

ARÇELİK A.Ş. - Climate Change 2018

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Arçelik A.Ş., founded in 1955, has operations in durable consumer goods and electronics sector with production, marketing and after sales services, offers products and services more than 145 countries around the world with its 30,000 employees.

Arçelik has 18 production plants in 7 countries (Turkey, Russia, Romania, China, South Africa, Thailand, Pakistan), sales and marketing companies all over the world with its 11 own brands (Arçelik, Beko, Grundig, Altus, Blomberg, Elektra Bregenz, Arctic, Leisure, Flavel, Defy, Dawlance).

Arçelik management provides its commitment to present future environmental and social issues with its announced vision "Respecting the World, Respected Worldwide".

With a "sustainable development" approach parallel to its vision and UN Sustainable Development Goals, Arçelik aims to develop and market products that are resource and energy efficient technologically innovative in design and easy to use, while also fulfilling its commitment to work on solutions against future threats such as drought, global warming, diminishing natural resources.

Arçelik conducts its business processes in accordance with ISO 14001 Environmental Management System (EMS), which is integrated with ISO 9001 Quality Management System and adopted to Total Quality Approach, since 1994.

In 2010, Arçelik established GHG Management and Reporting System based on continuously improvement principle.

Arçelik calculated the GHG emissions sourced by its facilities in accordance with ISO 14064-1 GHG Standard.

Arçelik's GHG values (Scope 1 and 2) have been audited and verified by an independent body in "100% verification" and "reasonable assurance" level since 2010.

Since 2013 Arçelik's domestic logistics' GHG emissions (Scope 3) have been calculated and verified by an independent body at "limited assurance" level. Arçelik's Scope 3 emissions boundaries have been widened to include domestic, export and import product logistic activities.

In 2012, Arçelik established Energy Management System in more systematic structure by using ISO 50001 Energy Management Standard (EnMS).

Arçelik's EnMS has been audited and certified by an independent body. Arçelik's EMS, EnMS and GHG Management Systems are integrated.

Arçelik's environmentally responsive "sustainable development" approach which is

controlled in all processes from design to product cycle has been achieved as a result of mentioned management systems and its vision.

Arçelik participates in national and international initiatives to combat climate change and achieves practices that set an example for all of its stakeholders, especially regarding the value chain. Pioneering its sector on a global scale in combating against climate change, Arçelik participates in climate conferences and shares its experiences since COP17. Arçelik also participated in the last Climate Change Conference (COP23) at several panels.

Arçelik, a signatory of the Science Based Targets initiative jointly launched by the Carbon Disclosure Project (CDP), United Nations Global Compact (UNGC), World Resources Institute (WRI), and World Wildlife Foundation (WWF), is committed to determine targets for greenhouse gas emission reduction based on scientific evidence and to reduce emissions. Arçelik CEO attended the "Dialogue for Climate Action" event in Vienna, which was launched by the World Bank in order to increase dialogue on this matter.

Parallel to its vision, one of Arçelik's other goals is to prevent consuming of resources. Arçelik focuses to achieve continuous improvement of the products, starting from design stage. In Arçelik, R&D, Industrial Design and Product Development Departments are responsible to conduct technological and product development studies. With these studies Arçelik always achieved to be the "world's mosts and firsts".

E.g AquaDrop - Washing Machine with 5.5-Liter Water Consumption; Highly-Efficient 24 " Dryer (Energy Star efficiency); Highly-Efficient Gas Stove Burners (use 17% less gas than standard burners). The other example of the environmentally friendly product is Arçelik Solar Refrigerator developed for rural regions of South Africa.

10 of Arçelik's production plants achieved a "Platinum" certificate for energy efficiency, Arçelik is the first in its sector.

Arçelik became the only industrial company from Turkey to enter the Dow Jones Sustainability Indices in 2017 in the category of "Emerging Markets". Arçelik received 'AAA' rating, the highest in the MSCI Global Sustainability Index Series and Arçelik is among the companies listed in the BIST SI. Arçelik shares its sustainability approach with its Sustainability Reports. Additionally, in 2017, Arçelik received the "A performance score" in both CDP Climate and CDP Water and entered in the Global A List in both programs, and become one of the 25 companies in the world that achieved this success.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	January 1 2016	December 31 2016	No	<Not Applicable>
Row 2	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 3	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 4	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

C0.3

(C0.3) Select the countries/regions for which you will be supplying data.

Turkey

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

TRY

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Financial control

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Director on board	Arçelik's board level oversight for sustainability&climate change issues belongs to Dr.Fatih Kemal Ebiçlioğlu,a member of Board of Directors.Arçelik Sustainability Council (SC) is responsible for the management of sustainability&climate change issues.SC is comprised of the full executive board,including COO,CFO,Assistant General Manager-Turkey Trade,Finance Director,Strategic Planning Director,Human Resources Director,Customer Services Director,Innovation Director,Corporate Communications Coordinator,Sustainability&Corporate Affairs Director.The head of SC is CFO.CFO reports critical issues regarding studies of SC including climate change to Dr. Fatih Kemal Ebiçlioğlu,a member of Board of Directors,that is why Director on Board has selected as board oversight for climate change issues.Climate change are one of the priority agenda item of Board of Directors' investment&company strategy meetings.Dr.Fatih Kemal Ebiçlioğlu informs the Board of Directors about SC studies on climate change.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	<ul style="list-style-type: none"> Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding business plans Setting performance objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues 	Climate change issues are one of the priority agenda item of Board of Directors' investment and company strategy meetings.

C1.2

(C1.2) Below board-level, provide the highest-level management position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Financial Officer (CFO)	Both assessing and managing climate-related risks and opportunities	Half-yearly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored.

Arçelik's sustainability approach is to consider social, economic, environmental and ethics aspects into its activities, to integrate these aspects into its corporate business targets, to manage its activities in accordance with sustainability principles, corporate policies and strategies. Arçelik assesses sustainability and climate change related risks and opportunities and stakeholder expectations as its main inputs.

(i) The highest level of direct responsibility of sustainability and climate change efforts is CFO, the Head of Sustainability Sustainability Council.

(ii) Arçelik Sustainability Council is comprised of the full executive board, including the COO (Chief Operations (Production&Technology) Officer), CFO, Assistant General Manager - Turkey Trade, Finance Director, Strategic Planning Director, Human Resources Director, Customer Services Director, Innovation Director, Corporate Communications Coordinator, Sustainability and Corporate Affairs Director.

The head of Sustainability Council is CFO and the General Secretariat of the council is Sustainability and Corporate Affairs Director. The Sustainability Council meets biannual. Duties and responsibilities of the Sustainability Council are:

- Specifying the corporate policies and strategies about corporate sustainability principles and climate change
- Following the consolidation of corporate business process with specified sustainability and climate change policies and strategies, provide integration to corporate business targets
- Evaluating corporate risks and opportunities in scope of sustainability principles and policies, make strategic decisions and manage prior risks and opportunities
- Identifying KPIs and targets of sustainability and climate change related issues
- Following the global developments on sustainability and climate change issues, to build the company strategies according to these developments
- Encouraging collaboration with NGOs, public enterprises, universities on sustainability and climate change issues
- Defining the strategic framework and decisions of the external sustainability assessment and rating tools (CDP, MSCI, BIST SI etc.) and follow up the results

The sustainability working groups are established to control and coordinate of the sustainability and climate change implementations. The members of sustainability working groups consist of specialists and/or managers responsible for sustainability issues.

Arçelik Sustainability Working Groups (WG) are; Environmental Coordination WG, Energy Coordination WG, Climate Change Coordination WG, Green Chemistry Coordination WG, Health & Safety Coordination WG, Human Rights & Business Ethics Coordination WG, Value Chain Coordination WG, Sustainability Reporting WG.

These groups report to the Sustainability Council members.

Duties and responsibilities of sustainability working groups are:

- Providing conformity of all activities in sustainability working groups to corporate strategy, policy and sustainability principles.
- Implementing decisions of Sustainability Council.
- Implementing the sustainability as a main strategy in related processes

- Developing and reporting proactive solutions for the companies sustainability and climate change related risks and opportunities, share best practices
- Preparing and/or coordinate action plans for sustainability and climate change targets, follow the progress against targets, reporting performance monitoring and KPI results
- Recommending a roadmap related to sustainability and climate change operational issues
- Prepare and present the reports of external sustainability assessment and rating tools (CDP, MSCI, BIST SI etc.)

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

Yes

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.

Who is entitled to benefit from these incentives?

All employees

Types of incentives

Monetary reward

Activity incentivized

Other, please specify (environment, energy and society projects)

Comment

In order to increase motivation, success and productivity of its employees and to materialize best practices and ensure their dissemination; Arçelik evaluates, rewards and ensures promotion within the company to all success, invention and suggestions that provide benefit. In this context, since 2005 Human Resources Dept. of Arçelik has been implementing an "Pyramid Climbers Awards" annually, All employees who are successful are encouraged and rewarded. One category of this award process is "Environment and Society Contributors". Projects nominated in this category are evaluated and concluded according to the following performance indicators: 1. to produce higher efficient solutions and/or products that reduce greenhouse gas emissions with spending less energy and source by environmentally friendly activities. 2. to develop projects that would contribute to the society lived and worked in with the perspective of social responsibility. 3. to set an example in/out of company with studies and make an effort for sustainability and dissemination of studies. Environmentally friendly activities for product and production with energy efficiency projects are evaluated under this reward process. Rewardable projects and solutions are announced within the company and the project owners are rewarded in "Pyramid Climbers Award Ceremony" which is held in October annually.

Arçelik develops environmental friendly, innovative and technological products which increase life standards of customers with R&D employees. R&D Department collects creative and innovative ideas of employees through a suggestion system called "Inter", an evaluation board evaluates suggestions and projects design opportunity is created for ideas that may be transformed into a product. In the name of encouraging employees for creativity, to ensure announcement of creative ideas within the company and to reward owners of such ideas "Invention Award Ceremony" is organized on World Patent Day (on April) every year. By using TPM tools, our white and blue collar employees develop projects on subjects like environment, energy and climate change and such projects are identified at individual performance target cards of employees. Employees receive individual performance points in consideration of TPM activities they perform and they are rewarded at year end in response to these points by using tools like situational reward.

Who is entitled to benefit from these incentives?

Chief Financial Officer (CFO)

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Energy Reduction Ratio (thus carbon emissions reduction) KPI is the part of the CFO's performance evaluation.

Who is entitled to benefit from these incentives?

Chief Operating Officer (COO)

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Energy Reduction Ratio (thus carbon emissions reduction) KPI is the part of the COO's performance evaluation.

Who is entitled to benefit from these incentives?

Other, please specify (Energy and Environment Managers)

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Energy Reduction Ratio (thus carbon emissions reduction) KPI is the part of the Energy and Environment Managers' performance evaluation.

Who is entitled to benefit from these incentives?

Other, please specify (White and blue collar employees)

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Energy Reduction Ratio (thus carbon emissions reduction) KPI is the part of related employees' performance evaluation.

Who is entitled to benefit from these incentives?

Other, please specify (Sustainability&Corporate Affairs Dir.)

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Energy Reduction Ratio (thus carbon emissions reduction) KPI is the part of the Sustainability and Corporate Affairs Director's performance evaluation.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	0	3	
Medium-term	3	10	
Long-term	10	30	

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	In Arçelik, Risk Management System is an integrated multi-disciplinary process. Strategic, operational, physical, financial, reputational and environmental risks and opportunities are covered in Arçelik Risk Management System, to the fulfillment of the short and long term goals. Sustainability Council evaluates corporate risks and opportunities related to climate change. Corporate climate change risks & opportunities are presented by the Sustainability Council to Risk Management Committee for providing the integrity of corporate main risks. Risk Management Committee is formed to carry out its activities by making recommendations to the Board of Directors concerning determination and evaluation of risks & opportunities, estimation of their impacts to company level, management of these risks, their consideration in decision-making mechanism, and establishment of effective internal control systems. In this context, the Risk Management Committee meets 6 times in a year to monitor and assess the risks.

C2.2b

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

In Arçelik, company level risks are mainly strategic and reputational risks which impact the whole company and stakeholders. Asset level risks are mainly operational, financial, physical and environmental risks which effect especially production plants, sales, purchasing, distribution and production engineering departments. Climate

Change Coordination WG identifies the climate change (CC) related risks and opportunities at asset level and reports to Sustainability Council.

Sustainability Council evaluates and prioritizes asset level corporate risks and opportunities. Company level risks and opportunities are identified by Sustainability Council by considering defined asset level risks. The management process of CC risks and opportunities are defined in Sustainability Management Procedure. Risk and opportunity identification, determination and prioritization methods have been defined and published in the "Arçelik Enterprise Risk Management Governance Manual".

CC related risks and opportunities are being scored and prioritized by the Sustainability Council. Defined and prioritized risks and opportunities are notified to the Risk Management Committee. Risk Management Committee integrates the CC related risks and opportunities into the main risks and opportunities of the company. Risk Management Committee meets 6 times in a year to monitor and assess the risks. Prioritized risk and opportunity results are monitored and assessed by the Board of Directors. Arçelik Sustainability Council members are the top level responsible of business processes. Related Department Managers develop proactive solutions to handle risks and opportunities and integrate into the business procedures. Plant Directors are responsible to monitor and ensure that the risks are under control and opportunities are being assessed.

In each year CC risks and opportunities are being assessed and audited by the internal and external integrated systems' (ISO 14001&50001&14064-1) audit experts in site audits. According to Arçelik's risk and opportunity scoring methodology.

The risks and opportunities are scored (1-5 points) considering financial, reputation, production, operational, human and legal impacts and the max score is defined as impact point. All risks are evaluated according to impact and frequency criteria. For scoring financial impact, Arçelik risk tolerance level should be considered. Risk tolerance can be defined as an appropriate level of financial loss that does not have a significant impact on the company. In Arçelik the substantive financial impact is related with Arçelik risk tolerance level and is defined according to financial loss before tax. Less than 750 K Euro is not considered as substantive financial impact.

The frequency of the risks and opportunities are also scored (1-5 points). The risk (R) and opportunity (O) points are scored by multiplying frequency (F) and impact point (I) for prioritization ($R, O = F * I$).

E.g. some of the high potential risks can be found below:

Risk1: International agreements, legal legislations, air emission and climate change limitations

Risk factor1: Additional investment need; Needs for using Best Available Technology (BAT); Energy cost increases; National GHG mitigation target; Necessity for buying Carbon credits

Risk2: Responsibilities of Emission Reporting

Risk factor2: Failure to obtain GHG emission factors from energy suppliers

Risk3: Product labelling regulations and standards

Risk factor3: Inability to capture the competition of using voluntary labels (water label, carbon label, eco-label etc.) except energy

E.g. one of the high potential opportunities can be found below:

Opportunity1: International agreements, legal legislations, air emission and climate change limitations

Opportunity Factor1: Voluntary reporting of GHG emissions

GHG emissions (Scope 1&2) are being verified voluntarily by an independent body since 2010. Since 2013 Arçelik's product logistics' GHG emissions (Scope 3) have been calculated and verified by an independent body.

C2.2c

(C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	In scope of "The Regulation on Monitoring of GHG Emissions" entered into force with publication in Official Journal, dated 25 April 2012 and no. 28274, approved GHG emission reports to be prepared and sent to the Ministry of Environment and Urbanization every year. Under this regulation, first reporting obligation period for industry will be started in 2017 for GHG emissions of 2015 and 2016. 3 of Arçelik Production Plants (Washing machine, Refrigerator, Electronics) are in the scope of this regulation and they sent their GHG Monitoring Plan to the Ministry. This plans are approved by the Ministry. In 2017, Arçelik 2015 and 2016 GHG report will be audited and verified by the licenced auditor company. To manage the risk, Arçelik has calculated greenhouse gas emissions released during its activities since 2006. In 2010, ARÇELIK established Greenhouse Gas (GHG) Management and Reporting System, before the regulation publish date. ARÇELIK calculated the Greenhouse Gas (GHG) emissions sourced by its facilities by using IPCC-2006 and in accordance with ISO 14064 GHG Standard. Since 2010, ARÇELIK's GHG values have been audited and verified by an independent body in "100% verification" and "reasonable assurance" level. In addition Arçelik's related plants (which are in scope of regulation) has prepared the monitoring plan for GHG. And they renewed their systems in accordance with Turkish GHG Regulation.
Emerging regulation	Relevant, always included	Turkey became a party to Kyoto Protocol on 26 August 2009. Turkey was not included in Protocol Annex-B list which contains Annex-I signatory countries. Accordingly, Turkey has no numerical limit or reduction target in first obligation phase which covers 2008 to 2012 of the Protocol. However, in Paris COP21, Turkey signed the Paris Agreement and submit its INDC plan to the UN Secretariat. According to the INDC, Turkey's target is to reduce 21% of its emissions according to business as usual scenario by 2030. But this target has not been allocated to the sectors. For this reason the financial implications that would become from the mitigation costs cannot be estimated and calculated. This is a grey area for Turkey and our sector. To manage the risk, we have energy efficiency targets annually and Arçelik has determined its GHG emission target as Net Zero Emission. Arçelik SC contributes this targets every year for increasing energy efficiency in production and using electricity produced by renewable energy sources (RES) to reduce GHG. With energy efficiency projects in Arçelik Production Plants at last 7 years (2010-2016), we have saved nearly 500000 GJ energy with 890 projects. Totally; 51976 tCO2e emissions has been reduced since 2010. Arçelik, starting from 2012, has been using electricity produced from RES. The supply rate of electricity generated from RES, which was realized approximately as 1% in 2012, 28% in 2013, 78% in 2014, and 82% in 2015, was increased to 88% in 2016.

