REPUBLIC OF TURKEY
MINISTRY OF
ENERGY AND
NATURAL RESOURCES

ENERGY
EFFICIENCY
ASSOCIATION

USE YOUR ENERGY EFFICIENTLY

# ENERGY TEAM


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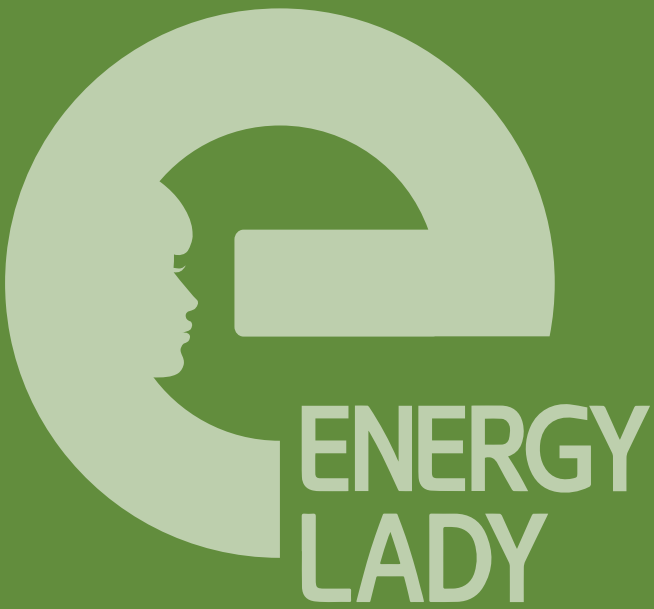
www.enver.org.tr

# Energy Efficiency Association

Efficiency-based activities are becoming more common around the world. All countries and big organizations have been spending (using) high budgets on research and development in this area. Several institutors and organizations are working on energy efficiency in our country.

The Energy Efficiency Association is a non-governmental organization. Its primary purpose is to create awareness in people, helping them to use energy efficiently and productively. Furthermore, it aims to continually conduct scientific research and also to increase public knowledge by sharing those findings with public enterprises and citizens

The Association; organizes successful campaigns, promotions and activities with the strong management and qualified technical infrastructure; it is already able to awareness about energy efficiency on the community in short time.




www.enerjihanim.com

# Small step for ladies,

# Great energy savings

# for your country.

# “Energy Lady”

REPUBLIC OF TURKEY
MINISTRY OF
ENERGY AND
NATURAL RESOURCES

Republic of Turkey
Ministry of Family and
Social Policy

ENERGY
EFFICIENCY
ASSOCIATION

"Energy Lady" project with an emphasis on energy efficiency efforts, especially in homes across the country, including our women learn to use energy efficiently and thus prior to the household economy, is intended to contribute to the country's economy


Reached 34 thousand women in 21 provinces of the campaign, tens of thousands of women and to raise awareness of home energy consumption reduction is achieved

**"With little savings, reduce your annual power consumption rate of 1 in 4 is possible. This first-quarter gold for your family, 4 billion lira for Turkey's economy means profit. "**

# APPLICATION FOR HOME ENERGY EFFICIENCY TO BE HELD AREAS

1. Oven
2. Refrigerator
3. Dishwashers
4. Electric Water Heater (Kettle)
5. Television
6. Air Conditioner
7. Lighting
8. Washing Machine
9. Flat Iron
10. Vacuum Cleaner
11. Hair Dryer
12. Electric Heaters (Water Heater, Boilers)

# 1. OWEN

- Do not frequently open or close oven lid and do not leave the lid open for a long time!
- Turn off the oven a few minutes before the cooking time, your meal will continue to be cooked!
- Do not perform pre-heating unless necessary!
- You can cook several meals simultaneously in the oven, so that you will have performed more work in lesser time!
- Cooking meals at lower temperatures will take time but their taste will increase!
- Close the lids of pans or broilers, so that their vapor will not go away! ("Close the lid and do not let energy to vaporize").
- You reduce oven temperature by 15 degrees by using glass and ceramic ovenware!

## 2. REFRIGERATOR

- Adjust the freezer and cooling temperatures correctly.
- Do not place the refrigerator close to other electricity appliances; this will reduce the refrigerator's temperature!
- Place food in refrigerator in closed cans and do not leave its door open
- Do not open and close the refrigerator door frequently!
- Place your food in the refrigerator after they become cold, so that neither your food nor your refrigerator will get corrupt.
- The temperature of the cooling department should be 4-5 degrees and that of the freezer department should be -20 -18 degrees.
- Keep it away from places receiving sunlight, radiators and sources of heat so that your energy consumption will decrease by 25%.
- Keep it full and place its contents orderly as much as possible!
- Regularly clean and perform maintenance for your refrigerator!
- Choose a cooler at desired dimensions, more is not needed!
- Models with deep freezers at the top or bottom are more efficient than the ones having them laterally.

# 3. DISHWASHERS

- Do not wash your dishes with hand, use a machine!
- Fill up the machine, let it run will full capacity!
- Connect the water inlet to hot water!
- Use a program with economic rotation and low temperature, you dishes will become spotlessly clean!
- The most efficient washing temperature for dishes is 50 degrees.
- Do not forget to clean the filter and discharge sections!

# 4. ELECTRIC WATER HEATER (Kettle)

- Unplug your device when not in use!

- Frequently clean the accumulating limes and residues!

- Heat only the needed water amount!

- Use the device with a filter!

## 5. TELEVISION

- Close the television from its button, not using the remote controller!
- Keep television sound low!

## 6. AIR CONDITIONER

- Use and air conditioner with an electronic thermostat!
- Use it when necessary in a controlled manner!
- Perform regular cleaning and maintenance on it!
- Place its external unit in a protected location!
- Do not let your air conditioner receive direct sunlight.
- Prefer low capacity models that conforms to the surrounding space!

