



ange solarbox

POULTRY HOUSE HEATING AND
VENTILATION SYSTEM WITH SOLAR
HEAT PUMP

F O S
S I L
FUEL-FREE
HEAT &
ENERGY
SYSTEMS

ZERO FUEL, ZERO WASTE, ZERO CARBON

HEATING AND VENTILATION SYSTEM WITH SOLAR HEAT PUMP

TECHNICAL SPECIFICATIONS OF THE SYSTEM

Our Enge Solar heating units are smarter, more useful, healthier and more profitable than other heating methods. With this system, you can avoid damages of fossil fuels and provide high savings by using an eco-friendly heating system.

With Enge Solar Heat Pumps, you can provide heating and ventilation of the areas by using the desired rate or 100% fresh air.

This solution is not only economical but also extremely beneficial in terms of protecting nature. With their high efficiency and clean energy use, Enge Solar Heat Pumps and Units reduce the energy costs of the areas to be used, while at the same time meeting the heating and ventilation needs without harming the environment.

COMPARISON TABLE FOR POULTRY HOUSES

	Enge SolarBox Solar Heat Pump	Solid Fuel Boiler	Air Heater System
Energy Recovery	Yes	N/A	N/A
Amount of Energy Recovery	60-90%	N/A	N/A
Poultry House Capacity	20.000	20.000	20.000
Energy Source	Electricity+Sun	Coal	Electricity+Coal
Efficiency	100%	60%	75%
Combustion Process	Outside	Outside	Inside
Fire Risk	N/A	Yes	Yes
Ventilation with 100% Fresh Air Usage	Yes	N/A	N/A
CO2 Emission	N/A	Yes	Yes
Environmental Pollution	N/A	Yes	Yes
Maintenance Cost	Low	High	High
Dust and Particle Filter	Yes	N/A	N/A
Expulsion of Dirty Air	Yes	N/A	N/A
Remote Control System	Yes	N/A	N/A
Energy Consumption and Data Monitoring	Yes	N/A	N/A



BENEFITS AND EFFECTS OF SOLAR HEAT PUMP SYSTEMS IN POULTRY HOUSES

Our systems offer solutions to three basic problems:



HEATING

It provides heating with the energy obtained from the sun and the recovery of waste heat.



VENTILATION

It provides natural ventilation with 100% fresh air by exhausting the dirty air.



HUMIDITY

It works as a partial humidity balancer and dehumidifier.



- Conventional systems cause moisture formation on the floor because they cannot dry the ground. Moisture is caused by the wetness resulting from the combination of sawdust on the floor with animal droppings. Another consequence of defecation is the accumulation of dense ammonia gas in the environment. This situation leads to animals constantly getting sick and an increase in deaths due to these illnesses. On the other hand, Enge SolarBox products perform heating and ventilation using clean air from the outdoors. As a result, deaths due to diseases are reduced.
- A humid environment may not only result in death; health problems may also occur in poultry in excessively humid environments, and ammonia burns can develop on the flesh of birds lying on wet litter. This is one of the factors that reduce profit and can sometimes result in the failure to reach the desired weight. Thanks to the operating system of ENGESOLARBOX® products, moisture, ammonia, harmful microorganisms, pathogens, and bacteria do not multiply in the environment.
- Adequate and regular ventilation must be provided without causing harmful air currents or excessive drops in the poultry house temperature.
- In conventional systems, the labor load from cleaning, solid fuel loading, and other tasks is high. There is no cleaning and labor burden in the use of ENGESOLARBOX® products.



BENEFITS AND EFFECTS OF SOLAR HEAT PUMP SYSTEMS IN POULTRY HOUSES

- Proper heating and ventilation in poultry houses is an important factor. When proper heating and ventilation are provided, chickens feed healthier and weight gain can be achieved.
- In ENGESOLARBOX® Solar Heat Pump systems, heating and ventilation can be performed simultaneously. Therefore, external ventilation is not needed.
- While the system is working, it reduces the humidity of the clean air it takes from the outside and exhausts the dirty and humid air inside. Thus, it balances the air and humidity of the environment.
- With the ENGESOLARBOX® Solar Heat Pump system, there is no need for the axial fans on the walls to work. It provides natural ventilation.
- It saves both electricity and fuel.
- It reduces carbon emissions and eliminates the factors that cause global warming.