	Relevance & inclusion	Please explain
Technology	Relevant, always included	<p>For the post 2012 period, Turkey has been signed the Paris Agreement in COP21 and submitted its INDC plan which includes the reduction target to the UN Secretariat. But it is still not clarified that how this target is distributed to sectors. In case of designation of a reduction target, companies would be required to adapt in a short period of time and fully comply with targets. In order to be ready to this, requirements to implement additional operational activities and/or BAT (Best Available Technologies) will arise; additional cost and investments shall be required. If sector/company target may not be achieved, requirement for carbon purchase will arise; this would affect costs significantly in turn. This may cause impact on company share certificates before investors. When it is needed to reflect operational and investment cost increase to product price, we may have disadvantage in competition. To manage this risk, most of the production processes of Arçelik production plants comply with IPPC and BAT documents. Nanotechnology product is using in the production. Integration process for introducing "Environmentally Friendly Nanotechnology Product" has been using for the entire plants to reduce the use of pre-treatment chemicals and energy during the surface finishing before the implementation of sheet piece powder coating. Thanks to this product, the related process is completed at 25 oC instead of 50-55 oC hence a significant level of energy is saved while the process also no longer produces any phosphate sludge. As an example; in our dishwasher plant nanotechnology surface treatment process is being used in production process since 2012. This technology provides less natural gas consumption (35053 m³/year reduction) and less GHG emission emitting (70 tCO₂e/year reduction). Thanks to this transition dishwasher plant has been selected as "Best Available Technology (BAT) using plant" by T.R. Ministry of Environment and Urbanization. In addition, powder die coating transition has been implemented in Arçelik plants. And this transition reduced VOC (volatile organic compound).</p>
Legal	Relevant, always included	<p>Besides uncertainties regarding reduction of greenhouse gas emissions, another subject that may cause problem at international competition is legal requirements related to energy. Operational costs are directly impacted by the variable prices in the world. The energy prices are being dependent on the global changes since Turkey is foreign-dependent in energy, intensification of general tax approach on energy sources, electricity generation from renewable energy sources is not at adequate level. With new legal requirements, it is highly probable that electricity and natural gas costs increase to extend that may cause problem in competition. To manage risk, energy consumption quantity per product is followed in "kWh/product", "m³/product" and reported. In the light of data, obtained projections are made and long term targets are determined. We determine the energy consumption levels at all the stages of our production processes, we query energy efficiency through periodical analyses, we identify areas open to improvement, and we design and realize projects that will increase energy efficiency in production. In addition to that, developments regarding renewable energy are closely followed; operations are carried out to include this subject into prospective business plans.</p>
Market	Relevant, always included	<p>We have 2 cogeneration systems with 6.3 MW capacities of each in Eskişehir and Çayırova plants. They have been working for approximately 23 years with total efficiency of 78.2%. Their electricity efficiency is nearly 40.3% and heat efficiency is nearly 37.9%. We use natural gas and fuel-oil as well for primary fuels. We use the produced electricity and heat in our factories. Because the capacities are lower than the requirements. That's why we purchase electricity from the grid too. It is possible to invest on new more efficient cogeneration systems or modernisation. But for both of the case the risk is natural gas price and supply. Price of natural gas has been increased too much in previous years especially according to increase on exchange rate of \$/TL. And because Turkey is energy dependent on natural gas, supply is affected from political situation and it seems there is a risk for investing on natural gas based power plants. To manage this risk, we are working on possible cogeneration investments with purchasing, finance and strategic planning departments We are trying to estimate possible natural gas unit price for further years. There is no cost to work on the possible cogeneration investments.</p>

	Relevance & inclusion	Please explain
Reputation	Relevant, always included	We aware that our environmental-friendly products and production activities turn the reputational risk to opportunity to increase our brand value and we perform our activities in accordance with this opportunity and also we focus on UN SDG. We share our sustainability activities through our sustainability reports with our stakeholders. According to a study conducted by Harvard Business School by reviewing 180 companies, long term market share and share certificate value of companies having high sustainability performances and reporting them increase in comparison with those with low sustainability performance and such companies draw attention of investors. In this scope, all activities concerning environment including also activities performed in connection with climate change are deemed as an opportunity financially. Environmental production and environment friendly products are the main elements of Arçelik's sustainability management. E.g. for environmentally friendly products: AquaDrop - Washing Machine with 5.5-Liter Water Consumption; Highly-Efficient 24 " Dryer (Energy Star efficiency); Highly-Efficient Gas Stove Burners (use 17% less gas than standard burners). The other example of the environmentally friendly product is Arçelik Solar Refrigerator developed for rural regions of South Africa.
Acute physical	Relevant, always included	Important effects of climate change include more arid climate, fall in precipitation quantities, increase in forest fires, decrease in agricultural yield, exhaustion of surface waters, floods, loss of plant species and dissemination of invasive species. Globally, much more extreme and variable weather conditions are anticipated. It is also anticipated that more floods will occur due to increasing storms and rises at sea levels and this constitutes risk for our plants in particular which have stream beds nearby. By handling such circumstances as emergency, emergency drills are conducted; emergency action plans are prepared and implemented. This is a factor that may increase our operational costs too. Another action to manage this risk, our products are manufactured more than one location, South Africa, Russia, Romania, China, Thailand etc. Because production of all of the products only in one location is very precarious. Because when a natural disaster is happened in this location, it is impossible to continue manufacturing.
Chronic physical	Relevant, always included	Gradual increase of concentration of gases causing greenhouse effect in atmosphere causes the world to warm more than normal and climate changes. Sea levels increase because of melting glaciers due to temperature rise; on the other hand some parts of Antarctica get colder. Important effects of climate change include more arid climate, fall in precipitation quantities, increase in forest fires, decrease in agricultural yield, exhaustion of surface waters, floods, loss of plant species and dissemination of invasive species. It is anticipated that while precipitation quantities will increase in coastal regions, aridity will arise at internal regions because of hot weather, more floods will occur due to increasing storms and rises at sea levels. A 2°C temperature increase globally will have many significant impacts on Mediterranean Basin which also includes Turkey. If global temperature increase reaches 2°C, Mediterranean climate will get warmer, aridity will be felt at extensive lands and there will be changes in climate. While general temperature rise in the region reaches to 1-2°C, this rise may reach to 5°C at Turkey's internal regions which are away from alleviating impact of sea. Such temperature changes will cause sudden and important changes at costs of energy spent for heating and cooling systems of plants in particular, and affect operational and investment costs. To manage this risk, changes and mean temperature and related risks/emergencies are considered in new investments including facility location choices.

	Relevance & inclusion	Please explain
Upstream	Not relevant, explanation provided	In consideration of Arçelik product life cycle assessment, upstream GHG emissions is not critical for Arçelik's production activities (95-96% consumer use, <4% production and raw material supply, <0.1% product logistics). However, as Arçelik, we request from our suppliers to monitor their own energy consumption, to implement measures to reduce energy consumption and meet our requirements regarding these activities. We have planned external party audits for our suppliers to monitor their environmental management implementations (including water/energy management as well). In addition, we are studying of green procurement policy and sustainable supplier system, and as a part of these studies GHG management is an essential requirement. We have developed a special award ceremony to encourage our suppliers' environmental management implementations. In addition, Arçelik selects and purchases multiple components to prevent the risks of all supply chain. Because of these reasons upstream activities are not considered in our climate risk assessment. However, in order to improve the environmental performance of our suppliers, we make suggestions on site visits and follow up their environmental studies.
Downstream	Relevant, always included	In consideration of Arçelik product life cycle assessment, GHG emission emitted during to use of the products is more higher (95-96% consumer use, <4% production and raw material supply, <0.1% product logistics). Because of this reason product use is an important step in our downstream activities for risk assessment. Therefore, R&D carries out studies on product energy efficiency development. Thus most the energy using household products that are of the most energy efficiency class(es) on the energy label are considered low carbon and climate-friendly solutions. Another risky point in downstream activities is Waste Electrical and Electronic Equipment. According to Turkish Regulation on the Control of Waste Electrical and Electronic Equipment, producers are responsible for financing the costs of the collection, treatment, recovery and environmentally sound disposal of WEEE from private households after collection points and distributors. To manage this risk Arçelik established 2 treatment plants to recycle WEEEs. Refrigerators and other cooling appliances contains Chlorofluorocarbons (CFCs) are being environmentally recycled. Buy-back campaigns are being organized to collect the old appliances. The goal of campaigns is transforming the old refrigerators and other old cooling appliances with the newer (with low GWP gas and more energy efficient product). Operations of these two plants provided savings that amounted to 108.3 GWh and CO2e reductions to 54,000 tonnes. The amount of savings equals the total annual energy production of seventeen wind turbines of 2.5 MW combined. Additionally, in this context of downstream activities, greenhouse gas emissions generated by domestic, import and export logistics operations of Arçelik products are calculated in accordance with ISO 14064-1 standard, and verified by an independent accredited institution. The greenhouse gas emissions generated in 2016 by domestic, export and import logistics operations amounted to 134,574 CO2e. Although the distance covered by logistics operations increased by 4.16%, greenhouse gas emissions in 2016 decreased by 0.32% compared to the year 2015 (base year) thanks to the improvement activities carried out within the scope of product logistics.

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Arçelik defines the risk as; threats to prevent reaching goals or opportunities that cannot be developed for achieving goals. Risk management covers opportunities as well as threats. Climate Change Coordination WG is responsible to identification of the climate

change(CC) related R&O at asset level and reports to SC. Company level R&O are identified by SC by considering defined asset level risks. Both asset and company level CC R&O are being scored and prioritized by SC. Prioritized R&O are notified to the Risk Management Committee(RMC). RMC integrates the CC related R&O into the main R&O of the company. Related Department Managers develop action plans and proactive solutions to handle R&O and integrate into the business procedures. Plant Directors are responsible to ensure that the risks are under control and opportunities are being assessed.

E.g. physical R&O: Production of all of the products only in one location is very precarious because when a natural disaster is happened in this location, it is impossible to continue manufacturing. To manage this risk, our products are manufactured more than one location/country. To turn this risk to opportunity we contribute to development of countries where we invest e.g. in South Africa we developed Solar Refrigerator for rural regions that lack electricity.

E.g. transitional R&O: According to Turkish Regulation on the Control of WEEE, producers are responsible for financing the costs of the collection, treatment, recovery and environmentally disposal of WEEE from private households. To manage this risk Arçelik established 2 treatment plants to recycle WEEEs. To turn this risk to opportunity, concerning increase demand of consumers' changing buying behaviour towards energy efficient products a turn-back campaign has been started across Turkey for the purpose of collecting WEEEs and reintroducing them to the nature and national economy. In scope of this campaign old technology less efficient households are changed with new technology products. Operations of these two plants provided savings that amounted to 108.3 GWh and CO2e reductions to 54,000 tonnes. The amount of savings equals the total annual energy production of seventeen wind turbines of 2.5 MW combined.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

Type of financial impact driver

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Turkey has no numerical limit or reduction target in first obligation phase which covers 2008 to 2012 of the Protocol. However, in Paris COP21, Turkey signed the Paris Agreement and submit its INDC plan to the UN Secretariat. According to the INDC, Turkey's target is to reduce 21% of its emissions according to business as usual scenario by 2030. Method of GHG reduction has not been identified yet. It is under progress. But it is anticipated that there will be carbon tax. In this context, it is deduced that the targets or taxes will be related to energy efficiency projects and the possible use of renewable energy resources. The INDC mainly focuses on increasing the use of solar, wind, hydroelectric, nuclear energy and increase of cogeneration plants in scope of energy. In addition it has also focused on financial incentives on energy efficiency projects. In this context it is deduced that the targets will be related to energy efficiency projects and the possible use of renewable energy resources. Because of this reason renewable energy usage and energy efficiency investment requirements will need to be increased. Companies may need to buy electricity from renewable sources with higher prices. Energy efficiency projects and carbon credit purchasing needs will be increased and thus costs are increased. There will be necessity for the investment to decrease GHG. This will cause significant increase in costs. Nonetheless, if the sectors may not reach the given targets, carbon purchase necessity may occur and costs would be affected significantly. Because of the cost increase product prices may be affected and there can be disadvantage in competition. To manage this possible obligation, Arçelik has energy efficiency targets annually and Arçelik has determined its GHG emission target as Net Zero Emission in production by 2025. Arçelik SC contributes this targets every year for increasing energy efficiency in production and using electricity produced by renewable energy sources (RES) to reduce GHG. With energy efficiency projects in Arçelik Production Plants at last 7 years (2010-2016), totally; 51976 tCO₂e emissions has been reduced since 2010. Arçelik, starting from 2012, has been using electricity produced from RES. The supply rate of electricity generated from RES, was increased to 88% in 2016.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium

Potential financial impact

600000000

Explanation of financial impact

There is a mitigation target in Turkey Pledge reported in UNFCCC technical paper. But this target has not been allocated to the sectors. For this reason the financial implications that would become from the mitigation costs cannot be estimated and calculated. This is a grey area for Turkey and our sector. To manage the risk, we have energy efficiency targets annually. The estimated financial implication (investments and costs) of the energy efficiency target is 23,523,378TL (for 2010-2016). Arçelik, starting from 2012, has been using electricity produced from RES. The supply rate of electricity generated from RES, which was realized approximately as 1% in 2012, 28% in 2013, 78% in 2014, and 82% in 2015, was increased to 88% in 2016. To produce our green electricity from our own renewable energy plants we have to invest 4 Million TL for each MW. For whole Arçelik plants in Turkey 150 MW peak and nearly 600 Million TL investment needed.

Management method

To manage the risk, we have energy efficiency targets annually and Arçelik has determined its GHG emission target as Net Zero Emission in production. Arçelik SC contributes this targets every year for increasing energy efficiency in production and using electricity produced by renewable energy sources (RES) to reduce GHG. With energy efficiency projects in Arçelik Production Plants at last 7 years (2010-2016), we have saved nearly 500000 GJ energy with 890 projects. Totally; 51976 tCO₂e emission has been reduced since 2010. Arçelik, starting from 2012, has been using electricity produced from RES. The supply rate of electricity generated from RES, which was realized approximately as 1% in 2012, 28% in 2013, 78% in 2014, and 82% in 2015, was increased to 88% in 2016. Investments and costs of energy efficiency projects (2010-2016): 23,523,378 TL. In 2016 we have also spent approx. 42 million TL for purchased electricity generated from renewable energy sources. Totally we spent 65,523,378 TL for energy efficiency projects & green electricity supply.

Cost of management

65523378

Comment

Investments and costs of energy efficiency projects (2010-2016): 23,523,378 TL. In 2016 we have also spent approx. 42 million TL for purchased electricity generated from renewable energy sources. Totally we spent 65,523,378 TL for energy efficiency projects & green electricity supply.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Enhanced emissions-reporting obligations

Type of financial impact driver

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Approved GHG emission reports to be prepared and sent to the Ministry every year under "The Regulation on Monitoring of GHG Emissions" which was prepared by T.R. Ministry of Environment and Urban Planning and entered into force with publication in Official Journal, dated 25 April 2012 and no. 28274, contains calculating and verifying of GHG emissions and GHG monitoring plans. Under the regulation, first reporting obligation period for industry will start in 2017 for GHG emissions of 2015 and 2016. 3 of Arçelik Production Plants (Washing machine, Refrigerator, Electronics) are in the scope of this regulation and they sent their GHG Monitoring Plan to the Ministry. This plans are approved by the Ministry. In 2017, Arçelik 2015 and 2016 GHG report will be audited and verified by the licenced auditor company. Arçelik has calculated greenhouse gas emissions released during its activities since 2006. In 2010, ARÇELIK established Greenhouse Gas (GHG) Management and Reporting System, before the regulation publish date. ARÇELIK calculated the Greenhouse Gas (GHG) emissions sourced by its facilities by using IPCC-2006 and in accordance with ISO 14064 GHG Standard. Since 2010, Arçelik's GHG values have been audited and verified by an independent body in "100% verification" and "reasonable assurance" level. The scope of this verification is Arçelik's all production plants in Turkey and Head Office. Arçelik shares the GHG emissions with all stakeholders through Sustainability Reports. However, for our ISO 14064 verification process there is no emission factor declared by the ministry for electricity. But this is important tool for ISO 14064-1, because declaration of the indirect emission in Sustainability Report. And this information can be compared with the competition. This causes uncertainties and differences (calculation results, acceptances etc.).

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium

Potential financial impact

50000

Explanation of financial impact

ISO 14064 GHG Emission Inventory Verification is an continuous process for Arçelik in yearly basis. The verification for the Ministry will start at 2017. Total estimated financial implication for both ISO 14064 & Ministry verification process and training are may be 50,000 TL for the verification period of 2015-2016.

