

*Addendum
to City Council Resolution No. 137
dated the « 05th » of April, 2016*

Sustainable Energy Action Plan 2020 for the City of Truskavets



Truskavets – 2016



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UKRAINE

TRUSKAVETS CITY COUNCIL
Lviv Region

(SESSION 48 of the 6th DEMOCRATIC ASSEMBLY)

R E S O L U T I O N

the 16th of April, 2015

No. 821

On Joining
by the city of Truskavets
to the European Initiative
«Covenant of Mayors»

In order to improve the efficiency of expenditure of energy resources, enhance energy safety, improve the quality of energy services rendered, protect the environment, and ensure sustainable development of the community, in accordance with the Clause 25 of the Ukrainian Law „On Local Self-Governance in Ukraine", Truskavets City Council has hereby

D E C R E E D :

1. To join the European Initiative launched by the EU in 2008, the «Covenant of Mayors» indicated in Addendum No. 1.
2. To authorise the Mayor of Truskavets, Mr Ruslan Kozyr, on behalf of the local community, to sign the application form and thereby join the European Initiative «Covenant of Mayors»» (*Addendum No. 2*).
3. Arrangements pertaining to implementation of the present decision shall be the responsibility of Deputy Mayor for Matters Related to Municipal Activities, Mr Yu. M. Yavorskyi
4. Supervision over implementation of the present decision shall be the responsibility of the Permanent Municipal Commission for Matters Pertaining to Housing and Utilities, Transportation, Construction, and Engineering Networks (Ruslan Kramar).

City Mayor**Ruslan Kozyr**

**Passport of the
«Sustainable Energy Action Plan
for the City of Truskavets, until 2020»**

Initiator of the Development	City Mayor Mr Andrii Kulchynskyi
SEAP Developer	Task Force set up to develop «Sustainable Energy Action Plan for the city of Truskavets until the year 2020» created by virtue of the Decree of the Mayor dated 15-Feb-2006 No. 66-R
Responsible Executor	Executive Committee of Truskavets City Council
Implementation Timeline	2016 to 2020
Stages of Implementation	Stage One – 2016 to 2018 Stage Two – 2019 to -2020
Scope of Implementation	103,576,052 UAH
Possible Sources of Funding	National Budget Regional Budget Local Municipality's Budget Budgets of enterprises/organisations Funds obtained from credit institutions Funds from donors Grant funds Other sources
Estimate reduction of CO ₂ , 2012 (baseline year) to 2020	21,25 %



Regulatory and Legal Framework

of the SEAP has been developed on the basis of:

- The Law of Ukraine «On Local Self-Governance in Ukraine».
- The Law of Ukraine «On Energy Saving» dated 01-July-1994 No. 74/94- VR, passed by the Ukrainian Parliament.
- The Law of Ukraine «On Alternative Energy Sources» dated 20.02.2003-July-1994 No. 555- VR, passed by the Ukrainian Parliament.
- The Law of Ukraine «On combined production of heat energy and electrical energy (cogeneration) and usage of discarded energy potential», passed by the Parliament of Ukraine on the 5th of April, 2005, No. 2509 – IV.
- Executive Decrees of the Ukrainian Government «On complex measures taken in order to implement the National Energy Programme of Ukraine», dated 10-July-1997, No. 731.
- Complex Ukrainian National Programme for Energy Saving, approved by the Executive Decree of the Ukrainian Government dated 5th of February, 1997 року, No. 148.
- Executive Decrees of the Ukrainian Government «On the Programme of State Support for Development of Nonconventional and Renewable Energy Sources, Small Hydropower and Heat Power Infrastructure» dated 31-Dec-1997, No. 505.
- Executive Decree of the Ukrainian Government No. 1337-R dated 16-Oct-2008 «On Implementation of Measures in order to Reduce the Consumption of Electrical Energy by Budget Institutions».
- UN Framework Convention on Climate Change dated 09-May-1992, ratified by the Ukrainian Law No. 435/96 – VR dated 29-Oct-1996.
- Kyoto Protocol to the UN Framework Convention on Climate Change dated 11-Dec-1997.
- «Covenant of Mayors» - a pan-European initiative to enhance energy efficiency in residential housing and reduce CO₂ emissions initiated by the European Commission dated 15-Jan-2009.



Introduction

Sustainable Energy Action Plan for the City of Truskavets until the year 2020 (hereinafter referred to as SEAP) is a strategic document stipulating long-term planning of municipal policy aimed at combating global climate change through reduction of greenhouse gas emissions.

The SEAP is an instrument to improve and enhance the implementation of city policy in the realm of energy efficiency and environmental protection. The principal goal of the SEAP is to reduce the emission of greenhouse gases (primarily CO₂) by over 20% as compared to the baseline level of the year 2012.

Principal activities of this SEAP that are aimed at reduction of greenhouse gases emissions are, first and foremost, the following ones: reduction and optimisation of the consumption of traditional energy sources as well as implementation of renewable energy sources.

One parameter crucial to the achievement of the goals of the present Action Plan is local partnership – co-operation with local governance authorities, commercial entities and citizens, in order to gain a reduction of CO₂ emissions in those sectors that are within their jurisdiction and competence.

The SEAP stipulates a set of activities, broken down into selected realms and target groups, that are to be systematically implemented throughout the planned period which will result in achievement of the planned reduction of cumulative CO₂ emissions in the city.

Every two years, we plan to revise intermediary results of the implementation of the SEAP in order to evaluate their efficiency and clarify.

Reduction of CO₂ emissions in each of the realms will be achieved through the following activities:

Residential Housing – stipulates for goals and assignments aimed at improvement of energy consumption in tower blocks and individual houses. Besides, the reduction of energy consumption in this sector very much depends on information and awareness activities, specifically modification of the mindset of the city residents and fostering energy saving behaviour patterns.

Budget – increase in efficiency of consumption of traditional energy sources and introduction of renewable energy sources in municipal buildings within the city (schools, kindergartens, cultural institutions, health care facilities, sports facilities, administrative buildings etc).

Transport – ensuring sustainable development of urban transit system and reduction of emissions through promotion of reduction of the level of usage of private cars and development of alternative vehicles of mobility (pedestrian traffic and cycling).

Industry and Commerce – reaching mutual understanding with key stakeholders in the industry sector of the city so that they develop and implement measures aimed at optimisation of consumption of traditional energy sources, utilisation of residue energy in the production process, as well as implementation of alternative and renewable energy sources.



Other (sanatoria, hotels, religious organisations and NGOs) - increasing the efficiency of consumption of traditional energy sources and introduction of renewable energy sources in the health resort-spa section of the city.

City's SEAP until 2020 shall constitute guideline in the implementation of local policy and practice of energy efficiency. It is also important to mention that, considering geopolitical and economic peculiarities of our country, it is quite difficult to develop long term strategic documents. It is also important to mention that, considering geopolitical and economic peculiarities of our country, it is quite difficult to develop long term strategic documents. With that in mind, the present SEAP includes most of the activities scheduled for the next 2-3 years and part of the activities scheduled for the long term. From time to time, the SEAP shall be reviewed and revised (updated).

1. General Info on the city of Truskavets

1.1 History of the City



Truskavets is a city of regional subordination and a world-famous balneological health resort—a unique of its kind, and one of the oldest health resorts in Europe. It has come to fame in 1827 when Józef Mickiewicz, the administrator of a state-owned estate in Truskavets, received an official permit from the central government in Vienna to open a hydropathic health care establishment which at that time was comprised of four bath cabins. At first, only bath treatment was applied. By the middle of the 19th century, Truskavets had become an intensely developed city, increasingly popular, year by year, its healing waters attracting people in hundreds of thousands.



Truskavets owes its world fame to Naftusia, a healing water first mentioned documentarily back in 1469 and then, in more detail, in 1578 when Wojciech Oczko, a Polish physician described it in his Cepline book. The scientific research into Naftusia was initiated by Teodor Torosevych, a pharmacist from Lviv, back in 1835 when he conducted its chemical analysis for the first time and when a physician, A. Mashek who described its healing effect in 1836. In 1838, in the forest part of the present-day park, another spring was detected with salty and bitterish water which was dubbed Sofia and which was successfully applied to cure off the diseases of



digestive organs. In 1861, a chemical analysis of the water was obtained from the strongest salty-bitterish spring, Bronislawa.

In addition to the mentioned mineral water springs, the following springs also became popular: Maria, Sofia, and Józia. In total, across the territory of the spa, there are substantial reserves of subterranean mineral water with 14 natural springs and deposits of ozokerite. The Barbara Salt produced in Truskavets from highly mineralised brine syrup is analogous to the famed salt of Karlove Vary.

Truskavets is capable of receiving up to 350 thousand tourists every month.

Surrounded by the magical world of nature and rich in medical resources, the health resort is an exemplary recreation town, a spa town, and an area of rest and refreshment, a location where cutting-edge technologies pertaining to health resort and spa realm are being honed and promoted as well as efficient methodologies of treatment, rehabilitation, and healing of citizens.



The city boasts its gem founded back in the 19th century by J. Wyczynski, the chairman of the resort association: the Grand Arboretum. Its area is 42 hectares. Here, several thousand rare and exotic plants have been planted originating from Europe, North America and other places. The Arboretum is, as of the present time, a monument of gardening and park landscape architecture and the cosiest place in Truskavets.

The city also stands out owing to its symbolic paraphernalia in the form of the coat of arms approved back in 1992 by the 7th session of Truskavets City Council, and based on an old stamp of the village of Truskavets approved back in 1787 by the Drohobych County Assembly.

Truskavets is a modern European health resort. As Ukraine proclaimed its independence in 1991, Truskavets adopted market model of economic development stipulating for creation of sanatoria and hotels providing the most up to date medical services in compliance with global quality standards. Such a requirement was a prerequisite for the creation of Special Health Resort Economic Area Kurortopolis Truskavets created by virtue of the corresponding law on the 1st of January, 2000. The mission of the Special Economic Area was to boost investment and preserve natural resources.

In 2014, the city was awarded the Council of Europe Diploma. This respectable European award was conferred upon Truskavets for the city's efforts in terms of preservation of its bright and unique image, establishment of international contacts, strengthening friendly links with foreign sister cities, and development and dissemination of the ideas of pan-European unity, friendship and co-operation between European regions.

The city has a signed agreement with the Carpathians-Poland Euroregion and a subdivision of a Carpathian health resort is being developed across Truskavets.



1.2. Population

As of the 01st of January, 2016, the population of Truskavets is:

28,982 citizens (actual population);

20 451 citizens (permanent population);

Average age of city residents is above 41.

Permanent population broken down into age groups, as of 01-Jan-2016:

0 to 17 —3,281 citizens (16%);

18 to -60 —12 816 citizens (62,7%);

above 61 —4 354 citizens (21,3%);

As per latest census, the following ethnic groups inhabit the city:

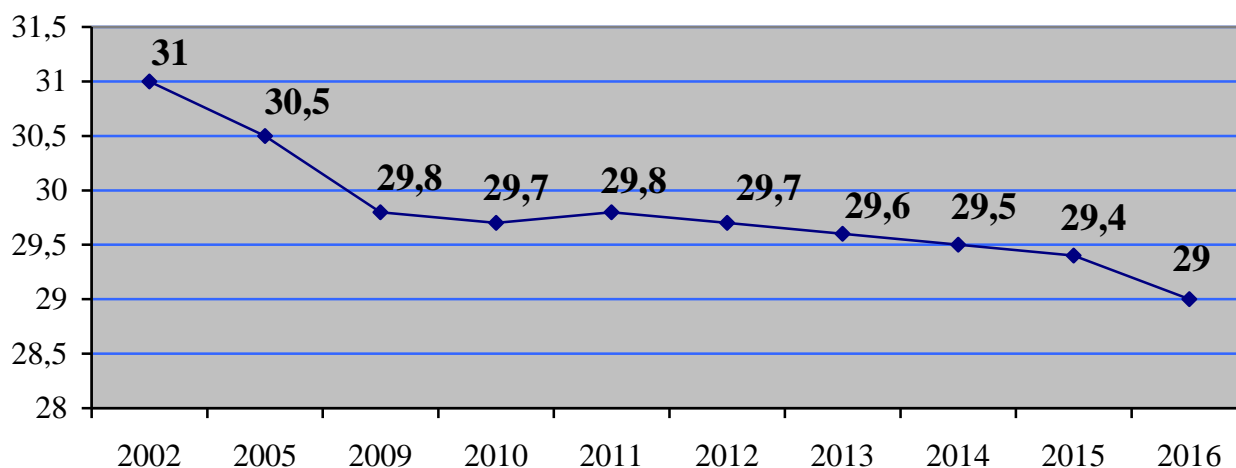
Ukrainians- 93,3%;

Russians- 4,9%;

Belarussians- 0,4%;

Poles- 0,4%.

