### SUSTAINABILITY

REPORT'1



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## about the report

As Kastamonu Entegre, we conduct our business with an ethical, transparent and accountable management approach in line with our vision of becoming a global brand. We have been carrying out our activities for 50 years with an awareness of our environmental, economic, social contribution and impacts. In addition to the annual report we have prepared for financial institutions regularly since 2014, we are now pleased to present our first sustainability report to all our stakeholders.

The report you are currently reading lays out the sustainability performance of our company regarding its operations in Turkey between January 1 - December 31, 2018.

This report has been prepared by the KEAS Sustainability Work Group as inspired by Global Reporting Initiative (GRI) Standards and by considering every step of our value chain. At the same time, the United Nations Sustainable Development Goals have provided significant input to the report. Sustainability priorities have been determined based on Stakeholder and Sustainability Committee feedback.

In the forthcoming periods, we aim to continue our reporting studies and develop them in step with the expectations of our stakeholders.

In order to minimize environmental impacts, we have prepared the Kastamonu Entegre 2018 Sustainability Report in the digital environment, and hereby submit it for your consideration at <a href="https://www.keas.com.tr">www.keas.com.tr</a>

You may submit your questions and suggestions to: <a href="mailto:surdurulebilirlik@keas.com.tr">surdurulebilirlik@keas.com.tr</a>



## CEO's message

Dear Stakeholders,

Kastamonu Entegre, having adopted the mission of "preserving the natural balance" and "contributing to society" upon inception, considers its sustainability approach focused on people and nature an integral component of its corporate governance principles. We are pleased to share this work that embodies this approach in our company's first sustainability report.

In order to leave a fairer and more viable world to future generations, our core target should be to ensure that the sustainability approach is adopted in all fields. As the Turkish leader of, and ranking among the world's top four manufacturers in product terms of the woodbased panel industry in the production of MDF, particle board, laminate flooring and door panels, and being the seventh largest manufacturer in the world, we realize all our business processes in light of our environmental, social and economic impact.

Our biggest responsibility today is to look for means to realize economic growth efficiently without consuming the world's resources. We focus on the circular economy by supplying the wooden raw material we use in production from sustainable, renewable and certified sources. We are developing solutions where waste is recycled

at an increasing rate. As for the ECOBULK Project created with the target of product design and production, the establishment of reverse logistics chains and better management and monitoring of waste flows, we have been elected to take part in it in our capacity as a manufacturer, and as the sole solutions partner from Turkey. We produce composite boards from waste. We produce raw and melamine coated particle boards for the furniture industry using 100% recycled raw materials at our Italian facilities. We are the second largest partner of ENAT A.Ş., established under the guidance of the Ministry of Agriculture and Forestry and TEMA Foundation with the aim of achieving sustainable forest management and ensuring industrial forest plantation development. To date, our company has planted 1.7 million saplings on 14,000 acres, and since 2016 has been supplying wood to the sector.

There is no doubt that one of the pressing global issues to be addressed today is the climate crisis. We develop renewable and innovative energy projects in line with the Climate Action target, a Sustainable Development Target. With our "Gasification of Waste Biomasses and Renewable Clean Energy Production" Project we ensure that waste generated at our production facilities is efficiently converted into energy at the gasification facility. This project of ours

was the recipient of two major prizes in 2018. With the Solar Power Plant we established in our Adana plant, we supply our electricity from renewable sources. And by converting from diesel fuel forklifts to electric alternatives at our facilities, we have both reduced our energy costs and prevented risks that may arise in terms of occupational health and safety.

Another factor that contributes to the sustainable development of our company is digitalization. We are changing the way we do business and increasing our productivity by converting our systems to digital platforms, both on our production lines and in administrative processes.

As a global brand in the wood-based panel industry, we will continue to work with respect and awareness of the right to a good life for future generations. We sincerely hope that these seeds we have been sowing will continue to grow, yielding fruit for tomorrow's generations, and for our employees and their families who have accompanied us on the steps we taken thus far. It is our foremost wish that environmental and sustainability works progress swiftly enabling sustainable progress, both for our country and the world at large.

Kindest Regards,

Haluk Yıldız

CEC

About Kastamonu Entegre



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production

countries

In the wood-based panel production industry<sup>1</sup>

in the world

6.091 employees

million m<sup>3</sup> production capacity

we produce door panels required for

per day, as well as wood-based panels required for their furniture and laminate

6



## about Kastamonu Entegre

Our company produces raw and melamine faced particle board and MDF, laminate flooring, skirting, fire resistant MDF and particle board, moisture resistant MDF and particle board, painted panel, colored MDF, honeycomb filled decorative panel, glossy panel, kitchen countertops and door panel required by the furniture, decoration and construction industry.

The company, established in Istanbul in 1969 under the name of Hayat Holding to manufacture in the wood-based panel sector with 100% domestic capital, commenced production in 1971 in Kastamonu. As of the end of 2018, production has started at our Adana, Balikesir, Gebze, Kastamonu, Samsun and Tarsus facilities in Turkey. Our overseas production facilities include Romania, Bulgaria, Russia, Italy and Bosnia-Herzegovina. Furthermore, we have a company in the USA where we manage the wood chip supply and logistics processes. Of our total production capacity 44% is accounted for by our overseas plants, and 56% by our plants in Turkey.

When viewed on a product basis, namely MDF, particle board, laminate flooring and door panel, our company is among the top 4 manufacturers in the world. We realize 6% of global laminate flooring production. We have an annual production capacity of 2.5 million m³ for MDF and 3 million m³ for particle board.

When viewed on a product basis, namely MDF, particle board, laminate flooring and door panel, our company is among the top 4 manufacturers in the world.



<sup>1</sup> All MDF, MS and OSB productions are taken into consideration.

# production plants



Kastamonu Italia S.P.A Particle Board Plant



atron Hayat D.O.O Bosnia & Herzegovina Kraft Paper Plant **Kastamonu Bulgaria A.D.**Particle Board Plant



### Kastamonu Romania S.A.

Particle Board and Doorskin Plants

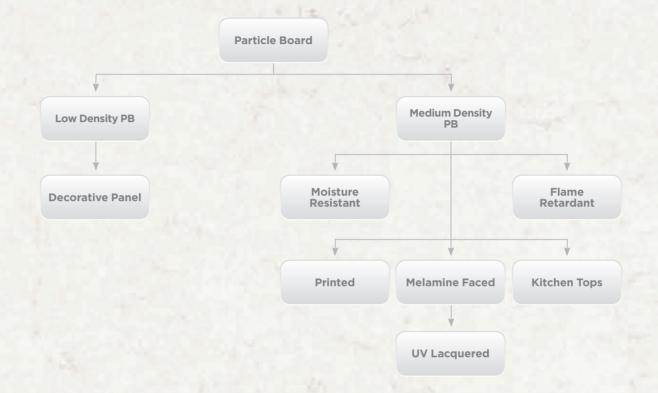
### Kastamonu Russia

MDF Plant

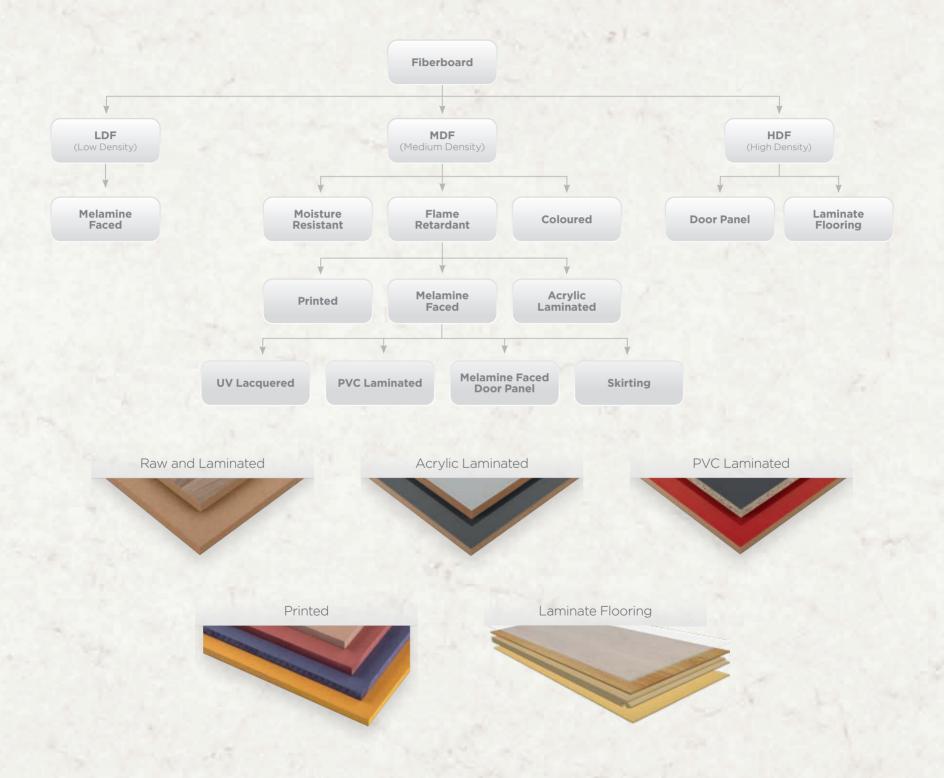


Kastamonu Particle Board Plant Gebze MDF & Particle Board Plant Balıkesir Particle Board Plant Kastamonu MDF Plant Samsun Particle Board Plant Tarsus Particle Board Plant Adana MDF Plant

## our product groups









## mission

To add value to the comfortable living spaces with high quality, innovative, reliable and environmentally friendly products which meet all stakeholders' expectations at the highest level in the wooden panel sector.





To become one of first 5 producers in the world in the wooden panel sector and to make Kastamonu Entegre become a global brand.



### core values



### **Teamwork**

- As part of a global team, we work together towards the same target.
- We share ideas, technology and talent and reach targets as a team.
- We trust each other individually and as a team and share responsibility.
- We embrace difficulties; we learn from each other.



### **Respect for Human and Nature**

- · We care about each other.
- · We approach differences with respect.
- We work with respect to the environment and nature, and are aware of our social responsibilities.
- We establish our relationships and communication with respect.



### **Transparency**

- We work in open communication.
- We share our knowledge and experience.
- · We work in a feedback culture.
- We share our ideas with a questioning culture.



#### Loyalty

- We ensure a working environment of high motivation.
- · We encourage and reward success.
- We support each other.
- We are part of a strong and learning organization.



### Responsibility

- We do not allow environments where we detect risks.
- We act within the framework of ethical values and principles.
- We perform our tasks with holistic responsibility.
- We anticipate the consequences of our words and behavior, and bear their responsibility.



### **Sense of Justice and Integrity**

- We treat all our employees fairly and offer equal opportunities.
- We build relationships with all our stakeholders based upon integrity, fairness and trust.
- We are accurate, open and consistent in our words and behavior.
- We encourage everyone to express their ideas.



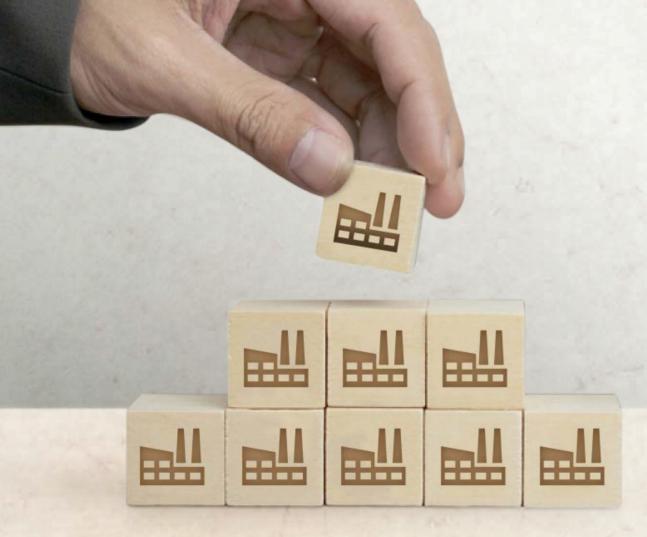
### **Continuous Improvement**

- We investigate and question in light of science.
- We monitor change and become part of it.
- We support our team members' potential and their activities that create value.
- We constantly renew ourselves and prepare for the future.





Transparency, integrity, ethical behavior and compliance with legal regulations constitute the basic principles of our company's corporate governance approach. We form our board of directors within the framework of our corporate governance principles and distribute tasks among the members. The Board of Directors manages and represents the company by observing the long-term interests of the company in the first place with a rational and prudent risk management approach by keeping the risk, growth and proceeds balance of the company at the most appropriate level with the strategic decisions to be taken on their part. The Board of Directors, which is the administrative body at the highest level, consists of 4 members.





Front Left **AHMET YAHYA KİĞILI** 

Chairman

Right Back

MEHMET AVNİ KİĞILI

Vice Chairman

Left Back

HALUK YILDIZ

Forestry Group CEO and Board Member

Front Right

MEHMET ORHAN IDIL

Board Member



## significant developments in 2018

Innovation was among the key issues that we focused on in 2018. We started to manage innovation in a systematic and holistic manner, making it an integral part of our corporate culture. Thanks to these studies, our company successfully completed the "Inosuit-Innovation-Based Mentoring" project conducted in cooperation with TIM (Turkish Exporters Assembly) and Sabanci University as the first and only brand in the sector.

The "Idea Platform" was launched to enable employee involvement in innovative processes and for them to share their innovative suggestions. The platform, launched within our corporate innovation system built around the principles of intellectual equivalence, empathy and collective intelligence, provided a solid foundation for the implementation of innovative projects. We initiated the "Lean Business Acceleration Program" and the "Incubation Program" for project implementation, with applications filed to this platform.





In 2018, Kastamonu R&D was established within Teknopark Istanbul by means of centralizing the R&D processes. In this context, while our R&D employees previously employed at factories were gathered under a single roof, a process was initiated to employ new employees of diverse expertise in line with our R&D Priorities. The company, being included in the TÜBİTAK 2244 Industrial Ph.D. Program, envisages the recruitment of a total of 12 PhD students in cooperation with 4 universities.

Kastamonu Entegre, being selected as the only participant in the ECOBULK Project supported by the world's highest budget civil research program in the wood-based panel sector, Horizon 2020, has started to test boards using bio-based glue formulations.

