement on October 2, 2017.

Research and development

The Group (the Company and its affiliated companies) actively promotes a variety of research and development activities such as new product development based on basic research, production technology research and performance enhancement of existing products, and quality improvement, which are mainly led by Fuji Research Laboratory, Chita Laboratory, and Hofu Laboratory, in collaboration with the Company's development and technology divisions.

The content and amount of research and development activities of the Group are presented in a combined form since they are difficult to be associated with specific segments.

(Major research and development activities)

Fine carbon and fine ceramics, which are positioned as growth areas in the Company, have excellent material properties and a wide variety of applications. Considering the remarkable growth in the energy-related, semiconductors, electronics and environmental areas in recent years, the Company is developing products that will meet these high-tech needs.

Based on the technology the Company has cultivated to date, the Company is investing in research and development on carbon anode materials for secondary lithium-ion batteries, aqueous carbon black for inkjet printers, etc.

Tokai Konetsu Kogyo Co., Ltd. is engaged in activities to ensure that the results of its R&D activities are linked to business, as a foundation for the growth strategy of the "T-2018" mid-term management plan.

On that basis, the Company is developing products that are differentiated and unavailable from other companies for both industrial furnaces and silicon carbide heating elements. It is also commercializing them for secondary battery manufacturers and electronic parts manufacturers while leveraging synergies in both areas. Furthermore, the Company will speed up production of marketing samples and launch of new products by strengthening collaboration between the development divisions and the plants, in order to create new products on a continuous basis.

(Amount of research and development expenditure)

Total R&D expenditure in the current consolidated fiscal year was ¥1,482 million.

Analysis of financial position, operating results, and cash flows

Forward-looking statements in the document are based on the judgments of the Group at the end of the current consolidated fiscal year.

(1) Important accounting policies and estimates

The consolidated financial statements of the Group are prepared in accordance with the generally accepted accounting principles of Japan. In preparing these financial statements, management makes estimates that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. However, since these estimates are based on historical experience and on various factors which are deemed reasonable under the circumstances, actual results may differ from those estimates.

(2) Analysis of operating results of the current consolidated fiscal year

Net sales for the current consolidated fiscal year grew 19.9% year-on-year to ¥106,252 million due to an increase in sales volume and sales prices mainly for the carbon black business and a weakening of the yen, among other factors.

Sales-cost ratio decreased 7.5 points year-on-year to 73.8%, primarily due to an improvement in profit margins in the three main businesses (carbon black, graphite electrodes, and fine carbon) and to a decrease in fixed costs, which derived from structural reforms. As a result, gross profit grew 68.7% year-on-year to ¥27,890 million.

Selling expenses decreased 4.6% year-on-year to ¥4,542 million despite an increase in net sales, as a result of the addition to allowance for doubtful receivables in the first half due to deteriorating performance on the part of customers. General and administrative expenses increased 11.5% year-on-year to ¥11,860 million as a result of recording expenses associated with the acquisition of the North American manufacturing base in the graphite electrodes business as well as an increase in labor costs, although research and development expenses decreased because a one-time charge had been recorded during the previous fiscal year. Total selling, general and administrative expenses increased 6.5% year-on-year to ¥16,403 million, and the ratio of SG&A to net sales decreased 2.0 points year-on-year to 15.4%. As a result, operating income substantially increased to ¥11,486 million compared to the previous fiscal year.

Non-operating income increased 36.1% year-on-year to ¥2,849 million mainly due to an increase in equity in earnings of affiliates, which resulted from strong results from equity-method affiliates. Non-operating expenses decreased 28.6% year-on-year to ¥1,087 million primarily due to a decrease in foreign exchange losses in conjunction with the depreciation of the yen and a decrease in interest expenses following repayment of borrowings.

Extraordinary income included ¥2,567 million from gain on sale of fixed assets, ¥522 million from gain on liquidation of subsidiaries and affiliates, and ¥58 million from gain on sales of investment securities. Extraordinary losses included ¥373 million from loss on sale of shares of subsidiaries and associates and ¥96 million from loss on sale of equity invested in affiliates. As a result, net income before income taxes was ¥15,927 million (compared to net loss of ¥7,938 million of the previous fiscal year).

Total income taxes amounted to ¥3,854 million, a substantial increase over the previous fiscal year, and the effective income tax rate was 24.2%. As a result, net income attributable to owners of the parent company rose to ¥11,816 million (compared to net loss of ¥7,929 million of the previous fiscal year).

Total assets at the end of the current consolidated fiscal year increased by ¥24,148 million from the end of the previous consolidated fiscal year to ¥182,972 million, due to an increase in assets resulting from the acquisition of the North American manufacturing base in the graphite electrodes business as well as the recording of goodwill, etc.

As a result, ROA (Ordinary Income to Asset Ratio) for the current consolidated fiscal year increased 6.8 points year-on-year to 7.8%.

(3) Factors that may significantly affect operating results

For factors that may significantly affect operating results, please refer to Risk of Business, etc.

(4) Analysis of the financial resources for capital and the liquidity of funds

1) Cash flows

For the status of cash flows, please refer to Cash flows under Business Results, etc.

2) Financial policy

The Group currently procures funds for working capital and capital investment from internal reserve funds or by borrowing from banks. The balance of loans payable at the end of the current consolidated fiscal year was ¥16,144 million.

In addition, the Company has a loan commitment contract to facilitate the efficient procurement of working capital. The unused balance at the end of the current consolidated fiscal year was ¥10,000 million.

The Group believes that it will be able to procure funds for working capital and capital investment that is required in the future to maintain the growth of the Group, on the basis of its sound financial condition and its ability to generate cash flows from operating activities.

Facilities and equipment

Capital investment, etc.

With a focus on product areas that are expected to grow over the long term, the Group makes investments for saving labor, rationalization, and improvement of product reliability. The Group implemented capital investment totaling ¥4,282 million mainly in the carbon black business during the current consolidated fiscal year.

In the carbon black business, the Group implemented capital investment of ¥2,224 million, mainly to renew facilities at its Chita plant.

In the graphite electrode business, the Group implemented capital investment of ¥679 million mainly at the Company and TOKAI ERFTCARBON GmbH.

In the fine carbon business, the Group implemented capital investment of ¥410 million mainly at the Company.

In the industrial furnaces and related products business, the Group implemented capital investment of ¥189 million, mainly at Tokai Konetsu Kogyo Co., Ltd.

In other operations business, the Group implemented capital investment of ¥506 million, including installation of new facilities at the production technology center at the Company.

Major facilities and equipment

(1) Tokai Carbon Co.,Ltd. (Stand alone)

As of December 31, 2017

Operational Sites (Location)	Segment name	Details of facilities and equipment	Book value (Million yen)						Number of employees
			Buildings and structures	Machinery, equipment, and vehicles	Furnaces	Land (area ㎡)	Other (Note 1)	Total	
Ishinomaki Plant (Ishinomaki-shi, Miyagi)	Carbon Black	Carbon black manufacturing facility	824	620	2	756 (82,295)	25	2,228	37
Chita Plant (Taketoyo-cho, Chita-gun, Aichi)	Carbon Black	Carbon black manufacturing facility	1,130	1,644	46	693 (179,974)	165	3,680	75
Kyusyu Wakamatsu Plant (Wakamatsu-ku, Kitakyushu-shi)	Carbon Black	Carbon black manufacturing facility	480	342	17	304 (32,560)	45	1,190	35
Hofu Plant (Hofu-shi, Yamaguchi)	Graphite Electrodes	Graphite electrodes manufacturing facility	507	663	114	151 (315,874)	15	1,452	70
Shiga Plant (Omihachiman-shi, Shiga)	Graphite Electrodes	Graphite electrodes manufacturing facility	435	425	72	331 (206,666)	74	1,338	54
Tanoura Plant (Ashikita-machi, Ashikita-gun, Kumamoto)	Fine Carbon	Fine carbon etc. manufacturing facility	1,515	338	294	10 (179,374)	235	2,394	99
Production Technology Center (Hofu-shi, Yamaguchi)	Other Operations	Anode materials manufacturing facility	744	1,135	—	5 (11,126)	38	1,924	24

(2) Domestic Subsidiaries

As of December 31, 2017

Company name (Location)	Segment name	Details of facilities and equipment	Book value (Million yen)						Number of employees
			Buildings and structures	Machinery, equipment, and vehicles	Furnaces	Land (area ㎡)	Other (Note 1)	Total	
Tokai Fine Carbon Co., Ltd. (Chigasaki-shi, Kanagawa, etc.)	Fine Carbon	Fine carbon etc. manufacturing facility (Note 2)	733	582	1	109 (25,441)	81	1,508	116
Oriental Sangyo Co., Ltd. (Kofu-shi, Yamanashi)	Fine Carbon	Fine carbon etc. manufacturing facility	286	153	—	158 (18,997)	14	612	62
Tokai Konetsu Kogyo Co., Ltd. (Taito-ku, Tokyo etc.)	Industrial Furnaces and Related Products	Silicon carbide heating element manufacturing facility etc.	311	104	92	30 (42,203)	139	677	108
Tokai Material Co., Ltd. (Yachiyo-shi, Chiba)	Other Operations	Friction materials manufacturing facility (Note 2)	278	254	—	504 (19,106)	25	1,063	108
Tokai Noshiro Seiko Co., Ltd. (Noshiro-shi, Akita)	Other Operations	Friction materials manufacturing facility (Note 2)	49	81	—	175 (26,665)	0	306	32

Major facilities and equipment

(3) Overseas Subsidiaries

As of December 31, 2017

Company name (Location)	Segment name	Details of facilities and equipment	Book value (Million yen)						Number of employees
			Buildings and structures	Machinery, equipment, and vehicles	Furnaces	Land (area ㎡)	Other (Note 1)	Total	
Cancarb Limited (Medicine Hat Canada)	Carbon Black	Carbon black manufacturing facility etc.(Note 3)	333	4,574	—	212 (230,300)	1,106	6,227	76
THAI TOKAI CARBON PRODUCT CO.,LTD. (Bangkok Thailand, etc.)	Carbon Black	Carbon black manufacturing facility (Note 4)	18	3,663	—	— [87,732]	33	3,715	103
TOKAI CARBON (Tianjin) CO., LTD. (People's Republic of China)	Carbon Black	Carbon black manufacturing facility (Note 5)	1,420	930	43	— [184,765]	16	2,411	116
TOKAI CARBON GE LLC (Charlotte U.S.A., etc.)	Graphite Electrodes	Graphite electrodes manufacturing facility	1,321	5,226	—	53 (1,272,805)	282	6,883	146
TOKAI ERFTCARBON GmbH (Grevenbroich Germany)	Graphite Electrodes	Graphite electrodes manufacturing facility	44	2,760	—	296 (146,861)	462	3,564	186
TOKAI CARBON U.S.A.,INC. (Hillsboro U.S.A.)	Fine Carbon	Fine carbon manufacturing facility	316	331	—	62 (12,871)	33	744	27

(Notes)
1. "Other" under the Book value is the sum of tools, furniture and fixtures and construction in progress. The amount does not include consumption tax.
2. Land and buildings are primarily leased from the submitting company, and the book value is based on the amount provided by the submitting company.
3. Includes waste heat treatment facilities acquired incidentally with the acquisition of Cancarb Limited.
4. A portion of the land and buildings are rented from outside the Group. The annual rent for the land is ¥29 million, and the area is indicated in parentheses.
5. The land is rented from outside the Group. The area of the land is indicated in parentheses.
6. There are no major facilities or equipment currently idle.

Planned new installation, disposal, etc. of facilities

(1) New installation of significant facilities, etc.

Company name and operational site	Location	Segment name	Details of facilities and equipment	Estimated investment amount		Funding method	Start and scheduled completion	
				Total amount (Million yen)	Amount paid (Million yen)		Start	Completion
Tokai Carbon Co., Ltd. Production Technology Center	Hofu-shi, Yamaguchi	Other Operations	New installation of manufacturing facilities	371	293	Own funds and borrowing	April 2016	March 2018
Tokai Carbon Co., Ltd. Chita Plant	Taketoyo-cho, Chita-gun, Aichi	Carbon Black	New installation of manufacturing facilities	1,010	87	Own funds and borrowing	December 2016	June 2018
Tokai Carbon Co., Ltd. Production Technology Center	Hofu-shi, Yamaguchi	Other Operations	New installation of manufacturing facilities	1,126	5	Own funds and borrowing	June 2017	December 2018

(2) Disposal of significant facilities, etc.

There are no scheduled disposals of significant facilities, etc.