Image 1. Dynamics of permanent population of Truskavets, 2002 to 2016 (as of the beginning of each respective year)



1.3. Geography

The balneological health resort city of Truskavets is situated in the picturesque forest-clad sidehills at the foot of Eastern Carpathians in the valley of Vorotyshche, a mountain river in the Dnister Basin, altitude above the sea level 350m to 400m.

The city is surrounded by numerous hills covered with coniferous and broad-leaved trees. The entire Truskavets resembles a urban forest parkland. On the NW, it is adjacent to a picturesque natural boundary of Lypky, and on the SE, by the forestland of Pomirky.



1.4. Climate

The city and its vicinity is characterised by warm and mildly continental climate. The winter is brief and snowy with frequent thawing and brief but sharp freeze-ups; the springtime is blooming; the summer is warm; and the autumn is lengthful and full of golden colours. The warmest months are July and August; the coldest ones are January and February. Winter is overall characterised by average temperature of -10° whereas the summer average is $+22^{\circ}$. Truskavets is characterised by high humidity (71% to 81% in winter and 83% in summer) and low atmospheric pressure fluctuating between 725 and 742 millimetres of mercury.

1.5. City area & location with respect to key locations in the region and nationwide

The area of Truskavets is 7.7 km² (774 hectares). Total length of the road network is 42.8 km. Truskavets borders on the following cities: Stebnyk (6.2km), Drohobych (county centre) 9 km, and Boryslav 10km.

Truskavets is located 100km to the south of the regional centre, the city of Lviv that can be reached by train (2.5h) or by bus (2h). Kyiv is 640km away and can be reached by train (7h or 11h) or by car (10h); Lviv is 90km away, 2.5h by train and 2h by bus.

Closest border checkpoints: Poland (86km, 2h by car), Slovakia (175km, 4h by car), Hungary (232km, 4.5h by car), Romania (275km, 5h by car).

Image 2. Distance from the city of Truskavets to major European cities

City	Distance (km)
Berlin	958
Brussels	780
Budapest	537
Warsaw	496
Vienna	1 899
London	2 022
Moscow	1 488
Prague	894

1.6. Automotive Roads Network

Territorial road: Truskavets-Drohobych, Truskavets-Lviv. Distance to the E50 Highway is 30km.



1.7. Air Transport Options

Distance to Lviv International Airport is 90km; airport can be reached by Truskavets-Lviv bus, by taxi, or by Truskavets-Lviv electric train. There is a sufficient number of flights, hence Truskavets can be reached from any part of the world.

1.8. Railway Network

The city has a railway link (station of Truskavets), connecting the city with major Ukrainian cities. There are electric trains running between Lviv to Truskavets, long-haul overnight passenger train Truskavets-Kyiv and another high speed Hyundai intercity train, Truskavets-Kyiv. Railway side lines are 10km away in the town of Stebnyk and the city of Drohobych.

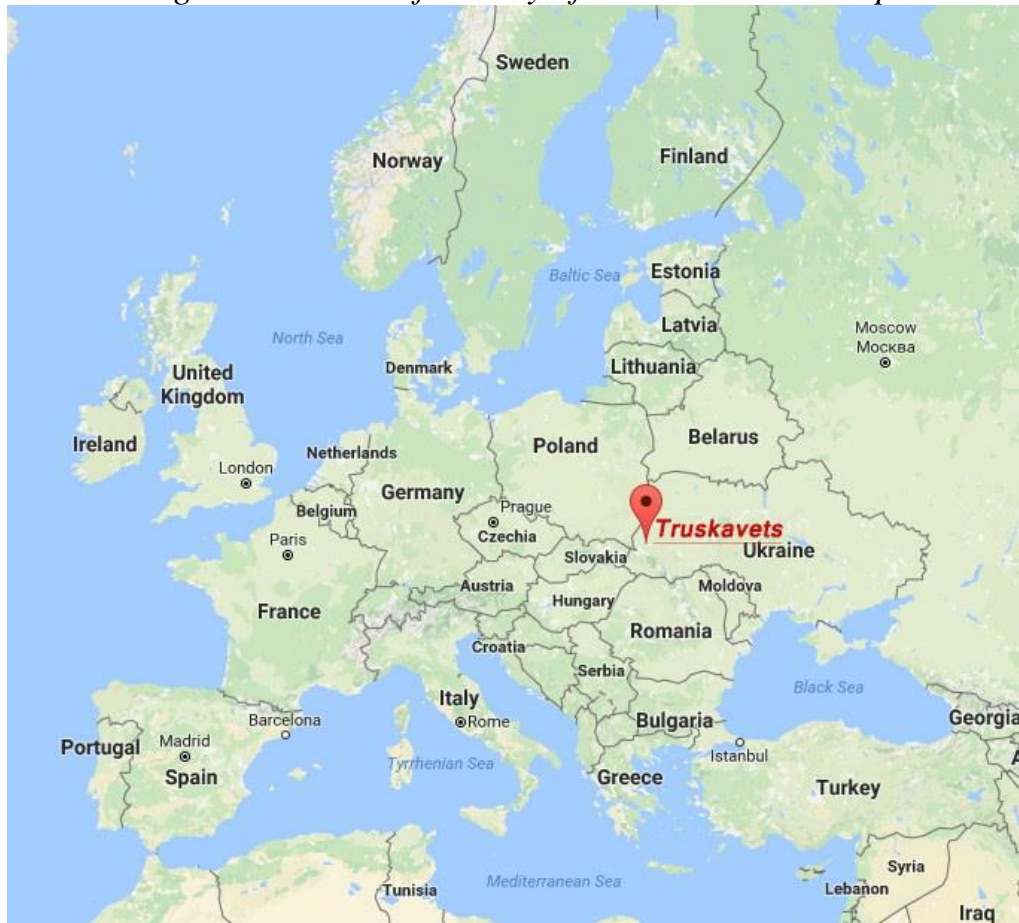
Image 3. Location of the city of Truskavets in Lviv Region



Image 4. Location of the city of Truskavets in Ukraine



Image 5. Location of the city of Truskavets in Europe



1.9. Trade, Commerce, Health Resort Facilities (sanatoria, hotels, etc)

The city of Truskavets, as of 01-Apr-2016, has a commerce network comprised of the following: retail outlets – 180 nr, including pharmacies - 21 nr, catering outlets – 91 nr, outlets rendering everyday services – 69 nr.

Entrepreneurship

Within the city's territory, as of the 01-Apr-2016, there are 842 legal entities and 1621 individual proprietors registered as taxpayers.

The following establishments are functioning in the city:

- Centre for administrative services of Truskavets City Council including centre for permits. In the 1st quarter of 2016, the Centre rendered 672 administrative services including 573 related to land use;
- Co-ordination assembly for matters pertaining to development of entrepreneurship under the auspices of City Mayor.

Sanatoria and Hotels

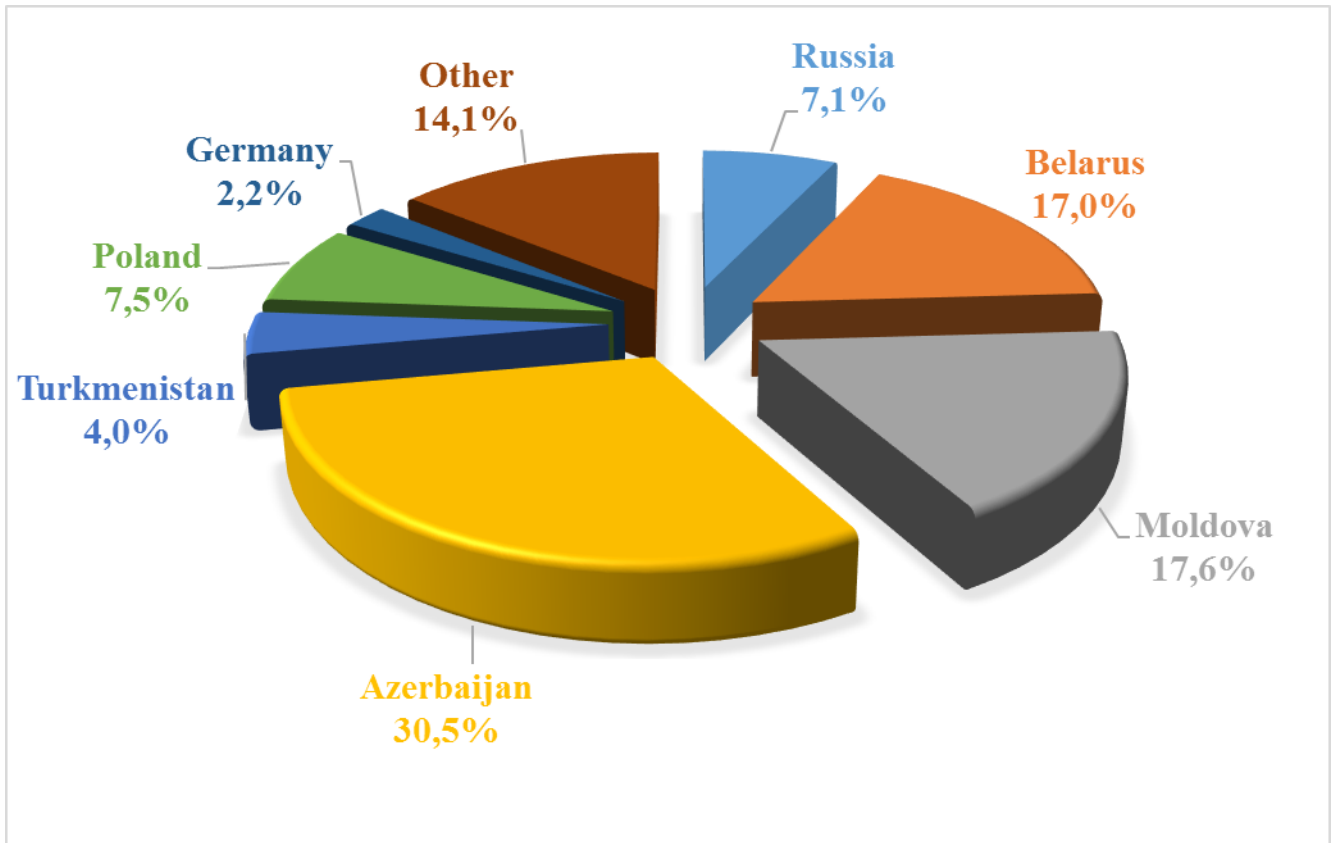
There are over 73 sanatoria and hotels in Truskavets, total capacity 13010 beds. In 2014, the city's sanatoria and hotels provided rest, recreation, and medical treatment to 187,131 citizen; the number for 2015 was 189,005.

*Image 6. Dynamics of health tourists
from 2010 to 2015.*



The sanatoria and hotels provided accommodation and medical services to 14,200 of foreign nationals in 2015 originating from 55 various countries; the top countries of origin were Azerbaijan, Russia, Moldova, Belarus, Turkmenistan, and Germany.

Image 7. Monitoring the number of foreign tourists by country of origin as of the Year 2015



2. ENERGY IN THE CITY

2.1. Heat Energy

In the city of Truskavets, there are two heat generating enterprises in operation: the Truskavetsteplo Municipal Enterprise located on 12 Kotsiubynskoho Street and founded as city's municipal property and pursuant to the Decision No. 52 dated 15-Feb-2011 of the Truskavets City Council and Truskavetskurortteploenergo which is a subsidiary of Private Joint Stock Company Truskavetskurort.

Organisation and management structure of Truskavetsteplo is comprised of 4 employees, specifically: Director, Deputy Director, Chief Accountant, and Chief Engineer. The enterprise employs 63 persons.

The enterprise was founded by Truskavets City Council. In its activity, the enterprise is subordinate to the Directorate of Housing and Communal Utilities and Construction Development.



Its main activities include:

1. Steam and conditioned air supply.
2. Electrical installation works.
3. Installation of water supply networks, heating system, air ventilation and air conditioning.
4. Construction of pipelines.
5. Construction of electrical power supply structures and telecommunication structures.
6. Construction of residential and nonresidential buildings.