The Gebze, Kastamonu, Adana and Tatarstan plants of Kastamonu Entegre have been the recipients of the Blue Angel, the world's first eco-labeled environmental certification. Kastamonu Entegre, which has successfully pioneered environmental, health and quality issues, has entered the sector as the first Turkish manufacturer to obtain this certificate in laminate flooring products. The Gebze, Kastamonu, Adana and Tatarstan plants of Kastamonu Entegre producing laminate flooring under the "Floorpan" and "Artfloor" brands was awarded Blue Angel certification confirming that inputs used in production are not detrimental to health.

At the Quality Circles Sharing Conference held by KalDer, our "Hand in Hand" team from the Balıkesir Particle Board plant and "Fast and Furious" team from the Kastamonu MDF plant were awarded for continuous process improvement.

2018 KALITE ÇEMBERÎ
ÖDÜL SAHÎBÎ

KASTAMONÎ I ENTEGRE A.Ş.

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Part of our sales office in İnegöl, which has been providing logistics support to furniture manufacturers and dealers since 2005, has been converted into a showroom. The company showroom, covering an area of 300 m² and where the latest trends are reflected in a display of high quality and aesthetic products, has also become a sharing environment by bringing together industry professionals. The trend meeting for designers and furniture manufacturers was held hosting LG Hausys' designer Josef Kim as a speaker. LG Hausys, offering solutions for building and interior applications within the LG Group, supplies us with industrial foil.



The "Laminate flooring Masters Seminar", held in Turkey in 2016 and 2017 to train qualified parquet masters opened abroad in 2018. 150 parquet masters, architects and merchants participated in the training held in Tehran, Tabriz and Isfahan. This program, designed for parquet masters, who serve as a crucial bridge between ourselves and the end user, includes applied training in developing technology and renewed products. Besides providing information on production and quality processes, pre-flooring prepa-



ration, the source of issues encountered during and after the flooring process and solution methods are practically explained to participants.

Within our Industry 4.0 activities, which we have accelerated over the past three years, we have started to implement digital transformation projects with our technical, automation and engineering teams in the fields of data collection, big data processing and the creation of decision support mechanisms. In addition to creating a corporate culture in this regard, we had the opportunity to share our works with diverse companies and become a reference point.

In one of our digital transformation projects, we are able to monitor all consumption and production data instantly through sensors. This provides us great benefits in terms of analysis and reporting as well as decision support. With the mathematical models used in addition to the system data, we are able to make estimations in our quality and maintenance processes. We are the only company in the sector in Turkey using this system.

We perform overall equipment effectiveness (OEE) and detailed failure monitoring with the software we have implemented within

the scope of Industry 4.0. The screens within the facilities ensure that all types of information regarding the production line and manufacturing process are collected and managed at a single center. These screens are customized according to product, and the statistics and data required for the purpose and the target are monitored using this software. Thanks to this system for machine and production line efficiency, we optimize the stages of production so as to immediately, and in detail, generate analysis reports to identify the source of any failure.

A system we use in another project applied within the scope of digitization efforts provides instant feedback to the previous stages of the production line by following the physical properties of the raw material we utilize in the production process. While the system displays on-screen warnings of loss of value, it also shares suggested solutions.



While significant gains are achieved in terms of energy saving, thanks to this project we also gain experience in machine learning.

The "IDS Interactive Room," marking a world first in the field of product testing, was brought together with sector professionals at the Intermob Fair. In this digital room, professionals quickly accessed all content con-



tained in the "IDS 3D" (Interior Design Studio) mobile application, moved around the room without 3-D glasses and wandered through virtual spaces, closely examining all products and enjoying the opportunity of reviewing the applications of the products examined. The IDS interactive room, capable of opening its doors to multiple users simultaneously, has made a difference with this feature.

In 2018, we expanded our production map by adding Gruppo Trombini, Italy's third largest particle board manufacturer, to our foreign investments. We completed the renovation works at the particle board plant in Pomposa in north-eastern Italy and commenced production therein. As one of the largest manufacturers in the world, we are proud to lead the way as the foremost Turkish investor in Italy where we have been doing export until today. Production at our Italian facility with 100% recycled materials is of particular importance for our investment.

The particle board production line with a capacity of 500,000 m³/year purchased from French company Darbo was relocated to our Bulgarian facility, with modernization works



commencing in 2018. This line will be put into operation in 2019. Our Bulgarian facility, receiving "Class A Investor Certification" in the same year, was the reference company at the "Turkey-Bulgaria Business Forum" organized by DEIK, and acknowledged as the preeminent business meeting between the two countries of the past 10 years.

In order to ensure the continuity of raw material supply, we have taken the delivery from the Oshima Shipyard of our second ship, which has a capacity of 46,000 tons of wood chip.



## our awards

- ✓ Kastamonu Entegre was ranked 46th on the Istanbul Chamber of Industry's list of "Turkey's Top 500 Industrial Enterprises 2018".
- ✓ It was positioned as 96th having increased its turnover to 2 billion 879 million Turkish lira according to the 2017 results of the "Capital 500" listing of Turkish companies with the highest turnover. With this success, the Company maintained its position in the "Permanent Leaders" listing in the "Wood and Forest Products" sector, maintaining its leadership position this year as well as the last.
- ✓ The "Gasification of Biomass Waste and Clean Renewable Energy Production" R&D project was awarded under the category of "University-Industry Cooperation" within the scope of 13th Technology Rewards, and simultaneously was under the "Biomass and Waste" category awarded within the scope of the 7th ICCI Energy Prizes, considered to be among the key energy-sector events in Turkey.
- ✓ It received the "20-Year Outstanding Contribution Award" at Domotex Asia's 20th Annual Gala Night prize ceremony.

- ✓ In the "Global 100 Awards" research conducted by Platin Magazine, it ranked first under the "Tree" category, standing out among its competitors. In the "Global 100 Awards" event conducted by Platin Magazine under the "INDUSTRY 4.0" theme, it ranked first in the sector among those companies successfully representing the country in the international arena. The company was ranked 27th in the general listing of onehundred companies making the highest contribution to Turkey.
- The company attended the Cairo Woodshow held for the first time in Cairo, Egypt, and was awarded the "Best Stand" prize at the fair among 175 companies from 24 countries.
- ✓ Kastamonu Entegre was the champion of the Schattdecor Beach Volley Tournament.
- The Kastamonu Entegre Adana MDF Facility received the "Innovative Company of the Year" award granted by Adana Refleks Newspaper.
- ✓ Within the framework of the 41st celebration activities of Adana Organized Industrial Zone, Kastamonu Entegre Adana MDF Facility came second in the "Greenest Plant" competition.



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## our memberships

We attach importance to our relations with the sectoral associations and nongovernmental organizations we collaborate with. We actively participate in the meetings and organizations organized by these institutions and organizations. Some of these are listed on the right.



MDF and Particle Board Industrialists Association

Turkey Forest Products Association of Industrialists and Businessmen (TORID)

Turkish Association of Foresters

Turkish People Management Association (PERYÖN)

Turkish Quality Association (KalDer)

Association of Ethics and Reputation (TEİD)

Foundation for the Preservation and Promotion of Environmental and Cultural Heritage (ÇEKÜL)

The Turkish Foundation for Combating Soil Erosion for Reforestation and the Preservation of Natural Habitats (TEMA)

Central Anatolia Exporters Association (OAIB)

Foreign Economic Relations Board (DEİK)

Istanbul Exporters Association (IEA)

Turkey Union of Chambers and Commodity Exchanges (TOBB)

University - Industry Cooperation Centers Platform (ÜSİMP)

Turkey Materials Marketplace (TMM)

Adana Chamber of Industry

Adana Chamber of Commerce

Balıkesir Chamber of Industry

Balıkesir Chamber of Commerce

Gebze Chamber of Commerce

Istanbul Chamber of Industry

Istanbul Chamber of Commerce

Kastamonu Chamber of Commerce and Industry

Kocaeli Chamber of Industry

Tarsus Chamber of Commerce and Industry

Terme Chamber of Commerce

Chamber of Forest Engineers



# sustainability approach

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ABOUT KASTAMONU ENTEGRE

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### **Sustainability Approach**

The management of risks and opportunities of our activities in the environmental, social and economic fields forms the basis of our sustainability management approach geared at leaving a more viable world for future generations. In the awareness of being a global brand, we have determined our sustainability strategy and started to implement it for the future with our stakeholders, with whom we form the links of a chain with our services that extend beyond borders.

We have established a "Sustainability Committee" to execute our sustainability efforts, based upon the action plans arising from our sustainability strategy, and to measure and monitor our performance in these endeavors. Our committee, operating under the leadership of our CEO affiliated to the Kastamonu

Entegre Board of Directors, and consisting of representatives from different units and departments, is the highest executive authority in terms of sustainability activities.

We have identified our priorities in the development of our sustainability strategy through inclusive stakeholder dialogue. We have planned our short-term, medium and long-term actions to implement our strategy and created performance indicators capable of measuring the efficiency of these actions.

### **Sustainability Strategy**

We have determined our sustainability strategy, formed in parallel with the goals and objectives of our company, based upon four main themes.





### **Sustainability Policy**

As Kastamonu Entegre, we adopt an ethical, transparent, equitable and accountable management approach in the awareness of our environmental, economic and social contributions and impacts.

We engage in activities that strengthen our corporate structure, and we take sustainable development-based growth as the basis, in line with our target of becoming a global brand.

In determining our strategies, we always consider the expectations and opinions of our stakeholders and create a strong bond by ensuring their satisfaction.

We conduct practices with an employee-oriented perspective that takes into account their expectations and needs, thereby creating an efficient and peaceful working environment.

Besides ensuring the health and safety of all our employees, we also contribute to their training and development activities.

Pursuant to our responsible purchasing approach, we perform our raw material supply processes based on sustainable forest management. We support initiatives related to this model and contribute positively to their development.

Our innovation and R&D processes enable us to develop and manufacture products that create high quality, environmentally friendly and healthy living spaces using state-of-the-art technology.

We respect human rights and encourage equal opportunity.

We pay regard to energy and water efficiency; we implement renewable and innovative energy projects accordingly.

We contribute to the welfare of the local community by creating employment and economic value in our geographic locations.

### **Sustainability Priorities**

Our sustainability priorities have been determined as the result of effective stakeholder dialogue, encompassing all stakeholder groups. Prioritization processes were carried out during a 3-month period.

The sustainability priorities consistent with the vision and objectives of Kastamonu Entegre that meet the expectations of stakeholders have underpinned the development of the company's Sustainability Strategy. While prioritizing issues, the economic, social and environmental impacts of Kastamonu Entegre, as well as the risks and opportunities associated with relevant sustainability issues and the effects of these issues on the company's long-term strategies have been taken into consideration.



### **Process of Determining Sustainability** Prioritization for Kastamonu Entegre 2,3,4

With the stakeholder dialogues performed together with the Sustainability Committee, Kastamonu Entegre employees, suppliers, customers, dealers, consultancy companies, financial institutions, sectoral associations, academic institutions, nongovernmental organizations and public and local governments, 161 stakeholder representatives in total contributed to the determination of Kastamonu Entegre's sustainability priorities.

In the workshops and online surveys done, those sustainability issues that could be prioritized have been shared with Kastamonu Entegre stakeholders, who were asked to select and list their priority issues. Sustainability training was respectively given to the participants in the workshop; thus it was ensured that a common language was created, and workshops were conducted more productively. The workshops provided an opportunity to understand the expectations of the stakeholders and to receive suggestions for improvement, as well as to strengthen stakeholder dialogue.

#### **PREPARATION**

Sustainability issues which can be prioritized have been listed by examining the information obtained from current due diligence meetings, feedback from stakeholders on different platforms. sectoral dynamics and relevant in-house/external resources.

### **DETERMINATION OF STRATEGIC PRIORITIES**

To identify the sustainability issues of strategic importance, a prioritization workshop was held with the "Sustainability Committee".

### **DETERMINATION OF PRIORITIES FOR STAKEHOLDERS**

In order to learn priority sustainability issues and receive feedback from stakeholders' face-to-face workshops and online surveys were conducted with different stakeholder groups.

#### **DETERMINATION OF KEAS SUSTAINABILITY PRIORITIES**

The issues deemed as a priority by the Sustainability Committee and the stakeholders were consolidated and therefore the prioritized sustainability issues for KEAS were transferred to the matrix.

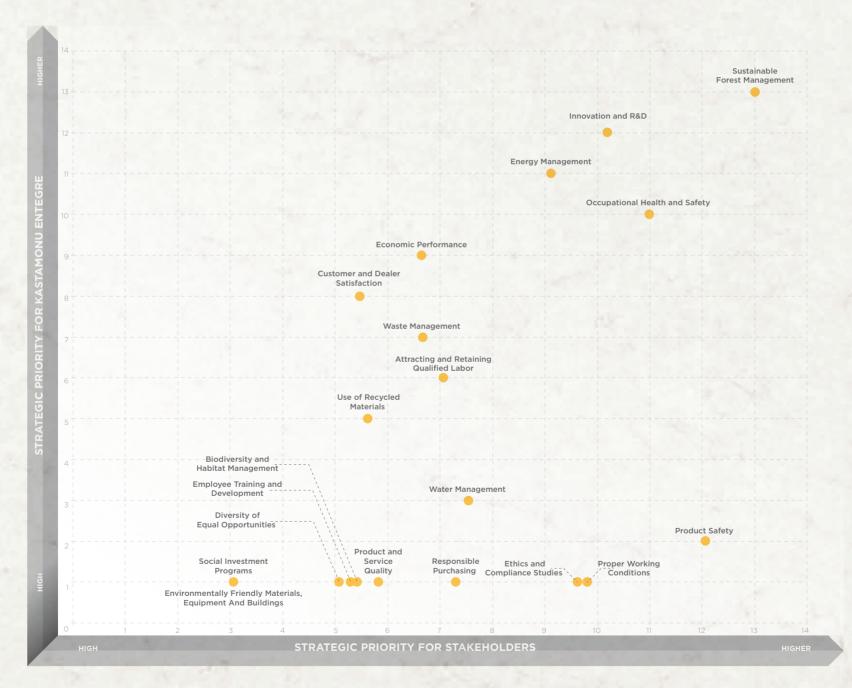
- 2 GRI report "Sustainability Issues for Sectors: What do Stakeholders want to know?" has been utilized.
- The Sustainability Committee consists of 47 members who perform duties in the senior management and who are decision makers.
- The scope of the report has been identified as Kastamonu Entegre Operations in Turkey. Sub-contractors have also been included within the scope under the heading of Occupational Health and Safety.



### **Kastamonu Entegre Sustainability Priorities Matrix**

The colored section in the prioritization matrix created in line with feedback from the Sustainability Committee and internal and external stakeholders indicates the priority issues. The scope of this report

has been identified as Kastamonu Entegre Operations in Turkey. Sub-contractors have also been included within the scope under the heading of Occupational Health and Safety.