# 7. LIGHTING

- Make sure to switch-off any lamp you are not using!
- Try to utilize solar energy; this is also important for your health!
- Use controlled lighting and energy saving bulbs!
- Use partial lighting instead of general lighting at home!
- Use a lamp with high power instead of several ones with low powers!
- Try not to make decorative lighting!
- Lighting yourself efficiently if you do not want the dark.
- Make use of daylight and use lighting with sensors.
- Efficient lamp means efficient energy.

# 8. WASHING MACHINE

- Fill up the machine, let it run will full capacity!
- Use economic and short programs, you will save time!
- Prefer lower temperature, so that your laundries will not wear-off!
- Perform maintenance for your machines regularly, their lifetime will increase!
- Prefer front-loaded models instead of top-loaded models!
- Use less detergent and protect your health!
- Lower temperature means laundries will have longer lifetime.
- Short programs will save both money and time.

# 9. FLAT IRON

- Choose a model with vapor adjustment and high vapor capacity!
- It is important that it has thermostat adjustment!
- 5 minutes before of the end of your work, unplug iron and complete the remaining work.
- Iron your laundries are wet, they can be ironed easier!
- It is base material should be scratch-proof coating!
- It is important that it can clean the lime layer on its own!

## 10. VACUUM CLEANER

- Empty its bag frequently!
- Renew worn-out brushes!
- Prefer vacuum cleaners with water reservoirs instead of those with bags!
- Do not forget to clean the engine, brush and pipe departments!
- Keep in mind that vacuum cleaners can also operate at lower power!

## 11. HAIR DRYER

- Dry your hair thoroughly with towel and then use the machine!
- Try drying at low temperature and for shorter time, you can also prevent damages to your hair by doing this!

# 12. ELECTRİC HEATERS (Water Heater, Boilers)

- Your water heater should be close to the place of use (maximum 6 meters)
- Do not forget to have your hot water pipes isolated!
- Adjust the thermostat temperature to a maximum of 50 degrees!
- Do not forget to power-off water heaters such as geysers and boilers when going to holiday!
- Attach non-return valves to hot and cold water connections!
- Pay attention to water leakages, repair if any!
- Operate boilers when they are full.


A++
A+
A
A

# GENERAL RULES ON ENERGY EFFICIENCY AT HOMES

- Paying attention that white appliances are of ENERGY EFFICIENT CLASS as they are bought;

- Depending on the product class, A/A+/A++/A++/A+++ signs on white appliances point to the lowest energy consumption. We thus have to prefer WHITE APPLIANCES that use minimum energy when we buy them.

- Leaving at least 5 centimeter vacant space at the back and on the sides when placing white appliances.

- Using double-glaze windows or weather strips for windows.

- Leaving vacant space in front of the radiator.

- Installing thermostatic valves on radiators. (this will allow adjusting room temperatures).

- Making building isolation.


www.enerjicocuk.org

# A Life With Saving Is A Better Life

## "Energy Kid"

REPUBLIC OF TURKEY
MINISTRY OF
ENERGY AND
NATURAL RESOURCES

Republic of Turkey
Ministry of National Education

ENERGY
EFFICIENCY
ASSOCIATION

Energy efficiency studies, with particular emphasis primarily at home, including children is located in environment energy by children efficiently in order to use our children's energy use and consumption raise awareness and children about energy efficiency economy of the country to contribute to the ensuring

# ACTIVITIES TO BE IMPLEMENTED UNDER THE PROJECT:

1. Every school club establishment of the Energy Efficiency
2. Establishment of Energy Children's Board
3. Creating Energy Kid Leader
4. Energy Efficiency stories and projects on the regulation of competition
5. Energy Kid Naz Cartoon Study

# WE LEARN TO BE ENERGY EFFICIENT, FROM ENERGY KID NAZ

- Do not forget to turn off lights whenever they are not needed.

- Open the curtains and let's make daylight entering the room.

- Open shades and curtains on sunny winter days to let the sun shine in.

- Turn on your computer only when you are going to use it. Warn your friends who forget to turn off their computer.

# WE LEARN TO BE ENERGY EFFICIENT, FROM ENERGY KID NAZ

- Do not forget to turn off when we were not watching television.

- Televisions, computers and all household appliances should be manually turned off by using the power button.

- Although the use of electrical appliances that are plugged in, removing the plug from the socket we want to help our growns.

- We should remind of using efficient light bulb to our family

- A new glass of water to drink every time I do not use the dishwasher empty space we get more work.

# WE LEARN TO BE ENERGY EFFICIENT, FROM ENERGY KID NAZ

- Set the heater to 21 °C to prevent energy loss and dress for the weather. Ask your parents to lower the temperature when it is too hot.

- Will not keep the refrigerator door open unnecessarily.

- Separate dirty and clean clothes to prevent unnecessary washing.

- Keep doors and windows shut to prevent cold air entering the house and heated air escaping.

- Let's keep an open front radiators Allow spread the heat well


www.enerjiverimlisanayi.com

# STRONG INDUSTRY
## FOR ENERGY EFFICIENT

## PROJECT TO IMPROVE ENERGY EFFICIENCY IN INDUSTRY

# "Energy Efficient Industrial"

REPUBLIC OF TURKEY
MINISTRY OF ENERGY AND NATURAL RESOURCES

ENERGY EFFICIENCY ASSOCIATION

OSB TOP ORGANIZATION

Our country's energy consumption is increasing each passing day. Our companies, with using energy efficiently, can reduce energy bills by over 30 percent. In this way, over the next decade it is able to contribute **65 billion TL** to the national economy.