Management method

To manage the risk, Arçelik has calculated greenhouse gas emissions released during its activities since 2006. In 2010, ARÇELIK established Greenhouse Gas (GHG) Management and Reporting System, before the regulation publish date. ARÇELIK calculated the Greenhouse Gas (GHG) emissions sourced by its facilities by using IPCC-2006 and in accordance with ISO 14064 GHG Standard. Since 2010, ARÇELIK's GHG values have been audited and verified by an independent body in "100% verification" and "reasonable assurance" level. The scope of this verification is Arçelik's all production plants in Turkey and Head Office. In addition Arçelik's related plants (which are in scope of regulation) has

prepared the monitoring plan for GHG. And they renewed their systems in accordance with Turkish GHG Regulation. The total cost of the verification for GHG ISO 14064 is 30,000 TL in 2016.

Cost of management

30000

Comment

The total cost of the verification for GHG ISO 14064 is 30,000 TL in 2016.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Market: Uncertainty in market signals

Type of financial impact driver

Market: Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment)

Company- specific description

Besides uncertainties regarding calculation and reduction of greenhouse gas emissions, another subject that may cause problem at international competition is legal requirements related to energy. Operational costs are directly impacted by the variable prices in the world. The energy prices are being dependent on the global changes since Turkey is foreign-dependent in energy, intensification of general tax approach on energy sources, electricity generation from renewable energy sources is not at adequate level. With new legal regulations, it is highly probable that electricity and natural gas costs increase to extend that may cause problem in competition.

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Medium

Potential financial impact

920000

Explanation of financial impact

For the last 10 years, electricity unit price has increased by an average of 7% per year. But in 2016, there are no significant changes in the prices. Between 2015-2016 electricity price increased 2%. Total extra cost sourced by price increases in electricity is approx. 920,000 TL.

Management method

To manage risk, energy consumption quantity per product is followed in "kWh/product", "m3/product" and reported. In the light of data, obtained projections are made and long term targets are determined. We determine the energy consumption levels at all the stages of our production processes, we query energy efficiency through periodical analyses, we identify areas open to improvement, and we design and realize projects that will increase energy efficiency in production. We applied approximately 173 energy efficiency projects in 2016 and have spent approximately 3,8 M TL. In addition to that, developments regarding renewable energy are closely followed; operations are carried out to include this subject into prospective business plans. In Eskişehir Plant we are planning to invest on 450 kWp solar PV system in 2019. All legal authorization process has been completed. The approx. cost of this investment 2.6 million TL. On the other hand, we are constructing a new factory in Romania. This new plant, which is built with the building management system, smart building concept, LEED Platinum certificate and the most energy efficient machines and equipment, will also have 930 kWp solar PV and 750 kW CSP systems.

Cost of management

3800000

Comment

We invested approximately 3.8 million TL to energy efficiency projects during reporting year.

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Technology: Substitution of existing products and services with lower emissions options

Type of financial impact driver

Technology: Research and development (R&D) expenditures in new and alternative technologies

Company- specific description

New EU energy labelling framework regulation has entered into force and product specific regulations are expected to enter into force for refrigerators, washing machines, TVs and dishwashers by 1st quarter of 2020. Such analysis led by the EU Commission showed the current energy label does not fully meet the technological advancement of today. Technological development has exceeded the limits of current energy label and top energy efficient class on the label has already become common in the market. Thus EU Commission has started to work on new energy label layouts along with calculation methods of energy efficiency index. Besides, the performance test standard for measuring energy consumption of refrigerating appliances has been revised. A new measurement methodology is going to be published for refrigerating appliances and

dishwashers in the EU. They are going to be effective with the introduction of new energy label. R&D test methodologies and product designs are to be updated accordingly. New label will introduce downgrading of current energy efficiency classes. A+++ of today will become C, D or E based on energy consumption of products. This will eventually cause manufacturers to design more efficient appliances to meet consumer demands towards higher energy efficient products. Performance standards for washing machines and washer dryers are also in revision process.

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Medium

Potential financial impact

45000000

Explanation of financial impact

To be complied with the regulations, Arçelik have budget for environmentally friendly R&D activities about 45 million TL for 2016.

Management method

Arçelik closely follows the new EU energy labelling and ecodesign legislations through CECED membership and takes necessary internal actions. In strong collaboration with TÜRKBESD, we convey developments about EU ecodesign and energy labelling to Turkish Ministry of Science, Industry and Technology and lead the sector. Financial impact of membership to some associations (CECED, TÜRKBESD etc.) is around 500,000 TL per year to follow the related regulations closely. To be complied with the new labelling regulations Arçelik has environmentally friendly R&D activities.

Cost of management

500000

Comment

Membership to some associations (CECED, TÜRKBESD etc.) is around 500,000 TL TL per year to follow the related regulations closely.

Identifier

Risk 5

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Other

Type of financial impact driver

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Regulation on the Control of Waste Electrical and Electronic Equipment was published in the Official Gazette No. 28300 of 22.05.2012. Producers are responsible for financing the costs of the collection, treatment, recovery and environmentally sound disposal of WEEE from private households after collection points and distributors. In the WEEE Regulation, WEEE from private household collection targets: 0.3 kg per inhabitant in 2013, growing to 4 kg/inhabitant in 2018. Collection targets of WEEE from private households are separated according to 6 WEEE collection categories. Producers shall provide to achieve the collection targets. Producers and treatment plants shall meet the recycling and recovery targets. The most important climate change issue for white goods sector is old refrigerators because of the high GWP gases included. Due to collection and destruction of the gases originating from old refrigerators costs will be incurred under Regulation on Waste Electric and Electronic Equipment (WEEE).

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

Medium

Potential financial impact

13000

Explanation of financial impact

During the life time of the refrigerators and coolers, there are annual losses of blowing agents. The losses change according to the age of the equipment. Quantity of collected blowing agents in the WEEE treatment plant has been estimated. For 2016 the cost of disposal of the gases to prevent fugitive emissions is approx. 13,000 TL.

Management method

To manage this risk Arçelik established 2 treatment plants to recycle WEEEs. Refrigerators and other cooling appliances contains Chlorofluorocarbons (CFCs) are being environmentally recycled. Buy-back campaigns are being organized to collect the old appliances. The goal of campaigns is transforming the old refrigerators and other old cooling appliances with the newer (with low GWP gas and more energy efficient product). Investment cost of the treatment plants are approximately 9 Million TL.

Cost of management

9000000

Comment

Investment cost of the WEEE treatment plants are approximately 9 Million TL.

Identifier

Risk 6

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Technology: Costs to transition to lower emissions technology

Type of financial impact driver

Technology: Costs to adopt/deploy new practices and processes

Company- specific description

Utilization of domestic renewable energy sources has vital importance for Turkey to reduce its dependence on foreign energy supplies and prevent the increase in greenhouse gas emission. That is why governmental authorities have been working on lots of regulations about renewable energy investments. Regardless of capacity, if a power plant generating electricity from renewable energy resources is isolated from the transmission and distribution grid, it will be exempt from the requirement of obtaining a production licence. For wind energy possible facility is our factory located in Çerkezköy and for solar energy possible facilities are our factories in Eskişehir and Çayırova. For wind energy investments the most important financial risks are; stability of wind, land costs, unpredicted maintenance costs. In Çerkezköy region, mean wind speed is really close to the critical operating speed for sustainable energy production and 0.5 m/sec wind speed reduction will result into low energy production. Area needed for base construction for wind turbines is not too much. But the important issue is the area needed for security. And the area needed for secure operation is a risk for possible future investment on land. For solar energy investments, the most important financial risks are; high prices, land costs, re-installation costs. Because of its high technology, the prices of PV panel and other constructional parts are really high but they are decreasing yearly. According to our evaluation, payback time for such kind of investment in Turkey is nearly 10-13 years. Such investment with higher payback time is a real financial risk for industry. Land cost is one of the most important cost of PV projects. For industrial areas, to use such kind of valuable land for PV installation is too risky. It is possible to use this land for increasing production capacity. Another financial risk is re-installation cost. If you install PV project on a specific site and if you have to move your facility to another location because of re-installation costs, payback time of investment will increase up to %25. The technology of equipment is changing rapidly. There is a possibility that the technology and efficiency of PV and wind turbines will change. So, there is risk for such kind of technological investments with higher payback time.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Potential financial impact

600000000

Explanation of financial impact

For last 10 years, electricity unit price has increased %7 per year. It will possibly increase during further years. If unit price increases more than expected, not to invest in renewable energy will affect our operational costs. If not, investing to renewable energy will reduce our capital availability. For each MW of peak renewable energy investments result into 4 Million TL reduction in capital availability. For whole Arçelik plants in Turkey 150 MW peak and nearly 600 Million TL investment needed.

Management method

We are working on possible renewable energy investments with purchasing, finance and strategic planning departments and following up the investments by other investors. We are trying to estimate possible positive/negative impacts of renewable energy production. There is no cost to work on the possible renewable energy investments. We can only do an estimation to manage the risk. In Eskişehir Plant we are planning to invest on 450 kWp solar PV system in 2019. All legal authorization process has been completed. The approx. cost of this investment 2.6 million TL. On the other hand, we are constructing a new factory in Romania. This new plant, which is built with the building management system, smart building concept, LEED Platinum certificate and the most energy efficient machines and equipment, will also have 930 kWp solar PV and 750 kW CSP systems

Cost of management

2600000

Comment

In Eskişehir Plant we are planning to invest on 450 kWp solar PV system in 2019. All legal authorization process has been completed. The approx. cost of this investment 2.6 million TL.

Identifier

Risk 7

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Acute: Increased severity of extreme weather events such as cyclones and floods

Type of financial impact driver

Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)

Company- specific description

Gradual increase of concentration of gases causing greenhouse effect in atmosphere causes the world to warm more than normal and climate changes. Sea levels increase because of melting glaciers due to temperature rise; on the other hand some parts of Antarctica get colder. Important effects of climate change include more arid climate, fall in precipitation quantities, increase in forest fires, decrease in agricultural yield, exhaustion of surface waters, floods, loss of plant species and dissemination of invasive species. Globally, much more extreme and variable weather conditions are anticipated in

the future, it is anticipated that while precipitation quantities will increase in coastal regions, aridity will arise at internal regions because of hot weather, more floods will occur due to increasing storms and rises at sea levels. A 2°C temperature increase globally will have many significant impacts on Mediterranean Basin which also includes Turkey. If global temperature increase reaches 2°C, Mediterranean climate will get warmer, aridity will be felt at extensive lands and there will be changes in climate. While general temperature rise in the region reaches to 1-2°C, this rise may reach to 5°C at Turkey's internal regions which are away from alleviating impact of sea. Such temperature changes will cause sudden and important changes at costs of energy spent for heating and cooling systems of plants in particular, and affect operational and investment costs. Floods that may happen due to sudden temperature rises and decreases constitute risk for our plants in particular which have stream beds nearby. By handling such circumstances as emergency, emergency drills are conducted; emergency action plans are prepared and implemented. This is a factor that may increase our operational costs too.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium

Potential financial impact

45000000

Explanation of financial impact

We have a new plant in Thailand. The investment cost for Thailand project is approx. 100 million USD. (approx 450 Million tl)

Management method

Changes and mean temperature and related risks/emergencies are considered in new investments including facility location choices. Production of all of the products only in one location is very precarious. Because when a natural disaster is happened in this location, it is impossible to continue manufacturing. To manage this risk, our products are manufactured more than one location, South Africa, Russia, Romania, China, Thailand etc. The investment cost for Thailand project is approx. 100 million USD approx 450 (Million tl).

Cost of management

45000000

Comment

We have a new plant in Thailand. The investment cost for Thailand project is approx. 100 million USD. (approx 450 Million tl)

Identifier

Risk 8

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Market: Uncertainty in market signals

Type of financial impact driver

Market: Abrupt and unexpected shifts in energy costs

Company- specific description

We have 2 cogeneration systems with 6.3 MW capacities of each in Eskişehir and Çayırova plants. They have been working for approximately 23 years with total efficiency of 78.2%. Their electricity efficiency is nearly 40.3% and heat efficiency is nearly 37.9%. We use natural gas and fuel-oil as well for primary fuels. We use the produced electricity and heat in our factories since the capacities are lower than the requirements. That's why we purchase electricity from the grid too. It is possible to invest on new more efficient cogeneration systems or modernisation of current systems. But for both of the case the risk is natural gas price and supply. Price of natural gas has been increased too much in previous years especially according to increase on exchange rate of \$/TL. And because Turkey is energy dependent on natural gas, supply is affected from political situation and it seems there is a risk for investing on natural gas based power plants.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Potential financial impact

320000000

Explanation of financial impact

If we invest cogeneration systems and if natural gas price increases than expected, it is possible to stop energy production and we have to purchase electricity. This case results into at least 11 M TL cost. The possible financial impact can be increased up to 32 M TL for higher capacity. For the modernisation investment, 5.5 M TL is needed to increase total efficiency from 78% to 82%. For higher capacity investment, we have to pay 16 M TL to increase total efficiency 78% to 81%.

Management method

We are working on possible cogeneration investments with purchasing, finance and strategic planning departments We are trying to estimate possible natural gas unit price for further years. There is no cost to work on the possible cogeneration investments.

Cost of management

0

Comment

We are working on possible cogeneration investments with purchasing, finance and strategic planning departments We are trying to estimate possible natural gas unit price for further years. There is no cost to work on the possible cogeneration investments.

Identifier

Risk 9

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Reputation: Increased stakeholder concern or negative stakeholder feedback

Type of financial impact driver

Reputation: Reduction in capital availability

Company- specific description

According to Harvard Business School study, long term market share and share certificate value of companies having high sustainability performances and reporting them increase in comparison with those with low sustainability performance and such companies draw attention of investors. In line with this approach, all stakeholders including investors are care about companies' green energy investment and usage. It is possible to reduce carbon emissions by using renewable energy in two ways. You can produce or you can buy from a renewable energy supplier. In Turkey, there are some energy companies that are producing electricity by from renewable sources like hydro, solar and wind. As Arçelik, while we are signing contract of electricity purchasing, we are asking to be sure that energy companies use renewable sources. Starting from 2012 June, we have been using electricity generated from renewable energy sources. In 2016, we have continued, our practice of supplying energy generated from renewable energy resources to our campuses. As part of the practice in 2016, 88% of energy electricity consumption was generated through renewable energy sources..We plan to generalize this to all of our domestic plants in coming years. If we can purchase all of our electricity from a renewable source we can reduce our emissions by nearly 100,000 tonnes of CO2e. The risk of such kind of method is financial. If we can purchase electricity from non-renewable energy plants with just 0.01 TL cheaper than renewable energy plants, it will cause 2.2 Million TL extra cost for electricity. Arçelik aims to have net zero carbon emission by eliminating its total eCO2 emissions of its domestic production plants until 2025 by implementing new energy efficiency projects (emission reduction projects), using the electricity generated from renewable energy sources, renewable energy plant investments and carbon offsets.

Time horizon

Current

Likelihood

Likely

Magnitude of impact

Medium

Potential financial impact

2200000

Explanation of financial impact

Nearly 2.2 Million TL extra cost for each year in case of 0.01 TL/kwh higher electricity cost.

Management method

We are following up unit prices of national providers, private companies and other alternatives and each year we use bidding method to get best prices. But our first priority is being purchasing from renewable energy sources. Nearly 2.2 Million TL extra cost for each year in case of 0.01 TL/kwh higher electricity cost.

Cost of management

2200000

Comment

Nearly 2.2 Million TL extra cost for each year in case of 0.01 TL/kwh higher electricity cost.

Identifier

Risk 10

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Technology: Costs to transition to lower emissions technology

Type of financial impact driver

Technology: Costs to adopt/deploy new practices and processes

Company- specific description

For the post 2012 period, Turkey has been signed the Paris Agreement in COP21 and submitted its INDC plan which includes the reduction target to the UN Secretariat. But it is still not clarified that how this target is distributed to sectors. In case of designation of a reduction target, companies would be required to adapt in a short period of time and fully comply with targets. In addition, when Turkey's new Integrated Environmental Directive draft (for EU IPPC implementation) comes into force there will be investments costs for GHG mitigation emitted from our operations. In order to be ready to this, requirements to implement additional operational activities and/or BAT (Best Available Technologies) will arise; additional cost and investments shall be required. If sector/company target may not be achieved, requirement for carbon purchase will arise; this would affect costs significantly in turn. This may cause impact on company share certificates before investors. When it is needed to reflect operational and investment cost increase to product price, we may have disadvantage in competition.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

Medium

Potential financial impact

151000000000

Explanation of financial impact

Turkish Ministry of Environment and Urbanization's EU Integrated Environmental Compliance Strategy Report 2016-2023 declares if Turkey starts to implement IPPC Directive requirements as in EU, the investment financial resource for Turkish industries will be approx. 28.8 billion EUR (151 billion TL).