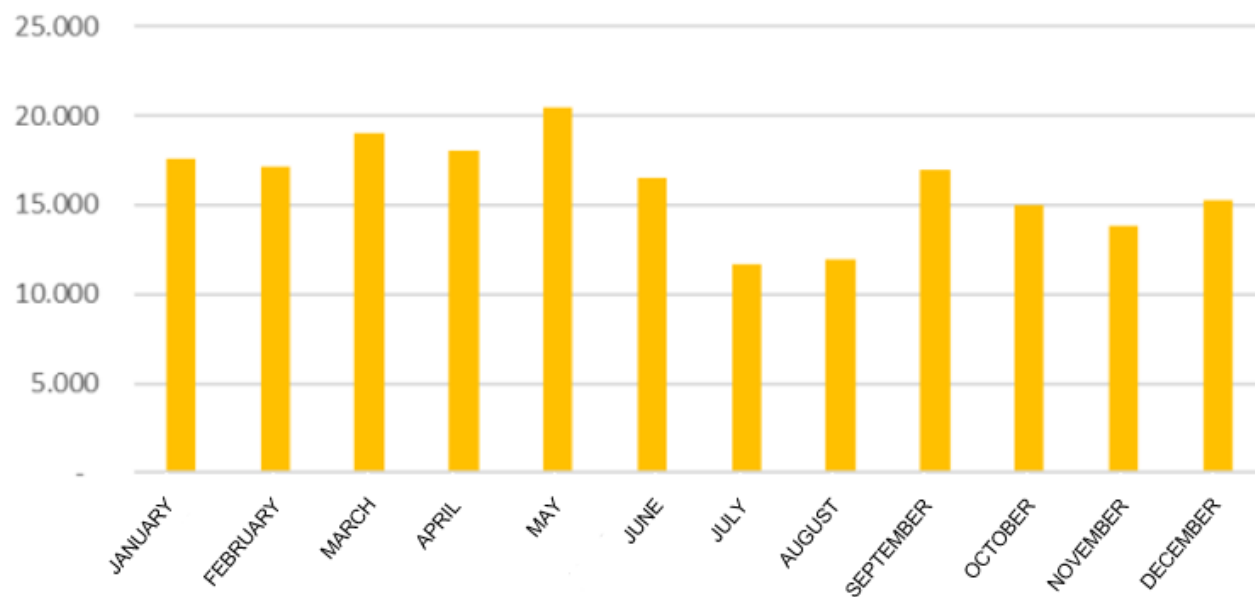
ENERGY EFFICIENCY OF POULTRY HOUSE HEATING SYSTEM WITH SOLAR HEAT PUMP

SOLAR HEAT PUMP SYSTEM EFFICIENCY

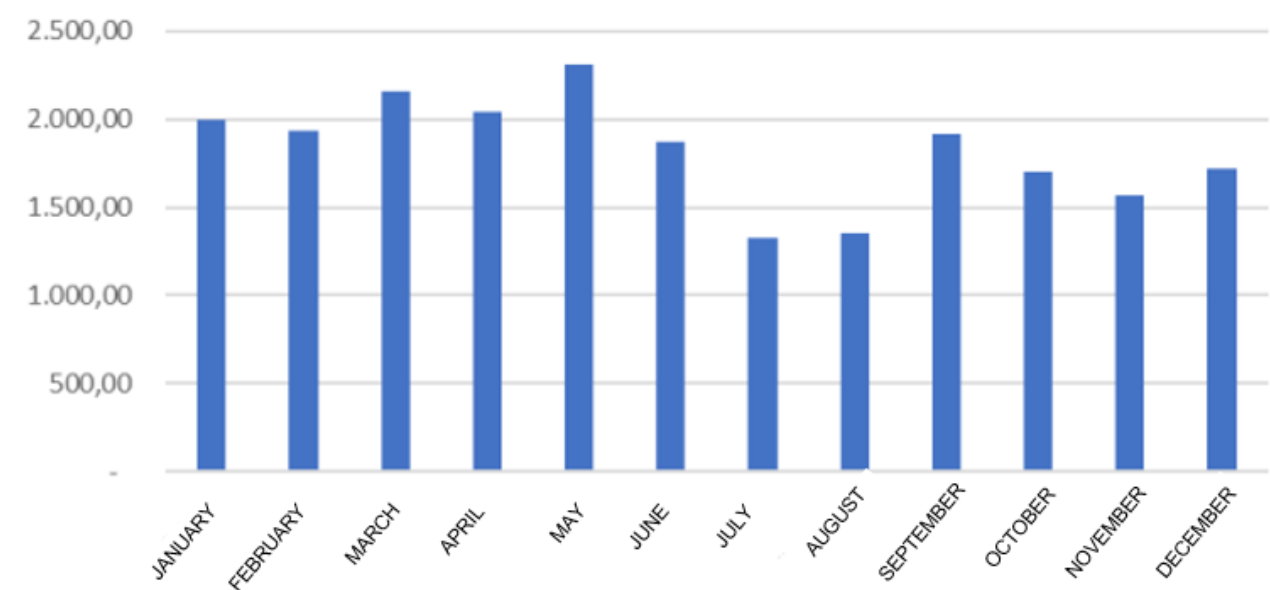
The following table has been created according to the flow rate of 10,000 m³/h. Calculations are based on the climate data of Düzce province.

DÜZCE	Total System Savings (kWh/month)	Saved Natural Gas (m ³ /Year)	Saved Lignite Coal (kg/Year)	Prevented Carbon Emission (Ton/Year)	Trees Reintroduced into the Natural Environment (Unt./Year)
JANUARY	17.606,35	1.994,92	3.028,29	4,03	9,78
FEBRUARY	17.099,76	1.937,52	2.941,16	3,91	9,50
MARCH	19.039,23	2.157,28	3.274,75	4,36	10,57
APRIL	18.043,39	2.044,44	3.103,46	4,13	10,02
MAY	20.428,68	2.314,71	3.513,73	4,68	11,35
JUNE	16.491,35	1.868,58	2.836,51	3,77	9,16
JULY	11.699,83	1.325,67	2.012,37	2,68	6,50
AUGUST	11.954,18	1.354,49	2.056,12	2,74	6,64
SEPTEMBER	16.945,99	1.920,10	2.914,71	3,88	9,41
OCTOBER	15.004,79	1.700,15	2.580,82	3,43	8,33
NOVEMBER	13.841,43	1.568,33	2.380,73	3,17	7,69
DECEMBER	15.213,50	1.723,80	2.616,72	3,48	8,45
TOTAL:	193.368,48	21.910,00	33.259,38	44,26	107,40