# What can be done with 65 Billion TL?

| | |
|---|---|
| • 6 units Nuclear Power Plant | • 10 pieces Bosphorus Bridge |
| • 7 Atatürk Dams | • 16.000 schools |
| • 10 Airports | • 3.200 full-fledged hospitals |

Our goal is to reduce foreign dependence on energy. Environmentally conscious, environmentally friendly industries, sustainable development and in 2023 Turkey which will be among the world's top 10 economies!

Turkey and for the future of our children, it's now time to start promoting energy efficiency projects. Now it's time for more production with less energy.

# EFFICIENCY OPPORTUNITIES

1. Furnace systems
2. Boiler systems
3. Steam systems
4. Drying systems
5. Cooling systems
6. Heating, ventilation and air-conditioning systems
7. Cooling tower systems
8. Fan systems
9. Compressed air systems
10. Pump systems
11. Electrical systems
12. Engine systems
13. Lighting systems
14. Waste water recycling
15. Energy management systems
16. Renewable energy systems

# 1. FURNACE SYSTEMS

**Waste heat recycling**

• The recuperator can be used at the preheating of secondary air by recycling the hot flue gas with regenerative burning or other gases.

• It is possible to use such recycled heat for the purposes of heating, baking, drying and etc.

• Also it's possible to produce a hot water by using the economizer.

• Hereabouts it can be provided an energy saving up to %45 by recycling the waste heat.

**Combustion efficiency enhancement operations (Fuel-Air mixture adjustment):**

• It is possible to increase the efficiency up to %14 by optimization of fuel-air mixture.

• The enhancement operations at burner systems or using the burner efficiently:

• The burner is a place where the fuel and air is mixed that's why the enhancement methods of combustion efficiency are valid.

**The enhancement operations at the flue systems:**

• It's provided an important information about the following of humidity, temperature, flue gas components such as CO2, O2 and CO and energy efficiency.

Use of alternative fuel or waste energy:

• It's gettable to save the fuel by burning the solid waste (garbage, waste mud and etc.) at the plants which have furnaces that works at the very high temperatures (abt 1000°C ) .

**The insulation of furnace surfaces and hot lines:**

• The furnace surface losses can reach up to %10. All surfaces those temperature is over 60°C' have to be insulated.

**The energy efficiency oriented design changes, modernization or furnace renewal:**

• The total thermal efficiency can reach up to %90 level by performing all these mentioned methods.

# 2. BOILER SYSTEMS

**The heating recycling (Flue gas heating):**

• If the waste flue gas temperature is more than 130°C then it's possible to provide the heating of the water with the recuperator by preheating of secondary air or with economizer.

• It can be provided to save the fuel between %3 and 20.

**Blowdown recycling:**

• It's possible to make saving up to %2,5 from the blowdown that is required to be changed regularly at the steam boiler by using the same waste heat recycling methods.

**Condensate recycling and flash steam acquisition:**

• It's in question to save the fuel up to %14.

• Please see steam systems part for more information.

**Insulation of boiler surface and hot lines:**

• It's possible to get increase about %1 in modern boilers and %10 increase at old boilers.

**Fuel burning conditions enhancement oriented operations:**

• Each 28°C increase in combustion air going into boiler provides approximately %1 increase of efficiency.

**Use of alternative fuel or waste fuel:**

• Please see Furnace systems.

**Combustion efficiency enhancement operations:**

• It's provided to make saving up to %20 by making the air-fuel mixture adjustment in right manner.

**Water treatment systems:**

• The quality of the boiler feed water directly influences the efficiency.

If the rate of the dissolved minerals is high then the incrustation in boiler will be increased.

• The incrustation and furring in boiler pipes decreases the heat transfer up to %60.

• Also the blowdown losses will increase due to the keeping more water in the boiler.

• Due to the cleaning, maintenance and breakdowns the costs will increase.

**The enhancement operations at flue systems:**

• Please see furnace systems.

The energy efficiency oriented design changes, modernization or furnace renewal:

• The hot water and electricity are produced totally with efficiency of %90 by cogeneration systems.

# 3. STEAM SYSTEMS

**The control of the steam lines, prevention of changes and leakages at the lines which have not been designed properly:**

• The leakage and thermal losses at the steam transferring systems are between %5-7 levels.

**Condensate recycling and flash steam acquisition:**

• The produced steam becomes a liquid cooling after it's been used.

• The occurred hot condensate is vaporized suddenly when it contacts with atmosphere. It's called a flash steam.

• The total of flash steam and condensate thermal losses can reach up to %20.

• Can be joined to the existed waste heat recycling system or created separate system.

**Insulation of steam and condensate lines:**

• The losses at insulated pipes are less %80-85 compared with uninsulated pipes.

**Maintenance, control of steam traps and renewal of failed ones:**

• The failed steam traps increases the leakages because of it will make a steam leakage.

• According to YEGM poll the %10 of traps at industry are defected.

**Using of appropriate steam trap:**

• It has to be selected a steam trap which is compatible with steam pressure.

# 4. DRYING SYSTEMS

**Waste heat recycling:**

• The recuperator can be used at the preheating of secondary air by recycling the hot flue gas with regenerative burning or other gases.

• It is possible to use such recycled heat for the purposes of heating, baking, drying and etc.

• Also it's possible to produce a hot water by using the economizer.

• Hereabouts it can be provided an energy saving up to %45 by recycling the waste heat.

**Utilization of flue gas humidity**

**Building a humidity control system in exhaust air and dried material.**

**Enhancement operations in hot air drying systems.**

**The enhancement operations at burner systems or using the burner efficiently**

• The burner is a place where the fuel and air is mixed that's why the enhancement methods of combustion efficiency are valid.