Consolidated Balance Sheets

(Millions of yen)

	FY2016	FY2017
Assets		
Current assets		
Cash and cash equivalents	16,528	22,152
Notes and accounts receivable	※4 24,220	※4 30,265
Securities	12,000	—
Merchandise and finished goods	7,516	9,257
Work in process	7,886	10,063
Raw materials and supplies	5,330	8,041
Deferred tax assets	1,677	1,312
Other	3,066	4,662
Allowance for doubtful accounts	(580)	(514)
Total current assets	77,645	85,241
Fixed assets		
Tangible fixed assets		
Buildings and structures, net	12,965	13,672
Machinery, equipment and vehicles, net	20,496	24,857
Furnaces, net	744	813
Land	5,747	5,914
Construction in progress	1,214	1,113
Other, net	1,953	2,075
Total tangible fixed assets	※1 43,122	※1 48,447
Intangible fixed assets		
Software	559	867
Goodwill	5,604	12,683
Customer-related assets	3,612	3,495
Other	758	699
Total intangible fixed assets	10,534	17,746
Investments and other assets		
Investment securities	※2 24,377	※2 28,121
Net defined benefit asset	1,923	2,531
Deferred tax assets	564	225
Other	※2 702	722
Allowance for doubtful accounts	(46)	(62)
Total investment and other assets	27,521	31,537
Total fixed assets	81,178	97,731
Total assets	158,824	182,972

(Millions of yen)

	FY2016	FY2017
Liabilities		
Current liabilities		
Notes and accounts payable	※4 7,471	※4 11,463
Electronically recorded obligations	※4 2,120	※4 3,059
Short-term borrowings	2,894	12,006
Current portion of long-term debt within one year	10,016	2,068
Income taxes payable	841	1,550
Consumption taxes payable	356	203
Accrued expenses	1,235	2,056
Reserve for bonuses	194	438
Other	※4 3,897	※4 4,023
Total current liabilities	29,028	36,870
Fixed liabilities		
Long-term debt	4,137	2,068
Deferred tax liabilities	6,037	8,053
Net defined benefit liability	3,840	6,189
Reserve for directors' retirement benefits	92	83
Reserve for executive officers' retirement benefits	42	39
Provision for environment and safety measures	473	45
Other	2,182	3,021
Total fixed liabilities	16,806	19,501
Total liabilities	45,834	56,372
Net assets		
Shareholders' capital		
Common stock	20,436	20,436
Additional paid-in capital	17,502	17,473
Retained earnings	69,005	78,902
Treasury stock	(7,250)	(7,253)
Total shareholders' capital	99,693	109,558
Other accumulated comprehensive income		
Net unrealized gains/losses on other securities	9,191	11,345
Foreign currency translation adjustments	1,356	3,631
Remeasurements of defined benefit plans	748	1,299
Total other accumulated comprehensive income	11,296	16,276
Non-controlling interests	1,998	763
Total net assets	112,989	126,599
Total liabilities and net assets	158,824	182,972

※1 Accumulated depreciation amount of tangible fix assets is as follows:

FY2016	FY2017
¥170,058 million	¥189,557 million

※2 Items concerning non-consolidated subsidiaries and affiliated companies are as follows:

	FY2016	FY2017
Investment securities (shares)	¥5,207 million	¥5,911 million
Investments and other assets, other (equity)	¥69 million	—

3 Commitment line agreement
Tokai Carbon concluded a loan commitment line agreement with ten correspondent financial institutions to efficiently procure operating funds.Details such as the unused loan commitment amount are as follows:

	FY2016	FY2017
Total loan commitment amount	¥20,000 million	¥10,000 million
Outstanding loan amount	—	—
Unused loan commitment amount	¥20,000 million	¥10,000 million

※4 Notes maturing at the end of the relevant fiscal year and electronically recorded monetary obligation, etc.
Accounting treatment in regard to notes matured at the end of the period and electronically recorded monetary obligation, etc. are settled as of the clearance date, etc.

Consolidated Statement of Operations

(Millions of yen)

	FY2016	FY2017
Net sales	88,580	106,252
Cost of sales	72,051	78,361
Gross profit	16,529	27,890
Selling, general and administrative expenses		
Selling cost	4,762	4,542
General administrative cost	10,635	11,860
Total of selling cost and general administrative cost	15,398	16,403
Operating income (loss)	1,131	11,486
Non-operating income		
Interest income	53	44
Dividend income	447	468
Royalty income	208	327
Rental income	293	138
Equity in income of non-consolidated subsidiaries and affiliates	794	1,325
Other	297	545
Total non-operating income	2,094	2,849
Non-operating expense		
Interest expense	418	334
Compensation expenses	60	121
Foreign exchange losses	224	68
Other non-operating expense	820	562
Total non-operating expenses	1,523	1,087
Ordinary income (loss)	1,702	13,249
Extraordinary income		
Gain on sales of non-current assets	1,380	2,567
Gain on liquidation of subsidiaries and associates	—	522
Gain on sales of investment securities	—	58
Total extraordinary income	1,380	3,148
Extraordinary losses		
Loss on sales of shares of subsidiaries and associates	—	373
Loss on sale of equity invested in affiliates	—	96
Impairment loss	※10,707	—
Special severance payments	314	—
Total extraordinary losses	11,021	470
Income (loss) before income taxes	(7,938)	15,927
Income taxes, inhabitants tax, and enterprise taxes	1,468	2,740
Income taxes adjustments	(1,535)	1,113
Total income taxes	(67)	3,854
Profit/(loss)	(7,871)	12,073
Loss attributable to non-controlling shareholders	58	257
Profit/(loss) attributable to owners of the parent	(7,929)	11,816

※ Impairment loss
The Group recorded impairment losses with respect to the asset groups below.
Previous fiscal year (January 1, 2016 to December 31, 2016)
①Assets that have suffered impairment

Use	Type	Company name	Location	Impairment loss (Million yen)
Carbon black manufacturing facility	Buildings and structures, Machinery, equipment, and vehicles, Construction in progress	Tokai Carbon (Tianjin) Co., Ltd.	Tianjin People's Republic of China	1,859
Fine carbon manufacturing facility	Buildings and structures, Machinery, equipment, and vehicles, Furnaces, Land, Construction in progress, Other, Software	Tokai Carbon Co., Ltd.	Ashikita-machi, Ashikita-gun, Kumamoto	3,117
Graphite electrode manufacturing facility	Buildings and structures, Machinery, equipment, and vehicles, Furnaces, Land, Other, Software	Tokai Carbon Co., Ltd.	Omihachiman-shi, Shiga	1,604
Graphite electrode manufacturing facility	Buildings and structures, Machinery, equipment, and vehicles, Furnaces, Land, Other, Software	Tokai Carbon Co., Ltd.	Hofu-shi, Yamaguchi	2,293
Idle asset	Machinery, equipment, and vehicles, Construction in progress	Tokai Carbon (Tianjin) Co., Ltd.	Tianjin People's Republic of China	307
Idle asset	Buildings and structures, Machinery, equipment, and vehicles, Furnaces, Construction in progress, Other	Tokai Carbon Co., Ltd.	Ashikita-machi, Ashikita-gun, Kumamoto	1,111
Idle asset	Machinery, equipment and vehicles	Tokai Carbon Co., Ltd.	Ishinomaki-shi, Miyagi	20
Idle asset	Buildings and structures, Machinery, equipment, and vehicles, Furnaces, Other	Tokai Carbon Co., Ltd.	Hofu-shi, Yamaguchi	13
Asset scheduled to be sold	Buildings and structures, Machinery, equipment, and vehicles, Land, Other, Software	Tokai Carbon Co., Ltd.	Taketoyo-cho, Chita-gun, Aichi	380

②Background to recognition of impairment loss
The Group recorded an impairment loss with respect to the carbon black manufacturing facility in Tianjin city of People's Republic of China, the fine carbon manufacturing facility in Ashikita-machi, Ashikita-gun, Kumamoto, and the graphite electrode manufacturing facilities in Omihachiman-shi, Shiga and Hofu-shi, Yamaguchi because the recoverable amount of these assets fell short of the book value due to a decline in profitability.
The Group recorded an impairment loss with respect to the idle asset in Tianjin city of People's Republic of China because the recoverable amount of the asset fell short of the book value, since the asset remained idle and no future use could be expected as a result of the decision to close one line of the production facility.
The Group recorded an impairment loss with respect to the idle asset in Ashikita-machi, Ashikita-gun, Kumamoto because the recoverable amount of the asset fell short of the book value, since the asset remained idle and no future use could be expected as a result of the decision to dispose of, suspend, etc. outdated facilities based on a management rationalization measure.
The Group recorded an impairment loss with respect to the idle asset in Ishinomaki-shi, Miyagi because the recoverable amount of the asset fell short of the book value, since the asset remained idle and no future use could be expected as a result of the decision to close one line of the production facility.
The Group recorded an impairment loss with respect to the idle asset in Hofu-shi, Yamaguchi because the recoverable amount of the asset fell short of the book value, since the asset remained idle and no future use could be expected as a result of the decision to dispose of outdated facilities.
The Group recorded an impairment loss with respect to the asset scheduled to be sold in Taketoyo-cho, Chita-gun, Aichi because the recoverable amount of the asset fell short of the book value as a result of the decision to sell it.
③Breakdown of the amount and types of impairment loss

Buildings and structures	¥4,603 million
Machinery, equipment, and vehicles	¥3,124 million
Furnaces	¥290 million
Land	¥961 million
Construction in progress	¥1,628 million
Other	¥71 million
Software	¥27 million

④Outline of asset groups that have suffered impairment loss and method of grouping
・Asset group
Tokai Carbon (Tianjin) Co., Ltd. – Carbon black manufacturing facility
Tokai Carbon Co., Ltd. – Fine carbon manufacturing facility
Tokai Carbon Co., Ltd. – Graphite electrodes manufacturing facility
Tokai Carbon (Tianjin) Co., Ltd. – Idle asset
Tokai Carbon Co., Ltd. – Idle asset
Tokai Carbon Co., Ltd. – Asset scheduled to be sold
・Method of grouping
The sections under management accounting are considered as grouping units. However, assets under leased assets, idle assets, and assets scheduled to be retired or assets scheduled to be sold are grouped according to each individual asset.
⑤Method of calculating recoverable amount
The recoverable amount of the carbon black manufacturing facility in Tianjin city of People's Republic of China was calculated by estimating the value-in-use, and applying a discount rate of 6.0% to the future cash flows.
The recoverable amount of the fine carbon manufacturing facility in Ashikita-machi, Ashikita-gun, Kumamoto was calculated by estimating the value-in-use, and applying a discount rate of 6.95% to the future cash flows.
The recoverable amounts of the graphite electrode manufacturing facilities in Omihachiman-shi, Shiga and Hofu-shi, Yamaguchi were calculated by estimating the value-in-use, and applying a discount rate of 8.63% to the future cash flows.
The idle assets in Tianjin city of People's Republic of China, Ashikita-machi, Ashikita-gun, Kumamoto, Ishinomaki-shi, Miyagi, and Hofu-shi, Yamaguchi were evaluated based on the residual values.
The recoverable amount of the asset scheduled to be sold of Taketoyo-cho, Chita-gun, Aichi was estimated based on the net selling price, and evaluated based on the amount of the sales contract.

Current Consolidated Fiscal Year (January 1, 2017 to December 31, 2017)
Not applicable

Consolidated Statement of Cash Flows

(Millions of yen)

	FY2016	FY2017
Cash flows from operating activities		
Net income/(loss) before income taxes	(7,938)	15,927
Depreciation and amortization	8,124	6,605
Impairment loss	10,707	—
Loss on sales of investment securities	(13)	(58)
Loss (gain) on liquidation of subsidiaries and associates	—	(522)
Loss (gain) on sales of equity invested in affiliates	—	96
Loss (gain) on sales of shares of subsidiaries and associates	—	373
Special severance payments	314	—
Loss on sales of tangible assets	(1,383)	(2,567)
Amortization of goodwill	372	514
Increase (decrease) in allowance for doubtful accounts	429	(39)
Increase (decrease) in reserve for bonuses	(14)	114
Increase (decrease) in net defined benefit liability	65	(500)
Decrease (increase) in net defined benefit assets	70	(608)
Increase (decrease) in provision for environment and safety measures	4	(428)
Interest and dividends income	(500)	(513)
Interest paid	418	334
Foreign exchange (gain) losses	30	20
Equity in income (loss) of non-consolidated	(794)	(1,325)
Increase (decrease) in trade receivables	2,179	(4,586)
Increase (decrease) in inventories	12,611	(3,253)
Increase (decrease) in trade payables	(1,440)	3,212
Increase (decrease) in accrued expenses	(101)	237
Increase (decrease) in account payables	(441)	71
Increase (decrease) in advance payments	(655)	(744)
Increase (decrease) in consumption taxes payables	(140)	(162)
Other	(179)	195
Subtotal	21,724	12,395
Interest income and dividends received	597	724
Interest paid	(429)	(324)
Income taxes paid	(4,149)	(2,252)
Special severance payments	(236)	—
Net cash provided by (used in) operating activities	17,505	10,543
Cash flows from investing activities		
Proceeds from withdrawal of time deposits	108	—
Purchase of tangible fixed assets	(5,168)	(4,336)
Proceeds from tangible fixed assets	1,610	2,704
Purchased of intangible assets	(227)	(360)
Proceeds from sales of investment securities	15	109
Proceeds from liquidation of subsidiaries and associates	—	542
Proceeds from sales of shares of subsidiaries and associates	—	246
Purchase of shares of subsidiaries resulting in a change in the scope of consolidation	—	※ (12,964)
Other	37	19
Cash flow from investing activities	(3,622)	(14,039)

(Millions of yen)

	FY2016	FY2017
Cash flows from financing activities		
Net increase (decrease) in short-term borrowings	(4,156)	9,019
Repayment of long-term debt	(2,068)	(10,042)
Payment of dividend	(1,279)	(1,918)
Payment attributable to non-controlling shareholders	(47)	(54)
Purchase of shares of subsidiaries that do not result in a change in the scope of consolidation	—	(1,499)
Others	(61)	(38)
Cash flows from financing activities	(7,613)	(4,534)
Effect of exchange rate change on cash and cash equivalents	(667)	1,654
Increase (decrease) in cash and cash equivalents	5,602	(6,376)
Cash and cash equivalents at beginning of the period	22,919	28,521
Cash and cash equivalents at end of the period	28,521	22,145

※ Cash flows
At the end of the consolidated fiscal year under review, the Group's cash and cash equivalents totaled ¥22,145 million, a decrease of ¥6,376 million from the previous consolidated fiscal year. Cash flows and the major sources and uses of cash in the consolidated fiscal year under review are summarized as follows.