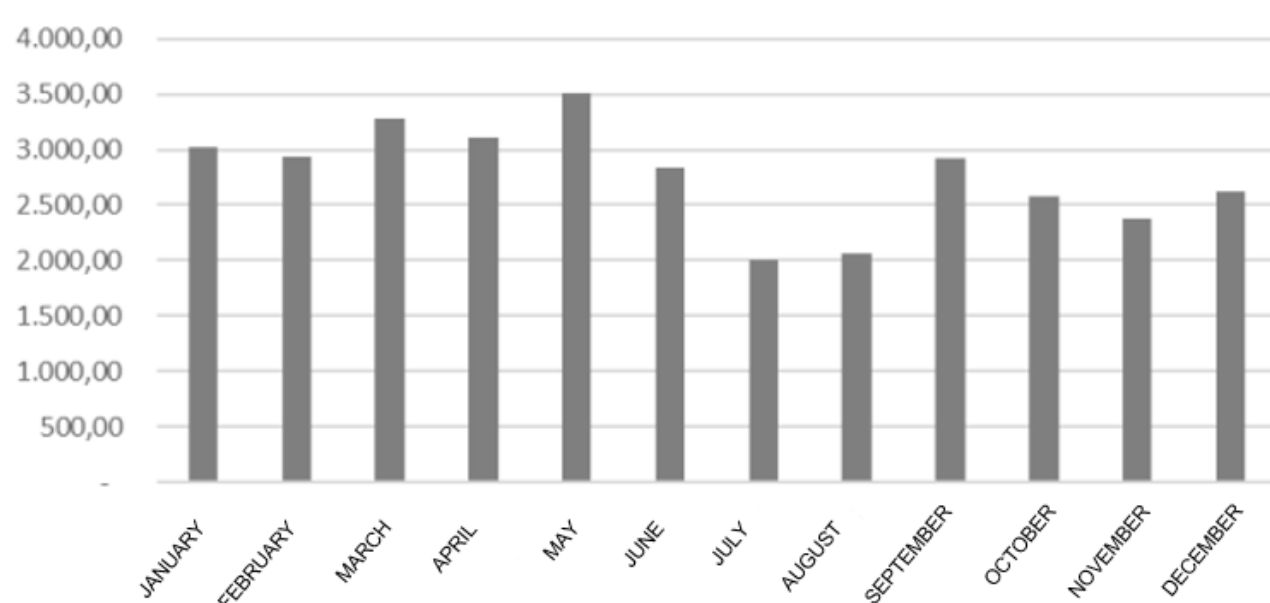
Total System Savings (kWh/month)



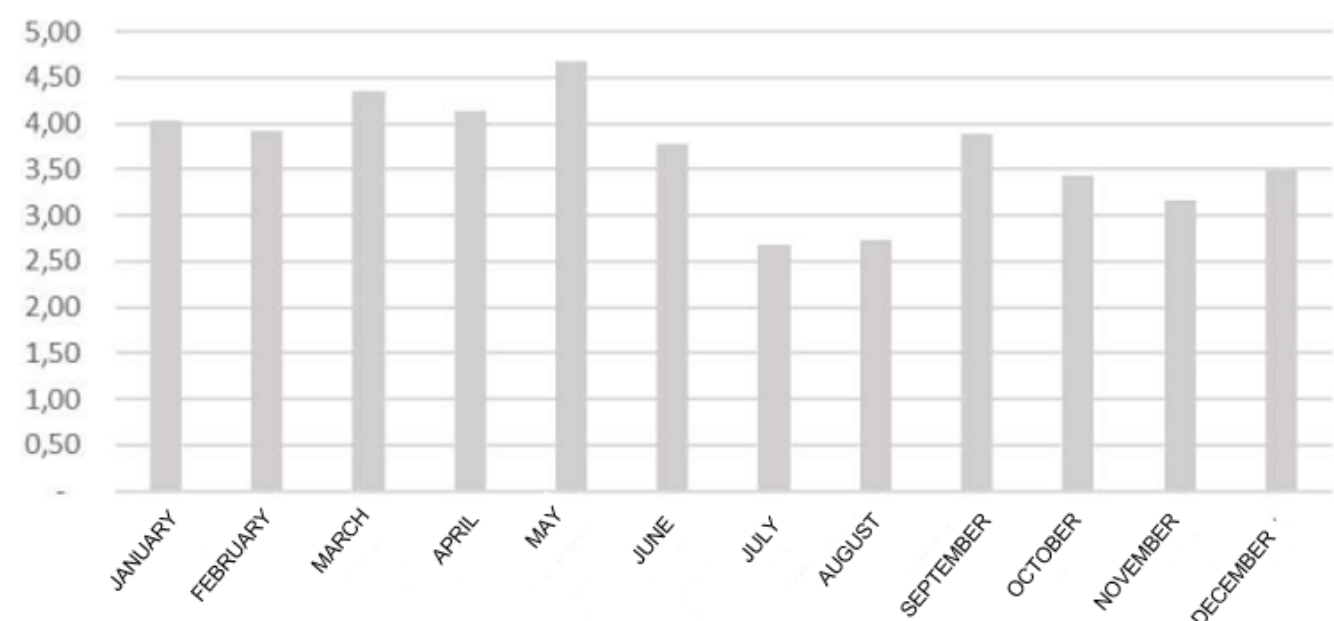
Saved Natural Gas Saved (m³/Year)