# 5. COOLING SYSTEMS

**Insulation of cooling lines:**

• In insulated pipes the energy loss is less by %70-80 compared with uninsulated pipes.

**The high efficiency engine applications in cooling system fan and pumps:**

• Class EFF1 engines are more efficient by %2-%6 compared with class EFF2 engines.

• If it's considered that %90 of total cost of the engine is energy along it's lifetime, the saving amount is quite a lot.

**Efficiency enhancement operations at cold storage warehouses:**

• It can be provided an energy saving up to %70 at cold storage warehouses by smart remote control systems.

**The operations regarding the prevention of factors that cause the decrease of heat transfer at cooling systems:**

• The pollution in the channels at cooling system causes an energy loss between %11-44.

**Waste heat recycling (exhaust heat, condenser heat):**

• The waste heat can be used at air heating or water heating at another system.

• It's saved on hot water, heating and steam expenses.

• The absorption cooling and waste heat also can be used at cooling.

**Trigeneration systems:**

• The electricity, hot water and/or cooling needs can be met by a single energy source (generally a natural gas). By this way the maximum efficiency can be provided.

# 6. HEATING, VENTILATON, AIR-CONDITIONING (HVAC) SYSTEMS

**Temperature and humidity control system operations at the areas where the air-conditioning is performed.**

**The control of cooling lines and the changes at the lines which haven't been designed properly.**

**Exhaust air waste heat recycling operations.**

**Land and/or water source heat pump applications.**

- Provides a saving up to %25 in cooling and up to %75 in heating

**Solar collector applications for the purpose of utilization of solar energy.**

- Can provide the entire hot water needs in summer months
- Can provide a support in heating and cooling.

# 7. COOLING TOWER SYSTEMS

**High efficiency engine application in fan and pumps of cooling tower**

• Class EFF1 engines are more efficient by %2-%6 compared with class EFF2 engines.

• If it's considered that %90 of total cost of the engine is energy along it's lifetime, the saving amount is high.

**Variable speed drive (VSD) application in fan and pumps of cooling tower.**

• It can be provided the energy saving up to %50.

**Modernization of cooling tower**

• Modern cooling towers increase the concerned cooling performance by %20.

**Insulation of lines**

# 8. FAN SYSTEMS

**Variable speed drive (VSD) application in fans**

• It can be provided the energy saving up to %50.

**High efficiency engine applications at fans**

• Class EFF1 engines are more efficient by %2-%6 compared with class EFF2 engines.

**Suitable air control and flow adjustment system operations**

• It can be provided the flow increase approximately by %20 by selection of wing/engine type according to the system and process with the same engine power.

• Demand controlled ventilation provides an energy saving and assures the ventilation quality.

**High efficiency fan applications**

• The belt losses can be reset by direct drive or coupler drive.

# 9. COMPRESSED AIR SYSTEMS

**Control of compressed air lines and making changes at the compressed air lines which haven't been designed properly**

• Control system renovation provides an energy saving up to %7.

**Variable speed drive (VSD) or soft starter applications in Compressors:**

• It can be provided an energy saving up to %10 by using
of VSD.

**By selection of appropriate compressor: up to %6,**

• It can be provided an energy saving up to %6 by optimization of pneumatic equipment.

**Prevention operations of losses and leakages**

• Decrease of air leakages provides a saving up to %42,

• Decrease of pressure losses provides a saving up to %4.

**Making efficient the air dryers and air tanks**

• It's provided an efficiency about %1 by purging the air from humidity.

• It decreases the condensate which is occurred in air tanks.

**Proper design of compressor room and compressor settlement**

• Each %5 decrease of intake air temperature provides %2 energy saving.

**Utilization of compressor waste heat (exhaust end cooling system)**

• The waste heat can be used for heating of water and air.

It can be provided a recycling up to %90.

# 10. PUMP SYSTEMS

**High efficiency pump applications**

- It can be provided %20 saving by low-frictional pump.
- It's possible to provide an energy saving totally up to %70 by VSD, high efficiency engine, pump and coupler

**Energy efficiency increasing preventions in pumps that have been selected at more capacity than it's needed**

- It can be made a saving in amount about VSD (10/1 cost) with depressurising by spinning the pump impellers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BANKI

# 11. ELECTRICAL SYSTEMS

**Utilization of efficient transformer**

• Due to not containing the moving parts the efficency of transformers are quite high ( ~ %98). But due to having
higher losses in outdated transformers it can be provided
%1-2 efficiency increase after their renovation.

**Efficiency increasing activities aimed at decrease of technical losses in transmission and distribution lines:**

• Thermal losses are decreased at the level of %2-3 by optimum conductor cut and voltage level.

**Modernization or renovation of electrical systems:**

• The losses and leakages are avoidable by smart network applications.

• Renewable energy sources are mostly utilized.

**Harmonic filter and compensation operations regarding prevention of harmonics occurred in electrical systems**

• VSD, discharge lamps, LED drivers, electronic ballasts and other a lot of devices make a harmonic. It has to be payed attention to the harmonic generation while these kind of elements are purchased.

• There are a lot of cost increasing influences of harmonics as of increasing of losses untill damaging to equipments.
For this reason they have to be filtered.

• The harmonics can be removed in a vast scale by right chosen and settled passive filters. Further to that utilization of active filters could be required.

• Removing of harmonics can positively affect the performance of power factor and compensation systems. The cost increasing arisen from penalties is avoidable.

# 12. ENGINE SYSTEMS

**Selection of engine in appropriate capacity according to the load.**

- Electric engines work at maximum efficiency under %85-90 of load. Also the power factors substantially go down under this value.

**Alteration of inefficient engines into efficient engines**

- Please see Cooling systems.