In order to produce thermal energy, the following resources are required:

fuel (natural gas) – supplied by NAK Naftogaz of Ukraine

electrical energy – supplied by PJSC Lvivoblenergo

purchased heat – LLC Hotel Management Group

water – LLC Truskavetskyi Vodokanal

Basic Characteristics of the City's Thermal Pipeline Network

		in service for the last	
Manner of installation	Total length, km	<5 years	> 15 years
underground, in channels trenches	14,9	1,0	13,1
trenchless	4,9	1,0	3,5
Total	19,8	2,0	16,6

Number of and details on boiler houses citywide

#	Boilerhouse	Boiler(s) brand, number, capacity, year launched into operation	Heating area, m ²	Thermal capacity of the boilerhouse
1	19a Ivasiuka Street	TVG-8M 3 nr. Kolvi440 2 nr.	53853	27,6 Gcal/h
2	62 Danylyshynykh Street	Kolvi440 1300 2 nr.	13150	1,2 Gcal/h
3	100 Stebnytska Street	Bernard 120 10 nr.	9261	1,2 Gcal/h
4	14 Sadova Street	Bernard 120 5 nr.	5365	1,2 Gcal/h
5	18a Sahaidachnoho Street	KVN-1750 4 nr.	7775,7	6 Gcal/h
6	Boilerhouse No. 2 Street Horodyshche 33	RCH-4000-3 nr launched in 2003		4000*3=12000 KW
		KOLBI- 1500 2 nr launched in 2005		1500*2=3000 KW
		DKVR 10/13-2 nr. launched in 1972		8100*2=16200 KW
7	34 Boryslavska Street	Ferolli, 2 nr Launched in 2016	4798 m ³	220 Gcal/h



8	27 Lesia Ukrainian Street	Ariston 3 nr, launched in 2016	6698 m ³	308,1 Gcal/h
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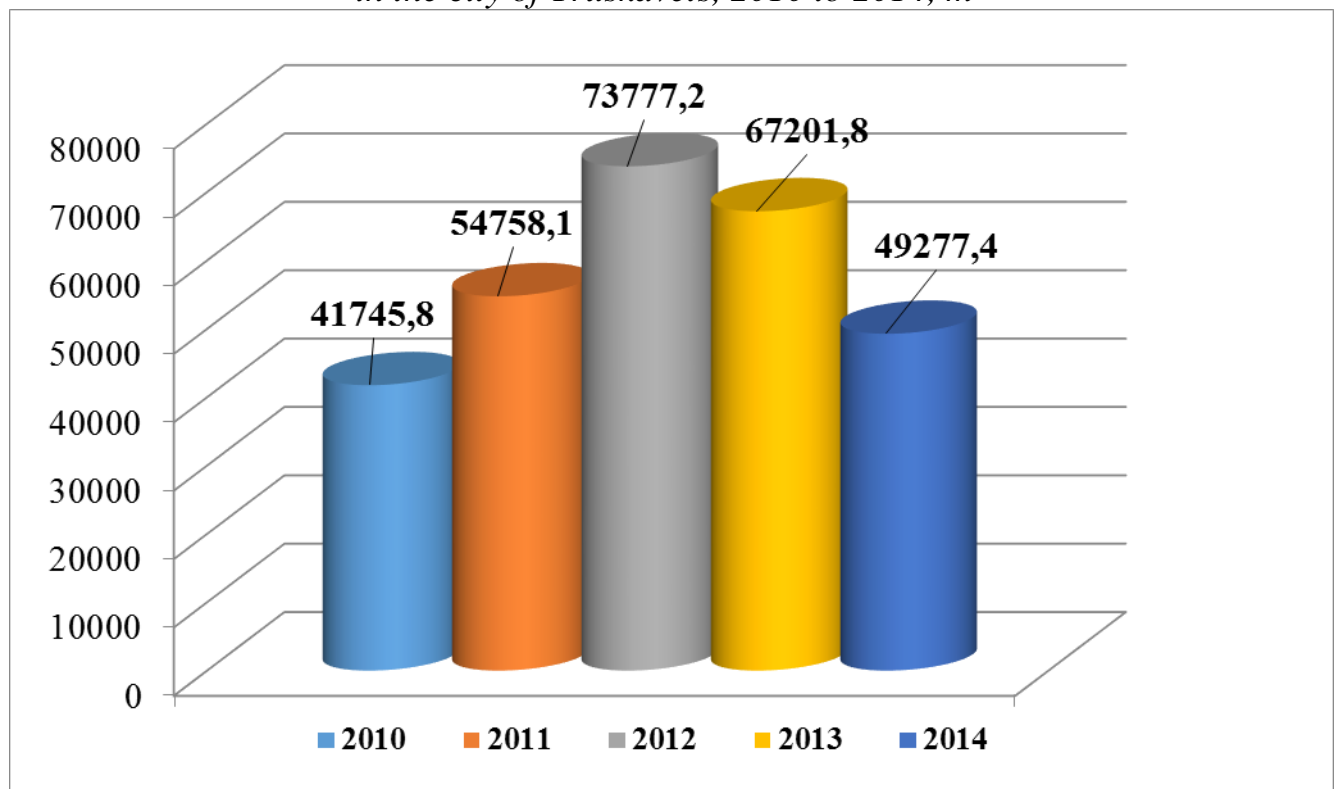
Fuel used to produce thermal energy citywide

Type of Fuel	Year				
	2010	2011	2012	2013	2014
Natural gas, thousand of m ³ .	7557,0	10207,0	9755,0	9291,0	5795,0

Consumption of thermal energy in the city of Truskavets, 2010 to 2014, Gcal

#	Designation	Year					Total
		2010	2011	2012	2013	2014	
1	Industry	-	-	-	-	-	-
2	Budget	1636,3	4681,1	7095,6	6044,6	4293,8	23751,4
3	Population	0,0	10739	26393	20719,0	14402,0	72253,0
4	Other	40109,5	39338,0	40288,6	40438,2	30581,6	190755,9
	Total	41745,8	54758,1	73777,2	67201,8	49277,4	286760,3

Dynamics of consumption of thermal energy in the city of Truskavets, 2010 to 2014, m³



One is to note that it was back in 2011 when the city of Truskavets decided to switch to energy saving technologies. In particular, a new thermal supply system was introduced with an autonomous heating system and, as of 01-June-2015, there are 4143 flats (apartments) citywide with autonomous heating systems. Only 15% of residential apartments in the city are using central heating; the remaining 85% have individual heating systems installed.

There are meters used to measure fuel and energy consumption and residential and housing utilities supplied: 10nr in budget-funded municipal institutions, 32 in residential housing buildings, and 9 in buildings belonging to other consumers.

2.1.1. Upgrading of the Heat Supply System

Boiler houses: switching to biofuel

In order to increase energy efficiency and obtain substantial environmental impact, energy saving technologies are being implemented. In order to achieve this, the city boiler houses plan to partially switch to biofuel until 2020. Cumulative heating capacity of such boiler houses shall amount to 15MW of heating capacity.

As the boiler houses switch to biofuel, this will slow down the hike in energy prices. In addition to that, new enterprises producing biofuel and wood preparation departments will bring about new jobs.

As the boiler houses switch to biofuel, this will bring about substantial environmental effect. CO₂ emissions caused by burning of wood residues shall not be taken into consideration as they are being produced from renewable energy sources, i.e. within a closed cycle of emissions.

In order to produce 49,277 Gcal of heat energy, one needs to burn approximately 5 795 m³ of natural gas. CO₂ emissions from burning of such an amount of natural gas amount to 15,319.4 tonnes. Boiler houses operating on biofuel shall satisfy almost all needs in thermal energy whereas the newly introduced fuel will allow to reduce CO₂ emissions by approximately 11,500 tonnes per year.





Image 8. Biofuel-powered boiler house

By using renewable biofuel such as wood substance will allow to obtain:

- cheap fuel;
- energy independence from suppliers of natural gas and fluctuations of gas prices;
- environmental effect;
- additional jobs in preparation and delivery of fuel.

Installation of individual heating units.

We intend to provide the end users of central heating systems with individual heating units which would allow to use heat energy in a more efficient manner. Such an upgrade will allow the consumer (the building) to adjust the consumption of heat. Consumption of heat may be adjusted by an authorised person appointed by Truskavetsteplo Municipal Enterprise—or, the adjustment may be set remotely via a control panel in a dispatcher's centre.

Owing to the option of temperature regulation in the installed thermal units, one may attain a saving in the amount of approximately 15% as compared to current heat consumption and thereby reduce CO₂ emissions by 1,500 tonnes per year (* - fuel used is natural gas in boiler houses).





Image 9. Individual heating unit

Renovation of heat supply networks.

Renovation of heat supply networks allows to increase the energy efficiency of the heat supply system and at the same time reduce heat losses in the networks. In the course of renovation, one may optimise the diameters of pipes, enhance the reliability of the system, improve the quality parameters of consumed heat energy.

Renovation of heat supply networks will help save about 15% on heat energy and reduce Co2 emissions by 1,500 tonnes per year (* - fuel used is natural gas in boiler houses).



Image 10. Trenchless installation of heat supply pipe networks



Renovation of buildings.

In order to increase energy efficiency, we plan to upgrade a range of residential buildings. Renovation shall include insulation of external walls, replacement of windows and entrance doors.

Through external insulation of walls, one can reduce heat losses in wintertime and thus gain serious thermal energy savings. Thermally insulated façades will allow to reduce heat losses in the building by up to 30%.

Windows account for 15% of heat losses. By replacing windows with energy efficient ones, we shall be able to preserve a significant amount of heat.

Renovation of buildings will help save about 45% on heat energy and reduce Co2 emissions by 5 000 tonnes per year (* - fuel used is natural gas in boiler houses).



Image 11. Tower block before and after renovation

2.2. Gas Supply System

The gas supplier for the city of Truskavets is PJSC Lvivgas. Truskavets has 18,345km of medium pressure gas pipelines and 27,325 high pressure gas pipelines.

As of the 01-July-2015, there are 9,060 gas consumers including:

Citizens - 8,901;

Industry - 1

Budget/municipal organisations – 10;

Others – 148.



Consumption of natural gas, 2010 to 2014

m³

#	Sector	Year				
		2010	2011	2012	2013	2014
1	Population	5943179,0	8471271,0	8676893,0	8202615,0	8859155,0
2	Budget	2073225,0	2318908,0	3048983,0	3073907,0	1592104,0
3	Industry	62795,0	64169,0	77752,0	76212,0	58914,0
4	Other	14588554,0	16189430,0	18526147	17666214,0	14045464,0
	Total	22667753,0	27043778,0	30329775,0	29018948,0	24555637,0

Dynamics of consumption of natural gas in the city of Truskavets, 2010 to 2014, m³



2.3. Electrical Energy Supply System

Electricity in the city of Truskavets is supplied by PJSC Lvivoblenergo through Boryslav Electrical Network District/REM .

Summary info on the condition, output, and length of electrical networks in the city of Truskavets as well as number of consumers.



#	Parameter	Qty, nr	Out-put kW	Length, km	Technical condition			
					Good	needs capital repair	Needs reconstruc tion	Needs replace ment
1	TPII,RP6- 10kV	76	63380	-	11 nr	44 nr	21 nr	
2	Cable lines 0.4 kV	209	-	22,235	15,915 km	2,22 km	-	4,1 km
3	Cable lines over 6-10 kW	121	-	71,931	62,231 km	6,1 km	-	3,6 km
4	Overhead power lines 0.4 kV	39	-	26,465	1,712 km	21,775 km	2,979 km	-
5	Overhead power lines over 6-10 kV	1	-	3,935	-	3,935 km	-	-
6	PS 35 kV	3	48900		3 nr	-	-	-
7	Cable lines 35 kV	2	-	5,86	5,86 km	-	-	-

In total, in the city of Truskavets, there are 1,121 electrical energy consumers that are entrepreneurs and physical persons and 8,460 household users with electrical consumption meters.