### **Stakeholder Dialogue**

We attach importance to the value that efficient stakeholder dialogue will bring to our sustainability performance. For this reason, the stakeholder dialogue is one of the main elements of our sustainability strategy. All people, institutions and organizations that are directly, or indirectly, affected by our activities, policies and products, and that at the same impact us are included on our stakeholder map.

We establish transparent and reliable relationships by reflecting the expectations of our stakeholders to our business strategies. Our main stakeholders are employees, customers, shareholders, end users, suppliers, public institutions and society at large. For each of our stakeholder groups, we have defined communication channels and processes to inform them and receive feedback through various platforms.

While setting forth our sustainability strategy, our various dialogue activities with diverse stakeholder groups have shaped our strategy.

You can find the platforms we use to communicate with our stakeholders and the schedule showing our communication frequency in the documentation section.

### **United Nations Sustainable Development Goals and Kastamonu Entegre**

The Sustainable Development Goals published by the United Nations in 2015 are a set of universal objectives formulated to eliminate poverty, protect our planet and contribute to all people living in peace and prosperity. These targets, also named global targets, were replaced with the Millennium Development Goals, which started the global mobilization in 2000.

As the result of our responsible management approach and with an awareness of fulfilling our duties, we aim to contribute to the achievement of sustainable development targets in line with our sector and corporate priorities.

As the result of our evaluation, reflective of our sustainability strategy and sectoral dynamics, we have determined that the following global targets particularly overlap with our business processes.





















performing our duty with a responsible management approach

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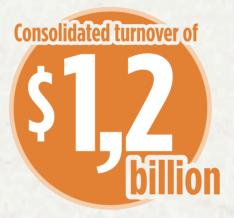
ABOUT KASTAMONU ENTEGRE

### PERFORMING OUR DUTY WITH A RESPONSIBLE MANAGEMENT APPROACH

PRESERVING THE BALANCE OF NATURE CONTRIBUTION TO SOCIETY DOCUMENTATION

### **Economic Performance**

Kastamonu Entegre, being the leader of the Turkish market both by domestic and foreign sales, with its innovative product portfolio, today carries out its production operations in six countries as the result of investments geared at improving its production capacity through successful financial and operational performance.



The vision of elevating Kastamonu Entegre to the top 5 manufacturers in the woodbased panel industry as a global brand lies at the heart of our strategy of overseas expansion. In this context, the company was included in the Turquality® project in 2015 by the Ministry of Trade with the vision of "Creating 10 Worldwide Brands in 10 Years".

The first company in the wood-based panel sector to receive Turquality support

In 2018, the total turnover of our company's domestic operations increased from 2.9 billion Turkish lira to 3.6 billion Turkish lira and a growth by 24% was achieved. Our company, being the sector leader with a domestic market share of 25-30%, is listed as the 46th among Turkey's Largest 500 Industrial Enterprises as announced by ISO for the year 2018.

Our company, contributing significant added value to Turkey's economy with exports to over 100 countries in Asia, America, Africa, Europe and Australia, has been an export champion in the sector since 2013, ranking among "Turkey's Top 1000 Exporters" prepared by the Turkey Exporters Assembly (TIM).

57% of our consolidated revenue in 2018 stemmed from our affiliates beyond Turkey and our export sales from Turkey. Our company's ranking in the category of "overseas share in turnover" in the "The Largest Turkish Companies Established Abroad" research published by Capital Journal has risen to 7<sup>th</sup>.



The investments we have made in different geographic locations and increased diversity in the value-added product range are the key factors contributing to our growth rate. Aiming to grow by increasing its share in global markets, through careful identification



of international investment opportunities, Kastamonu Entegre takes into consideration those criteria that support sustainable growth, such as rich raw material resources, population, rise in consumption and purchasing power of the economy, market size, proximity to target markets, qualified work force and a mixed energy matrix.

# **Ethics and Compliance**

A sense of justice and integrity, being among our long-standing core values, guides our working principles and constitutes the framework of our ethical management understanding across all decisions and actions.

The relations of our companies with public and private institutions and individuals are regulated in accordance with legal and moral values in order to increase the quality of products and services, to use resources in the most efficient manner and to ensure sustainable growth and success. By this means, our reputation is improved and maintained, whereby stability and trust are preserved.

In the light of our transparent and accountable management approach, we completely and fully inform our stakeholders of all company activities.

All our employees are required to fully comply with the laws and regulations of the country in which we operate. All employees support the internal audit activities carried out in order to monitor the compliance of our activities with the laws of the relevant country and of company regulations by means of cooperation. Our employees must comply with the reputation and integrity of the company by adhering to the principles

of equity, transparency, responsibility and accountability in performing their tasks.

In 2018, we carried out internal trainings for our target audience with the consultancy firm we cooperated within the scope of the Competition Law Compliance Program. We prepared simultaneous e-learning trainings. This teaching kit and Competition Law Handbook will be shared with our employees in 2019, and the internalization of this initiative will be ensured.

Within the scope of the Law on the Protection of Personal Data (LPPD) Compliance Program, we set out the data inventory of our company with the consultancy firm and started to provide informative trainings to our employees on LPPD. We plan to have completed these trainings with all employees in 2019. The policy and procedural work on LPPD will also be completed and published in 2019.

Code of Ethic: Our business ethics outline our business principles and responsibilities in our work processes and in our relations with all our stakeholders, within or beyond the organization.

To ensure that our business ethics are understood and adopted by all affiliated parties, we publish our rules on the Kastamonu Entegre website.

In our code of ethics, it is determined that our employees should have information on competition laws and legislation, and that relations with our competitors should be managed in this awareness.



## **Risk Management**

The efficient risk management activities applied by our side are aimed at early detection of strategic, financial, operational and compatibility risks that may jeopardize the existence, development and sustainability of our company, prioritizing the impact and probabilities of the same, managing the risks that it may be exposed to and taking these into consideration within the decision mechanisms.

Risk management activities are carried out within the framework of the "Risk Management Guide" established by the Risk Management Department and approved by senior management. The risk management process has been digitalized and the "Risk Management Module" put into practice within the enterprise resource planning software to increase efficiency.

In our risk management process, the risk management approach specified in the "COSO<sup>5</sup> - Corporate Risk Management Framework," and which consists of the following four stages, has been adopted:

- ✓ Determination of risks
- ✓ Risk assessment (impact and probability assessment)
- ✓ Risk management (response and controls)
- ✓ Reporting and updating of risks

Risk identification is made through risk identification workshops conducted separately with all process managers. The identified risks are classified under operational, financial, compliance and strategic headings according to their sources. The identified risks include those issues we manage within the scope of sustainability management.

Risks are evaluated across seven categories in terms of their impact on the achievement of targets:

Financial impact; Impact on profitability, additional expenses

Operational impact; Production downtime, supply chain interruption, quality

Impact on reputation; Negative news, decreased confidence in the brand

Market share; Impact on market share

Compliance Operations contrary to legislation, penalty payments

Environment; Environmental impact

People; Occupational health and safety, human resources

Those risks evaluated at senior level within the scope of the impact and probability assessment are reported to the Risk Committee on a quarterly basis. The current situation regarding the risks in question and the countermeasures that can be taken are submitted to the Board of Directors by the Risk Committee, and those measures resolved upon are implemented.

Internal audit practices, being among the foremost risk management tools, review the effectiveness of controls related to risks regarding the processes communicated by the Risk Management Department. The Internal Audit Department, which conducts its activities independently, performs its tasks directly under the Chairman of the Board. The findings of the audits performed at Group companies, the results of annual risk assessments and the annual work plans prepared are submitted to the board of directors for approval.

5 COSO: The Committee of Sponsoring Organizations of the Treadway Commission



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#### **Innovation and R&D**

Entering the Turquality® process initiated in 2014 with the target to become a worldwide brand that respects the nature and community and produces innovative solutions in all fields of life, we had the chance to review, develop and increase our brand value. The company, in addition to these efforts, in 2016 started to invest in its infrastructure to build a culture of innovation with regard to B2B in a traditional sector, as well as to deepen and develop systems and tools.

The company began to systematically invest in the innovation infrastructure and assess innovation by adopting a holistic approach considering the InoSuit-Innovation Oriented Mentoring Program launched by TIM at the end of 2016 as a catalyst, in order to scan best international examples and implement the most appropriate model for the company and its culture. Simultaneously, platforms where qualified knowledge and experience from external channels are shared and discussed have been organized by establishing a basis of cooperation with Sabancı University, Özyeğin University and the Technology Development Foundation of Turkey.

We define innovation as "the novelty creating value". Besides the impact of this value on ourselves as a manufacturer, we also pay

tion culture, the foundations of which were laid in 2016, is based on three core principles:
The principle of intellectual equivalence,

regard to its impact on our customers, and even on the end user. Our corporate innova-

The principle of intellectual equivalence, which emphasizes the freedom of idea circulation within the institution, regardless of the hierarchy and the transition to appropriate channels,

The principle of empathy, which prioritizes recognizing business partners in the value chain, understanding what is required by them and approaching these requirements without prejudice and in a spirit of learning,

The principle of collective intelligence, which considers innovation not as an individual performance output, but as a product of the cooperation of all our employees.

At the beginning of 2018, the "Idea Platform" was launched to enable employee involvement in innovation processes and their sharing of innovative suggestions. Ideas received by the platform are evaluated by the Innovation Board, on which representatives from all units are present, and the owners of ideas focused on are taken to the 4-week in-house entrepreneurship camp. We call this process, based on Design Thinking and Lean Startup methodologies, the Lean Business Acceleration Program. At the end of this program, which focuses on verifying customer requirements, the idea owners have the opportunity to present their innovative projects before the CEO and a jury.

Those projects that receive a budget for pilot



implementation following this presentation are included in the Incubation Program.

We aim to ensure that the Idea Platform becomes a

We aim to ensure that the Idea Platform becomes a value-added tool that allows the leaders of the next generation to be discovered. We expect the contribution of our

employees to be more visible in establishing qualified governance mechanisms for the development of business processes and to meet customer requirements, nurtured by the inputs of our employees to the platform in the discussion of issues of corporate significance.

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In the second half of 2018, Kastamonu R&D was established within Teknopark Istanbul by means of centralizing all R&D activities.



Aside from the fact that Teknopark Istanbul contains a real R&D ecosystem, particularly in terms of composite technologies, the key determining factor leading to its selection, its proximity to air and road transportation is also considered a sustainable solution for Kastamonu Entegre's domestic and overseas operations. While the R&D team, gathered our R&D employees, previously located at



other plants, under one roof, a new process has been initiated to employ new people of diverse competencies in line with our R&D Priorities. Upon completion of this process, the filing of an application for an R&D Center is planned for 2019.

At the closing of the year 2018, Kastamonu Entegre was included in the TÜBİTAK 2244 Industrial Doctorate Program. With this program, support for scholarships for doctoral students and employment support for the private sector are provided to encourage a greater number of researchers to be recruited by the private sector. By this means, it is aimed to improve the quantity and quality of human resources, critical in achieving desired levels in the value chain and achieving the targeted technological transformation through grants, incentives and investment

support. In line with this objective, our R&D Priorities will be centralized and collaboration with 4 universities established. A total of 12 doctoral students from Istanbul Technical, Sabancı, Karadeniz Technical and Bursa Technical Universities are expected to join the company.

In terms of the wood-based panel sector worldwide, we are the sole participant in the ECOBULK Project supported by the world's highest-budget civil research program, Horizon 2020, which we were included into in 2017. ECOBULK, being one of the largest innovation projects funded in the circular economy, aims to prove the possibilities of such an economy by focusing on furniture, automotive and construction sectors. Within the scope of the work packages introduced in 2018, board tests that combine bio-based



glue formulations with recycled raw materials have begun.

In step with our approach of holistic sus-

of Turkey (TTGV) an Association of Turkish Industrialists and Business People (TUSIAD) under the category of University - Industry Collaboration.



tainability, we both carry out process and product development works, and also realize projects aimed at effective resource consumption and environmental protection. The primary projects here are those aimed at minimizing industrial wastewater and emissions, recovering industrial wastewater by use of membrane technology and reducing consumption and emissions by raising the utilization rate of glue in MDF production, all of which are carried out with the support of TÜBİTAK.

With our project Gasification of Biomass Waste and Renewable Clean Energy Production (ABİGAS) included in the same context, we have received the Technology Awards given together by the Scientific and Technological Research Council of Turkey (TUBITAK), Technology Development Foundation



# **Responsible Supply Chain Management**

We aim to extend our sustainable growth approach to all links in our value chain. We have developed our supply chain management strategies in light of our target of delivering quality products to our customers in a timely manner and to a high service level through investments supported by state-of-the-art technology, in proximity to raw material resources and the market.

Our supply chain structure is comprised of our Supply Chain Directorate, Raw Materials Supply Directorate and Purchasing Directorate units. This supply chain enables us to contribute to the economic development of our operational geography.

The Supply Chain Directorate (SCD) has been aligned with the goal of realizing deliveries to our customers in line with targeted service levels, by taking into consideration the optimum stock level and minimum supply chain operation costs of related processes from demand forecast to sales. Pursuant to this goal, a total of six "strategic focus areas" have been defined, namely stock optimization, customer satisfaction, ownership cost, distribution/logistics costs, production efficiency and operational excellence. Strategies and working principles are respectively defined under these focus areas.

A supplier evaluation form is sent to those companies that apply to become a supplier of our company, and supplier criteria are questioned through this form. We furthermore specify our expectations regarding compliance with environmental and occupational safety legislation within the scope of our contracts concluded with our suppliers. Our raw material, packaging, energy and technical material suppliers are examined regarding

their holding of ISO 14001 Environmental Management System and OHSAS 18001 Occupational Health and Safety Assessment Series certification.

Among our criteria applied in the selection of suppliers, quality as well as other criteria such as compliance with the laws applicable to the forest products trade, relations with sub-suppliers, inquiries into forestry-related criminal record and tax liability also exist. We have explained in detail in our report our approach to sustainable forest management in the section on protecting the balance of nature.

Supplier evaluations are carried out by the Purchasing Directorate through our ERP software, as a result of which, cooperation with those suppliers on the approved supplier list continues. Suppliers are evaluated according to quality, price advantage, legal compliance and delivery criteria.

We believe that our supplier network has great importance regarding its contribution to our sustainable growth. Accordingly, Kastamonu Entegre supports the sustainable business success and development of its suppliers. For this purpose, R&D and productivity projects are implemented with suppliers to achieve joint profitability, and a contribution



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is made to increase the quality performance of these suppliers.