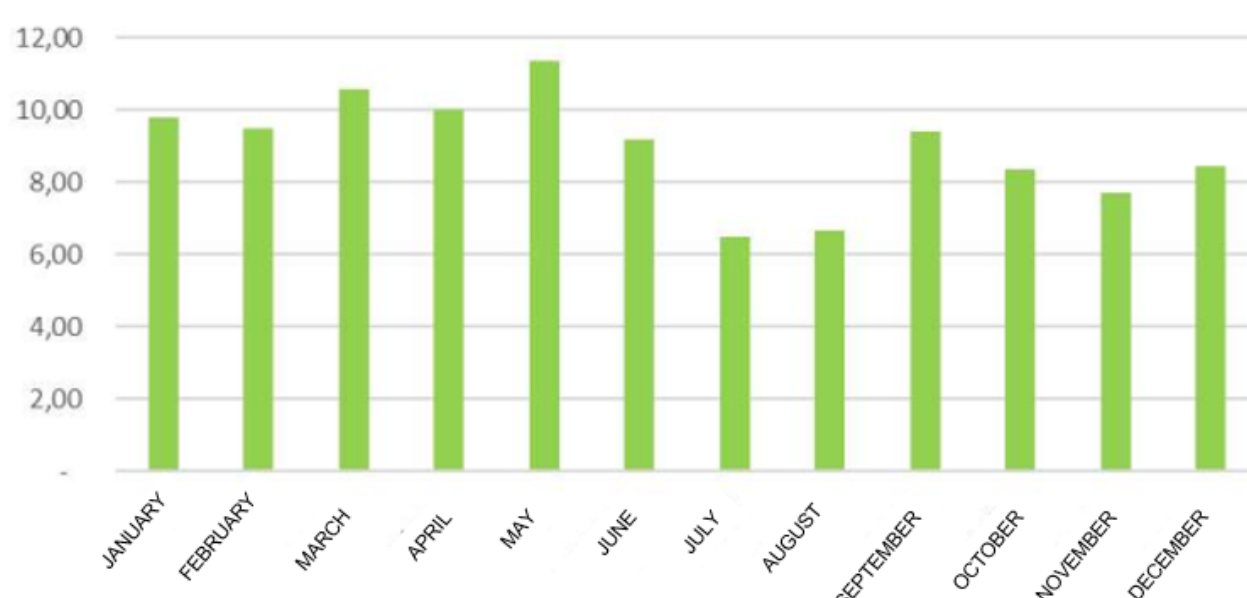
Saved Lignite Coal (Kg/Year)



Prevented Carbon Emission (Ton/Year)



Trees Reintroduced into the Natural Environment(Unit/Year)