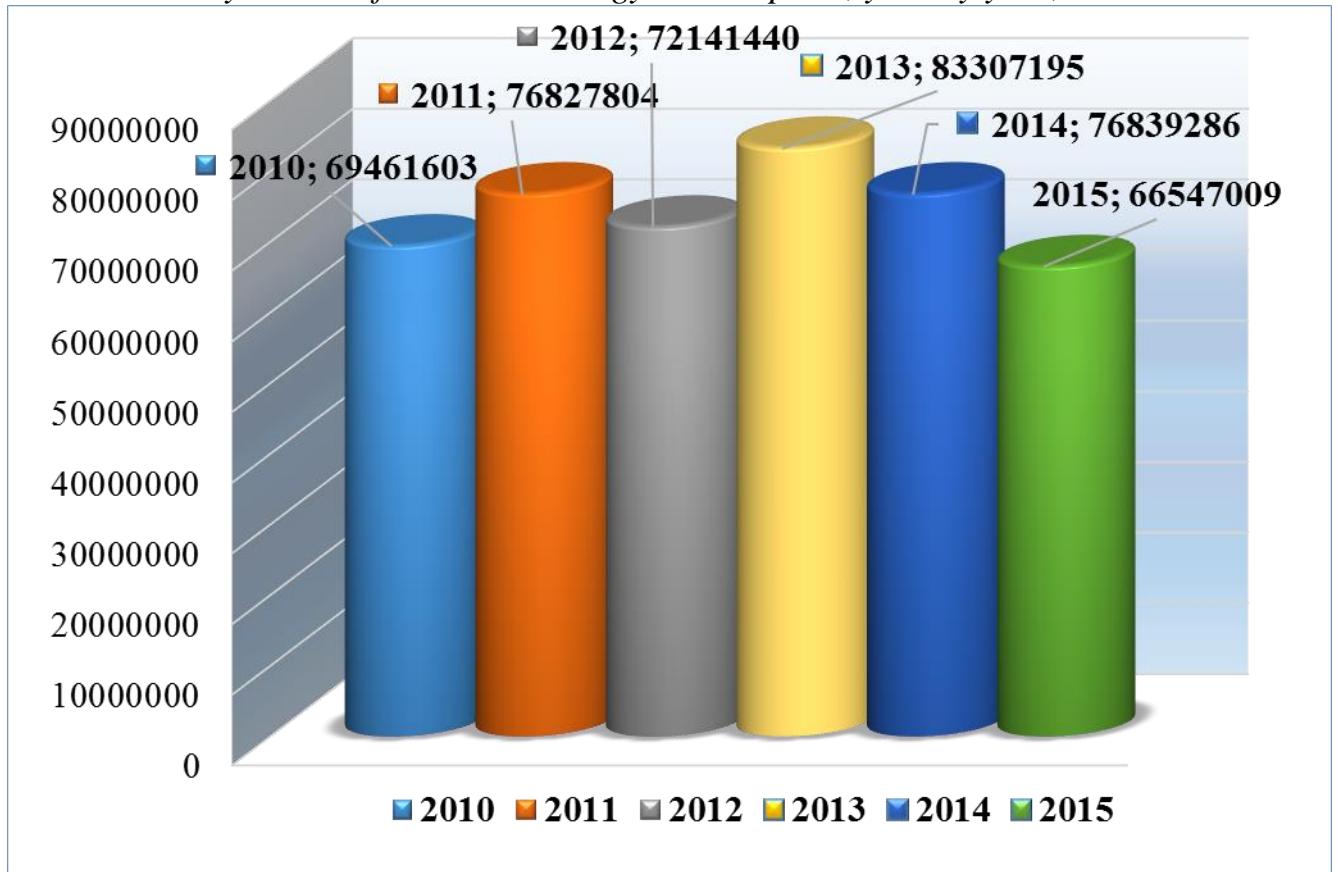
Consumption of electrical energy, 2010 to 2014

kWh

#	Sector	Year					2015
		2010	2011	2012	2013	2014	
1	Population	14399910	17169634	15457596	17619638	17286122	14432132
2	Budget	6650847	7206051	6846785	7934335	7193368	6462313
3	Industry	3189017	3455232	3282967	3804437	3449150	5282644
4	Oth. (sanatoria, resorts, spa, religious entities, NGOs)	45221829	48996887	46554091	53948785	48910646	40369920
Total		69461603	76827804	72141440	83307195	76839286	66547009



Dynamics of electrical energy consumption, year by year, kWh



2.4. Water Supply and Sewage System

The city is serviced by Truskavetskyi Vodokanal, a municipal enterprise supplying water to consumers. Water supply system of Truskavets is fed by county water pipe network under the agreement with Drohobychvodokanal Municipal Enterprise in Drohobych and also by a potable water reservoir on the river of Vorotyshche in the city of Truskavets.

Sewage discharge system off the city of Truskavets is operating by natural flow into the water treatment facilities of Drohobychvodokanal as per concluded agreement.

Length of water supply network in the city of Truskavets is 97.7 km including 69km that are dilapidated and in critical condition.

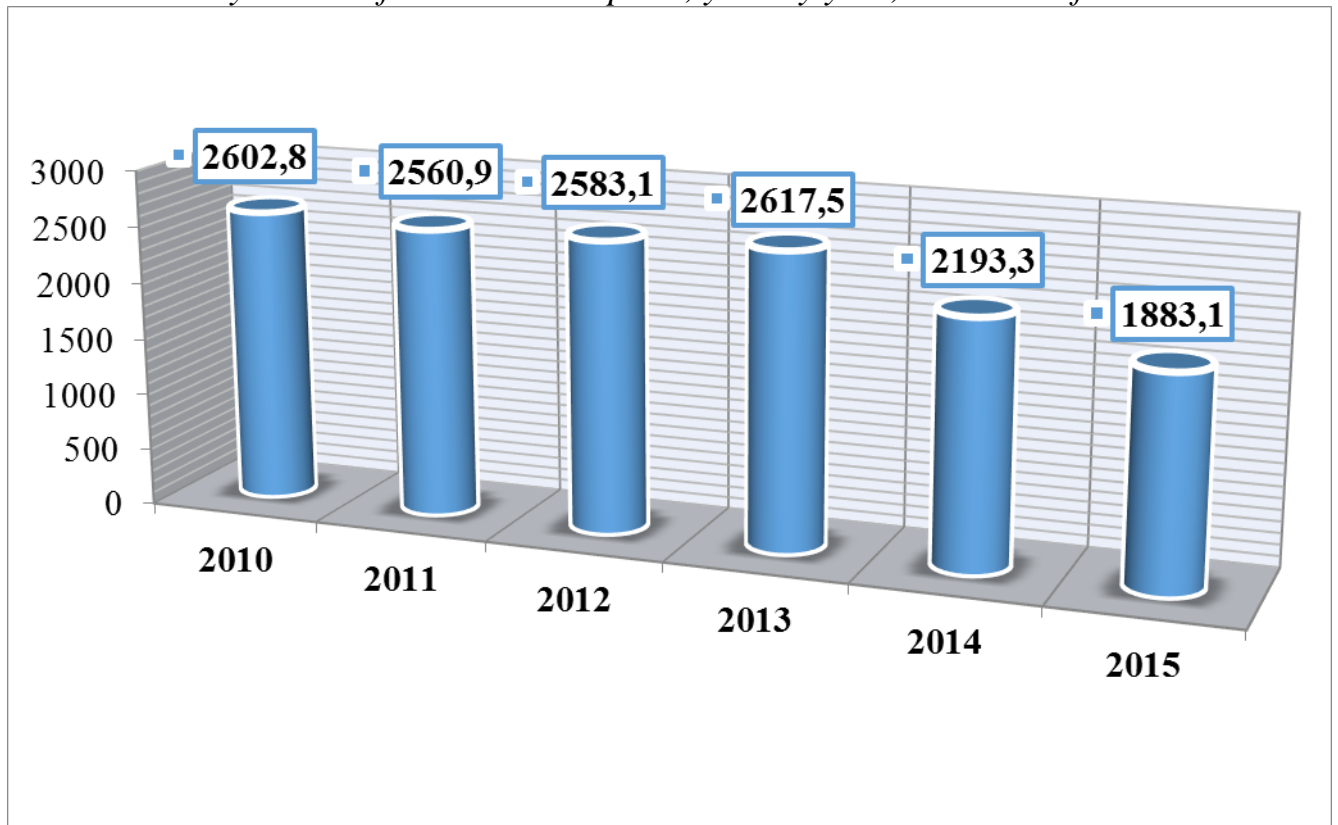
Length of sewage network in the city of Truskavets is 87.5 km including 28.1 rainwater intake network. 59.4% of sewage network and 78% of rainwater intake network is dilapidated and in critical condition.



Consumption of water in the city of Truskavets, 2010 to 2015, thousand of m³

#	Sector	Year					
		2010	2011	2012	2013	2014	2015
1	Population	708,3	741,0	733,9	742,4	637,3	619,3
2	National budget	270,0	272,5	268,3	283,8	219,4	262,7
3	Local budget	52,6	49,3	45,1	42,4	39,7	37,0
4	Industry	1571,9	1498,1	1535,8	1548,9	1296,9	964,1
5	Total	2602,8	2560,9	2583,1	2617,5	2193,3	1883,1

Dynamics of water consumption, year by year, thousand of m³



2.5. Street Illumination

Street lighting in the city of Truskavets are owned and operated by the Department of Housing and Communal Utilities and Construction Development and, as per agreements concluded prior to 2015, they have been serviced by LLC Siaivo. Since March 2015, as per Contract No. 2/03 dated 03-Mar-2015, the street illumination network (1631 lighting unit) have been handed over to LLC Nashe Svitlo for servicing and operation.

There are 26 electrical energy consumption meters installed citywide for street illumination systems.

Total length of networks is 56.6km including:
cable networks – 22.3 km;



overhead networks – 34.3km.

As per contract concluded with PJSC Lvivoblenergo and Boryslav REM No. 35264 dated 09-Feb-2015, the following tariff rates are applied:

day tariff – 1.3850 UAH per kWh;

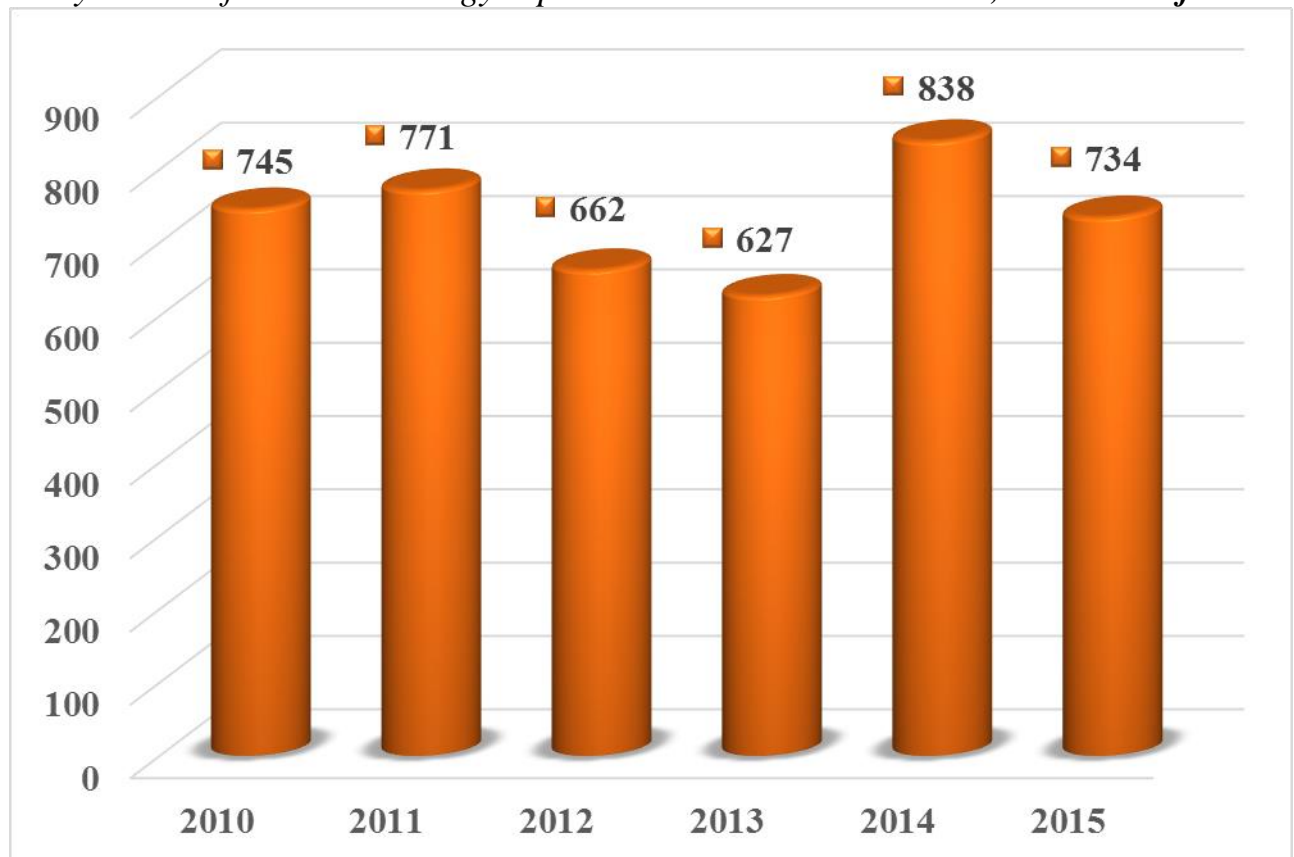
night tariff – 0.3463 UAH per kWh;

Energy expenditure for street lighting in the city of Truskavets

thousand of kW

Sector	Meas. Unit	Year					2015
		2010	2011	2012	2013	2014	
Street Illumination	thousand of kW	745	771	662	627	838	734
	UAH	233896,68	214861,64	240690,43	300000,00	400668,35	586048,0

Dynamics of electrical energy expenditure—street illumination, thousand of kW



2.6. Residential Properties in the City

Servicing of the city residential sector and legal entities, provision of urban amenities and landscape gardening of the city is provided by the LLC TKO Komfort-Servis which was recognised as the winner of the competition on the basis of a decision made by the executive committee No. 157 dated 16-Aug-2013. «On selection of the winner of a competition for provision of housing, building, and housing estate



management services, upkeep of buildings and maintenance and the adjacent territories in the city of Truskavets». Organisation of collection, separation, and removal of hard domestic waste is performed by subsidiary of KOM-EKO-Boryslav, joint venture of LLC KOM-EKO Lviv.