Management method

Most of the production processes of Arçelik production plants comply with IPPC and BAT documents. Nanotechnology product is using in the production. Integration process for introducing "Environmentally Friendly Nanotechnology Product" has been using for the entire plants to reduce the use of pre-treatment chemicals and energy during the surface finishing before the implementation of sheet piece powder coating. Thanks to this product, the related process is completed at 25 oC instead of 50-55 oC hence a significant level of energy is saved while the process also no longer produces any phosphate sludge. As an example; in our dishwasher plant nanotechnology surface treatment process is being used in production process since 2012. This technology provides less natural gas consumption (35053 m3/year reduction) and less GHG emission emitting (70 tCO2e/year reduction). Thanks to this transition dishwasher plant has been selected as "Best Available Technology (BAT) using plant" by T.R. Ministry of Environment and Urbanization. In addition, powder die coating transition has been implemented in Arçelik plants. And this transition reduced VOC (volatile organic compound).

Cost of management**Comment**

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Markets

Primary climate-related opportunity driver

Access to new markets

Type of financial impact driver

Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks)

Company- specific description

Arçelik has started operations for voluntary carbon trade to quickly adapt to system the moment obligatory trade commences and to turn it into opportunity after post 2012 period. Since Green Climate Fund steps, we constantly compile information about future carbon markets. We plan advanced level operations so that our Company will benefit to a maximum level from carbon trade both domestic and abroad. As a start, we have developed a voluntary Carbon Trade Project, "Arçelik Energy Efficient Refrigerators Grouped Project". The aim of project is, manufacturing of the energy efficient refrigerators by applying advanced technologies and selling them to Turkish customers. The Project crediting period is 10 years (2012-2022) and the estimated average emission reductions resulting from this project is estimated around 1.8 million tCO₂e, totally (The project is currently at the approval stage by the related authorities, the estimation was based on the assumptions made in line with the CDM methodology)

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium-high

Potential financial impact

2000000

Explanation of financial impact

In voluntary carbon market, unit price of carbon is assumed as approx. 0.20 – 0.40 EUR for VCS. The estimated average emission reductions resulting from this project is estimated around 1.8 million tCO₂e, approx. 360 K – 720 K EUR (approx. 2 million – 4 million TL)

Strategy to realize opportunity

To manage this opportunity we have developed a carbon trade project called "Arçelik Energy Efficient Refrigerators Grouped Project" as a voluntary carbon trade project. Total management cost of realizing this project is around 200,000 TL.

Cost to realize opportunity

200000

Comment

To manage this opportunity we have developed a carbon trade project called "Arçelik Energy Efficient Refrigerators Grouped Project" as a voluntary carbon trade project. Total management cost of realizing this project is around 200,000 TL.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact driver

Increased revenue through demand for lower emissions products and services

Company- specific description

The EU regulation for ecodesign requirements for refrigerating appliances were published in 2009. It introduces a gradual ban of less efficient products in the market. Placing refrigerators of energy class B and lower on the market are banned as of 1 July 2010. It is ruled that energy class of A cannot be put on the market from July 2012 on. In July 2014, minimum allowable energy efficiency index set to 42 which is 44 before. In Turkey, the same regulations are transposed into national law in order to be harmonized with the EU laws. As a result, "A" energy class products cannot be put on the market as of today both in Turkey and EU. EU Commission has just completed first analysis of current situation and comparison with technological development of the industry. Preparatory studies for ecodesign & energy labelling revisions has been completed for refrigerators, washing machines, dishwashers, and washer-dryers. Draft regulations are now under scrutiny with inputs from relevant stakeholders. A common goal in all these regulations are revising the label scale into A(most efficient) to G(least efficient).

Time horizon

Medium-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Potential financial impact

9600000000

Explanation of financial impact

In 2005, the Company's consolidated sales revenue was 3.1 billion EUR (approx 4.96 billion TL), while the international sales share was 40% of total sales revenue (1.2 billion

EUR ~ 1.92 billion TL). In 2016, the consolidated net sales turnover reached 16.096 billion TL, and international sales comprised 60% of consolidated sales (Aprox. 9.6 billion TL). One of the main reason of the increase in international sales share is our investment on environmentally friendly R&D activities and producing competitive energy efficient products.

Strategy to realize opportunity

Overall energy efficiency of Arçelik refrigerators sold in Turkey and EU are classified as "A+" by end 2012. It is projected to reach A++ efficiency level by 2017. Investment in improvement of high efficiency components is a key element to maintain sustainable energy efficiency increase. Compressor is one of the key component. R&D activities on variable speed compressors have reached to an advance level. Variable speed compressors enables the refrigerator consume less energy. In addition, continuous R&D activities have yielded efficient fan blade design that are being used in today's products. Another tool to reach high energy-efficient refrigerating appliance is considered insulation. The better the insulation, the higher the energy efficiency. Vacuum insulation panels (VIP) provides excellent insulation compared to PU insulation. Besides Arçelik endeavors to create a new level of VIPs with very low thermal conductivity that leads to design high energy efficiency. Strong background in cooling design is the powerful tool in hands of Arçelik to reach energy efficiency targets of 2017. Arçelik Long Term Plan and Product Roadmap systematic constitutes our main method. At least once in a year, energy & environmental-friendly product range and portfolio definition is made with top management, through this strong method we have towards domestic target markets environmental-friendly products. The cost of R&D studies for environmental friendly products is 45 million TL in 2016.

Cost to realize opportunity

45000000

Comment

The cost of R&D studies for energy efficient and environmental friendly products is 45 million TL in 2016.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Type of financial impact driver

Increased revenue through demand for lower emissions products and services

Company- specific description

Within the scope of its Extended Product Responsibility, Arçelik made investments for encouraging the recovery of the old products (WEEE) and established its own WEEE recycling plants in Bolu and Eskişehir plants to provide the usage of WEEEs as resources.

Large white goods and small household appliances are recycled in Arçelik's WEEE Recycling Plants. Therefore, the reduction of GHG emissions is ensured, especially through the recycling of old and high electricity consuming products at the WEEE recycling plants, thereby also contributing to our country's combat against climate change. To increase tendency in consumers' changing buying behaviour towards energy efficient products "The Greatest Renewal Movement of Turkey Campaign" has been started across Turkey for the purpose of collecting WEEEs and reintroducing them to the nature and national economy, with the slogan "Let the Return to Nature Begin". Recycling is also encouraged through our sales campaigns, sustainable business models are developed thanks to this campaign. Accordingly, it is seen that there is gradual tendency in consumers' changing their old and low efficient products by new energy efficient products. This is an opportunity for Arçelik.

Time horizon

Short-term

Likelihood

Very unlikely

Magnitude of impact

Medium-high

Potential financial impact

38000000

Explanation of financial impact

A significant contribution to energy efficiency in our country is ensured through the recycling of high energy consuming old products. The energy gain achieved by means of the recycling of high energy consuming old products at the two facilities since their engagement is equivalent to the annual energy generation of seventeen 2.5 MW wind turbines. This means approx. 38 Million TL gain to Turkish economy.

Strategy to realize opportunity

To increase demand of consumers' changing buying behaviour towards energy efficient products "The Greatest Renewal Movement of Turkey Campaign" has been started across Turkey for the purpose of collecting WEEEs and reintroducing them to the nature and national economy, with the slogan "Let the Return to Nature Begin". As part of the market transformation campaign, WEEEs collected from customers by Arçelik and Beko dealers and authorized services were sent to Arçelik's own licensed recycling plants. Materials obtained from WEEEs recycled at plants are regained to the economy in accordance with the concept of "Circular Economy". Investment cost of the WEEE recycling plants is approximately 9 Million TL.

Cost to realize opportunity

9000000

Comment

Investment cost of the WEEE recycling plants is approximately 9 Million TL.

Identifier

Opp4

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Type of financial impact driver

Increased revenue through demand for lower emissions products and services

Company- specific description

We aware that our environmental-friendly products and production activities are opportunities to increase our brand value and we perform our activities in accordance with this opportunity and also we focus on UN SDG. We share our sustainability activities through our sustainability reports with our stakeholders. According to a study conducted by Harvard Business School by reviewing 180 companies, long term market share and share certificate value of companies having high sustainability performances and reporting them increase in comparison with those with low sustainability performance and such companies draw attention of investors. In this scope, all activities concerning environment including also activities performed in connection with climate change are deemed as an opportunity financially.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Potential financial impact

9600000000

Explanation of financial impact

In 2005, the Company's consolidated sales revenue was 3.1 billion EUR (approx 4.96 billion TL), while the international sales share was 40% of total sales revenue (1.2 billion EUR ~ 1.92 billion TL). In 2016, the consolidated net sales turnover reached 16.096 billion TL, and international sales comprised 60% of consolidated sales (Aprox. 9.6 billion TL). One of the main reason of the increase in international sales share is our investment on environmentally friendly R&D activities and producing competitive energy efficient products.

Strategy to realize opportunity

Environmental production and environment friendly products are the main elements of Arçelik's sustainability management. Arçelik manages sustainability within its activities via Sustainability Council. The cost of R&D studies for energy efficient and environmental friendly products is 45 million TL in 2016.

Cost to realize opportunity

45000000

Comment

The cost of R&D studies for energy efficient and environmental friendly products is 45 million TL in 2016.

Identifier

Opp5

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact driver

Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services)

Company- specific description

To transform weather temperature changes into opportunity,we adopted to go beyond the legislations&standards regarding efficiency.In this context,we produce our products with a standard production rules in all countries.In new investments,we take our product&production technologies to that country and ensure that country also become aware about energy efficient products,therefore we seize the opportunity to contribute to reduction of country's GHG emissions.E.g. in 2014,Arçelik became a partner of the project called United for Efficiency which organized by UNEP and GEF to widen energy efficient products in houses contributing GHG emission reduction.In this project Arçelik gave technical support to developing countries particularly Thailand and South Africa(SA) to increase energy efficiency in refrigerators.In SA our employees climbed to Kilimanjaro mountain to attract attention to global warming.At the same time we contribute to development of countries where we invest.E.g. in SA we developed Arçelik Solar Refrigerator for rural regions of SA that lack electricity.We can all envisage the possibilities this product has offered in terms of storing foods and healthcare products in regions where there were no refrigerators before.In addition,in our SA plant,we are planing to transition to environmentally friendly refrigerants that used in refrigerators.It is planing to finalize in upcoming period (2019-2020). We are planningt o do a project in SA,we commenced basic infrastructure operations to enter into voluntary carbon trade.We have developed the "Arçelik Energy Efficient Refrigerators Grouped Project".Since Green Climate Fund steps,we constantly compile information about future carbon markets.We plan advanced level operations so that Arçelik will benefit to a maximum level from carbon trade.We aware that our environmental-friendly products&production activities are opportunities to increase our brand value and we perform our activities in accordance with this opportunity.According to Harvard Business School study,long term market share and share certificate value of companies having high sustainability performances and reporting them increase in comparison with those with low sustainability performance and such companies draw attention of investors In this scope,all activities concerning environment and climate change are deemed as an opportunity financially.

Time horizon

Current

Likelihood

Likely

Magnitude of impact

Medium-high

Potential financial impact

Explanation of financial impact

Strategy to realize opportunity

To manage this opportunity we have developed a carbon trade project called “Arçelik Energy Efficient Refrigerators Grouped Project” as a voluntary carbon trade, we are also planning to develop a Project on carbon trade in South Africa. Total management cost of realizing this project is around 200,000 TL.

Cost to realize opportunity

200000

Comment

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted	To be complied with the energy labelling regulations and satisfy the consumers' changing demand, environment friendly products are the main elements of Arçelik's sustainability management. R&D Departments design less consuming products in terms of both energy and water consumption and carry out projects aimed at efficient use of resources used in products. Currently Arçelik holds a number of records about white goods consuming least energy. The cost of R&D studies for energy efficient and environmental friendly products is 45 million TL in 2016.

	Impact	Description
Supply chain and/or value chain	Impacted	In consideration of Arçelik product life cycle assessment, GHG emission emitted during to use of the products is more higher (95-96% consumer use,<4% production and raw material supply,<0.1% product logistics). Because of this reason product use is an important step and accordingly customers are most important part of our value chain. Therefore, R&D carries out studies on product energy efficiency development. Thus most the energy using household products that are of the most energy efficiency class(es) on the energy label are considered low carbon and climate-friendly solutions. To increase tendency in consumers' changing buying behaviour towards energy efficient products "The Greatest Renewal Movement of Turkey Campaign" has been started across Turkey for the purpose of collecting WEEEs and reintroducing them to the nature and national economy, with the slogan "Let the Return to Nature Begin". Recycling is also encouraged through our sales campaigns, sustainable business models are developed thanks to this campaign. Accordingly, it is seen that there is gradual tendency in consumers' changing their old and low efficient products by new energy efficient products. The energy gain achieved by means of the recycling of high energy consuming old products at the two facilities since their engagement is amounted 108.3 GWh and CO2e reductions to 54,000 tonnes. This is equivalent to the annual energy generation of seventeen 2.5 MW wind turbines. This means approx. 38 Million TL gain to Turkish economy. In addition, in order to improve the environmental performance of our suppliers, we make suggestions on site visits and follow up their environmental studies.
Adaptation and mitigation activities	Impacted	Arçelik has determined its GHG emission target as Net Zero Emission.Arçelik SC contributes this targets every year for increasing energy efficiency in production and using electricity produced by renewable energy sources (RES) to reduce GHG. With energy efficiency projects in Arçelik Production Plants at last 7 years (2010-2016),we have saved nearly 50000 GJ energy with 890 projects. Totally;51976 tCO2e GHG emission has been reduced since 2010. Arçelik,starting from 2012,has been using electricity produced from RES.The supply rate of electricity generated from RES,which was realized approximately as 1% in 2012, 28% in 2013, 78% in 2014, and 82% in 2015, was increased to 88% in 2016. In Eskişehir Plant we are planning to invest on 450 kWp solar PV system in 2019. All legal authorization process has been completed. The approx. cost of this investment 2.6 million TL. On the other hand, we are constructing a new factory in Romania. This new plant, which is built with the building management system, smart building concept, LEED Platinum certificate and the most energy efficient machines and equipment, will also have 930 kWp solar PV and 750 kW CSP systems.
Investment in R&D	Impacted	To be complied with the energy labelling regulations and satisfy the consumers' changing demand, environment friendly products are the main elements of Arçelik's sustainability management. R&D Departments design less consuming products in terms of both energy and water consumption and carry out projects aimed at efficient use of resources used in products. Currently Arçelik holds a number of records about white goods consuming least energy. The cost of R&D studies for energy efficient and environmental friendly products is 45 million TL in 2016.
Operations	Impacted	Arçelik Sustainability Council contributes its Net Zero Emissions targets every year for increasing energy efficiency in production and using electricity produced by renewable energy sources (RES) to reduce GHG.With energy efficiency projects in Arçelik Production Plants at last 7 years (2010-2016),we have saved nearly 500000 GJ energy with 890 projects. Totally;51976 tCO2e GHG emission has been reduced since 2010. We invested approximately 23.5 million TL to energy efficiency projects during 2010-2016. Arçelik, starting from 2012,has been using electricity produced from RES.The supply rate of electricity generated from RES,which was realized approximately as 1% in 2012, 28% in 2013, 78% in 2014, and 82% in 2015, was increased to 88% in the 2016. Arçelik aims to increase the share of the supply of electricity generated from renewable energy resources to the level of 100% as of 2020. On the other hand, we are constructing a new factory in Romania. This new plant, which is built with the building management system, smart building concept, LEED Platinum certificate and the most energy efficient machines and equipment, will also have 930 kWp solar PV and 750 kW CSP systems. In addition, when Turkey's new Integrated Environmental Directive draft (for EU IPPC implementation) comes into force there will be investments costs for GHG mitigation emitted from our operations.
Other, please specify	Please select	

C2.6

(C2.6) Describe where and how the identified risks and opportunities have factored into your financial planning process.

	Relevance	Description
Revenues	Impacted	In 2005, the Company's consolidated sales revenue was 3.1 billion EUR (approx 4.96 billion TL), while the international sales share was 40% of total sales revenue (1.2 billion EUR ~ 1.92 billion TL). In 2016, the consolidated net sales turnover reached 16.096 billion TL, and international sales comprised 60% of consolidated sales (Approx. 9.6 billion TL). One of the main reason of the increase in international sales share is our investment on environmentally friendly R&D activities and producing competitive energy efficient products.
Operating costs	Impacted	To complying with new regulations has a financial impact and they are assessed in our financial assessment. E.g. approved GHG emission reports to be prepared and sent to the Ministry every year under "The Regulation on Monitoring of GHG Emissions" which was prepared by T.R. Ministry of Environment and Urbanization. Under the regulation, first reporting obligation period for industry will start in 2017 for GHG emissions of 2015 and 2016. 3 of Arçelik Production Plants (Washing machine, Refrigerator, Electronics) are in the scope of this regulation and they sent their GHG Monitoring Plan to the Ministry. This plans are approved by the Ministry. In 2017, Arçelik 2015 and 2016 GHG report will be audited and verified by the licenced auditor company. In 2010, ARÇELIK established Greenhouse Gas (GHG) Management and Reporting System, before the regulation publish date. Since 2010, Arçelik's GHG values have been audited and verified by an independent body in "100% verification" and "reasonable assurance" level. The plants that are in scope of the Regulation, renewed their systems in accordance with Turkish GHG Regulation. ISO 14064 GHG Emission Inventory Verification is an continuous process for Arçelik in yearly basis. The verification for the Ministry will start at 2017. Total estimated financial implication for both ISO 14064 & Ministry verification process and training are may be 50,000 TL for the verification period of 2015-2016. In addition environmental and energy studies and projects and their CAPEX and OPEX values are main components of our strategical planing process. We develop environmental and energy medium term strategic plan of each factories and update and monitor it yearly basis. And the budget is defined in accordance with this strategic plan.