(Cash flows from operating activities)
Operating activities provided net cash of ¥10,543 million, a decrease of ¥6,962 million from the previous consolidated fiscal year. This was mainly due to a decrease in cash as a result of an increase of inventories, although there was an increase in cash as a result mainly of the posting of net income before taxes.

(Cash flows from investing activities)
Investing activities used net cash of ¥14,039 million, an increase of ¥10,416 million from the previous consolidated fiscal year. This was mainly due to expenditures on purchase of shares of subsidiaries resulting in a change in the scope of consolidation.

(Cash flows from financing activities)
Financing activities used net cash of ¥4,534 million, a decrease of ¥3,079 million from the previous consolidated fiscal year, mainly due to an increase in short-term loans payable.

※ Principal assets and liabilities of a company that became a consolidated subsidiary due to acquisition of shares during the current fiscal year
Principal assets and liabilities of TOKAI CARBON GE HOLDING LLC upon consolidation of the company along with its two subsidiaries resulting from acquisition of its shares, as well as the relationship between the acquisition price of the shares of the company and expenditures (net) for its acquisition are as follows.

Current assets	¥ 4,796 million
Fixed assets	¥ 7,013
Goodwill	¥ 7,405
Current liabilities	¥(2,330)
Fixed liabilities	¥(3,511)
Foreign currency translation adjustments	¥ 2
Acquisition cost of shares of TOKAI CARBON GE HOLDING LLC	¥13,376
Cash and cash equivalents of TOKAI CARBON GE HOLDING LLC	¥(412)
Net:Funds used for acquisition of shares of subsidiaries resulting in a change in the scope of consolidation	¥12,964

Basic views on corporate governance

Tokai Carbon recognizes that enhancing mid- to long-term corporate value is the most important management objective. We believe that responding to the expectations of all stakeholders, including customers and shareholders, and building favorable relationships, is essential in achieving this objective. To this end, we embrace the corporate philosophy of Ties of Reliability. Through this philosophy and through the policies and values outlined in our Guidelines and Corporate Code of Ethics, we are working to develop an effective corporate governance structure.

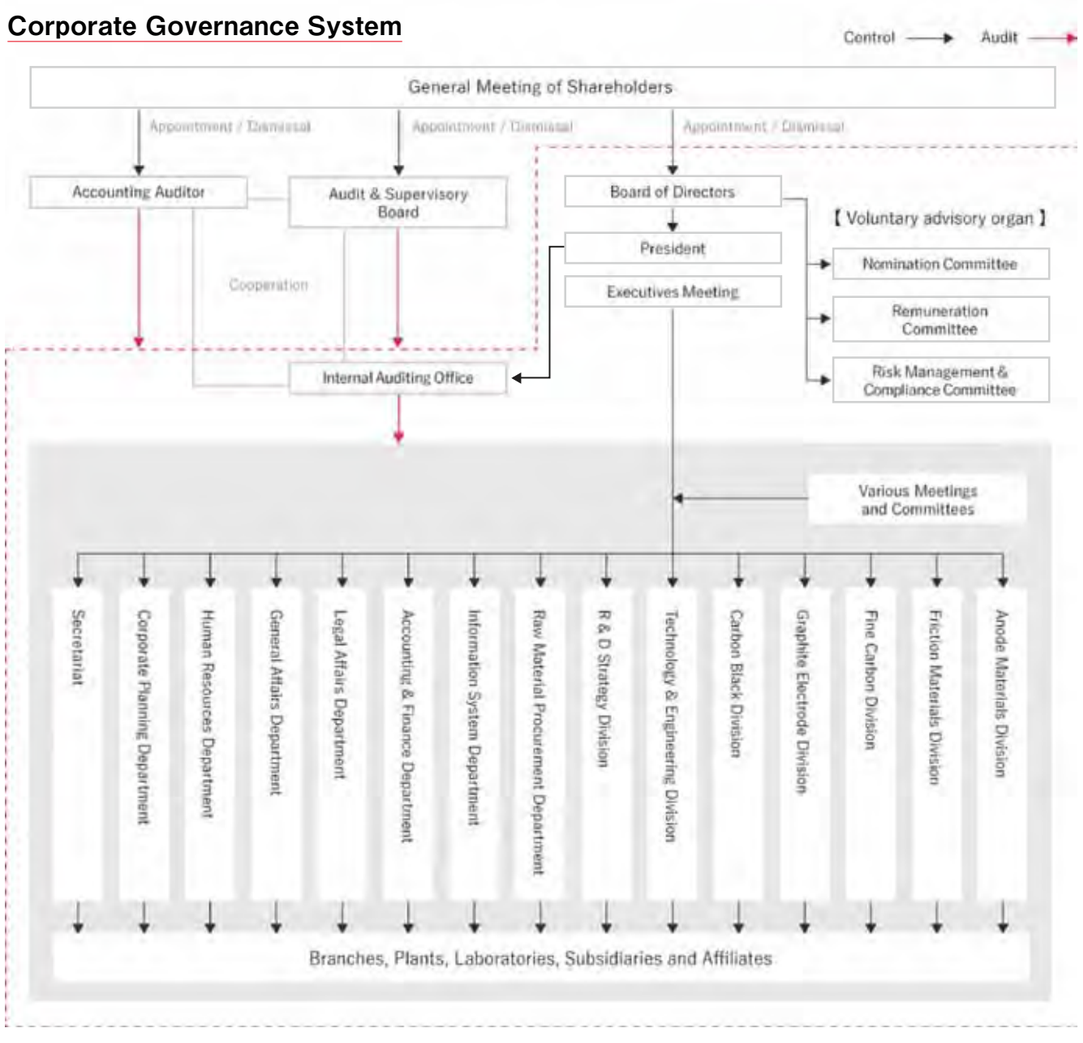
Corporate governance system

Tokai Carbon, as a company with an Audit & Supervisory Board, operates under the basic stance of reinforcing audits by Audit & Supervisory Board Members and the internal audit function. It also makes efforts to strengthen management supervision functions of the Board of Directors by appointing multiple External Directors and establishing voluntary committees in order to realize an appropriate corporate governance structure. In addition, from the perspective of clarifying the functions and responsibilities of corporate officers engaged in business execution, the Company has adopted the Executive Officer System and established a Managing Executives Meeting in an effort to enhance and strengthen business execution functions of the organization.

(a) Board of Directors

The Board of Directors is responsible for determining important management matters and supervising business execution and meets monthly as a general rule. As of the date of submission of this report, there are seven Directors two of whom are External Directors. The Company has established the Nomination Committee and the Remuneration Committee, the majority of members of which are External Directors, as voluntary advisory organs of the Board of Directors. It has also established the Risk Management & Compliance Committee as a voluntary committee under the Board of Directors.

Corporate Governance System



(b) Audit & Supervisory Board Members and the Audit & Supervisory Board

The Audit & Supervisory Board of the Company meets monthly as a general rule. As of the date of submission of this report, there are four Audit & Supervisory Board Members two of whom are External Audit & Supervisory Board Members. Based on the auditing policy and the audit plan resolved by the Audit & Supervisory Board, Audit & Supervisory Board Members perform audits of the status of execution of duties by Directors through attending meetings of the Board of Directors and other important meetings and investigating the status of business operations and assets.

(c) Business execution

The Management Committee was established under the Board of Directors to discuss and determine important matters concerning management based on the basic policies determined by the Board of Directors. Under the Management Committee are various committees that complement the discussions of the Management Committee by reporting the results of deliberation to the Management Committee.
Furthermore, the Company adopts the Executive Officer System under which the Board of Directors selects twelve Executive Officers who are accountable for business execution.

(d) Internal audits

The Company has established an Internal Auditing Office to serve as an internal auditing department. The Internal Auditing Office is in charge of improving and enhancing the internal control systems by performing internal audits on business operations of the Company and each Group company. The Internal Auditing Office ensures it follows up on audits performed to see that recommendations for improvement have been implemented. Important audit results are reported to the Board of Directors.

(e) Accounting audits

The Company has a contract in place with the accounting audit firm Deloitte Touche Tohmatsu LLC regarding accounting audits pursuant to Japan's Companies Act and Financial Instruments and Exchange Act. The Accounting Auditors audit the account statements and financial statements from the standpoint of an independent third party and report the results of the audit to the Company. Appropriate opinions on reviews and issues of internal control systems, etc. are then exchanged, and improvements are implemented in accordance with recommendations. The Company also submits information and data to the Accounting Auditors in order to ensure an environment in which audits can be carried out swiftly and accurately. There are no special conflicts of interest between the Company and the aforesaid accounting audit firm and executive members of the said accounting audit firm who perform audits of the Company.

Status of establishment of internal control system

To ensure that the Tokai Carbon Group on the whole properly executes business operations in accordance with relevant laws, regulations and the articles of incorporation, the Company resolved at its meeting of the Board of Directors in May 2006 to set forth the "Basic Policy for Establishing an Internal Control System." As of the date of submission of this report, the Company continues to make improvements to its internal control system based on the Basic Policy.

Compliance

The company has set "Basic Policy," "Practice Guidelines," and "Corporate Code of Ethics." We conduct corporate activities with a highly ethical viewpoint while also complying with the relevant laws, rules, and regulations based on those policies.

(a) Compliance Manual

The Compliance Manual was prepared based on Tokai Carbon's Corporate Code of Ethics and its Ethical and Compliance Standard. The manual outlines the standards of behavior that all officers and employees should maintain as they carry out their everyday duties, and is intended to help everyone in the Company understand compliance properly.

(b) Internal Reporting System

The company has an internal reporting system with both an internal contact point (Legal Affairs Department and Audit & Supervisory Board Member) and an external contact point (an advising attorney). The system allows employees to make reports and receive consultation by various means including telephone, fax, email, and post.
The Company's Guidelines on Handling of Internal Reports clearly states that, apart for the cases when the system is deliberately misused, informants will not be dismissed or subjected to unfair treatment under this system.

(c) Awareness-Raising and Education

Compliance training is held regularly for officers, managers, and new recruits, and facilitated by trainers from inside and outside the company. The company also strives to raise awareness of compliance in officers and employees, by distributing the compliance message video internally and informing the related issue through the company newsletter.

Information Disclosure to Stakeholders

Tokai Carbon strives to disclose information in a rapid manner based on transparency, fairness, and continuity, through the establishment of the Information Disclosure Basic Policy and compliance with the Companies Act, Securities and Exchange Act, and other relevant laws as well as relevant government guidelines and the Rules on Timely Disclosure of Company Information by Issuers of Listed Securities outlined by the Tokyo Stock Exchange.

Even when information is not applicable to the above, for information beneficial to stakeholders, we give consideration to ensure accurate, rapid, and fair dissemination of information via appropriate methods, regardless of whether or not the said information is of benefit to the Company.

Management



President & Chief Executive Officer
Chairman of the Board
Hajime Nagasaka



Member of the Board
Senior Managing Executive Officer
Nobuyuki Murofushi



Member of the Board
Managing Executive Officer
Masanao Hosoya



Member of the Board
Executive Officer
Yuji Serizawa



Member of the Board
Executive Officer
Masafumi Tsuji



Member of the Board
External Director
Yoshio Kumakura



Member of the Board
External Director
Nobumitsu Kambayashi

Managing Executive Officer **Toshiaki Fukuda**

Executive Officer **Yuji Yamake**

Executive Officer **Katsuyuki Yamaguchi**

Executive Officer **Syunji Yamamoto**

Executive Officer **Kazuhiko Matsubara**

Executive Officer **Hiroshi Takahashi**

Executive Officer **Takashi Masaki**

Stock Information

Stock Summary

Securities code	5301
Stock Exchange Listing	First Section of Tokyo Stock Exchange, Inc.
Fiscal Year	from January 1 to December 31
General Meeting of Shareholders	March
Shareholder Record Date	General Meeting of Shareholders: December 31 Year-End Dividend of Surplus: December 31 Interim Dividend: June 30 (when applicable)
Share Unit	100 shares
Shareholder Registry Administrator	4-5, Marunouchi 1-Chome, Chiyoda-ku, Tokyo Mitsubishi UFJ Trust and Banking Corporation
Method of Public Notice	Electronic notice (If unavoidable circumstances prevent notice from being given electronically, notice shall be posted in the Nikkei.)