LLC TKO Komfort Servis is servicing 116 residential buildings including 7 1-storied buildings, 19 3--storied buildings, 12 3--storied buildings, 11 4--storied buildings, 34 5--storied buildings, 4 8--storied buildings, and 28 9--storied buildings. Total number of flats is 5902. Total area of the buildings is 311,798.9 m². Area of adjacent territories is 254,869.6 m².

Removal and stockpiling of hard domestic waste is in the waste deposit in the city of Boryslav (15km away from Truskavets).

Housing Cooperatives

In the city of Truskavets, there are 39 successfully operating housing cooperatives within tower blocks; the remaining houses are serviced by municipal and private enterprises підприємствами. Total area of the buildings is 115,590 m².

2.7. Industry

The industry is not particularly developed in Truskavets due to apparent restrictions pertaining. Industry is represented by processing enterprises and enterprises operating in production and distribution of electricity, gas, and water.

The following processing enterprises are operating in the city:

1. Food industry:
 - extraction and bottling of mineral water (CJSC TSB, PE LLC Akwa-Eko);
2. Production of wood and wood items:
 - ritual services, particularly manufacturing of coffins (PE Budivelnik).
3. Machine building:
 - production of water consumption meters and water meter calibration devices (MPP TAKT).

Enterprises working in the production and distribution of electricity, gas and water citywide are represented by enterprises providing residential and housing services (Truskavetsteplo Municipal Enterprise, LLC Truskavetskyi Vodokanal, Truskavetskurortteploenergo).

2.8. Municipal Utilities Infrastructure

Municipal infrastructure is serviced by the following organisations:

- ✓ Directorate of Housing and Communal Utilities and Construction Development of the Truskavets City Council, 6 employees – maintenance of residential and housing assets (159 residential buildings), roads, park, cemeteries, rainwater intake system, street illumination etc;
- ✓ Truskavetszhytlo Municipal Enterprise - owner and operator of the city's residential assets;



- ✓ Truskavetsteplo Municipal Enterprise - maintenance of the city's heating system;
- ✓ LLC TKO Komfort-Servis - servicing and provision of residential and housing services to citizens and legal entities within the city territory, provision of urban amenities to residential buildings;
- ✓ LLC Truskavetskyi Vodokanal - water supply;
- ✓ Boryslav REM – electricity supply;
- ✓ PJSC Lvivgas - natural gas supply;
- ✓ Park Kurortnyi - Municipal Enterprise - provision of public amenities, keeping the health resort park tidy;
- ✓ Tourist and Information Centre Municipal Enterprise - provision of information and assistance to tourists;
- ✓ Automotive and Transportation Enterprise Municipal Enterprise - road marking, transportation of passengers;
- ✓ Truskavets Radio Municipal Enterprise - information activities of the city;
- ✓ Kharchovyk Municipal Enterprise - public catering;
- ✓ Knyhy Municipal Enterprise - retail trade in books and stationery items.

2.9. Education, Health Care, Culture & Arts, Rest, Recreation, and Sports

Education Establishments:

- Kindergarten No. 2, «Yalynka», 238 pupils maximum;;
- Kindergarten No. 4, «Sonechko», 115 pupils maximum;;
- Kindergarten No. 5, «Zirochka», 131 pupils maximum;;
- Kindergarten No. 6, «Teremok», 257 pupils maximum;;
- Kindergarten No. 7, «Dzvinochok», 125 pupils maximum;;
- Pupil's House of Creativity (43 circles, 71 group, 658 pupils),
- Secondary School No. 1 (715 pupils);
- Secondary School and Grammar School No. 2, 775 pupils;
- Secondary School No. 3 (473 pupils).

Health Care:

- Truskavets City Hospital Municipal Enterprise» 210 beds;
- one city polyclinic, 420 visitors per shift maximum;
- centre of minimally invasive surgery and urology;
- one balneological ozokerite hospital;
- two health resort polyclinics;
- medical diagnostic centre;
- International Rehabilitation Clinic of Professor V. Koziavkin which receives over 2,000 [patients every year from various countries, undergoing examination and treatment;
- 21 pharmacies.

Cultural institutions:

Truskavets is the venue of international and Ukrainian nationwide art festivals and competitions. Every year, viewers are attracted by winter folk festival "Rejoice Oh Ye Land", a childrens' creativity festival "Brightland".



All-Ukrainian festival of variety arts "Crystal Truskavets", spring festival "Come to Truskavets for Eastertime", Golden Pectoral International Cinema Festival in Truskavets.

Cultural heritage of the city of Truskavets is represented by 2 museums:



Museum of City History - a listed building dated early 20th century known as Sariusz Willa;



Mykhailo Bilas Museum of Visual Art – a museum of an exquisite and unique artist working in tapestry weaving situated in an old Goplana Villa constructed in the original Zakopane architectural style.

- Art School for Kids (41 class, 430 pupils).
- People's National Home.
- Truskavets city centralised system of libraries with 7,163 users as per registry database including.:
 - Outlet №1 in 36 Boryslavska Street.
 - Outlet №2 in 66 Stebnytska Street
 - Children's library in 60 Stebnytska Street
 - Central library in 12 Drohobyska Street.

The tourists can have fun in the following entertainment facilities: Palace of Culture named after. Taras Shevchenko, Millenium, Casanova and Ot Vinta night clubs/entertainment centres, Zlata Cinema House.



Sports:

SPORTOVETS Sports Club for Children and Adolescents (hereinafter referred to as Sportovets) - an extracurricular training facility within the jurisdiction of education department created in 1992 on the basis of Truskavets Children's Sports School founded back in 1981.

Sportovets offers the following training sections :

- basketball (boys);
- volley ball (girls);
- tennis;
- freestyle wrestling;
- swimming;
- boxing.

Sportovets has a sports and recreation facility featuring:

- swimming pools with baths: 25 m × 8,5 m , 10 m × 6 m and a sauna;
- gymnasium – 36 m × 18 m for volley ball, basketball, mini association football, tennis etc);
- two outdoor clay tennis courts;
- a gym for general physical training for wrestling and gymnastics with hard covern (and a 12x12m carpet for freestyle wrestling competitions);
- a workout facility with contemporary training equipment and inventory;
- an auditorium (30 places) with equipment for theoretical lessons (computer, printer, scanner);
- mini-hostel to accommodate guests from visiting teams (40 beds).

Average monthly number of persons using the services rendered by Sportovets is 1,360 persons.

The city has the following sports sections, local branches, and federations operating:

In the city of Truskavets, there are the following public sports organisations: city federation of chess and checkers, NGO Nika and NGO Health Group (association football, supporting veterans of sports), NGO STK Truskavets-92 (tennis), Sports Club Atlant (weightlifting, powerlifting), City Sports Club Berkut (mountaineering, alpinism, survivalism) within the city organisation of the Ukrainian Association of Veterans of the Soviet War in Afghanistan, Cheremshyna NGO (table tennis), NGO FC Truskavets and NGO FC Zoria-Truskavets (association football), TM FST Spartak (freestyle wrestling)

Recreation areas:

- The City Arboretum is a monument of a monument of gardening and park landscape architecture, total area 42 hectares.
- 12 pocket parks, total area about 6.7 hectares.



2.10. Transport Infrastructure

The city is being serviced by railways and buses.

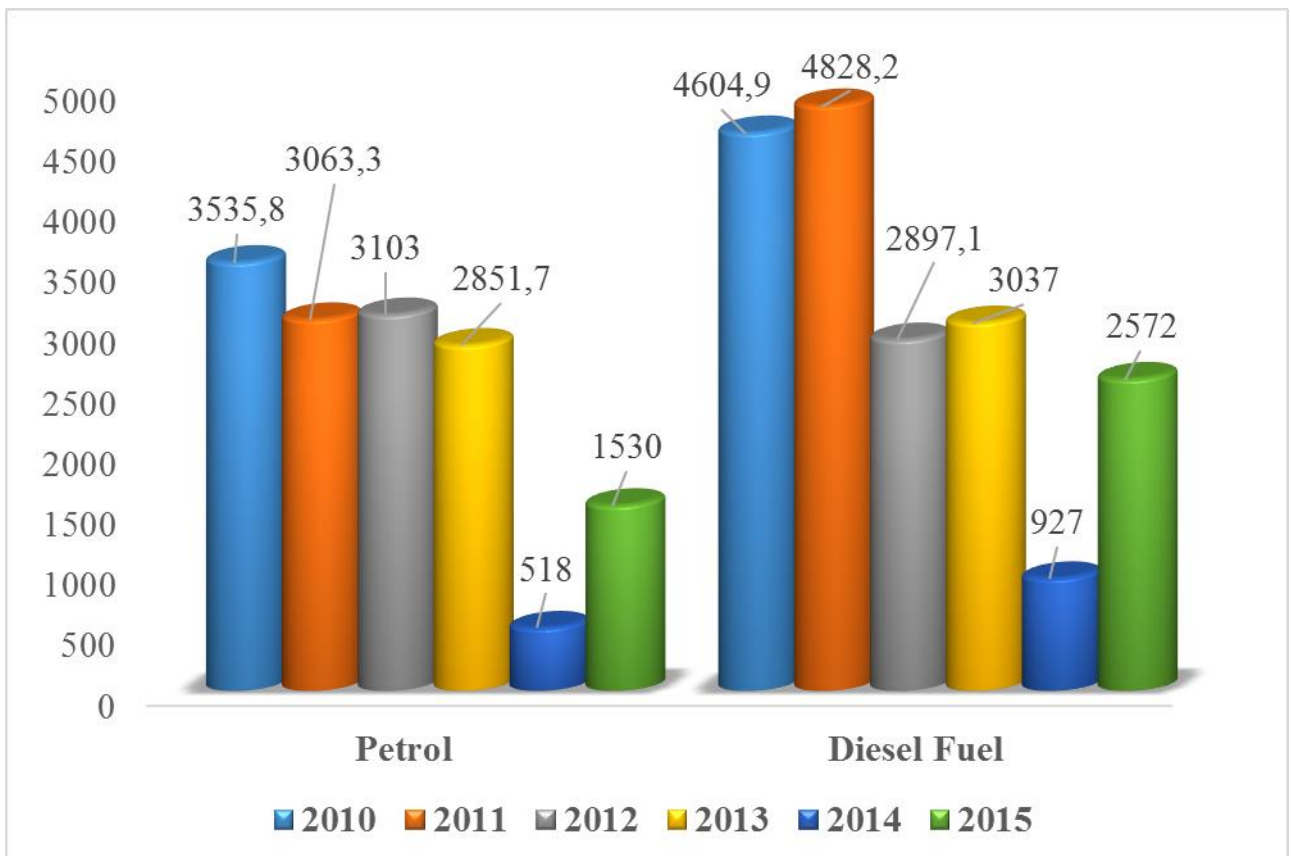
There is a two-track electricity-powered rail line link connecting the station of Truskavets with the national network; there is a modern building providing services to passengers.

In addition to buses, taxis are widespread. Parking places for taxis are situated in the most popular locations: near external transport outlets, near mass commerce outlets, and near hotels.