	Relevance	Description
Capital expenditures / capital allocation	Impacted	In scope of GHG mitigation target, we have energy efficiency targets. Arçelik SC contributes this targets every year for increasing energy efficiency in production and using electricity produced by renewable energy sources (RES) to reduce GHG. With energy efficiency projects in Arçelik Production Plants at last 7 years (2010-2016), we have saved nearly 500000 GJ energy with 890 projects. Totally; 51976 tCO ₂ e GHG emission has been reduced since 2010. For financial planning process, every year every plant has a budget for energy efficiency and environmental investments. E.g. We have spent 3,772,487 TL to energy efficiency projects in 2016. In addition environmental and energy projects and their CAPEX and OPEX values are main components of our strategical planing process. We develop environmental and energy medium term strategic plan of each factories and update and monitor it yearly basis. And the budget is defined in accordance with this strategic plan. In Eskişehir Plant we are planning to invest on 450 kWp solar PV system in 2019. All legal authorization process has been completed. The approx. cost of this investment 2.6 million TL. On the other hand, we are constructing a new factory in Romania. This new plant, which is built with the building management system, smart building concept, LEED Platinum certificate and the most energy efficient machines and equipment, will also have 930 kWp solar PV and 750 kW CSP systems. In addition To be complied with the energy labelling regulations and satisfy the consumers' changing demand, environment friendly products are the main elements of Arçelik's sustainability management. R&D Departments design less consuming products in terms of both energy and water consumption and carry out projects aimed at efficient use of resources used in products. The cost of R&D investments for energy efficient and environmental friendly products is nearly 700,000 TL in 2016.
Acquisitions and divestments	Impacted	Changes and mean temperature and related risks/emergencies are considered in acquisition processes including facility location choices. So it is a part of financial process. Production of all of the products only in one location is very precarious. Because when a natural disaster is happened in this location, it is impossible to continue manufacturing. To manage this risk, our products are manufactured more than one location, South Africa, Russia, Romania, China, Thailand, Pakistan etc. E.g. the investment cost for Thailand project is approx. 100 million USD (approx 450 Million TL).
Access to capital	Impacted	We aware that our environmental-friendly products and production activities turn the reputational risk to opportunity to increase our brand value and we perform our activities in accordance with this opportunity and also we focus on UN SDG. According to a study conducted by Harvard Business School by reviewing 180 companies, long term market share and share certificate value of companies having high sustainability performances and reporting them increase in comparison with those with low sustainability performance and such companies draw attention of investors. In this scope, all activities concerning environment including also activities performed in connection with climate change are deemed as an opportunity financially. So the environmental studies make more easy to access to capital. Environmental friendly production and products are the main elements of Arçelik's sustainability management. We have spent 45 Million TRY to environmental friendly product R&D studies and we have spent 16 million TL to minimize environmental impacts in 2016.
Assets	Impacted for some suppliers, facilities, or product lines	Physical changes in climate, country policies, regulation, market related issues, value chain, energy prices and technology can effect our assets' values. In our strategic plans, we identify environmental related CAPEX and OPEX requirements (including climate change) for at least 5 years. Also to decrease climate related risk and potential negative impact on our assets values, we focus on produce our products in more than one location, South Africa, Russia, Romania, China, Thailand, Pakistan etc. E.g. the investment cost for Thailand project is approx. 100 million USD (approx 450 Million TL).

	Relevance	Description
Liabilities	Impacted for some suppliers, facilities, or product lines	We aware that our environmental-friendly products and production activities can increase our credibility and reputation. According to a study conducted by Harvard Business School by reviewing 180 companies, long term market share and share certificate value of companies having high sustainability performances and reporting them increase in comparison with those with low sustainability performance and such companies draw attention of investors. In this scope, all activities concerning environment including also activities performed in connection with climate change are deemed as an opportunity for liabilities. In this context, we have spent 45 Million TRY to environmental friendly product R&D studies and we have spent 16 million TL to minimize environmental impacts in 2016.
Other	Please select	

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, qualitative

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

Arçelik 's 4th core business strategy is, to increase the ability to offer enriching, pioneer, innovative, climate change respected and environmental friendly product, solution and technology to society and customer through product life cycle. The highest level of direct responsibility of sustainability and climate change efforts is Sustainability Council (SC). All business strategies and targets are being studied and implemented by Climate Change Coordination WG (CCC WG). This WG is responsible to

integrate climate change efforts and ensures that all efforts comply to Arçelik's strategy, policy and legal regulations. This WG collects and reports the information to influence the strategy.

CCC WG identifies the company's climate change related risks and opportunities at asset level and reports to SC. SC evaluates and prioritizes asset level corporate risks and opportunities. Company level risks and opportunities are identified by SC. Climate change risks, strategies and influence to business targets are monitored and assessed by SC.

The aspects of climate change that influence Arçelik's strategy are mainly relevant to products and production phase. These aspects are;

International agreements, legal legislations (e.g. emission reporting, BAT)

Product labelling regulations and standards (e.g. energy label, voluntary environmental labels)

Extended producer responsibility and energy efficiency requirements (e.g. WEEE, Circular Economy Package)

Fuel/Energy taxes and regulations (e.g. energy prices, renewable energy)

Physical conditions (this mainly effects investments and location choice)

Decrease of Natural resources (e.g. water, energy, raw material decreases)

We focus on climate change in our short term strategies, which are based on 3 main issues: to mitigate GHG emitted by production; to provide our customers with green products that has the highest water and energy saving values; to conduct awareness raising informing studies regarding climate change

To support GHG mitigation;

- Our production plants have 5% saving target for energy consumption with energy efficiency projects. In 2016, 4383 tons of eCO₂ reduction has been achieved

- We switched to renewable energy (RE) usage

To provide our customers green products;

- We have spared TL 45 million to environmental-friendly R&D in 2016

To conduct awareness;

- Arçelik signed the 2°C Challenge Communiqué

- Arçelik CEO attended the "Dialogue for Climate Action" event in Vienna, which was launched by WB, within the frame of COP21 goals. Arçelik signed 'The Principles for Dialogue on Climate Action' in scope of this event.

- Arçelik made commitments to «Paris Pledge for Action» of Cambridge University and "Responsible corporate engagement policy" of "Road to Paris 2015 Project".

- Arçelik made commitment to Science Based Target Initiative

- Arçelik was a partner of "Market Transformation Towards Energy Efficient Appliances" Project to increase awareness for energy efficiency at homes

Arçelik's long term business strategies related to climate change are:

- To produce environmental friendly products by climate change and environment sensitivity, energy efficient production technologies, prioritizing climate change and environment sensitivity in all other activities, contributing to sustainable living by realizing mentioned commitments.

- Collaboration with institutions and public enterprises in developing-phase of legal regulations and standards

Proceeding in these strategies, we focus on;

- Enhance energy efficiency of the products beyond regulations with R&D studies

- To promote green product range

- To rise the range of purchasing electricity from RE sources

- To invest on solar energy by the end of 2020
- To provide energy efficiency by using our own productions “WAT” and “TEE” the energy efficient electric motors in our production plants
- Generalize clean and sustainable technology in production and green activities in processes
- To implement Arçelik’s target “Net Zero Emission” by 2025

To implement energy efficiency in new investment Romania, which is built with the building management system, smart building concept, LEED Platinum certificate and the most energy efficient machines and equipment, will also have 930 kWp solar PV and 750 kW CSP systems.

Arçelik keeps its strategic advantage over competitors, such as:

Arçelik’s GHG emissions have been verifying and certifying since 2010 and Arçelik was the first in its sector in Turkey.

Arçelik is honoured by its success in CDP for 6 years by achieving Disclosure&Performance Leaderships.

Arçelik has represented Turkey in COP21,COP22 and COP23.

Arçelik received ‘AAA’ rating, the highest in the MSCI. Arçelik is listed in the BIST SI.

The most substantial business decisions that have been influenced by the climate change are;

- 2025 climate change target is decreasing the emissions emitted by the production plants to “net zero emission”
- Increasing electricity supply generated through RE resources until 2020
- Ensuring continuity of the following certificates, ISO 14001&14064-1&50001 and extend the verification of GHG emissions abroad plants
- R&D investment and expenses for developing green products
- Committing to Science Based Target Initiative

One of the climate change aspects that influences our business strategy is product labelling regulations&standards.In EU, energy labelling regulation is has been revised in 2017 and it is expected that new energy label will be in force by Q1 2020.In the scenarios,high energy efficient products of today will be labelled with a reputation of less efficient.Arçelik plans to tackle energy efficiency challenges by designing high energy efficient products.

The most substantial business decision in Arçelik is reducing GHG emissions by using RE.As Arcelik,starting from 2012, we have been using electricity produced from renewable energy sources. The supply rate of electricity generated from renewable energy resources, which was realized approximately as 1% in 2012, 28% in 2013, 78% in 2014, and 82% in 2015, was increased to 88% 2016.

C3.1d

(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios	Details

Climate-related scenarios	Details
Other, please specify (A2 scenario of IPCC)	<p>The fifth assessment report of IPCC states that this change is extremely likely due to human activities. Based on different scenarios, climate scientists estimate increases between 1.5 and 4.5 oC by the end of the present century. Arçelik has 8 production plant located in Turkey (Eskişehir, İstanbul, Tekirdag, Ankara, Bolu). And Turkey is one of the countries that could be profoundly affected by the climate change. Arçelik considers climate change impacts to sustain its activities and use climate scenario analysis to assess the impacts. Arçelik use A2 scenario of IPCC. Assessment of climate change impact studies for Turkey are generally based on the A2 scenario of IPCC and that is why we select this scenario. In addition the future climate analysis of Turkey based on CMIP3 simulation that was used in the fourth Assessment Report of IPCC. The projection involves the simulation of the ECHAM5 General Circulation Model. For the wind projections, the northwestern parts of Turkey have the highest wind potentials. It could be said that the wind potential in these areas will increase in the future. The wind speeds in the Marmara region and northwestern parts of Aegean region are projected to increase up to 15% by the mid-century (2041-2070) and up to 20% and more by the end of the century (2071-2099). On the other hand, the wind speeds are simulated to decrease in the eastern parts of Turkey. According to these projections the most sufficient plants are located in Tekirdağ and İstanbul. Because future projections show that there will be an increase of wind above 15% in these cities and in current situation the wind average wind speed is sufficient (6.5-7 m/s). For the solar radiation, the climate change projections indicate that the solar radiation will slightly increase in much of Turkey. The increase will be up to 3% by the mid-century and up to 6% by the end of the century except eastern Black Sea coastal areas. All Arçelik plants are located in the areas that solar radiation will increase. And for the current situation, Turkey has already high solar energy potential due the its geographical location. In line with these projections, Arçelik's integrate renewable energy use to its business strategy and working on possible renewable energy production investments and following up the developments in technology and falling costs of renewable energy. Arçelik also has a target for 2020 to invest on 6 MWp renewable power plant. According to the Solar Energy Map of Turkey prepared by the Renewable Energy General Directorate, it has been determined that the total annual insolation time is 2741 hours (a total of 7.5 hours per day), and the total solar energy derived per year is 1.527 kWh/m² per year which is much more better than EU countries. With the actual unit electricity prices in industry, payback time is approximately 13 years in Turkey (This feasibility is done for 100% self-consumption and including yearly performance loss of PV panels and maintenance/operation costs of the plant). That's why Arçelik plans to establish 450 kWp solar PV plant on the roof of its Eskisehir plant at 2019 Q1. We are also preparing detailed feasibilities in Pakistan, Thailand and South Africa, where we also have factories. In these countries, unit electricity prices are almost 50% percent higher than electricity prices in Turkey. Solar irradiation levels are also same or higher than Turkey as well. Because of these reasons, payback time is around 6-8 years in these countries. On the other hand, we are constructing a new factory in Romania. This new plant, which is built with the building management system, smart building concept, LEED Platinum certificate and the most energy efficient machines and equipment, will also have 930 kWp solar PV and 750 kW CSP systems. Information on scenario analysis and Turkey's projections mentioned in this section are quated from A Holistic View of Climate Change and Its Impacts In Turkey Report prepared by İstanbul Policy Center.</p>

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Both absolute and intensity targets

C4.1 a

(C4.1 a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Scope

Scope 1+2 (location-based)

% emissions in Scope

100

% reduction from base year

60

Base year

2010

Start year

2014

Base year emissions covered by target (metric tons CO2e)

157725

Target year

2020

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

% achieved (emissions)

92.75

Target status

New

Please explain

Arçelik aims to reduce total eCO2 emissions of its domestic production plants from 2010 (base year) to 2020 by 60% by implementing new energy efficiency projects (emission reduction projects) and using the electricity generated from renewable energy sources. Thanks to energy efficiency studies and supply of electricity produced by renewable energy sources, we have reduced our GHG emissions by 55.65% compared to base year 2010.

Target reference number

Abs 2

Scope

Scope 1+2 (location-based)

% emissions in Scope

100

% reduction from base year

100

Base year

2010

Start year

2015

Base year emissions covered by target (metric tons CO2e)

157725

Target year

2025

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

% achieved (emissions)

55.65

Target status

New

Please explain

Arçelik aims to have net zero carbon emission by eliminating its total eCO₂ emissions of its domestic production plants until 2025 by implementing new energy efficiency projects (emission reduction projects), using the electricity generated from renewable energy sources and carbon offsets. Thanks to energy efficiency studies and supply of electricity produced by renewable energy sources, we have reduced our GHG emissions by 55.65% compared to base year 2010.

Target reference number

Abs 3

Scope

Scope 1+2 (location-based)

% emissions in Scope

100

% reduction from base year

100

Base year

2010

Start year

2014

Base year emissions covered by target (metric tons CO2e)

157725

Target year

2040

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

% achieved (emissions)

55.65

Target status

New

Please explain

Arçelik aims to continue having net zero carbon emission by eliminating its total eCO2 emissions of its domestic production plants until 2040 by implementing new energy efficiency projects (emission reduction projects), using the electricity generated from renewable energy sources and carbon offsets. Arçelik's first target year to meet this goal is 2025 but, Arçelik also aims to continue this target in the long term. Thanks to energy efficiency studies and supply of electricity produced by renewable energy sources, we have reduced our GHG emissions by 55.65% compared to base year 2010.

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Scope

Scope 1+2 (location-based)

% emissions in Scope

100

% reduction from baseline year

100

Metric

Metric tons CO2e per unit revenue

Base year

2010

Start year

2015

Normalized baseline year emissions covered by target (metric tons CO2e)

0.0000356

Target year

2025

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

% achieved (emissions)

81

Target status

New

Please explain

Arçelik aims to reduce total eCO2 emissions of its domestic production plants from 2010 (base year) to 2025 by 100% per sales revenue* by implementing new energy efficiency projects (emission reduction projects) and using the electricity generated from renewable energy sources and carbon offsets. In 2016, we decreased our 1+2 emissions per revised sales revenue 81% compared to our base year (2010) thanks to energy efficiency projects and supply of electricity produced by renewable energy sources.

% change anticipated in absolute Scope 1+2 emissions

-100

% change anticipated in absolute Scope 3 emissions

0

Target reference number

Int 2

Scope

Scope 1+2 (location-based)

% emissions in Scope

100

% reduction from baseline year

100

Metric

Metric tons CO2e per unit revenue

Base year

2010

Start year

2014

Normalized baseline year emissions covered by target (metric tons CO2e)

0.0000356

Target year

2040

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

% achieved (emissions)

81

Target status

New

Please explain

Arçelik aims to continue having net zero carbon emission by eliminating its total eCO2 emissions of its domestic production plants until 2040 by implementing new energy efficiency projects (emission reduction projects), using the electricity generated from renewable energy sources and carbon offsets. Arçelik's first target year to meet this goal is 2025 but, Arçelik also aims to continue this target in the long term. In 2016, we decreased our 1+2 emissions per revised sales revenue 81% compared to our base year (2010) thanks to energy efficiency projects and supply of electricity produced by renewable energy sources.

% change anticipated in absolute Scope 1+2 emissions

-100

% change anticipated in absolute Scope 3 emissions

0

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

Target

Renewable energy production

KPI – Metric numerator

The production rate of electricity from renewable energy sources

KPI – Metric denominator (intensity targets only)

The production rate of electricity from renewable energy sources

Base year

2012

Start year

2014

Target year

2020

KPI in baseline year

0

KPI in target year

1.4

% achieved in reporting year

0

Target Status

New

Please explain

We are working on possible renewable energy production investments and following up the developments in technology and falling costs of renewable energy. Arçelik plans to invest on solar energy till the end of 2020.