In order to ensure the sustainability of procurement processes, supplier risk analysis was conducted in 2018, wherein 75 critical suppliers were subject to a risk assessment, with action plans developed for 10 identified risks.

Contributing to the sustainability of our supply chain, a localization project has been initiated to substitute imported products with local alternatives. While this project reduces purchasing and logistics costs for Kastamonu Entegre, it also provides an important exemplar of increasing employment through local production and reducing carbon emission resulting from distance. Within the scope of the localization

project in 2018, a saving of 8.5 million Turkish lira was achieved. The project also brought together the specialists within different directorates to create a sharing environment.

In order to increase coordination between the purchasing departments at different locations, the Kastamonu Entegre Global Purchasing Meeting was held in 2018. This organization, now an annual event, will be held in Bulgaria in 2019.

In order to increase the professional knowledge and preparedness of Purchasing Directorate employees, the Purchasing Academy Program took place in 2018 and 12 purchasing department employees received ten-day training.









In line with the technology and digitalization which rapidly changes business processes, digital transformation projects increasing our efficiency and speed and providing competitive advantages are conducted. In this context, the e-catalog project will be implemented by the Purchasing Directorate in 2019, automating the procurement processes and digitalizing routine manual work, thereby allowing our employees greater time for more value-added tasks. Furthermore, comprehensive digital transformation projects are implemented at all links of the Supply Chain to increase the level of customer service and operational excellence.

As of the end of 2018, important projects directly contributing to sustainability were launched under SCD. Duly, the internal combustion (diesel) forklifts used at our plants have been replaced with electric alternatives whereby the annual use of 1 million liters of fossil fuel has ended. In certain of our wood chip fields, stacking is no longer done with a loader, but with the newly-installed electric conveyor belt stacking system, thereby ending the annual the use of one-hundred-thousand-liters of fossil fuel. The "Integrated Business Plan" model has been developed in the ERP software, and has gone live. <sup>6</sup> By this means, the optimizing of stock and resource utilization (capacity, raw material, labor) is achieved.

The projects planned for 2019 include the monitoring of the supply chain using the SCOR model to ensure performance measurement via the KESCO project, which will enable instant and retrospective traceability of all end-to-end import, export and international transportation processes. Likewise, a Supply Chain Academy is being planned for 2019 in order to make the organization more horizontal among managerial groups under

6 (DP, SNP, PP/DS, Global ATP)

SCD, and to align the departments. Within the scope of this series of events, it is anticipated that weekly trainings to be attended by unit managers and academicians from various universities will be available.

## **Product Quality and Safety**

We perform our manufacturing process within the framework of our quality policy in order to deliver high quality products to our customers. Thanks to our integrated management systems applications, we have a holistic approach across all quality-related issues.

The desired product quality is achieved while the production is in progress with the controls made with reference to EN (European Norms) standards at the thirty-six laboratories and in-house quality control points established at our plants.

At Kastamonu Entegre, the following checks are carried out throughout all our plants in order to fully meet customer requirements and expectations:

- Physical endurance tests (tensile strength, flexural strength, elasticity, etc.) of all products, as they may endanger human safety during their use
- ✓ Formaldehyde release amount checks across all products as it may have a



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negative effect on human health

- ✓ Product-specific performance tests for fire-resistant and waterproof products
- ✓ Product-specific performance tests for special hygienic products
- ✓ Surface tests for coated products
- ✓ Paint tests for painted products
- ✓ Special tests and checks for laminate flooring considering possible issues that may arise during use and final flooring applications

Performance limits in tests and controls have been reviewed and shared at all plants, whereby the uniformity among all plants is ensured. The commonization of the control plan is followed by using the appropriate module in the ERP software.

By providing key user trainings at all domestic and international plants, quality control performance results are more easily accessible and traceable on the same basis. For any discrepancies that may arise during checks, CPA (corrective and preventive action) is initiated with an internal customer approach related to the previous stages, and steps to prevent the recurrence of the same are meticulously taken.

Kastamonu Entegre holds certificates of conformity for Turkish Standards issued by the TSI<sup>7</sup> for all products manufactured in different properties and under formaldehyde emission classes. In line with customer requests, we are able to manufacture products that conform with fire retardant (FR), moisture resistant (MR), FSC certified<sup>8</sup>, CARB Phase II<sup>9</sup> and F\*\*\*\* standards<sup>10</sup>. We are the first Turkish company to have received the EO, FR and CE System1 certification for laminate flooring products.

## **Our Quality Policy**

the scope of, and pursuant to the objectives of the

achievements in line with the abovementioned principles.











Specifies products in the free formaldehyde release class that are compatible with the California Air Resources Board.



<sup>7</sup> TSI - Turkish Standards Institute

<sup>8</sup> While the FSC-Forest Stewardship Council provides its forestry assets based upon this certification, the degradation of natural forests and other habitats in the world is prevented, and high-quality forestry activities are supported by means of ensuring the efficient operation of forestry organizations.

<sup>10</sup> Specifies the products in the free formaldehyde release class that are compatible with Japanese Industrial Standards

Our Gebze plant was the first MDF facility in Turkey to have the TSI EO Certification.

Kastamonu Entegre confirms the importance given to the environment and human health with hygiene certificates verifying that its products have an antibacterial surface. We were the first company in Turkey to be awarded SGR Hygiene Certification for our Floorpan/Artfloor Boutique series laminate parquet products.

Furthermore, Kastamonu Entegre received "Blue Angel (Der Blaue Engel)" certification for all its domestic and overseas laminate flooring products in 2018, becoming

the first and only company entitled to hold such certification. Blue
Angel is a German certificate granted for products and

services with environmentally friendly features.

We contribute to the development of our sector by providing opinions to the relevant institutions and organizations that go towards determining the quality standards of our sector. The TSI has received support from Kastamonu Entegre in the setting of a value-added product standard with glossy surface boards, kitchen countertops and PVC/PET surfaces starting with the code "TSE K".

In the periodic Production, Quality and Stock Management meetings, the reasons for customer complaints based on products, customer complaint resolution times, second quality reasons of products and their rates, quality test performances and competitor data are reviewed and decisions to improve product quality are taken.



The first and only Turkish company to receive "Blue Angel" certification for laminate flooring products



# What is formaldehyde?

Formaldehyde is a simple chemical compound consisting of hydrogen, oxygen and carbon. All life forms (bacteria, plants, trees, animals and humans) naturally produce formaldehyde as part of cell metabolism.

Formaldehyde is used as resin during the production of wood-based panels. The release of formaldehyde caused by panels produced using formaldehyde-based resin has been limited by the application of national and international standards. As Kastamonu Entegre, we perform our production in accordance with national and international standards, in the

awareness of the impact of our living spaces on our health.

We monitor our products and tests with independent international accredited laboratories (WKI, IHD, RISE, CATAS, etc.).

In international markets, we are able to manufacture in compliance with the formaldehyde release certificates required by our customers.<sup>11</sup>

You can examine the table for Free Formaldehyde Limits in Different Countries, as summarized below, in the documentation section.



12 Since 2014, our company has been able to produce in compliance with CARB Phase II, which is valid for the US market. However, the Formaldehyde Standards for the Composite Wooden Products Act issued by the (US Environmental Protection Agency), which entered into force as of June 1, 2018, have been added to Article 6 of the TSCA Act. TSCA Title VI and CARB Phase II emission standards are essentially the same and are considered compliant in the first instance. However, as of March 22, 2019, the CARB certificate will no longer be considered as EPA compliant. We are preparing for 2019 by working with EPA-certified accreditation bodies for our customers exporting products to the US market.



# **Quality Management Systems Applied**

Kastamonu Entegre has always been a pioneer in its sector in Turkey at the point of applying the Quality Management Systems in the company. The breakdown of the management systems it has incorporated over the years since 2002 is shown below:

Internal audits are planned and performed by a competent group of internal auditors in order to review the compliance of applications with systems. As the result of all these efforts, external audits to ensure the continuity of the documents of management systems are successfully performed.

MANAGEMENT SYSTEMS	MERKEZ	GEBZE	KASTAMONU PB	BALIKESİR	KASTAMONU MDF	SAMSUN	ADANA	TARSUS
ISO 9001 Quality Management System	1	1	1	1	1	1	1	1
OHSAS 18001 Occupational Health and Safety Assessment Series	1	<b>√</b>	1	1	1	<b>√</b>	<b>√</b>	1
FSC Forest Stewardship Council	1	1	1	1	1		1	
ISO 50001 Energy Management System	1	1	1	1	1	1	1	1
CARB California Air Resources Board		1		1			1	
ISO 27001 Information Security Management System	1	1						
AEO Authorized Economic Operator	1	1						
ISO 14001 Environment Management System	1	<b>✓</b>	/	1	1	1	1	1

The formation and updating of all procedures, instructions, forms, etc. required to ensure the standardization and continuity of all quality management systems within the company are managed through the QDMS<sup>13</sup> system, and the required version updates are monitored.

Every year, regular trainings are given to employees to ensure that the implementation efficiency of all management systems is sustainable.

13 QDMS: Quality Documents Management System



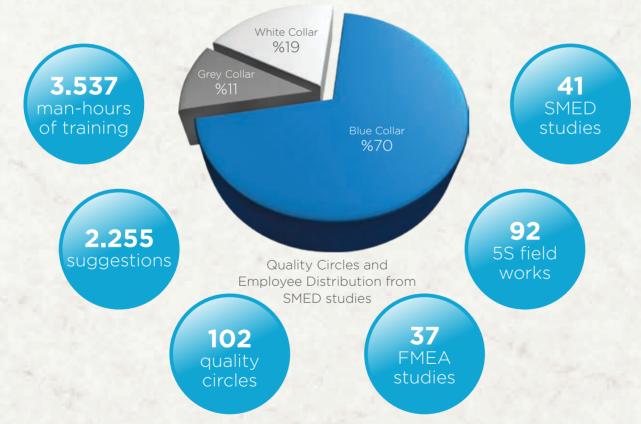
# **Total Quality Management Journey**

In our journey which was started in 2014 with hardware trainings based on fundamental concepts, we took opportunities to improve business efficiency, in terms of OHS and environmental matters aside from quality. The Quality Circle processes consisting of white, gray and blue-collar employees are added to the plant performance indicators (KPI) at all our facilities, which ensures that the number of teams and related work increases.

On the other hand, SMED<sup>14</sup> trainings have been given in 2016 and 5S and FMEA<sup>15</sup> in 2017 and implementations started in pilot areas. Projects have been created for the implementation of these techniques in all production processes.

As of 2016, KEAS Global Quality Summits have been launched to be held with the participation of the plant representative teams determined by annual competitions held at these plants.

## 2018 Results



<sup>14</sup> SMED: Single Minute Exchange of Dies

<sup>15</sup> FMEA: Failure Modes and Effects Analysis

In the Quality Circles Sharing Conference organization held by Turkish Quality Association Kal-Der Ankara Branch in 2018, the top-three teams in the KEAS 2nd Global Quality Summit event gave their presentations and were awarded two of the three prizes given in the Quality Circles category.

#### **Customer and Dealer Satisfaction**

Carrying customer service quality to the highest level with an innovative working method open to change by understanding the requirements and expectations of our customers is among the key strategies of our company. Our Customer Service department was established in 2017 with the aim of increasing the level of customer satisfaction and increasing the



efficiency of sales order operations and providing standard service. In 2018, we began to support our operations within the department with digital solutions. In order to provide good service to our customers at all times, while updating our order portal (KEP) to best meet the requirements, we also launched the Customer Relationship Management (CRM) program and integrated it into the order portal to provide direct feedback access to our customers.

To ensure customer satisfaction, all manner of feedback from our customers (industrial manufacturer, dealer) and product users (architect, carpenter, parquet master, end user) are given importance and handled with priority. Such notifications are received by telephone, KEP, e-mail and social media, or else by sales units during company visits.

Since 2017, there has been an increase in feedback with the sensitivity shown to

customer feedback. On the other hand, with digitalization, the fact that customers can access their feedback records over KEP and the start of direct information flow to the CRM system have also supported this increase.

Within this system, different approval strategies have been developed enabling swifter response to customer feedback. By including the customers in the complaint management system, the opportunity to monitor their complaints was taken at every stage. All stages of the process are monitored through the system at all levels.

When the past 3 years is reviewed, it is clear that a significant improvement in the resolution of customer complaints occurred. In 2019, it is aimed to review each complaint within 3 business days, and to finalize and close the same within 7 business days.



employee orientation



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improve our human resources practices for our employees, whom we regard as the most valuable asset of our company, and strive to take our performance in this area one step further.

### **Human Resources Management**

Pursuant to our human and employee rights-based human resources policy, we continuously improve our human resources practices for our employees, whom we regard as the most valuable asset of our company, and strive to take our performance in this area one step further.

It is our priority to ensure the rights of all our employees within the scope of the legislation in force. At the point of determining the wages and fringe benefits of employees, we have identified market conditions, business valuation outputs and performance evaluation results as our main criteria. Since we have adopted the principle of equal pay for equal work, we apply fair pay principles without any discrimination.



# **Human Resources Policy**

Kastamonu Entegre:

Acts in accordance with the protection of human rights and in compliance with the principle of respect for people within human resources processes.

Does not discriminate on ethnic origin, religion, language, race, age, gender, nationality, disability or cultural difference, nor does it act with behavior that will be qualified as discrimination.

Focuses on increasing the motivation and loyalty, as well as the continuous development of its qualified human resources.

Provides equal opportunities to all candidates in terms of training, knowledge, skills, competence and experience in recruitment processes.

Adopts the principle of equal pay for equal work. Similar salaries are determined for peer positions within the company and the salary difference between employees performing equivalent tasks only occurs based on differences in severance and performance.

Aims to provide career development and learning opportunities for its employees in different geographic locations in order to have a competent workforce.

Thanks to the globally adopted matrix organizational structure, it creates feedback and guidance mechanisms among the management staff that are separately linked in administrative and functional terms.

Enables a global strategy and culture to be adopted in the common functions of different organizations within the company thanks to this structure.

Our priorities include providing our employees with a safe and healthy work environment where they can develop their talents and participate in all processes of the company.



In order to provide a suitable working environment for employees, international conventions, in particular the International Labor Organization (ILO) and the regulations specified under local legislation are abided by. Since the most important factor determining the product or service quality of a business is the human resource, our employees form the basis of our organization. With the participation and support of our employees, it is important for us to create and maintain the most suitable working environment, both physically and socially.