**Alteration of low efficient transmission elements which are existed between an engine and load into high efficient transmission elements**

- The frictional losses decreases between %3-5.

**Variable speed drive (VSD) or soft starter applications in Engines**

- VSD ,engine speed and power are adjusted according to needs.
- At the same time a high flow traction is avoided while taking off (soft starter).
- Please see Fan System, Pump System, Cooling System.

# 13. LIGHTING SYSTEMS

**Selection of armatures which have high energy efficiency and are suitable for usage area.**

- It's possible to consume energy %40 less by using induction lamps compared with discharge lamps.
- New reflectors are %20 more efficient.
- Sodium vapor lamps are %60-70 more economical than mercury vapor lamps at exterior lighting.

**Electronic ballast usage in fluorescent lamps**

- It can be provided an electricity saving between %25-40.

**Lighting control system (dimmer, motion sensor, photocell, time clocks and etc.) applications**

- It can be presented %30 saving in average.
- The saving amount changes according to the usage area.

**Opening of lighting windows on the roof, at walls or at other places for the purpose of utilization of solar light at maximum level may reduce the lighting costs by %30.**

**LED lighting system applications at suitable areas.**

- Are %15-40 more efficient compared with discharge lamps.
- Is more expensive in the beginning but long-lasting
- Is seen as a lighting style of future.

# 14. WASTE WATER RECYCLING

**Applications regarding reducing the water consumption during dyeing and finishing processes in textile sector as well as in order to be used at relevant processes the technological changings in ion exchanger resin systems that produces soft water:**
**Water saving: %54**
**Chemical saving: %67**
**Energy saving: natural gas %21,5,**
**electric %0,5**

- In addition to the water saving especially it can be made a saving from the energy that is used for hot water generation. It can be reduced annual natural gas and electricity consumption and consequently carbon dioxide (CO2) emission by provided energy efficiency. In other respect in consequence of enhancements provided in water softening system, it can be obtained a salt saving.

**Company business sphere Textile sector: Fabric Production**

- Water consumption before the project: 300.000 m3/year
- Water saving: 162.000 m3/year (%54)
- Chemical saving: 192 ton/year NaCl (%67)
- Energy saving: 4.681.000 kWh/year natural gas (%21,5), 98.800 kWh/year electricity (%0,5)

**Total Cost of an Investment and Economic Achievements**

- Total cost of an investment : 22.000 $
- Water saving*: 223.234 $/year
- Energy saving:211.436 $/year
- 11.248 $/year electricity
- Chemical saving : 21.677 $/year NaCl
- Project payback period: less than 1 month

*A city water has been taken as a basis.

# 15. ENERGY MANAGEMENT SYSTEMS

**Energy monitoring, Control and Management System Establishment**

• By monitoring the energy consumption of business firm, by catching up the losses and leakages it can be provided %10-15 energy efficiency with training utilization habits enhancement as compared with other business firms.

**TS EN 50001 Energy Management System Establishment**

• Energy management establishment by business firm and monitoring, managing it's energy is necessary for efficiency increasing project supports.

**Automation System Establishment**

• It is possible to provide a serious energy saving and generation efficiency by following up the processes, business firm and making comparison.

# 16. RENEWABLE ENERGY SYSTEMS

**In scope of Free Electric Consumer; to purchase cheaper electric, tariff and demand methods.**

• Now it's possible to make more suitable energy agreements. It can be made saving on invoice amounts by production planning and shifting, by making production while electricity is cheaper.

**Photovoltaic Solar or Wind Power Production System Inside Establishment and to Roof**

• It can be made a saving by generating the electricity that is needed in the daytime by 1MWp Unlicensed PV Solar Plant and in the nighttime by getting the electricity from the network. Now it's possible to earn an income by selling the overproduced electricity to the network in weekends or during the holidays.

**CHOGENIC-TRIGENIC System**

• If it's possible in 7 x24 plants, at both heating and cooling needed business firms and plants very serious energy saving is provided.

## TYPICAL PROJECTS

| Name of the Project | Annual Saving Rate (%) | Annual Saving Rate (TEP) | Total Investment Amount | Recycling Period (Year) |
|---|---|---|---|---|
| Dyehouse Sewage Recycling | 26,64 | 6.992.966 | 256.310 | 0,122 |
| Alteration in Lighting System | 0,41 | 63,81 | 40.742 | 0,55 |
| Ventilation of Existed Compressor Room | 0,03 | 5,83 | 2.323 | 0,32 |
| Chiller Change | 1,2 | 185,89 | 103.667 | 0,48 |
| Boiler Fire Adjustment | 4,5 | 704,94 | 21.812 | 0,07 |
| Heat Insulation in Boiled Oil Lines | 0,18 | 27,69 | 13.333 | 0,79 |
| Boiler Economizer Renovation | 4,98 | 770,23 | 58.684 | 0,17 |
| Compensation | 0,6 | 93,17 | 135.000 | 1,25 |
| Energy Monitoring System Establishment | 0,09 | 14,33 | 22.500 | 1,35 |
| Insulaton Revision of Hot Oil lines | 0,41 | 64,45 | 66.667 | 0,89 |
| Water Tower Rehabilitation | 0,04 | 7,46 | 20.833 | 2,4 |
| BOPP Chiller Revision | 1,29 | 199,66 | 145.833 | 0,63 |