Part of emissions target

Abs2, Abs3, Int1, Int2

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	0	0
Implementation commenced*	0	0
Implemented*	173	4382
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Activity type

Energy efficiency: Processes

Description of activity

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

837

Scope

Scope 1

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

387402

Investment required (unit currency – as specified in CC0.4)

123157

Payback period

<1 year

Estimated lifetime of the initiative

11-15 years

Comment

Process Optimization Projects are usually low-budget activities, thus they have short-term payback periods; such as adding new sensors or monitoring devices in several areas, adapting the automation codes etc. Projects, which are categorized as Process Optimization, as follows; preventing the redundant usages in inactive lines and inactive hours (such as brake times), removing the redundant equipment with making changes in lines, cutting the energy with automation in inactive lines etc.

Activity type

Energy efficiency: Building services

Description of activity

Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

567

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

279897

Investment required (unit currency – as specified in CC0.4)

508475

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Lighting Projects include the changing of inefficient lighting armatures (flourescent, metal halide lamps) with LED technology, using the motion detectors to reduce the consumption when there is no occupancy, increasing the daylight usage in plants etc.

Activity type

Energy efficiency: Processes

Description of activity

Heat recovery

Estimated annual CO2e savings (metric tonnes CO2e)

35

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

14479

Investment required (unit currency – as specified in CC0.4)

195000

Payback period

1-3 years

Estimated lifetime of the initiative

11-15 years

Comment

Heat recovery is the process by which heat would be lost in processes is recaptured and used somewhere else, improving the energy efficiency of the facility. With adding some new equipment and making some changes in lines, it is possible to use the waste heat.

Activity type

Energy efficiency: Building services

Description of activity

HVAC

Estimated annual CO2e savings (metric tonnes CO2e)

299

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

124296

Investment required (unit currency – as specified in CC0.4)

44780

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Implementing high efficient HVAC technologies reduce the GHG emmissions and energy consumptions. As Arçelik we are following and if applicable, implementing the new technologies in HVAC equipment just like in other improvement activities.

Activity type

Energy efficiency: Processes

Description of activity

Compressed air

Estimated annual CO2e savings (metric tonnes CO2e)

811

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

400172

Investment required (unit currency – as specified in CC0.4)

815813

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Compression losses can be reduced by using fittings with low losses, reducing the number of equipment which use compressed air, reducing the operating pressure, making regular checks for leak detections and making air production more effective. Most of the initiative has no/low financial investment. Generally lifetime of application is long.

Activity type

Energy efficiency: Building services

Description of activity

Motors and drives

Estimated annual CO2e savings (metric tonnes CO2e)

492

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

227265

Investment required (unit currency – as specified in CC0.4)

368058

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

As Arçelik, we generally use new energy efficient electric motors in IE3 and IE4 classes. We also apply inverters to electric motors which have varying loads according to their feasibilities.

Activity type

Energy efficiency: Building services

Description of activity

Building controls

Estimated annual CO2e savings (metric tonnes CO2e)

2

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

1066

Investment required (unit currency – as specified in CC0.4)

100

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Building Control Technologies provide building automation and enable toreal-time consumption monitoring.

Activity type

Energy efficiency: Processes

Description of activity

Cooling technology

Estimated annual CO2e savings (metric tonnes CO2e)

57

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

28172

Investment required (unit currency – as specified in CC0.4)

132000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Reduce the water and energy consumption also emmissions with adapting the new technologies in Cooling Processes.

Activity type

Energy efficiency: Building fabric

Description of activity

Maintenance program

Estimated annual CO2e savings (metric tonnes CO2e)

440

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

192763

Investment required (unit currency – as specified in CC0.4)

82840

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

Maintenance programmes are scheduled and continues activities.

Activity type

Process emissions reductions

Description of activity

New equipment

Estimated annual CO2e savings (metric tonnes CO2e)

470

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

210540

Investment required (unit currency – as specified in CC0.4)

995580

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

High efficient technologies can help to reduce the energy consumptions during their lifetime. We are evaluating the equipments according to thier lifecycle costs.

Activity type

Energy efficiency: Building fabric

Description of activity

Insulation

Estimated annual CO2e savings (metric tonnes CO2e)

304

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

131098

Investment required (unit currency – as specified in CC0.4)

314979

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Insulation of exposed surfaces can help to reduce the heat leakages, that brings out the reduction of energy consumption (both for cooling and heating side). Insulation of cooling lines prevents the pipings from corrosion as well.

Activity type

Energy efficiency: Processes

Description of activity

Fuel switch

Estimated annual CO2e savings (metric tonnes CO2e)

63

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

57071

Investment required (unit currency – as specified in CC0.4)

58000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Changing the fuel type with procurement of new equipment and new technologies if it is applicable. Changing the fuel type can help to reduce the expenses coming from fuel consumed and GHG Emissions as well.

C4.3c**(C4.3c) What methods do you use to drive investment in emissions reduction activities?**

Method	Comment
Compliance with regulatory requirements/standards	Arçelik complies with legal legislations on GHG emission reduction and fully comply with eco-design legal legislation which describes product energy efficiency limits. Thanks to membership in CECEC (European Committee of Domestic Equipment Manufacturers) we participate in all operations carried out in EU regarding product energy performances and labelling and developments are closely followed. Arcelik has a close relationship with all relevant ministry departments and work together on implementation of EU regulations to Turkish regulations system. Energy efficiency operations in production are performed in accordance with all legal requirements described at Turkish Energy Efficiency Act. Greenhouse gas emission mitigation is achieved with energy efficiency operations at product and production level.
Dedicated budget for energy efficiency	Annually, energy budgets and energy efficiency investment budgets are designated, projects are materialized. At the beginning of each year, targets aimed at reducing energy consumption are designated and at the end of the every year, compliance status with planned target is followed. Emission reduction is rendered systematic with constant follow-up of the process.
Dedicated budget for low-carbon product R&D	R&D Departments in Arçelik plants design less consuming products in terms of both energy and water consumption and carry out projects aimed at efficient use of resources used in products. Currently Arçelik holds a number of records about white goods consuming least energy.
Financial optimization calculations	Arçelik performs operations aimed at optimization of energy consumption. Financial optimizations are made about energy efficiency and road for investment is paved. Short and medium term energy efficiency projects are constantly followed; financial optimization is made and put into practice in a short span of time.
Marginal abatement cost curve	Energy related expense items are followed and reduction targets are designated. While increase in production is targeted, goals for decline in energy consumption and energy budgets are set; operations are executed on this basis.
Partnering with governments on technology development	In order to increase energy efficiency in products and production, joint works with both governmental agencies and universities are performed. Projects are carried out with TÜBİTAK (The Scientific and Technological Research Council of Turkey), energy efficient product and production technologies are developed. Projects are carried out also under European Union framework Programs. In addition, many projects are carried out with both state and foundation universities and operations for increasing efficiency in product and production are carried out. Various cooperation projects are also carried out with Ministries.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Group of products

Description of product/Group of products

Highly energy efficient household products

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (2009/125/EC and 2010/30/EU Directives)

% revenue from low carbon product(s) in the reporting year

100

Comment

In consideration of product life cycle assessment, GHG emission emitted during to use of the products is more higher.(95-96% consumer use,<4% production and raw material supply,<0.1% product logistics). Operations aimed at developing product energy efficiency have great importance in terms of ensuring GHG emission mitigation at national and international level, the environmental impact of the products generated in usage phase. Therefore, R&D carries out studies on product energy efficiency development. Thus most the energy using household products that are of the most energy efficiency class(es) on the energy label are considered low carbon and climate-friendly solutions.

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).**Scope 1****Base year start**

January 1 2010

Base year end

December 31 2010

Base year emissions (metric tons CO2e)

77038

Comment**Scope 2 (location-based)****Base year start**

January 1 2010

Base year end

December 31 2010

Base year emissions (metric tons CO2e)

80687

Comment**Scope 2 (market-based)****Base year start**

January 1 2010

Base year end

December 31 2010

Base year emissions (metric tons CO2e)

0

Comment

C5.2**(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.**

ISO 14064-1

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Row 1

Gross global Scope 1 emissions (metric tons CO2e)

58246

End-year of reporting period

<Not Applicable>

Comment

2016 Scope 1 emissions are 58246 tons CO2e.

Row 2

Gross global Scope 1 emissions (metric tons CO2e)

<Not Applicable>

End-year of reporting period

<Not Applicable>

Comment

<Not Applicable>

Row 3

Gross global Scope 1 emissions (metric tons CO2e)

<Not Applicable>

End-year of reporting period

<Not Applicable>

Comment

<Not Applicable>

Row 4

Gross global Scope 1 emissions (metric tons CO2e)

<Not Applicable>

End-year of reporting period

<Not Applicable>

Comment

<Not Applicable>

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.**Row 1****Scope 2, location-based**

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

Our Scope 2 (location-based) emissions are emitted from grid electricity and calculated with using grid electricity emission factor and verified by accredited body. Our Scope 2 (market-based) emissions are only emitted from electricity that supplied from renewable energy sources and verified by accredited body as "0".

C6.3**(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?****Row 1****Scope 2, location-based**

11709

Scope 2, market-based (if applicable)

0

End-year of reporting period

<Not Applicable>

Comment

Our 2016 Scope 2 (location-based) emissions are emitted from grid electricity and calculated with using grid electricity emission factor and verified by accredited body as "11709". Our 2016 Scope 2 (market-based) emissions are only emitted from electricity that supplied from renewable energy sources and verified by accredited body as "0".

Row 2**Scope 2, location-based**

<Not Applicable>

Scope 2, market-based (if applicable)

<Not Applicable>

End-year of reporting period

<Not Applicable>

Comment

<Not Applicable>

Row 3

Scope 2, location-based

<Not Applicable>

Scope 2, market-based (if applicable)

<Not Applicable>

End-year of reporting period

<Not Applicable>

Comment

<Not Applicable>

Row 4**Scope 2, location-based**

<Not Applicable>

Scope 2, market-based (if applicable)

<Not Applicable>

End-year of reporting period

<Not Applicable>

Comment

<Not Applicable>

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

C6.5

(C6.5) Account for your organization's Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services**Evaluation status**

Relevant, calculated

Metric tonnes CO₂e

22713468

Emissions calculation methodology

2006 IPCC Guidelines for National Greenhouse Gas Inventories

Percentage of emissions calculated using data obtained from suppliers or value chain partners

9

Explanation

Scope 1 (stationary combustion (natural gas, LPG, diesel, fuel oil, purchased steam, LNG) and mobile combustion (fuel oil, diesel, LPG)) and Scope 2 (electricity) emissions of our suppliers' production activities have been calculated. Domestic suppliers and suppliers located in risky countries (in scope of sustainability) with a total of 90% of Arçelik purchasing revenue is considered. 9% of the suppliers have answered our questionnaire about GHG and these information are considered to calculate GHG emissions of suppliers.

Capital goods**Evaluation status**

Not relevant, explanation provided

Metric tonnes CO2e**Emissions calculation methodology****Percentage of emissions calculated using data obtained from suppliers or value chain partners****Explanation**

The capital goods are not relevant for Arçelik. Because our owned capital goods' emissions are estimated to be at negligible quantity of our total emissions in 2016.

Fuel-and-energy-related activities (not included in Scope 1 or 2)**Evaluation status**

Not relevant, explanation provided

Metric tonnes CO2e**Emissions calculation methodology****Percentage of emissions calculated using data obtained from suppliers or value chain partners****Explanation**

All Scope 1 and Scope 2 emissions of our activities are calculated. There are no emissions out of Scope 1 and Scope 2 such as heat, steam etc.

Upstream transportation and distribution**Evaluation status**

Relevant, not yet calculated

Metric tonnes CO2e**Emissions calculation methodology**

Percentage of emissions calculated using data obtained from suppliers or value chain partners**Explanation****Waste generated in operations****Evaluation status**

Not relevant, explanation provided

Metric tonnes CO2e**Emissions calculation methodology****Percentage of emissions calculated using data obtained from suppliers or value chain partners****Explanation**

Production waste disposal and recycling operations are not implemented in Arçelik plants. Disposal and recycling companies do not under control of Arçelik.

Business travel**Evaluation status**

Relevant, not yet calculated

Metric tonnes CO2e**Emissions calculation methodology****Percentage of emissions calculated using data obtained from suppliers or value chain partners****Explanation**

Our employee's vehicle emissions are calculated in our Scope 1 emissions which has been already audited and verified by an independent body.

Employee commuting**Evaluation status**

Relevant, not yet calculated

Metric tonnes CO2e**Emissions calculation methodology****Percentage of emissions calculated using data obtained from suppliers or value chain partners****Explanation****Upstream leased assets****Evaluation status**

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology**Percentage of emissions calculated using data obtained from suppliers or value chain partners****Explanation**

We have no leased assets for storing supplied materials from suppliers.

Downstream transportation and distribution**Evaluation status**

Relevant, calculated

Metric tonnes CO2e

134574

Emissions calculation methodology

EPA Center for Corporate Climate Leadership GHG Emission Factors Hub Emission Factors for Greenhouse Gas Inventories . The emission factors are taken from Table 9: Product Transport Emission Factors

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

The sources of greenhouse gas emissions from downstream transportation and distribution are road, off-road, air, railways and water-borne navigation activities. The GHG emissions emitted by our domestic, import and export product transportation activities has been calculated and verified by an independent body in accordance with ISO 14064-1 and ISO 14064-3 in 2016. The calculation methodology is "EPA Center for Corporate Climate Leadership: GHG Emission Factors for Greenhouse Gas Inventories".

Processing of sold products**Evaluation status**

Not relevant, explanation provided

Metric tonnes CO2e**Emissions calculation methodology****Percentage of emissions calculated using data obtained from suppliers or value chain partners****Explanation**

We produce and sell final products. Because of this reason processing of sold products is not relevant.

Use of sold products**Evaluation status**

Relevant, not yet calculated

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation**End of life treatment of sold products****Evaluation status**

Not relevant, explanation provided

Metric tonnes CO2e**Emissions calculation methodology**

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We have established and constructed WEEE plants in two locations (Eskişehir and Bolu) for our end of life products. These plants' GHG emissions are in scope of Arçelik's Scope1&2 GHG emissions inventory.

Downstream leased assets**Evaluation status**

Relevant, not yet calculated

Metric tonnes CO2e**Emissions calculation methodology**

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation**Franchises****Evaluation status**

Not relevant, explanation provided

Metric tonnes CO2e**Emissions calculation methodology**

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Arçelik has no franchising activities.

Investments**Evaluation status**

Not relevant, explanation provided

Metric tonnes CO2e**Emissions calculation methodology**

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Arçelik's new factory investment's GHG emissions will be accounted in Arçelik's Scope 1&2 emissions, the GHG emissions of factory investments are not relevant for Scope 3 emissions.