Stock Information

Stock Figures

Total number of shares issued by the company	598,764,000
Total number of outstanding shares	224,943,104
Total number of shareholders	17,382

Figures as of December 31, 2017

Major Shareholders

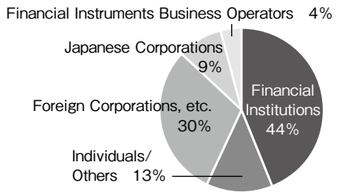
Name	Number of shares held (1,000 shares)	Shareholding ratio (%)
The Master Trust Bank of Japan, Ltd. (trust account)	24,720	11.60
Japan Trustee Services Bank, Ltd. (trust account)	16,576	7.78
JP MORGAN CHASE BANK 380084	9,648	4.53
MUFG Bank, Ltd.	7,958	3.73
Mitsubishi Corporation	6,748	3.16
Mitsubishi UFJ Trust and Banking Corporation	6,290	2.95
The Master Trust Bank of Japan, Ltd. (Retirement benefit trust account/Mitsubishi Chemical Corporation account)	5,900	2.77
CLEARSTREAM BANKING S.A	5,306	2.49
CHASE MANHATTAN BANK GTS CLIENTS ACCOUNT ESCROW	4,636	2.17
Japan Trustee Services Bank, Ltd. (trust account 5)	3,461	1.62

Figures as of December 31, 2017

Notes 1. Tokai Carbon holds 11,782,000 shares of treasury stock but has not been listed among the major shareholders above.
2. The shareholding ratio was calculated excluding treasury stock.

Share Owner Information

Shareholder	Number of shares held (1,000 shares)	Shareholding ratio
Financial Institutions	93,835 (44%)	
Individuals/Others	26,961 (13%)	
Foreign Corporations, etc.	63,805 (30%)	
Japanese Corporations	19,200 (9%)	
Financial Instruments Business Operators	9,352 (4%)	
Total	213,156	



Figures as of December 31, 2017

Notes 1. Share numbers are rounded down to the nearest 1,000 shares.
2. The shareholding ratio was calculated excluding treasury stock.

Dividend policy

- Tokai Carbon's policy to determine profit sharing is based on the earnings performance from a medium-term perspective, with due consideration given to securing sufficient retained earnings while aiming to strengthen the Group-wide business foundation, increase corporate value and pursue shareholders' interest.
- Our basic policy is to distribute dividends of surplus twice a year, an interim dividend and a year-end dividend. The decision-making body of such dividends of surplus is the Shareholders' Meeting for the year-end dividend, and the Board of Directors for the interim dividend.
- Retained earnings will be appropriated to strengthen financial condition and is intended to be used as funds to maintain stable dividend payments.
- The Articles of Incorporation provide that an interim dividend may be distributed with a record date of June 30 every year by the resolution of the Board of Directors.

Dividend amount per share and dividend payout ratio

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Dividend amount per share (yen)	10	8	8	8	7	6	6	6	6	12
Dividend payout ratio (%)	39.8	628.3	66.0	52.8	102.4	42.7	40.8	38.1	(11.8)	31.1

Company Overview

Trade Name	TOKAI CARBON CO., LTD.
Head Office	1-2-3 Kita-Aoyama, Minatoku, Tokyo 107-8636, Japan Tel：81-3-3746-5100 (Switchboard)
Established	1918
CEO	Hajime Nagasaka, President and CEO
Accounting Period	Ending December 31
Capital Stock	20,436 million yen (as of December 2017)
Number of Employees	693 (2,142 including group companies) (as of December 2017)
Operations	Manufacture and sale of carbon black, graphite electrodes, fine carbon, friction materials, industrial furnaces and related products
Offices	●Head Office:Tokyo ●Research Labs:Fuji (Shizuoka), Chita, Hofu ●Branches:Osaka, Nagoya
Plants	Ishinomaki, Shonan, Chita, Shiga, Hofu, Production Technology Center, Kyushu-Wakamatsu, Tanoura
Main Banks	Bank of Tokyo-Mitsubishi UFJ, Mitsubishi UFJ Trust and Banking Corporation

1918 ● Founded as Tokai Electrode Mfg. Co. Ltd.
Business set up to provide a steady supply of quality graphite electrodes. Anticipated growth in electricity-using industries with healthy demand for carbon products. Was also a response to make effective use of the excess electricity at the time.

1936 ● Japan's first exports of graphite electrodes (from the Nagoya Plant to Sweden)

1938 ● Chigasaki Plant completed. Began production of carbon motor brushes and carbon rods.

1941 ● First full-scale production of carbon black in Japan at the Kyushu-Wakamatsu Plant.

1950 ● Developed SEAST 116, Japan's first industrial-grade carbon black.

1960 ● Completed TD350, a carbon motor brush with excellent rectification and abrasion resistance, for the main motor in high-speed trains on the Tokaido Shinkansen(Bullet train). Won popularity for use in high-speed rail.

1962 ● Supplied the first Japanese 24-inch graphite electrodes and exported to Britain, Canada and West Germany.

1975 ● Changed trade name to Tokai Carbon Co., Ltd.

1986 ● The Tanoura Plant commenced production exclusively dedicated to fine carbon.

1987 ● Established Tokai Carbon America, Inc. in New York as an overseas subsidiary to strengthen Tokai Carbon's sales activities outside Japan.

1990 ● Helped finance Thai Carbon Product Co., Ltd., a joint venture in Thailand. Concluded a contract to provide Tokai Carbon's carbon production technology.

1992 ● Merged with Toyo Carbon Co., Ltd.

1994 ● Japan's Orbital Reentry Experiment (OREX) vehicle was launched with a nose cap outfitted with our carbon-carbon (C/C) composites.

1996 ● Established Tokai Carbon U.S.A., Inc. as an overseas subsidiary in Oregon to operate in businesses such as SiC coating.

2004 ● Established subsidiary Tokai Carbon (Tianjin) Co., Ltd in Tianjin, China to produce and sell carbon black.

2005 ● Successfully produced 32-inch graphite electrodes—the world's largest—for commercial use and shipped to the U.S.

Acquired German graphite electrode and cathode producer ERFTCARBON GmbH (now TOKAI ERFTCARBON GmbH).

2014 ● Acquired Canadian carbon black producer Cancarb Limited.

2017 ● With rapid growth in LiB anode materials, separated the anode material business from the R&D Strategy Division and made it a division.

Acquired North American graphite electrode plant. Achieved tri-regional structure of Asia, North America and Europe.



Founded in 1918 with a Grasp of the Day's Needs and Issues, as well as Future Developments

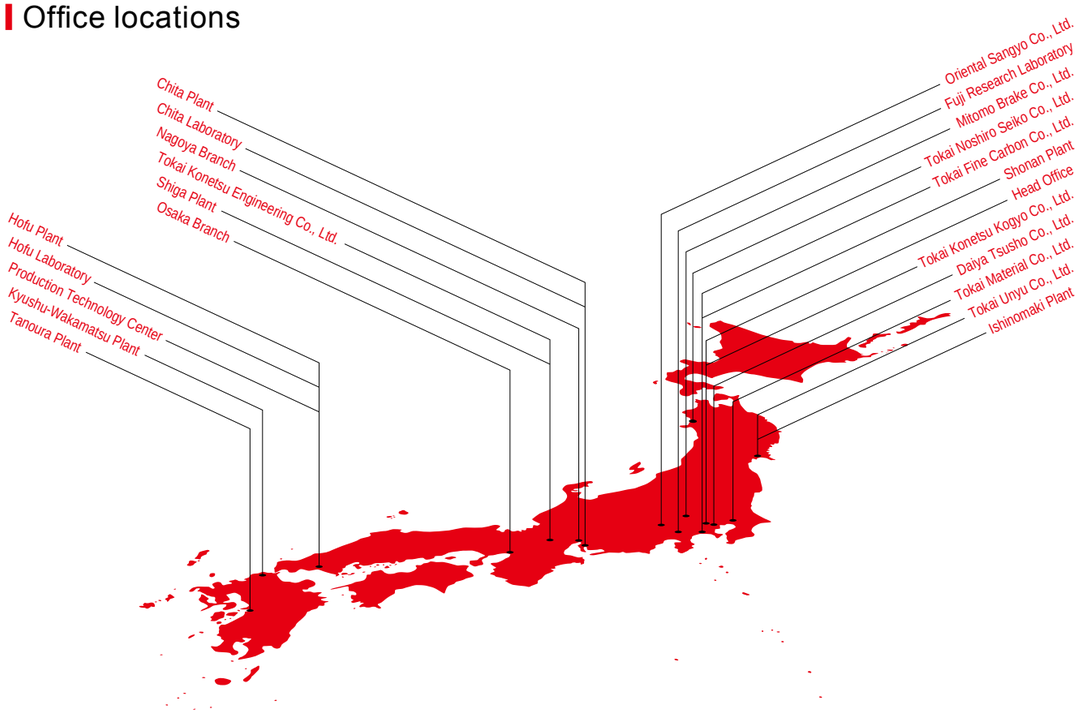


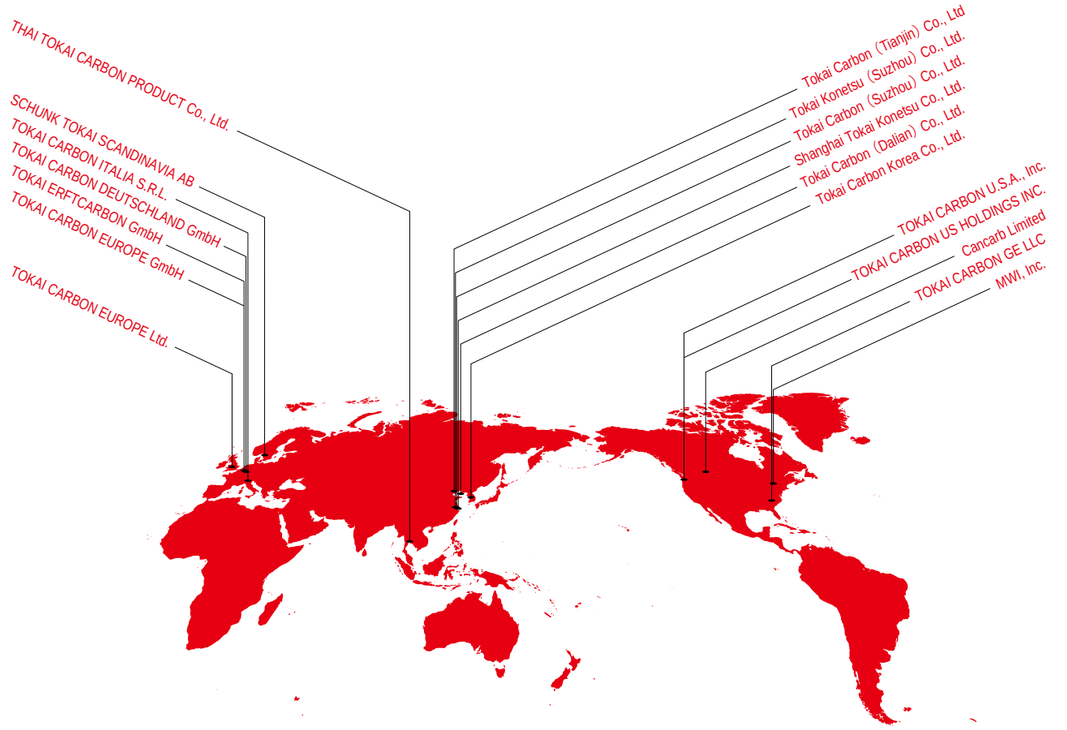
1941:First Production of Carbon Black in Japan



1987:From Japan to the World – Globalization and Agile Responsiveness

Office locations





Domestic Operations

Head Office

1-2-3 Kita-Aoyama, Minatoku, Tokyo 107-8636, Japan
Tel : 81-3-3746-5100　Fax : 81-3-3405-7205

Laboratory

Fuji Research Laboratory
394-1, Subashiri, Oyama-cho,Sunto-gun, Shizuoka 410-1431,Japan
Tel : 81-550-75-3411　Fax : 81-550-75-3430

Chita Laboratory
[Carbon Black]
5gouchi -1,Taketoyocho,Chita-gun,Aichi 470-2341,Japan
Tel : 81-550-75-3411　Fax : 81-550-75-3430

Hofu Laboratory
[Graphite Electrodes]
569, Hamakata,Hofu, Yamaguchi 747-0833, Japan
Tel : 81-835-23-2311　Fax : 81-835-21-6188

Branch

Osaka Branch
Osaka Fukoku Seimei Bldg. 2-4, Komatsubaracho, Kita-ku, Osaka 530-0018, Japan
Tel : 81-6-6363-1451　Fax : 81-6-6363-4046

Nagoya Branch
Nagoya International Center Bldg. 47-1 Nagono, 1-chome, Nakamura-ku, Nagoya, Aichi 450-0001, Japan
Tel : 81-52-571-4471　Fax : 81-52-586-4062

Plant

Ishinomaki Plant
[Carbon Black Division]
1-10, Shigeyoshi-cho, Ishinomaki, Miyagi 986-0844, Japan
Tel : 81-225-93-3611　Fax : 81-225-94-2239

Shonan Plant
[Friction Materials Division]
370, Enzo,Chigasaki, Kanagawa 253-0084, Japan
Tel : 81-467-82-0104　Fax : 81-467-85-1260

Chita Plant
[Carbon Black Division]
5gouchi -1,Taketoyocho,Chita-gun, Aichi 470-2341,Japan
Tel : 81-569-72-1011　Fax : 81-569-73-5392

Shiga Plant
[Graphite Electrodes Division]
705, Chokoji-cho, Oumihachiman, Shiga 523-0013, Japan
Tel : 81-748-37-6131　Fax : 81-748-37-6137