Employee hobby clubs (alternative nature sports club, photography club, aquarium club, etc.) at the central campus have been launched as pilot applications. Areas are allocated for our employees to meet on social issues at our production facilities.

## **Employee Profile**

As of the year 2018, 2,541 people had been employed in the Kastamonu Entegre operations in Turkey. The distribution of employees recruited within the headquarters, 6 plants, 5 sales offices and the R&D structure positioned at various locations is shown below.

2018	Blue Collar		White	Collar
Age	Number	Percent	Number	Percent
<30	259	%13,8	101	%15,1
30-50	1.556	%83,1	504	%75,4
>50	59	%3,1	63	%9,4

\*We recruit full-time employees.

2018	White Collar		Blue Collar		Total
LOCATION	Male	Female	Male	Female	
Adana	58	8	297	1	364
Balıkesir	52	7	237	1	297
Gebze	130	17	607	6	760
Genel Müdürlük	124	72	2		198
Kastamonu YL	22		137		159
Kastamonu MDF	94	3	314		411
Samsun	33	3	124	1	161
Tarsus	22	4	134	1	161
Ar-Ge	2	3			5
Ankara	5				5
İkitelli	1	1	2		4
İnebolu			3		3
İnegöl	2	1	6		9
İzmir	3	1			4
Overall Total	548	120	1.863	10	2.541



## **Equal Opportunity**

Regardless of religion, language, race, culture and gender, everyone is offered equal career and development opportunities within the company.

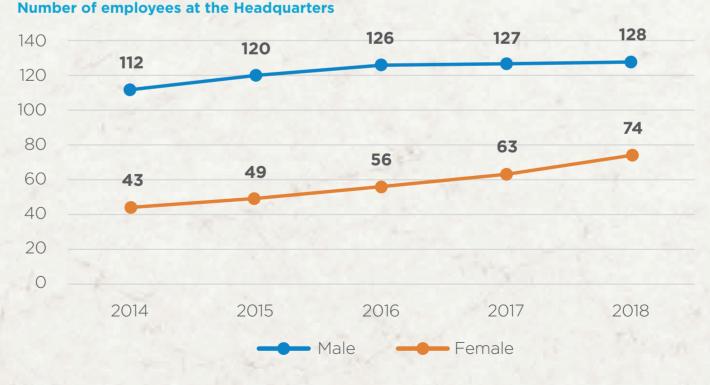
Efforts are being made to increase women's employment ratio in production. For example, the practice of increasing the number of female operators at certain of our production lines at the Gebze facility has begun. There has been an increase in the number of female employees holding administrative functions at our headquarters over recent years.

Breastfeeding rooms have been renewed at all campuses by considering the postmaternal needs of female employees.

No discrimination (gender, seniority, location, etc.) is applied in the development programs, or for the fringe benefits we

	Disabled Employee	Percent
White Collar	10	%14,1
Blue Collar	61	%85,9

Location	Number of Subcontractor Personnel
Adana Factory	62
Balıkesir Factory	55
Gebze Factory	108
Kastamonu Factory	58
Samsun Factory	30





kastamonu

provide within the organization, and all employees are enjoy equal opportunities.

All positions published outside the company are announced to company employees as internal announcements through the company's communication portal and the individual applications of employees and those indicated as the reference are prioritized during the evaluation process.

# **Attracting and Retaining Qualified Labor**

In order to attract and retain a qualified workforce, it is vital for our company to create an employer brand for which everyone is keen to work.

In this context, we behave openly and clearly towards our employees regarding our company culture, vision, mission and values. Our employees are informed of the open positions published on the internal portal. We engage in two-way communication with our employees and foster an environment where everyone's ability to share their opinions is ensured in performance feedback, communication and performance review meetings.

With the Idea Platform established within the corporation, our employees are included in the change and development processes of the company, and offered the opportunity to participate in those projects where they can directly work.

Within the scope of our recognition and appreciation practices, our talented employees displaying high performance are continuously motivated.

We encourage development by bringing suggestions for the career goals of our employees through Performance Review meetings.



Within the scope of our university-employer collaboration procedure, we organize workshops with students from the universities we have identified during the year. With the case studies and projects specially designed for our company, we carry out competency and academic knowledge evaluations of students. Bringing students considered successful to our company as employees is the main goal of this project.

We also organize long-term internship programs for students who are studying in their final year of our targeted universities, or for newly-graduated students. These internship programs are shaped according to the project requirements gathered from the various departments at the beginning of the year. In order to play an active role in the projects, those deemed successful among the students/newly graduated and included in the process are considered as the priority for eligible positions.

Employees within the organization are assigned to work in domestic and international investment projects in order to improve their competencies and professional knowledge. as well as to expand their experience.





In 2018, a pilot application was carried o ut within the new framework by restructuring the existing rotation applications at our domestic facilities. In line with the outcomes of the pilot application, necessary improvements were identified and made.

For the year 2019, it is planned to introduce and extend the new structure of the application throughout the company.

Rotation application has been structured under three main headings to be carried out among those people who perform the same function in different campuses, carry out activities in successive and complementary processes and perform different functions overlapping each other in the same campus.

The current expertise and training status of people, as well as their developmental areas and future career goals are the main determinants in this project, and are carried out on a voluntary basis. Transferring existing knowledge, sharing best practices and identifying development areas are among the outcomes of this practice.

## **Employee Development and Training**

We care about the personal and professional development of our employees in the desire to be an ever-evolving, innovative and learning company. Our training and



development strategy involves the training of leaders of the future and ensuring organizational development on the basis of our rich learning culture. We create a rich learning experience for all our employees.

It is essential that training and development investments made for our employees create value both for the employees and our company, and be related to strategic goals.

We have established our infrastructure that will ensure the development of employees in order to keep our corporate performance at the highest level. In the following process, our target is to strengthen and improve the relationship of this structure with our other human resources processes.

We implement development programs which are uniquely designed for the various requirements of different target groups, from young professionals to senior management, based on learning by experiencing, where new learning techniques are applied, and which we prepare together with specialists of the relevant field to cover all blue collar and white collar employees in line with the target audience.

The trainings we offer to our employees;

- ✓ Leadership and Managerial Competence Trainings: Leadership Development Programs, In-House Entrepreneurship, First Level Manager Development Programs
- ✓ Coaching Trainings
- ✓ Competency Oriented Training Programs
- ✓ Vision-related talks focused on People, Change, Corporate Culture and Innovation
- ✓ Technical and Professional Expertise



- ✓ Personal Development and Team Training: Foreign Language, Presentation Techniques, MS Office Programs,
- ✓ Master's Degree

# **Performance and Career Management**

The performance management process aims to reveal and sustain successful business results, behavior and the high performance of employees in accordance with corporate culture and values.

In order to support this process, we offer an effective performance management system and career management program to ensure high performance is shown by our employees along their career paths. As of the recruitment process, the performance management system is our most important tool to transparently evaluate the progress of all our employees and their contributions to our company. All our white-collar employees work on individual business objectives and competency development goals that they wish to focus on for a period of one year, in line with company targets set in the Financial, Strategic, Human Resources and OHS categories. They evaluate their performance together with their managers at the end of the year with mutual feedback.

Turining House	Planned		Reached		
Training Hours	WC	ВС	WC	ВС	
2018	39	30	38	37	
2019	26	27	-	-	

In order to increase the potential of our employees to progress to a higher level, we provide trainings to promoted managers, present middle rank and senior managers within the scope of the "Leadership Development Program" and provide master's degree support. "Career Development Plan Meetings" have been put into practice as of 2017 in order to direct and guide our employees along their career development path.

With the "Mentorship" study promoted in 2016-2017, and that we have realized in order to extend the culture of learning from one another, sixty-nine people participated in the process and supported each other's development. Mentoring is a process of development dialogue between the more experienced person (mentor) and the person who intends to learn/ develop (mentee). The mentoring program aims to support individual and corporate development, and is offered to all our whitecollar employees on a voluntary basis.

The second term of the "Mentoring" procedure is planned to start in May 2019.



Mentor	Mentee	Total
28	41	69



## **Occupational Health and Safety**

## **OHS Management**

Occupational health and safety are among the core issues we primarily and thoroughly deal with. We take pains to ensure that our occupational health and safety management system, established with a scientific approach and systematic methodology, is internalized by all employees of Kastamonu Entegre. It is our core objective to manage all risks that we face, and to minimize any loss that may occur in order to create a continuous, safe and healthy working environment for our employees.

We comply with the OHSAS 18001 Occupational Health and Safety Management System Standard requirements and all legislation in force in all of our activities to cover all our employees and subcontractor employees at our facilities and at the headquarters.

Our production facilities exist in the very dangerous works category within the scope of the prevailing legislation. We conduct various risk analysis processes at various periods using different methods, with the participation of diverse expert groups and employees in order to identify the hazards we face and measure our risks within each business group we manage. We take every precaution

detect, and keep these risks below acceptable levels by considering compliance with

against the risks we

legal limits. Eliminating hazards ranks first in our prevention hierarchy, and we apply engineering measures for those hazards that cannot be eliminated.

Within our occupational health and safety organization, we have occupational safety specialists suitable for our hazard group, and a sound health team. Health examinations related to the duties of our employees are performed and monitored annually by our workplace health department and appropriate recruitment is made accordingly.

As in all our work, we collaborate with our employees on occupational health and safety as well. In addition, we have integrated the employees of all sub-contractor companies operating in our facilities into our OHS management system. Thanks to the near-miss system we have established at all our facilities, we can prevent minor or serious injuries with the feedback provided by our employees.

In order to fulfill our commitments under this policy, we collaborate with and take necessary measures regarding our employees,

> trainees, suppliers, contractors, businesses and visiting guests be it for visit or commercial purposes, thereby fostering a culture open to continuous development. All our

> > employees, in particular our managers, are responsible for taking and implementing the necessary measures related to their field of activity in order for the system to adapt to changing conditions.



OHS League: We have initiated our "OHS League" practice at our plants in order to create an occupational safety culture to be adopted by all employees from the senior to junior level. The objective of the OHS League is to improve OHS performance on the basis of the sub-units of enterprises with proactive safety culture practices, and to prevent accidents by leveraging the synergy of team spirit.

Kastamonu 10 Audit System: With the "Kastamonu 10 Audit System" that we have established and integrated at our facilities, we carry out OHS internal audits under international standards with our expert staff, thus better defining our opportunities and risks for continuous improvement.

The OHS performance of our facilities is reviewed weekly and monthly. Besides this, important decisions are taken unanimously at the monthly "Occupational Health and Safety Board" meetings, where the participation of our employees is actively ensured within the scope of the legislation in force. Employee representatives who are elected in accordance with the number of persons and procedures defined in the statutory legislation, represent all employees and participate on the Occupational Health and Safety Board.

Occupational accidents and emergency management are handled under the control of our expert staff and management team at our facilities. In the case of experiencing nearmiss or occupational accidents, we follow up on all processes by creating activity plans to identify existing root causes and take actions to eliminate them. Accident statistics are recorded at all our facilities and presented monthly at the directors' meeting.

### **Occupational Health and Safety Policy**

Kastamonu Entegre recognizes the human being as the preeminent asset in all its activities and undertakes:

- To comply with the entire legislation in force on occupational health and safety,
- ✓ To evaluate all kinds of new products, processes and facilities within the scope of occupational health and safety starting from the project stage,
- ✓ To identify and evaluate risks that have a negative impact on occupational health and safety with the cooperation of employees, and to take necessary measures to prevent occupational accidents and occupational diseases,
- ✓ To develop systems that will minimize our losses in the event of an accident or emergency that may occur during our operations,
- ✓ To include our employees, subcontractors and guests within the scope of our health and safety practices, and to be open to technological developments that will ensure a safe working environment,
- ✓ To continuously maintain training activities in order to improve occupational health and safety awareness,
- ✓ To continuously improve, increase and supervise occupational health and safety performance.



Within the framework of the Regulation on the Prevention and Mitigation of Major Industrial Accidents issued by the Ministry of Environment and Urbanization in line with the European Union SEVESO III Directive. our Adana, Balıkesir, Gebze and Kastamonu plants have been designated as "top level organizations". In this context, tank site overflow prevention and fire monitoring systems that increase the security levels of the processes have been established. Specialist consultants have worked on training, operation, process and maintenance safety, emergency modeling and exercise planning. Safety Report studies were completed in 2017, and will be revised according to the new notices to be published by the end of 2019.

In the trainings we provide to our employees, methods that enable them to think and ensure their active participation are used. Knowledge contests under the slogan 3D (Stop-Think-Continue) in preventing occupational accidents are examples of this. By this means, both theoretical training is given and its efficiency measured. During the OHS week held every year, "working at height with VR glasses" experience and applied tests of falling from height prevention systems were performed. There have been no fatal occupational accidents suffered by our employees since 2015.

Thanks to the applied sustainable OHS programs and improvement plans, the number of work accidents with day losses at all our facilities throughout Turkey, which was at 112 in 2015, declined by 36% in 2018 to 71 accidents.











preserving the balance of nature



64-83



ABOUT KASTAMONU ENTEGRE

SUSTAINABILITY APPROACH

PERFORMING OUR DUTY WITH A RESPONSIBLE MANAGEMENT APPROACH

**EMPLOYEE ORIENTATION** 

PRESERVING THE BALANCE OF NATURE

CONTRIBUTION TO SOCIETY

DOCUMENTATION

## **Environmental Policy**

As Kastamonu Entegre, we will strive to continuously reduce the environmental impact arising as the result of our activities, in order to protect our environment and leave a more viable world for future generations, and will endeavor to raise and extend environmental awareness.

For this reason, we undertake:

- ✓ To fulfill all environmental compliance obligations,
- ✓ To include practices that will not cause climate change, protect biodiversity and ecosystems in our processes,
- ✓ To increase the efficiency of our processes, use sustainable resources and decrease our natural resource consumption continuously to leave a more viable environment for future generations,
- ✓ To continuously improve and maintain our environmental performance,
- ✓ To raise environmental awareness among all our employees by organizing continuous training activities.

#### **Environmental Management**

Preserving the balance of nature is an important part of our sustainability strategy. We have established our environmental management system pursuant to our goals

to minimize our environmental footprint and fulfill our assumed responsibility in all our activities. All of our plants operate in accordance with the "ISO 14001 Environmental Management System Standard" and are certified accordingly. Within the framework of our environmental policy, we implement environmental risk assessments for all of our processes in line with our risk-based approach, and take the necessary measures in those fields of activity which we consider to bear risk. We aim to take our performance to the highest level by preparing action plans for our areas open to improvement in light of environmental risk assessments.