Other (upstream)**Evaluation status****Metric tonnes CO2e****Emissions calculation methodology**

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation**Other (downstream)****Evaluation status****Metric tonnes CO2e****Emissions calculation methodology**

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation**C6.7**

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.0000067

Metric numerator (Gross global combined Scope 1 and 2 emissions)

69955

Metric denominator

unit total revenue

Metric denominator: Unit total

10394000000

Scope 2 figure used

Location-based

% change from previous year

18

Direction of change

Decreased

Reason for change

Greenhouse gas emissions per revenue decreased by 18%,in 2016. Major reasons of this decrease is energy reduction activities. This energy reduction activities include the use of the electricity generated by renewable energy resources and energy efficiency projects performed at Plants.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	53704	IPCC Third Assessment Report (TAR - 100 year)

Greenhouse gas	Scope 1 emissions (metric tons of CO ₂ e)	GWP Reference
CH ₄	66	IPCC Third Assessment Report (TAR - 100 year)
N ₂ O	109	IPCC Third Assessment Report (TAR - 100 year)
HFCs	4221	IPCC Third Assessment Report (TAR - 100 year)
Other, please specify (chemicals)	146	IPCC Third Assessment Report (TAR - 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO ₂ e)
Turkey	58246

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By facility

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO ₂ e)	Latitude	Longitude
Ankara Dishwasher Plant	2116	39.97582	32.563568
Çerkezköy Tumble Dryer and Electric Motors Plant	3764	41.306196	27.965484
Bolu Cooking Appliances Plant	11887	40.763176	31.64291
Beylikdüzü Electronics Plant	7585	41.017437	28.633986
Eskişehir Refrigerator and Compressor Plant	12318	39.746225	30.618559
Çayırova Washing Machine Plant	18793	40.821279	29.361822
Sütlüce Headquarter	1783	41.047518	28.941751

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Turkey	11709	0	221493	195032

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By facility

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Ankara Dishwasher Plant	0	0
Çerkezköy Tumble Dryer and Electric Motors Plant	0	0
Bolu Cooking Appliances Plant	0	0
Beylikdüzü Electronics Plant	0	0
Eskişehir Refrigerator and Compressor Plant	0	0
Çayırova Washing Machine Plant	11709	0
Sütlüce Headquarter	0	0

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	6686	Decreased	8.6	In 2015, Arçelik purchased electricity produced from renewable sources was 179905 MWh. In the reporting year this amount increased to 195032 MWh. Emission reduction caused from $195032 - 179905 = 15127$ MWh. And this means 6686 tCO2e emissions reduction ($15127 \text{ MWh} \times 0.442 \text{ tCO}_2\text{e/MWh}$). Previous year the total Scope1+2 emissions was 77662 tCO2e. The emission value percentage = $(6686 / 77662) \times 100 = 8.6$
Other emissions reduction activities	4383	Decreased	5.64	Thanks to energy efficiency studies realized in 2016 4383 tCO2 emissions were saved. Previous year the total Scope1+2 emissions was 77662 tCO2e. Emissions value percentage = $(4383 / 77662) \times 100 = 5.64\%$
Divestment		<Not Applicable>		
Acquisitions		<Not Applicable>		
Mergers		<Not Applicable>		
Change in output		<Not Applicable>		
Change in methodology		<Not Applicable>		
Change in boundary		<Not Applicable>		
Change in physical operating conditions		<Not Applicable>		
Unidentified		<Not Applicable>		
Other		<Not Applicable>		

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	259515.44	259515.44
Consumption of purchased or acquired electricity	<Not Applicable>	195031.95	26460.92	221492.87
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	195031.95	285976.36	481000.31

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Acetylene

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

331.4

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Fuels (excluding feedstocks)

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

8401.9

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Fuels (excluding feedstocks)

Fuel Oil Number 4

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

7672.9

MWh fuel consumed for the self-generation of electricity

7672.9

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

7672.9

Fuels (excluding feedstocks)

Liquefied Petroleum Gas (LPG)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

5932.8

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Fuels (excluding feedstocks)

Methane

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

4.7

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Fuels (excluding feedstocks)

Motor Gasoline

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

4764.8

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

232161.2

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

50149.63

Fuels (excluding feedstocks)

Propane Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

28.3

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Fuels (excluding feedstocks)

Other, please specify (Industrial Base Oil)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

217.2

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

217.2

C8.2d**(C8.2d) List the average emission factors of the fuels reported in C8.2c.****Acetylene****Emission factor**

3.38

Unitmetric tons CO₂e per metric ton**Emission factor source**

Stoichiometric CO₂ calculation was made. $2\text{H}_2\text{C}_2 + 5\text{O}_2 \rightarrow 4\text{CO}_2 + 2\text{H}_2\text{O}$ 52 gr H₂C₂ = 176 gr CO₂ tons CO₂/tonsH₂C₂ = 3.38

Comment

Stoichiometric CO₂ calculation was made.

Agricultural Waste**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Alternative Kiln Fuel (Wastes)**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Animal Fat**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Animal/Bone Meal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Anthracite Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Asphalt**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Aviation Gasoline**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Bagasse**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Bamboo**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Basic Oxygen Furnace Gas (LD Gas)**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Biodiesel**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Biodiesel Tallow**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Biodiesel Waste Cooking Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Bioethanol**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Biogas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Biogasoline**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Biomass Municipal Waste**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Biomethane**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Bitumen**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Bituminous Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Black Liquor**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Blast Furnace Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Brown Coal Briquettes (BKB)**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Burning Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Butane**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Butylene**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Charcoal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Coal Tar**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Coke**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Coke Oven Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Coking Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Compressed Natural Gas (CNG)**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Condensate**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Crude Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Crude Oil Extra Heavy**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Crude Oil Heavy**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Crude Oil Light**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Diesel**Emission factor**

0.0741

Unit

metric tons CO2 per GJ

Emission factor source

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change, Table 2.2: Default emission factors for stationary combustion in the energy industries, Table 2.3: Default emission factors for stationary combustion in manufacturing industries and construction IPCC Guidelines for National Greenhouse Gas Inventories Chapter 3: Mobile Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 3.2.1: Road transport default CO2 emissions factors and uncertainty ranges, Table 3.2.2: Road transport N2O and CH4 default emissions factors and uncertainty ranges

Comment

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change, Table 2.2:

Default emission factors for stationary combustion in the energy industries, Table 2.3:
Default emission factors for stationary combustion in manufacturing industries and
construction IPCC Guidelines for National Greenhouse Gas Inventories Chapter 3: Mobile
Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table
3.2.1: Road transport default CO2 emissions factors and uncertainty ranges, Table 3.2.2:
Road transport N2O and CH4 default emissions factors and uncertainty ranges

Distillate Oil

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Dried Sewage Sludge

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Ethane

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Ethylene

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Fuel Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Fuel Oil Number 1**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Fuel Oil Number 2**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Fuel Oil Number 4**Emission factor**

0.0774

Unit

metric tons CO2 per GJ

Emission factor source

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change , Table 2.2: Default emission factors for stationary combustion in the energy industries, Table 2.3: Default emission factors for stationary combustion in manufacturing industries and construction

Comment

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change , Table 2.2: Default emission factors for stationary combustion in the energy industries, Table 2.3: Default emission factors for stationary combustion in manufacturing industries and construction

Fuel Oil Number 5**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Fuel Oil Number 6**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Gas Coke**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Gas Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Gas Works Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

GCI Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

General Municipal Waste**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Grass**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Hardwood**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Heavy Gas Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Hydrogen**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Industrial Wastes**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Isobutane**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Isobutylene**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Jet Gasoline**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Jet Kerosene**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Kerosene**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Landfill Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Light Distillate**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Lignite Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Liquefied Natural Gas (LNG)**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Liquefied Petroleum Gas (LPG)**Emission factor**

0.0631

Unit

metric tons CO2 per GJ

Emission factor source

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change, Table 2.2: Default emission factors for stationary combustion in the energy industries, Table 2.3: Default emission factors for stationary combustion in manufacturing industries and construction IPCC Guidelines for National Greenhouse Gas Inventories Chapter 3: Mobile Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 3.2.1: Road transport default CO2 emissions factors and uncertainty ranges, Table 3.2.2: Road transport N2O and CH4 default emissions factors and uncertainty ranges

Comment

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change, Table 2.2: Default emission factors for stationary combustion in the energy industries, Table 2.3: Default emission factors for stationary combustion in manufacturing industries and

construction IPCC Guidelines for National Greenhouse Gas Inventories Chapter 3: Mobile Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 3.2.1: Road transport default CO2 emissions factors and uncertainty ranges, Table 3.2.2: Road transport N2O and CH4 default emissions factors and uncertainty ranges

Liquid Biofuel

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Lubricants

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Marine Fuel Oil

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Marine Gas Oil

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Metallurgical Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Methane**Emission factor**

21

Unit

metric tons CO2e per metric ton

Emission factor source

ISO 14064-1 GHG Reporting Standard - Annex C: Greenhouse Gas Global Warming Potentials

Comment

ISO 14064-1 GHG Reporting Standard - Annex C: Greenhouse Gas Global Warming Potentials

Motor Gasoline**Emission factor**

0.0693

Unit

metric tons CO2 per GJ

Emission factor source

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 3: Mobile Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 3.2.1: Road transport default CO2 emissions factors and uncertainty ranges, Table 3.2.2: Road transport N2O and CH4 default emissions factors and uncertainty ranges, Table 3.3.1 Default Emission Factors For Off-Road Mobile Sources And Machinery

Comment

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 3: Mobile Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 3.2.1: Road transport default CO2 emissions factors and uncertainty ranges, Table 3.2.2: Road

transport N₂O and CH₄ default emissions factors and uncertainty ranges, Table 3.3.1
Default Emission Factors For Off-Road Mobile Sources And Machinery

Naphtha

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Natural Gas

Emission factor

0.0561

Unit

metric tons CO₂ per GJ

Emission factor source

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 2.2: Default emission factors for stationary combustion in the energy industries, Table 2.3: Default emission factors for stationary combustion in manufacturing industries and construction

Comment

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 2.2: Default emission factors for stationary combustion in the energy industries, Table 2.3: Default emission factors for stationary combustion in manufacturing industries and construction

Natural Gas Liquids (NGL)

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Natural Gasoline

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Non-Biomass Municipal Waste**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Non-Biomass Waste**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Oil Sands**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Oil Shale

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Orimulsion**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Other Petroleum Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Paraffin Waxes**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Patent Fuel

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

PCI Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Peat**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Pentanes Plus**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Petrochemical Feedstocks

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Petrol**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Petroleum Coke**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Petroleum Products**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Pitch

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Plastics**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Primary Solid Biomass**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Propane Gas**Emission factor**

2.86

Unit

metric tons CO2e per metric ton

Emission factor source

American Petroleum Industry Compendium (2009) Table 3.8 Densities, Higher Heating Values and Carbon Contents for Various Fuels, Table 4.3. CO2 combustion emissions factor for common industry fuel types

Comment

American Petroleum Industry Compendium (2009) Table 3.8 Densities, Higher Heating Values and Carbon Contents for Various Fuels, Table 4.3. CO2 combustion emissions factor for common industry fuel types

Propane Liquid

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Propylene

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Refinery Feedstocks

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Refinery Gas

Emission factor

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Refinery Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Residual Fuel Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Road Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

SBP**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Shale Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Sludge Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Softwood**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Solid Biomass Waste**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Special Naphtha**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Still Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Straw**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Subbituminous Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Sulphite Lyes**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Tar**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Tar Sands**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Thermal Coal**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Thermal Coal Commercial**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Thermal Coal Domestic**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Thermal Coal Industrial**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Tires**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Town Gas**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Unfinished Oils**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Vegetable Oil**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Waste Oils**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Waste Paper and Card**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Waste Plastics**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Waste Tires**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

White Spirit**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Wood**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Wood Chips**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Wood Logs**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Wood Pellets**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Wood Waste**Emission factor**

<Not Applicable>

Unit

<Not Applicable>

Emission factor source

<Not Applicable>

Comment

<Not Applicable>

Other**Emission factor**

0.0733

Unit

metric tons CO2 per GJ

Emission factor source

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 1.2: Default net calorific values, Table 1.4: Default CO2 emission factors for combustion

Comment

IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2: Stationary Combustion- Volume 2: Energy Intergovernmental Panel on Climate Change 2006, Table 1.2: Default net calorific values, Table 1.4: Default CO2 emission factors for combustion

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	11774.11	11774.11	0	0
Heat	0	0	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

C8.2f

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low-carbon emission factor

Contract with suppliers or utilities (e.g. green tariff), not supported by energy attribute certificates

Low-carbon technology type

Wind

Hydropower

MWh consumed associated with low-carbon electricity, heat, steam or cooling

195031.95

Emission factor (in units of metric tons CO2e per MWh)

0

Comment

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Waste

Metric value

97904

Metric numerator

tons

Metric denominator (intensity metric only)

% change from previous year

5.88

Direction of change

Decreased

Please explain

Thanks to waste reduction projects in our plants our waste amount generated from production activities is reduced 5.88% compared to 2015.

Description

Energy use

Metric value

1729538

Metric numerator

GJ

Metric denominator (intensity metric only)**% change from previous year**

1.23

Direction of change

Decreased

Please explain

Thanks to energy efficiency projects in our plants our energy usage amount is reduced 1.23% compared to 2015.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement[GHG_Verification.pdf](#)**Page/ section reference**

Arçelik Carbon Footprint Verification Certificate (Page:1-3), CDP Verification Document (Page:4-5), Renewable Energy Declarations (Page:6-10)

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement[GHG_Verification.pdf](#)**Page/ section reference**

Arçelik Carbon Footprint Verification Certificate (Page:1-3), CDP Verification Document (Page:4-5), Renewable Energy Declarations (Page:6-10)

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

[GHG_Verification.pdf](#)

Page/ section reference

Arçelik Carbon Footprint Verification Certificate (Page:1-3), CDP Verification Document (Page:4-5), Renewable Energy Declarations (Page:6-10)

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope

Scope 3- at least one applicable category

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Attach the statement

[Scope3_GHG_Verification.pdf](#)

Page/section reference

Verification Opinion Statement Page 1-3

Relevant standard

ISO14064-3

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C4. Targets and performance	Change in Scope 1 emissions against a base year (not target related)	ISO 14064-3	<ul style="list-style-type: none"> Besides, GHG procedures, operational instructions "on-site" implementations GHG emissions, uncertainty and materiality calculations, energy efficiency projects' GHG performances are also submitted to Verification Body as "Arçelik A.Ş. Green House Gas Emissions Report (2016)". In this report changes in Scope 1&2&3 emissions against the base year have been verified.
C4. Targets and performance	Change in Scope 2 emissions against a base year (not target related)	ISO 14064-3	<ul style="list-style-type: none"> Besides, GHG procedures, operational instructions "on-site" implementations GHG emissions, uncertainty and materiality calculations, energy efficiency projects' GHG performances are also submitted to Verification Body as "Arçelik A.Ş. Green House Gas Emissions Report (2016)". In this report changes in Scope 1&2&3 emissions against the base year have been verified.
C6. Emissions data	Change in Scope 1 emissions against a base year (not target related)	ISO 14064-3	<ul style="list-style-type: none"> Besides, GHG procedures, operational instructions "on-site" implementations GHG emissions, uncertainty and materiality calculations, energy efficiency projects' GHG performances are also submitted to Verification Body as "Arçelik A.Ş. Green House Gas Emissions Report (2016)". In this report changes in Scope 1&2&3 emissions against the base year have been verified.
C6. Emissions data	Change in Scope 2 emissions against a base year (not target related)	ISO 14064-3	<ul style="list-style-type: none"> Besides, GHG procedures, operational instructions "on-site" implementations GHG emissions, uncertainty and materiality calculations, energy efficiency projects' GHG performances are also submitted to Verification Body as "Arçelik A.Ş. Green House Gas Emissions Report (2016)". In this report changes in Scope 1&2&3 emissions against the base year have been verified.
C6. Emissions data	Change in Scope 3 emissions against a base year (not target related)	ISO 14064-3	<ul style="list-style-type: none"> Besides, GHG procedures, operational instructions "on-site" implementations GHG emissions, uncertainty and materiality calculations, energy efficiency projects' GHG performances are also submitted to Verification Body as "Arçelik A.Ş. Green House Gas Emissions Report (2016)". In this report changes in Scope 1&2&3 emissions against the base year have been verified.

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, but we anticipate being regulated in the next three years

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

In Paris COP21, Turkey signed the Paris Agreement and submit its INDC plan to the UN Secretariat. According to the INDC, Turkey's target is to reduce 21% of its emissions according to business as usual scenario by 2030.

This target has not been allocated to the sectors yet. And method of GHG reduction has not been identified yet. It is under progress. But it is anticipated that there will be carbon tax.

In this context, it is deduced that the targets or taxes will be related to energy efficiency projects and the possible use of renewable energy resources. Because of this reason renewable energy usage and energy efficiency investment requirements will need to be increased. Companies may need to buy electricity from renewable sources with higher prices. Energy efficiency projects and carbon credit purchasing needs will be increased.

To manage this possible obligation, Arçelik has energy efficiency targets annually and Arçelik has determined its GHG emission target as Net Zero Emission by 2025.

Arçelik SC contributes this targets every year for increasing energy efficiency in production and using electricity produced by renewable energy sources (RES) to reduce GHG. With energy efficiency projects in Arçelik Production Plants at last 7 years (2010-2016), we have saved nearly 50000 GJ energy with 890 projects. Totally; 51976 tCO_{2e} GHG emission has been reduced since 2010. Arçelik, starting from 2012, has been using electricity produced from RES. The supply rate of electricity generated from RES, which was realized approximately as 1% in 2012, 28% in 2013, 78% in 2014, and 82% in 2015, was increased to 88% in the 2016. Arçelik aims to increase the share of the supply of electricity generated from renewable energy resources to the level of 100% as of 2020.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

Yes

C11.2a

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.**Credit origination or credit purchase**

Credit origination

Project type

Energy efficiency: households

Project identification

We have developed a "Arçelik Energy Efficient Refrigerators Grouped Project". It is a voluntary emission reduction Project, because there is not any regulatory emission trading scheme in Turkey and so that there are no allowances allocated or purchased in scope of our Project. The project activity is manufacturing enhanced energy efficient refrigerators by applying advanced technologies and selling them to Turkish customers. The Project crediting period is 10 years (2012-2022) and the estimated average emission reductions resulting from this project is estimated around 1.8 million tCO₂e, totally (The project is currently at the approval stage by the related authorities, the estimation was based on the assumptions made in line with the CDM methodology). The validation process and registration phase have been completed (Registry: APX; Project ID:1117). Now the verification is under process.

Verified to which standard

VCS (Verified Carbon Standard)

Number of credits (metric tonnes CO₂e)**Number of credits (metric tonnes CO₂e): Risk adjusted volume**

1800000

Credits cancelled

No

Purpose, e.g. complianceVoluntary Offsetting

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Navigate GHG regulations
 Stakeholder expectations
 Change internal behavior
 Drive energy efficiency
 Drive low-carbon investment
 Stress test investments
 Identify and seize low-carbon opportunities

GHG Scope

Scope 1
 Scope 2

Application

Arcelik uses an implicit price system on plants. Every plant has its own budget about Energy Efficiency Improvement Projects. Thanks to these "Efficiency Improvement Projects" which are already mentioned in C4.3b, GHG emissions can be reduced while efficiency improvement projects are developed. At the end of the year, total investment of energy projects is divided by total CO2 reduction; hereby applied price is found with this way.