Hofu Plant
[Graphite Electrodes Division]
569, Hamakata, Hofu, Yamaguchi 747-0833, Japan
Tel : 81-835-23-3204　Fax : 81-835-23-3256

Production Technology Center
[Anode Materials Division]
569, Hamakata, Hofu, Yamaguchi 747-0833, Japan
Tel : 81-225-93-3611　Fax : 81-225-94-2239

Kyushu-Wakamatsu Plant
[Carbon Black Division]
2-26, Fujinoki 3-chome, Wakamatsu-ku, kita-Kyusyu, Fukuoka 808-0074, Japan
Tel : 81-93-791-0731　Fax : 81-93-791-1777

Tanoura Plant
[Fine Carbon Division]
959-1 Kodanoura, Ashikita-cho, Ashikita-gun, Kumamoto 869-5393, Japan
Tel : 81-966-87-0006　Fax : 81-966-87-2182

Group Company (Japan)

Tokai Konetsu Kogyo Co., Ltd.　Head Office
[Industrial Furnaces and Related Products Division]
1-2-3 Kita-Aoyama, Minatoku, Tokyo 107-8636, Japan (3F Aoyama Bldg.)
Tel : 81-3-5827-8711　Fax : 81-3-5827-8719

Tokai Material Co., Ltd.　Head Office/Plant
[Friction Materials Division]
1095-6, Yoshihashi, Yachiyo, Chiba 276-0047, Japan
Tel : 81-47-450-8511　Fax : 81-47-450-8547

Tokai Fine Carbon Co., Ltd.　Head Office
[Fine Carbon Division]
370, Enzo, Chigasaki, Kanagawa 253-0084, Japan
Tel : 81-467-85-8000　Fax : 81-467-85-7621

Oriental Sangyo Co., Ltd.
[Fine Carbon Division]
180, Kamijo-Araimachi, Kofu, Yamanashi 400-0052, Japan
Tel : 81-55-241-3221　Fax : 81-55-241-5424

Tokai Unyu Co., Ltd.　Ishinomaki Office
[Carbon Black Division]
1-10, Shigeyoshi-cho, Ishinomaki, Miyagi 986-0844, Japan
Tel : 81-225-96-8921　Fax : 81-225-96-5941

Tokai Noshiro Seiko Co., Ltd.
[Friction Materials Division]
1-2, Ogibuchi, Ogida, Noshiro, Akita 016-0122, Japan
Tel : 81-185-58-3125　Fax : 81-185-58-3127

Tokai Konetsu Engineering Co., Ltd.
[Industrial Furnaces and Related Products Division]
705, Chokoji-cho, Oumihachiman, Shiga 523-0013, Japan
Tel : 81-748-37-2014　Fax : 81-748-37-1743

Mitomo Brake Co., Ltd.
[Friction Materials Division]
218-1, Aoyama, Ogawamachi, Hiki-Gun, Saitama 355-0324, Japan
Tel : 81-49-372-0974　Fax : 81-49-372-1400

Daiya Tsusho Co., Ltd.　Head Office
[Friction Materials Division]
12-7, Morishita 5 chome, Koto-ku, 135-0004 Tokyo, Japan
Tel : 81-3-5600-2700　Fax : 81-3-5600-3800

Group Company (Overseas)

Germany

TOKAI ERFTCARBON GmbH
[Graphite Electrodes Division]
Aluminiumstrasse 4, 41515 Grevenbroich, Germany
Tel : 49-2181-4952-100　Fax : 49-2181-4952-252

TOKAI CARBON EUROPE GmbH
[Fine Carbon Division]
Aluminiumstrasse 4, 41515 Grevenbroich, Germany
Tel : 49-2181-4952-261　Fax : 49-2181-4952-273

TOKAI CARBON DEUTSCHLAND GmbH
[Fine Carbon Division]
Industriepark 25 D-53567 Buchholz-Mendt, Germany
Tel : 49-2683-9783-0　Fax : 49-2683-9783-99

United Kingdom

TOKAI CARBON EUROPE Ltd.
[Fine Carbon Division]
Roway Lane, Oldbury, Warley,
West Midlands B69 3EJ, United Kingdom
Tel : 44-121-552-5577　Fax : 44-121-552-6748

Italy

TOKAI CARBON ITALIA S.R.L.
[Fine Carbon Division]
Via Cagliari 40. 20060 TREZZANO ROSA,
Milano Italy
Tel : 39-02-9096-9190　Fax : 39-02-9096-8851

Sweden

SCHUNK TOKAI SCANDINAVIA AB
[Fine Carbon Division]
Kardanvaegen 40, 461 38 Trollhaettan, Sweden
Tel : 46-520-81185　Fax : 46-520-479270

Thailand

THAI TOKAI CARBON PRODUCT Co., Ltd.
[Carbon Black Division]
9th Floor, Harindhorn Tower, 54 North Sathorn Road, Silom, Bangkok 10500, Thailand
Tel : 66-2266-3232　Fax : 66-2266-3230

China

Tokai Carbon (Tianjin) Co., Ltd
[Carbon Black Division]
No.45 Xixia Road, TEDA Hangu Modern Industry Park, Tianjin 300480, P.R. China
Tel : 86-22-5991-1000　Fax : 86-22-5991-1002

Tokai Carbon (Dalian) Co., Ltd.
[Fine Carbon Division]
Room#1804, Tian An international Tower, No.88 Zhongshan Road Zhongshan District,Dalian, Liaoning, China
Tel : 86-411-82311183　Fax : 86-411-82311186

Tokai Carbon (Suzhou) Co., Ltd.
[Friction Materials Division]
A2 Building, 59Qiye Road, Suzhou Industrial Park, China
Tel : 86-512-6280-0695　Fax : 86-512-6280-0692

Shanghai Tokai Konetsu Co., Ltd.
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U.S.A.

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MWI, Inc.
[Fine Carbon Division]
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TOKAI CARBON US HOLDINGS INC.
[Graphite Electrodes Division US Holding Company]
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TOKAI CARBON GE LLC
[Graphite Electrodes Division]
6210 Ardrey Kell Road, Suite 270, Charlotte, NC 28277, U.S.A.
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Ten-year Summary (2008 - 2017)

(million yen)

Consolidated	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Statements of Income										
Net sales	128,485	83,298	107,679	104,924	98,704	100,935	114,576	104,864	88,580	106,252
Gross profit	38,579	18,323	24,348	23,958	18,560	15,267	18,651	19,960	16,529	27,890
Selling, general and administrative expenses	16,960	13,024	13,773	13,491	12,859	13,611	14,947	15,871	15,398	16,403
Operating income	21,618	5,299	10,575	10,467	5,700	1,655	3,703	4,088	1,131	11,486
Ordinary income	18,770	4,993	9,854	10,104	6,470	3,114	4,180	4,317	1,702	13,249
Net income before income taxes	18,789	4,937	9,211	9,336	3,992	2,926	4,345	6,726	(7,938)	15,927
Income taxes	7,606	2,270	3,232	2,937	2,142	1,802	1,749	4,345	(67)	3,854
Net income	11,084	2,674	5,630	6,119	1,993	1,213	2,562	2,484	(7,929)	11,816
EBITDA	28,038	15,204	19,357	18,923	16,084	12,470	13,845	14,581	10,616	20,703
Year-on-Year (%)										
Net sales	9.4	(35.2)	29.3	(2.6)	(5.9)	2.3	13.5	(8.5)	(15.5)	19.9
Operating income	4.2	(75.5)	99.6	(1.0)	(45.5)	(71.0)	123.7	10.4	(72.3)	915.1
Ordinary income	(10.2)	(73.4)	97.4	2.5	(36.0)	(51.9)	34.2	3.3	(60.6)	678.3
Net income before income taxes	(10.7)	(73.7)	86.6	1.4	(57.2)	(26.7)	48.5	54.8	—	—
Net income	(2.8)	(75.9)	110.5	8.7	(67.4)	(39.1)	111.2	(3.0)	—	—
EBITDA	(3.1)	(45.8)	27.3	(2.2)	(15.0)	(22.5)	11.0	5.3	(27.2)	95.0
Sales ratio (%)										
Gross profit	30.0	22.0	22.6	22.8	18.8	15.1	16.3	19.0	18.7	26.2
Selling, general and administrative expenses	13.2	15.6	12.8	12.9	13.0	13.5	13.0	15.1	17.4	15.4
Operating income = ROS	16.8	6.4	9.8	10.0	5.8	1.6	3.2	3.9	1.3	10.8
Ordinary income	14.6	6.0	9.2	9.6	6.6	3.1	3.6	4.1	1.9	12.5
Net income before income taxes	14.6	5.9	8.6	8.9	4.0	2.9	3.8	6.4	(9.0)	15.0
Net income	8.6	3.2	5.2	5.8	2.0	1.2	2.2	2.4	(9.0)	11.1
EBITDA	21.8	18.3	18.0	18.0	16.3	12.4	12.1	13.9	12.0	19.5
Investment-related										
Capital expenditure	17,544	8,066	6,710	13,975	12,287	9,007	6,830	5,301	6,013	4,282
Depreciation	8,046	9,524	8,853	8,286	8,712	8,656	8,629	9,242	8,124	6,605
R&D expenses	2,026	2,073	2,012	1,956	1,961	1,800	1,882	1,822	2,249	1,482
Cash flow										
Cash flow from operating activities	8,279	12,080	18,586	12,771	8,828	11,606	11,983	20,613	17,505	10,543
Cash flow from investment activities	(16,567)	(9,231)	(6,088)	(10,666)	(12,770)	(10,791)	(24,027)	3,189	(3,622)	(14,039)
Free cash flows	(8,288)	2,849	12,498	2,105	(3,941)	815	(12,043)	23,802	13,883	(3,496)
Cash flow from financing activities	9,636	(7,287)	(6,795)	2,629	(3,611)	1,441	9,728	(14,926)	(7,613)	(4,534)
Increase (decrease) in cash and cash equivalents	208	(4,296)	5,027	4,560	(6,674)	4,155	(1,307)	8,180	5,602	(6,376)
Exchange rate (USD/JPY)	103.46	93.57	87.81	79.84	79.82	97.65	105.85	121.05	108.85	112.19

*Corporate exchange rate

(million yen)

Consolidated	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Balance Sheet										
Total current assets	90,819	76,878	81,684	88,421	86,879	90,984	94,685	87,968	77,645	85,241
On-hand liquidity	13,629	9,285	12,076	16,572	11,891	16,048	14,862	23,045	28,528	22,152
Accounts receivables	36,544	28,408	31,494	28,543	28,259	30,075	33,972	26,897	24,220	30,265
Inventory	36,835	36,821	33,868	37,979	42,993	41,507	41,299	34,253	20,734	27,362
Other current assets	3,809	2,363	4,245	5,325	3,734	3,352	4,551	3,771	4,162	5,460
Total fixed assets	81,353	78,043	73,619	73,142	79,788	92,443	115,753	96,106	81,178	97,731
Tangible fixed assets	56,473	54,767	50,916	55,166	58,169	61,985	67,581	56,629	43,122	48,447
Intangible fixed assets	1,680	700	490	382	438	464	14,103	11,324	10,534	17,746
Investment and other assets	23,198	22,576	22,212	17,593	21,179	29,994	34,069	28,153	27,521	31,537
Total assets	172,172	154,922	155,304	161,563	166,668	183,427	210,439	184,074	158,824	182,972
Total current liabilities	58,445	28,582	28,625	45,439	38,050	42,385	44,897	31,126	29,028	36,870
Short-term interest-bearing liabilities	27,085	10,687	6,272	19,471	14,636	20,718	21,576	9,537	12,910	14,075
Accounts payables	18,501	10,488	15,051	16,059	16,145	14,179	16,051	11,397	9,591	14,522
Other current liabilities	12,858	7,405	7,301	9,907	7,268	7,488	7,269	10,191	6,525	8,272
Total long-term liabilities	9,293	20,297	21,072	8,901	15,351	17,809	33,198	27,976	16,806	19,501
Long-term interest-bearing liabilities	—	11,333	12,162	1,747	6,191	5,044	16,713	14,398	4,137	2,068
Other long-term liabilities	9,293	8,964	8,910	7,154	9,160	12,765	16,484	13,577	12,669	17,432
Total liabilities	67,738	48,879	49,698	54,340	53,401	60,195	78,096	59,103	45,834	56,372
Total net assets	104,433	106,042	105,605	107,223	113,266	123,232	132,343	124,971	112,989	126,599
Shareholder's capital	99,612	100,326	102,200	106,606	106,887	106,807	108,006	108,910	99,693	109,558
Total liabilities and net assets	172,172	154,922	155,304	161,563	166,668	183,427	210,439	184,074	158,824	182,972
Ratio analysis (%)										
ROA	10.8	3.1	6.4	6.4	3.9	1.8	2.1	2.2	1.0	7.8
ROE	10.4	2.6	5.4	5.9	1.9	1.0	2.0	2.0	(6.8)	10.0
Capital-to-asset ratio	59.7	67.2	66.6	64.5	66.1	66.0	61.8	66.8	69.9	68.8
Indicator per share										
EPS (yen)	50	12	26	29	9	6	12	12	(37)	55
BPS (yen)	472	478	485	488	516	567	610	577	521	590
Dividend (yen)	10	8	8	8	7	6	6	6	6	12
Dividend payout ratio (%)	20	65	31	28	75	106	50	52	—	22

