

## Relationship Of Environment-Industry In Sustainable Development

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**Abstract:** Thought of analysis necessity of environmental problems arising from production have become prevalent as a principal concern with onset of utilization concept of sustainable development in industry. Sustainable development has comprehensive dimensions as economical, environmental and cultural aspects. However, only dimension of environment-industry of sustainable development has been handled in this study. Problems put forward within this relationship framework are industrial solid wastes, waste water, energy consumption and hazards which release sources give to environment. Amount of industrial solid waste of Turkey in 2004 is 17.4 million ton and out of this, only 7.7 % proportion part has been recycled, 46.9 % has been disposed of. These disposed solid wastes have been removed by pouring 47.2 % rate to seas, lakes and rivers. Rate of solid water released without treated in the same dates is 64.1 %. Industry has 30.7 % share in CO<sub>2</sub> emission. In addition to this, amount of greenhouse gas emission shows increase in each year. Turkey requires more clean and renewable energy sources in terms of sustainable development.

**Keywords:** Sustainability, sustainable development, industry, environment, solid waste, waste water, energy

### Introduction

Respect to nature. Management of all species and natural resources should be taken care of in line with sustainable development principles. However, endless abundance which nature has presented us can be preserved and can be transferred to future generations through these means. Current unsustainable production and consumption moulds are to be changed for the sake of our and our children's welfare. (6<sup>th</sup> Article of UN Millennium Summit Decisions)

One of the most fundamental values discusses in UN Millennium Summit held in New York on September 6-8, 2000 has been the issue of respect to nature. Supplying environmental sustainability, development principles and programmes of countries from Millennium Development objectives handled in eight separate areas have been discussed and it has borne necessity of formation of new strategies. Sustainable Development has been defined as development meeting current requirements without making concessions from requirements of future generations in Rio Summit which World Commission on Environment and Development. Ultimate decisions documents of Rio Summit have affected agenda of UN meetings to be held soon after. Sustainable development and environmental relationships constantly have formed agenda topics in World Population Development Conference (1994), World Social Development Summit (1995), Habitat II (İstanbul-1996) and Millennium Summit (2000).

Significant steps have been taken in recognition and acceptance of this concept by business world and industry and enabling it measurable within ten years following this Rio Conference. Business Council for Sustainable Development Turkey (TBCSD) has been running mutual studies and programmes made with World Business Council for Sustainable Development (WBCSD), United Nations Development Programme (UNDP), State Planning Organization (DTP) and the Ministry of Environment. WBCSD which has its head office in Switzerland has 55 regional representatives and world company member more than one thousand. Sustainable development is not discussed through sole environmental dimensions within the framework of macro economical policies targeted for 21<sup>st</sup> century. It is constantly emphasized that equilibrium between these aspects should be observed for obtaining sustainable results in long-term period without disregarding the fact that social, economical and environmental factors are unceasingly interacted with one another.

It is essential not to disregard relationships of all these dimensions in all studies to be conducted in regard with sustainable development which possess social, economical, environmental and cultural aspects.

Industrialisation which constitutes first and fundamental approach of sustainable development in this study conducted has only handled environmental dimension in relationships of sustainable development. Issues such as environmental pollution arising from industrial wastes and wastes in Turkey, preservation of natural sources and recycling methods related with its management, energy sources used in industry and conformity with release standards have been discussed in detail. While conducting these researches, relationships of industry-environment of sustainable development in Turkey have been elucidated with the help of tables and graphics by providing the most recent data which Turkish Statistical Institution (TÜİK) has published hereof.

#### Relationships of Industry-Environment in Sustainable Development

When environmental dimension of sustainable development in Turkey has been evaluated in terms of industry, it is seen that emergent problems are generally related with infrastructure. Wastes emerged along with industrialization lead to air, water and soil pollution. It is encountered with bureaucracy and infrastructure problems in implementation of respective legislations and other legal regulations concerning control of these wastes. Yet, suitable elimination plants or technological choices which shall provide meeting limit values which these regulations stipulate should be in improved level. If industrialized countries lack suitable systems and plants for specifically industrial wastes and their disposal, it might be impossible to sustain development.