Actual price(s) used (Currency /metric ton)

860.91

Variance of price(s) used

Arcelik uses evolutionary pricing method for carbon pricing. Carbon price varies according to the amount of investment and the total GHG saving.

Type of internal carbon price

Implicit price

Impact & implication

Energy improvement projects cause to drive the company to low carbon emission technologies. Thus energy improvement project budgets are directly affecting to low carbon emissions technologies. Arcelik uses an implicit price system on plants. Every plant has its own budget about Energy Efficiency Improvement Projects. Thanks to these "Efficiency Improvement Projects" which are already mentioned in C4.3b, GHG emissions can be reduced while efficiency improvement projects are developed. At the end of the year, total investment of energy projects is divided by total CO2 reduction; hereby applied price is found with this way.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

C12.1 a

(C12.1 a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Collect climate change and carbon information at least annually from suppliers

% of suppliers by number

15

% total procurement spend (direct and indirect)

90

% Scope 3 emissions as reported in C6.5

9

Rationale for the coverage of your engagement

As Arçelik, we adopt our "sustainability" approach is adopted in the direction focus of our strategy and business model and all our activities are carried out within this frame. However, Corporate Sustainability covers not only managing governs the economic, social and environmental impacts of our company, but also includes the monitoring and development of sustainability performances of our suppliers. In line with this approach, we have a "Supplier Sustainability Survey" in order to monitor our suppliers' sustainability activities more closely and to realize the necessary actions along this path. Climate change engagement is one of the subject in this Sustainability Survey. We collect information about suppliers' GHG data, energy use data with this survey. For the coverage of this survey, we prioritized the suppliers to send this questionnaires. The coverage of this survey is; domestic suppliers and suppliers located in risky countries (in scope of sustainability) with a total of 90% of Arçelik purchasing revenue. We will plan to extend this coverage in the next years.

Impact of engagement, including measures of success

Responses from suppliers are reviewed and evaluated. After the evaluation of the responses suppliers are categorized to their sustainability scores as 'high risk', 'middle risk', 'acceptable', 'good', 'excellent'. Arçelik does not work with 'high risk' and middle risk suppliers until they reached to 'acceptable' level. Arçelik provides supplier development studies (training, awareness, etc.) to ensure that suppliers at acceptable levels move up to higher levels and incentives (awards, priorities, etc.) for suppliers reached higher levels are given. Our measure of success is to increasing the response rate from suppliers and increase the rate of suppliers which is positioned 'acceptable' at least.

Comment

As Arçelik, we adopt our "sustainability" approach is adopted in the direction focus of our strategy and business model and all our activities are carried out within this frame. However, Corporate Sustainability covers not only managing governs the economic, social and environmental impacts of our company, but also includes the monitoring and development of sustainability performances of our suppliers.

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Education/information sharing

Details of engagement

Share information about your products and relevant certification schemes (i.e. Energy STAR)

Size of engagement

100

% Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

We engage and raise our customers' awareness by advertisements, documentaries and publications related to energy efficiency and by producing best energy efficient products. All of our customers are covered in this engagement. For customer awareness, our product's user manuals include information part of "Things to do to save energy". In our website, and on the product labels, customers can reach energy consumption information of our products.

Impact of engagement, including measures of success

We try to raise awareness of our customers on energy efficiency. Our measure of success is to increase demand of customers to our most energy efficient appliances and increase the rate of revenue from most efficient home appliance sales.

C12.1c

(C12.1c) Give details of your climate-related engagement strategy with other partners in the value chain.

Arçelik has a close relationship with all relevant ministry departments with joining and leading their climate change projects . E.g. Arçelik was a partner to Market Transformation of Energy Efficient Appliances (EVÜdP) in Turkey. EVÜdP Project started in 2010 and completed by the end of 2015. UNDP, GEF, T.R. Ministry of Science, Industry and Technology and T.R. Ministry of Energy and Natural Resources Directorate General of Renewable Energy and TÜRKBESD are also members of the Project. The aim was to enhance the strategy and infrastructure of market transformation towards more energy efficient household appliances thus reducing domestic electricity consumption and decreasing greenhouse gas emissions. As a result of EVÜdP project, EU ecodesign and energy labelling regulations for washing machine, dishwasher, oven, hob, hood, refrigerator, freezer, air conditioners, dryer and television implemented to Turkey in 2011 in parallel with EU laws. Under the EU harmonization efforts, non-energy efficient refrigerator, washing machine and dishwasher are banned in 2011. In this way products are placed on the market as of today are 2 times more efficient compared to 2010. For implementing EU regulations to Turkish legislation; strong coordination between Science, Industry and Technology Ministry and the producers have been created.

Arçelik also supports national and international activities for combating against climate change. Arçelik participates in Global Climate Conferences and shares its best practices in the panels since 2011. And Arçelik attends meetings organized by Ministry for defining of Turkey's climate strategy.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

- Direct engagement with policy makers
- Trade associations
- Other

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Energy efficiency	Support	<p>1) Arçelik was a partner to Market Transformation of Energy Efficient Appliances (EVÜdP) in Turkey. EVÜdP Project started in 2010 and completed by the end of 2015. UNDP, GEF, T.R. Ministry of Science, Industry and Technology and T.R. Ministry of Energy and Natural Resources Directorate General of Renewable Energy and TÜRKBESD are also members of the Project. The aim was to enhance the strategy and infrastructure of market transformation towards more energy efficient household appliances thus reducing domestic electricity consumption and decreasing greenhouse gas emissions. 2) Arçelik participates and gives comment at the preliminary legislative phase of EU regulations on energy efficiency, energy labelling and circular economy package through the membership in CECED (European Domestic Equipment Manufacturers' Association). 3) Arçelik has a close relationship with relevant ministry directorates in Turkey and works together on the transposition of EU regulations into Turkish law. Arçelik has taken active part in the consultation phase of Turkish energy labelling and eco-design regulations for product groups that are published in parallel with EU versions.</p>	<p>1) As a result of EVÜdP project, EU ecodesign and energy labelling regulations for washing machine, dishwasher, oven, hob, hood, refrigerator, freezer, air conditioners, dryer and television implemented to Turkey in 2011 in parallel with EU laws. Under the EU harmonization efforts, non-energy efficient refrigerator, washing machine and dishwasher are banned in 2011. In this way products are placed on the market as of today are 2 times more efficient compared to 2010.. For implementing EU regulations to Turkish legislation; strong coordination between Science, Industry and Technology Ministry and the producers have been created. 2) In line with the opinions transmitted via CECED lobbied for a stable new energy labelling scheme to be included in the draft regulation. Finally, 10-year stability is guaranteed in the new framework regulation that is adopted in June 2017. The new energy labelling regulation was published in August 2017 and it is foreseen that it will be entered into force by 1st quarter of 2020 for refrigerators, washing machines, dishwashers, TVs and within 6 years after publication of framework regulation for other products. 3) For the purpose of dissemination of highly energy efficient products, "industry opinion" for incentives were provided to the Ministry of Finance. Arçelik give important contribution to these proposals. 4) In February 2017, extra tax (other than VAT) on durable goods was removed by the government. It will remain canceled until September 2017 as declared by the Ministry.</p>

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Other, please specify (climate change)	Support	<p>1) Arçelik took part in the working group which has been established by the Ministry of Environment and Urbanization&UNIDO. The group is working on the technical specifications of determining, collecting and disposal of the Ozone Depletion Substances that are banned. 2) Arçelik became a member of Climate Platform of Turkey which is established as an independent non-profit initiative by REC Turkey and TÜSİAD. 3) Arçelik gave comments on draft Regulation on Turkish Monitoring and Reporting, in 2012. 4) Arçelik made a joint study with Ministry of Energy and Natural Resources Directorate General of Energy Affairs to calculate regional diffraction of emission factor to reduce risk of reflection of such uncertainty to GHG emissions. 5) Arçelik's former CEO represented Turkey as "President of Turkey Climate Change Group of Leaders" and presented opinions of private sector at "Towards Rio +20, Business Leaders Build Change" panel in COP17. Arçelik also actively participated in work groups at the Ministry of Environment and Urbanization ahead of the WCC realized in Lima in 2014. Arçelik participated in the COP21 held in Paris and COP22 held in Marrakech and COP23 held in Bonn represented Turkey. Arçelik CEO attended the "Dialogue for Climate Action" event in Vienna, which was launched by WB, within the frame of COP21 goals. Arçelik signed 'The Principles for Dialogue on Climate Action' in scope of this event. Arçelik made commitments to «Paris Pledge for Action» of Cambridge University and "Responsible corporate engagement policy" of "Road to Paris 2015 Project". Arçelik also committed to "Science Based Targets" initiative. 6) Arçelik considers climate change as an important risk for world's sustainability, maintains its support to local and international projects executed by business world both in Turkey and abroad. In this scope, Arçelik signed "The 20C Challenge Communiqué" prepared by Corporate Leaders Network (CLN). 7) Arçelik takes part in Istanbul Stock Exchange Sustainability Index (BIST SI) formation on the sustainability which also includes climate change performance indicators. 8) WEEEs such as refrigerator, air conditioner etc. may contain ODS which have high GWP. The gases must be properly extracted and treated in an environmental-friendly way. Arçelik made a joint study with the Ministry of Environment and Urbanization to publish the "WEEE Regulation" in Turkey.</p>	<p>1) In Turkey, Arçelik was the first household appliances manufacturer to produce refrigerators without ozone-depleting CFC gases in 1995, much earlier than 2006, which was the deadline set for Turkey under the Montreal Protocol. Arçelik contributed the national regulation in this area and led to its sector for this transition. 2-5-6) Because of the responsibility being Climate Platform Leader of Turkey, Arçelik led its sector to combat climate change and shared the sector's view to the world in World Climate Summit. 3-4) Arçelik has given its comments to Ministry for Turkish MRV Regulation on the importance of specifying Turkish grid emission factor and specifying the tiers. 8) Arçelik has cooperated and communicated with Ministry for creating and implementing of Turkish WEEE Regulation. Arçelik contributed to WEEE Management System in Turkey.</p>

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Energy efficiency	Support	1) Arçelik has a close relationship with all relevant ministry departments and work together on the preliminary phase of transposition of EU regulations into Turkish law. Arçelik took active part in the consultation phase of Turkish energy labelling and ecodesign directives, which are published in official journal, dated 22 June 2012. 2) In order to increase energy efficiency in products and production, joint works with both governmental agencies and universities are performed. Projects are carried out with TÜBİTAK (The Scientific and Technological Research Council of Turkey), energy efficient product and production technologies are developed. Projects are carried out also under European Union 7th Framework Program. 3) Arçelik also has a close relationship with ministry of Science, Industry and Technology and work together on energy efficiency and energy regulations in industrial electric motors.	The aim is to have Turkish ecodesign and energy labelling regulations entered into force simultaneously with EU. Arçelik continuously provide its comments to relevant governmental departments and participates in the meetings in the scope of public-private dialogues.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

TUSIAD – Environment and Climate Change Working Group

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

This working group is established for supporting the development of environmental policies in Turkey and the development of regulations in order to provide economic growth in parallel with the sustainability of natural resources. The Working Group evaluates the effective implementation of the regulations, conducts research, and presents suggestions to relevant institutions and organizations in this framework. The Working Group contributes to the work of the Climate Change and Air Management Coordination Board, which TÜSİAD is a member, and to the COPs. The group also contributes to the work of the Turkish Climate Platform established by REC Turkey and

TÜSİAD in order to raise awareness in the business world in the field of climate change in Turkey.

How have you, or are you attempting to, influence the position?

Arçelik A.Ş. Sustainability and Corporate Affairs Director is the president of this working group.

Trade association

TOBB – Consumer Durable Goods Council Environmental Sub-Working Group

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

This working group is established for supporting durable goods sector to develop sectoral knowledge on environmental issues and the development of regulations in order to provide sectoral economic growth in parallel with the sustainability of natural resources. The sub-working group evaluates the effective implementation of the environmental regulations and presents suggestions to relevant institutions and organizations in this framework.

How have you, or are you attempting to, influence the position?

Arçelik A.Ş. Environment Manager is the president of this sub-working group.

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

Arçelik conducts cooperation activities with universities on climate change subject:

- Sustainable Energy Efficient Project-The Union of Chambers and Commodity Exchanges of Turkey (TOBB) Economy and Technology University Mechanical Engineering, Degree Thesis Study,
- Life Cycle Engineering-Istanbul Technical University Mechanical Engineering, Degree Thesis Study
- Project for optimization of energy consumption at cooling system of plastic injection machines-Yıldız Technical University (YTU) Mechanical Engineering, Master Degree Thesis Study.
- Water Recycling, Minimization and Integrated Water Management Project in Arçelik Cooking Appliances Plant-Istanbul Technical University, Environmental Engineering
- Water efficiency studies performed in Cooking Appliances Plant published in scientific papers (e.g. World Academy of Science Engineering and Technology, International Journal of Environmental and Ecological Engineering Vol:3, No:3, 2016, "Assessment of Water Reuse Potential in a Metal Finishing Factory", "Assessment of Waste Water Reuse Potential for an Enamel Coating Industry).
- Arçelik has become a partner to the United For Efficiency (U4E) Project led by UNEP and GEF. Arçelik supports market transformation towards Energy Efficient Appliances and Equipment globally. In this context, Arçelik supports development of country saving

assessments with the transition to energy efficient household refrigerators and freezers at developing countries e.g. the Republic of South Africa and Thailand. Arçelik provides technical assistance and expertise on the development of energy efficiency policies, setting up performance standards, monitoring and verification schemes, test methods and the installation of test facilities for energy efficient refrigerators and gives support to the global action campaign to promote the global transition to energy efficient refrigerators particularly at developing countries. The contribution will take different forms such as technical expertise and market insights to be provided, , at the meetings of the global multi-stakeholder platforms, at technical task forces and high level and expert discussions.

- Environmental impacts of a printed circuit board manufacturing plant via streamlined approach – Istanbul Technical University Environmental Engineering, Thesis Study

- Arçelik has become a partner to the United For Efficiency (U4E) Project led by UNEP.

Arçelik supports market transformation towards Energy Efficient Appliances and Equipment globally. In this context, Arçelik supports development of estimates on the benefits and policy status of the transition to energy efficient household refrigerators, particularly in the Republic of South Africa and Thailand. Arçelik contributes to the development of performance standards, monitoring and verification schemes, test methods and the installation of test facilities for energy efficient refrigerators and give support to the global action campaign to promote the global transition to energy efficient refrigerators particularly at developing countries. The contribution will take different forms such as technical expertise and market insights to be provided, for instance, to meetings of the global multi-stakeholder platform, technical task forces and high level and expert discussions.

- Arçelik has made a commitment to “Responsible corporate engagement policy” program in scope of “Road to Paris 2015 Project” which is a global project related to combat climate change launched by CDP.

- Arçelik has made a commitment to “Science Based Targets Initiative”.

- Arçelik signed 'The Principles for Dialogue on Climate Action' within the scope of the event.

- Arçelik has signed «Paris Pledge for Action» sent by Cambridge University Institute for Sustainability Leadership

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

All business strategies and targets are being studied and implemented by Climate Change Coordination WG (CCC WG) which consists of Energy and Environment Managers, Environment and Energy Specialists and production managers. This Group is responsible to integrate climate change efforts and ensures that all efforts comply to Arçelik's climate change strategy, policy and legal regulations. This Group collects and reports the information to influence the strategy. The Group meets quarterly. CCC WG identifies the company's climate change related risks and opportunities at asset level and reports to Sustainability Council.

Arçelik has an integrated ISO 50001 & 14001 & 14064-1 Management Systems. Energy managers of the plants reviews the projects that provides GHG mitigation and energy efficiency projects quarterly and reports the results to directors and CCC WG annually. CCC WG controls the compliance of the results with the climate change policy and strategy. The communication and coordination are handled by CCC WG.

Arçelik engages with policy makers on mitigation and adaptation as well as environmental legislative issues using a wide variety of communication channels. CCC WG representatives are also the member of T.R. Environment and Urbanization Ministry's technical committees (TC) on climate change (Climate Change Awareness, Mitigation TC etc.). Energy and Environment Departments represent Arçelik in several NGOs in Turkey (TUSIAD, ISO, TOBB Durable Goods Council) and mainly in CECED for EU activities.

These organizations and activities are exist to ensure that all engagement activities are in line with Arçelik's climate change policy and strategy.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

[ANNUAL REPORT_2016_15_05_17.pdf](#)

Content elements

Governance

Emissions figures

Other, please specify (climate related awards (CDP etc.))

Publication

In voluntary sustainability report

Status

Complete

Attach the document

[Sustainability Report 16_14.6.17.pdf](#)

Content elements

Governance

Emissions figures

Emission targets

Other, please specify (energy use, energy projects, awards etc)

C14. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Chief Financial Officer (CFO)	Chief Financial Officer (CFO)

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	Public or Non-Public Submission	I am submitting to
I am submitting my response	Public	Investors

Please confirm below

I have read and accept the applicable Terms



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