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Tokai Carbon Co, Ltd Quarterly Report (Q3 2018)

November 14, 2018

Q3 2018 Consolidated Financial Results [Japanese GAAP]

Company name: TOKAI CARBON CO., LTD. Listed on: Tokyo Stock Exchange
Stock code: 5301 URL: https://www.tokaicarbon.co.jp/en/
Representative: Hajime Nagasaka, President & Chief Executive Officer
Contact: Kazuhiko Matsubara, Executive Officer and General Manager, Accounting & Finance Department
Tel.: 81-3-3746-5100
Schedule date of submission of quarterly report: November 14, 2018
Commencement of dividend payments: -
Supplementary reference documents to support the quarterly financial statements: Yes
Explanatory meeting of the Q3 results: Yes (Conference call presentation for institutional investors and analysts)

(Rounded down to nearest million yen)

1. Consolidated Financial Results for the Third Quarter FY 2018 (January 1 to September 30, 2018)

(1) Consolidated Operating Results (First nine month period) (Percentage figures represent year-on-year changes)

	Net Sales		Operating Income		Ordinary Income		Quarterly Net Income Attributable to Owners of the Parent Company	
	Millions of yen	%	Millions of yen	%	Millions of yen	%	Millions of yen	%
At the end of Third Quarter of the year ending December 2018	155,385	107.0	51,975	586.5	52,797	500.3	59,433	598.6
At the end of Third Quarter of the year ending December 2017	75,067	13.1	7,570	-	8,795	-	8,507	–

Note: Comprehensive income: Nine months ended September 30, 2018 59,044 million yen (403.4%)
Nine months ended September 30, 2017 11,728 million yen (–%)

	Quarterly Net Income per Share	Quarterly Net Income per Share Fully Diluted
	Yen	Yen
At the end of Third Quarter of the year ending December 2018	278.83	–
At the end of Third Quarter of the year ending December 2017	39.91	–

(2) Consolidated Financial Position

	Total Assets	Net assets	Capital-to-asset ratio
	Millions of yen	Millions of yen	%
At the end of Third Quarter of the year ending December 2018	313,130	190,957	57.6
Year ending December 2017	184,730	127,130	68.4

For reference: Shareholders' capital: As of September 30, 2018 180,227 million yen
As of December 31, 2017 126,366 million yen

Note: During the third quarter of the year ending December 31, 2018, the Company finalized the provisional accounting treatment related to the business combination with TOKAI CARBON GE HOLDINGS LLC. Figures for the year ended December 31, 2017 have been adjusted to reflect the finalized provisional accounting treatment.

2. Dividends

	Annual Dividends				
	End of 1st quarter	End of 2nd quarter	End of 3rd quarter	Year-end	Full Year
	Yen	Yen	Yen	Yen	Yen
Year ending December 31, 2017	–	6.00	–	6.00	12.00
Year ending December 31, 2018	–	12.00	–		
Year ending December 31, 2018 (Forecast)				12.00	24.00

Note: Amendment of dividend forecast that have been disclosed lastly: No

Breakdown of dividend per share at the end of the first six months of fiscal year ending December 31, 2018

Ordinary dividend: 10.00 yen 100th anniversary commemorative dividend: 2.00 yen

3. Consolidated Earnings Forecast for Fiscal Year Ending December 31, 2018 (January 1 to December 31, 2018)

(Percentages represent year-on-year changes)

	Net Sales		Operating Income		Ordinary Income		Net Income Attributable to Owners of the Parent Company		Net Income per Share
	Millions of yen	%	Millions of yen	%	Millions of yen	%	Millions of yen	%	Yen
Full Year	230,000	116.5	75,000	576.1	75,500	487.3	74,000	499.4	347.17

Note: Amendment of earnings forecast that have been disclosed lastly: Yes

* Notes:

(1) Changes in significant subsidiaries during the consolidated total period of the quarter (that accompanied changes in the scope of consolidation): Yes

(2) Application of accounting principles peculiar to quarterly consolidated financial statement preparation: No

(3) Changes in accounting policy and changes and restatements of accounting estimates:

(a) Changes in accounting policy accompanying the revision of accounting standards: None

(b) Changes in accounting policy other than those listed in (a): None

(c) Changes in accounting estimates: None

(d) Restatements: None

(4) Number of shares issued (capital stock)

(a) Number of shares issued at end of period (including treasury shares)

3Q of the year ending December 31 2018	224,943,104 shares	Year ending December 2017	224,943,104 shares

(b) Number of treasury shares at end of period

3Q of the year ending December 31 2018	11,788,919 shares	Year ending December 2017	11,786,878 shares

(c) Average number of shares during the period (quarterly cumulative period)

3Q of the year ending December 31 2018	213,155,367 shares	3Q of the year ending December 2017	213,159,087 shares

* Quarterly financial results are not included in the certified accountant or auditing firm's fourth quarter review

* Appropriate use of earnings forecasts and other pertinent information

(Cautionary statement on forward-looking statements)

These materials contain various forward-looking statements and other forecasts regarding performance and other matters. Such statements are based on information available at the time of preparation as well as certain reasonable assumptions. Actual results may differ materially from those expressed or implied by forward-looking statements due to a range of factors.

(How to obtain Quarterly Account Settlement Supplementary Explanation)

Tokai Carbon plans to hold a conference call presentation for institutional investors and analysts on November 14, 2018 (Wed.). The materials for this explanatory meeting will be posted on the Company website on the day of the meeting.

○ Supplemental Materials

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1. Qualitative information related to this quarter's settlement

(1) Explanation regarding business performance in quarterly results

During the consolidated first nine months of fiscal 2018 (January 1 to September 30, 2018), the global economy continued its steady growth overall. Meanwhile, future trends require careful watching due to great uncertainty concerning such matters as macroeconomic policy management in the U.S., trade friction between the U.S. and China, the development of the U.K.'s negotiations on EU withdrawal and the situation on the Korean Peninsula.

Amid these conditions, in this year, which is the final year of our three-year Mid-Term Management Plan T-2018, we are continuing our efforts to expand business domains and optimize our business portfolio as part of the measures set out in the growth strategies we have been pursuing since FY2017.

As a result, net sales increased 107.0% year on year for the third quarter consolidated cumulative period of 2018, reaching 155,385 million yen. Operating income showed year on year growth of 586.5% at 51,975 million yen. Ordinary Income showed year on year growth of 500.3% for 52,797 million yen. Net income attributable to owners of the parent company increased 598.6% year on year to 59,433 million yen.

Results by business segment were as follows:

Graphite Electrodes

Global supplies of graphite electrodes remain tight and we continued operating at full capacity. In addition, because the new North American business unit added last November, coupled with global market for graphite electrodes growth, contributed to consolidated performance, both net sales and operating income increased considerably year on year.

As a result, net sales for the Graphite Electrodes business were up 364.6% year on year to 69,239 million yen, while operating income rose significantly year on year to 38,062 million yen.

Carbon Black

Production by end-users in the tire and automotive industries has been robust. Higher sales volume in Japan and abroad, along with price revisions accompanying a rise in crude oil prices and production increase were among the factors that lifted sales and profits over the same period last year. In addition, the conversion of Tokai Carbon CB Ltd., the Group's production base in the U.S., into a subsidiary from September 2018 has contributed to the Group's consolidated earnings.

As a result, net sales for the Carbon Black business increased by 38.5% year on year to 48,987 million yen, while operating income rose 46.8% year on year to 7,795 million yen.

Fine Carbon

Production by end-users in the semiconductor and general industry markets is robust. Supply and demand for special lead material continues to be tight. Under such circumstances, customer inquiries about lead materials and CVD (chemical vapor deposition) products are increasing. Our special lead material production facilities remain operating at high capacity, while sales prices have risen as well. In addition, Tokai Carbon Korea Co., Ltd. became a consolidated subsidiary in June, contributing to growth in sales and operating income.

As a result, net sales for the Fine Carbon business increased by 64.8% to 17,518 million yen year on year, while operating income rose 307.3% year on year to 3,972 million yen.

Industrial Furnaces and Related Products

Net sales of industrial furnaces rose considerably year on year as capital expenditures continue to build up for major buyers in the IT-related sectors and energy-related industries. Net sales of heating elements and other products increased year-on-year owing to the robust demand in the electronic components industry and glass industry. With regards to operating income, improved performance from industrial furnaces and Chinese subsidiaries contributed to a year-on-year increase.

As a result, net sales for the Industrial Furnaces and Related Products business rose 83.0% year on year to 7,991 million yen, while operating income increased by 150.2% year on year to 2,048 million yen.

Other Operations

Friction materials

Demand by end-users for agricultural machinery was weak but remained robust for construction machinery such as mining machinery and hydraulic shovels, as well as machine tools, including industrial robots.

As a result, net sales of friction materials rose 10.7% year on year to 7,018 million yen.

Anode materials

The market for anode materials for secondary lithium-ion batteries is expanding more due to such factors as stronger regulations on CO_2 emissions in Europe, the wider range of makers covered by zero-emission-vehicle regulations in the U.S., and China's introduction of a New Energy Vehicle policy.

As a result, net sales of Anode materials rose by 37.6% year on year to 4,515 million yen.

Other

Other net sales such as those from real estate leasing fell 38.5% year on year to 114 million yen.

The above factors resulted in net sales for Other Operations rising by 18.8% year on year to 11,648 million yen and operating income by 42.9% year on year to 894 million yen.

2. Quarterly Consolidated Financial Statements and Notes

(1) Quarterly Consolidated Balance Sheets

(Millions of yen)

	Previous Consolidated Fiscal Year (December 31, 2017)	Third Quarter Consolidated accounting period of 2018 (September 30, 2018)
Assets		
Current assets		
Cash and cash equivalents	22,152	44,921
Notes and accounts receivable	30,265	53,830
Merchandise and finished goods	9,429	15,310
Work in process	10,094	21,706
Raw materials and supplies	8,041	16,615
Deferred tax assets	1,312	2,289
Other	4,662	4,463
Allowance for doubtful accounts	(514)	(534)
Total current assets	85,444	158,603
Fixed assets		
Tangible fixed assets		
Buildings and structures, net	14,839	27,136
Machinery, equipment and vehicles, net	26,398	30,509
Furnaces, net	813	2,435
Land	6,161	7,363
Construction in progress	1,113	5,640
Other, net	2,077	2,388
Total tangible fixed assets	51,405	75,473
Intangible fixed assets		
Software	867	1,086
Goodwill	9,510	48,244
Customer-related assets	4,569	4,236
Other	1,395	1,308
Total intangible fixed assets	16,343	54,876
Investments and other assets		
Investment securities	28,121	20,801
Net defined benefit asset	2,531	2,483
Deferred tax assets	225	202
Other	722	741
Allowance for doubtful accounts	(62)	(51)
Total investments and other assets	31,537	24,177
Total fixed assets	99,286	154,527
Total assets	184,730	313,130

(Millions of yen)

	Previous Consolidated Fiscal Year (December 31, 2017)	Third Quarter Consolidated accounting period of 2018 (September 30, 2018)
Liabilities		
Current liabilities		
Notes and accounts payable	11,463	20,268
Electronically recorded obligations	3,059	3,254
Short-term loans payable	12,006	43,047
Current portion of long-term loans payable	2,068	2,068
Income tax payable	1,550	11,031
Consumption taxes payable	203	—
Accrued expenses	2,056	3,171
Reserve for bonuses	438	1,798
Other	4,023	7,934
Total current liabilities	36,870	92,575
Long-term liabilities		
Long-term loans payable	2,068	9,033
Deferred tax liabilities	9,281	11,590
Net defined benefit liability	6,189	5,481
Reserve for directors' retirement benefits	83	83
Reserve for executive officers' retirement benefits	39	50
Provision for environment and safety measures	45	216
Other	3,021	3,139
Total long-term liabilities	20,728	29,597
Total liabilities	57,599	122,173
Net assets		
Shareholder's capital		
Capital stock	20,436	20,436
Capital surplus	17,473	17,333
Retained earnings	79,433	135,030
Treasury stock	(7,253)	(7,257)
Total shareholder's capital	110,089	165,542
Other accumulated comprehensive income		
Net unrealized gains/losses on other securities	11,345	9,863
Foreign currency translation adjustments	3,631	3,580
Remeasurements of defined benefit plans	1,299	1,241
Total accumulated other comprehensive income	16,277	14,685
Non-controlling interests	763	10,729
Total net assets	127,130	190,957
Total liabilities and net assets	184,730	313,130

(2) Quarterly Consolidated Statements of Income and Quarterly Consolidated Statements of Comprehensive Income

(Quarterly Consolidated Statements of Income)

(Third Quarter Consolidated Cumulative Period)

(Millions of yen)