Nowadays, energy and energy costs continue to be significant problem in industrial sector. Energy sources used either comply with release standards or constrain competition conditions due to high cost. This case herewith increases uncontrolled and unconscious applications.

## 1. Industrial Wastes and Environmental Pollution

Environmental legislation in Turkey constituted at the beginnings of 2000 in a great extent. Seven main legislation carrying importance in regard with industrial world are in question within this scope. These are legislations of environmental effect evaluation, control of solid wastes, control of hazardous wastes, control of air quality, water pollution and control of pharmaceutical wastes. Scientific and periodic data asserted in all these areas are vital in regard with adaptation of concept of sustainability accurately and measurability.

A general evaluation can be handled under the headlines given below in terms of sustainability in regard with effects of industry on environment.

### 1.1. Solid Wastes

Waste method in industry is one of the most important components in implementation of sustainability principle. Wastes arising from industrial production and services involve proper management in compliance with environmental and human health by diminishing loss of raw material. Reducing waste amount, recycling, disposal of wastes in compliance with environmental and human health are among principal objectives of sustainable development.

When we examine industrial solid waste amounts in 2000-2004 in Turkey (Table 1), we can see that there is an increase in total solid waste amounts along with increased industrialization. The amount being 17.059 thousand ton/year in 2000 has increased to 17.498 thousand ton/year in 2004. No significant development has been made in solid waste recycle issue with the increase in these amounts. While 8.5 % of waste amounts were recycled or re-used, this rate decreased to 7.7 % with even falling drastically in 2004.

	Total amount of waste	Recycled and reused		Sold or donated		Disposed of	
	Thousand tonnes/year	Thousand tonnes/year	%	Thousand tonnes/year	%	Thousand tonnes/year	%
2000	17 059	1 460	8.5	5 916	34.6	9 683	56.8
2004	17 498	1 346	7.7	7 943	45.4	8 209	46.9

Source: TÜİK, 2006; 23

Table 1. Total amount of industrial waste

When sources of wastes are examined, four main sectors come to the fore as construction, mining, industry and domestic garbage. Such wastes are recycled in 90 % rate in some countries such as Germany, Denmark and the Netherlands. While rate of industrial wastes is 17 % in these countries (Ayvaz, 2004), this rate is 30 % in Turkey (DİE, 2004:164); rate of recycled industrial solid waste is only 8 %. (Figure 1).

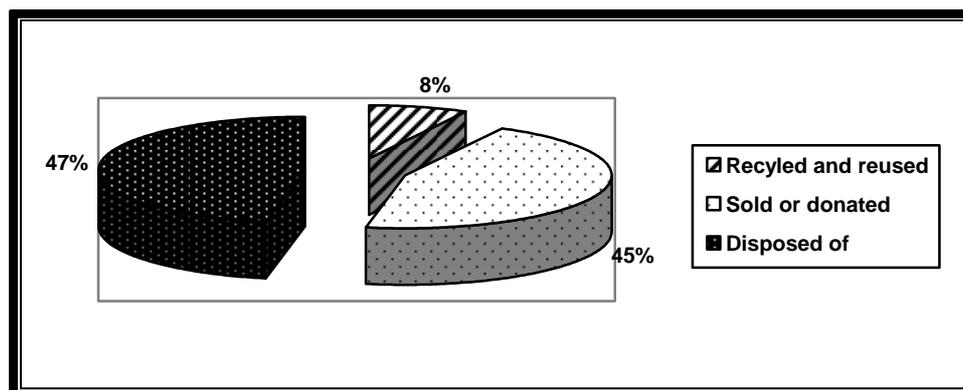


Figure 1. Distribution range of amount of industrial solid waste

	Recycled and reused		Sold or donated		Disposed of		Total
	Thousand tonnes/year	%	Thousand tonnes/year	%	Thousand tonnes/year	%	Thousand tonnes/year
2000	142	10.8	343	26.2	823	62.9	1308
2004	71	5.9	248	20.7	877	73.3	1196