Consumption of fuel by transportation vehicles, tonnes

#	Type of Fuel	Year					
		2010	2011	2012	2013	2014**	2015
1	Petrol	3 535,8	3 063,3	3 103,0	2 851,7	518,0 (2190,5)	1 530,0
2	Diesel Fuel	4 604,9	4 828,2	2 897,1	3 037,0	927,0	2 572,0
	Total	8140,7	7891,5	6000,1	5888,7	1445,0	4102,0

* Data obtained from the Main Department of Statistics in Lviv Region



3. City Energy Balance

In order to ascertain and clearly compare the consumption of various types of power sources, one needs to compile a balance of energy consumption in the city with a breakdown into (a) types of energy sources; as well as (b) categories of consumers.

All of the varieties of energy sources are expressed through a unified value: MWh (megawatt-hour). In order to translate the values accordingly, the following coefficients have been applied.

Coefficients used to translate natural values of energy consumption into MWh

Energy Source	Natural Value	Value in MWh
Thermal Energy	1Gcal	1,16
Electrical Energy	1,000 kWh	1
Natural Gas	1,000m ³	9,4
Petrol	1 tonne	12,4
Diesel Fuel	1 tonne	11,8

Consumption of NATURAL GAS in Truskavets (2010 to 2014), MWh

#	Sector	Year					Total
		2010	2011	2012	2013	2014	
1	Population	55865,9	79629,9	81562,8	77104,6	83276,1	377439,2
2	Budget	19488,3	21797,7	28660,4	28894,7	14965,8	113807,0
3	Industry	590,3	603,2	730,9	716,4	553,8	3194,5
4	Other (sanatoria, hotels, religious organisations and NGOs)	137132,4	152180,6	174145,8	166062,4	132027,4	1995740,3
	Total	213076,9	254211,5	285099,9	272778,1	230823,0	2490181,0

Consumption of THERMAL ENERGY in Truskavets (2010 to 2014), MWh

#	Sector	Year					Total
		2010	2011	2012	2013	2014	
1	Population	-	12457,2	30615,9	24034,0	16706,3	83813,0
2	Budget	1898,1	5430,1	8230,9	7011,7	4980,8	27552,0



3	Industry	-	-	-	-	-	-
4	Other (sanatoria, hotels, religious organisations and NGOs)	46527,0	45632,1	46734,8	46908,3	35474,7	221277,0
	Total	48425,1	63519,4	85581,6	77954,0	57161,8	332642,0

**Consumption of ELECTRICAL ENERGY in Truskavets (2010 to 2014),
MWh**

#	Sector	Year					Total
		2010	2011	2012	2013	2014	
1	Population	14399,9	17169,6	15457,6	17619,6	17286,1	81932,9
2	Budget	6650,8	7206,1	6846,8	7934,3	7193,4	35831,4
3	Industry	3189,0	3455,2	3283,0	3804,4	3449,2	17180,8
4	Other (sanatoria, hotels, religious organisations and NGOs)	45221,8	48996,9	46554,1	53948,8	48910,6	243632,2
5	Street illumination	745,3	770,9	662,0	626,8	837,8	3642,8
	Total	70206,8	77598,7	72803,5	83934,0	777677,1	382220,1

**Consumption of FUEL by TRANSPORTATION VEHICLES
in Truskavets (2010 to 2014) (rough data), MWh**

#	Type of Fuel	Year				
		2010	2011	2012	2013	2014
1	Petrol	43 843,9	37 984,9	38 477,2	35 361,1	6 423,2
2	Diesel Fuel	54 337,8	56 972,8	34 185,8	35 836,6	10 938,6
	Total	98 181,6	94 957,7	72 663,0	71 197,7	17 361,8

Upon having analysed the market of consumption of energy sources, we have ascertained four main sectors of END USERS:

- Residential Areas;
- Budget-funded Municipal Infrastructure;
- Industry;
- Transportation Vehicles;

Other (sanatoria, hotels, religious organisations and NGOs)



**Consumption of energy sources in Truskavets broken down into selected sectors of
END USERS in the year of 2012—expressed in natural values**

END USER of energy sources	Amount of Energy Sources Consumed				
	Electrical Energy, MWh	Thermal Energy, Gcal	Natural gas, thous. m ³	Fuel, tonnes	
				Petrol	Diesel
Residential Areas;	15 457,6	26 393,0	8 676,9	-	-
Budget-funded Municipal Infrastructure;	7 508,8	7 095,6	3 049,0	-	-
Industry	3 283,0	-	77,8	-	-
Transport	-	-	-	3 103,0	2 897,1
Other (sanatoria, hotels, religious organisations and NGOs)	46 554,1	40 288,6	18 526,1	-	-
Total	72 803,5	73 777,2	30 329,8	3 103,0	2 897,1

**Consumption of energy sources in Truskavets broken down into selected
sectors of END USERS in the year of 2014—expressed in natural values**

END USER of energy sources	Amount of Energy Sources Consumed				
	Electrical Energy, MWh	Thermal Energy, Gcal	Natural gas, thous. m ³	Fuel, tonnes	
				Petrol	Diesel
Residential Areas;	17286,1	14 402,0	8 859,2	-	-
Budget-funded Municipal Infrastructure;	8031,2	4 293,8	1 592,1	-	-
Industry	3449,2	-	58,9	-	-
Transport	-	-	-	518,0	927,0
Other (sanatoria, hotels, religious organisations and NGOs)	48910,6	30 581,6	14 045,5	-	-
Total	77677,1	49 277,4	24 555,7	518,0	927,0



**Consumption of energy sources in Truskavets broken down into selected sectors of
END USERS in the year of 2012—expressed in MWh**

END USER of energy sources	Amount of Energy Sources Consumed					Total	%
	Electrical Energy	Thermal Energy	Natural Gas	Fuel			
				Petrol	Diesel		
Residential Areas;	15 457,6	30 615,9	81 562,9	-	-	127 636,4	24,7
Budget-funded Municipal Infrastructure;	7 508,8	8 230,9	28 660,6	-	-	44 400,3	8,6
Industry	3 283,0	-	731,3	-	-	4 014,3	0,8
Transport	-	-	-	38 477,2	34 185,8	72 663,0	14,1
Other (sanatoria, hotels, religious organisations and NGOs)	46 554,1	46734,8	174145,3	-	-	267 434,2	51,8
Total	72 803,5	85 581,6	285 100,1	38 477,2	34 185,8	516 148,2	-
%	14,1	16,6	55,2	7,5	6,6	-	100 %

**Consumption of energy sources in Truskavets broken down into selected sectors of
END USERS in the year of 2014—expressed in MWh**

END USER of energy sources	Amount of Energy Sources Consumed					Total	%
	Electrical Energy	Thermal Energy	Natural Gas	Fuel			
				Petrol	Diesel		
Residential Areas;	17 286,1	16 706,3	83 273,1	-	-	117 265,5	30,6
Budget-funded Municipal Infrastructure;	8 031,2	4 980,8	14 965,8	-	-	27 977,8	7,3
Industry	3 449,2	-	553,8	-	-	4 003,0	1,0
Transport	-	-	-	6 423,2	10 938,6	17 361,8	4,5
Other (sanatoria, hotels, religious organisations and NGOs)	48 910,6	35 474,7	132 027,4	-	-	216 412,7	56,6
Total	77 677,1	57 161,8	230 820,1	6 423,2	10 938,6	383 020,8	-
%	20,3	14,9	60,3	1,7	2,8	-	100 %



Based on the input data obtained through the analysis presented above, we have derived that the largest consumer of energy sources in the city of Truskavets is the sector of sanatoria, resorts, spa, and other consumers (56.6%), next goes the residential sector (30.6%). The city mostly consumes electrical energy (20.3%) and natural gas (60.3%).

Analysis of energy sources consumption broken down into selected sectors of end users in the city of Truskavets, tendencies of changes in consumption patterns, expressed in MWh.

END USER of energy sources	Amount of Energy Sources Consumed					Total
	Electrical Energy	Thermal Energy	Natural Gas	Fuel		
				Petrol	Diesel	
Residential Areas;	+1828,5	-13909,6	+1710,2	-	-	-10370,9
Budget-funded Municipal Infrastructure;	+522,4	-3250,1	-13694,8	-	-	-16422,5
Industry	+166,2	-	-177,5	-	-	-11,3
Transport	-	-	-	-32054,0	-23247,2	-55301,2
Other (sanatoria, hotels, religious organisations and NGOs)	+2356,5	-11260,1	-42117,9	-	-	-51021,5
Total	+4873,6	-28419,8	-54280,0	-32054,0	-23247,2	-133127,4

4. Assessment of the Current Situation with Emissions

Considering the fact that the first year starting from which we have had the most complete and precise data on the matter of consumption of energy sources citywide is the Year 2012, we have selected this year as the Baseline Year for the purposes of the present Action Plan.

In order to measure and calculate CO₂ emissions, we have applied standard coefficients established by the Intergovernmental Panel on Climate Change.



CO₂ emission coefficients per resource unit*

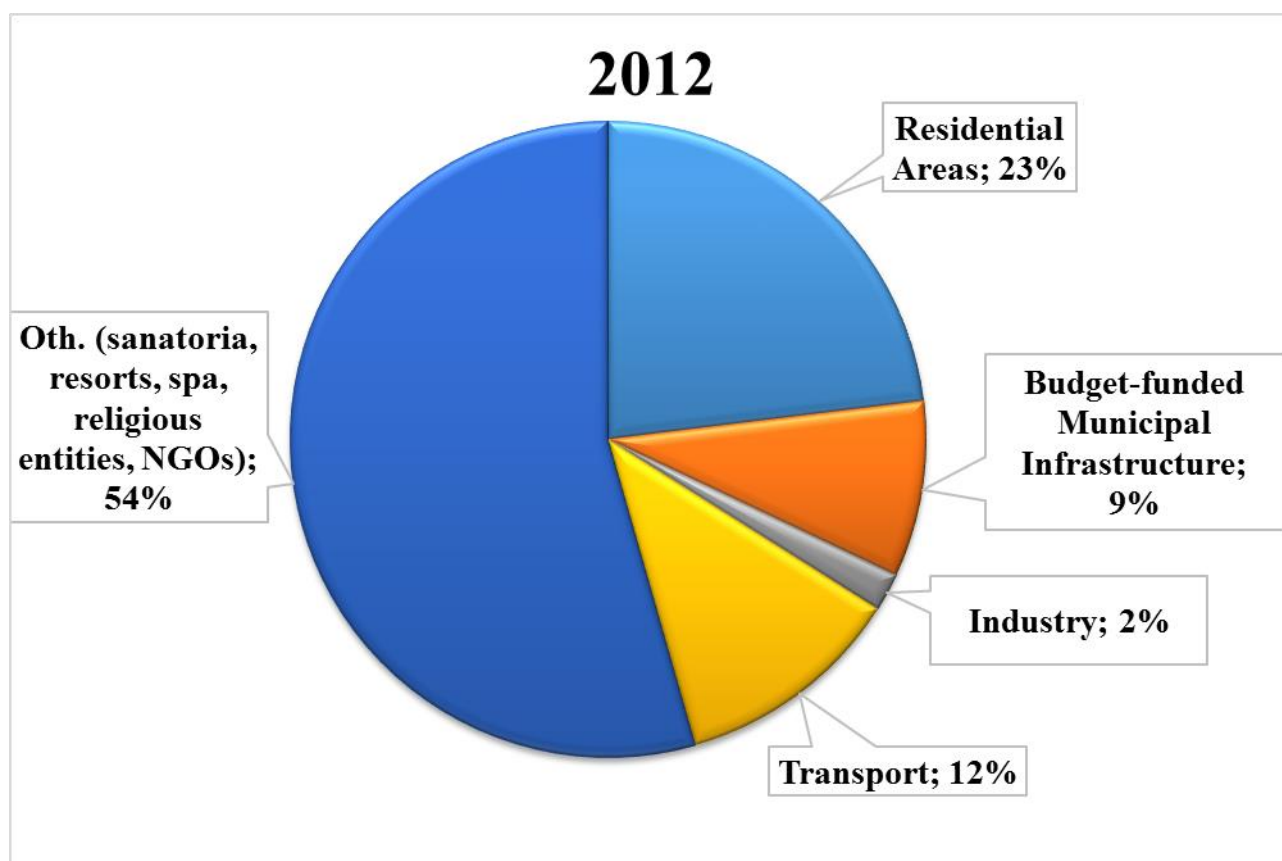
Energy Source	Natural Value	Value in tonnes
Electrical Energy	1 MWh	0,912
Thermal Energy	1 MWh	0,216
Natural Gas	1 MWh	0,202
Petrol	1 MWh	0,249
Diesel	1 MWh	0,267

**In order to perform the present calculations, we have applied the standard emission coefficients for fuel materials suggested by the EC Covenant of Mayors initiative. The coefficient used to translate electrical energy into a tonne of CO₂ is the same which is stipulated in the official CoM document «Guidebook on How to compile a Sustainable Energy Development Action Plan in the cities of Eastern Partnership and Central Asia – GUIDELINE. Part 2 Basic Registry of Emissions» (Clause 21 Table "IPCC National Coefficients of Emissions for Electrical Energy») For Ukraine, the 2012 coefficient is applied (0.912).