	Previous third quarter consolidated cumulative period (January 1 to September 30, 2017)	Third quarter consolidated cumulative period of 2018 (January 1 to September 30, 2018)
Net Sales	75,067	155,385
Cost of sales	55,969	86,352
Gross profit	19,097	69,032
Selling, general and administrative expenses	11,527	17,056
Operating Income	7,570	51,975
Non-operating income		
Interest income	27	104
Dividend income	317	357
Rent income	109	116
Equity in income of non-consolidated subsidiaries and affiliates	953	685
Foreign exchange gains	—	233
Other	619	499
Total non-operating income	2,028	1,997
Non-operating expenses		
Interest expenses	252	360
Foreign exchange losses	86	—
Other	464	815
Total non-operating expenses	803	1,175
Ordinary Income	8,795	52,797
Extraordinary income		
Gain on step acquisitions	—	22,843
Gain on sales of non-current assets	2,555	67
Gain on liquidation of subsidiaries and associates	522	33
Gain on sales of investment securities	58	—
Total extraordinary income	3,136	22,944
Extraordinary loss		
Loss on retirement of non-current assets	—	13
Loss on sales of non-current assets	—	4
Loss on sales of shares of subsidiaries and associates	373	—
Loss on sales of investments in capital of subsidiaries and associates	96	—
Total extraordinary loss	470	18
Quarterly Net income before income taxes	11,462	75,723
Income taxes - current	2,149	15,339
Income taxes - deferred	608	(221)
Total income taxes	2,758	15,117
Quarterly net income	8,703	60,605
Quarterly net income attributable to non-controlling interests	195	1,171
Quarterly net income attributable to owners of the parent company	8,507	59,433

(Quarterly Consolidated Comprehensive Income Statements of Operations)

(Third Quarter Consolidated Cumulative Period)

(Millions of yen)

	Previous third quarter consolidated cumulative period (January 1 to September 30, 2017)	Third quarter consolidated cumulative period of 2018 (January 1 to September 30, 2018)
Quarterly net income	8,703	60,605
Other comprehensive income		
Net unrealized gains/losses on other securities	1,400	(1,485)
Foreign currency translation adjustments	1,741	242
Remeasurements of defined benefit plans	(42)	(58)
Share of other comprehensive income of entities accounted for using equity method	(74)	(260)
Total other comprehensive income	3,024	(1,561)
Comprehensive income	11,728	59,044
(Of which)		
Quarterly Comprehensive income attributable to owners of the parent	11,505	57,842
Quarterly Comprehensive income attributable to non-controlling shareholders	222	1,202

(3) Notes to Quarterly Consolidated Financial Statements

(Notes on the Going-Concern Assumption)

N/A

(Notes when there are notable fluctuations in shareholders' stock amount fluctuates)

N/A

(Segment Information)

Ⅰ First nine months of the previous fiscal year (January 1 to September 30, 2017)

Information on the amounts of net sales and income for each reportable segment

(Millions of yen)

	Reportable Segment					Other Operations (Note 1)	Total	Adjustments (Note 2)	Amount recorded in the Quarterly consolidated Statements of Income (Note 3)
	Graphite Electrodes	Carbon Black	Fine Carbon	Industrial Furnaces and Related Products	Subtotal				
Net Sales									
External sales	14,904	35,362	10,627	4,365	65,260	9,807	75,067	—	75,067
Inter-segment sales or transfers	10	44	107	191	354	—	354	(354)	—
Total	14,915	35,407	10,735	4,557	65,615	9,807	75,422	(354)	75,067
Segment income	644	5,309	975	818	7,748	625	8,374	(803)	7,570

Notes: 1. The Other Operations segment is a business segment that is not included among reportable segments. It consists of the friction materials business, real estate leasing business, and other businesses.

2. The 803 million yen negative adjustment in segment income includes company-wide expenses of 793 million yen that were not allocated to each reportable segment. Company-wide expenses consist of research and development expenses and other expenses not attributable to reportable segments.

3. Segment income is adjusted with the operating income reported in the Quarterly Consolidated Statements of Income.

Ⅱ First nine months of the fiscal year under review (January 1 to September 30, 2018)

Information on the amounts of net sales and income for each reportable segment

(Millions of yen)

	Reportable Segment					Other Operations (Note 1)	Total	Adjustments (Note 2)	Amount recorded in the Quarterly consolidated Statements of Income (Note 3)
	Graphite Electrodes	Carbon Black	Fine Carbon	Industrial Furnaces and Related Products	Subtotal				
Net Sales									
External sales	69,239	48,987	17,518	7,991	143,736	11,648	155,385	—	155,385
Inter-segment sales or transfers	5	69	66	278	421	0	421	(421)	—
Total	69,245	49,057	17,585	8,269	144,158	11,648	155,806	(421)	155,385
Segment income	38,062	7,795	3,972	2,048	51,879	894	52,773	(798)	51,975

Notes: 1. The Other Operations segment is a business segment that is not included among reportable segments. It consists of the friction materials business, real estate leasing business, and other businesses.

2. The 798 million yen negative adjustment in segment income includes company-wide expenses of 744 million yen that were not allocated to each reportable segment. Company-wide expenses consist of research and development expenses and other expenses not attributable to reportable segments.

3. Segment income is adjusted with the operating income reported in the Quarterly Consolidated Statements of Income.

(Business combinations, etc.)

Business combination through acquisition

Tokai Carbon entered into an agreement on June 26, 2018 regarding the acquisition of 100% of the interests of Sid Richardson Carbon, Ltd. and its affiliate companies SRCG, Ltd. and New SRCG Genpar, LLC, held by SRCG Holdco, L.P., SRCE, L.P. and their affiliate company SRCG Genpar, L.P., to convert them into subsidiaries. Based on this agreement, Tokai Carbon completed acquiring said interests on August 31, 2018 through TOKAI CARBON US HOLDINGS INC., its consolidated subsidiary, and converted Sid Richardson Carbon, Ltd. and its two affiliate companies into consolidated subsidiaries.

1. Summary of business combination

(1) Name and business of acquired company

Name: Sid Richardson Carbon, Ltd.

Business: Manufacturing, selling and R&D for furnace black

(2) Reasons for the business combination

Under Phase 2 of the three-year mid-term management plan (T-2018) released in February 2017, Tokai Carbon is now shifting its focus to the growth strategy. By utilizing a strategic investment budget of approx. 50 billion yen, set for M&As and other purposes in accordance with the growth strategy, Tokai Carbon acquired shares in SGL's U.S. subsidiary operating the graphite electrode business in November 2017 and converted Tokai Carbon Korea Co., Ltd. into a consolidated subsidiary in May 2018, and the acquisition of Sid Richardson Carbon and its affiliate companies are part of such strategic investment.

Carbon black is a cornerstone of Tokai Carbon's business and one that we intend to grow from a mid- to long-term viewpoint. The acquisition of Sid Richardson Carbon will support Tokai Carbon's expansion into the North American market, the second-largest market after China. The acquisition will also permit Tokai Carbon to build a global supply network for tire and rubber product manufacturers while broadening its worldwide customer base to include European and North American customers as well.

Further, the acquisition is aimed at contributing significantly to Tokai Carbon's ongoing efforts to establish itself as a global player in the carbon black business, in order to expand the scale and profitability of businesses and enhance corporate value.

(3) Date of business combination

August 31, 2018

(4) Legal form of the business combination

Acquisition of ownership interest with cash as consideration

(5) Name of the company after the combination

The company's name was changed to Tokai Carbon CB Ltd. on August 31, 2018.

(6) Percentage of ownership interest acquired

100%

(7) Main reason for the decision to acquire the company

TOKAI CARBON US HOLDINGS INC., a consolidated subsidiary of the Company, acquired a 100% ownership interest in Sid Richardson Carbon, Ltd. with cash as consideration.

2. Period of the acquired company's business results included in the Quarterly Consolidated Statements of Income for the first half of the fiscal year

Business results from the date of the business combination to September 30, 2018 are included.

3. Details of the acquisition cost of the acquired company and considerations by category

Acquisition consideration	Cash	34,428 million yen	(310,000 thousand dollars)
Acquisition cost		34,428 million yen	(310,000 thousand dollars)

(Note) The acquisition price is subject to adjustment to reflect changes in working capital, etc. based on the agreement.

4. Details and amount of principal acquisition-related expenses

Compensation, fees and others for advisors, etc. 798 million yen

5. Amount of gain on goodwill, reasons for recognition, and amortization method and period

(1) Amount of gain on goodwill

9,852 million yen (88,715 thousand dollars)

The amount above is provisional as allocation of the acquisition cost has not been completed as of the end of the third quarter of the fiscal year under review.

(2) Reasons for recognition

Additional income-generating power expected to derive from business development in the future

(3) Amortization method and period

Equally amortized over 12 years.

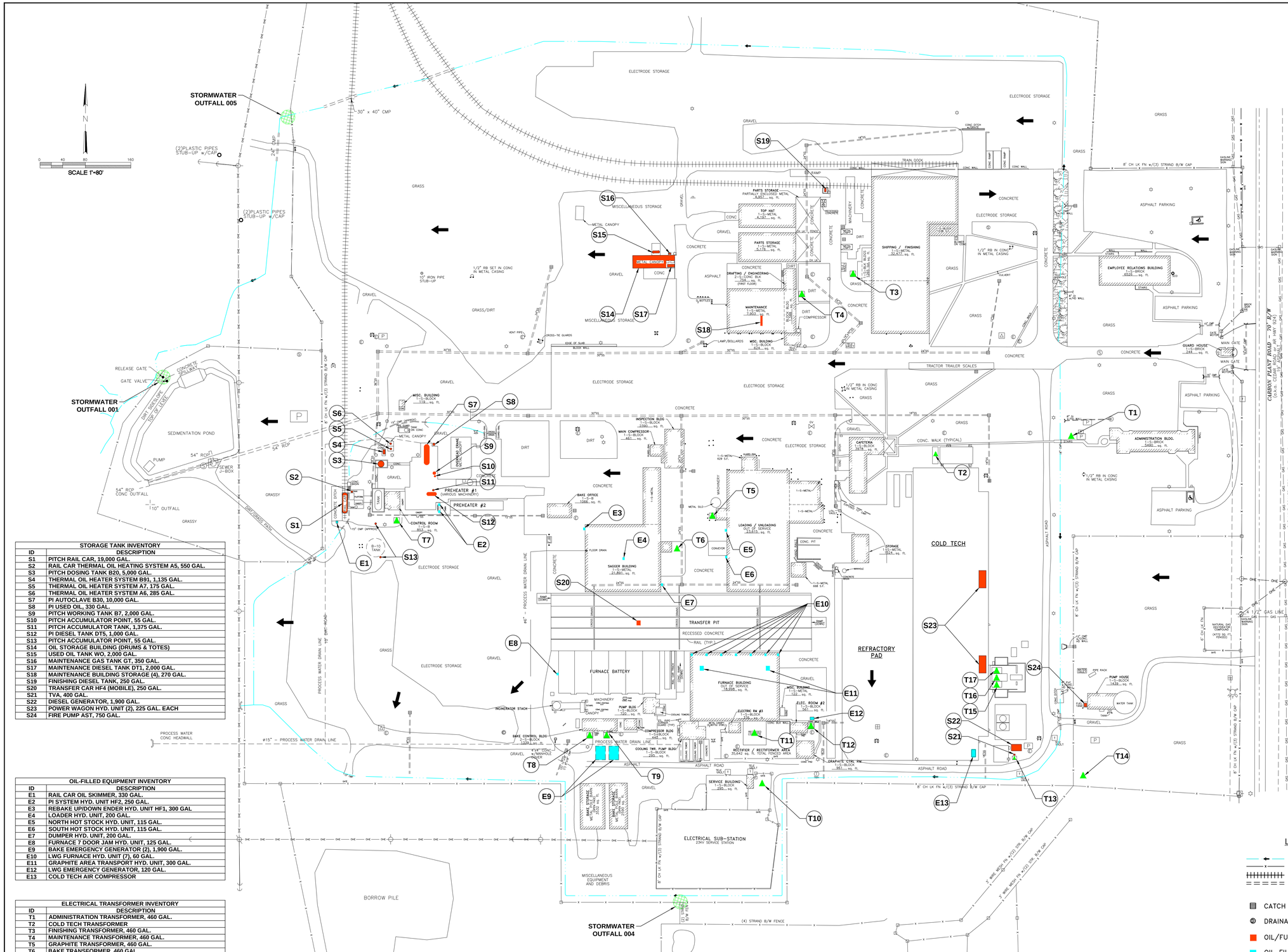
Finalization of Provisional Accounting Treatment Related to Business Combination

During the previous fiscal year, Tokai Carbon applied provisional accounting treatment for the business combination with TOKAI CARBON GE HOLDINGS LLC executed on November 7, 2017, and finalized said accounting during the third quarter of the fiscal year under review. During the third quarter of the fiscal year under review, the acquisition price of the acquired company increased by 1,202 million yen due to adjustment of consideration paid.

Accordingly, the comparative information included in the quarterly consolidated financial statements for the consolidated first nine months ended September 30, 2018 has been revised to reflect a significant change to the initial allocation of the acquisition cost. As a result of allocation to tangible fixed assets of 2,988 million yen, customer-related assets under intangible fixed assets of 1,083 million yen, technology-related assets under intangible fixed assets of 703 million yen, inventories of 609 million yen, and deferred tax liabilities of 2,154 million yen, the amount of provisionally calculated goodwill of 7,405 million yen decreased by 2,028 million yen to 5,377 million yen.