Source: TÜİK, 2006;23

Table 2. Amount of hazardous industrial waste

There occurred 1.2 million tonnes hazardous industrial solid waste in 2004 in Turkey. (Table 2). When we compare this amount with the year of 2000, we can see a decrease accordingly. Additionally, there is a decrease in the rate of recycled hazardous solid waste. While 10.8 of hazardous waste were recycled, 5.9 of this were recovered in 2004. However, rate of disposed hazardous waste increased from 62.9 % to 73.3 %. Whereas disposal and recycling plant capacities of existing industrial waste are not adequate for waste amount arising from sources from country industry, adequate waste is not dispatched to even existing plants. Primary reason for this can be specified such that control inadequacy and industrial institutions' not being ready for high waste disposal costs. (The Ministry of Environment, 2002;116).

Industry group	Recycled and reused %	Disposed of %	Sold or donated %
Manufacture of food and beverages	2.4	31.3	66.3
Manufacture of tobacco products	27.3	37.5	35.2
Manufacture of textiles	1.4	22.3	76.3
Manufacture of paper and paper products	8.5	49.8	41.7
Manufacture of basic metals	9.9	63.5	26.6

Source: [tuik.gov.tr](http://tuik.gov.tr)

Table 3. Methods of elimination of solid wastes in industrial sectors, 2004

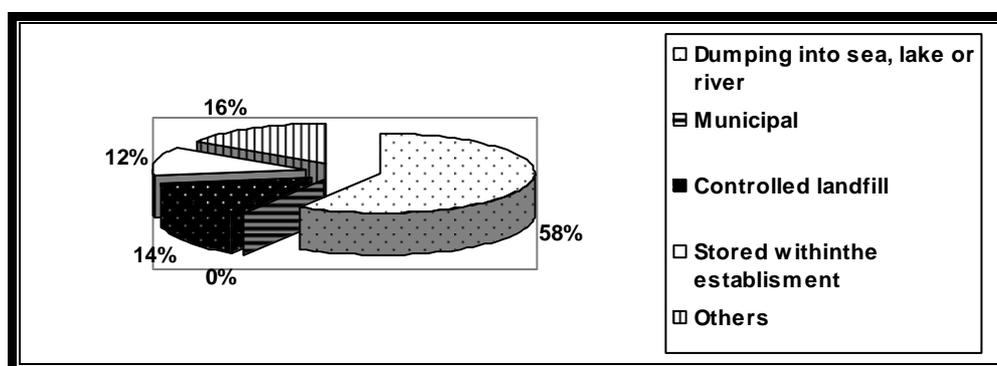
When we examine industrial solid waste elimination methods of important industry branches located in our country (Table 3), it is seen that Food sector disposed of 31.3 % of waste by selling or donating 66.3 % and re-evaluated 2.4 % by recycling. 37.5 % of wastes come out in tobacco industry was disposed and 35.2 % was sold. While the highest rate within disposed tobacco industry belongs to base metal industry, the highest figure in rate of sold or donated waste is seen in textile industry. Recycled highest waste rate is in tobacco industry. Recycled waste rates of industrial sectors have not reached desired level yet.

Industry group	Municipal dumping site	Controlled landfill	Incineration	Open area	Stored within the establishment	Dumping into sea, lake or river	Using as filling material	Burial	Others
Manufacture of food and beverages	49.0	2.5	0.1	0.02	29.8	0.4	11.6	0.2	6.3
Manufacture of tobacco products	7.4	73.2	0.2	-	2.6	-	-	-	16.5
Manufacture of textiles	72.2	24.3	1.0	-	1.8	0.02	0.2	0.04	0.02
Manufacture of paper and paper products	94.5	1.7	0.2	-	3.5	-	-	-	0.05
Manufacture of basic metals	1.5	8.5	0.2	-	7.1	78.5	4.1	-	0.02
Manufacture of motor vehicles and trailers	5.6	8.9	80.6	0.001	4.6	0.005	0.3	-	0.001
Turkey	20.0	10.9	2.4	0.1	9.3	47.2	7.7	1.0	1.2