Our teams of expert environmental engineers work at our factories for compliance with legal regulations and the monitoring of environmental performance. Periodic performance monitoring is vital for its effective management and continuous improvement. By setting environmental targets annually, we ensure that these targets are extended across all directorates.

We allocate significant investment and expenditure budgets each year to minimize our environmental impact. We organize training activities for our employees and subcontractor employees to strengthen environmental awareness. We realize necessary actions by evaluating environmental notifications from our stakeholders in a timely fashion. We have a very sound internal audit system that allows us to identify our areas for improvement.

No environmental non-compliance has been detected at our company in legal terms during the reporting period.



### **Sustainable Forest Management**

As Kastamonu Entegre, we transform forestry products into economic value, while ensuring that the forests achieve a healthy condition.

Forests contain the earth's most important natural assets, as well as featuring up social and ecological dimensions. It is one of our core responsibilities to ensure the continuity of the forests, and to extend the sheer wealth of this unique beauty to future generations. The key factor in ensuring the continuity of forests is their sustainable management in terms of economic, social and ecological impact.

Like every living creature, trees are born, grow, mature, age and die. At the end of the maintenance activities in forests, those trees that complete their life span (administration period) are rejuvenated in a planned manner by using techniques that vary according to their species and biological structure. The raw materials we use consist of the products obtained during these rejuvenation and maintenance activities that are mandatory for the continuity of the forests. As Kastamonu Entegre, we process these to convert them into an economic value, while ensuring that the forests achieve a healthy balance. Wood products can be recycled when they have completed their life span, whereby wood is a renewable source of raw materials. Since a lack of rejuvenation and maintenance activities in forests will not allow young and healthy trees to grow, this constitutes a risk and hazard to ensuring the continuity of forests and increasing their productivity.

As Kastamonu Entegre, we process these to convert them into an economic value, while ensuring that the forests achieve a healthy balance.



Different applications can be observed in from country to country in terms of forest management. The organization responsible for managing forests in Turkey is the Directorate General of Forestry (OGM). OGM allocates some of the forestry resources in a certain region to companies in proportion to the capacities of facilities in the same region. Other than this, we purchase wood by participating in tenders pertaining to forestry resources in different regions to the extent required by our company. In addition, the by-products (sawdust, lath, cover, etc.) of the wood industry are disposed of in our products and thereby brought into production. The share of these products in total products rose from 13% in 2016 to 17% in 2018.

The company has become a partner to the establishment processes of ENAT A.Ş. (Industrial Tree Agriculture and Industry and Trade Joint Stock Company) aiming to develop industrial forest plantations in Turkey. Established in 2005, Kastamonu Entegre is the second biggest shareholder with a 21.83% stake in ENAT. ENAT, being of great importance in terms of the development of the forestry products industry in Turkey, has determined its key target as enabling the planting of trees on an approximate area of 300 hectares per year, composed of the rapidly growing tree types throughout the country, and ensuring their development and widespread utilization by the private sector. To date, 1.7 million saplings have been planted on an area of 14 thousand acres (approximately as large as 2,000 football fields) and the wood is being supplied to the sector.

ENAT stakeholders aim at better protection of natural forest areas, continuous supply of raw materials in forestry products sector. prevention of erosion and minimization of carbon emissions.

In the Plovdiv region of Bulgaria, we are planning to establish industrial poplar tree plantations on an area of 1,100 decares, which we have leased for a period of 30 years from the municipality legal entity, along the River Evros. It is intended to consider this project. to be initiated in 2019, as a pilot project, and that its achievements be an exemplar that may be extended to all countries.

Contacts are established with representatives of diverse ministries to promote and expand the industrial plantation. Other contacts with ministerial representatives focus on increasing the number of forest protection officers and forest management chiefs, as well as addressing issues related to the improvement of forest roads and infrastructure to increase production efficiency.

Within the framework of our strategy to preserve the balance of nature, we pay regard to the procurement and efficient use of wood as a raw material, and the main input of our production processes from sustainable resources. As per our raw material procurement policy, we supply no raw materials from unregistered sources with high protection values, or from areas where fundamental human rights are violated.

The company, being committed to obtaining wood raw materials from sustainable and renewable sources, has been able to undertake production in accordance with the FSC® (Forest Stewardship Council) chain since 2013. This chain certifies that it is managed sustainably during the period starting from the cutting of the forest assets to their becoming wood-based panels and reaching the end-user in furniture form through a distribution network, and that it is supervised and approved by an independent board. A 3.1-million-hectare portion of the forestry

assets in Turkey, at 22.3 million hectares as per 2018 OGM data, holds FSC® Certification, which corresponds to 17% of total forestry assets. Kastamonu Entegre's domestic plants, namely Gebze, Balıkesir, Kastamonu and Adana and the overseas plants, namely Romania, Bulgaria and Russia hold this certification.

With the 100% recyclable nature of the wood that constitutes the main input of its production as a starting point, Kastamonu Entegre made an important investment in Italy in 2017. Wood-based panel industry in Italy realizes almost all of its production using recycled materials. Upon purchasing the particle board plants belonging to Gruppo Trombini and completing the necessary upgrades at those facilities, Kastamonu Entegre commenced its related production in 2018. At this point, the investment made in recycling is a significant development both in terms of pursuing an environmentally friendly methodology and in creating employment opportunities in a brandnew market and contributing to economic growth. However, the recycling heading is also included in the R&D Structuring Technology Roadmap, which was expanded and centralized in 2018. From this perspective, the company has aimed to allocate a 2 million Turkish lira research budget for recycling and the utilization of internal and external waste in 2019.

According to OGM's 2018 data, the actual use of the wood-based panel industry has amounted to 12.5 million tons. While the portion of this use covered by imports was 3.2 million tons in 2015, it declined by 17% in 2018 to 2.1 million tons. It is anticipated that the share of imports in total use will decline further over the forthcoming years.



Import raw materials are also used from time to time at our Gebze and Adana plants due to the limited forest resources available in those regions and rising production capacities. In this context, Kastamonu USA (KUSA) was established at the beginning of 2016, whereby a chipper unit is available to transform imported wood into chips.

Our facilities take care to supply the wooden raw material they require from the least distance possible. Average distances at our domestic facilities range from 100 km to 225 km. Such distances vary according to the presence of forest in those regions where facilities are located and the required tree type. However, these distances are optimized by evaluating wood raw materials from an integrated perspective in order to reduce both transportation cost and carbon footprint.

Bioenergy and tree-based panel sectors are in competition because they use similar raw

materials in our country as indeed throughout the world. This sector, being encouraged by the state to increase the share of renewable energy in the energy mix of our country, constitutes risk for some parts of the wood-panel sector with the increasing use of wooden raw materials in addition to agricultural wastes. The wooden raw material being converted into a product, when considering the value chain of the wood-based panel sector, is incinerated once thereby completing its life span by generating energy in the bioenergy sector.

Our Raw Material Supply unit regularly participates in the "Forestry and Water Council" organized by the Ministry of Agriculture and Forestry. This event intends for the forest and water resource players of our country to comply with global developments and changes regarding the development of national policy and strategies pertaining



to sustainability management issues. It is ensured that all relevant parties negotiate views and recommendations and take application-oriented decisions for the solution of problems encountered in such issues as structural, legislation, resource management, implementation, monitoring and evaluation. Our Business Planning and Innovation Director is also a member of the Sustainable Forest Industry Advisory Board of the World Agriculture Organization (FAO).

#### **Material Management and Use of Recycled Materials**

We expend significant effort to achieve the highest efficiency level of raw material use and material management. We produce innovative, competitive, high quality, environmental and user-friendly products using sustainable and renewable raw materials.

Any improvements in material management processes contribute to both reducing environmental impacts and operational costs. We have a strict monitoring system regarding the amount of raw materials and consumed materials per product unit, and realize various actions to improve our performance in this area.

Recycling is an issue in which we are highly sensitive. We strive to implement all recycling facilities at our plants. In this regard, we provide trainings to our employees and work to increase the level of awareness.

Our products are recyclable. As mentioned under the title of Sustainable Forest Management, the inclusion of industrial by-products at all our plants and production with 100% recyclable materials at our Italy plant defines our waste management approach

in the procurement process of wooden raw materials. One of the projects to enter the Idea Platform in 2018, and that reached the incubation phase being upon admission to the Acceleration Program, focuses on establishing a business model for furniture recycling in Turkey. As per Waste Management Regulations, a more prioritized method is adopted, rather than generating energy by the disposal or incineration of waste. Additionally, the packaging cartons with our product labels and the rings used to hold the packaging together are made from recycled raw materials.





Meanwhile, we can all do our best in an effort to "reduce - reuse - recycle", although wood is also the only material that is "renewable". It regrows after harvesting. Natural resources such as oil, natural gas, coal, minerals and metals cannot be recycled. 16

Renewable natural resources are those that, after use (harvest), can attain previous natural stock levels through natural growth or renewal processes. These resources are rapidly renewed by ecological cycles or agricultural processes. Therefore, materials and services derived from these sources are not compromised and remain ready and available for future generations. 18

Besides the wood raw material, mainly constituting the bulk of our products, we have also made studies into producing glue, another main component normally produced from fossil resources, from renewable natural alternatives.

## **Efforts Against Climate Change and Energy Management**

Climate change, which has become a global problem, causes adverse effects almost everywhere on our planet, threatening life, biodiversity and socioeconomic systems. Parallel to the Climate Action target, which features among the Sustainable Development Goals, we work with due diligence on carbon and energy management, in full awareness of our responsibility.

As a sector, reducing the amount of CO<sub>2</sub> in the atmosphere by using wood is one of the important contributions we offer nature in combating climate change.



# Wood and CO<sub>2</sub> reduction

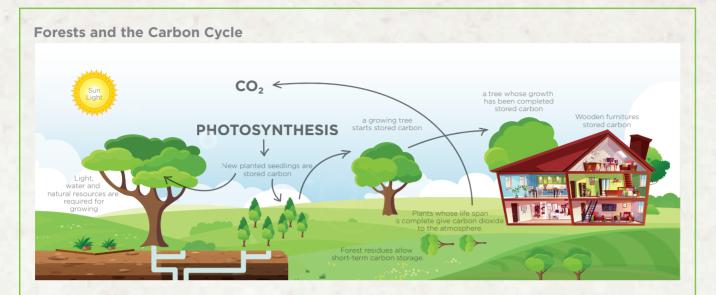
There are two ways to reduce the amount of CO<sub>2</sub> in the atmosphere. Either by reducing emissions or by isolating and storing CO<sub>2</sub> (reducing carbon resources and increasing carbon storages). Wood is a material having the unique ability to do both.



<sup>16</sup> Bill Cook (2008), MSU, "Manufactured wood products are renewable and environmentally friendly"

<sup>17</sup> OECD (2008), Measuring material flows and resource productivity - OECD guide

<sup>18</sup> GRI Standards (2016), GRI 301 - Materials



Forests play an important role in climate change with the bi-directional effect of isolating and storing carbon emissions. Forests, like the oceans, are the most important carbon storages in nature. They store carbon in the atmosphere within themselves and grow accordingly. Wooden products do not continue to absorb carbon dioxide from the atmosphere, but rather. extend the time in which carbon dioxide is removed from it, thereby promoting forest growth, and allowing forests to absorb more carbon.

Through photosynthesis, trees can capture CO<sub>2</sub> in the air and combine it with water from the soil to produce wood, which is the essential organic material.

Growing trees absorb CO<sub>2</sub> and produce O<sub>2</sub>. On average, a typical tree absorbs 1 ton of carbon dioxide per 1 cubic meter of growth through

photosynthesis, while producing equivalent oxygen of 0.7 tons. 19 However, this situation continues until the tree reaches maturity, after which CO<sub>2</sub> storage stops. On the other hand, dead trees begin to give back to the atmosphere what they had previously stored.

From this point of view, the European Confederation of Wood Industrialists states that the sustainable management of forests and the harvesting of trees that have completed their life span will allow the storage of stored carbon dioxide within the product. The wood-based panel industry also supports this cycle as it uses harvested trees as raw materials. Since carbon constitutes half of the chemical structure of wood, thanks to woodbased products, carbon remains in the product without being released.<sup>20,21</sup>

It means that carbon storage and substitution stores 0.9-tons of CO<sub>2</sub> of combined 1 m3 wood and substitutes 1.11 of CO<sub>2</sub>, which makes 2.0 tons of CO<sub>2</sub> in total

Dr. A Frühwald

<sup>19</sup> Edinburgh Center for Carbon Management

<sup>20</sup> CEI Bois: "Tackle Climate Change: Use Wood"

<sup>21</sup> Dr. Arno Frühwald, University of Hamburg

Replacement of Fossil Fuel: When wood cannot be reused or recycled, it can still generate energy through incineration. The energy generated is an efficiently stored solar energy. Wood incineration is a carbonneutral process, since the amount of CO<sub>2</sub> emitted during the incineration process is no more than that previously stored. This issue is well known by the wood industry, which derives 75% of its consumed energy from wood by-products.

**Thermal Efficiency:** The use of wood also helps to save energy during the life span of a building. This is because its cellular structure provides excellent thermal insulation 15 times better than concrete, 100 times better than steel and 1,770 times better than aluminum. A wooden board with a thickness of 2.5 cm has a better thermal resistance than a brick wall with a thickness of 11.5 cm.

Using one cubic meter of wood instead of other construction materials (concrete, block or brick) results in an average of **CO<sub>2</sub>** saving of **0.75** tons against 1 ton.

International Institute for Environment and Development, Using Wood Products to Mitigate Climate Change, 2004.

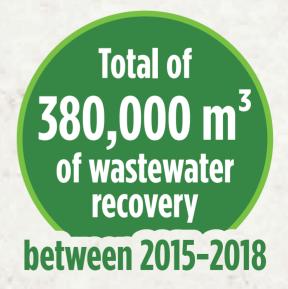
In our opinion, the behavioral attitudes of all our employees towards climate change are important both within and beyond the company. In this context, we ensure all our employees conduct a mission to address this global issue through awareness-raising trainings provided within our Environment and Energy management systems.

#### Good practice example Monitoring chimney emissions

We take care that the fumes emitted by chimneys at our production facilities constantly remains within the limits set by the Ministry of Environment and Urbanization. At our facilities located close to settlement areas, the Provincial Directorate of Environment monitors data simultaneously through the continuous emission measurement system applied to chimneys.

#### **Water Management**

In a world where natural resources are depleting rapidly, we take all our steps with a responsibility for consuming these resources efficiently and consciously. For this reason, we focus on minimizing water consumption in our production processes and on reusing water. We calculate our water consumption per unit product annually in order to follow our performance in this field.