Register of CO₂ emissions in the year of 2012, expressed in tonnes

END USER of energy sources	Amount of CO₂ emitted through					Total
	Electrical Energy	Thermal Energy	Natural Gas	Fuel		
				Petrol	Diesel	
Residential Areas	14097,33	6613,03	16475,71	-	-	37186,07
Budget-funded Municipal Infrastructure	6848,03	1777,87	5789,44	-	-	14415,34
Industry	2994,10	-	147,72	-	-	3141,82
Transport	-	-	-	9580,82	9127,61	18708,43
Oth. (sanatoria, resorts, spa, religious entities, NGOs)	42457,34	10094,72	35177,35	-	-	87729,41
Total	66396,8	18485,62	57590,22	9580,82	9127,61	161181,07

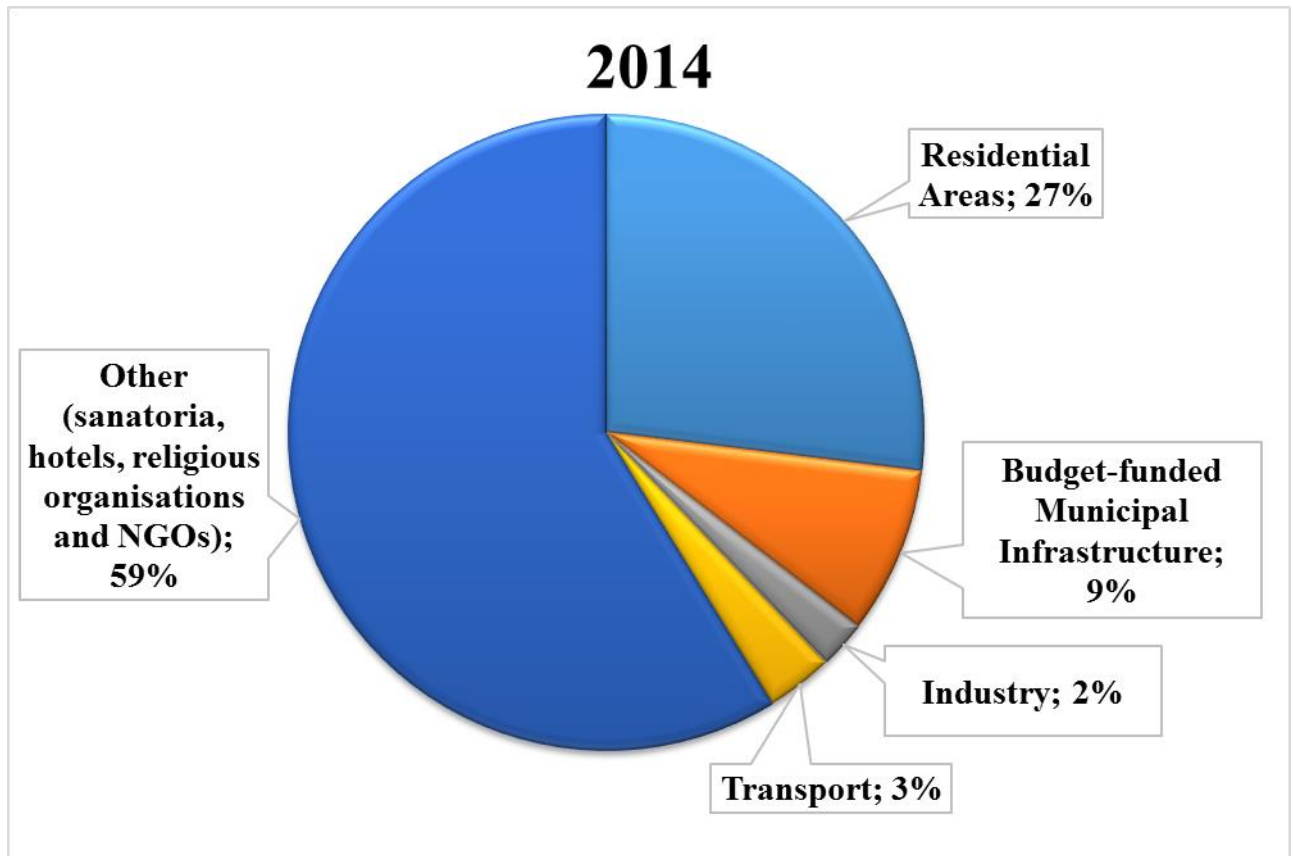




Register of CO₂ emissions in the year of 2014, expressed in tonnes

END USER of energy sources	Amount of CO ₂ emitted through					Total
	Electrical Energy	Thermal Energy	Natural Gas	Fuel		
				Petrol	Diesel	
Residential Areas	15764,92	3608,56	16821,17	-	-	36194,65
Budget-funded Municipal Infrastructure	7324,45	1075,85	3023,09	-	-	11423,39
Industry	3145,67	-	111,87	-	-	3257,54
Transport	-	-	-	1599,38	2920,61	4519,99
Other (sanatoria, hotels, religious organisations and NGOs)	44606,47	7662,54	26669,53	-	-	78938,54
Total	70841,51	12346,95	46625,66	1599,38	2920,61	134334,11





Thus we can summarise that baseline emissions in Truskavets through usage of energy sources amount to 161,100 tonnes of CO₂ per year.

Greenhouse gas emissions through usage of energy sources in Truskavets has reduced by about 16.66% in the latest years as a result of a range of energy saving projects that have been implemented.

The calculations presented above clearly show that the main source of greenhouse gas emissions in the city of Truskavets is the “Other” sector, specifically: sanatoria, health resorts, spa, religious organisations and NGOs which actually show a tendency to increase their emissions over time.

Therefore, the baseline **level of emission of carbon dioxide into the atmosphere has amounted to 161,181.07 tonnes of CO₂ in 2012.**

Upon having reached such conclusions, the city authorities deem it necessary to proceed with further policies aimed at saving energy sources, particularly and specifically focusing on interaction with local residents, educating them in terms of energy saving behaviour, promoting energy saving technologies, and taking other efficient steps in this direction.



5. Sustainable Energy Action Plan

5.1. Purpose and Mission of the Action Plan

This section contains brief info on the SEAP (2016 to 2020) aimed at reduction of CO₂ emissions in the city of Truskavets.

The present Action Plan stipulates application of information and technical activities. Implementation of such energy efficiency activities calls for allocation of proper funding and relevant political instruments.

Implementation of energy saving and energy efficiency activities will help reduce the consumption of fuel and energy sources which in turn will help reduce emission of harmful substances into the atmosphere and prevent global warming and climate change.

In order to fulfil our undertaking under the Covenant of Mayors, every 2 years of implementation (2018, 2020) we shall be composing and submitting progress reports on results achieved in order to ascertain activities needed to accomplish the undertaking and monitor the emissions of CO₂.

Considering the information provided in the preceding chapter, with the current emissions level being at 161,181.07 tonnes of CO₂ in 2012, it is evident to us that by 2014 we had reduced the emissions by 26,846.96 tonnes. In order to meet the target values established by the present #Action Plan (i.e. in order to reduce CO₂ emissions citywide by 21,25%), we need to have a cumulative reduction of CO₂ emissions by at least 7,401.57 tonnes from 2016 to 2020.

5.2. Scheduled Activities Aimed at Reduction of the CO₂ Emissions

5.2.1. Information activities

#	Nature and substance of activity	Responsible individual, department, or organisation	Implementation Timeline	Estimate funding, thousand of UAH*	Anticipated energy savings, MWh/year**	Anticipated reduction of CO ₂ emissions (tonnes/year)
1	Energy Days	Truskavets City Council	2016-2020	21,0	47,4	14,22
2	School workshops on energy saving	Education Department of TCC	2016-2020	1,0	20,4	6,12
3	Creation of monitoring groups among 9-11 form pupils to oversee heat, electricity, and water consumption in school premises	Education Department of TCC	2016	1,0	2,0	1,76
4	Engagement of school monitoring groups in composition of plans on how to enhance energy efficiency in schools and holding a competition for the best plan	Education Department of TCC, Truskavets City Council	2016-2020	7,0	0,7	0,62
5	Publishing/procurement of guidebooks on energy saving	Education Department of TCC	2016-2020	10,0	15,7	4,71
6	Children's drawing competition: «Energy Saving»	Education Department of TCC, Truskavets City Council	2016-2020	3,5	2,3	0,70
7	Photo competition on energy saving and environment protection in the city of Truskavets	Truskavets City Council, NGOs	2016-2020	7,0	7,2	2,2
8	Encouraging members of Housing Cooperatives and residents of other buildings to reduce energy expenditure in housing estates in the form of material and moral incentives	Truskavets City Council, Housing Cooperatives, NGOs	2016-2020	50,0	57,8	17,3
9	Encouraging enterprises to adopt the ISO: 50001 standard	Truskavets City Council	2016-2020	0,0	134,1	54,2

10	Topical sessions, presentations, and films on energy saving and ecology	Truskavets City Council, NGOs	2016-2020	0,0	18,7	5,6
11	Distribution of leaflets among city residents containing information on energy saving	Truskavets City Council	2016-2020	0,0	6,9	2,1
12	Energy audits of municipally owned buildings	Truskavets City Council	2016-2016	80,0	0	0
13	Conducting energy monitoring and analysis of consumption of energy sources	Truskavets City Council	2016-2020	4,0	62,4	18,7
14	Implementation of Energoplan software for efficient monitoring of energy consumption by municipal buildings	Truskavets City Council	2016	7,2	0	0
15	Establishing ceilings for fuel and energy and water consumption for municipally funded organisations	Truskavets City Council	2018	0,2	32,1	9,6
16	Conducting topical conferences, seminars, round tables with the community	Truskavets City Council	2016-2020	20,0	24,8	7,4
17	Conducting polling of residents or building employees that are to be subject to implementation of energy efficient activities	Truskavets City Council	2016-2020	0,0	2,4	0,7
18	Topical sections in local mass media	Truskavets City Council	2016-2020	0,0	50,5	15,1
19	Organisation and equipping of a permanently operating exhibition on contemporary energy efficient technologies	Truskavets City Council	2016	7,0	20,6	6,1
20	Promoting green construction citywide	Truskavets City Council	2016-2020	7,0	20,6	6,1
21	Organisation of training sessions for local stakeholders on the matter of implementation of energy saving projects	Truskavets City Council	2016-2020	15,0	48,0	15,0

22	Printout and distribution of SEAP for the city of Truskavets by 2020	Truskavets City Council	2016	0,0	21,2	6,4
Total				223,9	575,2	188,53

* The calculations considered the necessity to engage funding for information activities by 2020.

**The calculations used statistical data on energy consumption, qualitative and quantitative values for objects provided by enterprises, institutions, and organisations of any kind of property;

In order to calculate the reduction of energy consumption, we have used the technical parameters of the equipment and the characteristics of the equipment as well as the following standards: DSTU B V.2.6-34:2008, DSTU B V.2.7-8-94.

***The data is calculated as a difference between consumption of energy sources by autonomous (individual) heating systems installed in flats of the residents and the natural gas consumed by Truskavetsteplo to heat the said flats (central heating).