Source: [tuik.gov.tr](http://tuik.gov.tr)

Table 4. Amount of industrial waste by disposal methods and industry group, 2004 (%)

In Table 4, amounts and disposal methods of Turkey's disposed solid waste industry amount have been shown according to important industry groups. When we primarily examine disposal methods of total of Turkey, we can see that wastes in the highest rate are dumped into seas, lakes and rivers with 47.2 % rate. Yet, pollution of water sources with industrial wastes is the most crucial point which we should attach importance in these days of mentioning effects of global warming. It has been determined that rate of industrial waste dumped into municipality dumping site is 20 %. Disposal of with control landfill is 10.9 %, storing within the establishment is 9.3 % rate of using as filling material is 7.7 %. Only 2.4 % of industrial solid wastes are disposed of by incineration and 1 % of it by burying.



Source: Table 4.

Figure 2. Disposal methods of industrial solid wastes

When we examine distribution of disposal rates by means of municipal dumping site among sectors, it can be stated that the highest rate belongs to industry of paper and paper products with 94.5 % rate. (Table 4). In

second sequence, textile products with 72.2 % and food products and beverage industry with 49 % can be seen. The sector which uses disposal methods maximally by storing solid wastes regularly is the industry of tobacco products. (%73.2). Base metal industry which has the highest rate of disposal by dumping into seas, lakes and rivers is the industry sector which pollutes environment maximally. (78.5). However, when we examine average annual disposal amounts of manufacturing industry and rates of annual waste disposal, it can be seen that the highest figure and rate belong to base metal industry. Amount of industrial solid waste in 2004 was 17.4 million tonnes and 8.2 million tonnes of this was disposed of. (Table 1). Amount of disposed industrial solid waste in 2004 is over 4.9 million tonnes and its rate in Turkey total is approximately 63 %.

## 1.2. Waste Water

Importance of water is increasing each passing day as a result of increase of rapid industrialisation, population growth and domestic water usage. Though only 11 % of water obtained from nature in our country is used in industry, problem of waste water arising from industry is becoming more important. (Ç.B. 2002;112). Waste water standards are applied within this scope with Water Pollution Control Legislation published in 1988. Waste water discharge in industry has been tied up to discharge permit certificate renewed once in a three years. Environmental Effect Evaluation (ÇED) Legislation published in 1992 is not implemented in a desired level. In addition to this, it is being compulsory somehow in the issue of taking required precautions in regard with preservation of water sources.

	Amount of water consumed		Amount of water recycled		Amount of waste water discharged		Treated		Untreated	
	Thousand m <sup>3</sup> /year	Thousand m <sup>3</sup> /year	%	Thousand m <sup>3</sup> /year	%	Thousand m <sup>3</sup> /year	%	Thousand m <sup>3</sup> /year	%	
2000	1 454 061	516 589	35.5	746 877	51.3	235 530	31.5	511 527	68.5	
2004	1 215 090	410 300	33.7	637 756	52.4	228 440	35.8	409 316	64.1	

Source: Tüik, 2006; 23

Table 5. Water usage and waste water in manufacturing industry

While water amount consumed in manufacturing industry in 2000 in Turkey was 1.4 billion m<sup>3</sup>, it was approximately 1.2 m<sup>3</sup> in 2004. Therefore, whereas there is decrease in re-used water rates in same periods, it is recorded that there is increase in discharged and treated water rates. While 51.3 % of water used in industry in 2004 was discharged, this rate increased to 52.4 % in 2004. Water rated treated in the same manner increased from 31 % to 35 %. (Table 5). Agreements signed between some industrial sectors (Paper, fermentation, sugar, leather etc.) and the Ministry of Environment for encouraging construction of waste water treatment plants and industrial investments made with this purpose led an increase in the number of mutual treatment plants in specifically organized industrial zones. Increase in number of industrial institutions having certificate of environmental management system such as ISO 14000<sup>2</sup> made positive contributions to preservation of water sources. Number of industrial workplaces with ISO 14000 certificate in 2008 is 1174. Number of workplace with ISO 14001 certificate is 259. (TÜİK, 2006;23).