| Name of the Project | Annual Saving Rate (%) | Annual Saving Rate (TEP) | Total Investment Amount | Recycling Period (Year) |
|---|---|---|---|---|
| Speed Control in Water Tower Pumps | 0,15 | 23,47 | 30.000 | 1,05 |
| Recuperator, Flash and Trim Applications at Steam Process | 32,6 | 769,0 | 152.621 | 0,6 |
| Rising the Temperature of Feed Water by being passed of the Boiler Flue Gases through the Economizer. | 2,36 | 150 | 74.000 | 1,42 |
| Heat Recycling from Hot Waste Water | 4,74 | 298 | 100.000 | 2,46 |
| Flue Gas Economizer Application | 13,0 | 1.531 | 127.000 | 0,37 |
| Increasing the steam generation per 1 kW electric in boiler room | 5,0 | 293 | 8.333 | 0,125 |
| Reducing the Natural Gas Consumption in Statical Dye Lines | 10,0 | 280 | 10.000 | 0,11 |
| Evaporative Cooling System at Offset Print Hall | 7,0 | 26 | 23.000 | 0,75 |
| Recycling of Waste Heat that is threw out of the Flues of Stenter and Dyeing Machines | 17,0 | 1.320 | 350.000 | 0,86 |
| Frequency Convertor Investment | 0,9 | 457 | 276.028 | 0,8 |
| Completion of Uncompleted Isolation | 7,5 | 4.011 | 237.036 | 0,13 |
| Farin Feeding System with Rotary Furnace Elevator | 0,14 | 181 | 1.051.707 | 7,04 |
| Absorption Cooling System | 0,05 | 65 | 180.000 | 3,4 |
| Lighting Saving Project | 0,96 | 338 | 29.000 | 0,06 |

| Name of the Project | Annual Saving Rate (%) | Annual Saving Rate (TEP) | Total Investment Amount | Recycling Period (Year) |
|---|---|---|---|---|
| Converting the Coke Gas into the Oven Gas | 4,56 | 55.433 | 92.000 | 0,08 |
| Electro filter and Aspiration Enhancement | 0,078 | 942 | 418.000 | 0,5 |
| Feeder-Breaker Enhancement | 0,001 | 10,11 | 20.381 | 1,97 |
| Speed Control at High Furnace and Steel Mill Gas Lines | 0,0109 | 182 | 7.490 | 0,05 |
| Slab Furnace Modernization | 0,32 | 5.342 | 876.254 | 0,4 |

## 5TH REGION INCENTIVES FOR INVESTMENTS ON ENERGY EFFICIENCY

The Resolution of the Council of Ministers numbered: 2014/6058 that took effect upon publication in the Official Gazette dated: 9 May 2014 and numbered: 28995, resolved to incent some energy investments.

**The energy investments to be incented:**

- Investments on energy efficiency to be realized in existent production industry plants with annual energy consumptions of minimally 500 TEP (petroleum equivalent in tons), that provide a minimum energy saving of 20% per unit and with maximum recycling times of 5 years.
- Investments based on electricity production by the recycling of waste heat in a plant (excluding electricity production plants based on natural gas) .
- This resolution will also benefit the liquefied natural gas (LNG) investments as well as subterranean natural gas storage investments with minimum amounts of 50 Million TL; and

Regardless of the region of investment, the AFORESAID SHALL BENEFIT FROM THE INCENTIVES PROVIDED TO THE 5TH REGION.

**The 5th Region Incentives to be Benefited From:**

- Value Added Tax Exception,
- Exemption from Customs Tax,
- Tax Rebate,
- Insurance premium employer share support,
- Interest Support,
- Allocation of an investment place,

**Value Added Tax Exception:**

Value added tax will not be paid for investment commodities, machinery & equipment that will be obtained domestically or from abroad within the scope of the incentive certificate.

**Exemption from Customs Tax:**

Customs tax will not be paid for investment commodities, machinery & equipment that will be obtained from abroad within the scope of the incentive certificate.

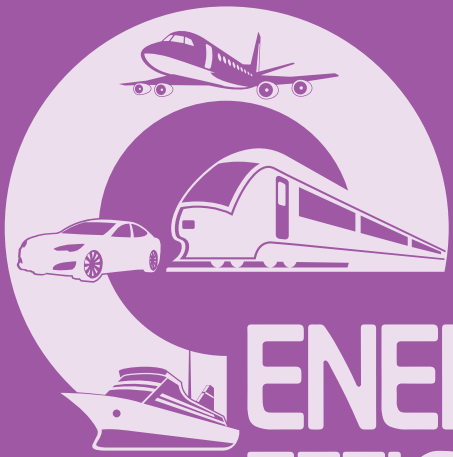
**Tax Rebate:**
Application of the income or the corporate tax with discount until it reaches the contribution amount envisaged for the investment (the contribution amount to investment for the 5th Region is 30%; the rebate ratio for the income or the corporate tax is 70%).

**Insurance Premium Employer Share Support:**
The employer's insurance premium share, which should be paid for additional employment and which corresponds to minimum wage, shall be met by the Ministry.

**Interest Support:**
Interest Support represents a financial support provided for instrument credits, which have maturities of at least one year and which are utilized within the scope of the incentive certificate, and the Ministry will, up to 70% of the fixed investment amount registered in the incentive certificate, meet a certain portion of the interest or profit share that are to be paid for such credits utilized (five points in Turkish Liras for regional investments made in the 5th region and two points for foreign exchange credits and credits on foreign exchange index).

**Allocation of an Investment Place:**
Allocation of an investment place for investments for which an Incentive Certificate has been issued, and within framework of the principles and procedures established by the Ministry of Finance.