MAPS & DIAGRAMS

Site Map



STORAGE TANK INVENTORY	
ID	DESCRIPTION
S1	PITCH RAIL CAR, 19,000 GAL.
S2	RAIL CAR THERMAL OIL HEATING SYSTEM A5, 550 GAL.
S3	PITCH DOSING TANK B20, 5,000 GAL.
S4	THERMAL OIL HEATER SYSTEM B91, 1,135 GAL.
S5	THERMAL OIL HEATER SYSTEM A7, 175 GAL.
S6	THERMAL OIL HEATER SYSTEM A6, 285 GAL.
S7	PI AUTOCLAVE B30, 10,000 GAL.
S8	PI USED OIL, 330 GAL.
S9	PITCH WORKING TANK B7, 2,000 GAL.
S10	PITCH ACCUMULATOR POINT, 55 GAL.
S11	PITCH ACCUMULATOR TANK, 1,375 GAL.
S12	PI DIESEL TANK DT5, 1,000 GAL.
S13	PITCH ACCUMULATOR POINT, 55 GAL.
S14	OIL STORAGE BUILDING (DRUMS & TOTES)
S15	USED OIL TANK WO, 2,000 GAL.
S16	MAINTENANCE GAS TANK GT, 350 GAL.
S17	MAINTENANCE DIESEL TANK DT1, 2,000 GAL.
S18	MAINTENANCE BUILDING STORAGE (4), 270 GAL.
S19	FINISHING DIESEL TANK, 250 GAL.
S20	TRANSFER CAR HF4 (MOBILE), 250 GAL.
S21	TVA, 400 GAL.
S22	DIESEL GENERATOR, 1,900 GAL.
S23	POWER WAGON HYD. UNIT (2), 225 GAL. EACH
S24	FIRE PUMP AST, 750 GAL.

OIL-FILLED EQUIPMENT INVENTORY	
ID	DESCRIPTION
E1	RAIL CAR OIL SKIMMER, 330 GAL.
E2	PI SYSTEM HYD. UNIT HF2, 250 GAL.
E3	REBAKE UP/DOWN ENDER HYD. UNIT HF1, 300 GAL
E4	LOADER HYD. UNIT, 200 GAL.
E5	NORTH HOT STOCK HYD. UNIT, 115 GAL.
E6	SOUTH HOT STOCK HYD. UNIT, 115 GAL.
E7	DUMPER HYD. UNIT, 200 GAL.
E8	FURNACE 7 DOOR JAM HYD. UNIT, 125 GAL.
E9	BAKE EMERGENCY GENERATOR (2), 1,900 GAL.
E10	LWG FURNACE HYD. UNIT (7), 60 GAL.
E11	GRAPHITE AREA TRANSPORT HYD. UNIT, 300 GAL.
E12	LWG EMERGENCY GENERATOR, 120 GAL.
E13	COLD TECH AIR COMPRESSOR

ELECTRICAL TRANSFORMER INVENTORY	
ID	DESCRIPTION
T1	ADMINISTRATION TRANSFORMER, 460 GAL.
T2	COLD TECH TRANSFORMER
T3	FINISHING TRANSFORMER, 460 GAL.
T4	MAINTENANCE TRANSFORMER, 460 GAL.
T5	GRAPHITE TRANSFORMER, 460 GAL.
T6	BAKE TRANSFORMER, 460 GAL.
T7	PI TRANSFORMER, 460 GAL.
T8	WEST BAKE TRANSFORMER, 460 GAL.
T9	EAST BAKE TRANSFORMER, 460 GAL.
T10	LWG RECTIFORMER, 5,000 GAL.
T11	LWG TRANSFORMER SYSTEM, 15,000 GAL.
T12	GRAPHITE CONTROL TRANSFORMER, 460 GAL.
T13	COLD TECH 2,000 kVA TRANSFORMER,
T14	MAIN PUMP HOUSE TRANSFORMER, 460 GAL.
T15	COLD TECH RECTIFIER TRANSFORMER, 7,500 GAL.
T16	COLD TECH RECTIFIER TRANSFORMER, 9,200 GAL.
T17	COLD TECH RECTIFIER TRANSFORMER, 7,500 GAL.

LEGEND

- DRAINAGE DITCH
- FENCE LINE
- RAILROAD TRACKS
- CULVERT
- CATCH BASIN/GRATE INLET
- DRAINAGE MANHOLE
- OIL/FUEL STORAGE TANK
- OIL FILLED EQUIPMENT
- ELECTRICAL TRANSFORMER
- STORMWATER OUTFALL
- SURFACE RUNOFF DIRECTION

APPROXIMATE SIZE OF AREA USED FOR INDUSTRIAL ACTIVITY: 61 ACRES

R: \projects\18200-1918-0011-001\cad\dwg\18200-1918-001 - SM01.dwg

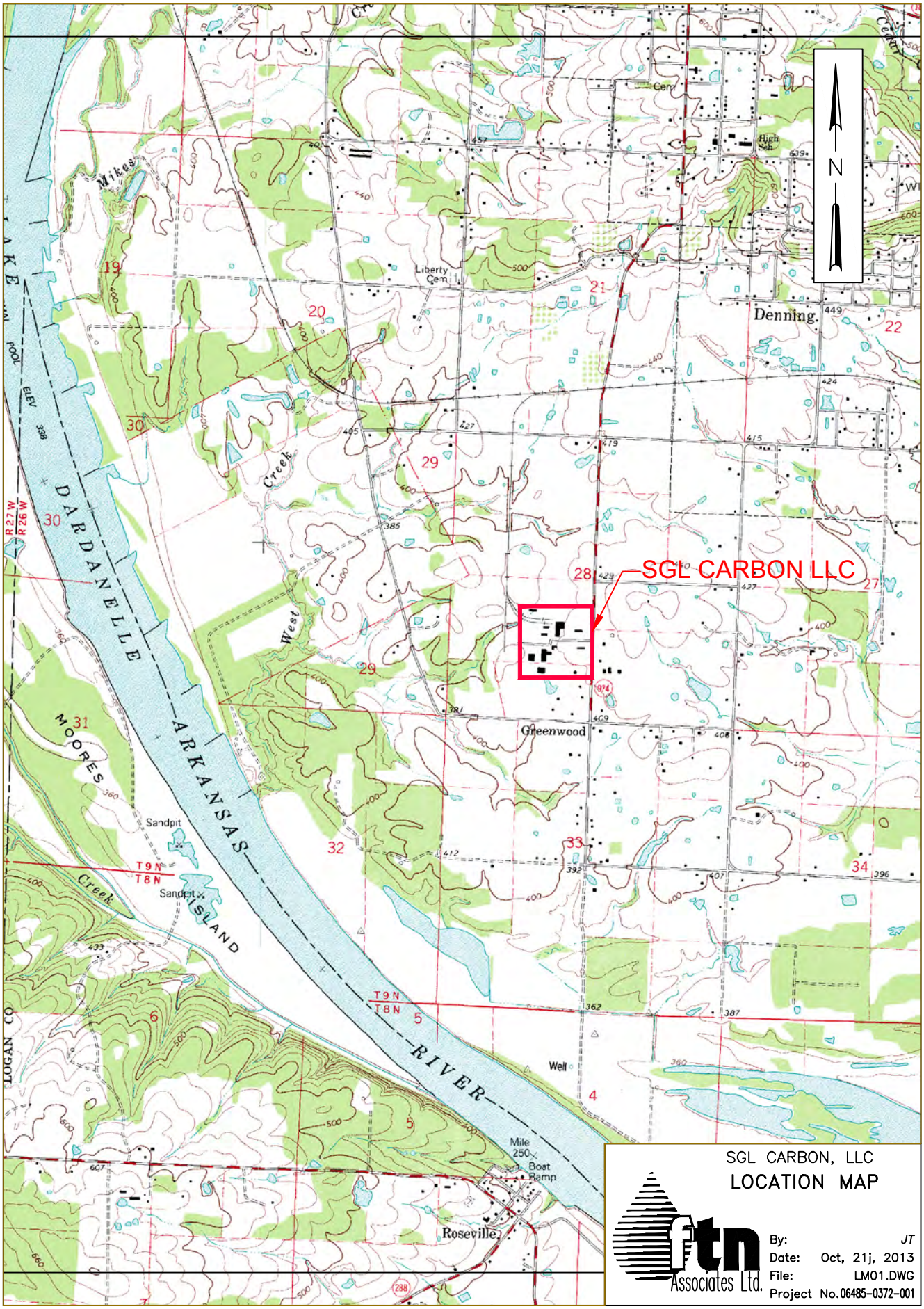
tri-state associates, ltd.
water resources / environmental consultants

TOKAI CARBON
STORMWATER POLLUTION PREVENTION PLAN
3931 CARBON PLANT ROAD
OZARK, ARKANSAS

STORMWATER POLLUTION PREVENTION (SWPP) PLAN
SITE MAP

DRAWN BY: CAR	FILE NAME: SM01.dwg
APPROVED: DCW	PROJECT NO. 18200-1918-001
SCALE: 1" = 80'	DATE: 10/01/2018
SHEET NO. 1 OF 1	

Topographic Map



SGL CARBON, LLC

LOCATION MAP

ftn Associates Ltd.

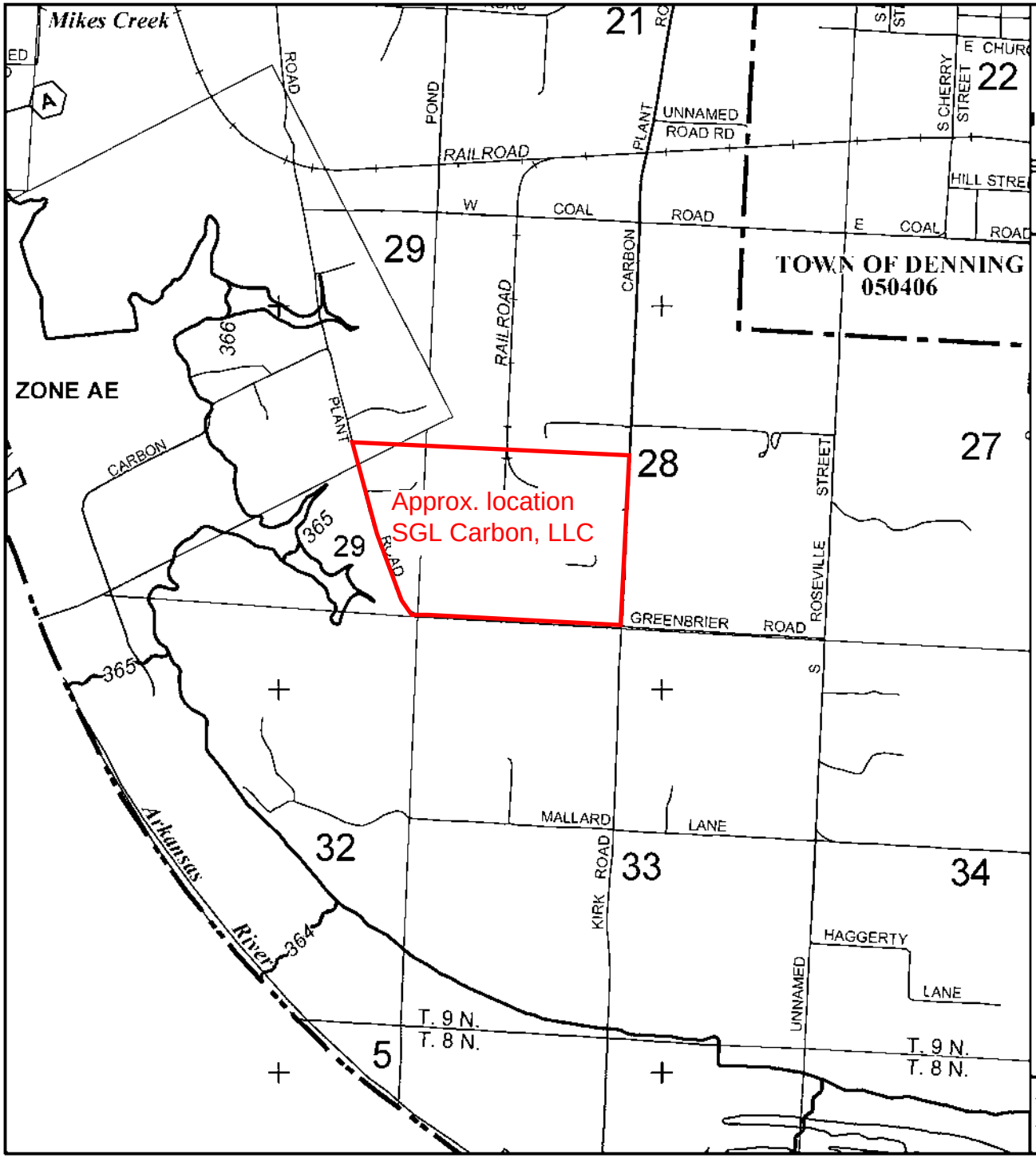
By: JT

Date: Oct, 21j, 2013

File: LM01.DWG

Project No.06485-0372-001

FIRM Map



MAP SCALE 1" = 2000'

1000 0 2000 4000

FEET

METERS

NFIP

PANEL 0350D

FIRM

FLOOD INSURANCE RATE MAP

FRANKLIN COUNTY, ARKANSAS AND INCORPORATED AREAS

PANEL 350 OF 525

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALTUS, CITY OF	050381	0350	D
DENNING, TOWN OF	050406	0350	D
FRANKLIN COUNTY, UNINCORPORATED AREAS	050432	0350	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
05047C0350D

MAP REVISED
AUGUST 2, 2011

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Flow Diagram / Wastewater Design

Wastewater Flow Schematic
SGL Carbon Group