Crises lived from time to time in economy of Turkey and high energy costs affect proper operation of water treatment plants and investments of waste water treatment plants negatively. Desire of implementing Aqua cultural Legislation which has brought too low discharge limits in the regions where specifically industry is dense is not regarded as realistic by industrial institutions. Since it is almost impossible to stepping down to these discharge limits, there occur problems in implementation and controls. (ÇB, 2002;113).

<sup>2</sup> ISO 14001 Environmental Management Standard covers environmental dimensions which institutions can hold in control and/or can affect herein.

	City sewerage.	Sea	Lake	River	Land	Septic tank	Others
Industrial wastewater discharged without treatment	6.8	82.0	0.8	8.7	0.4	0.1	1.1
Industrial wastewater discharged after treatment	10.9	23.1	0.2	54.2	6.9	0.07	4.6
Domestic wastewater discharged without treatment	65.3	0.7	0.9	19.8	0.5	11.7	1.1
Domestic wastewater discharged after treatment	11.8	44.6	0.4	36.3	1.7	0.5	4.6

Source: tük.gov.tr

Table 6. Amount of wastewater discharged to the receiving bodies by the status of treatment and industry group 2004, (%)

Waste water rates discharged according to industry group and treatment status can be gathered under four headlines. (Table 6). Out of these, first group consist of industrial waste water discharged treatment. Vast majority of waste water discharged from industry without treatment, namely 82 % of this, is generally discharged to seas. 8.7 % of remaining untreated waste water is discharged rivers and 6.8 % of it to city sewage. When we examine rates of industrial waste water discharged after treatment, it is seen that the highest rate is waste water discharged to rivers with 54.2 % rate. Rates of treated waste water discharged respectively to sea (23 %) and city sewage (10.9 %) are in second and third sequence. In third and fourth group, we see Domestic wastewater discharged without treatment and Domestic wastewater discharged after treatment. Out of these, the highest rate in waste water discharged without treatment is discharged to city sewage with 65.8 % and to rivers with 19.8 %. The highest rate in domestic waste water dumped after treatment is discharged to seas with 44.6 % and to rivers 36.8 %. Just like in industrial solid wastes, maximal degree is dumped into surface water sources in waste water.

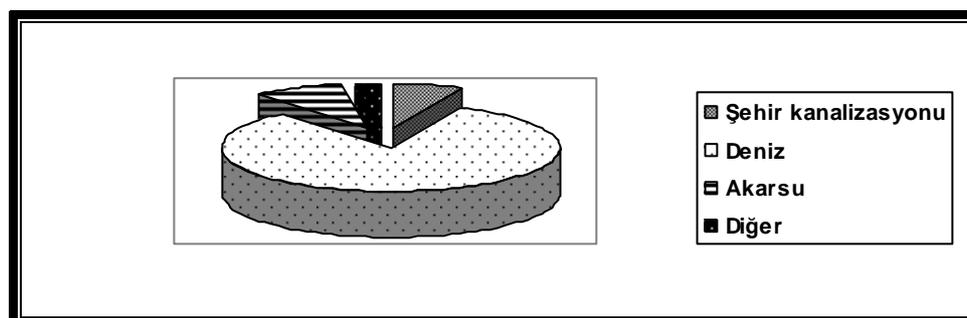


Figure 3. Industrial wastewater discharged without treatment

Environmental pollution has irrecoverable costs. Out of the factors causing this pollution, share of waste water discharged from industry without treatment undoubtedly substantial. As it is seen from Figure 3, dumping the said waste water mostly to seas is an indication of not reaching desired effective level of environmental management systems.