An "Investment Incentive Certificate" should be obtained for benefiting from such incentives.
Investors aspiring to benefit from the 5th region incentives in their Energy Efficiency investments can obtain detailed information from the Ministry of Economy, the General Directorate of Incentive Applications and Foreign Capital.
www.tesvik.gov.tr

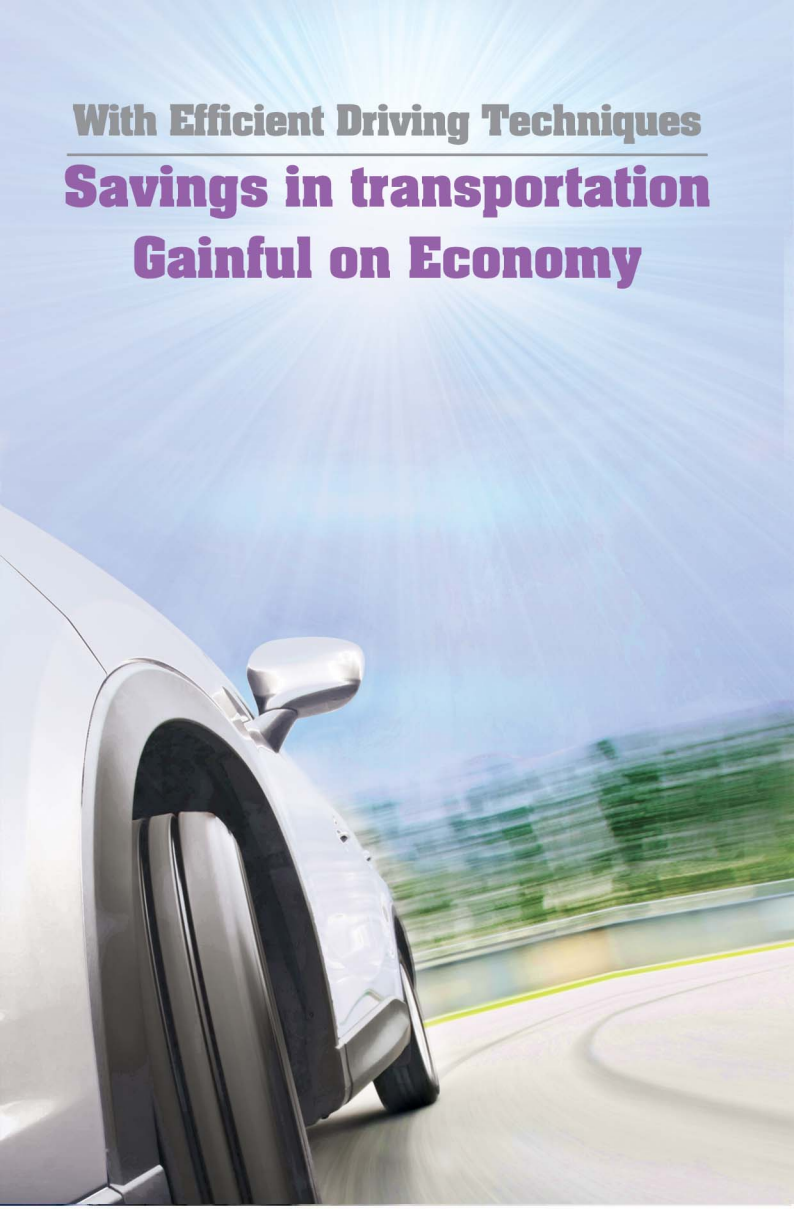


# ENERGY EFFICIENT TRANSPORTATION

www.enerjiverimliulasim.com

## With Efficient Driving Techniques

# Savings in transportation Gainful on Economy



# "Energy Efficient Transportation"

REPUBLIC OF TURKEY
MINISTRY OF
ENERGY AND
NATURAL RESOURCES

ENERGY EFFICIENCY ASSOCIATION

Turkey in the last 25 years, growth trends continue the case in 2020, passenger traffic today's level of about 3.3 times (540 billion passenger / km), freight traffic is 2.5 times (300 billion tons / km) will come is estimated.

Given that the estimated increase in the transport sector improving the energy efficiency of work to do for a moment before realizing projects are the subject of study.

## MISSION

Total energy consumption in our country, which has a share of 14% in the transport sector, with productivity provider to introduce the work in this area to reduce the amount of energy consumed.

## AIM

The targets set under the project are as follows.

- To reduce fuel consumption of nonrenewable energy source of motor vehicles,
- To increase the share of railways in public transport and freight transport,
- To avoid wasting unnecessary fuel in urban transport,
- To reduce the level of emission of harmful gases released to nature.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# NEED TO BE DONE FOR ENERGY-EFFICIENT TRANSPORTATION

- When we want to go from one place to another prefer public transport instead of our private vehicles. In this way, both the energy savings provided and to prevent our environment contamination by more exhaust gas, as well as reduce traffic crowded a little bit.

- To minimize the fuel consumption and exhaust pollution recommended speed is between 35 - 95 km . You should keep in mind.

- Be careful not to use our engine at high revs in the city and upstate.

Needs to be done about gear change:

Gasoline and LPG vehicles

< 2500 RPM (Rev – Minute)

Diesel vehicles

< 2000 RPM (Rev –Minute)


AUTO

# NEED TO BE DONE FOR ENERGY-EFFICIENT TRANSPORTATION

- Don't forget that when your car getting older and aged, the used of fuel ans exhaust gas pollution increases. For this reason have our serviced and repaired periodically, make the necessary care. In this way, we have secured of our life's security.

- While driving our vehicles, as much as possible try to close the windows. Did you know that while you drive your vehicle at a speed of 100 km per hour as windows open, your vehicle caused approximately 4% extra fuel consumption?