The concept of wastewater recycling is an important issue for our company as part of the objective of reducing natural resource consumption. A total of 380,000 m3 of wastewater was recovered at our domestic facilities in wastewater recovery units between 2015 and 2018. As of 2018, the average annual recovery is 140,000 m<sup>3</sup>, which meets the annual water demand of approximately 1,800 persons. The company aims to recover a total of 1.7 million m<sup>3</sup> of wastewater between 2019 and 2030.

The wastewater generated at our facilities is discharged after treatment within the limits stipulated by legal regulations. At our facilities where chemical and biological treatment systems are in operation, we constantly monitor the performance of these systems and keep them under control.

#### **Carbon Footprint**

In 2015, we started the process of carbon footprint calculation in order to gauge and reduce the direct and indirect impact of our activities on climate change.

At our domestic plants, carbon emissions per unit product are calculated and emission targets are set by taking into consideration the changes in the energy portfolios planned by the plants.

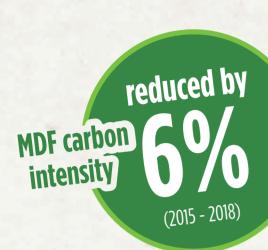
In order to increase value, noncompliant waste wood is converted into environmentally friendly electricity and heat at our biomass power plants, whereby we avoid an annual average of 240,000 tons of CO<sub>2</sub> emissions compared to energy production using natural gas.

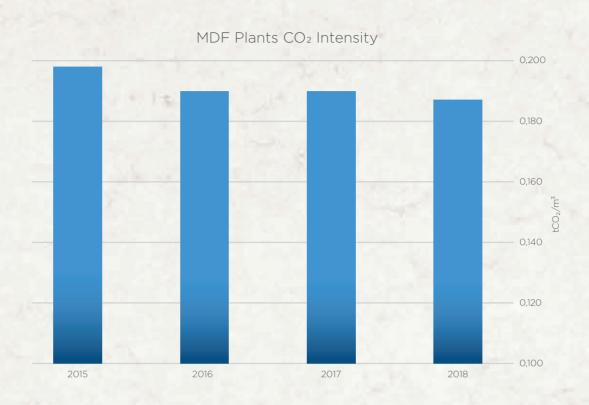
#### Kastamonu Entegre Carbon Footprint

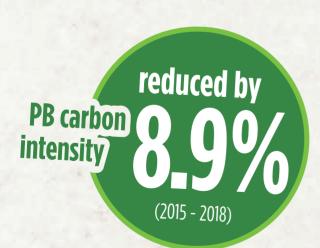


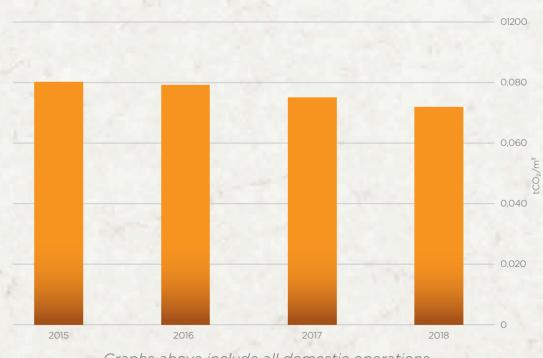
The carbon emission details of domestic plants are given in the table above.











PB Plants CO<sub>2</sub> Intensity

Graphs above include all domestic operations.



#### **Energy Management**

The basis of our energy management approach is set by considering all factors that may affect our energy performance. The Electricity and Energy Systems and Renewable Energy Units under the Technical Directorate coordinate with the energy managers at each of our facilities and carry out studies on the establishment of energyrelated targets and long-term planning.

In order to carry out and monitor our energy efficiency processes conducted by observing all our processes, in accordance with international standards, we introduced the ISO 50001 Energy Management System at all our facilities in 2014 for a sustainable quality of human life and sustainable production.

#### **Energy Policy**

- ✓ To increase energy performance values including energy efficiency and intensity in all processes,
- ✓ To reduce costs by making improvements in all processes in step with energy efficiency.
- ✓ To be the most energy efficient company in the sector by increasing the energy management quality through constant monitoring of developing technologies,
- ✓ To ensure continuous improvement with employees, whose training in and experience of energy efficiency are continuously increased, with a management approach open to communication,
- ✓ To comply with national and international legal obligations on energy management,

- ✓ To take care of the environment by reducing the emission values based on efficiency, while producing and consuming energy,
- ✓ To ensure sustainability in energy by diversifying our fuel types and supply resources.
- ✓ To be traceable by realizing our energy measurement, evaluation and reporting in the most effective manner,
- ✓ To ensure the purchase of energyefficient products, services and designs to improve energy performance, and to allocate budget for necessary improvements,
- ✓ To reduce fossil fuel consumption by increasing production opportunities using renewable energy resources.



Our renewable energy investments are related to both Clean Energy and Responsible Production and Consumption within the UN Sustainable Development Goals. Besides the main raw material forming our product being renewable, we focus on increasing the share of renewables in the energy we use. We monitor all kinds of innovations in this regard and try to take advantage of a wide range of opportunities. Our main renewable energy investments are as follows:

- ORC (Organic Rankine Cycle) Turbine:
   Electricity and heat energy are obtained
   with very low losses (2%) from the ORC
   cycle, which has high energy efficiency.
   The ORC turbine commissioned at our
   Gebze facility at the beginning of 2015, the
   first such facility established in Turkey, has
   received competency (CE) certification.
   The annual power generation of our facility
   is 6.5 million kWh with a thermal input
   power of 6.5 MW.
- **Solar Power Plant:** The solar power plant installed on the roof of our Adana MDF facility was commissioned in March 2016. The panel power of the plant, which comprises 4,356 PV modules, is 1,113 kWp, and it generates an annual 1.4 million kWh of energy.
- Gasification Facility: Our TÜBİTAKTEYDEB project on "Gasification of
  Waste Biomass and Renewable Clean
  Energy Production" has been successfully
  completed, and the project is aimed at
  energy recovery from waste biomass
  generated by our processes. In the project,
  gasification technology has been used
  as an alternative to firing technology,
  and renewable energy generation has
  been achieved by the development of

gasification reactors, the production of synthesis gas and the use of organic cycle (ORC) turbines to generate energy using synthesis gas. With this plant, commissioned in 2017, 20,000 tons of biomass waste generated annually as the result of production is used for energy recovery, while 6.5 million kWh of electrical energy and 43.6 million kWh of thermal energy are also generated..

While the share of renewable energy in our entire energy consumption is 51.6%, this ratio rises to 57% when only direct energy consumption is considered.

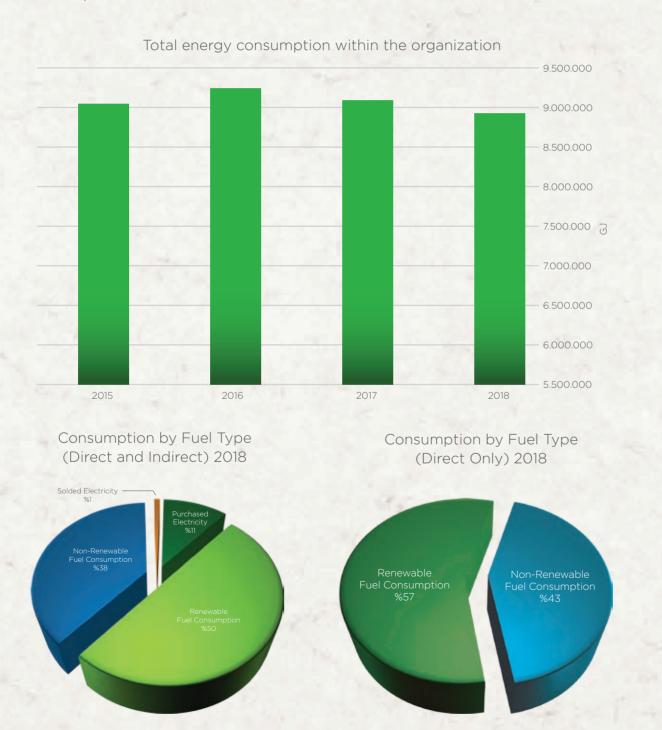




#### **Energy consumption**

The values for energy consumption in 2015, 2016, 2017 and 2018 may be seen below: In 2018, an energy saving of 2.87% was achieved compared to 2015.

While the share of renewable energy in our entire energy consumption is 51.6%, this ratio rises to 57% when only direct energy consumption is considered.



MDF and Particle Board energy intensity

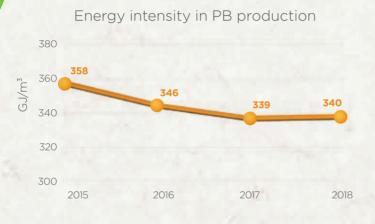
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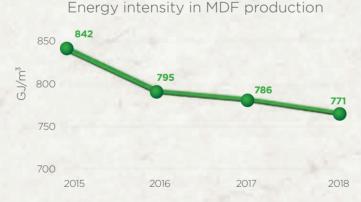
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(2015 - 2018)

#### **Energy intensity**

Energy intensity is calculated on the basis of the ratio of the total energy consumption of the related facility to its total production amount per year. In 2018, the energy density was 340 GJ/m³ for particle board production and 770 GJ/m³ for MDF (fiberboard) production. The high electricity requirement of the unit (refiner), where the defibrating process is performed in the production of fiberboard, causes the density to increase compared to particle board production.





#### **Our Energy Efficiency Studies**

We have carried out numerous energy efficiency processes for the compressors

and compressed air systems of the production lines at all our locations, in both water and hot oil lines with the assistance of pumps, in air lines with the assistance of fans, and also in lighting and compensation systems. Improvements made in heat generation and transfer systems, and in the recovery of waste heat generated during production have played an important role in reducing energy consumption.

We have been producing efficiencyincreasing projects supported by the Turkish Republic Ministry of Energy and Natural Resources General Directorate of Renewable Energy since 2013.

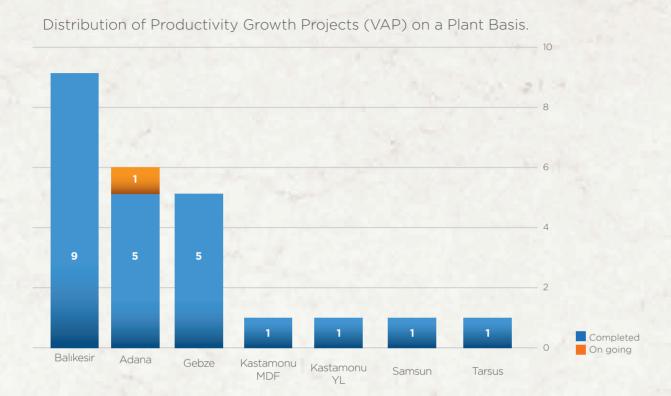
As of the end of 2018, a total of 24 productivity growth projects have been worked on, 23 of which have been completed.<sup>22</sup> Within the scope of these projects, an annual energy saving of 40 million kWh is envisaged.

Some of the productivity growth projects we have implemented at our facilities are as follows:

• Replacement of steam absorption chiller with hot water-operated absorption chiller: Electricity is produced by burning gas of high calorific value at the gasification facility in the ORC turbine of our Gebze plant. During this process, with the procurement of an absorption chiller which operates with hot water to replace the existing steam chiller used for the cooling of hot water, a reduction of vapor consumption is ensured where existing facilities are utilized in the most efficient manner through the use of waste heat. With this project, 5.5 million kWh of energy saving has been achieved.

22 A total of 37 applications were filed by Kastamonu Entegre. Eight of these have been rejected and five have been cancelled.





· Cooling of gas turbine inlet air and panel chambers with absorption chiller:

With this project carried out at our Balikesir facility, a part of the gas turbine exhaust gas and steam from the steam generator (by means of hot oil boiler) are obtained. The gas turbine inlet air and panel chambers were cooled with the heat exchanger and fan-coil units and the cooling water from the existing absorption chiller procured within this project. In other words, by using gas turbine exhaust gas waste heat, the gas turbine inlet air and panel chambers are cooled. In this context, while the waste heat is evaluated, electricity is saved by eliminating the use of electrically operated duct type and split type air conditioners. With this project, a 2.5 million kWh energy saving has been achieved.

Recovery of Heat Discharged from the Hot Oil Boiler By-Pass Line: The hot oil obtained by burning biomass at our Adana facility is used to produce steam both in the process and in the steam generator. The temperature of the smoke fumes emitted by the hot oil boiler is around 350-380°C, and this heat is used for drying the wood chip. When the heat requirement in the dryer unit decreases, some of the hot fume gas emitted by the boiler is discharged into the atmosphere via the by-pass line. With this project, the heat discharged from the bypass line will be recovered and fed into the existing waste heat boiler, and energy production will be increased by boosting the steam production. With this project, a 9.2 million kWh energy saving is achieved.



Another important project of ours worthy of mention in terms of energy efficiency is the replacement of diesel forklifts at all our facilities with electric alternatives. With this change, we both reduce our energy costs and eliminate carbon emissions associated with diesel fuel use. In the project we started at the end of 2015, we replaced 136 diesel forklifts with electric ones within the scope of a related program.

As for the diesel fuel consumptions at Turkish plants, a decrease of 24% in 2016, 85% in 2017 and 94% in 2018 occurred when compared to 2015. This change has led to the release of 3,545 tons less CO<sub>2</sub> over the past three years, with resulting savings of 2.8 million euro.

On the other hand, working with diesel fork-lifts at our workplaces (especially in enclosed areas) means that these areas are adversely affected by exhaust fumes. With electric forklifts, both exhaust fumes and engine noise are eliminated. When the scope of the project is considered, such a transformation in terms of both fuel consumption and occupational health and safety was an important step for our company, as well as for the industry we operate in.

#### **Waste Management**

Our waste management approach is based on reducing, separating, collecting, storing, disposing of and recovering waste at its source, and recycling such waste to the extent possible, and has a structure supportive of a circular economy.

In the first stage, the prevention of waste formation is evaluated, and if not achievable, waste minimization is considered and aimed at. Thereafter, the reuse of waste and if that is not possible either, then its recycling and

energy recovery are aimed at. Wastes that cannot be reduced, reused and recycled are disposed of in accordance with environmental legislation in a manner that does not harm human and environmental health.

In terms of soil and water health, we apply the necessary measures at all our factories to prevent leaks and spills, and have contingency management plans in place for all possibilities. No significant leakage or spillage occurred during the reporting period.