	Used in agriculture	Used in production	Municipal dumping site	Open area	Controlled landfill	Incineration	Dumping into rivers	Others	Total
(ton/year)	234 322	245 131	431 482	347 236	705 087	101287	4603	237387	2306535
%	10.2	10.6	18.7	15.0	30.1	4.4	0.2	10.2	

Source: tük.gov.tr

Table 7. Amount of treatment sludge by disposal methods and industry group , 2004

Treatment sludge emerged as a result of waste water treatment apart from solid waste and waste water in industrial sectors can lead environmental pollution. As a matter of fact, amount of treatment sludge arising from treatment of industrial waste water in Turkey in 2004 is 2.3 million tonnes. Out of treatment sludge emerged in the same dates, 30.1 % is disposed of by control landfill, 18.7 % by municipal dumping site, 15 % by open area, 10.2 % by agricultural usage (Table 7).

## 1.3. Energy Consumption and Release Sources

14.2 % of electric energy consumed in Turkey is used in commercial establishments, 23.7 % in residential houses, 3.6 % in government offices, 3.2 % in illumination of streets, more than 55 % in industrial sector (Table 8).

Government offices	Commercial	Residential	Street illumination	Ind. Cons. And others .	Total
4 662 719	18 543 784	30 934 976	4 142 988	71 978 292	130 262 759
% 3.6	% 14.2	% 23.7	% 3.2	% 55.3	

Source: TÜİK, 2006; 227

Table 8. Consumption of electricity- M Wh (2005)

The highest value within energy rates which manufacturing industry consumes according to usage areas in 2005 has been reserved to production of goods and service with 69.1 %. (Table 9). When we examine other rates, 14.5 % of energy consumed is in coke oven, 11 % is in electricity generation.

Production of goods and services	Space heating	Transportation	Electricity generation	Heat production	Coke oven/ Blast furnace	Non-energy use (TOE)
69.1	2.9	1.5	11.0	0.6	14.5	0.4

Source: TÜİK, 2006; 227

Table 9. Total energy consumption by sectors and usage areas, 2005 (%)

Turkey is a country which is under world average in terms of energy consumption and meets substantial part of energy requirement via import. While per person consumed 1 808 kWh in our country in 2004 (TÜİK,2006;231), this amount was 2 292 kWh in Belgium in 1998 and 3 520 kWh in Finland (DİE,2000;94). When we evaluate total energy sources, it is apparent that our primary energy sources are abundant and it is necessary to evaluate widespread lignite. However, evaluation of the said energy sources should be handled meticulously in terms of sustainable environment.

Coal	Lignite	Fuel-oil	Natural Gas (Motor Oil)	Hydraulic	Other
8.1	18.5	3.2	45.3	24.4	0.5

Source: TÜİK,2006;227

Table 10. Thermal electricity generation by energy resources (10<sup>6</sup>kWh), 2005, %

When energy sources are taken into consideration, natural gas is in first row (45.3 %), hydraulic is in second row (24.4 %), and lignite is in third row (18.5 %). (Table 10). Rates of coal and fuel-oil are fairly low. 90 % of demand of crude oil nowadays and 98 % demand of natural gas are met with import. It is estimated that demand of crude oil of Turkey by 2020 shall be doubled and demand of natural gas shall be five folded. (Ç.B. 2002;107). When energy subject is evaluated within approach of industry and sustainable development, domestic sources are not in a level responding total energy demand of the country. Turkey needs a reliable energy regime.

In parallel with increase of rate of natural gas in energy generation as to years, its share in energy generation increased and reached 9.2 % in 2000. However, when it is considered that Turkey supplies substantial part of its energy from consumable sources, it is noticed that Turkey should orient to clean or renewable sources. It should not be disregarded that we should evaluate our existing energy sources in the best way in terms of sustainability and we should increase usage of renewable energy sources in an economical way.