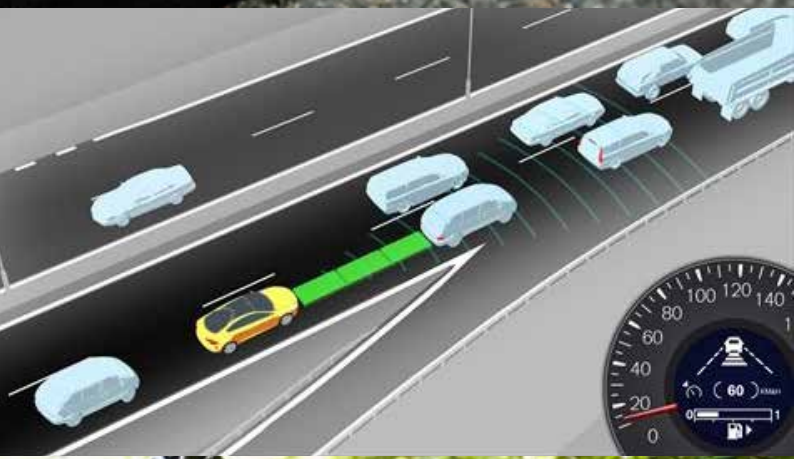
- In case where the weather conditions are appropriate should avoid to use air-condition unnecessarily. When we use air-condition, our vehicle's energy needs increased, if possible only use fans for air circulation. In addition, avoid setting air-conditions at high revs and maximum temperatures Air-condition is an extra burden for the car's engine which uses fuel. Not to use air condition provide fuel savings up to 5%.

# NEED TO BE DONE FOR ENERGY-EFFICIENT TRANSPORTATION

- Let's make the car's exhaust gas measurements on time. Thus, we could have taken control if our engine is burning oil or fuel.

- To ensure running your vehicle at maximum efficiency, have your car serviced regularly. Contaminated spark plugs, dirty air filter or clogged fuel filter will affect your fuel economy in a negative way. Changing the engine oil regularly is very important in terms of fuel efficiency. A properly maintained engine can improve fuel economy up to 4%.

- Tires have a significant impact on vehicle's rolling resistance. Using Fuel Saver Technology tires can reduce rolling resistance significantly. Engine wasted less energy, so less fuel consumed. It is better for environment and you'll spend less on fuel.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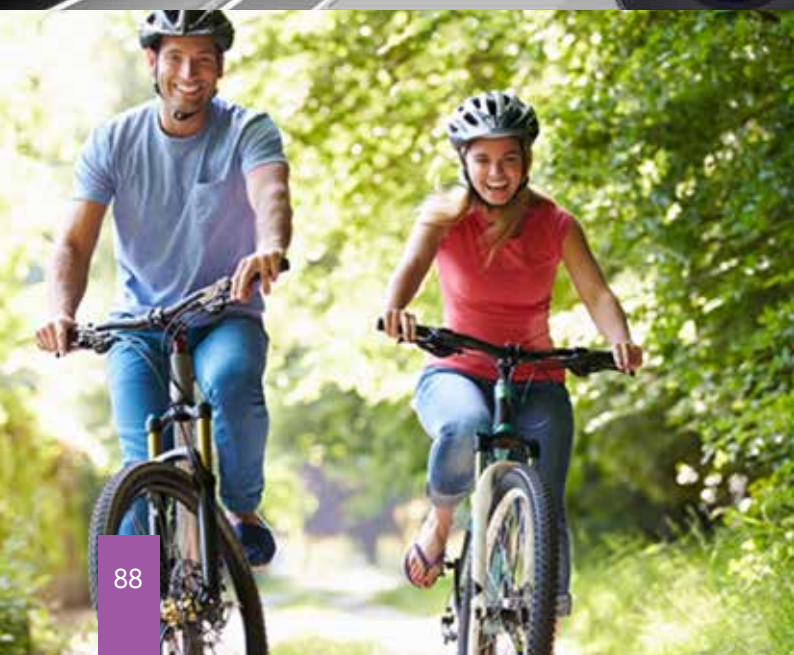

# NEED TO BE DONE FOR ENERGY-EFFICIENT TRANSPORTATION

- The tire air pressure affects 5-10% of fuel consumption. 0.5 bar diminished increases fuel consumption by 5%. Pay attention to the air pressure value in tires are in recommended value. Let's prefer to use radial tires recommended for highways and urban.

- Use the fixed rate options, especially for long motorway journeys. These two features also increases the overall way to go.

- Go short distance by walking or use bicycle if there is suitable ways in your area. Walking and using bicycle is beneficial to your health as well as environment-friendly actions.


PUSH

# NEED TO BE DONE FOR ENERGY-EFFICIENT TRANSPORTATION

- Minibus, pickups, vans, utility vehicles, such as vehicles with high engine capacity, consumes more fuel than others. Avoid if you don't need to use this type of vehicles.

- Do not place more weight on vehicle. Overload is both reduce the road can the vehicle go and breaking can neutralize. Your fuel consumption increases 1-2% for every extra 50 kg. How heavy vehicles they will need more energy to move, so the result of overload cause higher fuel consumption. Carefully to evaluate what you need to transport in your vehicle and unload all the unnecessary items.

- Try to heat your car while moving. When the car halts, it heats late and consumes more fuel.


THULE

# NEED TO BE DONE FOR ENERGY-EFFICIENT TRANSPORTATION

- Use the right motor oil. For this check the vehicle's user manual. Make sure the brand you choose will with energy saving. These are includes substances of reducing friction and improving the efficiency. To choose wrong motor oil can reduce 2% of road to go.

- Aggressive driving style like making quick maneuvers and sudden braking can result 20% more consumption from a smooth ride*.

- Roof racks adversely affect to your vehicle's aerodynamic efficiency. Cause of the aerodynamic drag on the vehicle they increase fuel consumption by 5%. Attach roof rack to your vehicle only when absolutely necessary and remove when not in use.

## NOTES

## NOTES

## NOTLAR