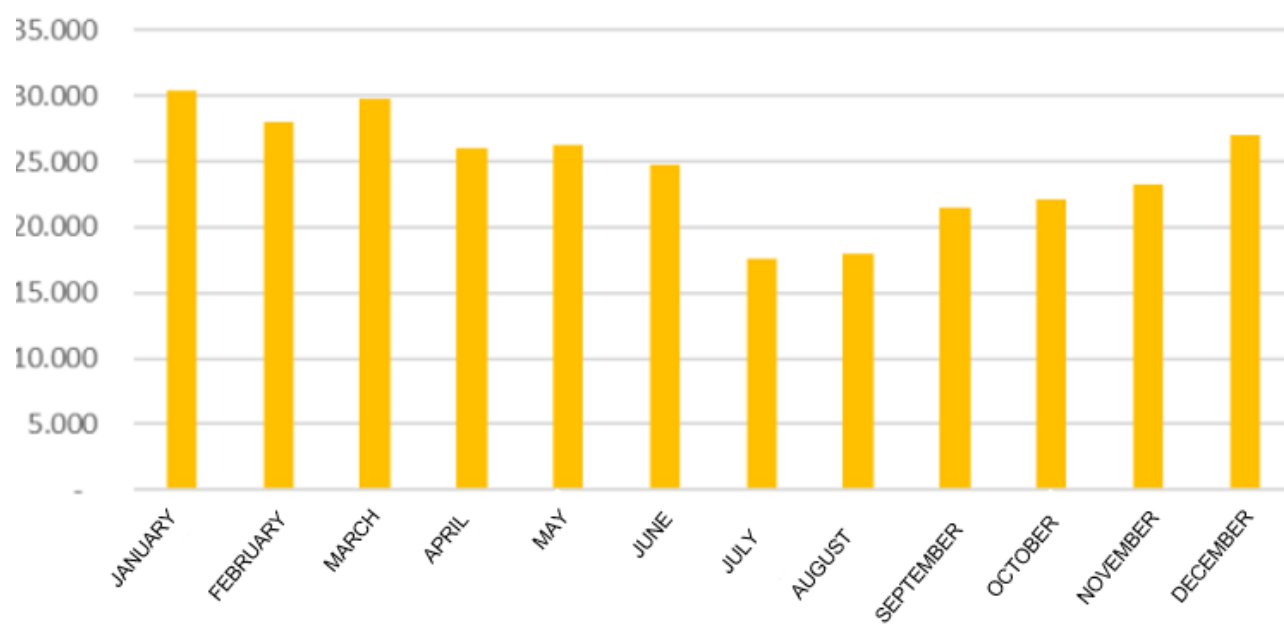
ENERGY EFFICIENCY OF POULTRY HOUSE HEATING SYSTEM WITH SOLAR HEAT PUMP

SOLAR HEAT PUMP SYSTEM EFFICIENCY

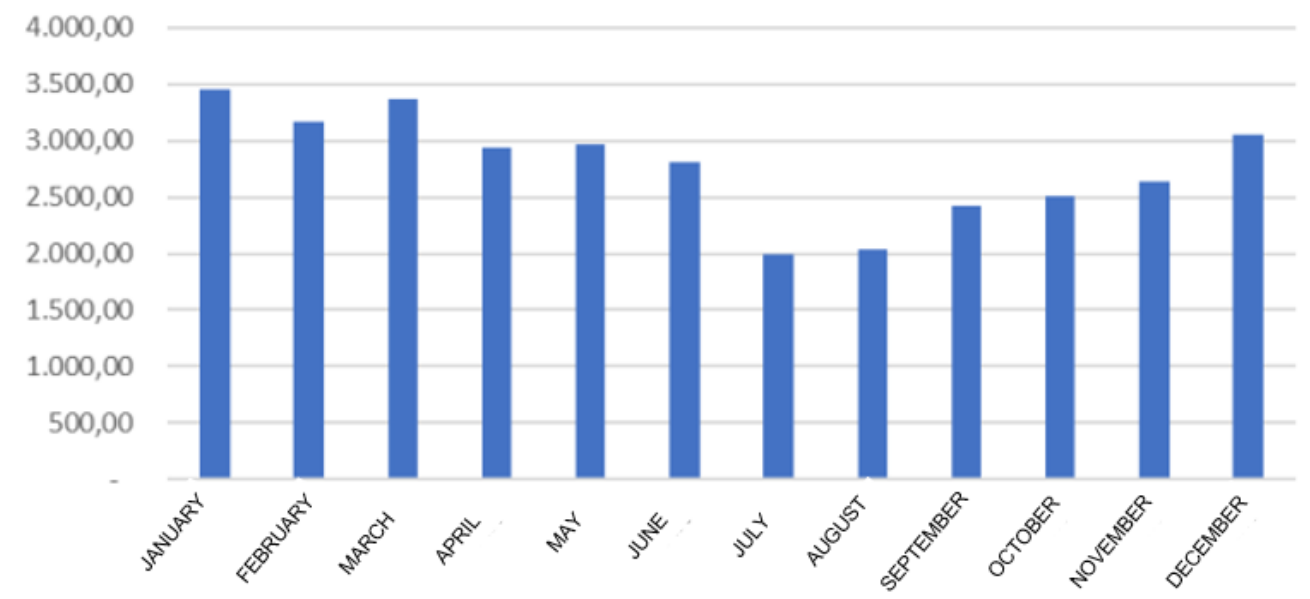
The following table has been created according to the flow rate of 15,000 m³/h. Calculations are based on the climate data of Düzce province.

DÜZCE	Total System Savings (kWh/month)	Saved Natural Gas (m ³ /Year)	Saved Lignite Coal (kg/Year)	Prevented Carbon Emission (Ton/Year)	Trees Reintroduced into the Natural Environment (Unt./Year)
JANUARY	30.446,49	3.449,80	5.236,80	6,97	16,91
FEBRUARY	27.950,68	3.167,01	4.807,52	6,40	15,52
MARCH	29.730,16	3.368,64	5.113,59	6,80	16,51
APRIL	25.936,26	2.938,76	4.461,04	5,94	14,41
MAY	26.215,01	2.970,34	4.508,98	6,00	14,56
JUNE	24.737,02	2.802,88	4.254,77	5,66	13,74
JULY	17.549,75	1.988,51	3.018,56	4,02	9,75
AUGUST	17.931,27	2.031,74	3.084,18	4,10	9,96
SEPTEMBER	21.425,73	2.427,68	3.685,23	4,90	11,90
OCTOBER	22.113,71	2.505,64	3.803,56	5,06	12,28
NOVEMBER	23.227,55	2.631,84	3.995,14	5,32	12,90
DECEMBER	26.951,49	3.053,79	4.635,66	6,17	14,97
TOTAL:	294.215,13	33.336,63	50.605,00	67,34	163,41