	Electricity production	Industry	Transport	Other
2000	37.0	28.9	16.9	17.2
2004	34.3	30.7	18.2	16.8

Source: TÜİK, 2006; 20

Table 11. CO<sub>2</sub> emissions by sectors

In industry, energy and energy costs affect the environment negatively by not obeying emission standards of energy sources besides being a very important problem. In Turkey, it is observed that CO<sub>2</sub> emission, which used to be 223 806 thousand/ton in 2000, has risen up to 241 884 in 2004. In the same years, emission rates per person has increased from 3.32 to 3.40 (TUIK, 2006; 20). When the emission distribution rates of CO<sub>2</sub> is revised in terms of sectors (Table 11), the emission which is distributed in 2004 has resulted from electricity production in 34.3%, industry in 30.7% and transportation in 16.8. The emission rate from other group including housing and agriculture, etc. is 18.2%. After beginning natural gas for heating purposes in large cities and in electricity production, there has been a decrease in emission rates in both areas when compared with years 2000 and 2004. However, the emission rates in industry have risen up from 28.9% to 30.7%.

After the publication of Air Pollution Regulation in 1986, positive developments have been attained in application. The emission rates resulting from industry are prevented to a large extent by natural gas transformation in industrial zones, widespread conscious of energy savings and heat conservation and heat recycle in industrial chambers.

	1991	1995	2000	2006
Energy	137.96	160.79	212.55	258.21
Industrial Processes	15.22	21.64	22.23	27.12
Agriculture	19.04	17.97	16.13	16.36
Waste	9.74	20.31	29.04	30.06
Total	181.96	220.72	279.96	331.7
Increase rates in 1990	7.0	29.8	64.6	95

Source: tük.gov.tr

Table 12. GHG emissions by sectors (million tonnes CO<sub>2</sub> eq.)

In spite of all measures taken, rapid urbanization and industrialization have led the waste amounts and other environmental problems to increase. As seen in Table 12, greenhouse gas rates in Turkey have risen up so fast. In a research published by TUIK, year 1990 has been taken as a basis and increase percentages of greenhouse gas are calculated through this year. Thus, the increase rates have risen up to 7% in 1991, 29.8% in 1995, 64.6% in 2000 and 95% in 2006. 181 million tons of greenhouse gas emissions in 1991 have increased to 331 million tons in 2006. When the related table is revised, it is seen that the largest increase rate is made in wastes. For wastes, 9.7 million tons of greenhouse gas emission in 1991 has reached 30 million with a three times larger multiplication in 2006. In spite of measurements taken in industry, greenhouse gas emission in this sector has risen up from 15 million tons to 27 million tons.

When 1990-2005 Annual European Community Greenhouse Gas Inventory and 2007 Inventory Report are examined, AB-15: SG emissions have decreased to 1.5% between 1990 and 2005. Especially in 2004-2005, emission rates have decreased in such countries as Germany, Finland, Holland, Belgium, Denmark, France and England. Turkey is the 13<sup>th</sup> country by having the largest greenhouse gas emission in the world. Total greenhouse gas emission rate is approximately 1.3% in 2004.

Kyoto Protocol has been valid in 174 countries since 2000 and approximately 60% of greenhouse gas emissions of these countries are involved. Therefore, the countries signing Kyoto Protocol will decrease 5% of greenhouse gas emissions in 1990 by putting several limitations for industrial organizations between 2008 and 2012. When this protocol is applied, 13 million tons of total greenhouse gas amounts in 1990 will be 12.7 million tons in 2012.

## 2. Industrial Wastes and Environmental Management

When the purposes of 9<sup>th</sup> Development Plan (DPT, 2006) which will be applied in Turkey between 2007-2013, the focus is mainly on such decisions as taking responsibility of environmental protection and

environmental management by industrial organizations, using sources more efficiently and environmental management (article 518-519). Besides, when public policies of ninth development plan are examined, it is seen that maintaining sustainability in growth by revising industry-environment connections, making productions in accordance with human health and coherence and following social responsibility standards have been highly important.