5.2.2. Technical Activities

#	Nature and substance of activity	Responsible individual, department, or organisation	Implementation Timeline	Estimate funding, thousand of UAH	Anticipated energy savings, MWh/year	Anticipated reduction of CO2 emissions (tonnes/year)
RESIDENTIAL AREAS						
RE1	Replacement of windows and entrance doors in public places of 62 residential tower blocks	Building managers, Housing Cooperatives, residents, Truskavets City Council	2016-2020	2790,0	85,56	18,48
RE2	Insulation of external walls of 12 residential tower blocks	Department of Housing and Communal Facilities and Construction Development of Truskavets City Council, Housing Cooperatives, residents,	2016-2020	11426,8	10880,64	2350,22
RE3	Replacement of electrical lamps with energy saving lamps with automatic systems for management of illumination inside 95 residential tower blocks	Building managers, Housing Cooperatives, residents	2016-2018	216,0	411,7	375,47
RE4	Replacement of electrical consumption equipment in flats with more efficient models	Residents	2016-2020	5000,0	1152,0	1050,62
RE5	Replacement of electrical lamps with energy saving lamps in private residential houses (flats)	Residents	2016-2020	1090,0	72,00	65,66

RE6	Installation of autonomous (individual) gas or electric heating in the flats of residential tower blocks	Truskavets City Council, residents	2016-2018	10860,0	2937,6***	634,52
Subtotal				31 382,8	15 539,5	4 494,97
Budget-funded Municipal Infrastructure						
B1	Complex thermal retrofitting of the School and Grammar School No. 2 in the city of Truskavets (Creation of a centre for promotion of healthy lifestyle within the School/Grammar School No. 2 in the city of Truskavets)	Truskavets City Council, Education Department of TCC	2016-2020	12236,034	558,4	181,6
B2	Reconstruction of the roof and insulation of the walls of the School No. 3 in 98 Stebnytska Street in Truskavets	Truskavets City Council, Education Department of TCC	2016-2020	7160,123	367,99	131,2
B3	Thermal Retrofitting of the Minimally Invasive Surgery Centre in the City Hospital (Reconstruction of the Minimally Invasive Surgery Centre in the City Hospital of Truskavets)	Truskavets City Hospital Municipal Enterprise	2016-2020	5454,6	3343,4	1090,6
B4	Thermal Retrofitting of Truskavets Children's and Adolescent Sports Club SPORTOVETS with replacement of windows and insulation of the façade under the following address: city of Truskavets, 11 Danylyshnykh Street	Truskavets City Council, Education Department of TCC	2016-2020	2649,495	799,7	257,3
B5	Capital repair of the city lighting system in the city of Truskavets, Sahaidachnoho, Boryslavska, Stebnytska, and Mazepy streets with introduction of energy saving (LED) illumination technologies and systems of management and consumption tracking	Truskavets City Council	2016-2020	4110,0	73,58	67,10
B6	Reconstruction (thermal insulation) of the façades of educational establishment	Truskavets City Council	2016-2020	9300,0	647,6	139,88

	(kindergartens, art school) In the city of Truskavets					
B7	Replacement of electrical lamps with energy saving lamps in municipal buildings	Truskavets City Council	2016-2020	50,0	64,4	58,73
B8	Reconstruction (thermal insulation) of cultural institutions	Truskavets City Council	2016-2020	4800,0	334,3	72,21
B9	Reconstruction (thermal insulation) of polyclinical, surgical, and therapeutic buildings of the city hospital	Truskavets City Hospital Municipal Enterprise	2016-2017	10038,3	329,44	71,16
B10	Reconstruction of roofs with thermal insulation in 5 budget/municipal institutions	Truskavets City Council	2016-2020	1920,0	155,42	33,57
B11	Closing two boilerhouses and full transition to autonomous (individual) heating systems.	Truskavets City Council, Truskavetsteplo, residents of the city	2016-2018	600,0	-	-
B12	Construction of energy efficient boiler house for the Art School in 11 Richky Street	Truskavetsteplo ME	2016-2017	1458,0	47,0	10,15
Subtotal				59 776,552	6 721,23	2 113,5
Industry						
In1	Introduction of heating systems operating on renewable fuel within industrial enterprises operating in the city	industrial enterprises in the city	2016-2020	5000,0	1220,0	263,52
In2	Replacement of electrical lamps in the premises of industrial enterprises with energy saving ones	industrial enterprises in the city	2016-2018	12,0	15,33	13,98
Subtotal				5 012,0	1 235,33	277,5
Transport						
T1	Expansion of pedestrian-only area in the health resort heart of the city	Truskavets City Council	2016-2020	1800,0	105,1	26,17
T2	Creating options for electrical cars to be running in the city	Truskavets City Council, petrol stations	2016-2020	570,0	245,8	61,45
T3	Switching city taxis to electric cars	Private entrepreneurs in transportation	2018-2020	3000,0	194,38	48,40

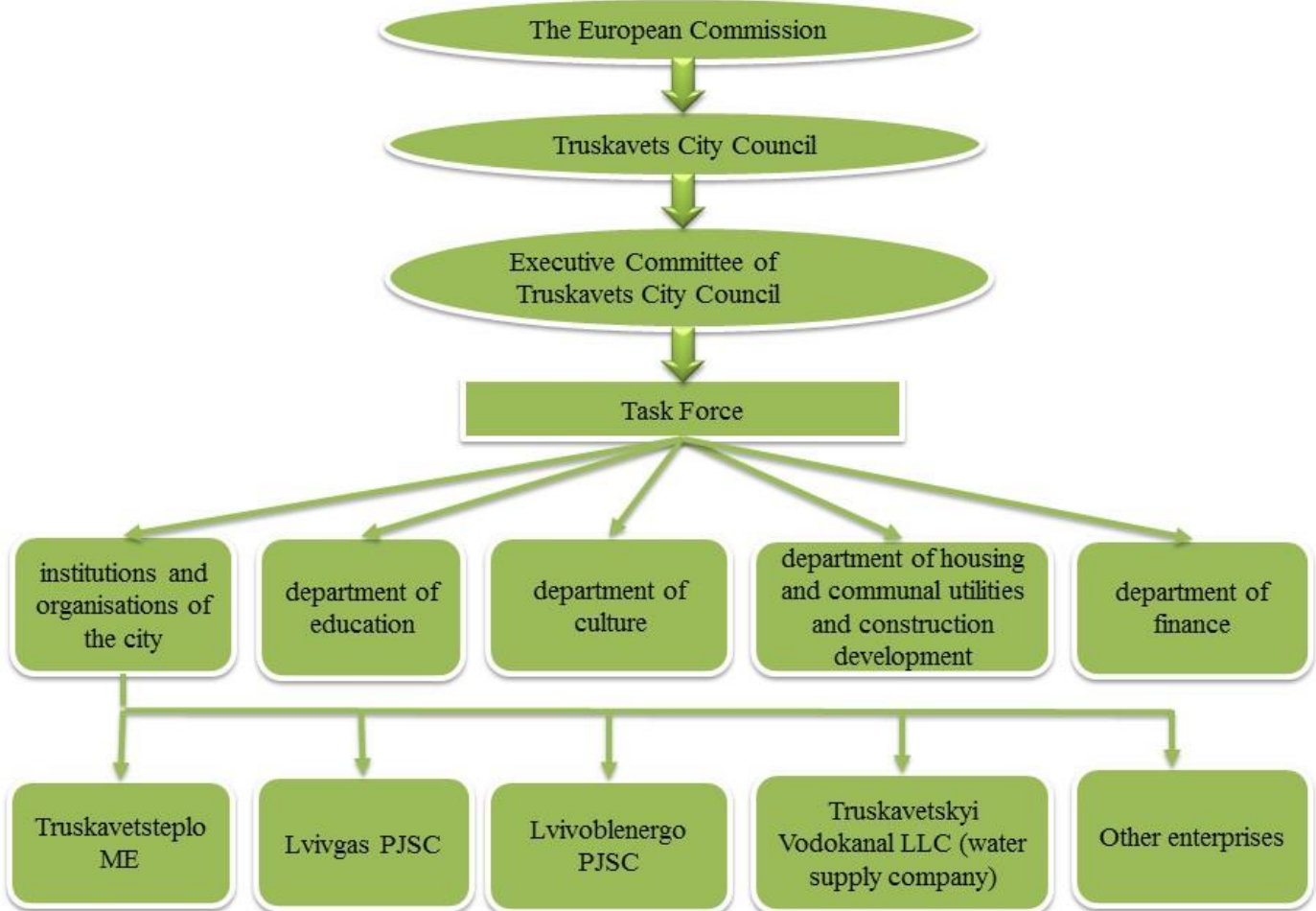
Subtotal				5 370,0	545,28	136,02
Other						
O1	Introduction of heating systems operating on renewable energy sources in religious institutions of the city (churches)	Religious organisations	2016-2020	1500,0	84,6	18,27
O2	Replacement of electrical lamps in the premises of religious institutions of the city with energy saving ones	Religious organisations	2016-2016	10,8	18,4	16,78
Subtotal				1 510,8	103,00	35,05
HARD DOMESTIC WASTE						
hdw	Upgrading the system of handling hard domestic waste (collection, transportation, separation and processing of various types of rubbish)	Truskavets City Council,organiser of HDW transportation	2016-2020	300,0	-	156,0
Subtotal				300,0	-	156,0
Total				103 576,052	24 719,54	7 401,57

In 2014, we had already managed to reduce CO₂ emissions by 26,846.96 tonnes as a result of thermal insulation (retrofitting) of buildings.

The technical and information activities stipulated by the present Action Plan are expected to result in the reduction of greenhouse gas emissions by 7,398.21 tonnes of CO₂ by 2020. By and large, the reduction of CO₂ emissions shall amount to minus 21.25% by year 2020 as compared to the values of the Baseline Year of 2012.

6. Administrative Dimension of the Action Plan

6.1. Organisation framework



6.2. Monitoring and Assessment of the Progress of SEAP Implementation

As per Decree of the Mayor No. 66-R dated 15-Feb-2016, the development of the SEAP shall be conducted by a Task Force that is to use the collected materials as basis. The SEAP Task Force shall ensure the coordination of the operation of structural subdivisions of the executive committee, enterprises, institutions, and organisations of the city on the matters related to preparation of the project. Upon the approval of the SEAP by virtue of a Resolution of the City Council, the materials shall be handed over to the European Commission for examination.

Monitoring is an important component of the SEAP implementation process. Since November 2015, a system of monthly and yearly monitoring of energy consumption has been in place in Truskavets municipal institutions. The said monitoring system also engages subdivisions of Truskavets City Council (department of education, department of culture, department of housing and communal utilities and construction development) as well as various organisations operating in the city

(Truskavetsteplo ME, Truskavets City Hospital ME, TKO Komfort Servis LLC, Truskavetskyi Vodokanal LLC (water supply company), Lvivgas PJSC, Park Kurortnyi ME, Truskavetskurort PJSC, Lvivoblenergo PJSC, Hotel Management Group LLC). Each of the said institutions has a responsible employee appointed by the manager to conduct "grassroot monitoring".

Generalised data are being created and calculated by the energy manager of Truskavets City Council. The data obtained thereby are available to any official directly or indirectly affecting the energy saving and energy sources saving tendencies citywide. The results of the monitoring are used to prepare suggestions as to how administrative or technical measures may be taken.

By conducting the said monitoring, one manages to detect and eliminate various obstacles in the form of standstills, waste, unforeseen circumstances, force majeure etc.

Signatories to the Covenant of Mayors are obliged to submit the Report on Implementation every two years following the submission of the Action Plan in order to conduct evaluation, monitoring, and provide confirmation. Sample report forms are made available by the European Commission. Such a report on implementation is to contain the most up to date information on the CO₂ emissions (monitoring of information reports on emission levels). A «Report on Implementation» shall contain quantitative info on the measures taken and activities conducted, their impact on energy consumption and CO₂ emissions level, as well as analysis of the SEAP implementation process including corrections and preventive activities if any are necessary.

Budget/municipal institutions and enterprises of any kind of ownership are to provide info every year by 15-Feb on measures funded and implemented as well as data on scheduled/upcoming energy saving activities.

7. Sources Engaged to Fund the SEAP

As per Clause 12 of the Ukrainian Law «On Energy Saving» dated 01-July-1994. No. 74/94-VR, the following sources shall be used to fund activities aimed at efficient usage of fuel and energy sources: State Fund for Energy Saving, own funds and loan funds of enterprises, institutions, and organisations, National Budget of Ukraine, local budgets, as well as other sources.

Activities scheduled for 2016 to 2020 in Truskavets are expected to be funded from the following sources:

- Local budget;
- Other budgets (regional, national);
- Own funds of enterprises, organisations, and individuals;
- International and Ukrainian credit funds;
- Funds obtained through saving of energy sources as a result of reduction of energy consumption;
- International technical assistance;
- Sponsorship funds;
- National and international target programmes and grants.

8. Anticipated Results of SEAP Implementation

The main result of the SEAP 2020 implementation in Truskavets is to cherish awareness among local denizens with respect to nature and energy sources. As of the present time, there is no single accepted methodology that would allow to assess environmental impact of energy saving in monetary terms. Preceding sections focused on the economic effect achieved through energy saving and reduction of CO₂ emission into the atmosphere. One should, however, note that the bulk of energy saving activities not only bring about economic and ecological effect but also a social impact.

As a result of the implementation of the present measures scheduled by Truskavets SEAP 2020, we plan to achieve a reduction of CO₂ emissions by 21,25% as compared to the emissions level in the baseline year.

Secretary of the City Council

N. Ponomarenko