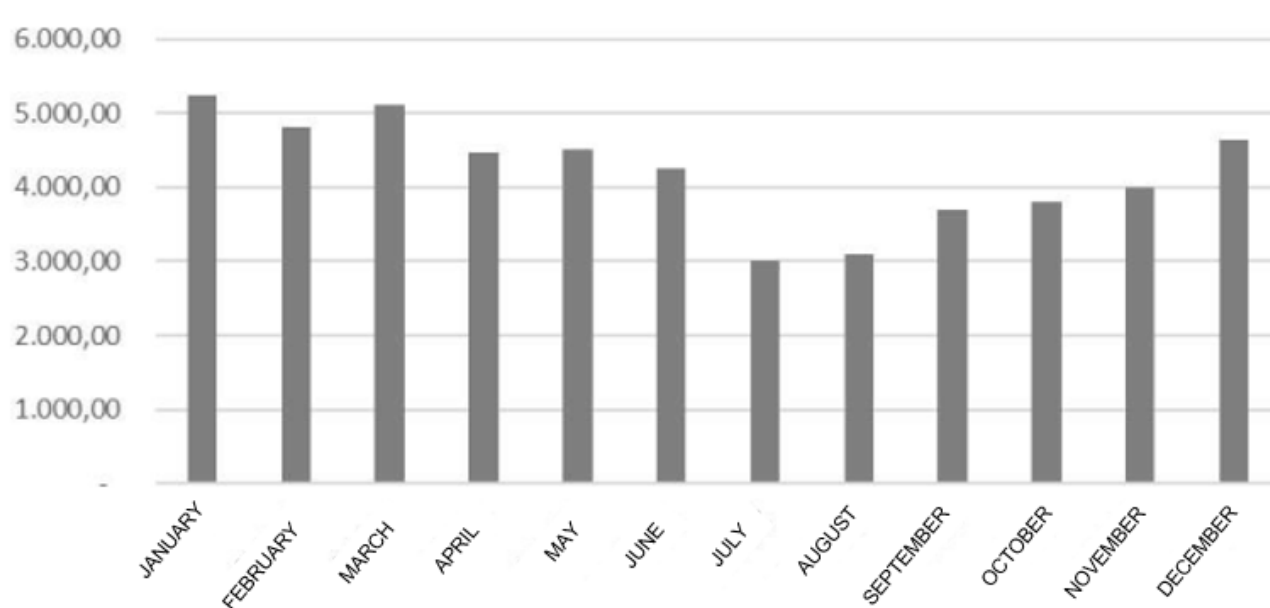
Total System Savings (kWh/month)



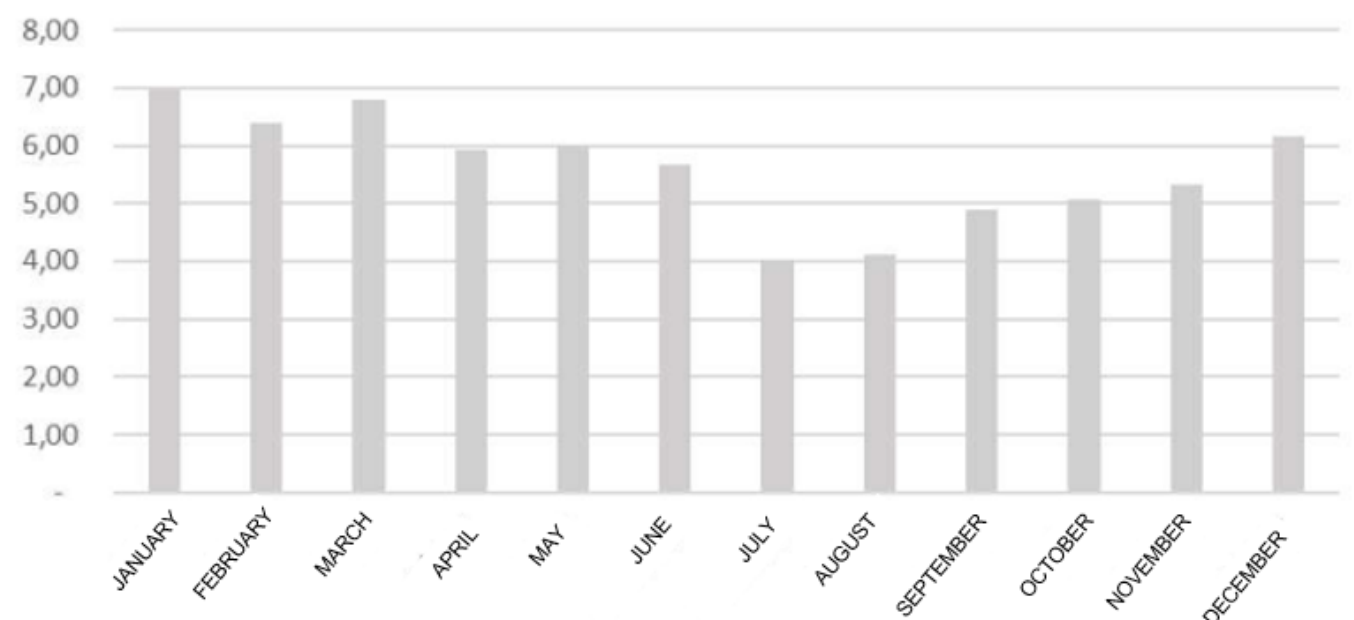
Saved Natural Gas Saved (m³/Year)