Since 1980, significant achievements are obtained in terms of air pollution and environmental sources in our country. Although various problems are experienced in constructing sectoral policies and environmental management planning, 648 million TRY have been spent in total for environmental expenditures of production industry in 2007. When the distribution of expenditure is examined (Table 13), the largest rate is seen in waste water management (48%). 23.1% of this rate is used in waste management and 12.7% for climate protection.

	Protection of ambient air and climate	Wastewater management	Solid waste management	Protection of soil and groundwater	Noise and vibration abatement	Protection of biodiversity and landscape	Research and development	Others
%	12.7	48.0	23.1	0.4	0.3	0.5	2.1	12.9

Source: [tuk.gov.tr](http://tuk.gov.tr)

Table 13. Environmental expenditure of manufacturing industry sector, (2007)

The waste types and rates resulting from industrialization in Turkey are not quite different from other developing countries. Within certain intervals, TUIK publishes some data in order to determine amounts and distributions of industrial wastes and to take measurements accordingly. Moreover, the Ministry of Environment prepares industrial inventories for certain regions in determined periods. For instance, the detailed industrial inventory including Marmara, Mediterranean and Western Anatolia is one of those issued in 2002.

Dangerous waste burn plant and regular storing plant of dangerous solid waste built within İzmit Integrated Environmental Project operated by İZAYDAŞ as the most important infrastructure plant in order to diminish wastes resulting from industry. Apart from İZAYDAŞ having a 35 thousand tons dangerous solid burning capacity annually and operating as licensed in our country does not have a licensed industrial waste burn and regular storing plant (Ç.B. 2002; 114-116). In recent years, temporary license certifications are given to some small-scaled plantations. However, legal inspection mechanisms are not effectively valid in these plants in terms of quality of recycle materials and disposal of wastes.

### 3. Results and Suggestions

Turkey's involvement within customs union and EU membership process has been an impulsive force in terms of putting sustainability principles into action. Nonetheless, all measurements taken have not been enough. The amount of industrial solid waste in Turkey is 17.4 million tons, but only 46.9% of this rate is disposed of. The amount of dangerous solid waste is yearly 70 thousand tons on average. Besides, the amount of waste water has reached 1.2 billion m<sup>3</sup> in 2004 and only 33.7% of it has been re-used and 64% has been left into nature without purification. The largest rates of waste water and solid wastes are determined to be disposed into seas or rivers.

Turkey meets most of his energy need from importation. We are unable to use our present energy sources in full capacity in terms of sustainability. Most of CO<sub>2</sub> emissions released results from industry in 30%. We are the 13<sup>th</sup> country in greenhouse gas emission in the world. In recent twenty years, there has been an increase of more than 90% in greenhouse gas emission.

Turkey should primarily secure its sustainable use of natural sources such as air, soil and water.

It should also take measurements to decrease the effects of wastes and emissions on natural environment and re-arrange its regulations accordingly.

States should be sensitive and supportive enough in terms of waste disposal costs of industrial organizations.

In industrial organizations of Turkey, SMEs (small and medium sized entrepreneurs) play an important role. Especially in most of these, there are many infrastructure insufficiencies. In order to meet this need, states should construct stable policies and make substantial investments.

It is conditional to have a proper system for disposal of industrial wastes and to increase the number of these plants.

It is important to make investments and to take necessary precautions in order to use the cleanest and sustainable energy together with energy and energy costs used in industry.

The uncertainty in economy should be dissolved in order to enable a sustainable development in terms of industry in our country. The determined policies will reach its aim thanks to absence of economical doubts and calculations in industrial environments. Unfair competition of business and industry environments working together peacefully with environment protection and sustainable development efforts and required enforcement should be applied.

In this research, sustainable development is only tried to be described in terms of environment and Turkey's present structure is explained. Yet, it should not be forgotten to take economical, social and environmental dimensions into consideration for sustainable developments of countries. Not only businessmen are responsible for this, but also are productive sectors and citizens.

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