Within the scope of our environmental management system, we provide trainings for all our employees to inform them of our practices related to waste management.

The waste density of our company per unit product is shown in the below graph. The change in these figures is directly affected by studies into increasing the production volume and preventing waste generation.

Biomass waste (sanding dust, bark, etc.) aris-



es at our facilities as the result of our production, and is used as fuel at our plants upon approval by the Ministry of Environment and Urbanization in accordance with the TS EN ISO 17225-1 standard. Therefore, biomass has been excluded from the graphic above.



We cooperate with third-party institutions for the collection of packaging materials (package carton, stretch film, pallet, etc.) that we launch to the market as per the Regulation on the Control of Packaging Waste. Amounts collected for different packaging types are given below by year:

Packaging Type [Documentation Amount (ton/year)]	2015	2016	2017	2018
Paper-Cardboard	1.427,8	2.136,0	1.536,0	577,0
Polyethylene (PE)/Polyamide (PA)	444,8	515,5	408,6	366,3
Wood	260,2	376,7	292,0	505,2

#### **Good practice example:**

#### The recycling of impregnated paper waste in particle board production

Laminated products are produced by pressing papers impregnated with glued resin to the board at a certain temperature and pressure. Waste from impregnated paper occurs during the impregnation of paper and after pressing on the sheet. This results in a certain waste disposal cost. With the project we have implemented, we are treating and recycling these wastes at our particle board plants.

In the waste management hierarchy of EU Waste Legislation, prevention and reduction are monitored in terms of the reuse of waste as a primary option. We generate unavoidable waste in direct proportion to our production. Therefore, by using this waste in another product, we save on both glue and wood, while simultaneously managing our waste using a higher priority option<sup>23</sup>, and by this means we avoid any additional cost. We are currently implementing the project at our Gebze, Adana, Kastamonu MDF and Balikesir facilities. Waste from Adana is recycled at the Tarsus facility and of Kastamonu MDF is recycled at the Kastamonu YL facility. By this means, all our facilities are included within the aforementioned recycling project.

#### Good practice example:

#### Waste gas line from boiler to drying unit at the Samsun Plant

Prior to 2018, the amount of waste gas coming from the energy facility to the Particle board drying facility of our Samsun plant was 2 MW. By adding a fan to the transition pipe of waste gas to drying, the efficiency of the energy plant was increased, and 3 MW of energy was gained in addition to an energy amount of 2 MW. Accordingly, the fuel consumed per 1 m3 of chip in the drying unit has decreased by 20.3% and the amount of ash formed during the year has decreased by about 20%.

#### **Good practice example: Electrostatic Dust Holding Filter**

Electrostatic dust holding filters (WESP) are typically used to control particulate matter emissions with high explosive potential in exhaust gas flows that contain adhesive and condensable hydrocarbon contaminants. With this filter used at our Gebze plant, the particle board drying facility is treated with waste gas at the chimney outlet. The same project has been planned for the Balikesir particle board plant, which is intended to be commissioned in 2019.



<sup>23</sup> In the management of these wastes, options for energy recovery by incineration or burial are available. While there will be harmful gas emissions during incineration, this waste, which will not dissolve in nature for many years, will damage groundwater.

# contribution to society

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ABOUT KASTAMONU ENTEGRE

SUSTAINABILITY APPROACH

PERFORMING OUR DUTY WITH A RESPONSIBLE MANAGEMENT APPROACH

**EMPLOYEE ORIENTATION** 

PRESERVING THE BALANCE OF NATURE

CONTRIBUTION TO SOCIETY

DOCUMENTATION

#### **Community Investment**

Since 1969, the year of our establishment, we have positioned the principle of "being beneficial to society" at the heart of our work. We have integrated our work into the vision, mission, values and all operations with human and social considerations at the core. We have concentrated our social development activities in the fields of education, sports and culture.

#### Culture

As Kastamonu Entegre, we carry out various activities in order to protect all assets we gain from the locations in which we operate, and to pass them onto future generations:

- The book "Tartarica", which holds great importance in terms of Turkish and Tatar history, was translated from Russian to Turkish with the contribution of Kastamonu Entegre. The book, now translated into Turkish for the first time, stands out for being the first publication to comprehensively treat the history and geography of its subject matter.
- We have been the sponsor of the International Rose Festival, celebrated annually in the city of Kazanlik since the establishment of the Bulgaria Factory in 2000.
- Event launch night support was provided in Kastamonu, when it was named the "2018 Turkish World Cultural Capital" by the International Turkish Organization (TURKSOY).

#### Training

We believe that the country and the environment can achieve their highest quality levels with education, as reflected in importance we give to in-house training. We consider it vital for the scientific potential of the university system for it to be transferred to industry and developed into economic value. In this context, we cooperate with universities across diverse fields.

- Within the scope of the TÜBİTAK 2244 Industrial Ph.D. Program, we plan to employ within our company a total of 12 PhD students in cooperation with 4 universities.
- We contribute to the development of the 3rd and 4th year students of universities by including them in our "Long Term Internship Programs" in those countries where our production facilities are located.
- We sponsored the ORENKO 2018 International Forestry Products Congress
   organized by Karadeniz Technical
   University. A presentation was made
   by Kastamonu Entegre at the Industry
   Session of the congress where sector
   problems, proposed solutions and
   scientific studies in the field of forest
   industry were shared regarding the
   current status and future of the sector.
- In the Turkish Engineering Career Fair (TÜMKAF), in which we participate annually, we come together with engineering students, new graduates and experienced engineers alike who seek innovative experiences in their career.



EMPLOYEE ORIENTATION PRESERVING THE BALANCE OF NATUR

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DOCUMENTATION

ARTARICA
ARTARICA

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- We were the sponsor of the 11th National Furniture Design Competition Organized by the Central Anatolia Association for Furniture, Paper and Forestry Products Exporters. Thanks to this contest, primary, secondary, high school and undergraduate students were able to meet designers from both the professional and academic arenas.
- Our company was the silver sponsor of the 14th National Home Furniture Design Contest, which has been organized by MOSDER - Turkish Furniture Industrialists Association since 2005.
- Every year, we continue our efforts to meet the demands and requirements of numerous educational institutions.
- All our production facilities hosted secondary school, high school and university students throughout the year.
   With these activities, students were able to

discover the production processes of the sector and increase their awareness.

#### **Sports**

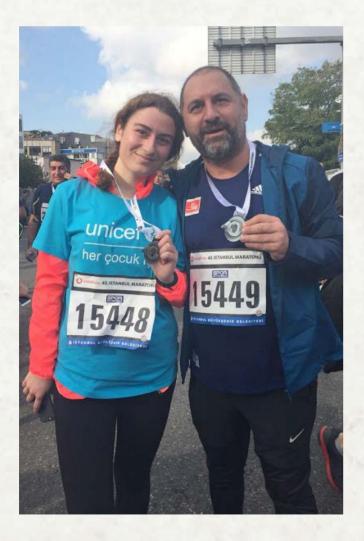
We consider sports to be among the most important elements contributing to the individual and the society, and support successful projects in the sporting arena, particularly in domestic and foreign locations where our production facilities are located.

- The Kiril Methodi High School Volleyball team, sponsored by our side, ranked first in Bulgaria and was entitled to represent Bulgaria in the 2018 World Inter-School Volleyball Tournament (ISF WSC Volleyball 2018 - Czech Republic).
- Within the scope of the "Education for Every Child" project, it participated in the 40th Istanbul Marathon.



• It participated in the 13th Istanbul Half Marathon with the "Koşar Adım LÖSEV" team.

- Fitness centers were opened at the Altunizade Headquarters and Kastamonu Bulgaria offices, allowing employees to exercise regularly.
- We support our employees' sports activities in order to further their individual development.
- · Tournaments have been organized in different locations at the domestic facilities in order to encourage employees to participate in sports and strengthen internal communication.





#### **Social Impact**

- We sponsored the "No to Violence against Women and No to Drugs" panel organized by the Kastamonu People Solidarity Association (KASDER) Şişli, İstanbul Branch.
- A total of 250 employees were supported in becoming homeowners within the Kastamonu Entegre Prestige Residences, constructed for Kastamonu Entegre employees.
- · As part of the Forest Week events, commemorative forests are created in those regions where production facilities are located..





documentation

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ABOUT KASTAMONU ENTEGRE

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DOCUMENTATION

### **Reporting Principles**

#### **Carbon Footprint Calculations**

While calculating the carbon footprint of Kastamonu Entegre production facilities in Turkey, Intergovernmental Panel on Climate Change 2006 (IPCC 2006)<sup>i</sup> Guidelines were adhered to and direct and the indirect emissions of the company were calculated.

The Tier 1 method was used in the calculation and the following steps were followed:

- 1. Determination of annual consolidated fuel amount values consumed by plants
- 2. Finding the carbon emission factor according to the type of fuel/energy consumed
- 3. Determination of carbon emission arising from oxidation and combustion
- 4. Multiplication of the above 3 data sets for the respective consumed fuel/energy type

Formulation of the method in question is;

CO<sub>2</sub> emission = Fuel consumption x Emission factor x Oxidation factor

CO<sub>2</sub> emission: Amount of greenhouse gas (kg CO<sub>2</sub>) depending on fuel type

Fuel consumption: Consumed fuel amount (kg, lt fuel)

Emission factor: The default greenhouse gas (SG)  $CO_2$  emission factor (kg  $CO_2$ /kg fuel) based on fuel type

Oxidation factor: In the Intergovernmental Panel on Climate Change, the oxidation factor is considered and accepted as 1. Since carbon is readily oxidized, it converts to CO<sub>2</sub> and the oxidation factor is considered as 1 based on CO<sub>2</sub>.

The table below shows the emission factors by energy resource. IPCC 2006 Guidelines are taken as the reference for natural gas, diesel oil, coal and methanol. In the calculation of CO<sub>2</sub> emissions arising from electricity consumption, the emission factor calculated by Climate Transparency depending on country conditions has been used instead of IPCC data considering the resources and technology of electricity production in Turkey<sup>ii</sup>.

For biomass, the thermal values of bark and sanding powder were calculated in the first instance based on the article by Uçar, G. dated 1988, whereupon the emission factor in the NCASI 2009 Guideline was used

Energy source	EF Unit	Emission Factor (EF)	Net Calorific Value (TJ/Gg)	Information Source
Diesel	ton CO <sub>2</sub> / TJ	74,1	43	IPCC 2006
Coal	ton CO <sub>2</sub> / TJ	94,6	25,8	IPCC 2006
Natural Gas	ton CO <sub>2</sub> / TJ	56,1	48	IPCC 2006
Methanol	ton CO <sub>2</sub> / ton	0,375	-	IPCC 2006
Electricity	kg CO <sub>2</sub> / kWh	0,497	-	Climate Transparency, 2017
Wood Chips	ton CO <sub>2</sub> / TJ	1,47		NCASI, 2009

i IPCC: Intergovermental Panel on Climate Change



ii https://www.climate-transparency.org/wp-content/uploads/2017/07/B2G2017-Turkey.pdf (Access date: April 2019)

iii Uçar, G., (1988). Possibilities for evaluating wood and forest wastes as resources of energy and chemical substances, IU Faculty of Forestry Journal, series b, Volume: 38, Issue: 1, page 80.

#### **Communication with Stakeholders**

STAKEHOLDER GROUP	COMMUNICATION CHANNEL	FREQUENCY	
Employees	Intranet	Continuous	
	Social Media	Continuous	
	KEAS Global Magazine	Quarterly	
	Announcements	Continuous	
	Employee Loyalty and Satisfaction Survey	Updating	
	Hayat Academy	Continuous	
	Dealer Order System	Continuous	
	Social Media	Continuous	
	Websites	Continuous	
Customers	KEAS Global Magazine	Quarterly	
	Customer Satisfaction Survey	Annually	
	Meetings	Periodically	
	Announcements	Periodically	
Business Partners (Suppliers, Subcontractors, Service Providers, Finance Institutions,	Supplier Entry System	Continuous	
	Social Media	Continuous	
	Websites	Continuous	
Consulting Firms, etc.)	Meetings	Periodically	
	Annual Report	Annually	
	Social Media	Continuous	
Social Stakeholders (Media, NGO and	Marketing Communication Activities	Continuous	
Local Communities)	Websites	Continuous	
	Meetings	Periodically	
	Social Media	Continuous	
	Marketing Communication Activities	Continuous	
Public Institutions	Websites	Continuous	
(Governments, University and	Meetings	Periodically	
Academic Institutions,	Audits	Periodically	
Local Authorities)	Annual Report	Annually	
	Memberships	Biennially	
	Official correspondences	Continuous	



		TC FN ICO 12460 F	TC FN ICO 12460 7	TC FN 12460 1	TC FN ICO 12460 4	ACTM F1777
FREE FORMALDEHYDE LIMITS FOR DIFFERENT COUNTRIES		TS EN ISO 12460-5	TS EN ISO 12460-3	TS EN 12460-1	TS EN ISO 12460-4	ASTM E1333
			TS-EN-717-2	TS-EN-717-1	JIS A 5908+JIS A 1460	ASTM D6006
					AS/NZS1859-1&2	
		Perforator Method	Gas Analysis Method	Chamber Method	Desiccator Method	Large Chamber Method
		mg/100g	mg/m² h	mg/m² air	mg/L	ppm
EUROPE (EN)	E2	≤30				>0,1
	E1	≤8	3,5	0,124	1,5	≤0,1
	EO	2,5 <sub>A</sub>	1,75 <sub>B</sub>	0,062 <sub>B</sub>	0,5	
	Süper E0	1,5 <sub>A</sub>			0,3	
IKEA IOS-MA-0003	PB	4				0,09
	MDF (all thicknesses except flooring)	5				O,11
	MDF (thicknesses ≤8mm used for flooring)	8				0,13
USA (EPA-CARB)	TSCA Title 6					0,09
	TSCA Title 6					0,11
	TSCA Title 6					0,13
JAPAN	F★★	6,5 <sub>A</sub>			≤1,5	~0,143 <sub>C</sub>
	F*** (E0)	2,5 <sub>A</sub>			≤0,5	≤0,055 <sub>c</sub>
	F**** (SEO)	1,5 <sub>A</sub>			≤0,3	≤0,035 <sub>c</sub>
AUSTRALIA	E2				≤4,5	
	E1				≤1,5	
	E1				≤1	
	EO				≤0,5	

A - SUBSPORT Specific Substances Alternatives Assessment - Formaldehyde, 2013 B - TSE EO Information Form C - Alves da Costa N.J. (2013): Adhesive system for low formaldehyde emission wood-based panels. PhD Dissertation, University of Porto