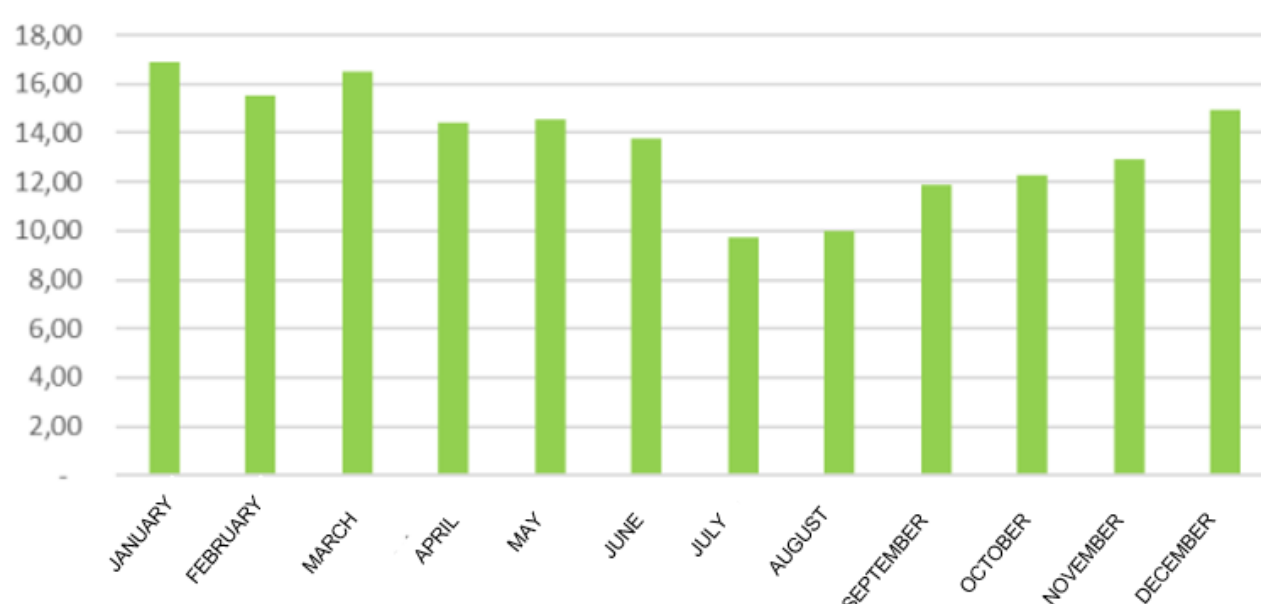
Saved Lignite Coal (Kg/Year)



Prevented Carbon Emission (Ton/Year)



Trees Reintroduced into the Natural Environment(Unit/Year)






BENEFITS OF POULTRY HOUSE HEATING AND VENTILATION SYSTEM WITH SOLAR HEAT PUMP






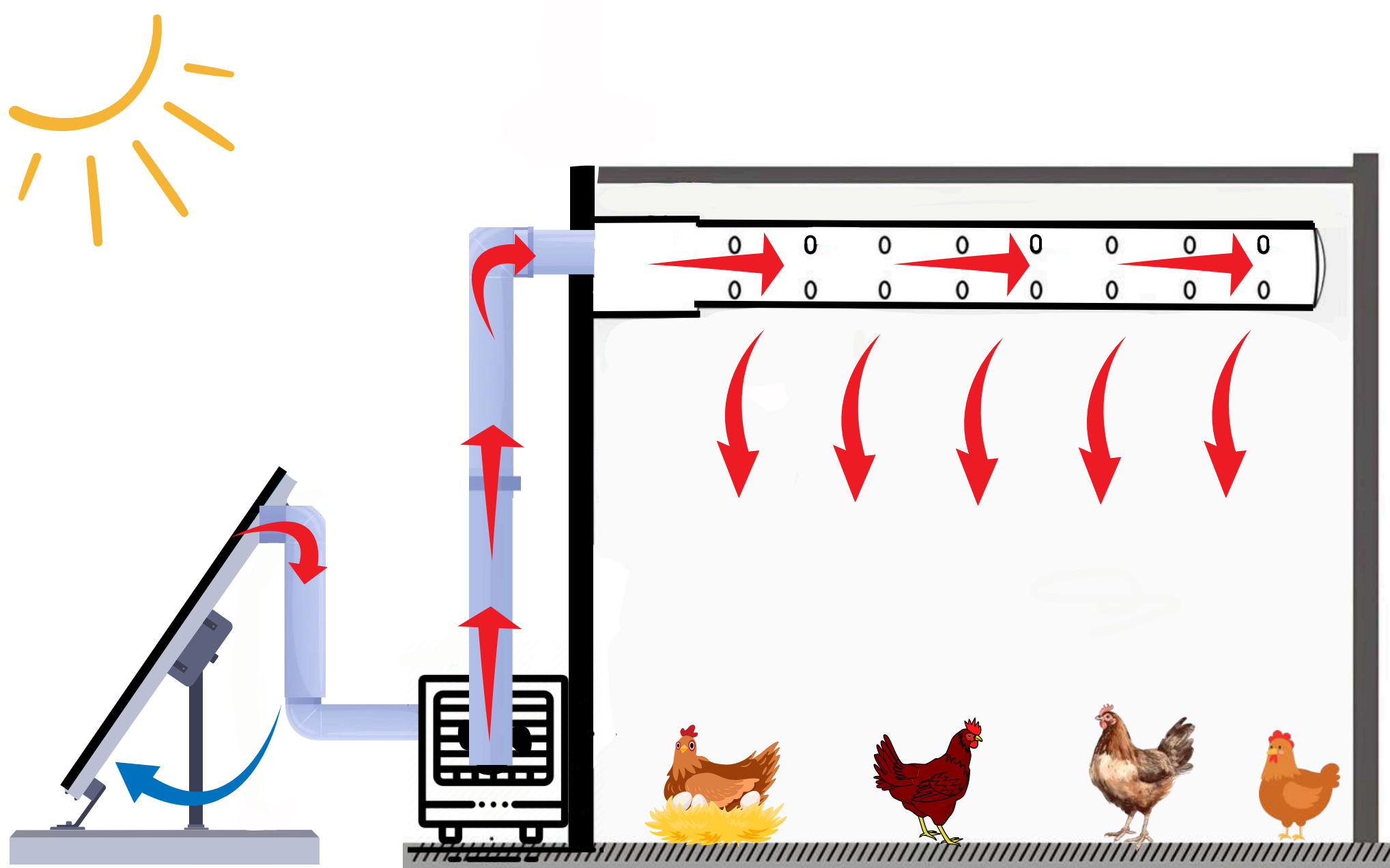
No	Technical Specification	Enge SolarBox
1	Solar Energy Support	Yes
2	Heating Capacity	2-90 Kw
3	100% Fresh Air Usage	Yes
4	Mixed Air Usage	Yes
5	Closed Air Cycle	Yes
6	Waste Energy Recovery	Yes
7	Dust and Particle Filter	Yes
8	Average Power Consumption on Sunny Days (Daytime)	0 kW
9	Average Active Power Consumption (Night-time)	1-20 kW

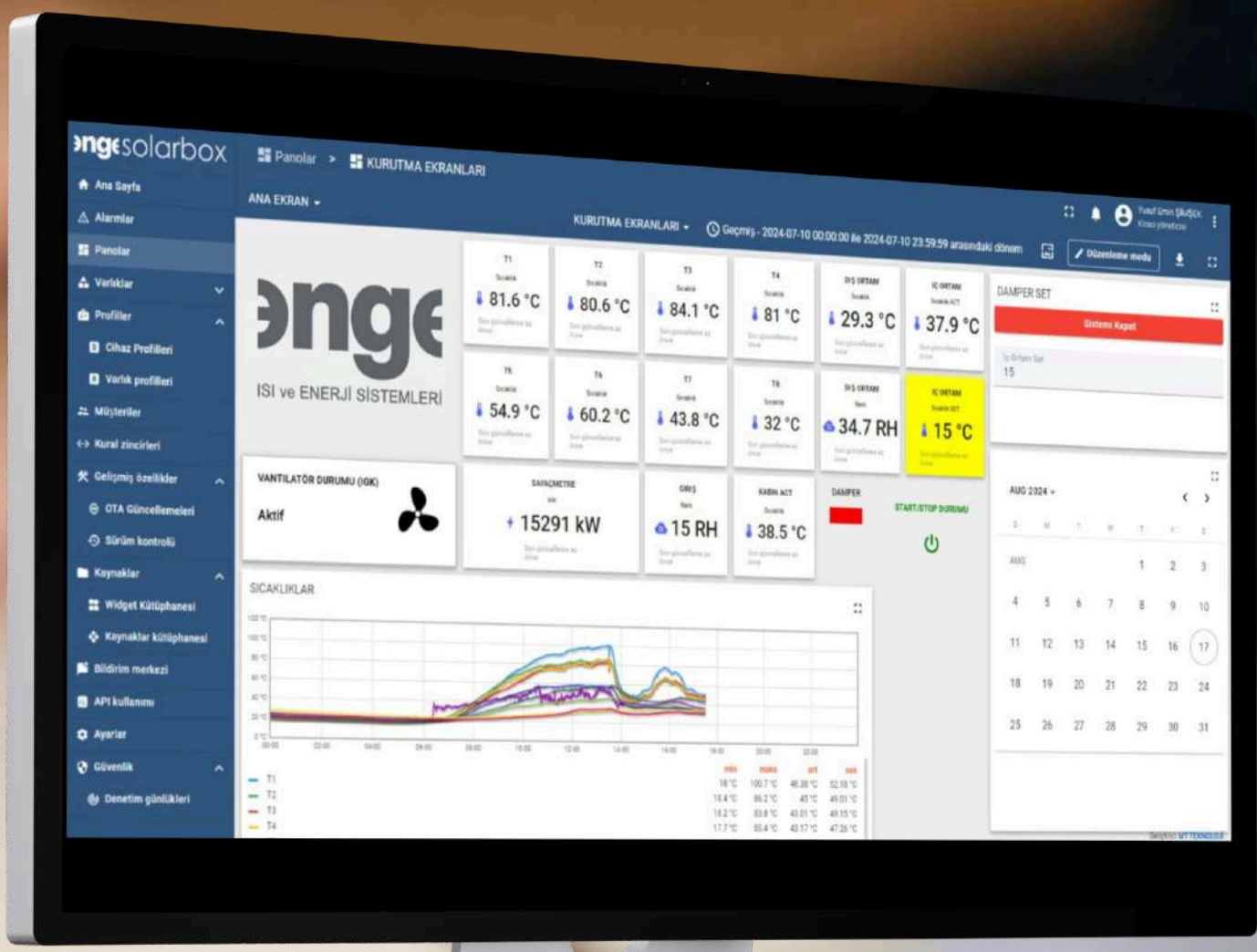
The table below has been prepared based on the flow rate of 10,000 m³/h. Calculations are based on the climate data of Düzce province.

 Total System Savings	€4.865 /Year
 Trees Saved Per Year	107 Units
 Prevented CO ₂ Emissions Per Year	44 Tons

The table below has been prepared based on the flow rate of 15,000 m³/h. Calculations are based on the climate data of Düzce province.

 Total System Savings	€ 7.402 /Year
 Trees Saved Per Year	163 Units
 Prevented CO ₂ Emissions Per Year	67 Tons





The ENGESOLARBOX® tracking and monitoring system provides users with access via both web and mobile devices. This allows you to optimize energy consumption, monitor system performance, and adjust settings according to your needs.



ENGESOLARBOX®'s advanced tracking system allows you to monitor how much profit you are making.

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